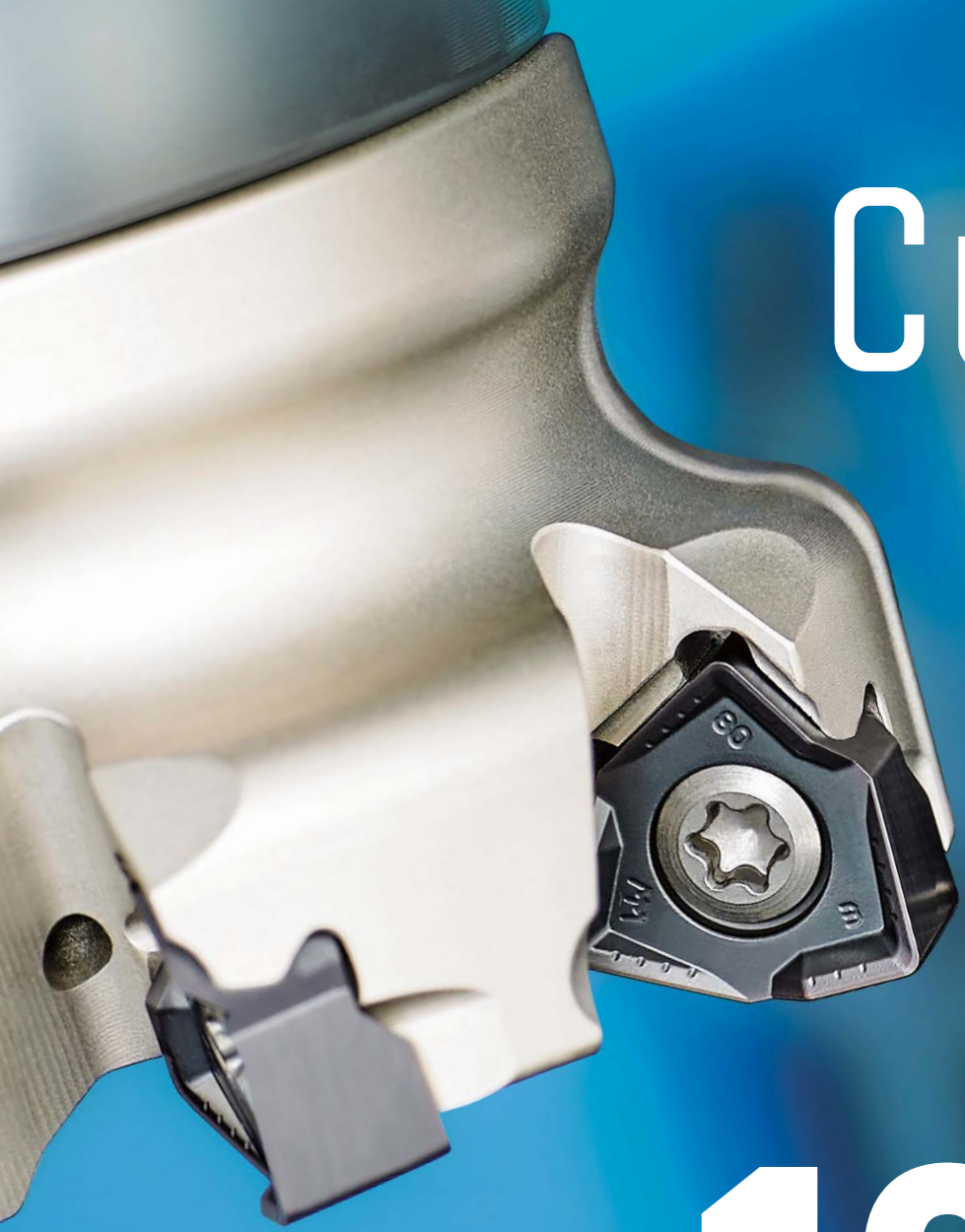
KORLOY Product Catalog - English

Cutting Tools



2018›19

Aerospace Industry

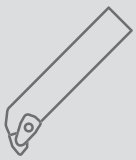
Automotive Industry

Medical Industry

Railway Industry

KORLOY

2018▸2019
KORLOY CUTTING TOOLS



Turning



Milling



Holemaking



Endmilling

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SAFETY GUIDE OF CARBIDE PRODUCTS

KORLOY Inc. is continuously trying to develop safer and higher quality products
Please be aware of the safety guidelines below prior to using KORLOY Inc. products

- It is generally accepted that the proper handling of cemented carbide tools requires awareness of safety as noted above. For more information, please contact us.
- KORLOY does not accept any responsibility for any accident caused by inappropriate use, abuse of tools, or changes to the products.

1. PL (Product Liability)

In accordance with the PL (Product Liability) law, we have attached a WARNING label on the case of KORLOY products.
There is no warning on the surface of the tools. Please read this safety guidelines before using carbide tools and provide safety education to all users.

2. Basic characteristics of CEMENTED CARBIDE tools

Cemented carbide tools are made of carbides, nitrides, carbonitrides, oxides of Tungsten (W), Titanium (Ti), Alluninyum (Al), Silicon (Si), Tantalum (Ta), Boron (B) etc and metal omponent like Cobalt (Co), Nickel (Ni), Chrom (Cr), Molybdenum (Mo) as binder. Cemented carbides tools have high hardness and specific gravity.
Generally there's no smell but according to usage and treatment, appreance and color could be changed

3. Precaution for CEMENTED CARBIDE tools

1) Cemented carbides are extremely hard and brittle at the same time. Impact shock or excessive clamping power could cause fracture or breaking of the tool.
2) Cemented carbides have large sepcific gravity, thus they require special attention as a heavy material when you handle big sizes or large quantities.
3) Cemented carbides have different thermal expansion coefficient with steel and ferrous materials. Shrink fit or swell fit products may cause trouble if they are used at undesirable conditions like extremly high or low temperatures.
4) There are several cemented carbide products having sharp cutting edges.Be careful not to handle the tools with bare hands which may cause cuts or injury, especially when removing the tools from the case, do not touch the cutting edge and be careful not to drop it.
5) Storing carbide tools in a corrosive atmosphere may cause erosion which can reduce toughness.
6) Please refer to the catalouge safety guidance prior to handling the tools.
7) Do not absue tools under inappropriate conditions.

4. Precaution for machining (grinding, welding, EDM) of CEMENTED CARBIDE tools

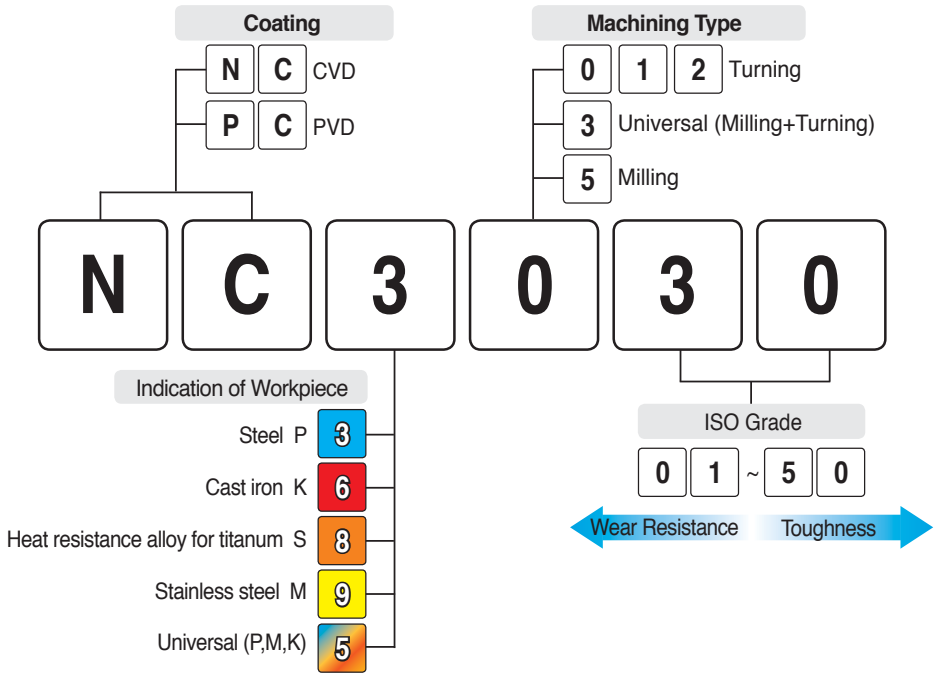
1) Surface condition can affect the toughness of the tool, so it is recommended to use a diamond grinding wheel.
2) Grinding of cemented carbide creates mist and dust. It contains harmful compositions like Cobalt (Co), thus it is recommended to use a mask, mist collection, and other protective facilities. If the dust gets in your skin or eye, rinse immeditely with continously running water.
3) In case of grinding with coolant, coolant contains harmful metal components which cause environmental problems. Handle the coolant according to the manufacturer's recommendations.
4) Check for cracks after re-grinding carbide tool and reuse.
5) Marking with laser or electric pen may cause cracks on the carbide tool. The crack can shortened tool life.
6) EDM of carbide may cause residual cracks on the carbide tool, so if necessary , remove the crack with a grinding process.
7) Brazing of carbide tools at extremly high or low temperatures compare with the melting point of brazing materials may cause loosening or breakage.
8) Overheating a oil base coolant may cause a fire or flames, thus be prepared for fire prevention.

5. METALCUTTING SAFETY

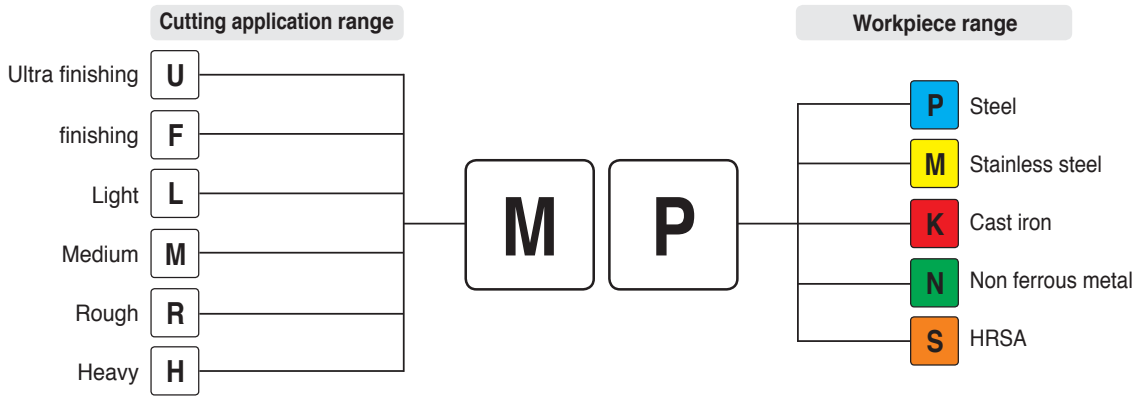
	DANGEROUS FACTOR	SAFETY COUNTERPLAN
Cutting tools	· Sharp cutting edge of cutting tools may cut your bare-hand	· Use gloves when pulling out the insert from the case or mounting it on the machine
	· Inappropriate conditions or usage may cause fragmentation and expel parts of tools which may cause injury	· Use glasses or safety cover for your safety · Use the tools within the recommended range · Please refer to catalogue and safety guidelines first
	· Severe load on tool and premature wear of cutting edge may bring excessive cutting force on tool, causing fracture of the tool and may cause injury	· Use glasses or safety cover for your safety · Change the tool as required before excessive wear or fracture
	· Chips evacuated during cutting are hot and sharp and maycause burns and cuts	· Use glasses or safety cover for your safety · Stop machining and put safety glove on and use a hook tool to remove chips
	· Touching the workpiece immediately after cutting may cause burns	· Use gloves or safety cover for your safety
	· Be aware of sparks, fire, or explosion of hot chips generated during the cutting operation	· Do not use at the place where having explosive materials · Prepare for fire extinguishments
	· In case of high RPM machining, vibration and chattering may occur due to the improper balance of the machine	· Use glasses or safety cover for your safety · Check first if there's any chattering, vibration or strange noises prior to your main cutting operation
	· Touching a burr remaining on the workpiece with a bare-hand may cause a cut	· Do not touch the burr with bare-hand · Use gloves or safety cover for your safety
	· Loose clamping of the workpiece may cause the tool to fracture and result in damage to the cutter body and possible injury	· Clamp the workpiece tightly
	· Tools are operated to right-hand direction normally · Left-hand direction operation can cause fracture of tool and body damage	· Do not use left-hand direction without notice · Check the package of product to check the availability of left-hand operation
Indexable tools	· Loose clamping of inserts and parts may result in ejection of the tool during cutting and may cause serious injury	· Check the clamping of inserts and parts prior to machining,and use original parts only
	· Over loaded clamping of inserts by a lever (such as a pipe) may cause dangerous fracturing of parts and inserts	· Do not use lever inappropriately
	· In case of high speed machining, parts and inserts can be forced out by centrifugal force	· Use within recommended condition · Use glasses or safety cover for your safety
Rotating tools	· Since cutter has sharp cutting edges touching with a bare-hand may cause a cut	· Use gloves or safety cover for your safety
	· It is dangerous to use glove with rotating machine · Contact with body or clothes is dangerous with rotating parts	· Do not wear gloves when you work with rotating machine · Keep your body and clothes away from rotating machine
	· Vibration generated by balancing trouble may cause a fracture and ejection of the tool which may cause serious injury	· RPM should be controled within recommended condition · Check the balance of rotating part periodically
	· In case of drilling, the uncut bottom core can fly out of the part with high speed and cause serious injury	· Use gloves or safety cover for your safety
	· The edges of small diameter drill are sharp and easy to break	· Use gloves or safety cover for your safety
Brazed tools	· Fragmentation and ejection of brazed carbide tip may cause injury	· Check the brazed tip before using · Do not use at high temperature cutting condition
ETC	· There's a possibility of breaking the carbide tip after several brazing	· Do not use brazing a tip that has been brazed several times
	· Abusing may cause fragmentation of tool and is very dangerous	· Stick to safety regulations and guidelines

KORLOY Inc. Code System

Grade Name for Coated Carbide



Chip Breaker



The same chip breaker code is used for both negative type and positive type.

Terminology of tool formula

TERM	CODE	UNIT
Tool diameter	D	inch
Cutting speed	vc	sfm
Revolution per minute	n	min
Feed per minute	vf	ipm
Feed per revolution	fn	ipr
Feed per tooth	fz	ipr
Tooth	z	-
Axial depth of cut	ap	inch
Radial depth of cut	ae	inch
Peak feed	pf	inch

TERM	CODE	UNIT
Horse power requirement	Pc	kW
Specific cutting resistance	kc	MPa
Torque	Mc	N.m
Thrust	Tc	N
Cycle time	tc	min
Tool life	T	min
Flank wear	V_s	inch
Crater wear	Kt	inch
Nose radius	r	inch

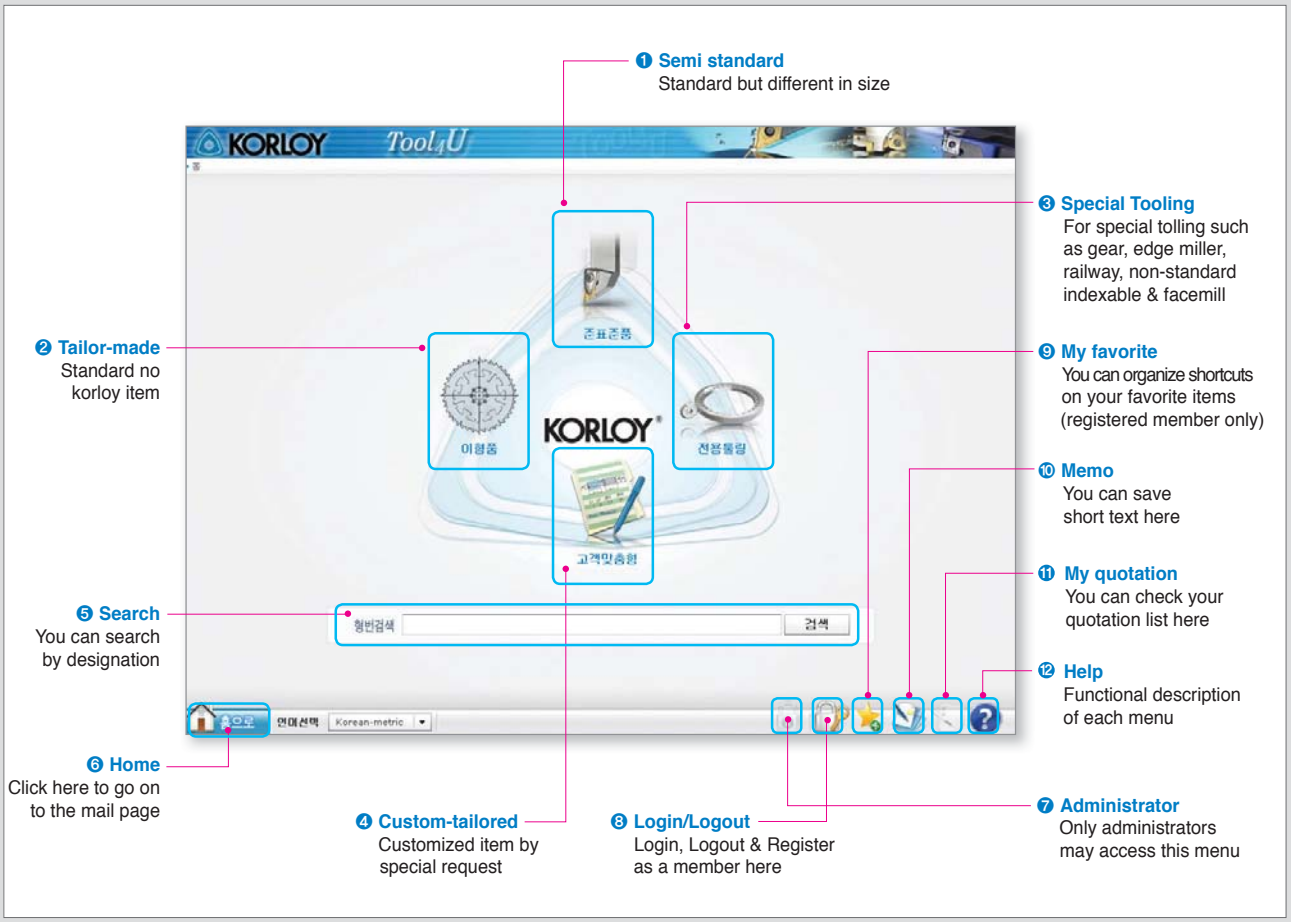
How to use Tool4U (Web quotation requriement)

1. Contact with Korloy Homepage

http://www.korloy.com (Korloy Homepage)

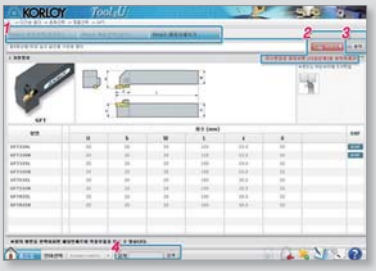
2. Click Tool4U banner-icon on the web site

3. Main page



4. Screen shot

Screen shot 1: step3. Product detail



1. **Step**: Select category, product and check product detail
2. **Next step**: Open new window for changing dimension
3. **Print**: Print current page
4. **Search**: Search product by designation

Screen shot 2: Size input page



Enter essential information needed to quote and click “Quote” button to send e-mail

A

GRADES & CHIP BREAKERS

KORLOY's new grades are designed with optimal substrates for each application and are PVD coated for high temperature, high hardness and oxidation resistance, or CVD coated for high tempeure and wear resistance. Additionally, the improved post-coating treatment provides superior surface finishes to ensure the highest levels of quality and productivity.



Grades

A02 Grades system

Turing Grades

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A05 CVD coated grades
A14 PVD coated grades
A17 Uncoated carbide grades
A19 Cermet grades
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Milling Grades

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A26 CVD coated grades
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Solid Endmills & Solid Drills Grades

A35 Solid endmills grade selections
A37 Solid drills grade selections

Others (Turning/Milling/Endmills)

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A41 DLC coated grades
A42 cBN inserts grades
A47 PCD Inserts grades

Chip Breakers

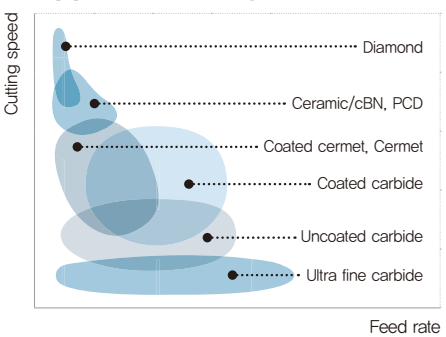
A48 Chip breaker for turning
A51 Chip breaker for milling
A55 Chip breaker for drilling

Grades system

Cutting tool

Uncoated carbide	P	Steel	ST10	ST20	ST30A						
	M	Stainless steel	U20								
	K	Cast iron	H01	H05	G10						
	S	Titanium alloy	H01	H05							
	N	Non-ferrous metal	H01	H05							
	H	Hardened steel	H01								
Coated carbide for turning	P	Steel	NC3215	NC3225	NC3120	NC3030	NC5330				
	M	Stainless steel	PC8105	PC8110	PC8115	NC9115	NC9125	NC5330	NC9135	PC5300	PC9030	PC5400
	K	Cast iron	NC6315	NC5330	PC5300	PC5400						
	S	HRSA	PC8105	PC8110	PC8115	NC9125	NC9135	PC5300	PC5400			
	N	Non-ferrous metal	ND3000	PD1000								
	H	Hardened steel	PC8105	PC8110	PC8115							
Coated carbide for milling	P	Steel	NC5330	NC5340	NCM325	PC3500	PC3600	PC5300	PC5400	NC5350	NCM335	
	M	Stainless steel	NC5330	NC5340	NCM325	PC5300	PC9530	NC5350	NCM335	PC5400		
	K	Cast iron	PC8110	PC6510	NC5330	PC5300	NC5340	PC5400				
	S	HRSA	PC5300	PC5400								
	N	Non-ferrous metal	ND3000	PD2000								
	H	Hardened steel	PC2005	PC2010	PC2015	PC210F	PC2505	PC2510				
Coated carbide for drills, endmills	P	Steel	PC3500	PC5300	PC5335	PC5400	NC5330					
	M	Stainless steel	PC5300	PC5335	PC5400							
	K	Cast iron	PC6510	PC5300								
	S	HRSA	PC5300	PC5400								
	N	Non-ferrous metal	H01									
Turning cermet	P	Steel	CN1500	CN2000	CN2500							
	K	Cast iron	CN1500	CN2500								
Coated cermet	P	Steel	CC1500	CC2500								
Milling cermet	P	Steel	CN2000	CN30								

Application range



Grades system

Cutting tool

Solid endmills	P M K	General	PC203F	PC215F	PC303S	PC310U	PC315E	PC320	PC320S
	S	HRSA	PC320	PC320S					
	H	Hardened steel	PC203F	PC303S	PC310U				
	N	Non-ferrous metal	ND3000	ND2100	PD3000	PC210C	H01	H05S	
Solid drills	P M K	General	PC325U	PC215G	PC315G	PC230F			
	N	Non-ferrous metal	FG2	ND2100					
cBN	K	Cast iron	KB350	KB370	KB800				
	S	HRSA	KB370						
	H	Hardened steel	KB410	KB420	KB425	KB1000	KB2000	KB320	KB335	KB370
Coated cBN	H	Hardened steel	DNC100	DNC250	DNC350	DNC400			
PCD	N	Non-ferrous metal	DP90	DP150	DP200				

Wear resistance tool

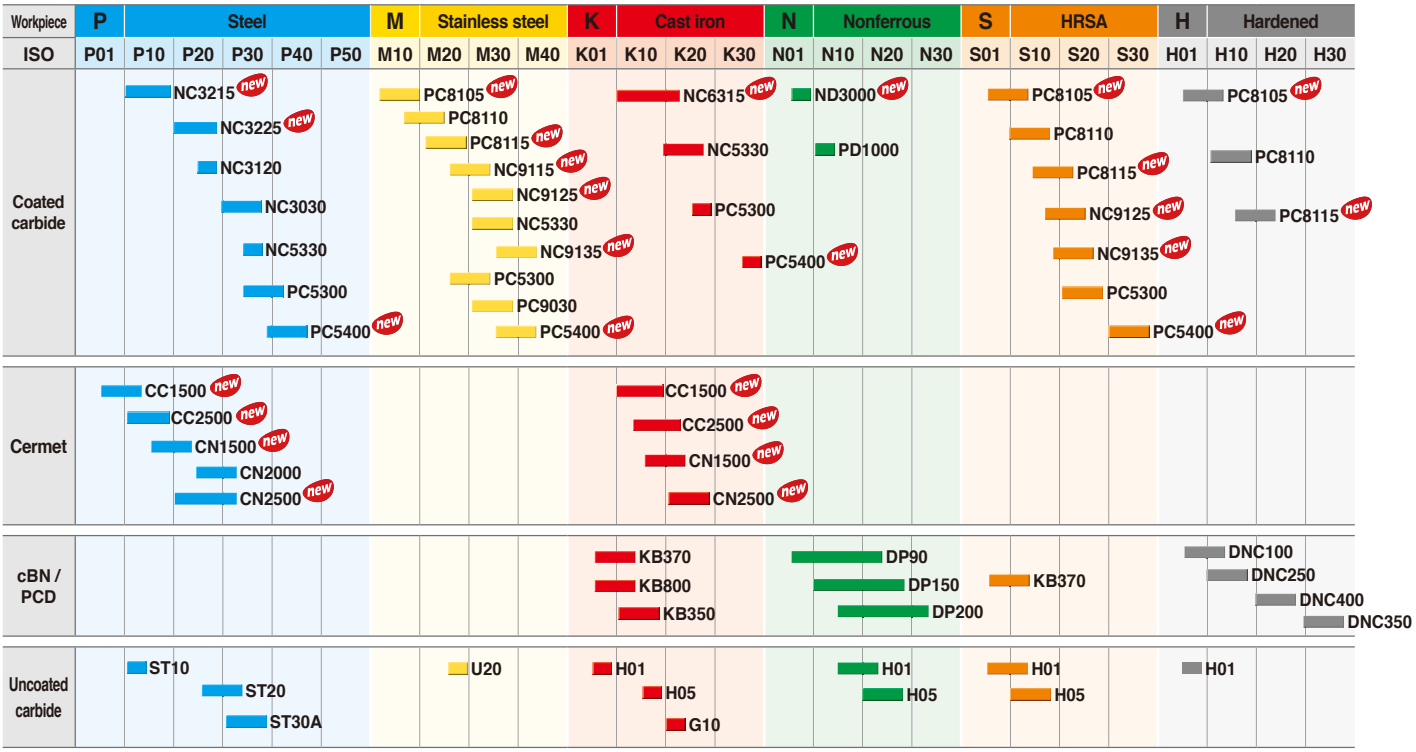
Ultra fine grain cemented carbide	Z	Ultra fine grain cemented carbide	FS1	FA1	FCC	
Uncoated carbide	V	Wear parts	D1	D2	D3	G5
	I	Corrosion resistance	IN10	IN20	IN40	

Mining tool

Uncoated carbide	E	General	GR10	GR20	GR30	GR35	GR40

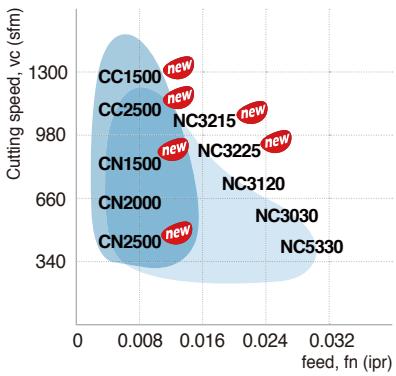
Turning grade selections

Selection system

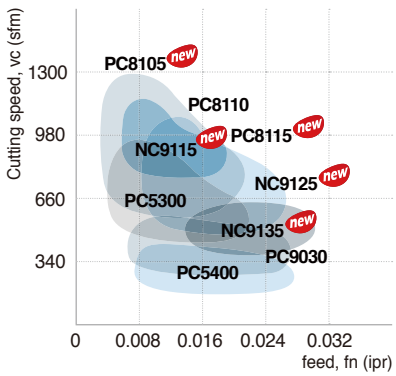


Application range of turning grades

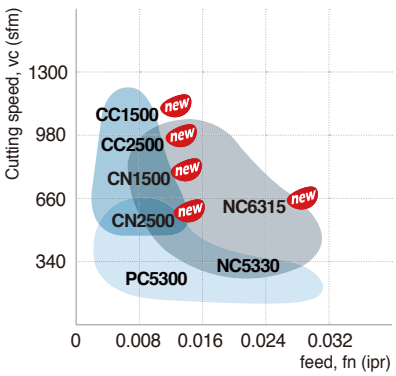
P Steel



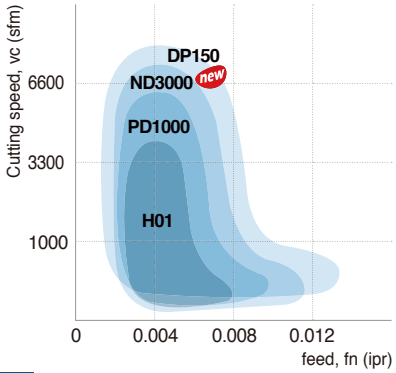
M Stainless steel



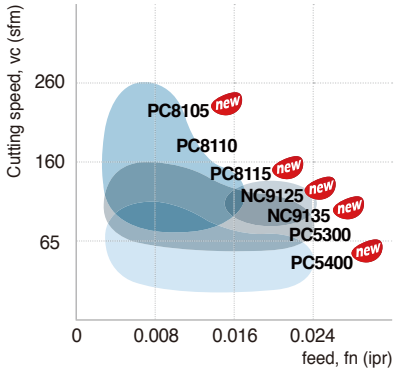
K Cast iron



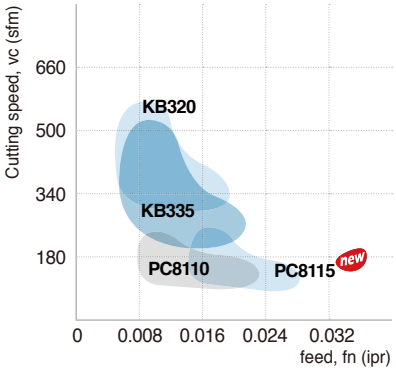
N Non-ferrous metal



S Heat resistant alloy



H Hardened steel



CVD coated grades

NC3215 new / NC3225 new

- Universal grade especially for machining forged automobile components and bearing steel both in continuous and interrupted cutting
- Available for all kinds of steels - carbon steel, alloy steel, rolled steel, tool steel, mild steel, bearing steel and other special kinds of steel
- New coating technology increases welding resistance and chipping resistance, which leads to longer tool life

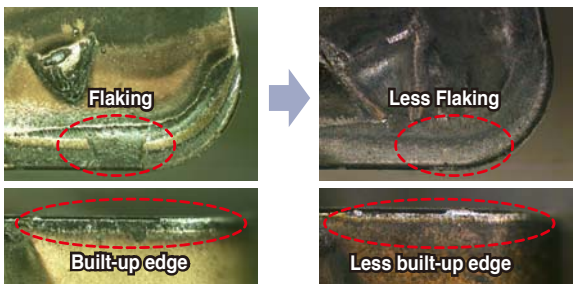
Features

• Stable tool life
→ Higher production stability

• Longer tool life & Higher removal rate
→ High cutting conditions and shorter cutting time available

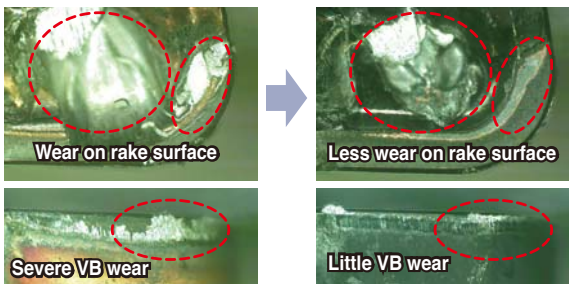
• Ideal combination of a grade and chip breakers
→ Prolongs tool life
→ Wide applications ranging from roughing to finishing

Unstable tool life → **Stable tool like**



Competitor | NC3215/NC3225

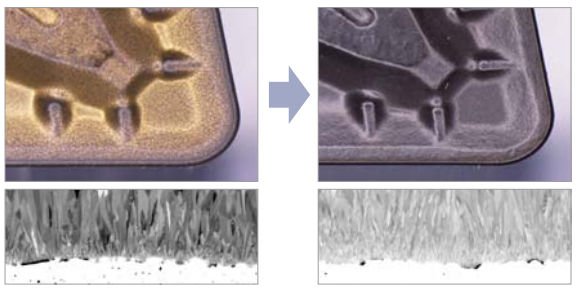
Poor wear resistance → **Increased wear resistance**



Competitor | NC3215/NC3225

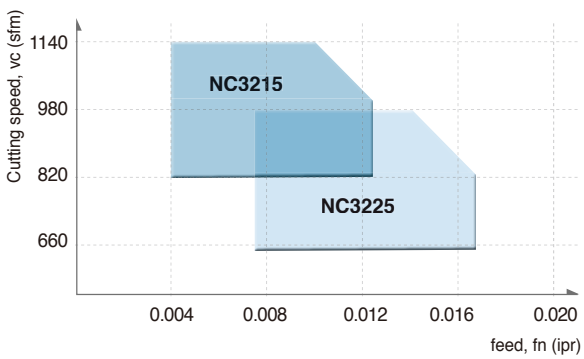
• Disperse cutting force ⟶ Reduce chipping ⟶ Increase tool life ⟶ Improved productivity

Previous coating → **New coating**

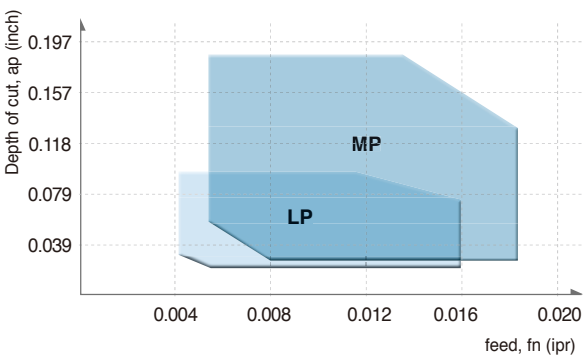


Application range

Grades line up



MP/LP chip breaker



CVD coated grades

Universal grade for cast iron

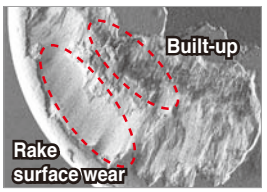
NC6315 new

- Higher wear and chipping resistance
  - CVD coated inserts with increased resistance to wear and chipping
- Solutions for most common Issues in cast Iron machining
  - Preventing excessive wear on rake and flank surfaces of insert, chipping and burr creation

Features

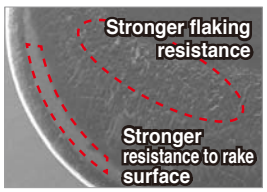
- Excellent wear resistance of rake surface in highly interrupted cutting of ductile / gray cast iron at high speeds over vc = 1148sfm
- Improved alumina coating → Minimizes built-up edges
- Augmented tool life stability and wear resistance

Rake surface wear and built-up edge



Competitor

Improved resistance to wear and flaking



NC6315

Excessive flank wear

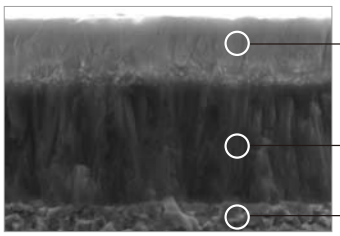


Competitor

Enhanced wear resistance



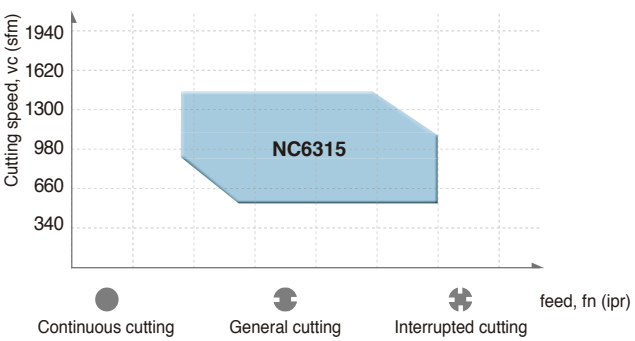
NC6315



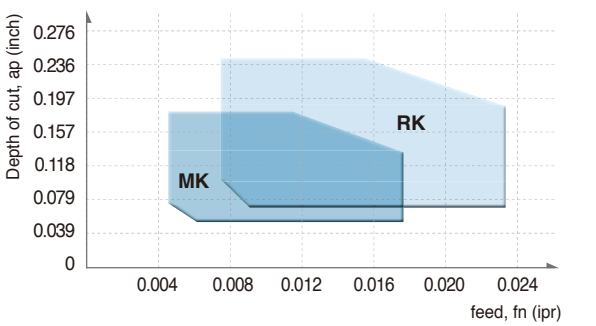
- Alumina layer with better surface finish and increased resistance to wear and welding
- Titanium layer with stronger anti-fracture
- Functional substrate with optimized combination of hardness and toughness

Application range

Grades line up



MK / RK chip breaker



CVD coated grades

Turning grades for stainless steel

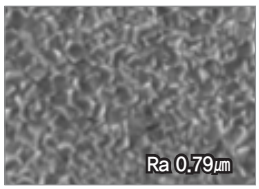
NC9115 new / NC9125 new / NC9135 new

- Optimized for reducing built-up edges, notch wear, plastic deformation and burrs, and for machining stainless steel
- Ideal combination of a grade and MM/RM chip breakers for stable tool life and wide applications ranging from roughing to finishing
- Stable tool life even at high speeds, feeds and depth of cuts (for STS316, vc over 492sfm available), shortening cutting time
- Excellent versatility responding to workpiece change, covering the austenite, the martensite and the ferrite

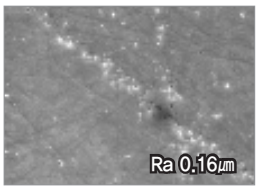
Features

• Improved surface finish thanks to the new lubricative CVD coating

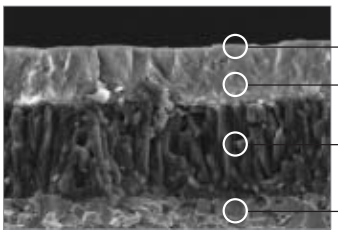
Lubricative coating layer to prevent built-up edge



Existing coating



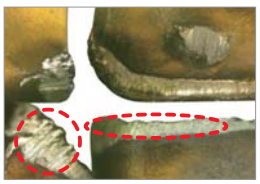
NC9100 Series



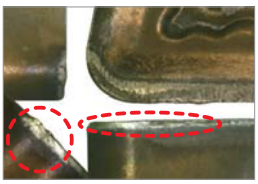
- Top coat with improved welding resistance
- Alumina coating layer for high speed cutting
- Titanium coating layer with stronger resistance to chipping
- Tough substrate optimized for continuous cutting and both light & heavy interruption

• Coated layers of stronger chipping resistance and the substrate of high toughness → Inhibits notch wear creation
• Lubricative coating layers → Improves welding resistance

Inhibited built-up edge and blade damage

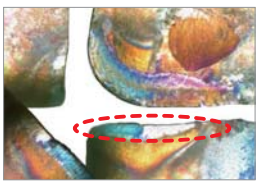


Competitor (M25)

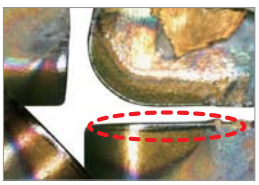


NC9125 (M25)

Inhibited wear on notch and relief surface



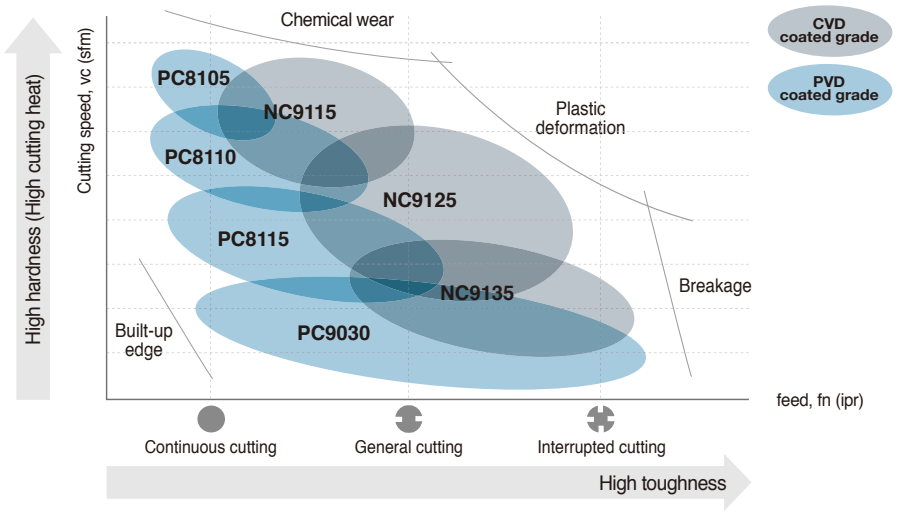
Competitor (M25)



NC9135 (M35)

CVD coated grades

Grades line up



Recommended grade and chip breaker per stainless steel type

[Austenitic stainless steel]

Grade	Cutting speed (sfm)				
	164	328	492	656	820
NC9115			525 – 722		
NC9125			492 – 656		
NC9135		328 – 492			

[Duplex stainless steel]

Grade	Cutting speed (sfm)				
	164	328	492	656	820
NC9115			394 – 525		
NC9125			328 – 459		
NC9135		197 – 328			

[Ferritic / Martensitic stainless steel]

Grade	Cutting speed (sfm)				
	164	328	492	656	820
NC9115			492 – 820		
NC9125			394 – 722		
NC9135		328 – 492			

[Precipitation hardened (PH) stainless steel]

Grade	Cutting speed (sfm)				
	164	328	492	656	820
NC9115	164 – 361				
NC9125	131 – 361				
NC9135	98 – 328				

Selection system of CVD coated grade

Workpiece		Machining types	Recommended grade	Recommended cutting speed (sfm)	ISO	Application range
P	Steel	Continuous cutting	NC3215 new	968 (558~1378)	P10	NC3215 new
		Interrupted cutting	NC3225 new	853 (492 ~ 1214)	P15	NC3225 new
					P20	NC3120
			NC3120	853 (394 ~ 1214)	P25	NC3030
			NC3030	673 (394 ~ 951)	P30	NC5330
			NC5330	673 (394 ~ 951)	P35	NC500H
			NC500H	673 (394 ~ 951)	P40	
M	Stainless steel	Continuous cutting	NC9115 new	787 (722~853)	M10	NC9115 new
			NC9125 new	689 (623~755)	M20	NC9125 new
		Interrupted cutting	NC9135 new	591 (525~656)	M30	NC5330
					M40	NC9135 new
K	Cast iron	Continuous cutting	NC6315 new	820 (427~1214)	K10	NC6315 new
		Interrupted cutting		722 (427~1017)	K20	NC5330
			NC5330	623 (361 ~ 886)	K30	
S	HRSA	Continuous cutting	NC9125 new	131 (66~197)	S10	NC9125 new
		Interrupted cutting	NC9135 new		S20	NC9135 new

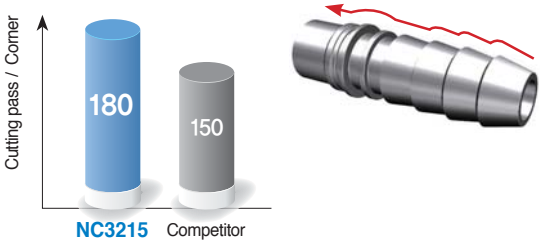
The features of CVD coated grades

CVD Coated grades	ISO	Features
NC3215 new	P10~P15	• Continuous machining of general steel and forged steel at high speed • Substrate with excellent thermal crack /plastic deformation resistance, coating with improved chipping resistance for continuous machining • MT-TiCN + Al_2O_3 + TiN
NC3225 new	P15~P25	• Universal grade for general steel and forged steel • 1st recommended grade for general machining with the use of high toughness substrate and coating layer with improved welding/chipping resistance • MT-TiCN + Al_2O_3 + TiN
NC3120	P20~P25	• Medium to roughing for steel • Combining excellent fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability • MT-TiCN + TiC + Al_2O_3
NC3030	P25~P35	• Medium to low speed machining of steel and interrupted roughing • Harmony between substrate with excellent wear/fracture resistance and Al2O3 film with excellent thermal/chipping resistance • Increased stability in wide ranges of cutting conditions • MT-TiCN + TiC + Al_2O_3 + TiN
NC5330	P30~P35 M25~M35 K15~K25 S15~S25	• Stainless Steel - General cutting for mild steel & forging steel • Excellent cutting performance in hard to cut materials which are vulnerable to built up edge, due to the high tough substrate with improved fracture resistance and the coated layers • MT-TiCN + Al_2O_3 + TiN
NC9115 new	M10~M20	• High speed cutting for ferritic and martensitic stainless steels • MT-TiCN + Al_2O_3 + TiN
NC9125 new	M20~M30	• General cutting of stainless steel and heat resistant alloys • MT-TiCN + Al_2O_3 + TiN
NC9135 new	M30~M40	• Interrupted cutting of stainless steel and heat resistant alloys • MT-TiCN + Al_2O_3 + TiN
NC500H	P25~P35	• Heavy interrupted cutting for steel • Plastic deformation and fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability in wide ranges of cutting conditions • MT-TiCN + TiC + Al_2O_3 + TiN
NC6315 new	K10~K15	• Universal grade for ductile and gray cast Iron • Excellent performance thanks to the alumina (Al_2O_3) coating's improved grip on the tough substrate • MT-TiCN + Al_2O_3

Application examples (NC3215/NC3225)

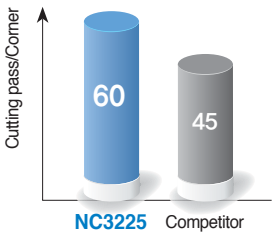
P Carbon steel (1020)

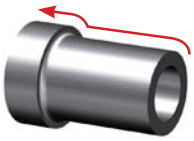
- **Workpiece** Part for fuel system
- **Cutting condition** vc (sfm) = 820~1247, fn (ipr) = 0.008~0.012
  ap (inch) = 0.059~0.079, wet
- **Designation** **Insert** : CNMG433-MP (NC3215)
  Holder: PCLNL16-4D
- **Test result**



P Alloy steel (4320, molding)

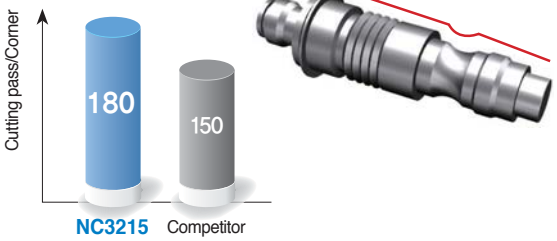
- **Workpiece** Part for engine
- **Cutting condition** vc (sfm) = 328, fn (ipr) = 0.006
  ap (inch) = 0.118, wet
- **Designation** **Insert** : CNMG432-MP (NC3225)
  Holder: PCLNR16-4D
- **Test result**





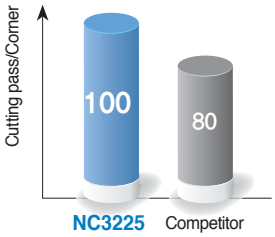
P Carbon steel (1039, cold forging)

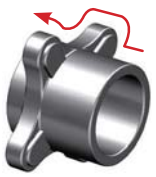
- **Workpiece** Part for steering
- **Cutting condition** vc (sfm) = 558, fn (ipr) = 0.012
  ap (inch) = 0.106~0.118, wet
- **Designation** **Insert** : DNMG432-MP (NC3215)
  Holder: DDJNL16-4D
- **Test result**



P Carbon steel (1055, hot forging)

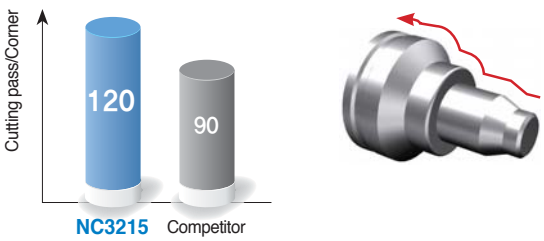
- **Workpiece** Part for steering
- **Cutting condition** vc (sfm) = 755, fn (ipr) = 0.012
  ap (inch) = 0.020~0.059, wet
- **Designation** **Insert** : CNMG432-MP (NC3225)
  Holder: PCLNL16-4D
- **Test result**





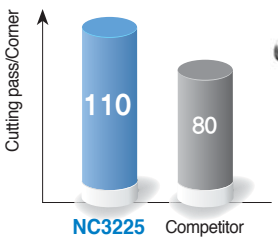
P Carbon steel (1045, cold forging)

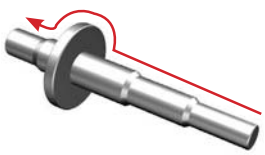
- **Workpiece** Part for steering
- **Cutting condition** vc (sfm) = 656~820, fn (ipr) = 0.010~0.014
  ap (inch) = 0.039~0.079, wet
- **Designation** **Insert** : DNMG443-LP (NC3215)
  Holder: DDJNL16-4D
- **Test result**



P Alloy steel (5120, cold forging)

- **Workpiece** Part for mission
- **Cutting condition** vc (sfm) = 525, fn (ipr) = 0.005
  ap (inch) = 0.039, wet
- **Designation** **Insert** : DNMG442-LP (NC3225)
  Holder: DDJNL16-4D
- **Test result**

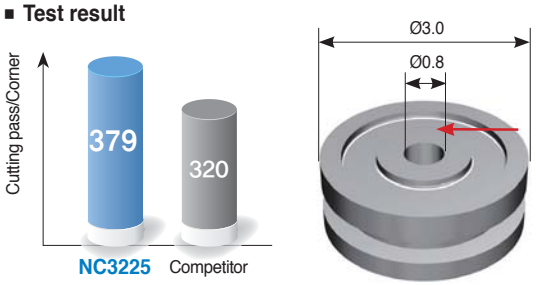




Application examples (NC3225)

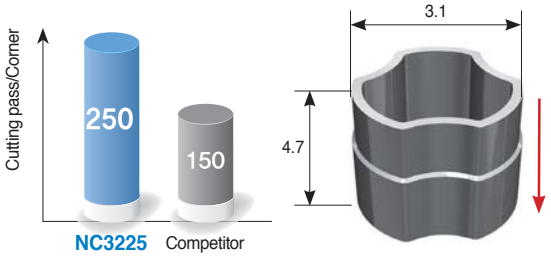
P Alloy steel (5120H, hot forging)

- **Cutting condition** vc (sfm) = 1180~1410, fn (ipr) = 0.008
  ap (inch) = 0.048~0.06 (external machining/facing), wet
- **Designation** **Insert** : CNMG432-VC
  Holder: PCLNR16-4D
- **Test result**



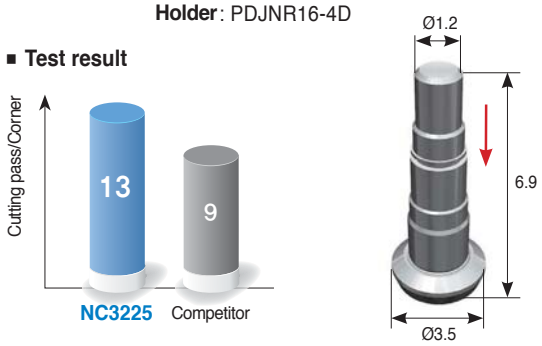
P Carbon steel (1040, cold forging)

- **Cutting condition** vc (sfm) = 918, fn (ipr) = 0.008~0.010
  ap (inch) = 0.04, dry
- **Designation** **Insert** : CNMG433-VC
  Holder: PCLNR16-4D
- **Test result**



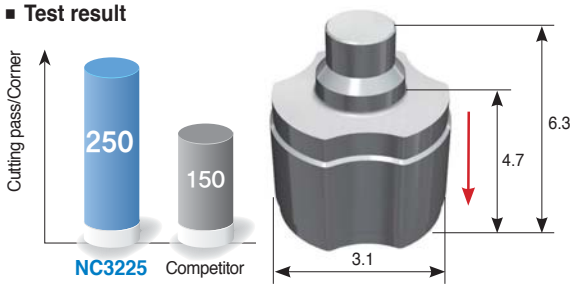
P Alloy steel (4130H, hot forging)

- **Cutting condition** vc (sfm) = 262~1640
  fn (ipr) = 0.006~0.012 (External machining/facing/grooving/tapping), ap (inch) = 0.028~0.006, wet
- **Designation** **Insert** : DNMG442-VC
  Holder: PDJNR16-4D
- **Test result**



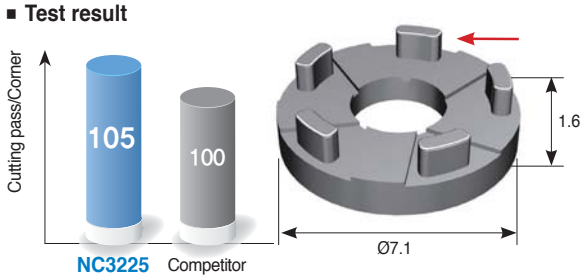
P Carbon steel (1053, cold forging)

- **Cutting condition** vc (sfm) = 918
  fn (ipr) = 0.008~0.010(External machining/internal machining), ap (inch) = 0.04, dry
- **Designation** **Insert** : DNMG442-VC
  Holder: PDJNR16-4D
- **Test result**



P Alloy steel (SCR series, cold forging)

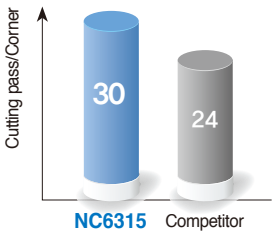
- **Cutting condition** vc (sfm) = 1030
  fn (ipr) = 0.010 (external machining/facing)
  ap (inch) = 0.04, wet
- **Designation** **Insert** : CNMG432-VM
  Holder: PCLNR16-4D
- **Test result**



Application examples (NC6315)

K Gray cast iron (No30B)

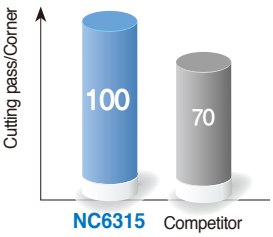
- **Workpiece** Break disc
- **Cutting condition** vc (sfm) = 1804, n (rpm) = 547, fn (ipr) = 0.012, ap (inch) = 0.118, wet
- **Designation** **Insert** : CNMG433-RK **Holder**: DCLNR16-4D
- **Test result**





K Ductile cast iron (80-55-06)

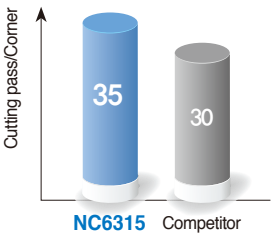
- **Workpiece** Diff. case mission
- **Cutting condition** vc (sfm) = 820, n (rpm) = 800, fn (ipr) = 0.010, ap (inch) = 0.059, wet
- **Designation** **Insert** : CNMG432-MK **Holder**: DCLNR16-4D
- **Test result**





K Ductile cast iron (80-55-06)

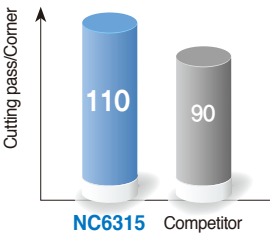
- **Workpiece** Fly wheel
- **Cutting condition** vc (sfm) = 1312, n (rpm) = 398, fn (ipr) = 0.012, ap (inch) = 0.079, wet
- **Designation** **Insert** : CNMA432 **Holder**: DCLNR16-4D
- **Test result**





K Ductile cast iron (80-55-06)

- **Workpiece** Knuckle
- **Cutting condition** vc (sfm) = 656, n (rpm) = 1100, fn (ipr) = 0.010, ap (inch) = 0.079, wet
- **Designation** **Insert** : DNMG442-MK **Holder**: DDJLNR16-4D
- **Test result**

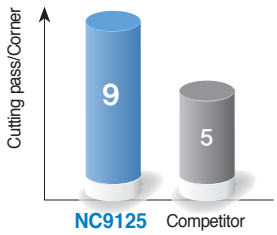




Application examples (NC9100 Series)

M Stainless steel (304)

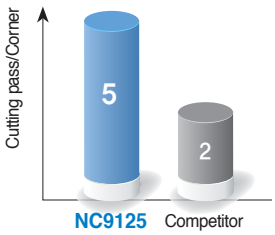
- **Workpiece** Hydraulics part (Mechanical seal)
- **Cutting condition** vc (sfm) = 459, fn (ipr) = 0.011
  ap (inch) = 0.12, wet
- **Designation** **Insert** : CNMG432-MM (NC9125)
  Holder : S32S-PCLCR-4
- **Test result**

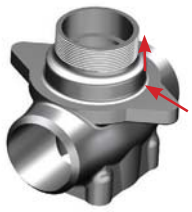




M Stainless steel (304)

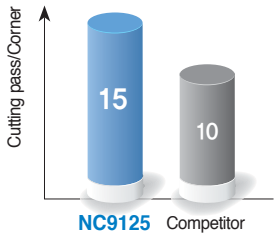
- **Workpiece** Valve part (Piston valve)
- **Cutting condition** vc (sfm) = 459, fn (ipr) = 0.011
  ap (inch) = 0.12, wet
- **Designation** **Insert** : CNMG432-MM (NC9125)
  Holder : DCLNL16-4D
- **Test result**





M Stainless steel (317L)

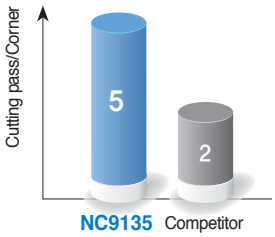
- **Workpiece** Wind power/offshore plant part (Flange)
- **Cutting condition** vc (sfm) = 492, fn (ipr) = 0.012~0.02
  ap (inch) = 0.16~0.24, wet
- **Designation** **Insert** : CNMG544-MM (NC9125)
  Holder : PCLNR20-5D
- **Test result**





M Stainless steel (316)

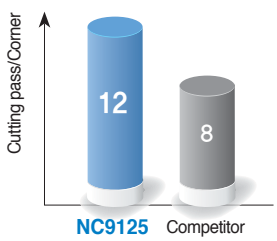
- **Workpiece** Wind power plant part (Flange)
- **Cutting condition** vc (sfm) = 574, fn (ipr) = 0.012~0.031
  ap (inch) = 0.02, wet
- **Designation** **Insert** : TNMG434-RM (NC9135)
  Holder : PTFNR16-4D
- **Test result**





M Stainless steel (Super duplex)

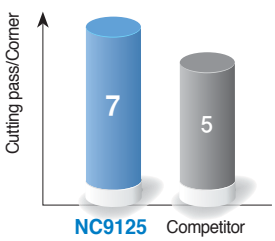
- **Workpiece** Plant part (Flange)
- **Cutting condition** vc (sfm) = 328, fn (ipr) = 0.02
  ap (inch) = 0.12, wet
- **Designation** **Insert** : CNMG544-MM (NC9125)
  Holder : PCLNR20-5D
- **Test result**





M Stainless steel (Duplex)

- **Workpiece** Hydraulics part
- **Cutting condition** vc (sfm) = 394, fn (ipr) = 0.016
  ap (inch) = 0.24, wet
- **Designation** **Insert** : CNMG544-RM (NC9125)
  Holder : DCLNR20-5D
- **Test result**





PVD coated grades

Turning grade for heat resistant alloy and stainless steel

PC8105 new

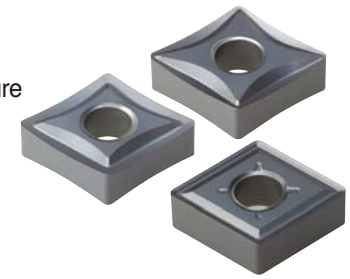
- Micro grain carbide minimizes chipping of cutting edge due to enhanced edge strength
- Latest PVD coating technology with high hardness and high temperature oxidation resistance
- Excellent tool life when finishing heat resistant alloys and stainless steels at high speeds

PC8110

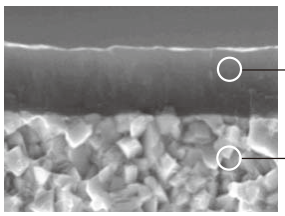
- Substrate with superior wear resistance and plastic deformation resistance at high temperature
- PVD coating technology with high hardness and oxidation resistance at high temperature
- Long tool life when machining heat resistant alloy and stainless steel at high speed

PC8115 new

- Ultra fine matrix technology increases wear resistance and chipping resistance.
- PVD coating technology with high hardness and oxidation resistance at high temperature
- Strong cutting edge and excellent chipping resistance guarantees stable machining
- Long tool life when machining heat resistant alloy and stainless steel at middle to low speed and medium cutting to roughing



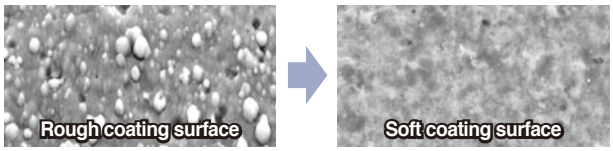
Features of PC8100 series



It prevents wear at a high temperature to apply excellent surface roughness and coating with oxidation resistance and high hardness

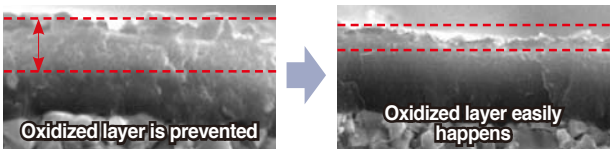
It improves wear resistance to equalize submicron matrix, secure stability between corners and improve chipping- and wear resistance

Coating surface treatment technology (Pictures of coating layer)



Conventional coating — Improved lubrication — PC8100 Series

Oxidation resistant coating technology (Pictures of coating layer heat-treated at 900°C)



Competitor — Improved oxidation resistance — PC8100 Series

Selection system of PVD coated grade

Workpiece		Machining types	Recommended grade	Recommended cutting speed (sfm)	ISO	Application range
P	Steel	Continuous cutting	PC5300	574 (328~820)	P30	PC5300, PC5400 new
		Interrupted cutting		476 (262~394)	P40	
			PC5400 new	410 (262~525)	P50	
M	Stainless steel	Continuous cutting	PC8105 new	574 (394~755)	M01	PC8105 new, PC8110, PC8115 new, PC5300, PC9030, PC5400 new
			PC8110	525 (361~689)	M10	
			PC8115 new	492 (328~656)	M20	
		Interrupted cutting	PC5300	443 (262~623)	M30	
			PC9030	427 (262~591)	M40	
			PC5400 new	361 (262~459)	M50	
S	Heat resistant alloy	Continuous cutting	PC8105 new	180 (131~230)	S01	PC8105 new, PC8110, PC8115 new, PC5300, PC5400 new
			PC8110	164 (115~213)	S10	
			PC8115 new	148 (98~197)	S20	
		Interrupted cutting	PC5300	131 (66~197)	S30	
			PC5400 new	115 (66~164)	S40	
H	Hardened	Interrupted cutting	PC8105 new	361 (262 ~459)	H01	PC8105 new, PC8110, PC8115 new
			PC8110	328 (230~427)	H05	
			PC8115 new	295 (213~377)	H10	

The features of PVD coated grades

PVD Coated grades	ISO	Features
PC8105 new	M05~M15 S01~S10 H01~H05	• For high speed and continuous finishing of hard-to-cut materials and STS • Excellent cutting performance with high wear resistance and oxidation resistance • Ultra fine substrate and the new TiAlN coating layer
PC8110	M10~M20 S05~S15 H01~H10	• For high speed and continuous medium cutting of hard-to-cut materials and STS • Excellent tool life with high wear/plastic deformation resistance at high temperature • New TiAlN coating layer and substrate with excellent thermal resistance
PC8115 new	M15~M25 S10~S20 H05~H15	• For medium to low speed and medium to rough cutting of hard-to-cut materials and STS • Excellent tool life with high wear resistance and chipping resistance • Ultra fine substrate and the new TiAlN coating layer
PC5300	P30~P40 M20~M30 K20~K25 S15~S25	• Universal grade for stainless,HRSA,steel and interrupted cast iron machining • High chipping and welding resistance for longer tool life • New TiAlN coating and ultra fine grain substrate adopted
PC9030	M25~M35	• Medium,roughing and heavy interrupted cutting for stainless steel • TiAlN coating and ultra fine grain substrate adopted • High chipping and welding resistance for stable machining
PC5400 new	P35~P45 M30~M40 K30~K35 S25~S35	• For medium cutting for hard-to-cut materials, stainless steel, steel, and cast iron at medium or low speed • Stable machinability with chipping resistance, fracture resistance and welding resistance • Ultra fine substrate with high toughness and new AlCiN layer

Application examples (PC8105/PC8110/PC8115)

S Inconel 718

- **Cutting condition**: vc (sfm) = 164, fn (ipr) = 0.006, ap (inch) = 0.020, wet
- **Designation**: **Insert** : CNMG432-VP3 (PC8105), **Holder**: PCLNR16-4D
- **Test result**



PC8105 | Competitor A | Competitor B

S Inconel 718

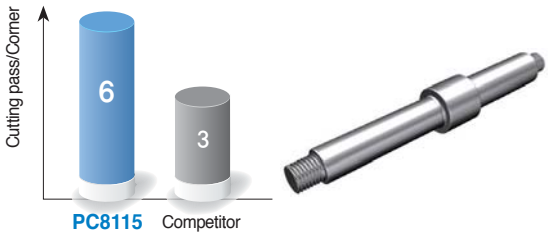
- **Cutting condition**: vc (sfm) = 164, fn (ipr) = 0.006, ap (inch) = 0.020, wet
- **Designation**: **Insert** : CNMG432-VP3 (PC8115), **Holder**: PCLNR16-4D
- **Test result**



PC8115 | Competitor | Conventional grade

M Stainless steel (316L)

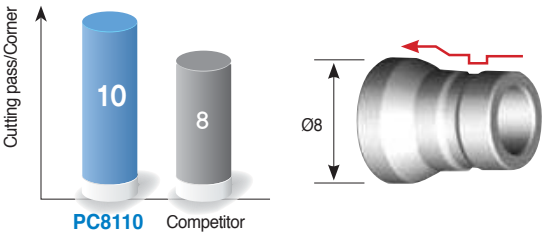
- **Cutting condition**: vc (sfm) = 262, fn (ipr) = 0.008, ap (inch) = 0.276, wet
- **Designation**: **Insert** : CNMG432–VP3(PC8115), **Holder**: PCLNR16-4D
- **Test result**



PC8115 | Competitor

S Inconel 625

- **Cutting condition**: vc (sfm) = 197, fn (ipr) = 0.008, ap (inch) = 0.08, wet
- **Designation**: **Insert** : DNMG442-HS(PC8110), **Holder**: DDLNL16-4D
- **Test result**

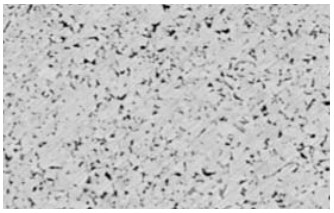


PC8110 | Competitor

Uncoated carbide grades

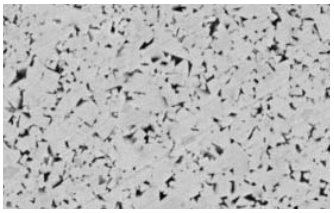
Uncoated carbide grades for turning application of titanium

H01



- Increased wear resistance and chipping resistance with the use of ultra fine substrate
- Improved welding resistance and chipping resistance with the use of special surface treatment and sharp cutting edge of VP chip breaker
- Excellent tool life when finishing titanium alloy at high speed

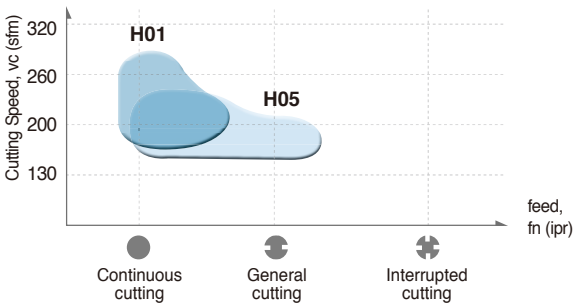
H05



- The 1st recommended grade for machining titanium alloy in a variety of cutting conditions
- Improved welding resistance and chipping resistance with the use of special surface treatment and sharp cutting edge of VP chip breaker
- Ideal for medium cutting of titanium alloy

Grades line up

Titanium alloy



Selection system of uncoated carbide grades

Workpiece		Recommended grade	Recommended cutting speed (sfm)	ISO	Application range
P	Steel	ST10	361 (230~459)	P10	ST10
		ST20	262 (164~361)	P20	ST20
		ST30A	230 (131~295)	P30	ST30A
M	Stainless steel	U20	230 (131~295)	M25	U20
K	Cast iron	H01	344 (197~459)	K01	H01
		H05	344 (197~459)	K10	H05
		G10	361 (164~394)	K20	G10
N	Aluminum alloy	H01	1969 (1476~2461)	N10	H01
	Copper alloys	H05	1394 (1050~1739)	N20	H05
S	Titanium alloy	H01	180 (131~230)	S01	H01
		H05	164 (115~213)	S10	H05
H	High hardness steel	H01	262 (180~344)	H10	H01

Main composition and application range

Workpiece	Composition	Features	Workpiece
P	WC-TiC-TaC-Co	Heat resistance, excellent plastic deformation resistance	Carbon steel, Alloy steel, Stainless steel
M	WC-TiC-TaC-Co	General tools stable heat resistance with strength	Carbon steel, Alloy steel, Stainless steel, Cast steel
K	WC-Co	High strength and superior wear resistance	Cast iron, Non-ferrous metal, Plastic, etc
S	WC-Co	Excellent wear resistance and chipping resistance	Titanium alloy

The physical properties of uncoated carbide grades

Workpiece	Grade	Hardness (HRA)	TRS (kgf/mm^2)	Young's modulus ($10^3 kgf/mm^2$)	Thermal expansion coefficient ($10^{-6}/°C$)	Thermal conductivity (cal/cm · sec·°C
P	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U20	91.1	210	-	-	88
	ST30A	91.3	230	53	5.2	-
K	H01	92.9	210	66	4.7	109
	G10	90.9	250	63	-	105
S	H01	92.9	210	66	4.7	109
	H05	91.8	250	-	-	-

1KPa = 102kgf/m², 1w/mk = 2.39×10⁻³cal/cm·sec·°C

Application examples (H01/H05)

S Titanium alloy (Ti-6Al-4V)

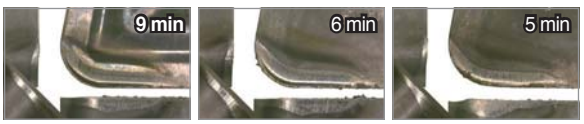
- **Cutting condition**: vc (sfm) = 328, fn (ipr) = 0.004, ap (inch) = 0.020, wet
- **Designation**: **Insert** : CNMG432-VP1 (H01), **Holder** : PCLNR16-4D
- **Test result**



H01 (VP1) | H01 (VP3) | Competitor

S Titanium alloy (Ti-6Al-4V)

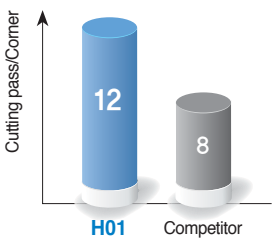
- **Cutting condition**: vc (sfm) = 262, fn (ipr) = 0.008, ap (inch) = 0.079, wet
- **Designation**: **Insert** : CNMG432-VP3 (H05), **Holder** : PCLNR16-4D
- **Test result**



H05 | Competitor A | Competitor B

S Titanium alloy (Ti-6Al-4V)

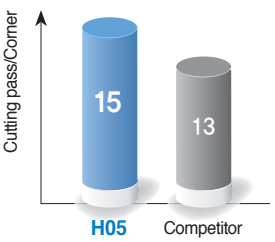
- **Workpiece**: Part of an industrial machine
- **Cutting condition**: vc (sfm) = 197, fn (ipr) = 0.008, ap (inch) = 0.031, wet
- **Designation**: **Insert** : CNMG432–VP2 (H01), **Holder** : PCLNL16-4D
- **Test result**





S Titanium alloy (Ti-6Al-4V)

- **Workpiece**: Part of an industrial machine
- **Cutting condition**: vc (sfm) = 164, fn (ipr) = 0.006, ap (inch) = 0.079, wet
- **Designation**: **Insert** : CNMG432–VP3 (H05), **Holder** : PCLNL16-4D
- **Test result**





Cermet grades

Solution for turning application of steel

CN1500 new

- For continuous machining of cold/hot forged steel and Sintered ferrous alloy at high speed and low depth of cut
- Excellent wear resistance and crater resistance
- Improved surface roughness acquired by optimized cutting edges

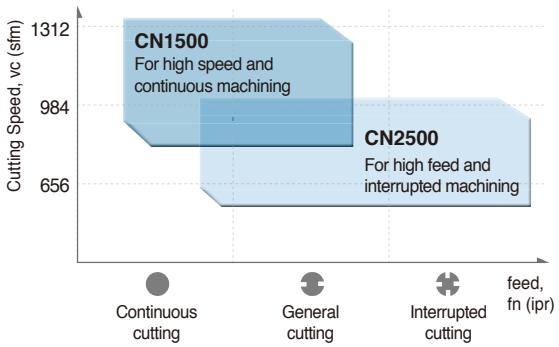
CN2500 new

- For high interrupted machining of cold/hot forged steel and Sintered ferrous alloy at high feed and high depth of cut
- Excellent resistance against chipping, fracture and thermal crack
- Improved surface roughness acquired by optimized cutting edges

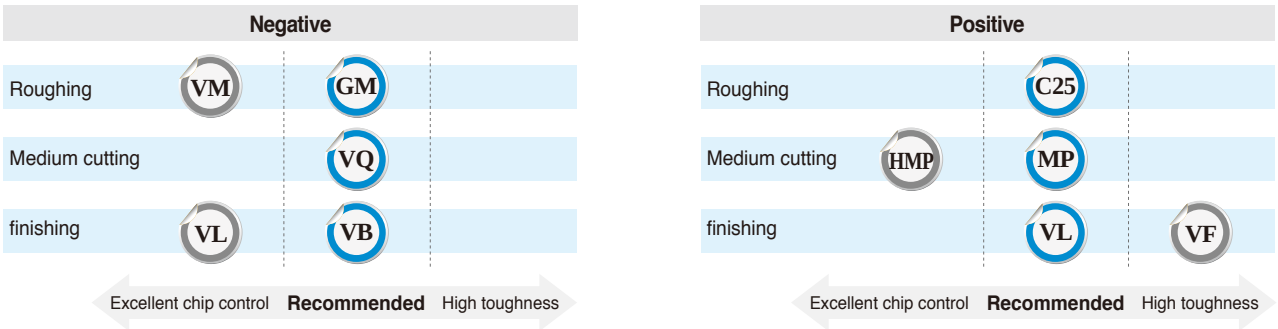
Recommended cutting condition

Division	Workpiece	Grade	Recommended cutting speed (sfm)		
			Minimum	Recommended	Maximum
Turning	1010 (AISI) C10E (DIN)	CN1500	492	**886**	1312
		CN2500	427	**787**	1148
	1045 (AISI) C45 (DIN)	CN1500	492	**820**	1148
		CN2500	427	**722**	984
	4140(H) (AISI) 42CrM04	CN1500	394	**722**	984
		CN2500	328	**656**	820

Grades line up



Chip breakers line up



Selection system of cermet grades

Workpiece		Machining types	Recommended grade	Recommended cutting speed (sfm)	ISO	Application range
P	Steel	Continuous cutting	CN1500 new	820 (492~1148)	P10	CN1500 new
		Interrupted cutting	CN2500 new	722 (427~984)	P20	CN2500 new
					P30	

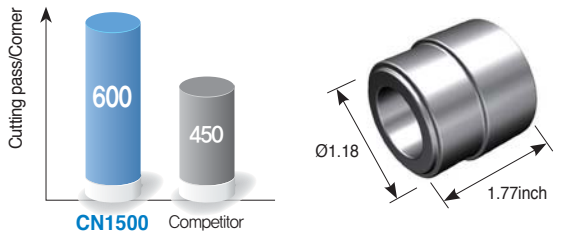
Comparison of chip breakers

Insert types	Machining types	Application range	Chip breakers				
			KORLOY	CompetitorA	CompetitorB	CompetitorC	CompetitorD
Nega type	Continuous cutting	For machining mild steel with enhanced chip control	**VL**	FA	GP	TF	FA
	General cutting	For low interrupted cutting with stronger cutting edges than VG chip breaker	**VB**	FG	XP CQ	TSF TS	LU SE
	General cutting	For medium cutting to finishing at low interruption	**VQ**	MC	HQ	AS, ZM	SU
	Interrupted cutting	For medium cutting to roughing at high interruption	**GM**	MT	HS	TM	GU
Posi type	Continuous cutting	For machining mild steel with enhanced chip control	**VL**	FA	GP	PF	FP
	Continuous cutting	Enhanced chip control when machining internal diameter with stronger cutting edges than VL chip breaker	**VF**	FG-PC	HQ	PS	LU
	General cutting	Stronger cutting edges than VF chip breaker	**MP**	FG	HQ	PS	LU
	General cutting	For medium cutting to finishing at low interruption	**HMP**	FG	HQ	PM	SU
	Interrupted cutting	For medium cutting to roughing at high interruption	**C25**	MT	GK	24	SC

Application examples (CN1500)

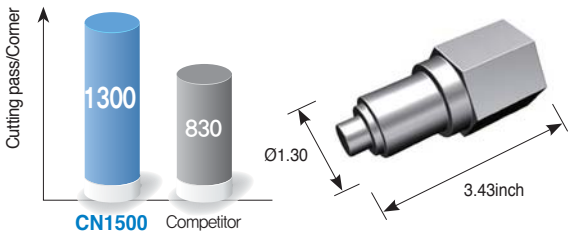
P Carbon steel (1045)

- **Cutting condition** vc (sfm) = 656, n (rpm) = 1,800
  fn (ipr) = 0.004, ap (inch) = 0.012
  wet
- **Designation** **Insert** : CCMT32.51-HMP (CN1500)
  Holder : SCLCR12-3B
- **Test result**



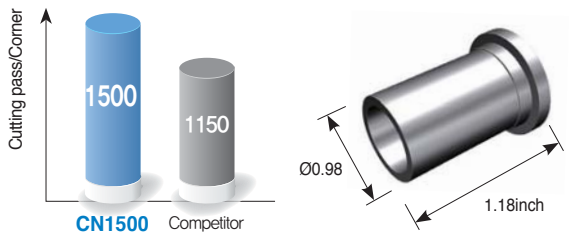
P Alloy steel (4131)

- **Cutting condition** vc (sfm) = 755, n (rpm) = 2,000
  fn (ipr) = 0.005, ap (inch) = 0.031
  wet
- **Designation** **Insert** : TNMG331-VQ (CN1500)
  Holder : DTGNR20-3D
- **Test result**



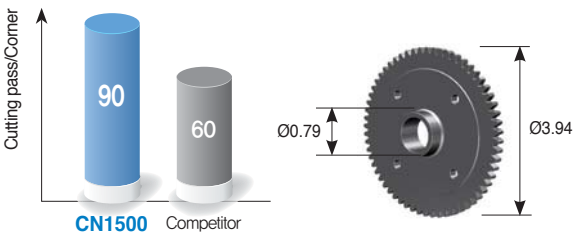
P Bearing steel (52100)

- **Cutting condition** vc (sfm) = 656, n (rpm) = 2,500
  fn (ipr) = 0.004, ap (inch) = 0.012
  wet
- **Designation** **Insert** : DCMT32.50-VF (CN1500)
  Holder : SDJCR16-3D
- **Test result**



P Sintered ferrous alloy

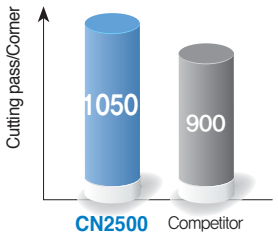
- **Cutting condition** vc (sfm) = 525, n (rpm) = 1,200
  fn (ipr) = 0.007, ap (inch) = 0.008
  wet
- **Designation** **Insert** : SNMG432-VM (CN1500)
  Holder : MSRNR16-4D
- **Test result**



Application examples (CN2500)

P Carbon steel (1045)

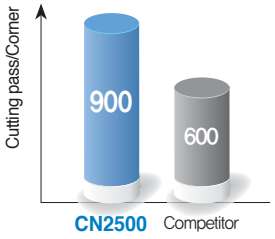
- **Cutting condition** vc (sfm) = 607, n (rpm) = 2,300
  fn (ipr) = 0.006, ap (inch) = 0.016
  wet
- **Designation** **Insert** : CCMT32.51–MP (CN2500)
  Holder : SCLCR12-3D
- **Test result**

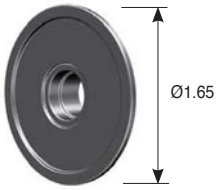




P Alloy steel (5120H)

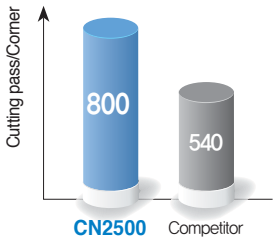
- **Cutting condition** vc (sfm) = 656, n (rpm) = 2,000
  fn (ipr) = 0.006, ap (inch) = 0.008
  wet
- **Designation** **Insert** : DCMT32.51-HMP (CN2500)
  Holder : SDJCR16-3D
- **Test result**

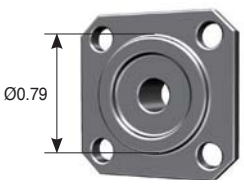




P Sintered ferrous alloy

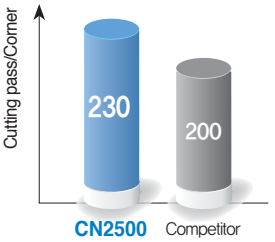
- **Cutting condition** vc (sfm) = 919, n (rpm) = 2,000
  fn (ipr) = 0.008, ap (inch) = 0.008
  wet
- **Designation** **Insert** : VBMT331-MP (CN2500)
  Holder : SVABL12-3B
- **Test result**





P Alloy steel (4115)

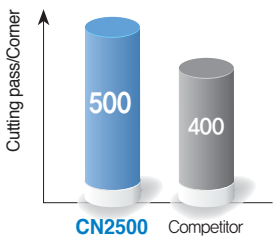
- **Cutting condition** vc (sfm) = 984, n (rpm) = 2,200
  fn (ipr) = 0.010, ap (inch) = 0.012
  wet
- **Designation** **Insert** : CNMG432-GM (CN2500)
  Holder : PCLNR16-4D
- **Test result**

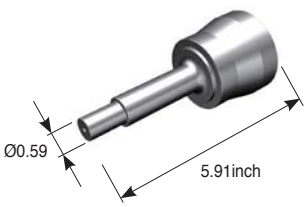




P Carbon steel (1045)

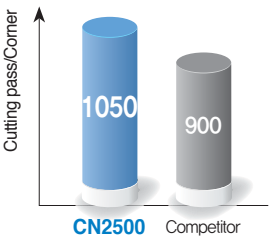
- **Cutting condition** vc (sfm) = 984, n (rpm) = 2,800
  fn (ipr) = 0.010, ap (inch) = 0.016
  wet
- **Designation** **Insert** : CNMG431-VB (CN2500)
  Holder : PCLNR20-5D
- **Test result**





P Alloy steel (5120)

- **Cutting condition** vc (sfm) = 656, n (rpm) = 2,300
  fn (ipr) = 0.008, ap (inch) = 0.012
  wet
- **Designation** **Insert** : CCMT32.51-HMP (CN2500)
  Holder : SCLCR12-3D
- **Test result**





Coated cermet grades

Coated cermet for machining carbon steel, alloy steel and sintered ferrous components

CC1500 new

- Maximized resistance to built-up edge and oxidation in continuous cutting at high speeds and low depth of cuts
- Superior wear resistance vs. existing tools in continuous cutting of carbon steel and alloy steel

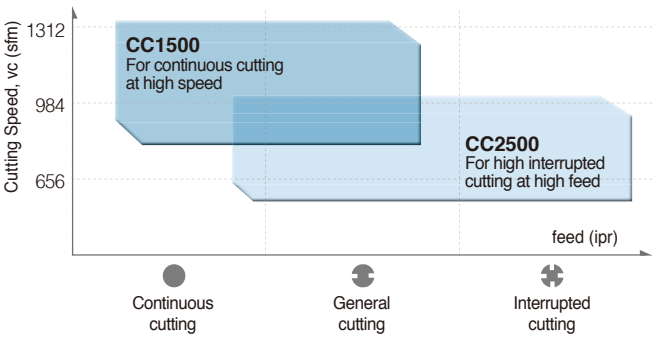
CC2500 new

- Maximized resistance to built-up edge and oxidation in interrupted cutting at high feeds and high depth of cuts
- Superior impact resistance vs. existing tools in interrupted cutting of carbon steel and alloy steel

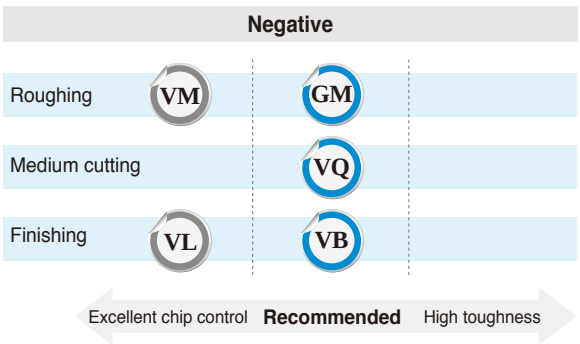
Recommended cutting condition

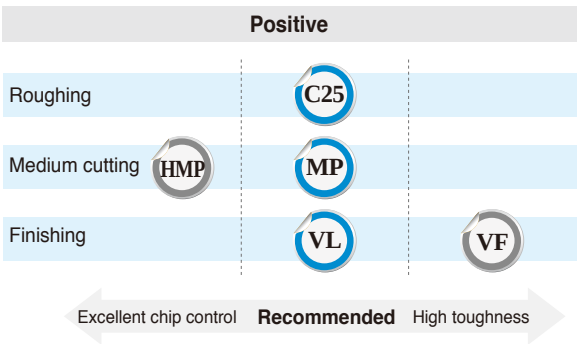
Division	Workpiece	Grade	Recommended cutting speed (sfm)
Turning	1010 (AISI) C10E (DIN)	CC1500	656 < **1148** < 1476
		CC2500	591 < **951** < 1312
	1045 (AISI) C45 (DIN)	CC1500	656 < **984** < 1312
		CC2500	591 < **886** < 1148
	4140(H)(AISI) 42CrM04	CC1500	591 < **886** < 1148
		CC2500	492 < **820** < 984

Grades line up



Chip breakers line up





Selection system of coated cermet grades

Workpiece		Machining types	Recommended grade	Recommended cutting speed (sfm)	ISO	Application range
P	Steel	Continuous cutting	CC1500 new	325 (200~450)	P10	CC1500 new
		Interrupted cutting	CC2500 new	265 (180~350)	P20	CC2500 new
					P30	

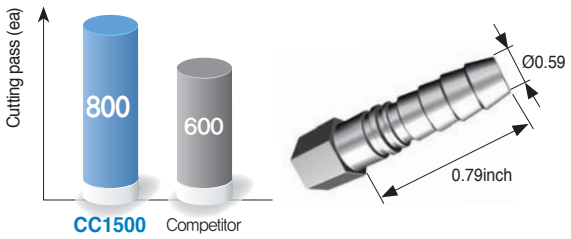
The features of coated cermet grade

Coated cermet	ISO	Features
CC1500 new	P10~P20	• PVD coated Cermet • Light cutting for steel and cast iron in high speed machining • Optimized for precision boring
CC2500 new	P20~P30	• PVD coated Cermet • Light cutting for steel and cast iron in medium or high speed machining • Dry and wet cutting are available

Application examples (CC1500)

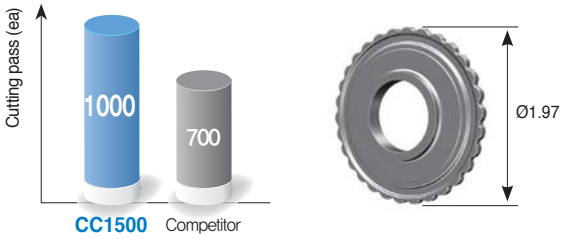
P Carbon steel (1020)

- **Workpiece** Nipple
- **Cutting condition** vc (sfm) = 558, n (rpm) = 2,000
  fn (ipr) = 0.005, ap (inch) = 0.005, wet
- **Designation** **Insert** : TPMT221-MP (CC1500)
  Holder : S12R-STWPR2
- **Test result**



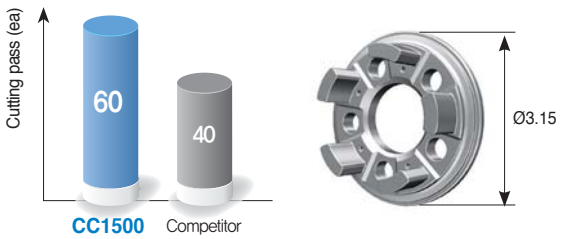
P Alloy steel (1040)

- **Workpiece** Plate carrier
- **Cutting condition** vc (sfm) = 1476, n (rpm) = 2,500
  fn (ipr) = 0.008, ap (inch) = 0.008, wet
- **Designation** **Insert** : DCMT32.51-HMP (CC1500)
  Holder : SDJCR16-3D
- **Test result**



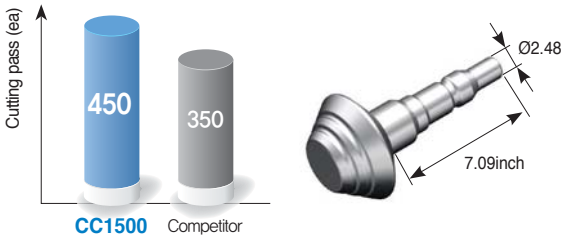
P Carbon steel (1045)

- **Workpiece** Cut plate carrier
- **Cutting condition** vc (sfm) = 984, n (rpm) = 2,500
  fn (ipr) = 0.012, ap (inch) = 0.016, wet
- **Designation** **Insert** : CCMT32.51-C25 (CC1500)
  Holder : SCACR08-3K
- **Test result**



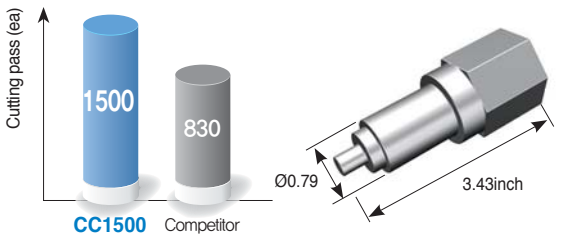
P Alloy steel (4118)

- **Workpiece** Pinion
- **Cutting condition** vc (sfm) = 820, n (rpm) = 2,500
  fn (ipr) = 0.008, ap (inch) = 0.020, wet
- **Designation** **Insert** : DNMG441-VL (CC1500)
  Holder : PDJNR16-4D
- **Test result**



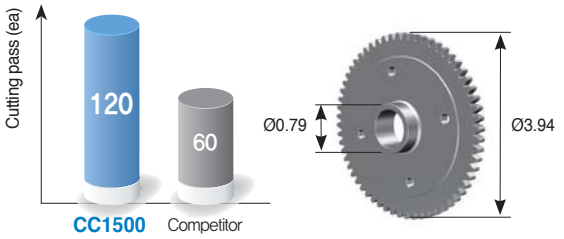
P Hot forging (4130)

- **Workpiece** Valve
- **Cutting condition** vc (sfm) = 755, n (rpm) = 2,200
  fn(ipr) = 0.031, ap (inch) = 0.005, wet
- **Designation** **Insert** : TNMG331-VQ (CC1500)
  Holder : PTTNR10-3A
- **Test result**



P Sintered ferrous alloy

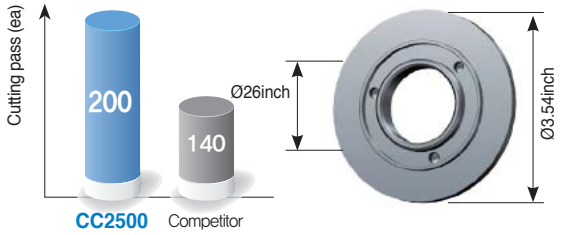
- **Workpiece** Sprocket
- **Cutting condition** vc (sfm) = 525, n (rpm) = 500
  fn (ipr) = 0.007, ap (inch) = 0.008, wet
- **Designation** **Insert** : SNMG432-VM (CC1500)
  Holder : MSKNR85-4D
- **Test result**



Application examples (CC2500)

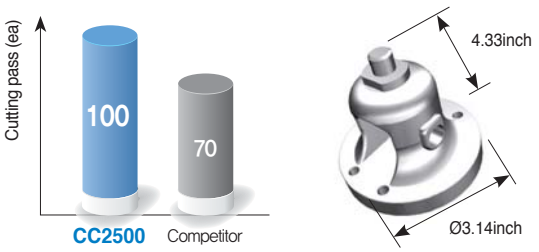
P Carbon steel (1045)

- **Workpiece** Swash-Plate
- **Cutting condition** vc (sfm) = 820, n (rpm) = 890
  fn (ipr) = 0.002, ap (inch) = 0.004, wet
- **Designation** **Insert** : DNMG331-VQ (CC2500)
  Holder : SDJCR16-3D
- **Test result**



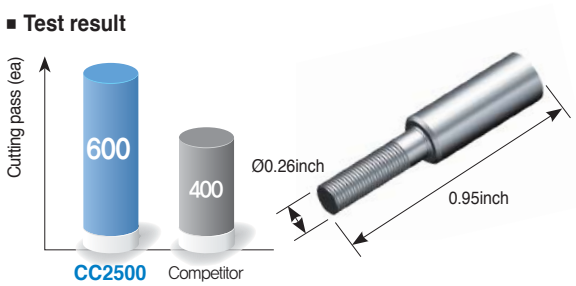
K Ductile cast iron (60-40-18)

- **Workpiece** Diff. case
- **Cutting condition** vc (sfm) = 492, n (rpm) = 600
  fn (ipr) = 0.006, ap (inch) = 0.012, wet
- **Designation** **Insert** : VBMT331-MP (CC2500)
  Holder : SVJBR16-3D
- **Test result**



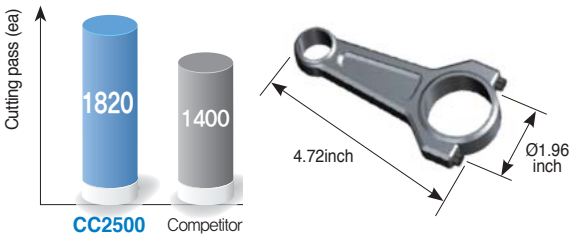
P Carbon steel (1035)

- **Workpiece** Piston Rod
- **Cutting condition** vc (sfm) = 400, n (rpm) = 4,800
  fn (ipr) = 0.006, ap (inch) = 0.079, wet
- **Designation** **Insert** : DNMG441-GM (CC2500)
  Holder : MDQNR16-4D
- **Test result**



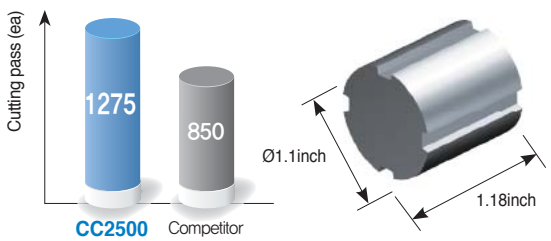
P Alloy steel (4120)

- **Workpiece** Connecting Rod
- **Cutting condition** vc (sfm) = 1,115, n (rpm) = 2,100
  fn (ipr) = 0.006, ap (inch) = 0.003, wet
- **Designation** **Insert** : TPMT221-MP (CC2500)
  Holder : S06M-STFPR-2
- **Test result**



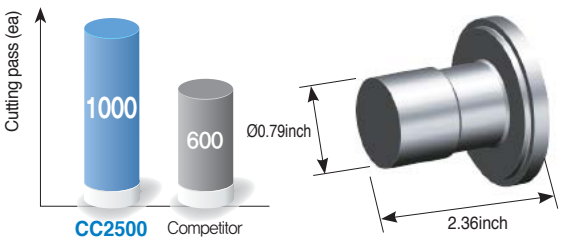
P Alloy steel (4115)

- **Workpiece** Bush
- **Cutting condition** vc (sfm) = 1,030, n (rpm) = 3,500
  fn (ipr) = 0.039, ap (inch) = 0.008, wet
- **Designation** **Insert** : CNMG432-VQ (CC2500)
  Holder : MCLNR16-4D
- **Test result**



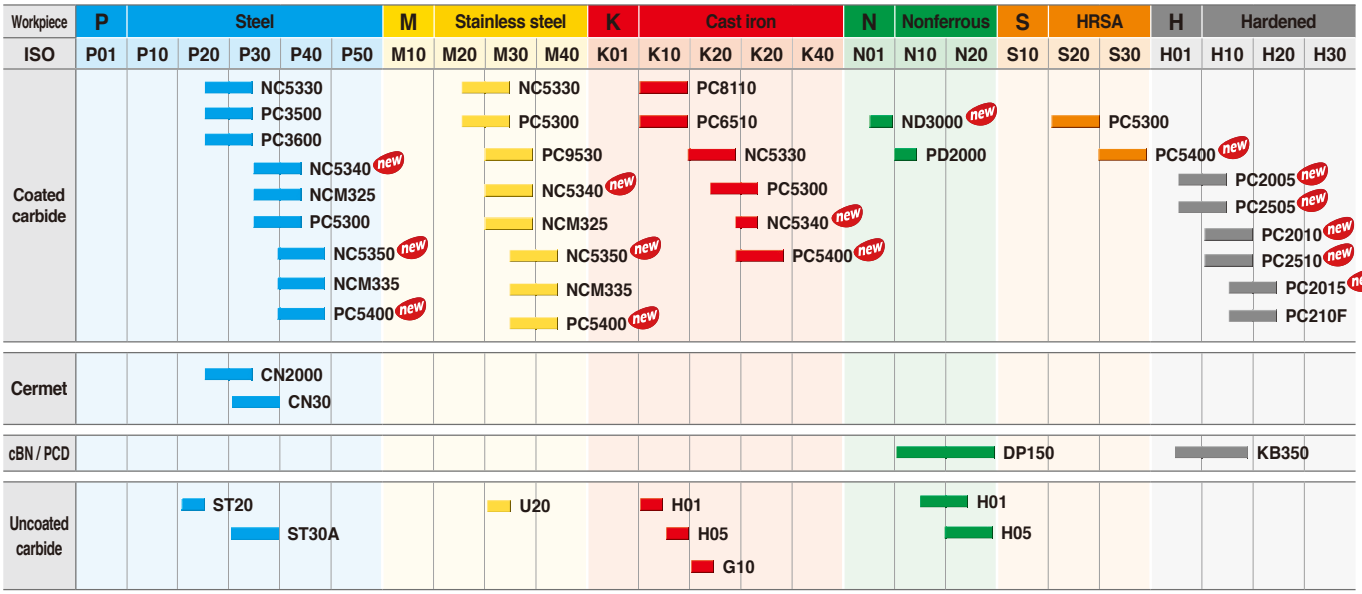
P Alloy steel (1541)

- **Workpiece** Shaft
- **Cutting condition** vc (sfm) = 1,204, n (rpm) = 5,800
  fn (ipr) = 0.001, ap (inch) = 0.061, wet
- **Designation** **Insert** : TPMT221-MP (CC2500)
  Holder : S06M-STFPR-2
- **Test result**



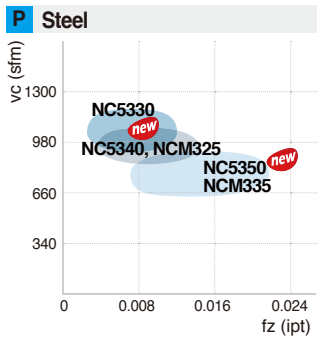
Milling grade selections

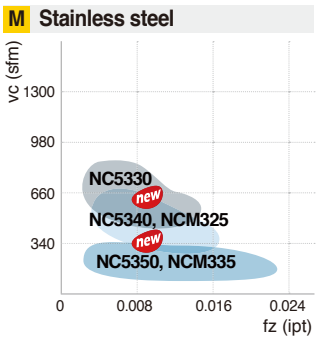
Selection system

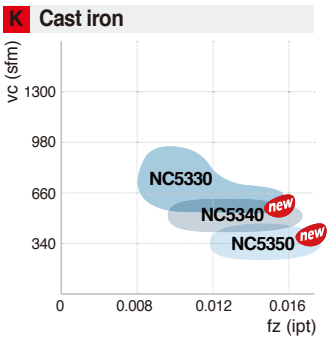


Application range of milling grades

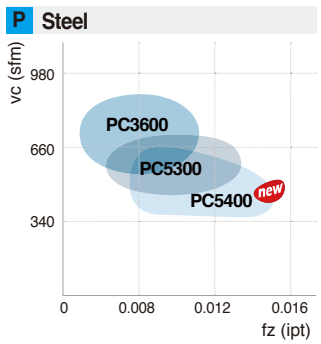
CVD

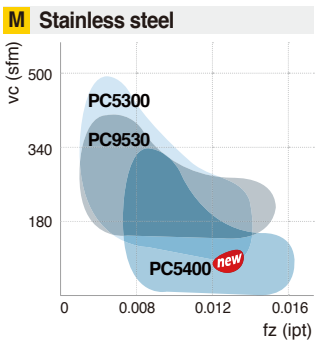


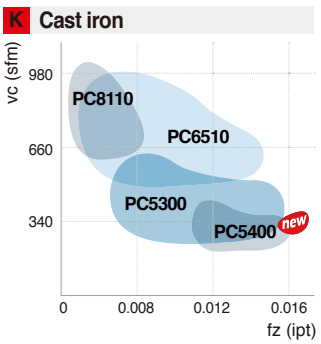


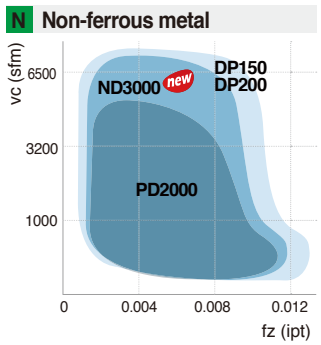


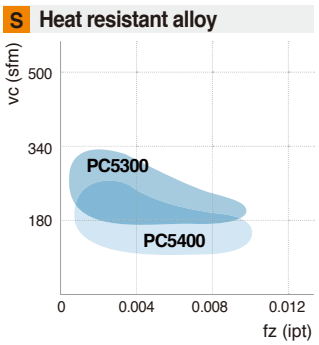
PVD

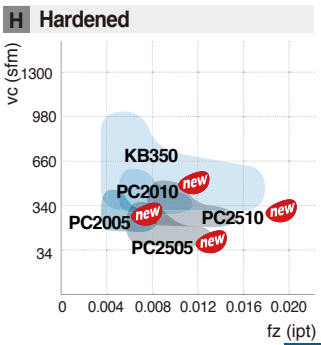












CVD coated grades

Universal Line up of CVD-coated grades

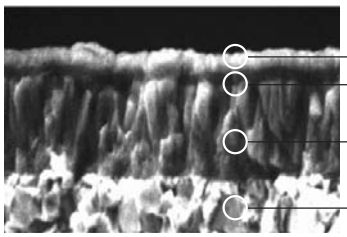
NC5330

- Excellent quality and a universal grade applicable to P, M, and K materials
- High toughness substrate and coating layer with excellent surface roughness and welding resistance

NC5340 new / NC5350 new

- Milling grades applicable to P, M, K
- Stable tool life due to its tough substrate and chipping-resistant coatings

Coating structure



- Lubricative coating with excellent surface finish and welding resistance
- Alumina coating with strong oxidation resistance
- Titanium coating with superb toughness and wear resistance
- High-tough substrate specialized for the coating films

Selection system of CVD coated grades

Workpiece		Machining types	Recommended grade	Recommended cutting speed (sfm)	ISO	Application range
P	Steel	Continuous cutting	NC5330	650 (590~750)	P20 P25	NC5330
		Continuous cutting	NC5340 new NCM325	590 (490~650)	P30 P35	NC5340 new, NCM325
		Interrupted cutting	NC5350 new NCM335	490 (430~590)	P40 P45	NC5350 new, NCM335
M	Stainless steel	Continuous cutting	NC5330	490 (390~590)	M10 M20	
		Continuous cutting	NC5340 new NCM325	430 (330~490)	M25 M30	NC5330, NC5340 new, NCM325
		Interrupted cutting	NC5350 new NCM335	360 (300~430)	M35 M40	NC5350 new, NCM335
K	Cast iron	Continuous cutting	NC5330	623 (361~886)	K10 K20	NC5330
			NC5340 new	492 (262~820)	K30	NC5340 new

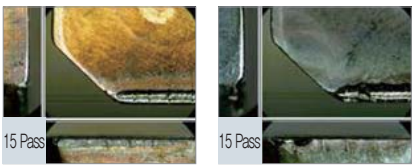
The features of CVD milling grades

CVD Coated grades	ISO	Features
NC5330	P20~P30 M20~M30 K15~K25	• For high speed milling of steel and stainless steel • Superior wear resistance and chipping resistance grade for steel and stainless steel • MT-TiCN + Al_2O_3 + TiN
NC5340 new NCM325	P30~P40 M25~M35 K25~K30	• For high speed milling of steel and stainless steel • Optimized grade for steel & stainless steel by employing proper substrate and hard coating • MT-TiCN + Al_2O_3 + TiN
NC5350 new NCM335	P35~P45 M30~M40	• For interrupted and rough milling of steel and stainless steel • Toughest substrate with hard coating provides stable cutting and tool life for severe interrupted cutting • MT-TiCN + Al_2O_3 + TiN

Application examples (NC5330/NC5340)

P Alloy steel (4140)

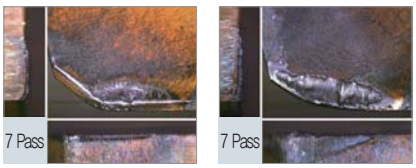
- **Cutting condition** vc (sfm) = 820, fz (ipt) = 0.012
  ap (inch) = 0.079, dry
- **Designation** **Insert** : SDKN53AESN-SU (NC5330)
  Holder : ADNA5500R
- **Test result**



NC5330 Competitor A

P Alloy steel (4140)

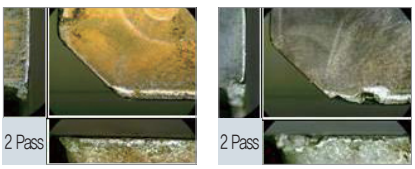
- **Cutting condition** vc (sfm) = 984, fn(ipr) = 0.012
  ap (inch) = 0.079, wet
- **Designation** **Insert** : SPCN42EDR (NC5340)
  Holder : EPN4500R
- **Test result**



NC5340 Competitor A

M Stainless steel (304)

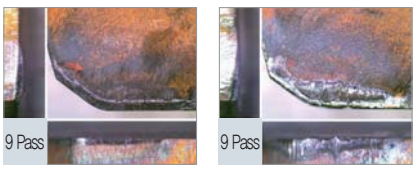
- **Cutting condition** vc (sfm) = 492, fz (ipt) = 0.010
  ap (inch) = 0.079, dry
- **Designation** **Insert** : SDKN53AESN-SU (NC5330)
  Holder : ADNA5500R
- **Test result**



NC5330 Competitor A

P Carbon steel (1045)

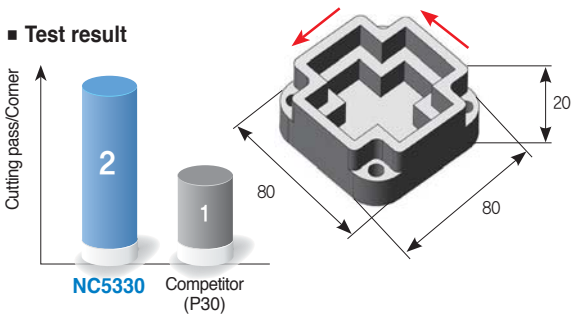
- **Cutting condition** vc (sfm) = 1148, fn (ipt) = 0.014
  ap (inch) = 0.079, wet
- **Designation** **Insert** : SPCN42EDR (NC5340)
  Holder : EPN4500R
- **Test result**



NC5340 Competitor A

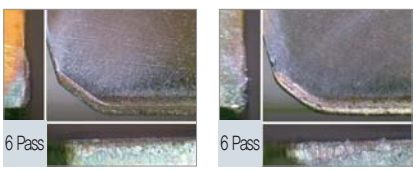
K Ductile cast iron (80-55-06)

- **Cutting condition** vc (sfm) = 656, fz (ipt) = 0.008
  ap (inch) = 0.197, dry
- **Designation** **Insert** : SDKN53AESN-SU (NC5330)
  Holder : ADNA5400R
- **Test result**



K Gray cast iron (No35B)

- **Cutting condition** vc (sfm) = 1312, fn (ipt) = 0.008
  ap (inch) = 0.118, wet
- **Designation** **Insert** : SPCN42EDR (NC5340)
  Holder : EPN4400R
- **Test result**



NC5340 Competitor A

PVD coated grades

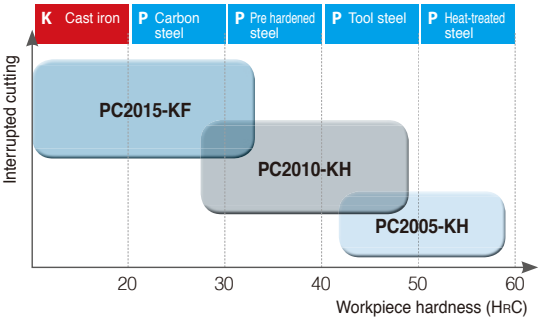
PVD coated grades for finishing high hardened steel

PC2005 new / PC2010 new / PC2015 new

- Finishing grade lineup for tool steel and plastic die steel
- PC2005 with extremely hard substrate and coatings
- PC2010 with high hardened cutting edges, ideally suited for pre-hardened steel and interrupted cutting
- PC2015 for carbon steel and casting machining, demonstrating excellent performance in hard-to-cut materials

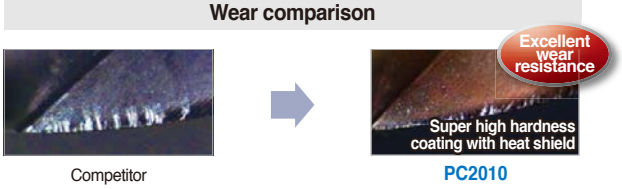
Application guideline per workpiece

Recommended grade and chip breaker

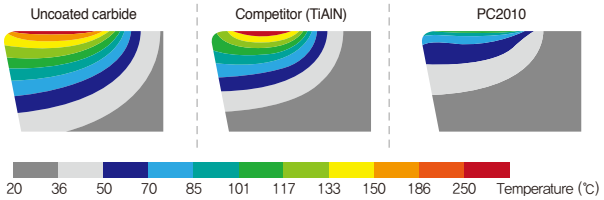


Features

Wear comparison



Result of heat conductivity



- Heat shield coating was applied to prevent thermal crack.
- Ultra fine WC was combined with high contents cobalt to be optimized for machining pre hardened steel.

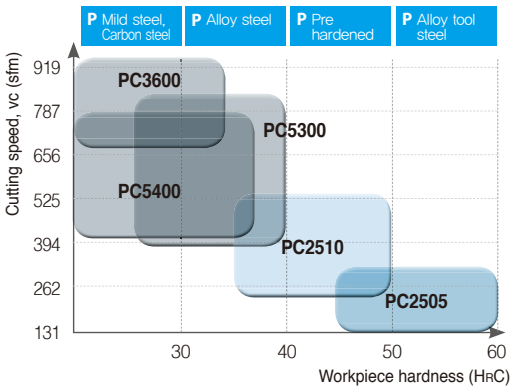
PVD coated grades for roughing high hardened steel

PC2505 new / PC2510 new

- Roughing grade series for high hardened steel
- PC2505 with excellent wear resistance, ideal for machining die steel and high hardened steels over HRC50
- PC2510 with stabilized toughness, ideal for interrupted cutting of high hardened steel and wet cutting accompanied by massive thermal shock

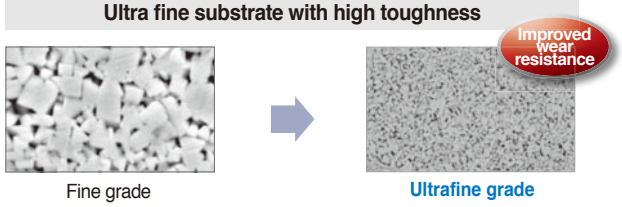
Application guideline per workpiece

Recommended grade and chip breaker

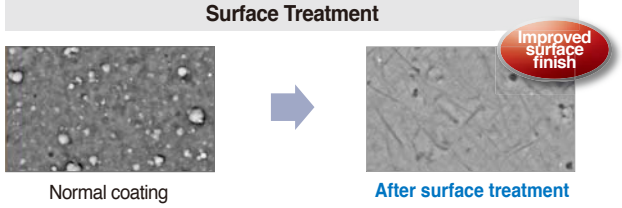


Features

Ultra fine substrate with high toughness



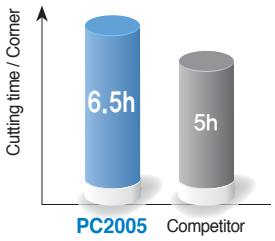
Surface Treatment



Application examples (PC2005/PC2010/PC2015)

H Alloy tool steel (D2, heat treated)

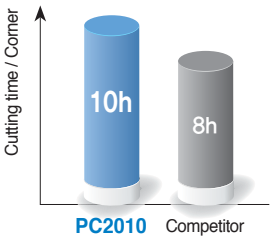
- **Workpiece** Automobile press mold
- **Cutting condition** vc (sfm) = 1237, fz (ipt) = 0.020
  ap (inch) = 0.020, ae (inch) = 0.012, dry
- **Designation** **Insert** : LBH1000-KH (PC2005)
  Holder: LBEA100551S-S100C
- **Test result**





P Mold steel (P20+Ni)

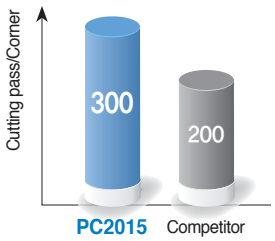
- **Workpiece** Automobile press mold
- **Cutting condition** vc (sfm) = 656, fz (ipt) = 0.004
  ap (inch) = 0.004~0.020, ae (inch) = 0.004~0.020, wet
- **Designation** **Insert** : LBH0625-KH (PC2010)
  Holder : LBEA062394S-S063C
- **Test result**





P Carbon steel (1053)

- **Workpiece** CV Joint
- **Cutting condition** vc (sfm) = 656, fz (ipt) = 0.010
  ap (inch) = 0.020~0.079, ae (inch) = 0.004~0.039, dry
- **Designation** **Insert** : LBH1000-KF (PC2015)
  Holder: LBEA100551S-S100C
- **Test result**

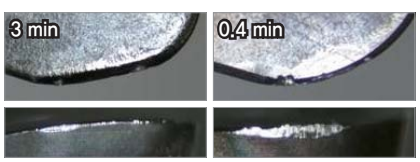




Application examples (PC2505/PC2510)

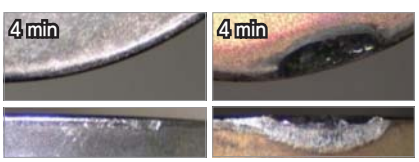
H Alloy tool steel (D2, heat treated)

- **Cutting condition** vc (sfm) = 262, fz (ipt) = 0.02
  ap (inch) = 0.012, ae (inch) = 0.394, dry
- **Designation** **Insert** : LPEW040210R-C (PC2505)
  Holder : HFMSA1037HR-2S037
- **Test result**



H Alloy tool steel (D2, heat treated)

- **Cutting condition** vc (sfm) = 98, fz (ipt) = 0.016
  ap (inch) = 0.028, ae (inch) = 1.575, dry
- **Designation** **Insert** : RPMW1204M0S1 (PC2510)
  Holder: FMRSA4200HRP-4M125
- **Test result**



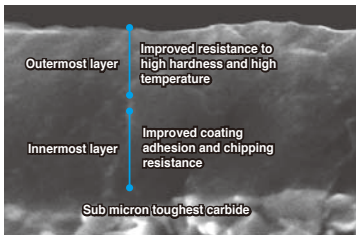
PVD coated grades

Universal PVD grade

PC5300

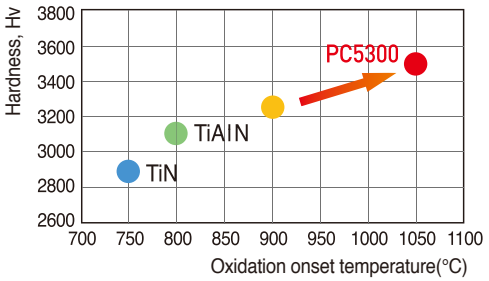
- Advanced PVD coating with high hardness and high temp stability
- High tough substrate and coating films produce excellent surface finish
- Universal tooling capability covering P, M, K, S with this single grade, PC5300
- Stable machining resulting from excellent edge hardness and chipping resistance

Features



- Latest PVD coating technology developed by KORLOY
- New concept of coating equipped with high temperature oxidation resistance and high hardness

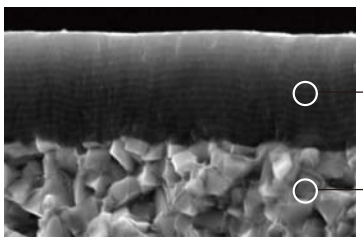
High temp properties



PC5400 new

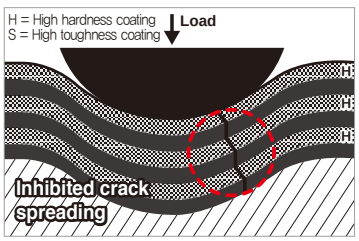
- New PVD coating layer with high toughness and lubrication
- High adhesive strength and toughness between the substrate and coating layer
- Excellent cutting edge strength and chipping resistance ensure stable machinability for P, M, K, S.

Features

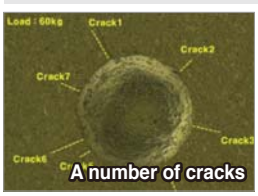


Improved lubrication
High toughness and strong adhesion

Ultrafine substrate of high toughness



Crack creation on the coating surface after leaving an indentation by 60kg



Normal coating



High toughness coating

Selection system of PVD coated grades

Workpiece		Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P	Steel	Continuous cutting	PC3600	771 (591~2690)	P20	PC3600
			PC3500		P30	PC3500
		Interrupted cutting	PC5300	640 (492~787)	P40	PC5300
			PC5400 new	476 (262~689)		PC5400 new
M	Stainless steel	Continuous cutting	PC5300	427 (328~525)	M20	PC5300
			PC9530	410 (262~492)	M30	PC9530
		Interrupted cutting	PC5400 new	361 (262~492)	M40	PC5400 new
K	Cast iron	Continuous cutting	PC8110	591 (459~755)	K05	PC8110
			PC6510	591 (459~755)	K10	PC6510
		Interrupted cutting	PC5300	476 (360~591)	K20	PC5300
			PC5400 new	410 (279~525)	K30	PC5400 new
S	HRSA	Continuous cutting	PC5300	180 (131~230)	S10	
					S20	PC5300
		Interrupted cutting	PC5400 new	131 (98~164)	S30	PC5400 new
H	High hardness steel	Continuous cutting	PC2005 new	197 (131~262)	H01	PC2005 new
			PC2010 new	180 (131~230)	H10	PC2505 new, PC2010 new, PC2510 new
			PC2015 new	164 (115~213)	H20	PC2015 new
			PC210F	164 (115~213)	H30	PC210F

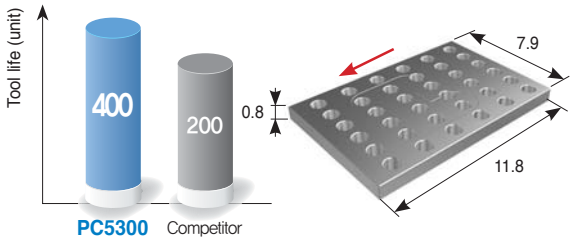
The features of PVD coated grades

PVD Coated grades	ISO	Features
PC3600	P20~P30	• Milling grade for medium and roughing of steel • New coating layer with superior wear resistance and oxidation resistance with high toughness substrate
PC3500	P25~P35	• Medium and rough milling for steel • K-Gold coating
PC5300	P30~P40 K20~K30 M20~M30 S15~S25	• Superior universal grade for steel, cast iron, hard to cut material, stainless steel • New coating and ultra fine grain provide wear resistance and oxidation resistance • TiAlN Series new coating
PC5400 new	P35~P45 K25~K35 M30~M40 S25~S35	• Universal grade for interrupted machining of steel, cast iron, hard-to-cut materials and stainless steel with stable machinability • New coating layer with high toughness and lubrication on ultra fine grain substrate with high toughness • AlCiN series new coating
PC8110	K05~K15	• Excellent wear resistance in cast iron milling finish applications • Superior wear resistance for finishing cast iron • New coating and ultra fine grain provide wear resistance and oxidation resistance • TiAlN Series new coating
PC6510	K05~K15	• High speed milling grade for cast iron and aluminum • K-Gold coating
PC9530	M25~M35	• Medium to rough cutting of hard to cut materials such as stainless steel, Cr-Ni steel, etc. • The toughest sub-micron substrate provides excellent cutting performance at high feed • TiAlN coating
PC2005 new	H01~H10	• Exclusive for Laser Mill in milling of high hardness workpieces and press mold steel • Utmost wear resistance due to high hardness substrate and coating • Ultra high hardness K-Brown coating
PC2010 new	H05~H15	• Exclusive for Laser Mill in milling of pre hardened steel and plastic mold steel • High hardness enhanced cutting edges due to ultra fine WC and high contents binder for expanding application range to high hardness steel and pre hardened steel • Ultra high hardness K-Brown coating
PC2015 new	H10~H20	• Exclusive for Laser Mill in milling of carbon steel and cast • Highly lubricative K-SILVER coating • Lubricative coating layer and high contents substrate for machining mild steel and hard-to-cut cast materials
PC210F	H10~H20 P25~P35 K15~K25 M15~M25 S10~S20	• High speed milling grade for hardened steel, cast iron, and stainless steel(Laser Mill) • New coating and ultra fine grain provide wear resistance and oxidation resistance • TiAlN Series new coating
PC2505 new	H01~H10	• Roughing grade for high hardened steel and pressed die steel • Excellent wear resistance ideal for machining die steel and high hardened steel over HRC50
PC2510 new	H05~H15	• Roughing grade for pre-hardened steel and plastic die steel • Stabilized toughness ideal for interrupted cutting of high hardened steel and wet cutting accompanied by massive thermal shock

Application examples (PC5300)

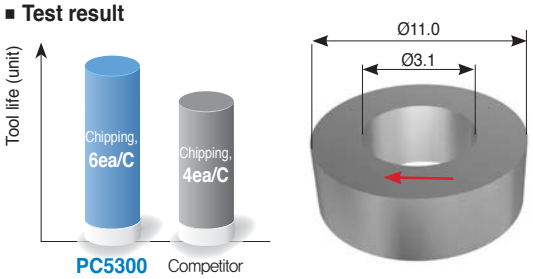
P Mold steel (P20)

- **Cutting condition** vc (sfm) = 820, fn (ipr) = 0.039
  ap (inch) = 0.039, dry
- **Designation** **Insert** : WNMX130520ZNN-MM
  Holder: HRMDCA13200HR-3
- **Test result**



M Stainless steel (316)

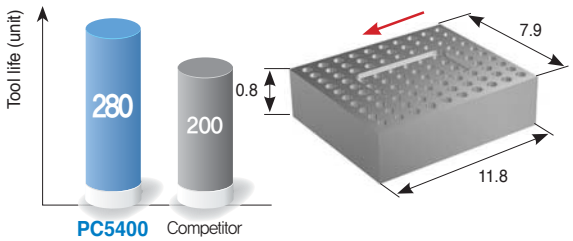
- **Cutting condition** vc (sfm) = 213, fn (ipr) = 0.006
  ap (inch) = 0.118, wet
- **Designation** **Insert** : SEET14M4AGSN-MM
  Holder: FMACA4400HR
- **Test result**



Application examples (PC5400)

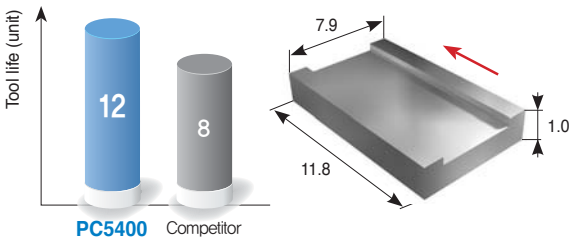
P Carbon steel (1045)

- **Cutting condition** vc (sfm) = 820, fz(ipt) = 0.047
  ap (inch) = 0.039, dry
- **Designation** **Insert** : WNMX130520ZNN-MM
  Holder: HRMDCA13200HR-4
- **Test result**



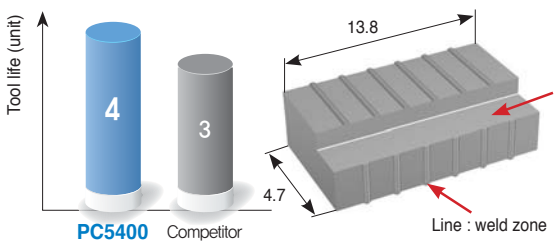
P Alloy steel (5140)

- **Cutting condition** vc (sfm) = 591, fz (ipt) = 0.008
  ap (inch) = 0.079, dry
- **Designation** **Insert** : RDKT1605M0-MM
  Holder: FMRCA5250HRD-H
- **Test result**



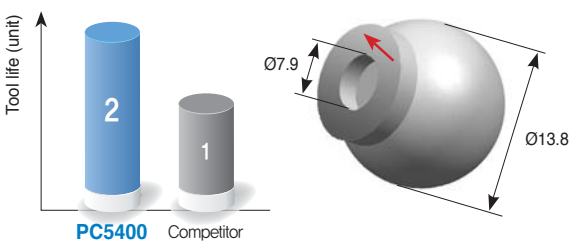
M Stainless steel (316)

- **Cutting condition** vc (sfm) = 164, fz (ipt) = 0.004
  ap (inch) = 0.157, ae (inch) = 0.591, dry
- **Designation** **Insert** : APMT1604PDSR-MM
  Holder: AMCA3250HS
- **Test result**



S Heat-resistant alloy (Inconel 718)

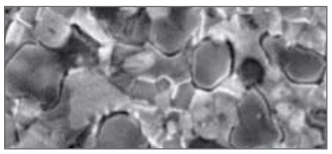
- **Cutting condition** vc (sfm) = 197, fz (ipt) = 0.004
  ap (inch) = 0.098, wet
- **Designation** **Insert** : SNMX1206ANN-MM
  Holder: RM8ACA4300HR
- **Test result**

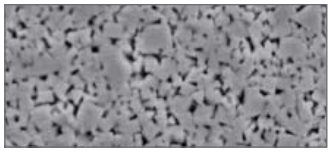


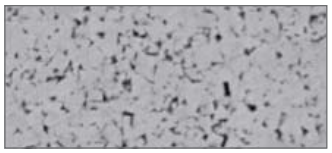
Uncoated carbide grades

Features

- Due to KORLOY's advanced sintering technology, our uncoated carbide grades have a fine alloy structure which is necessary to get superior quality from a uncoated cutting tool


P type


M type


K type

Advantages

- Consist of P,M,K carbide grades and can be used in all kinds of workpiece
- Excellent quality at machining with coolant, due to the superior thermal crack resistance of the carbide
- Due to the special design of carbides, it has fine micro structure and low affinity with workpiece
- It has excellent toughness and produces lower cutting loads

Selection system of uncoated carbide grade

Workpiece		Grade	Recommended cutting speed (sfm)	ISO	Application range
P	Steel	ST30A	262 (197~328)	P30	ST30A
M	Stainless steel	U20	295 (230~361)	M20	U20
				M30	
K	Cast iron	H01, H05	492 (361~623)	K10	H01, H05
		G10	394 (295~492)	K20	G10
N	Aluminum alloy	H01	1969 (1476~2461)	N10	H01
	Copper alloys	H05	1394 (1050~1739)	N20	H05

Main composition and application range

Workpiece	Composition	Features	Workpiece
P	WC-TiC-TaC-Co	Excellent thermal shock resistance and plastic deformation resistance	Carbon steel, Alloy steel, Stainless steel
M	WC-TiC-TaC-Co	General grades with thermal shock resistance and hardness	Carbon steel, Alloy steel, Stainless steel, Cast steel
K	WC-Co	High hardness and superior wear resistance	Cast iron, Non-ferrous metal, Non metal

The physical properties of uncoated carbide grades

Workpiece	Grade	Hardness (HRA)	TRS (kgf/mm²)	Young's modulus (10^3kgf/mm²)	Thermal expansion coefficient(10^{-6}/°C)	Thermal conductivity (cal/cm·sec·°C)
P	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U20	91.1	210	-	-	88
K	H01	92.9	210	66	4.7	109
	G10	90.9	250	63	-	105

1KPa = 102kgf/m², 1w/mk = 2.39×10^{-3}cal/cm·sec·°C

Cermet grades

Features

- High hardness substrate ensures long tool life in high speed milling
- High toughness cutting edge ensures long tool life even in high impact machining
- Chemically stable substrate provides excellent surface finish of the workpiece

Selection system of cermet grades

Workpiece		Machining types	Grade	Recommended cutting speed (sfm)	ISO	Application range
P	Steel	Continuous cutting	CN2000	820 (656~984)	P20	CN2000
		Interrupted cutting	CN30	492 (328~656)	P30	CN30

The features of cermet grades

Cermet Grade	ISO	Features
CN2000	P20~P30	• Universal grade from finishing to roughing of steel • Functionally Gradient Material
CN30	P25~P35	• For milling of steel • Cermet with high toughness

The physical properties of cermet grades

Workpiece	Grade	Hardness(Hv)	TRS(kgf/mm^2)	SG(g·cm^{-3})
P	CN2000	< 1800	210 <	6.8~7.0
	CN30	< 1500	240 <	7.0~7.3

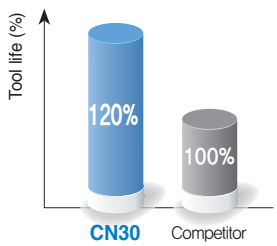
Application examples (CN30)

P Carbon steel (D2, NAK80, 1045, P20)

■ **Cutting condition** vc (sfm) = 394~492, fz (ipt) = 0.003~0.005
ap (inch) = 0.08, dry

■ **Designation** **Insert** : SDCN42MT
Holder : ADNA41200R

■ **Test result**



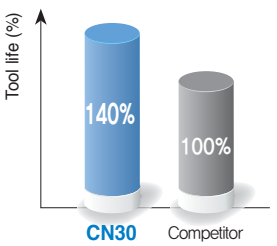


P Mold steel (1055, P20)

■ **Cutting condition** vc (sfm) = 754, fz (ipt) = 0.004~0.006
ap (inch) = 0.04, dry

■ **Designation** **Insert** : SDCN42MT
Holder : ADNA41200R

■ **Test result**





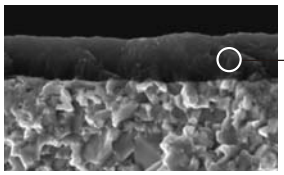
Solid endmills grade selection

Grades for H Endmill

PC303S new / PC310U new

- Ultrafine substrate & high hardness coatings for excellent wear resistance
- Special surface treatment provides higher chipping resistance

Features



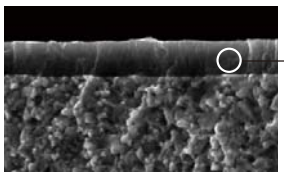
Exceptional wear resistance resulting from extremely hard coating layers

Grades for Z Endmill

PC315E new

- Fine substrate & lubricative coatings for stable machinability

Features



Lubricative coatings for excellent machinability

Selection system

Workpiece		Grade	ISO	Application range
P	Steel	PC303S new	P01	
		PC310U new	P10	PC303S new, PC203F
		PC315F new	P20	PC310U new
		PC320 new	P30	PC315E new, PC320 new, PC215F
			P40	
M	Stainless steel	PC303S new	M01	
		PC310U new	M10	PC303S new, PC203F, PC310U new
		PC320S new	M20	PC320S new, PC315F new, PC320, PC215F
		PC315E new	M30	
K	Cast iron	PC303S new	K01	
		PC310U new	K10	PC303S new, PC203F, PC310U new
		PC315F new	K20	
		PC320 new	K30	PC315E new, PC320 new, PC215F, PC220, FA2
			K40	
N	Nonferrous	ND3000 new	N01	ND3000 new
		ND2100 new	N05	ND2100 new, PD3000, H01, H05S, PC210C
		PD3000	N10	
		H01	N20	
S	HRSA	PC210	S10	
		PC320S new	S20	PC210, PC320S new, PC315E new, PC320, PC215F, PC220, FA2
		PC315E new	S30	
H	High hardness steel	PC303S new	H01	
		PC203F	H10	PC303S new, PC203F, PC310U new
		PC310U new	H20	

Solid endmills grade selection

Grade information for each product

Item	Grade	
	Coated	Uncoated
H Endmill new	PC303S, PC310U	-
V Endmill	PC215F	-
Z Endmill new	PC315E	-
F Endmill	PC203F	-
T Endmill new	PC2510, ND3000	-
I+ Endmill	PC320	-
Z+ Endmill new	PC320U	-
S+ Endmill	PC320S	-

Item	Grade	
	Coated	Uncoated
R+ Endmill new	HN30T, HC10T, HC20T, HC30T, PC10T, PC20T, PC30T, PC40T	FN30T
Aluminum solid endmill new	PD3000	H01
A+ Endmill	-	H05S
C-Max	PC210C	-
D Endmill new	ND3000	-
Composite Router Endmill new	ND2100	-
Brazed endmill	PC221F	FCC

The features of PVD coated grades

Workpiece	ISO	Features
PC303S new	P05~P15 M05~M15 K05~K15	• Excellent wear/chipping resistance in high speed machining due to the combination of ultra fine substrate and PVD coating • For high speed machining of high hardness steel • New film applied with excellent oxidation resistance and hardness at high temperature
PC310U new	P10~P20 M10~M20 K10~K20	• Excellent wear/chipping resistance in high speed machining due to the combination of ultra fine substrate and PVD coating • For high speed machining of high hardness steel • New film applied with excellent oxidation resistance and hardness at high temperature
PC315E new PC320 new	P20~P35/M20~M30 K20~K35/S20~S30	• Excellent wear/welding resistance in high speed machining due to the combination of ultra fine substrate and PVD coating • For low/medium speed machining of general steel • New film applied with excellent chipping/wear resistance
PC320S new	M15~M25 S15~S25	• Low to medium speed cutting of stainless steel and heat resistant alloys • Advanced coating layers with increased resistance to built-up edge and oxidation • Excellent resistance to wear and built-up edge at high speeds due to the ultrafine substrate and dedicated coating layers
PC210C	N10~N20	• Medium to high speed cutting of copper and copper electrode • Medium to high speed cutting of acrylic materials • K-Silver coating with excellent lubrication and wear and chipping resistant substrate
ND3000 new	N01~N05	• For electrode machining of graphite at medium to high speeds • Dia. coating layer with high wear resistance and lubrication
ND2100 new	N05~N10	• For composite materials • Diamond-coated layers with excellent adhesion
PD3000	N05~N10	• For Non-ferrous metals(Aluminum alloy) machining • DLC(Diamond Like Carbon) coating layer with high wear resistance and lubrication

Features of korloy endmills

Index	Features
H Endmill (Endmill for high hardness steel)	• Negative cutting edges proper to machine high hardness heat-treated workpiece under HRC70 • Longer tool life with the use of ultra fine substrate and high hardness film
Z Endmill/I+ Endmill (Endmill for general cutting)	• Excellent in machining various workpieces such as carbon steel, alloy steel, cast iron, pre hardened steel, etc. under HRC45 • Longer tool life with the use of ultra fine substrate and new coating technology
T Endmill (For dental purpose)	• Endmill for dental prostheses made of zirconia, titanium, Co-Cr, wax, PMMA, and glass ceramic • Custom-made tools for each type of milling machines for dental purpose
Z+ Endmill	• Universal endmill applicable to a variety of workpiece materials under HRC47 • Roughing and finishing availability • Improved tool life thanks to the new substrate and the most advanced coating • Inhibited chipping and longer cutting time due to the optimized blade design
SSEA/A+ Endmill (Endmill for aluminum)	• Suitable for high speed machining in aluminum and other Non-ferrous materials • Can accomplish excellent surface finishing, superior chip removal in high feed rate
S+ Endmill (Endmill for hard-to-cut materials)	• Sharp cutting edge and high rake angle with streamline chip pocket shows good cutting performance in stainless steel machining where work hardening is a problem
R+ Endmill	• High efficient roughing endmill for medium to rough cutting • Excellent machining efficiency thanks to the high efficient roughing edge design • Reduced cutting force thanks to specifically designed corners, and irregular flute spacing and lead angle
D Endmill	• Diamond-coated endmill for graphite and ceramic • Excellent wear resistance thanks to the diamond coating of high hardness and high purity • Optimized for high speed and heavy duty cutting thanks to the strong grip of coating • Excellent cutting performance and finish thanks to the optimized blade design of high rake
Composite Router Endmill	• Router endmill for machining composite materials (CFRP & GFRP) • Minimized machining defects thanks to its design to prevent flaking, peeling off and burrs • Excellent resistance to wear and flaking thanks to the nano-crystalline diamond coating of high hardness and high purity
C-Max	• Ideally suited for machining copper, brass, bronze, and Non-ferrous materials thanks to the optimized combination between K-Silver coating with excellent lubrication and resistance to wear and chipping, and the dedicated substrate

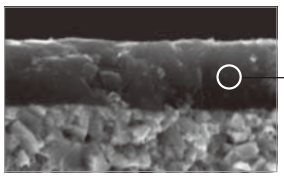
Solid drills grades selection

Grades for Mach Solid Drill (MSD)

PC325U new

- Special surface treatment provides improved lubrication and reduced cutting loads
- Stable tool life thanks to increased welding resistance

Features



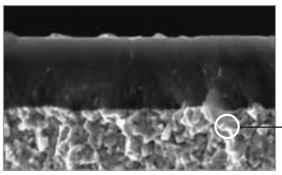
Increased welding resistance in medium to high speed cutting due to highly lubricative coating layers
Increased wear resistance in carbon steel machining

Grades for Mach Long Drill (MLD)

PC215G new / PC315G new

- Improved wear resistance due to the ultrafine substrate
- Reduced friction resistance and smooth chip flow due to improved coating lubrication

Features



Exceptional wear resistance due to the ultrafine substrate

Selection system

Workpiece		Grade	ISO	Application range
P	Steel	PC215G new	P01	
		PC315G new	P10	
		PC325U new	P20	PC215G new, PC315G new, PC325U new, PC230F
		PC230F	P30	
M	Stainless steel	PC215G new	M01	
		PC315G new	M10	
		PC205F	M20	PC215G new, PC315G new, PC205F, PC325U new
		PC325U new	M30	
K	Cast iron	PC215G new	K01	
		PC315G new	K10	
		PC205F	K20	PC215G new, PC315G new, PC205F, PC325U new
		PC325U new	K30	
N	Nonferrous	ND2100 new	N05	ND2100 new
		FG2	N10	FG2
			N20	

Solid drills grades selection

Grade information for each product

Item	Grade	
	Coated	Uncoated
MSD Plus new	PC325U	FU25
MSD Plus CFRP new	ND2100	FK02
MSFD new	PC325U	FU25
MLD Plus new	PC215G, PC315G	FG2
VZD	PC230F	ST30N
SSD Plus new	-	FA1, FG2

The features of PVD coated grades

Workpiece	ISO	Features
PC325U new	P20~P35 M20~M30 K20~K35	• Universal grade for machining steel, cast iron, stainless steel, etc. • Stable cutting performance with excellent wear/chipping resistance • Increased welding resistance due to lubricative new coating at medium to high speed
PC215G new	P15~P30 M15~M25 K15~K30	• Universal grade for machining steel, cast iron, etc. • Stable cutting performance with excellent wear/chipping resistance
PC315G new	P15~P30 M15~M25 K15~K30	• Universal grade for machining steel, cast iron, stainless steel, etc. • Stable cutting performance with excellent wear/chipping resistance • Increased welding resistance due to lubricative new coating at medium to high speed
PC230F	P25~P35	• For machining general steel at medium to high speed • Stable cutting performance with excellent wear/chipping resistance
ND2100 new	N05~N10	• For machining composite materials • Diamond-coated layers with excellent adhesion
FG2	N05~N25	• Increased wear/chipping resistance with the use of ultra fine substrate

Features of KORLOY drills

Index	Features
MSD Plus	• Increased welding resistance in medium to high speed cutting due to highly lubricative coating layers • Increased wear resistance in carbon steel machining • Reduced friction resistance around corners and flutes
MSD Plus CFRP	• The best tool for hole making of CFRP workpieces • Excellent wear resistance due to the diamond-coated grade • Reduced burr creation in CFRP machining due to high rake cutting edges
MSFD	• High quality hole making capability with 180° point angle • Improved anti-chipping and welding resistance by edge honing and chamfering • Minimized creation of burrs compared to general drills
MLD Plus	• Higher rigidity due to straight-edge design • Smooth chip flow due to wider chip pockets and improved surface finish on flutes • Double margin system for stable machinability
MSD Plus	• Improved chip control due to newly developed design • Improved surface finish and design for high quality machining • Increased productivity due to stable tool life

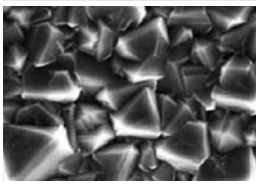
Diamond coated grades

Grade for graphite and ceramic

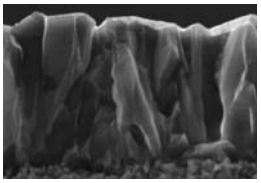
ND3000 new

- SP3-crystalline diamond coatings of high purity and high hardness
- Improved adhesion between coated layers and the substrate that is specialized for diamond coatings
- Excellent tool life when machining graphite and ceramic

Surface of ND3000



Cross section of ND3000's coated layers

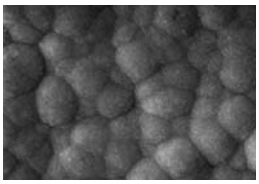


Grade for composite materials

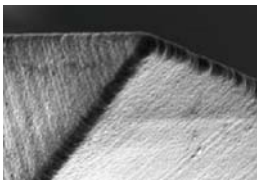
ND2100 new

- Improved surface finish and wear resistance due to the control technology of nano-crystalline diamond particles
- Improved flaking resistance due to the substrate that is specialized for diamond coatings
- High quality and high precision machining availability thanks to sharp edges
- Excellent tool life when machining composite materials

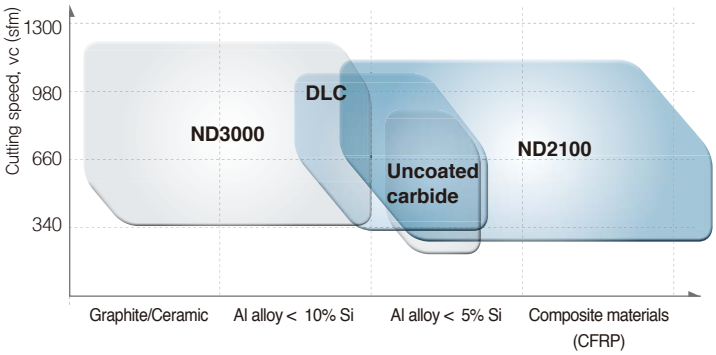
Surface of ND2100



Sharp edges of ND2100



Application range



Selection system

Workpiece			Grade	ISO	Application range
N	Nonferrous	Graphite/Ceramic	ND3000 new	N01	ND3000 new
		Al alloy	ND3000 new ND2100 new	N05	ND2100 new
		Composite materials	ND2100 new	N10	

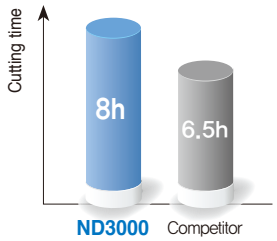
The features of diamond coated grades

Grade	ISO	Features
ND3000 new	N01~N05	• For continuous roughing of graphite, ceramic, and Al alloy at high speeds • Exceptional cutting performance due to high resistance to wear and flaking • High hardness diamond coatings of high purity SP3-crystalline structure
ND2100 new	N05~N10	• For continuous finishing of composite materials and Al alloy at high speeds • Stable machinability due to durable sharp edges • Nano-crystalline diamond coatings under particle control

Application examples (ND3000/ND2100)

N Graphite mold

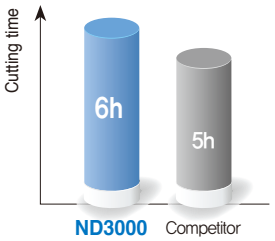
- **Cutting condition** vc (sfm) = 328, fz (ipt) = 0.004, ap (inch) = 0.010, dry
- **Designation** **Endmill** : DBE4060-110-N250S06 (ND3000)
- **Test result**





N Graphite mold

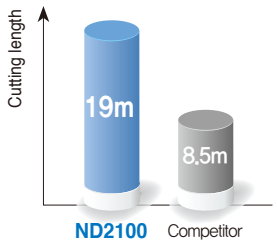
- **Cutting condition** vc (sfm) = 984, fz (ipt) = 0.004 ap (inch) = 0.006, dry
- **Designation** **Endmill** : DBE2060-080-N250S06 (ND3000)
- **Test result**





N CFRP

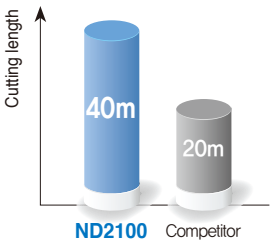
- **Cutting condition** vc (sfm) = 656, fn (ipr) = 0.008, ap (inch) = 0.394, ae (inch) = 0.110
- **Designation** **Endmill** : CCR2080-075 (ND2100)
- **Test result**





N CFRP

- **Cutting condition** vc (sfm) = 656, fz (ipt) = 0.007 ap (inch) = 0.394, ae (inch) = 0.047
- **Designation** **Endmill** : CCLR4080-075 (ND2100)
- **Test result**

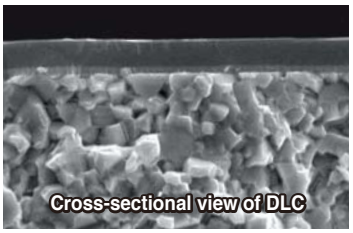




DLC coated grades

Features

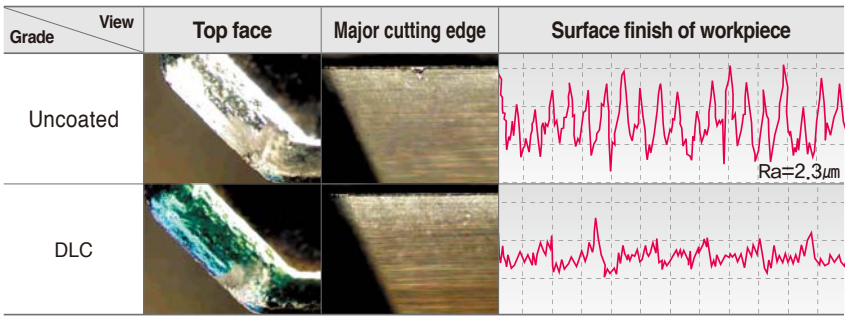
- Hardness of film is up to Hv 7000, tool life is 3~6times of cemented carbide cutting tool
- Good surface finish can be acquired due to the lubrication effect that led from low friction co-efficient (<0.1)
- Suitable for Non-ferrous material machining



Application

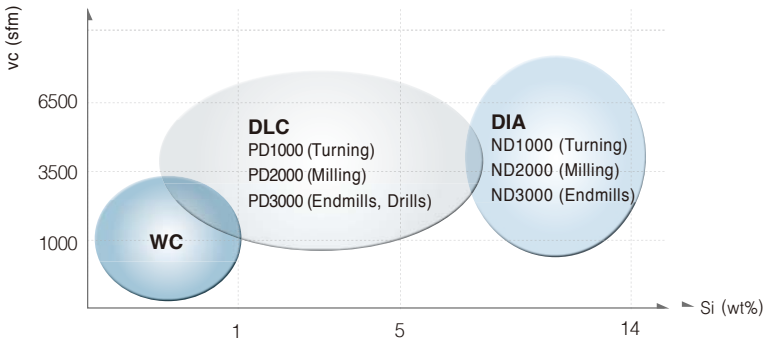
- For aluminum, carbon, plastic, wood/Insert, drill, endmill

Cutting performance (Built- up edge / surface finish, FMACM3100R)



• Workpiece: 319.0
• Cutting length: 47.24inch • Cutting condition: vc (sfm) = 4920, fz (ipt) = 0.006, ap (inch) = 0.079, Dry

Application range

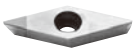
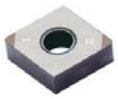
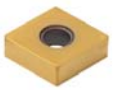


cBN inserts grades

Features

- Excellent hardness and thermal resistance by sintering KORLOY's main constituents and special ceramic binder at high pressure and high temperature
- Excellent hardness and wear resistance for higher productivity in machining cast iron and heat-treated alloy at high speed

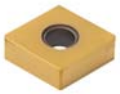
▶ Insert type

High presicion		Wear resistance		Productivity	
					
For regrinding type	One use type	Multi-corner type	Multi-corner type (coated)	Solid type	Grooving type

cBN inserts

Multi edge coated type



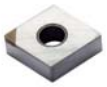


2NU-CNGA432

- Easy handling of corners
- Strong Brazing
- Excellent tool life compared to non-coated insertse

One use type



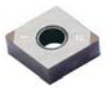


NU-CNGA432

- Economic price
- Easy handling of tools
- A wide variety of series
- Smaller than expensive cBN and dramatic cost down
- Strong weld face and stable cutting performance

Multi edge type



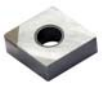


2NU-CNGA432

- Price per edge is more reasonable compare to normal single cornered, one-used type
- Insert with several brazed cBN
- Wide application of continuous to interrupted machining

Regrinding type

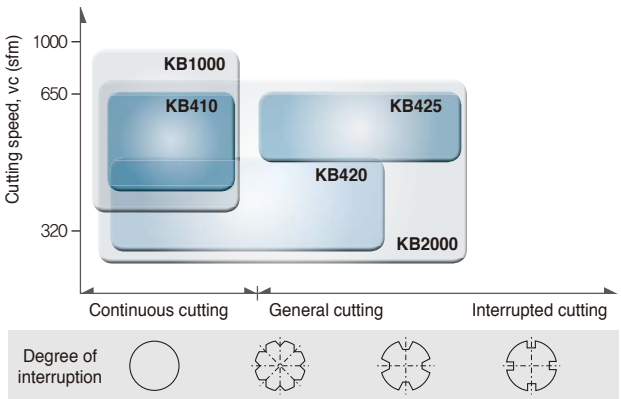




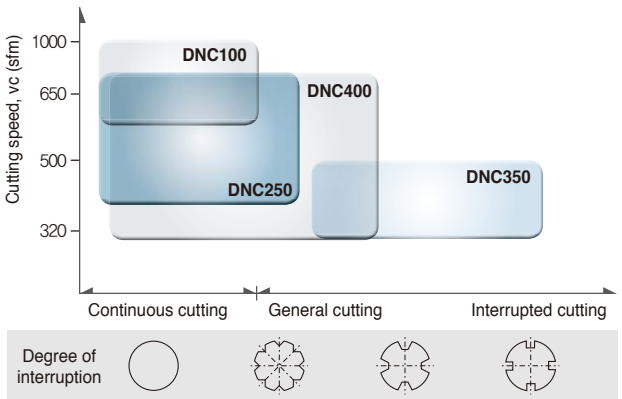
CNMA432

- Long tool life
- Excellent wear resistance, High hardness
- Saved tool cost due to the regrinding insert 3~4 time

cBN application range



Coated cBN application range



Cutting condition of cBN grades

ISO	Grades		Insert color	Application	Cutting speed, vc (sfm) 164 328 492 656 820 984	feed, fn (ipr)	Depth of cut, ap (inch)
H Heat-treated steel	Coated	DNC100 new		Continuous cutting at high speed	591 – 984	0.001~0.012	0.001~0.012
		DNC250		Continuous and low interrupted cutting at high speed	394 – 722	0.002~0.012	0.002~0.012
		DNC350		Medium and high interrupted cutting	295 – 492	0.002~0.012	0.002~0.012
		DNC400 new		Continuous and medium interrupted cutting	295 – 722	0.002~0.012	0.002~0.020
	Non-coated	KB410		Continuous cutting at high speed	492 – 656	0.001~0.005	0.001~0.008
		KB1000		Continuous cutting at high speed	427 – 820	0.001~0.006	0.001~0.008
		KB420		Highly efficient cutting	394 – 492	0.001~0.012	0.001~0.020
		KB425		Interrupted cutting at high speed	492 – 656	0.001~0.012	0.001~0.020
		KB320		Medium and low interrupted cutting	262 – 394	0.001~0.008	0.001~0.012
		KB2000		Medium and low interrupted cutting	262 – 656	0.001~0.008	0.001~0.012
		KB335		High interrupted cutting	262 – 361	0.001~0.008	0.001~0.012
		KB400		High speed and high depth of cut	394 – 722	0.004~0.012	0.020

Solid type cBN

KB400

Features

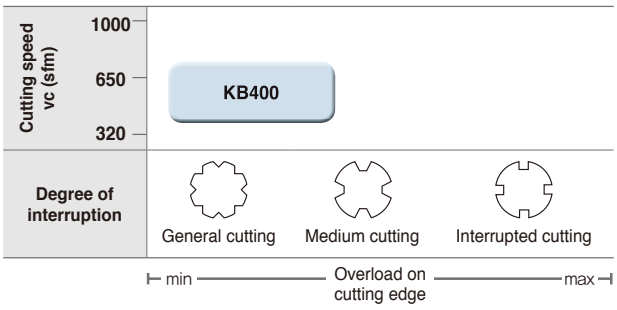
- For medium and light interrupted cutting of heat-treated steel
- Balanced grade of wear resistance and shock resistance
- Solid type for highly efficient machining

Features of solid type

- Increased productivity at high speed and high depth of cut
- Ideal for removing cemented layer and machining the welds
- Stable welding with the use of 3-face blazing
- Excellent performance at varying depth of cuts



Application range



Recommended cutting condition

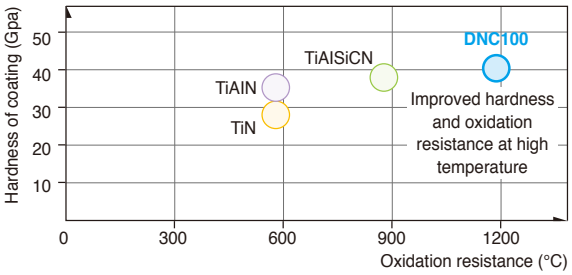
Cutting speed vc (sfm)	394 – 722
feed fn (ipr)	0.004 – 0.012
Depth of cut per time ap (inch)	0.020

Coated cBN

DNC100 new

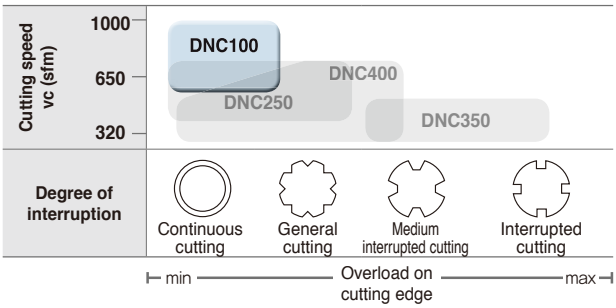
Features

- Excellent thermal resistance
- Coating layer with high hardness, oxidation resistance and chipping resistance





Application range



Recommended cutting condition

Cutting speed vc (sfm)	591 — 984
feed fn (ipr)	0.001 — 0.012
Depth of cut per time ap (inch)	0.001 — 0.012

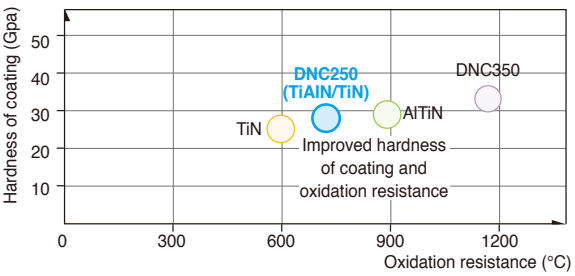
- Increased oxidation resistance and wear resistance due to high hardness coating layer
- Dramatically improved fracture resistance and chipping resistance

Multi-corner coated cBN for high efficient cutting of heat-treated alloy

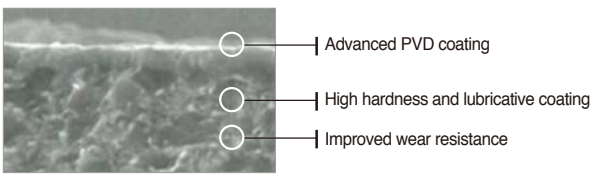
DNC250

Features

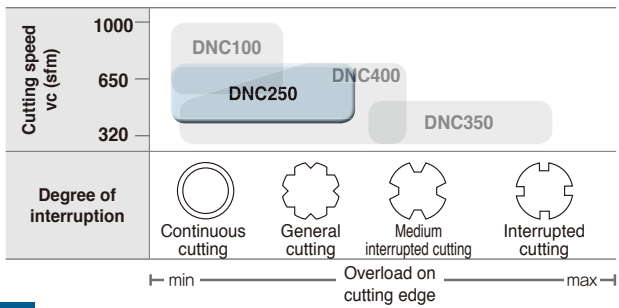
- Stable and long tool life
- Cost effective by multi-cornered one-use insert







Application range



Recommended cutting condition

Cutting speed vc (sfm)	394 — 722
feed fn (ipr)	0.002 — 0.012
Depth of cut per time ap (inch)	0.002 — 0.012

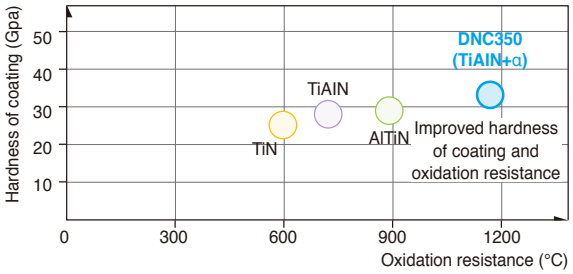
Coated cBN for high interrupted cutting

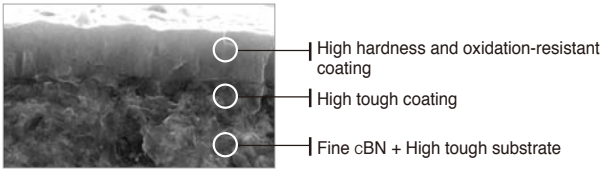
DNC350

Features

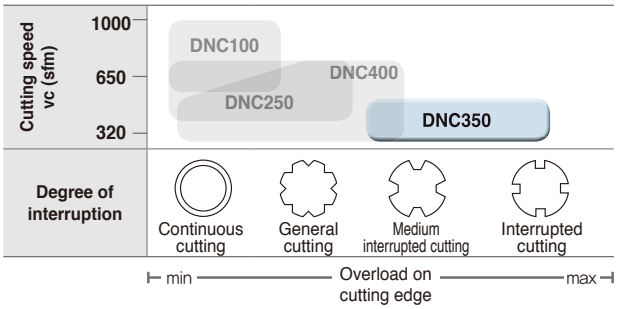
- Excellent tool life and productivity in interrupted cutting
- New PVD coating applied with high hardness and oxidation resistance







Application range



Recommended cutting condition

Cutting speed vc (sfm)	295 – 492
feed fn (ipr)	0.002 – 0.012
Depth of cut per time ap (inch)	0.002 – 0.012

Solid type coated cBN

DNC400 new

Features

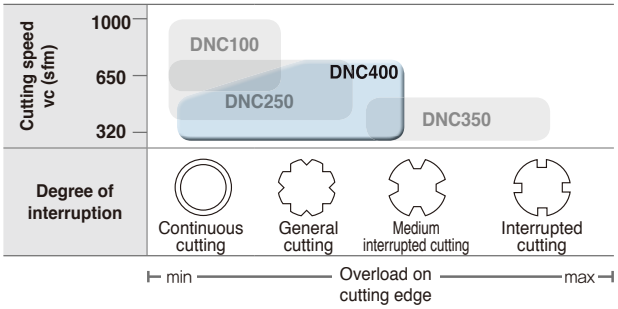
- For machining heat-treated steel in continuous and medium interrupted cutting
- Longer tool life due to coating layer
- Solid type for universal purpose

Features of solid type cBN

- Increased productivity at high speed and high depth of cut
- Ideal for removing cemented layer and the welds
- Better welding stability due to 3-face blazing
- Excellent cutting performance at varying depth of cuts



Application range



Recommended cutting condition

feed fn (ipr)	**DNC400**	**0.002 – 0.012**
	DNC250	0.002 – 0.012
	DNC350	0.002 – 0.012
Depth of cut ap (inch)	**DNC400**	**0.002 – 0.020**
	DNC250	0.002 – 0.012
	DNC350	0.002 – 0.012

Non-coated cBN
KB1000

Features

- Non-coated cBN with the highest wear resistance at high speed
- Excellent tool life in continuous to light interrupted cutting
- Improved fracture resistance along with high wear resistance
  - Higher thermal resistance and hardness due to pure TiCN ceramic binder



Non-coated cBN
KB2000

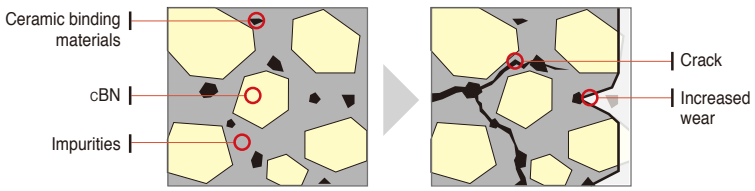
Features

- Universal grade for overall machining of heat-treated
  - Stable tool life in continuous to low/medium interrupted cutting
- Both fracture resistance and wear resistance acquired with the use of pure ceramic binder
- Stable surface roughness



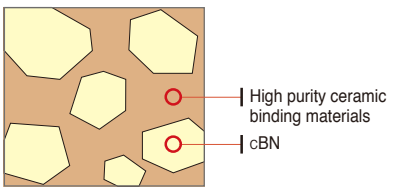
New technology of high purity ceramic binding materials

Conventional grade



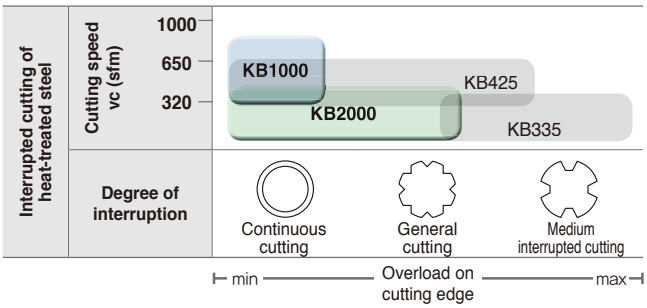
Impurities included in conventional grade's ceramic binder caused inferior thermal resistance and hardness of sintered compounds, which led to crack (fracture) and wear

KB1000/KB2000



KB2000 dramatically minimizes impurities with the use of high purity ceramic binding materials and enhances thermal resistance and toughness.

Application range



Recommended cutting condition (KB1000)

Cutting speed vc (sfm)	427 – 820
feed fn (ipr)	0.001 – 0.006
Depth of cut ap (inch)	0.001 – 0.008

Recommended cutting condition (KB2000)

Cutting speed vc (sfm)	262 – 656
feed fn (ipr)	0.001 – 0.008
Depth of cut ap (inch)	0.001 – 0.012

PCD inserts grades

Features

KORLOY PCD products are manufactured by using high quality PCD tips under ultra high temperatures and pressure. The PCD tip is welded on the qualified KORLOY carbide insert KORLOY high quality PCD products meet a wide range of application needs in turning, milling, and endmills.

- Excellent tool life for aluminum alloy and copper alloy
- Excellent tool life for Ceramic, high-silicon aluminum and rock or stone
- Excellent tool life for rubber, carbon, graphite and wood

PCD grade

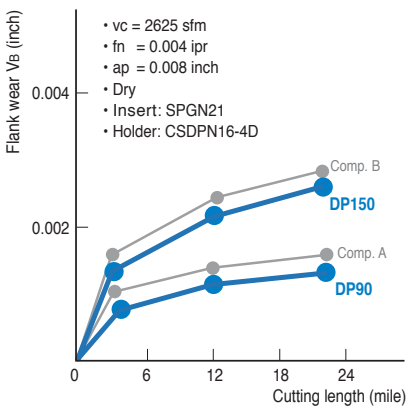
Grade	Features	Application	Grain size (㎛)	Hardness (Hv)	TRS (kgf/mm²)
DP90	Coarse diamond grain has been used to get excellent wear resistance enough to machine cemented-carbide, high Si aluminum alloy	Cemented carbide Ceramic roughing High Si aluminum alloy Rock, Stone	50	10,000~12,000	110
DP150	By use of fine diamond grain having good bonding property, it is suitable for machining of Non-ferrous metal, graphite	High Si aluminum alloy Copper, Bronze alloy Rubber, Wood, Carbon	5	10,000~12,000	200
DP200	By use of ultra fine diamond grain, it is possible to make sharp cutting edge. Thus it is appropriate grade to machine Non-ferrous material	Plastic Wood Precise finishing of aluminum	0.5	8,000~10,000	220

Recommended cutting condition

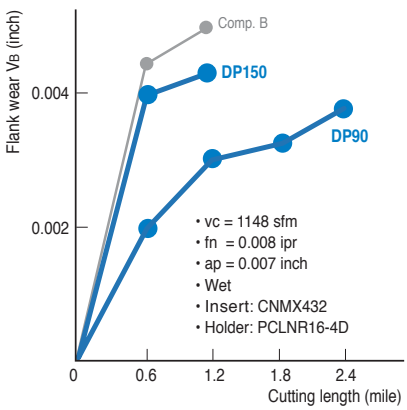
Workpiece	Cutting speed (sfm)	Feed (ipr)	Depth of cut (inch)	Recommended grade	
				1st	2nd
Aluminum alloy (4%~8% Si)	3281~9843	0.004~0.024	~0.118	DP150	DP200
Aluminum alloy (9%~14% Si)	1969~8202	0.004~0.020	~0.118	DP150	DP200
Aluminum alloy (15%~18% Si)	984~2297	0.004~0.016	~0.118	DP150	DP200
Copper, Bronze alloy	~3281	0.002~0.008	~0.118	DP150	DP200
Reinforced plastic	~3281	0.004~0.012	~0.08	DP150	DP200
Wood	~13123	0.004~0.016	-	DP150	DP200
Cemented carbide	33~98	~0.008	~0.02	DP90	DP150

Cutting performance

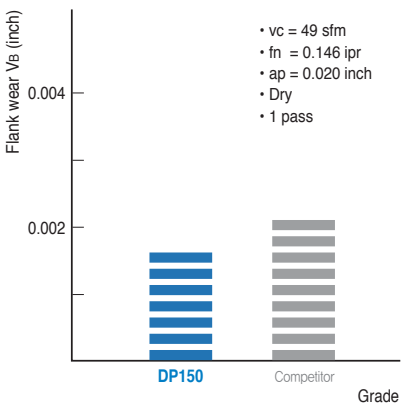
Continuous cutting test (Workpiece: Al-25%Si)



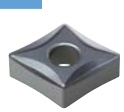
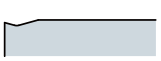
Interrupted cutting test (Workpiece: Al-20%Si)



Cutting test of cemented carbide



Chip breaker for turning

	Geometry	Cutting edge	Application range	Features
V series	VQ 		feed rate fn (ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap (inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512 0.004~0.016 0.039~0.118	**For Medium to finish cutting** • Medium to finishing cutting edges offer improved edge hardness
	VL 		0.004~0.014 0.008~0.059	**For Finishing** • Stable chip control in high toughness material; low carbon steel, pipe steel & steel plates • Improved chip control for facing, copy machining and better surface finish
	VF 		0.002~0.014 0.020~0.059	**For Finishing** • Good chip control quality on varied depth of cut • Excellent cutting edge strength has been acquired due to the special chip-breaker
	VB 		0.006~0.018 0.020~0.079	**For Finishing** • Improved chip control for smaller depth of cuts • Excellent chip control in copying, corner R machining
	VC 		0.005~0.018 0.020~0.138	**For Medium to finish cutting** • Stable chip control in copying and internal machining with various depths of cut
	VM 		0.004~0.020 0.039~0.197	**For Medium cutting** • Wide available chip control range from medium-finishing to medium-roughing • Suitable chip breaker for CNC machining
	VH 		0.028~0.055 0.236~0.591	**For Heavy duty cutting** • Designed specifically for heavy machining • Specialized chip breaker for the heavy industries like Ship building, Power plant industry
	VT 		0.030~0.063 0.276~0.669	**For Heavy duty cutting** • Designed specifically for heavy machining • Specialized chip breaker for the heavy industries like Ship building, Power plant industry
	VP1 		0.002~0.008 0.004~0.059	**For Finishing** • High positive cutting edge • Reduced contract chip minimizes temperature to improve tool life
	VP2 		0.002~0.016 0.020~0.157	**For Medium to finish cutting** • Stable chip control and high machinability in copying with various depths of cut

Notice: Application ranges are based on main cutting material

Chip breaker for turning

	Geometry	Cutting edge	Application range	Features
V series	VP3		0.002~0.018 0.020~0.177	**For Medium cutting** • High positive cutting edge with wide land • Stable cutting performance in interrupted machining with high toughness • Stable machinability and chip control in machining with high depth of cut
	VP4		0.006~0.018 0.039~0.177	**For Inconel medium cutting and medium to rough cutting of stainless steel** • The first recommended chip breaker for inconel cutting • High hard and resistant rake angle to prevent notch wear in roughing of rugged surfaces
	VR		0.010~0.020 0.047~0.276	**For Medium cutting of cast iron and medium to roughing of steel** • High feed machining with the combination of wide land and pockets • Shallow chip breaker design prevents chip blocking at high feed • Decreased wear on major cutting edge due to special treatment on blade
-P series	LP		0.004~0.016 0.020~0.098	**For Medium to finish cutting of steel** • Angle land decreases cutting resistance for better surface roughness • Special dot design prevents chip blocking by clear chip breaking
	MP		0.006~0.018 0.020~0.177	**For Medium cutting of steel** • Increased productivity due to excellent chip control in various conditions • Stable tool life by reducing cutting load at high speed and high feed
-M series	MM		0.005~0.018 0.020~0.217	**For Medium cutting of steel** • The first recommended chip breaker for continuous stainless applications cutting • Improved tool life and surface finish due to dual lands combining both machinability and toughness • Wide chip pockets for stable chip evacuation at high depth of cuts and high feeds
	RM		0.006~0.022 0.079~0.236	**For Roughing of steel** • The first recommended chip breaker for interrupted cutting or roughing of stainless steel • Inhibited notch wear and burr creation at high depth of cuts and feeds • Reduced cutting loads and longer tool life at high feeds
-K series	MK		0.004~0.020 0.039~0.197	**For Medium cutting of steel** • Suitable for continuous cutting of ductile and gray cast iron • Excellent tool life and surface finish thanks to angle lands improving cutting performance
	RK		0.008~0.024 0.059~0.236	**For Roughing of steel** • Suitable for machining ductile and gray cast iron at high speeds and high feeds • Improved toughness and chipping resistance due to flat lands
H series	HA		0.001~0.012 0.020~0.098	**For Light-alloy, stainless steel machining** • Sharp cutting edge generates low cutting force • Specially designed tough main cutting edge • Suitable for cutting of low carbon steel, stainless steel, aluminum

Application range — feed rate fn (ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248

Application range — depth of cut ap (inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512

Notice: Application ranges are based on main cutting material

Chip breaker for turning

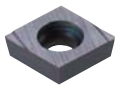
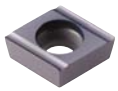
Geometry		Cutting edge	Application range	Features
G series	GR		feed rate fn (ipr): 0.012~0.031; 0.118~0.315	**For Medium to roughing** • Suitable for deep depth of cut and high feed cutting of steel and cast iron • Suitable for intermittent cutting
G series	GH		feed rate fn (ipr): 0.012~0.051; 0.118~0.433	**For Heavy duty cutting** • Suitable for heavy duty cutting due to strong cutting edge • Wide chip control range with low cutting force
B series	B25		feed rate fn (ipr): 0.020~0.039; 0.157~0.394	**For General cutting** • Suitable for general cutting condition cutting
V-Posi series	VF		feed rate fn (ipr): 0.002~0.010; 0.004~1.059	**For Finishing** • Improved surface finish and size accuracy due to stable inner boring
V-Posi series	VL		feed rate fn (ipr): 0.002~0.008; 0.004~0.039	**For Finishing** • Superior chip control in low carbon steel, pipes, and steel plates
V-Posi series	VP1		feed rate fn (ipr): 0.001~0.010; 0.004~0.059	**For Finishing** • Excellent chip control in application with micro depth of cut and low feed • Low cutting load and superb surface finish • Optimal for both internal and external machining
H-Posi series	HMP		feed rate fn (ipr): 0.001~0.016; 0.020~0.138	**For Medium cutting** • Excellent chip control at wide range of cutting conditions • Machining versatility over a wide range of materials
C series	C25		feed rate fn (ipr): 0.004~0.014; 0.039~0.118	**For Medium cutting** • Suitable for interrupted cutting and cast iron machining • Good surface finish due to low cutting force • Suitable for both boring and outer diameter turning
P-Posi series	MP		feed rate fn (ipr): 0.002~0.012; 0.012~0.118	**For Medium cutting** • Sharp cutting edge and wide chip pocket for low cutting load • Stable chip control at varying depth of cuts • Excellent cutting performance when machining automobile components
AL series	AK		feed rate fn (ipr): 0.001~0.016; 0.004~0.157	**For Aluminum cutting** • High rake angle and low resistance cutting edge secures long tool life in continuous cutting of aluminum turning • High speed of finishing operation

feed rate fn (ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248

depth of cut ap (inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512

Notice: Application ranges are based on main cutting material

Chip breaker for turning

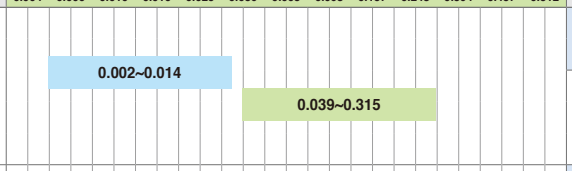
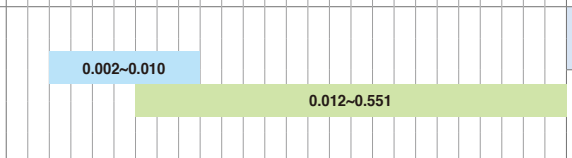
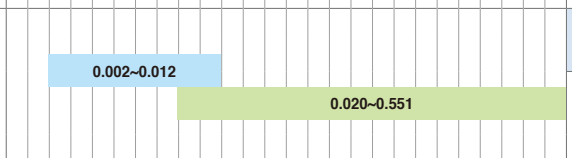
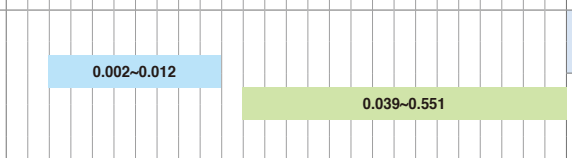
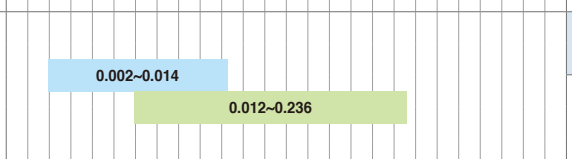
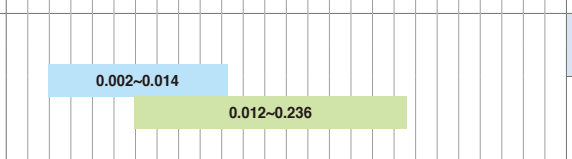
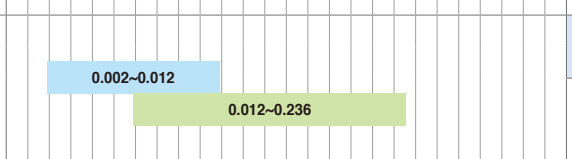
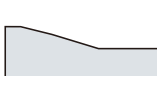
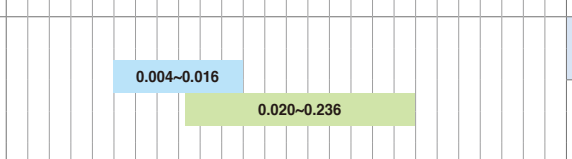
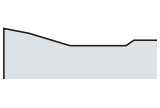
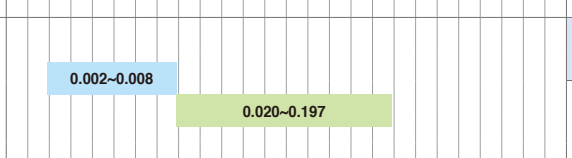
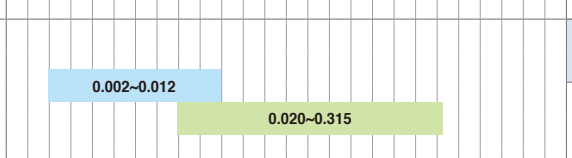
Geometry		Cutting edge	Application range	Features
			feed rate fn (ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap (inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512	
AL series	AR 		0.002~0.020 0.020~0.157	**For Aluminum cutting** • High stability of cutting edge secures great performance in high speed and interrupted machining • High speed of medium and interrupted operation
Auto tool series	KF 		0.001~0.005 0.001~0.039	**For Finishing** • Shallow depth of cut with sharp edge • Longer tool life at high speed cutting due to low cutting force • Good surface finish
	KM 		0.002~0.006 0.002~0.059	**For Medium to finish cutting** • Improved chip control makes tool life long and better machining
Wiper tool series	LW 		0.006~0.024 0.039~0.197	**For Medium cutting (Wiper)** • Guarantees excellent surface roughness and good chip controls at high feed machining
	VW 		0.006~0.020 0.020~0.138	**For Finishing (Wiper)** • Improved surface roughness at shallow depth of cut and high feed due to strong cutting edge

Chip breaker for milling

Geometry		Cutting edge	Application range	Features
			feed rate fn(ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap(inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512	
MX series	MX 		0.004~0.012 0.039~0.197	**For Roughing** • Possible to increase productivity through increase feed and depth • Excellent heat resistance due to the special chip breaker design of top face of insert
Rich Mill series-RM3	MA 		0.002~0.016 0.039~0.315	**For Aluminum milling** • Sharp cutting edge for low cutting load, which is ideal for machining steel, hard-to-cut materials and aluminum
	ML 		0.002~0.012 0.039~0.315	**For machining hard-to-cut materials** • Low cutting resistance for light cutting and machining hard-to-cut materials with excellent tool life and surface roughness

Notice: Application ranges are based on main cutting material

Chip breaker for milling

Geometry		Cutting edge	Application range	Features
Rich Mill series-RM3	MM			**For Medium to roughing** • Available for most of applications with universal design for general milling
Rich Mill series-RM4	MA			**For Aluminum milling** • Sharp cutting edge design ensures low cutting resistance and excellent machining in difficult- tocut materials, aluminum and light machining
	MF			**For Finishing of milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM			**For Medium to roughing of milling** • Suitable geometry design for general milling has wider ranges of machining
Rich Mill series-RM8	MA			**For Aluminum** • Sharp cutting edge and lubricated top face show excellent chip flow and welding resistance in aluminum machining
	MF			**For Finishing of milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	ML			**For Machining hard-to-cut materials** • Low cutting resistance for excellent tool life and surface roughness in machining hard-to-cut materials
	MM			**For Medium to roughing of milling** • Suitable geometry design for general milling has wider ranges of machining
Rich Mill series-RMT	MF			**For Finishing of milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM			**For Medium to roughing of milling** • Suitable geometry design for general milling has wider ranges of machining

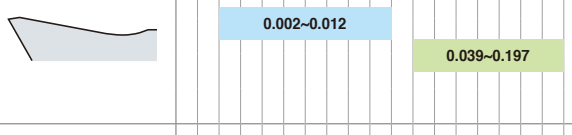
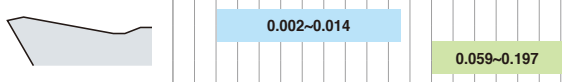
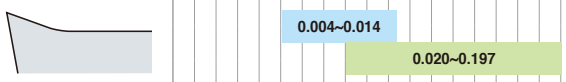
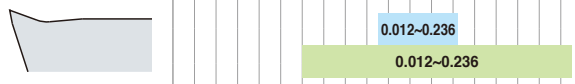
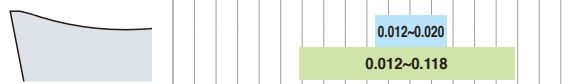
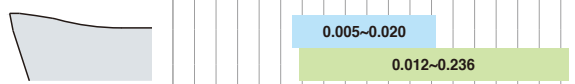
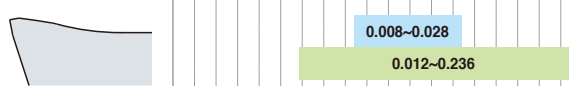
Notice: Application ranges are based on main cutting material

Chip breaker for milling

	Geometry	Cutting edge	Application range	Features
RichMill series-RM16	MA		feed rate fn (ipr): 0.002~0.012, 0.012~0.217 depth of cut ap (inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512	**For Aluminum** • Sharp cutting edge design ensures low cutting resistance and excellent machining in difficult- tocut materials, aluminum and light machining
	MF		0.002~0.008, 0.012~0.217	**For Finishing of milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	ML		0.002~0.014, 0.012~0.217	**For Machining hard-to-cut materials** • Low cutting resistance for excellent tool life and surface roughness in machining hard-to-cut materials
	MM		0.004~0.018, 0.020~0.217	**For Medium to roughing of milling** • Suitable geometry design for general milling has wider ranges of machining
	W		0.002~0.012, 0.012~0.079	**For Finishing of milling (Wiper)** • Wiper insert provides improved surface roughness due to special cutting edge
Alpha Mill series	MA		0.004~0.016, 0.020~0.630	**For Aluminum** • Sharp cutting edge and lubricated top face show excellent chip flow and welding resistance in aluminum machining
	MF		0.002~0.006, 0.020~0.630	**For Finishing of milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM		0.004~0.010, 0.020~0.630	**For Medium to roughing of milling** • Suitable geometry design for general milling has wider ranges of machining
	ML		0.002~0.006, 0.020~0.630	**For Hard-to-cut material machining** • The chip breaker with low cutting resistance ensures superior machinability in hard-to-cut materials
Future Mill series	MF		0.002~0.008, 0.020~0.197	**For Finishing of milling** • Special design for light cutting of gummy materials like stainless steel and hard to machine material provide fine surface finish and longer tool life

Notice: Application ranges are based on main cutting material

Chip breaker for milling

Geometry		Cutting edge	Application range	Features
			feed rate fn (ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap (inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512	
Future Mill series	MM			**For Medium cutting of milling** • Chip breaker design to cover general cutting condition provides wide available application range • Ground type and as sintered type is available
	MR			**For Roughing of milling** • Strongest cutting edge strength provide stable tool life even in case of severe cutting with heavy intermittent and heavy roughing
	MA			**For Aluminum** • Sharp cutting edge and lubricated top face show excellent chip flow and welding resistance in aluminum machining
Future Mill series P-posi	MA			**For Aluminum milling** • Excellent surface roughness due to buffed surface in machining aluminum
	ML			**For Machining titanium and inconel** • Low cutting resistance and high hardness cutting edges for excellent surface roughness in machining titanium and Inconel
	MF			**For Finishing of milling** • Low cutting resistance for light cutting
	MM			**For Medium to rough milling** • Universal purpose for most of milling applications
	None C/B			**For Machining high hardness steel** • Ideal for machining high hardness mold steel and heat resistant alloy

Notice: Application ranges are based on main cutting material

Chip breaker for drilling

Geometry		Cutting edge	Application range	Features
KING DRILL series	PD		feed rate fn (ipr): 0.002 0.003 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 depth of cut ap (inch): 0.004 0.006 0.010 0.016 0.025 0.039 0.063 0.098 0.157 0.248 0.394 0.457 0.512 0.002~0.008 2.362~11.811	**For General steel machining** • Chip breaker with strong cutting edge for universal applications with steel, stainless steel, and cast iron
	LD		0.002~0.006 1.575~9.843	**For General steel (mild steel and forged steel)** • Superior chip control in machining of mild steel, forged steel and stainless steel
	RD		0.002~0.008 2.362~11.811	**General steel and heat-treated steel** • Improved central chipping resistance due to reinforced corners of the KING DRILL central inserts • Excellent cutting performance even in machining where there is frequent corner breakage of central inserts • e.g. Machining heat-treated steel or stainless steel, and high feed machining, etc.
	ND		0.002~0.039 3.937~15.748	**Non-ferrous metals** • Chip breaker with sharp and polished cutting edge for aluminum and Non-ferrous metals. Machining with KING DRILL ensures good chip flow and resistance to chip welding.

Notice : Application ranges are based on main cutting material

Turning Chip Breakers

B02 Application range of KORLOY Main Chip Breakers

B04 Recommended Chip Breakers for workpiece

B12 Feature of Chip Breakers

Inserts

B24 Turning Insert Code System (ISO)

B26 Turning Insert (Negative)

B62 Turning Insert (Positive)

B86 Aluminum Insert (Positive)

B94 cBN Insert

B98 PCD Insert

SAVE TURN

B100 Technical Information for Save Turn

B101 Save Turn Insert

B102 Save Turn Holder

B105 Save Turn Boring Bar

Auto Tools

B107 Technical Information for Auto Tools

B108 ISO Type

B115 Blade Type

B118 Multi Utility Type

B121 KGT / MGT Type

B124 MSB Tool

B130 Sleeve

Multi Turn

B131 Technical Information for Multi Turn

B133 Multi Turn

Bearing Solutions

B134 Technical Information for Bearing Solution

B135 Bearing Solution

B141 Special Order Form for Bearing Inserts



External Tool Holder

B142 External Tool Holder Code System (ISO)
B143 Index for External Holder
B146 Instruction of External Holder
B147 Features of Double Clamp / Lever lock System
B148 Double Clamp System
B153 Lever Lock System
B161 Wedge Clamp System
B163 Clamp On System
B165 Multi Lock System
B172 Screw On System
B179 Ceramic Holder

Boring Bar

B181 Boring Bar Code System (ISO)
B182 Index for Boring Bar
B184 Instruction of Boring Bar assembly
B185 Double Clamp System
B187 Lever Lock System

Boring Bar

B191 Clamp On System
B192 Multi Lock System
B194 Screw On System
B204 Compact Mini

Cartridges

B207 Cartridge Code System (ISO)
B208 Index for Cartridge
B209 Clamp On System
B211 Screw On System



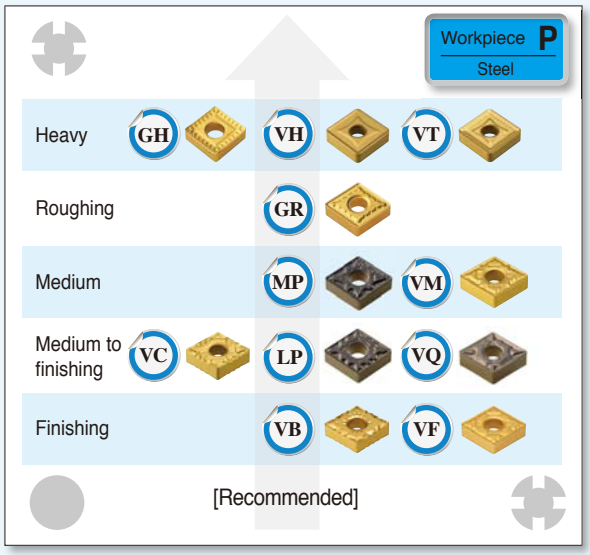
TURNING

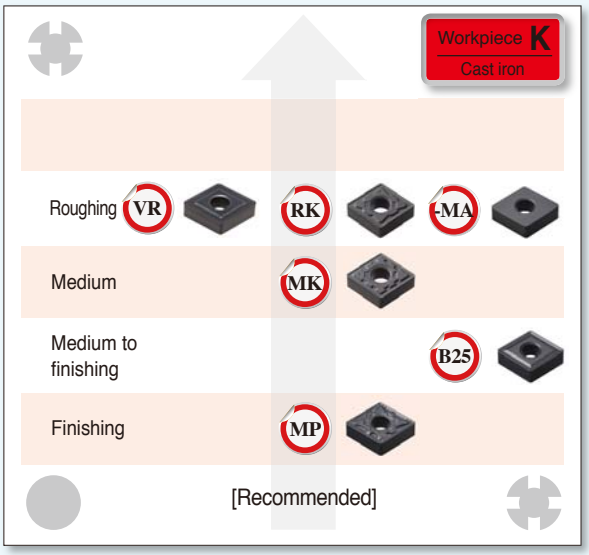
Korloy turning tools cover a wide application range with a full line-up of ISO tools that produce high quality and high precision parts for all manufacturers' requirements.

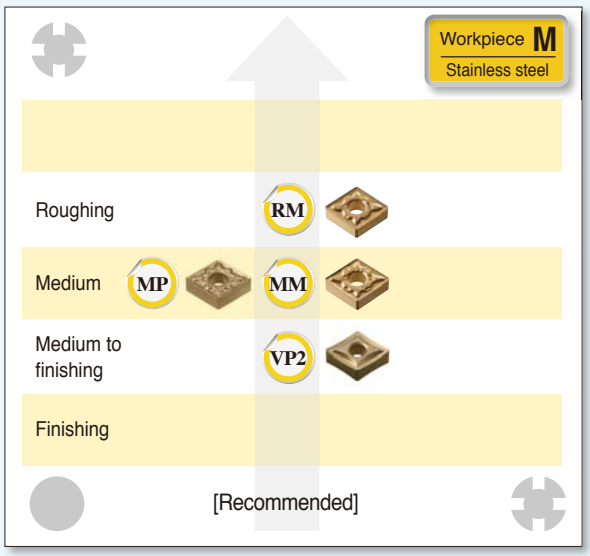
B

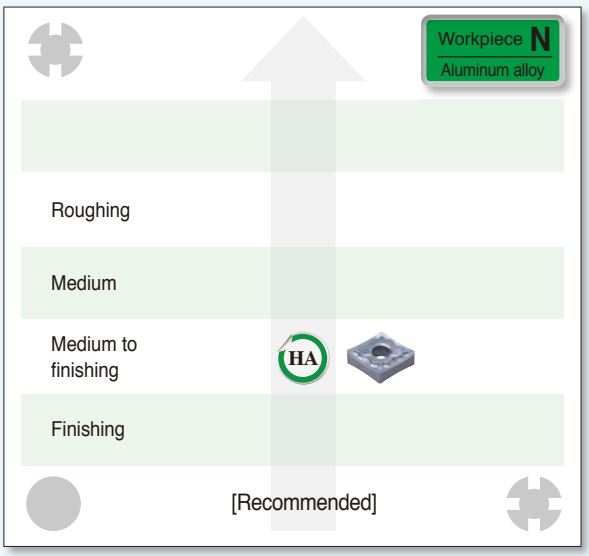
Applications range of chip breakers

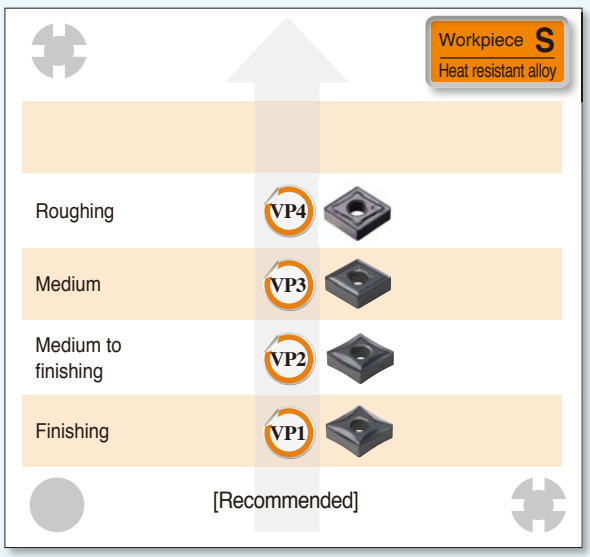
Negative inserts





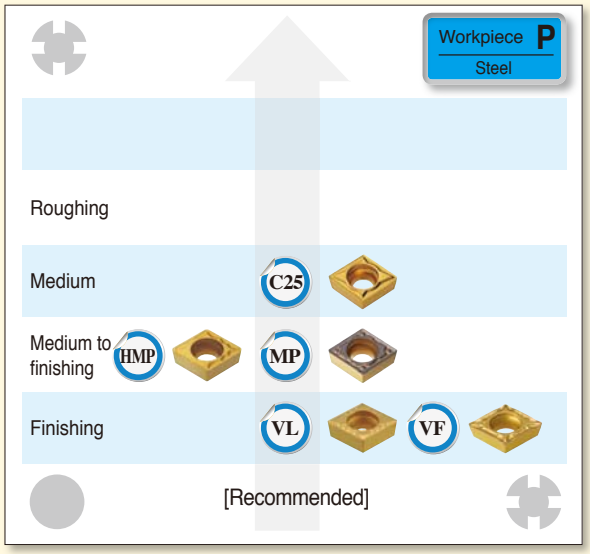


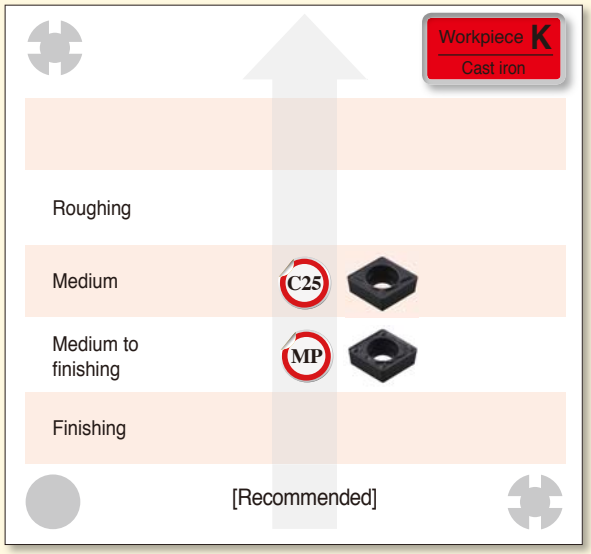


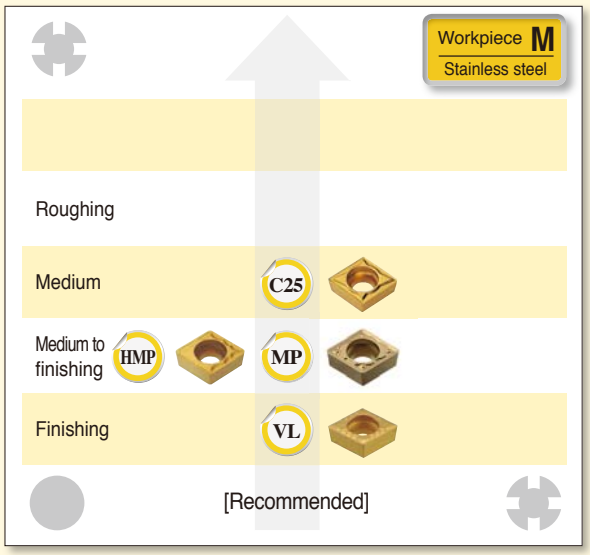


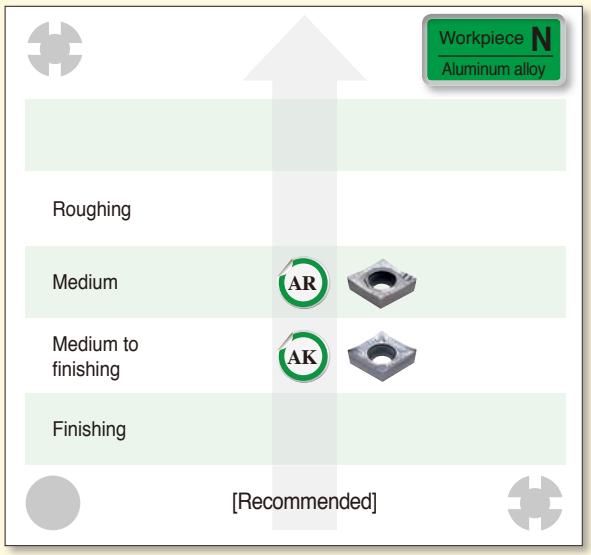
Applications range of chip breakers

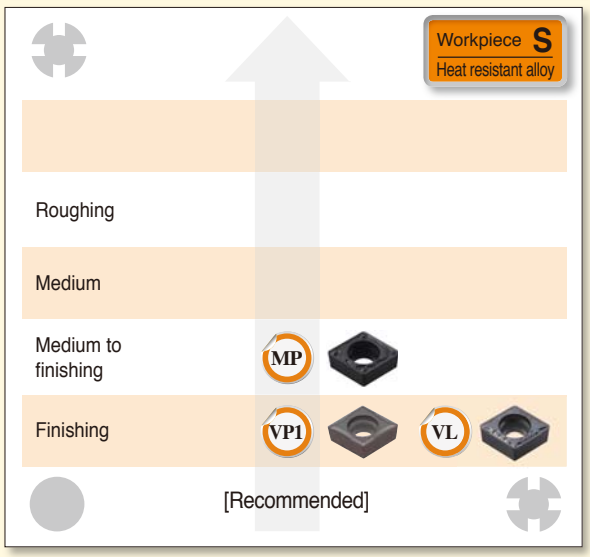
Positive inserts











Recommended chip breaker for workpiece

Workpiece **P** Steel

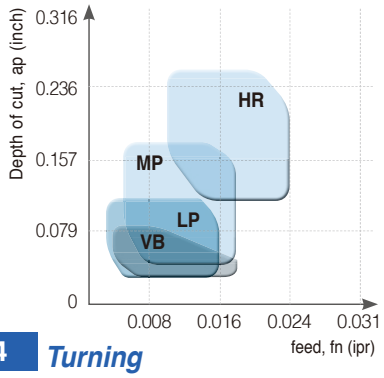
Materials: 1010, 1015, 1025, 8615, 5120, 4130

Hardness: under 180HB

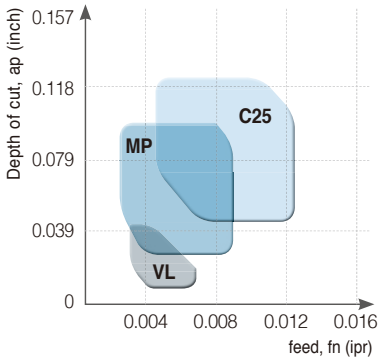
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.008 ~ **0.031** ~ 0.059 Finishing	VL		0.004 ~ **0.008** ~ 0.014	NC3215 NC3225 CN1500 CN2500	1000 820 853 755	CNMG p. B27	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
	0.020 ~ **0.039** ~ 0.059 Finishing	VF		0.002 ~ **0.006** ~ 0.014	NC3215 NC3220 NC3225 NC5330	1000 886 886 689	CNMG p. B26	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
	0.020 ~ **0.039** ~ 0.079 Finishing	VB		0.006 ~ **0.008** ~ 0.016	NC3215 NC3225 CN1500 CN2500	1115 820 787 689	CNMG p. B26	DNMG p. B33		TNMG p. B50		WNMG p. B58
	0.020 ~ **0.059** ~ 0.138 Medium to finishing	VC		0.005 ~ **0.010** ~ 0.018	NC3215 NC3220 NC3225 NC5330	935 820 837 656	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B52	VNMG p. B56	WNMG p. B59
	0.020 ~ **0.039** ~ 0.098 Medium to finishing	LP		0.004 ~ **0.010** ~ 0.016	NC3215 NC3225 NC5330	984 820 656	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B59
	0.020 ~ **0.059** ~ 0.177 Medium to finishing	MP		0.006 ~ **0.012** ~ 0.018	NC3215 NC3225 NC5330	984 869 656	CNMG p. B29	DNMG p. B36	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	0.039 ~ **0.098** ~ 0.197 Medium to finishing	VM		0.004 ~ **0.010** ~ 0.020	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	968 853 853 673 722 656	CNMG p. B30	DNMG p. B37	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	0.039 ~ **0.118** ~ 0.177 Medium to roughing	GR		0.008 ~ **0.014** ~ 0.020	NC6205 NC6210 NC6215	591~1214 492~1083 427~917	CNMG p. B30	DNMG p. B38	SNMG p. B46	TNMG p. B54		WNMG p. B60
	0.236 ~ **0.394** ~ 0.591 Heavy (General)	VH		0.028 ~ **0.039** ~ 0.055	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B32		SNMM p. B47			
	0.276 ~ **0.472** ~ 0.669 Heavy (High feed cutting)	VT		0.030 ~ **0.047** ~ 0.063	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B32		SNMM p. B47			

●: The first recommended cutting condition

P Negative



P Positive

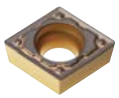


Recommended chip breaker for workpiece

Workpiece **P** Steel

Materials: 1010, 1015, 1025, 8615, 5120, 4130

Hardness: under 180HB

	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Positive	0.004 ~ **0.020** ~ 0.039 Finishing	VL 		0.002 ~ **0.004** ~ 0.008	NC3215 **NC3220** **NC3225** NC5330 CN1500 CN2500	1000 **886** **886** 689 853 787	CCMT  p. B64	DCMT  p. B69	SCMT  p. B71	TCMT  p. B75	VB(C)MT  p. B81	
	0.004 ~ **0.020** ~ 0.059 Finishing	VF 		0.020 ~ **0.006** ~ 0.010	NC3215 NC3220 **NC3225** NC5330 CC1500 CN1500 CN2500	1000 886 **886** 689 853 820 755	CCMT  p. B64	DCMT  p. B68	SCMT  p. B70	TC(P)MT  p. B75	VB(C)MT  p. B80	
	0.020 ~ **0.039** ~ 0.118 Medium to finishing	MP 		0.039 ~ **0.008** ~ 0.014	NC3215 **NC3225** CN1500 CN2500	984 **820** 787 656	CCMT  p. B65	DCMT  p. B69	SCMT  p. B71	TC(P)MT  p. B76	VB(C)MT  p. B81	
	0.020 ~ **0.059** ~ 0.118 Medium to finishing	HMP 		0.003 ~ **0.008** ~ 0.016	NC3215 NC3220 **NC3225** NC5330 CN1500 CN2500	1050 935 **935** 738 787 656	CCMT  p. B64	DCMT  p. B69	SCMT  p. B71	TCMT  p. B75	VB(C)MT  p. B81	
	0.039 ~ **0.079** ~ 0.118 Medium	C25 		0.004 ~ **0.010** ~ 0.014	NC3215 NC3220 **NC3225** NC5330 CN1500 CN2500	1050 935 **935** 738 755 689	CCMT  p. B65	DCMT  p. B69	SCMT  p. B71	TCMT  p. B76		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece **P** Steel

Materials: 1045, 1049, 4140, 1522

Hardness: under 180~260HB

	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.020 ~ 0.039 ~ 0.059 Finishing	VF		0.002 ~ 0.006 ~ 0.014	NC3215 NC3225 NC5330	1000 886 820	CNMG p. B26	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
	0.020 ~ 0.039 ~ 0.079 Finishing	VB		0.006 ~ 0.008 ~ 0.016	NC3215 NC3225 CN1500 CN2500	1115 820 755 623	CNMG p. B26	DNMG p. B33		TNMG p. B50		WNMG p. B58
	0.020 ~ 0.039 ~ 0.098 Medium	LP		0.004 ~ 0.010 ~ 0.016	NC3215 NC3225 NC5330	984 820 656	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B59
	0.020 ~ 0.059 ~ 0.177 Medium	MP		0.006 ~ 0.012 ~ 0.018	NC3215 NC3225 NC5330	984 820 656	CNMG p. B29	DNMG p. B36	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	0.020 ~ 0.059 ~ 0.138 Medium to finishing	VC		0.005 ~ 0.010 ~ 0.018	NC3215 NC3220 NC3225 NC5330	935 837 820 656	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B52	VNMG p. B56	WNMG p. B59
	0.039 ~ 0.098 ~ 0.197 Medium	VM		0.004 ~ 0.010 ~ 0.020	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	853 804 804 673 689 558	CNMG p. B30	DNMG p. B37	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	0.039 ~ 0.118 ~ 0.177 Medium to roughing	GR		0.008 ~ 0.014 ~ 0.020	NC6205 NC6210 NC6215	591~1214 492~1083 427~917	CNMG p. B30	DNMG p. B38	SNMG p. B46	TNMG p. B54		WNMG p. B60
	0.236 ~ 0.394 ~ 0.591 Heavy (General)	VH		0.028 ~ 0.039 ~ 0.055	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B32		SNMM p. B47			
	0.276 ~ 0.472 ~ 0.669 Heavy (High feed cutting)	VT		0.030 ~ 0.047 ~ 0.063	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B32		SNMM p. B47			
Positive	0.004 ~ 0.020 ~ 0.039 Finishing	VL		0.002 ~ 0.004 ~ 0.008	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1132 1017 1017 787 820 689	CCMT p. B64	DCMT p. B69	SCMT p. B71	TCMT p. B75	VB(C)MT p. B81	
	0.004 ~ 0.020 ~ 0.059 Finishing	VF		0.002 ~ 0.006 ~ 0.010	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	869 984 984 755 853 787 689	CCMT p. B64	DCMT p. B68	SCMT p. B70	TC(P)MT p. B75	VCMT p. B80	
	0.012 ~ 0.059 ~ 0.118 Medium to finishing	MP		0.002 ~ 0.006 ~ 0.014	NC3215 NC3225	984 820	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
	0.039 ~ 0.079 ~ 0.118 Medium	C25		0.004 ~ 0.010 ~ 0.014	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1050 935 935 738 755 656	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece **P** Steel

Materials: 4320, 4340, 5140, F2, D3, 4140, Hardened steel
Hardness: 260~350HB

	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.020 ~ **0.039** ~ 0.059 Finishing	VF		0.003 ~ **0.006** ~ 0.012	NC3215 NC3220 NC3225	591 522 522	CNMG p. B26	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
	0.020 ~ **0.039** ~ 0.079 Finishing	VB		0.006 ~ **0.008** ~ 0.016	NC3215 NC3225 CN1500 CN2500	656 486 722 656	CNMG p. B26	DNMG p. B33		TNMG p. B50		WNMG p. B58
	0.020 ~ **0.059** ~ 0.138 Medium to finishing	VC		0.005 ~ **0.010** ~ 0.018	NC3215 NC3220 NC3225 NC5330	551 486 492 656	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B52	VNMG p. B56	WNMG p. B59
	0.020 ~ **0.039** ~ 0.098 Medium	LP		0.004 ~ **0.010** ~ 0.016	NC3215 NC3225 NC5330	984 820 656	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B59
	0.020 ~ **0.059** ~ 0.177 Medium	MP		0.006 ~ **0.012** ~ 0.018	NC3215 NC3225 NC5330	984 820 656	CNMG p. B29	DNMG p. B36	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	0.039 ~ **0.098** ~ 0.197 Medium	VM		0.004 ~ **0.010** ~ 0.002	NC3215 NC3220 NC3225 CN1500 CN2500	571 502 502 394 328	CNMG p. B30	DNMG p. B37	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	0.039 ~ **0.118** ~ 0.177 Medium to roughing	GR		0.008 ~ **0.014** ~ 0.020	NC6205 NC6210 NC6215	591~1214 492~1083 427~917	CNMG p. B30	DNMG p. B38	SNMG p. B46	TNMG p. B54		WNMG p. B60
	0.236 ~ **0.394** ~ 0.591 Heavy (General)	VH		0.028 ~ **0.039** ~ 0.055	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B32		SNMM p. B47			
	0.276 ~ **0.472** ~ 0.669 Heavy (High feed cutting)	VT		0.030 ~ **0.047** ~ 0.063	NC3215 NC3030 NC500H NC5330	164~820 164~492 164~492 164~492	CNMM p. B32		SNMM p. B47			
Positive	0.004 ~ **0.020** ~ 0.039 Finishing	VL		0.002 ~ **0.004** ~ 0.008	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1000 1017 1017 787 689 623	CCMT p. B64	DCMT p. B69	SCMT p. B71	TCMT p. B75	VB(C)MT p. B81	
	0.004 ~ **0.020** ~ 0.059 Finishing	VF		0.002 ~ **0.006** ~ 0.010	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	1083 984 984 755 853 820 787	CCMT p. B64	DCMT p. B68	SCMT p. B70	TC(P)MT p. B75	VB(C)MT p. B80	
	0.012 ~ **0.059** ~ 0.118 Medium to finishing	MP		0.002 ~ **0.006** ~ 0.014	NC3215 NC3225 NC5300 CN1500 CN2500	1000 935 738 787 722	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
	0.039 ~ **0.079** ~ 0.118 Medium	C25		0.004 ~ **0.010** ~ 0.014	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	1020 935 935 738 328 262	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

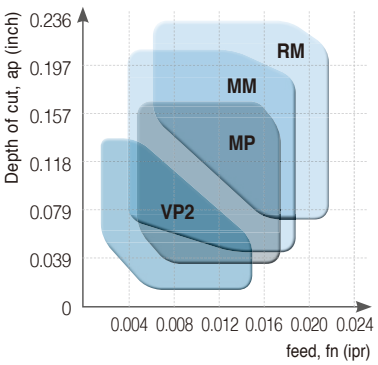
Workpiece **M** Stainless steel

Materials: 304, 316, 430, 630
Ferrite, austenite, martensite, precipitation hardening stainless steels
Hardness: 135~300HB

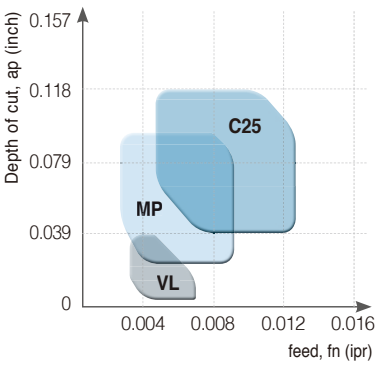
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.020 ~ 0.059 ~ 0.157 Medium to finishing	VP2		0.004 ~ 0.008 ~ 0.016	PC8105 PC8110 PC8115 PC5300 PC5400	607 558 525 443 394	CNMG p. B28	DNMG p. B35	SNMG p. B43	TNMG p. B52		WNMG p. B59
Negative	0.039 ~ 0.079 ~ 0.177 Medium	MP		0.006 ~ 0.012 ~ 0.018	PC8105 PC8110 PC8115 PC5300 PC5400	574 525 492 427 361	CNMG p. B29	DNMG p. B36	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
Negative	0.020 ~ 0.118 ~ 0.217 Medium	MM		0.005 ~ 0.010 ~ 0.018	NC9115 NC9125 NC9135 PC8110 PC8115 PC5300	623 558 427 525 492 427	CNMG p. B29	DNMG p. B36	SNMG p. B44	TNMG p. B52	VNMG p. B57	WNMG p. B59
Negative	0.079 ~ 0.157 ~ 0.236 Roughing	RM		0.006 ~ 0.012 ~ 0.022	NC9115 NC9125 NC9135 PC8110 PC8115 PC5300	623 558 427 525 492 427	CNMG p. B31	DNMG p. B39	SNMG p. B46	TNMG p. B54	VNMG p. B57	WNMG p. B61
Positive	0.004 ~ 0.020 ~ 0.039 Finishing	VL		0.002 ~ 0.004 ~ 0.008	PC8105 PC8110 PC8115 PC5300 PC5400 NC5330 NC9025	705 640 623 541 443 541 541	CCMT p. B64	DCMT p. B69	SCMT p. B71	TCMT p. B75	VB(C)MT p. B81	
Positive	0.012 ~ 0.059 ~ 0.118 Medium to finishing	MP		0.002 ~ 0.006 ~ 0.014	PC8105 PC8110 PC8115 PC5300 PC5400 NC5330 NC9025	623 574 558 443 394 492 492	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
Positive	0.039 ~ 0.079 ~ 0.118 Medium	C25		0.004 ~ 0.010 ~ 0.014	PC8110 PC5300 PC9030	558 509 509	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: The first recommended cutting condition

M Negative



M Positive



Recommended chip breaker for workpiece

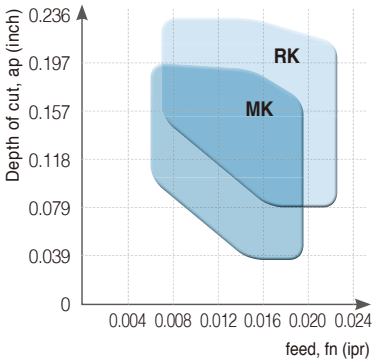
Workpiece K Cast iron

Materials: No208B, No55B, 60-40-18, 80-55-06, etc : Gray cast iron, Ductile cast iron
Hardness: 135~185HB
Tensile strengt: 450N/mm²

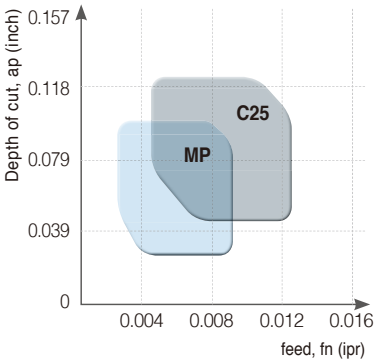
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.039 ~ 0.098 ~ 0.236 Roughing	C/B 無		0.002 ~ 0.012 ~ 0.024	KB410 KB350 KB370 NC6205 NC6210 NC6215	492~656 656~1640 1640~6560 558~1378 459~1148 394~951	CNMA p. B26	DNMA p. B33	SNMA p. B42	TNMA p. B50		
Negative	0.059 ~ 0.118 ~ 0.236 Roughing	RK		0.008 ~ 0.012 ~ 0.024	NC6315	492~1476	CNMG p. B31	DNMG p. B38	SNMG p. B46	TNMG p. B54		WNMG p. B61
Negative	0.039 ~ 0.118 ~ 0.177 Roughing	VR		0.008 ~ 0.014 ~ 0.024	NC6215	656~820	CNMG p. B31	DNMG p. B39	SNMG p. B47	TNMG p. B54		WNMG p. B61
Negative	0.020 ~ 0.079 ~ 0.138 Medium to finishing	B25		0.008 ~ 0.014 ~ 0.024	NC6205 NC6210 NC6215	558~1247 459~1050 394~951	CNMG p. B30	DNMG p. B38	SNMG p. B45	TNMG p. B53		
Negative	0.039 ~ 0.098 ~ 0.197 Medium to finishing	MK		0.004 ~ 0.010 ~ 0.020	NC6315	492~1476	CNMG p. B28	DNMG p. B36	SNMG p. B44	TNMG p. B52	VNMG p. B57	WNMG p. B59
Positive	0.012 ~ 0.059 ~ 0.118 Medium to finishing	MP		0.004 ~ 0.008 ~ 0.014	NC6215	656~820	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
Positive	0.039 ~ 0.079 ~ 0.138 Medium	C25		0.004~ 0.010 ~ 0.016	NC6205 NC6210 NC6215	1115 935 656	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: The first recommended cutting condition

K Negative



K Positive



Recommended chip breaker for workpiece

Workpiece N Aluminum alloy

Materials: Aluminum alloy
Hardness: 20~110HB

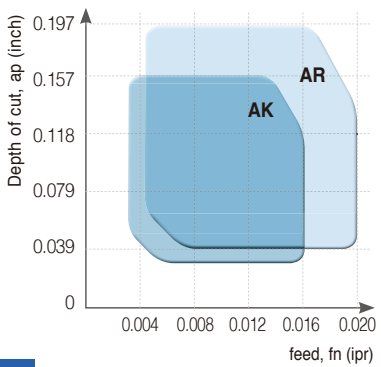
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.020 ~ 0.079 ~ 0.236 Medium	HA		0.004 ~ 0.008 ~ 0.020	H01	1640	CNMG p. B27	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
Positive	0.004 ~ 0.039 ~ 0.157 Medium to finishing	AK		0.001 ~ 0.008 ~ 0.016	H01 ND1000 PD1000	3281 3281 3281	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89
	0.020 ~ 0.059 ~ 0.157 Medium	AR		0.002 ~ 0.012 ~ 0.020	H01 ND1000 PD1000	3281 3281 3281	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89

Materials: Copper Bronze alloy
Hardness: 20~110HB

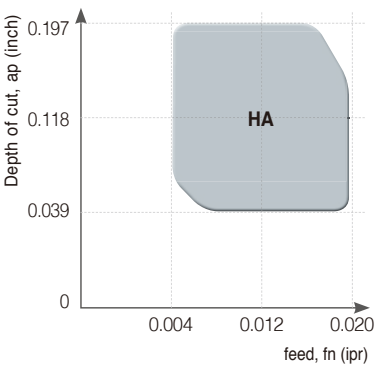
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.020 ~ 0.079 ~ 0.157 Medium to finishing	HA		0.004 ~ 0.008 ~ 0.020	H01	3281	CNMG p. B27	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
Positive	0.004 ~ 0.039 ~ 0.118 Medium to finishing	AK		0.001 ~ 0.008 ~ 0.012	H01	3281	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89
	0.020 ~ 0.059 ~ 0.118 Medium	AR		0.002 ~ 0.010 ~ 0.016	H01	3281	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89

● : The first recommended cutting condition

N Negative



N Positive



Recommended chip breaker for workpiece

Workpiece **S** Heat resistant alloy

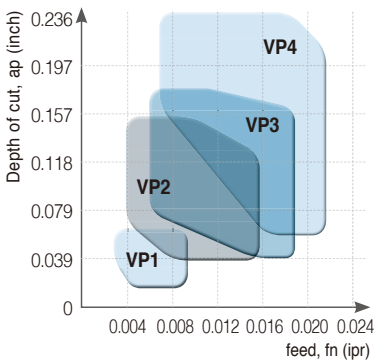
Materials: Inconel, Nimonic, Stellite, Ti alloy

Hardness: 160~350HB

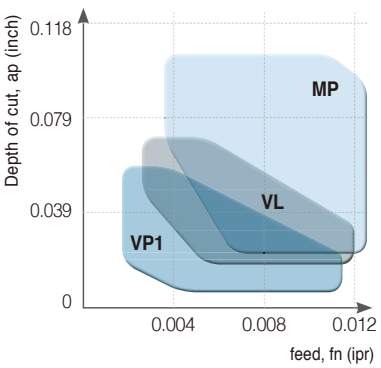
	Depth of cut (inch)	C/B	Cutting edge	Feed (ipr)	Grades	Cutting Speed (sfm)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.004 ~ 0.020 ~ 0.059 Finishing	VP1		0.002 ~ 0.004 ~ 0.008	PC8110 PC5300 NC5330	197 164 164	CNGG p. B26	DNGG p. B33				
	0.020 ~ 0.059 ~ 0.157 Medium to finishing	VP2		0.004 ~ 0.008 ~ 0.016	PC8110 PC5300	197 148	CNMG p. B28	DNMG p. B35	SNMG p. B43	TNMG p. B52		WNMG p. B59
	0.039 ~ 0.079 ~ 0.118 Medium	VP3		0.002 ~ 0.006 ~ 0.010	PC8110 PC5300	197 131	CNMG p. B30	DNMG p. B37	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	0.039 ~ 0.098 ~ 0.157 Roughing	VP4		0.006 ~ 0.008 ~ 0.014	PC8115	197 131	CNMG p. B31	DNMG p. B39	SNMG p. B46	TNMG p. B54		WNMG p. B61
Positive	0.004 ~ 0.020 ~ 0.059 Finishing	VP1		0.002 ~ 0.004 ~ 0.008	PC8110 PC5300	197 148	CCGT p. B63	DCGT p. B68			VCGT p. B82	
	0.004 ~ 0.020 ~ 0.039 Finishing	VL		0.002 ~ 0.004 ~ 0.008	PC8110 PC8115	197 164	CCMT p. B64	DCMT p. B69	SCMT p. B71	TCMT p. B75	VCMT p. B83	
	0.020 ~ 0.039 ~ 0.118 Medium	MP		0.004 ~ 0.008 ~ 0.014	PC8110 PC8115	197 164	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81(B83)	

●: The first recommended cutting condition

S Negative



S Positive



Features of Chip Breaker

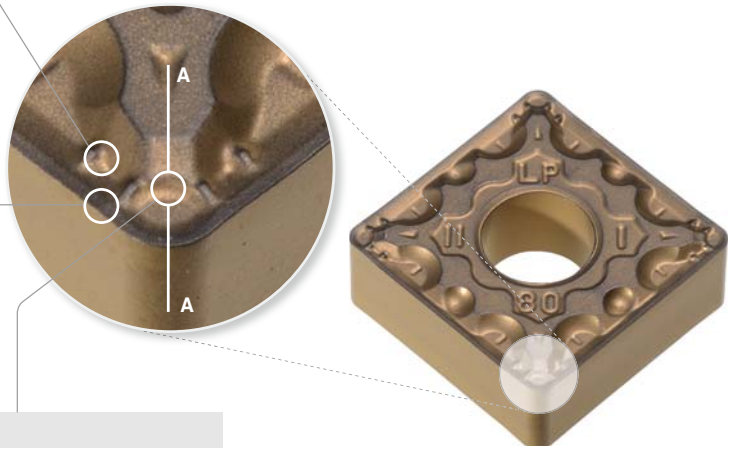
LP Chip Breaker new [For medium cutting to finishing]

- Chip breaker for forged steel of automobile parts and normal steel
- Quad dots improve productivity through efficient chip control at high feed
- Angle land minimizes cutting force

Features of LP chip breaker

▶ Front dot

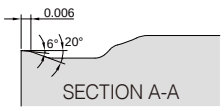
- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at low depth of cut and high feed



▶ Variable land

- Less crater wear
- Prevents chipping on minor cutting edge

▶ Flat zone

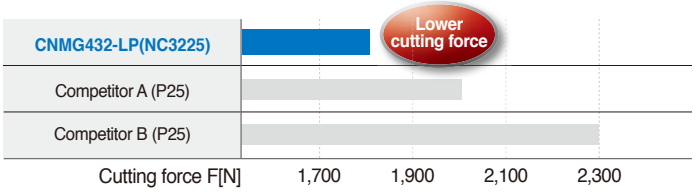


- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips

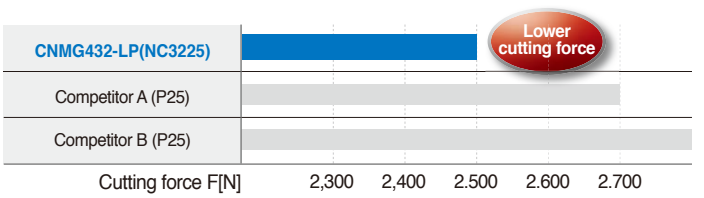
Performance evaluation (Evaluation of cutting force)

- **Workpiece** 1045 (Carbon steal), Ø3.937(inch), External machining
- **Cutting condition** vc (sfm) = 820, ap (inch) = 0.039, fn (ipr) = 0.010/0.016, wet
- **Tools** CNMG432-LP

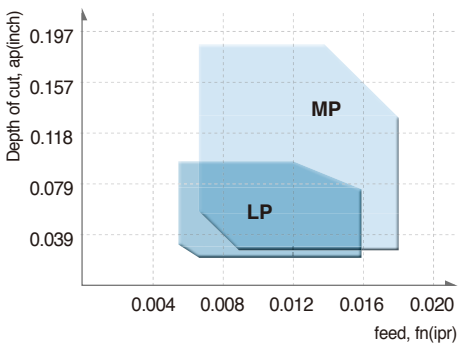
Medium feed (0.010 ipr)



High feed (0.016 ipr)



Application range



Features of Chip Breaker

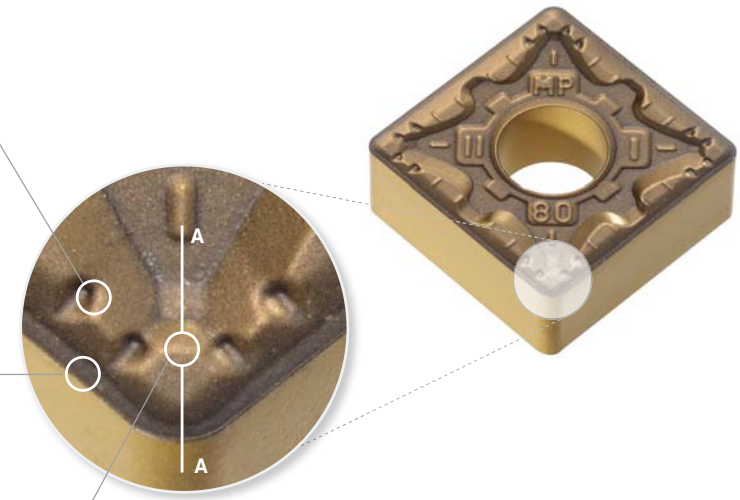
MP Chip Breaker new [For medium cutting]

- Chip breaker for forged steel of automobile parts and all other steels
- Quad dots improve productivity through efficient chip control at high feed
- Angle land minimizes cutting force

Features of MP chip breaker

▶ Front two step dot

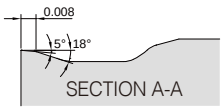
- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at high depth of cut



▶ Variable land

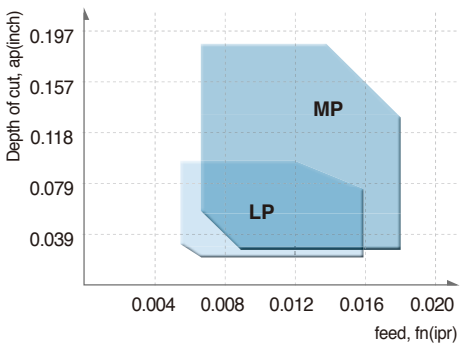
- Less crater wear
- Prevents chipping on minor cutting edge
- Higher toughness at high depth of cut and interrupted cutting

▶ Flat zone



- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips

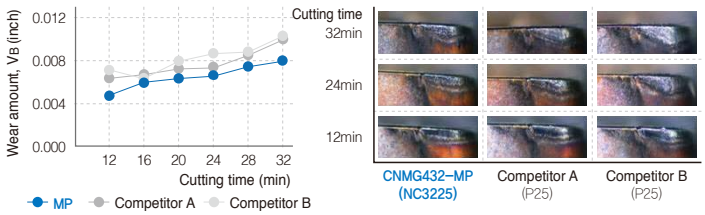
Application range



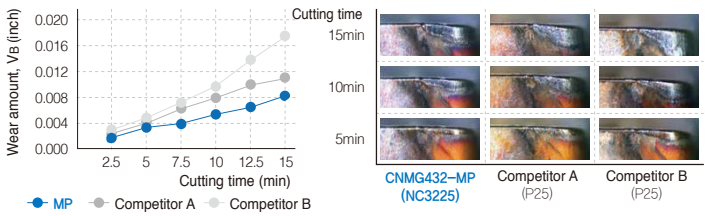
Performance evaluation (Evaluation of wear resistance)

- **Workpiece** 4140 (Alloy steel), Ø3.937(inch), Outer diameter machining
- **Cutting condition** vc (sfm) = 919, ap (inch) = 0.059, fn (ipr) = 0.010/0.016, wet
- **Tools** CNMG432MG-MP

Medium feed (0.010 ipr)



High feed (0.016 ipr)



Features of Chip Breaker

MM Chip Breaker new [For medium cutting]

- The 1st recommended chip breaker for stainless steel machining
- Change to: A dual land achieves sharp cutting performance and insert toughness
- Wide chip pockets for stable chip evacuation at high feeds/depths of cut

Features of MM chip breaker

▶ Variable Land

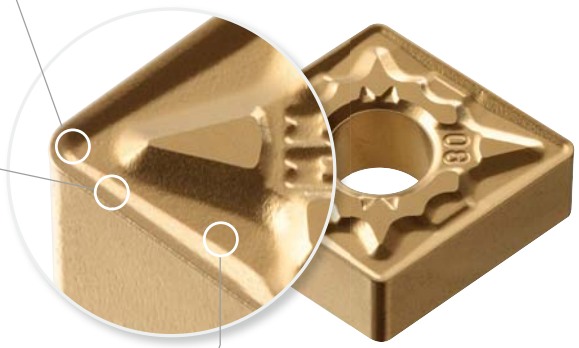
- Excellent chip control and sharp cutting at low depths of cut
- Delays crater wear
- Prevents plastic deformation

▶ Dual Land

- Balance between requirements of sharp and tough cutting edges
- Sharp cutting edge for high speed machining
- Prevents chipping in interrupted machining

▶ Wide Chip Pocket

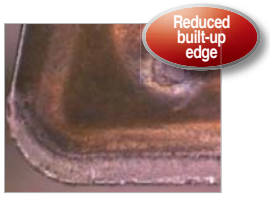
- Stable chip evacuation at high speeds/feeds
- Improved surface finishes by reduced workpiece scratches caused by work-hardened chips at high depths of cut
- Prevents built-up edge



Performance evaluation

Built-up edge

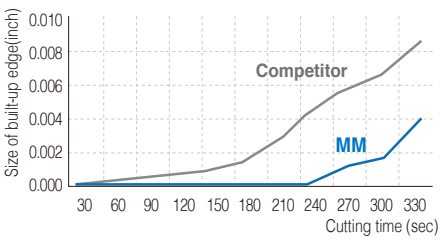
- **Workpiece** 405 (Ferrite)
- **Cutting condition** vc (sfm) = 590, fn (ipr) = 0.012, ap (inch) = 0.12, wet
- **Tools** **Insert** : CNMG432-MM (NC9125) **Holder** : PCLNL16-4D



MM (NC9125)

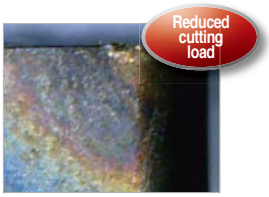


Competitor

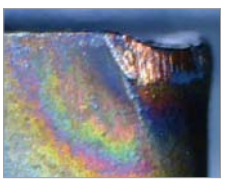


Plastic deformation

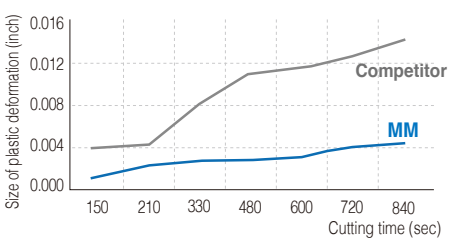
- **Workpiece** 316 (Austenite)
- **Cutting condition** vc (sfm) = 656, fn (ipr) = 0.014, ap (inch) = 0.08, dry
- **Tools** **Insert** : CNMG432-MM (NC9135) **Holder** : PCLNL16-4D



MM (NC9135)



Competitor



Features of Chip Breaker

RM Chip Breaker new [For rough cutting]

- The 1st recommended chip breaker for rough and interrupted machining of stainless steel
- Prevents notch wear and burrs at high feeds and depths of cut
- Reduced cutting force extends tool life in high feed machining

Features of RM chip breaker

▶ Variable Land

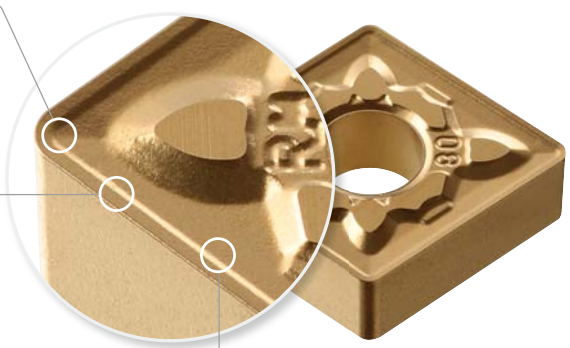
- Excellent chip control and sharp cutting at low depths of cut
- Delays crater wear
- Prevents plastic deformation

▶ Wide land & Gentle front angle

- Sharp cutting edges and a wide land reduce cutting force
- Reduced burrs
- Dispersed cutting load enables higher toughness

▶ Stepped Design

- Stepped design makes chip evacuation easier
- Smooth chip evacuation prevents plastic deformation



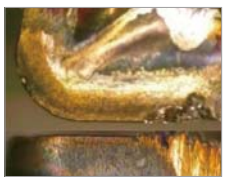
Performance evaluation

Notch wear

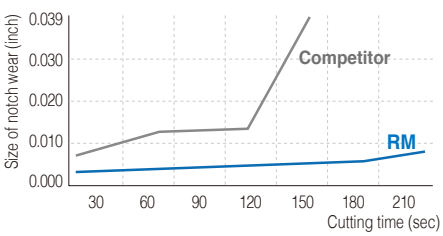
- **Workpiece** 410 (Martensite)
- **Cutting condition** vc (sfm) = 492, fn (ipr) = 0.01, ap (inch) = 0.12, wet
- **Tools** **Insert** : CNMG432-RM (NC9115) **Holder** : PCLNL16-4D



RM (NC9115)

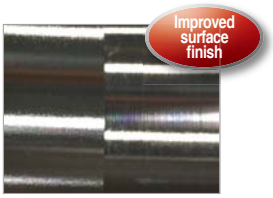


Competitor



Burr

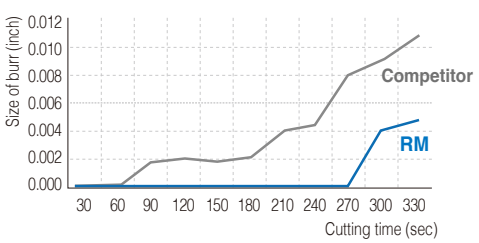
- **Workpiece** Duplex
- **Cutting condition** vc (sfm) = 394, fn (ipr) = 0.008, ap (inch) = 0.08, dry
- **Tools** **Insert** : CNMG432-RM (NC9125) **Holder** : PCLNL16-4D



RM (NC9125)



Competitor



Features of Chip Breaker

MK Chip Breaker new [For medium cutting]

- Ideally suited for continuous cutting of ductile cast iron and gray cast iron
- Angle lands provide upgraded surface finish

Features of MK chip breaker

Angle land



- Angle lands provide sharper cutting performance
- Maximized wear resistance in continuous cutting
- High quality results in surface finish



Wide supporting area

- Higher clamping stability
- Prevents chipping at vibrations during operation

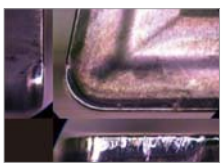
Performance evaluation

Wear resistance test

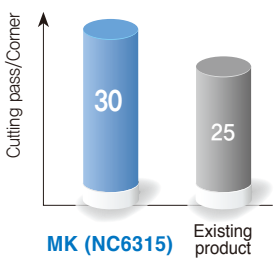
Workpiece	80-55-06(AISI), Ø3.543 (Spherical tube) → Ø1.181 machining
Cutting conditions	vc (sfm) = 1312, fn (ipr) = 0.014, ap (inch) = 0.098, wet
Cutting time	30 passes with results of normal wear on rake/flank surface
Tools	**Insert** : CNMG432-MK (NC6315) **Holder** : DCLNR16-4D



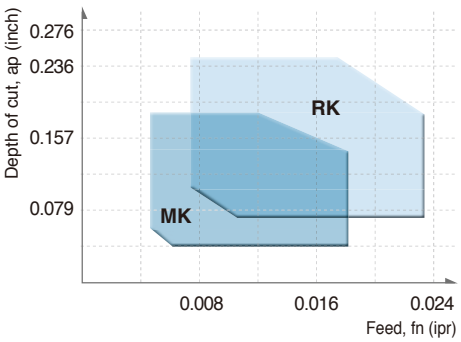
MK (NC6315)



Existing product



Recommended cutting range



Features of Chip Breaker

RK Chip Breaker new [For roughing]

- Ideally suited for high speed / high feed cutting of ductile cast iron and gray cast iron
- Flat lands provide upgraded toughness and chipping resistance

Features of RK chip breaker

Flat land



- Flat lands provide upgraded toughness and chipping resistance
- Stable machining availability under high cutting loads at high depth of cuts or interrupted cutting
- Optimized land width for high feed machining

Wide supporting area

- Higher clamping stability
- Minimizes vibration and chipping.



Performance evaluation

Impact resistance test

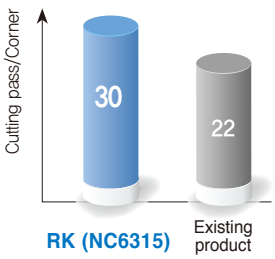
■ **Workpiece**	80-55-06(AISI), Ø3.543 (Triangular tube) → Ø1.181 machining
■ **Cutting conditions**	vc (sfm) = 1246, fn (ipr) = 0.014, ap (inch) = 0.079, wet
■ **Cutting time**	15 passes with results of normal rake surface wear and good chipping resistance
■ **Tools**	**Insert** : CNMG432-RK (NC6315) **Holder** : DCLNR16-4D



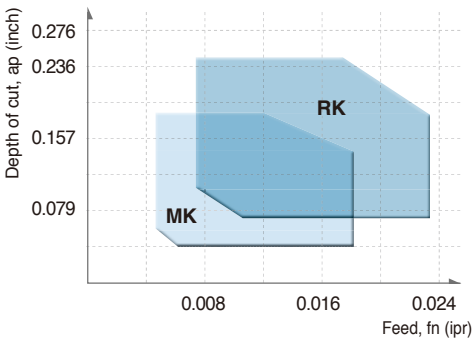
RK (NC6315)



Existing product



Recommended cutting range



Features of Chip Breaker

VP1 Chip Breaker

- Cutting edges designed in high-positive
  - Reduced contact area between rake surface and chip minimizes cutting heat and improved tool life
- Recommended cutting conditions: fn (ipr) = 0.002~0.008, ap (inch) = 0.004~0.060

Features of VP1 chip breaker

Optimized design for finishing



- Obtains excellent cutting performance and quality surface finish at low depth of cut and high speed



High-positive blade design

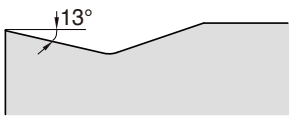
- Minimizes cutting heat by reducing the contact area between flank surface and chips
- Prevents built-up edge and extends tool life

VP2 Chip Breaker

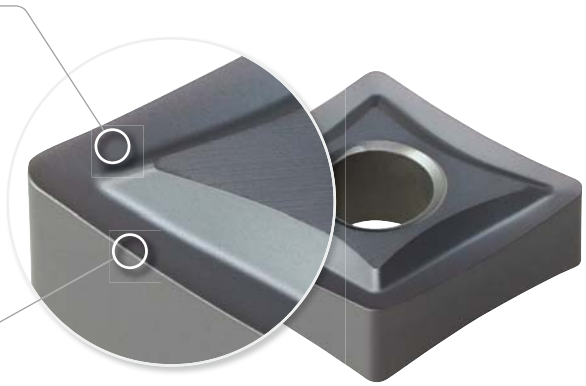
- High-positive cutting edge design/Side rake angle applied
  - Stable chip control improves machinability when ball machining at variable depths of cut
- Recommended cutting conditions: fn (ipr) = 0.004~0.016, ap (inch) = 0.020~0.177

Features of VP2 chip breaker

Sharp blades and wide chip pockets



- Increase productivity
- Ideal for medium to finish cutting



High-positive blade design

- Improves cutting performance with its stable chip control at varying depth of cuts

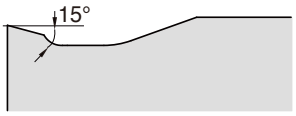
Features of Chip Breaker

VP3 Chip Breaker

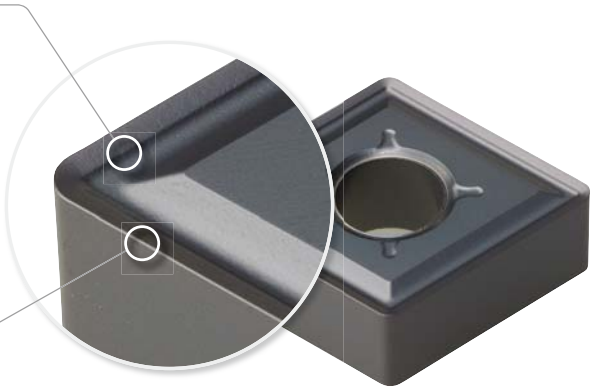
- High-positive cutting edge design/Wide land applied
  - Improved stability at interrupted cutting when toughness is required. Stable chip control and machinability at high depth of cut
- Recommended cutting conditions: fn (ipr) = 0.004~0.018, ap (inch) = 0.020~0.197

Features of VP3 chip breaker

Chip pocket design leading to a R-shaped cutting edge



- Creates a stepped space between edge and land to make smooth chip flow at low and high depth of cuts



High-positive blade design / Wide land

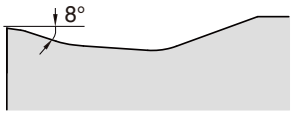
- Minimize heat concentration at high depth of cut
- Improves stability in interrupted machining of a tough workpiece

VP4 Chip Breaker new

- The 1st recommended chip breakers for machining Inconel which remains highly resistant to and hard at high temperature
- Rough machining stability resulting from reinforced cutting edges and wide chip pockets

Features of VP4 chip breaker

Rake angle design resistant to high hardness cutting



- Reinforces cutting edges and prevents notch wear in rough surface machining
- Prevents chipping in interrupted cutting

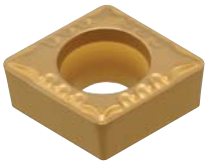


Wide chip pockets

- Reduce cutting loads and improve stability even at high depth of cut in roughing

Features of Chip Breaker

Single-sided VL Chip Breaker



[For medium to finish cutting]

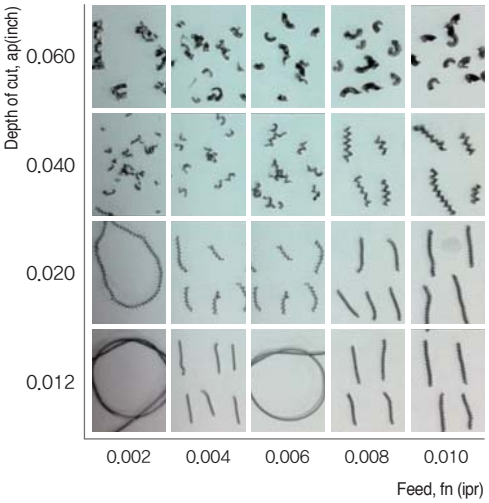
- The sharp flank surface and the chip breaker design significantly improve chip control when machining tough materials such as low carbon steel, pipe steel, and iron plates
- Sharp cutting edges reduce cutting resistance and provide excellent chip control at low depth of cuts, leading to stable machining on automated production lines

Features of VL chip breaker

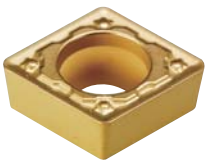
- **Sharp cutting edges**
  - High rake cutting edges provide improved surface finishes
  - Low cutting resistance reduces cutting heat
- **2-step rear rake angle**
  - Stable chip control regardless of varying feed rates
  - Excellent machinability even when machining mild workpieces

Chip control test

- **Workpiece** 4140(Alloy steel), Ø1.968, Internal diameter turning
- **Cutting condition** vc (sfm) = 820, ap (inch) = 0.012~0.059, fn (ipr) = 0.002~0.010
- **Tools** CCMT21.52-VL



Single-sided MP Chip Breaker



[For medium cutting]

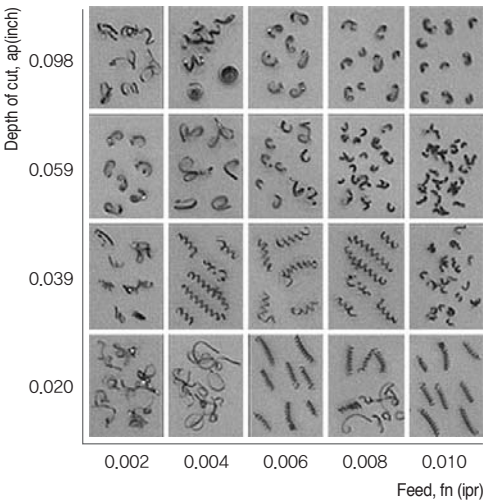
- For continuous cutting of forged steel at high feed
- Turning insert for internal machining of automobile components

Features of MP chip breaker

- **Three-dimensional 2 step chip breaker**
  - Stable chip control in unstable internal machining
  - Prevents chip blocking at internal diameter at varying depth of cut and feed.
- **Stronger cutting edge and wide chip pocket**
  - Increased chipping resistance in unstable internal machining

Chip control test

- **Workpiece** 4140(Alloy steel)
- **Cutting condition** vc (sfm) = 656 , ap (inch) = 0.020~0.098, fn (ipr) = 0.002~0.010
- **Tools** CCMT32.51-MP



Features of Chip Breaker

VL Chip Breaker [For mild steel]



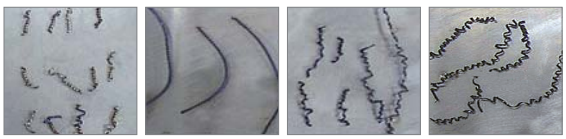
- Improved chip control for machining material that have high toughness such as low carbon steel, pipe, steel plate etc
- Improved chip control and decreased cutting load on external, facing, and copying applications
- Improved strength of the cutting edge for measurable efficiency in automated production

Features of VC chip breaker

• **2 steps designed chip-breaker**	- Suitable Mild steel - Stable chip control on the low feed and cutting depth
• **Designed with special dots**	- Stable chip breaking on the low cutting depth
• **Applied side rake angle**	- Improved chip control on facing, copying applications - Decreased cutting load and better surface finish

Chip control test

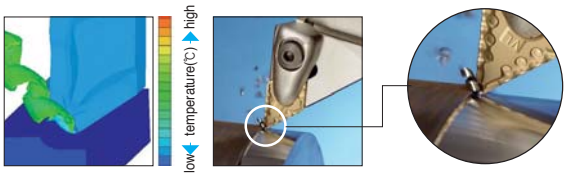
- **Workpiece** AISI1020
- **Cutting conditions** vc (sfm) = 830, ap (inch) = 0.02 fn (ipr) = 0.008 (Side), wet
- **Tools** DNMG432-VL



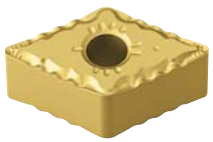
VL Chip Breakers | Competitor A | Competitor B | Competitor C

FEM Cutting simulation analysis in the design

- For design of geometry, chip shapes and chip flow are predictable
- Optimal chip breaker design by various cutting conditions and workpieces



VB Chip Breaker [For copying]



- Excellent chip evacuation in continuous and high speed machining of various workpieces
- 3-dimensional chip breaker achieves lower cutting resistance, high rigidity of the cutting edge, and longer tool life
- Stable chip control in copying and internal machining

Features of VB chip breaker

• **6 bumps on the insert corner**	- Superior chip control and chip cutting in copying with various depths of cut
• **Side rake angle**	- Superb chip cutting in facing and copying. Superior tool life due to improved surface roughness and lower cutting resistance
• **Cutting edge on 100˚ part for medium machining (For CNMG)**	- Excellent chip evacuation and toughness in machining with high depth of cut

Performance



VB Chip Breakers | Conventional chip breaker

Features of Chip Breaker

VC Chip Breaker [For medium to finish cutting]



- Superior chip evacuation in high speed and continuous machining of various workpieces (carbon steel, alloy steel etc.)
- Korloy 3 dimensional chip breaker ensures longer tool life due to low cutting load and improved cutting edge strength
- Stable chip control in copying and internal machining

Features of VC chip breaker

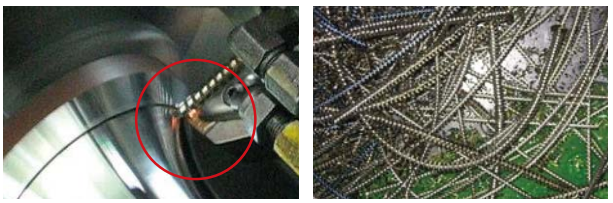
• 4 bums on the insert corner
- Excellent chip control in various depths of cut and superb chip cutting in external, internal, copy machining and facing

Evaluation of chip control (Copying)

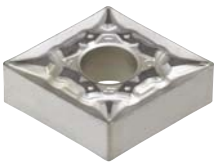
VC Chip Breakers



Conventional chip breaker



VQ Chip Breaker [For medium to finish cutting]



- Excellent cutting performance and reinforced cutting edges
- Improved chip control at low depth of cuts

Features of VQ chip breaker

• Three dimensional rake angle
- Improved surface finish thanks to sharp cutting performance
- Less cutting heat and longer tool life thanks to low cutting resistance

• Beveled protruding structure
- Smooth chip flow at low depth of cuts
- Wide application range

Performance evaluation

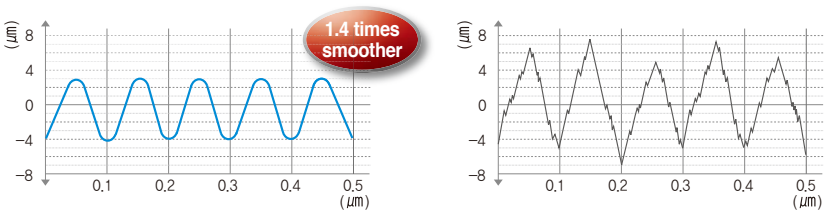
- **Workpiece** 4140(Alloy steel), Ø3.937(inch), External diameter turning
- **Cutting condition** vc (sfm) = 919, ap (inch) = 0.059, fn (ipr) = 0.010
- **Tools** CNMG432-VQ

Wear comparison



VQ(CN2500) Competitor

Surface roughness comparison



VQ (CN2500) (Ra 3.0μm) Competitor (Ra 7.0μm)

Features of Chip Breaker

VH/VT Chip Breaker [For heavy duty machining]

- Heavy duty chip breaker suitable for Heavy machining in the ship building and power plant industries
- Suitable for large vertical machines when machining shafts, rollers, rotors and optimal for the big flange machining

Features of VH chip breaker

• For good chip control in heavy machining (comprehensive type)



- Designed from the study of heavy cutting mechanism
- Smooth chip control from the high rake angle
- Wider cutting edge land provides stronger cutting
- Unique cutting edge treatment provides smooth cutting
- Optimized chip pocket design provides smooth chip flow

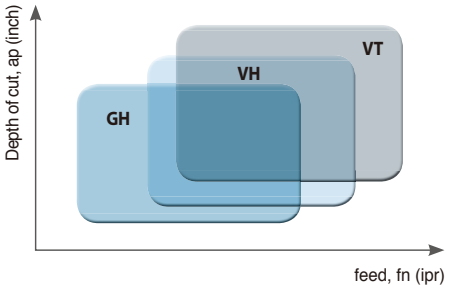
Features of VT chip breaker

• For long tool life and stable cutting (higher feeds, big depth) in heavy machining



- Designed from the study of heavy cutting mechanism
- Strong edge design provides long and stable cutting (2 step rake angle of cutting edge)
- Varied cutting edge land strengthens the cutting edge
- The positioning of the chip breaking convex dot deflect the machining heat, optimizes inserts wear & absorb shock

Applications range of Chip breakers

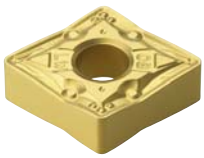


GH : ap (inch) = 0.20~0.47, fn (ipr) = 0.021~0.047
VH : ap (inch) = 0.24~0.59, fn (ipr) = 0.027~0.055
VT : ap (inch) = 0.28~0.67, fn (ipr) = 0.030~0.063

LW/VW Chip Breaker [For high feed cutting]

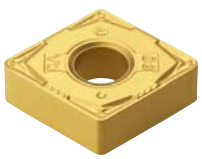
- Improved productivity with higher feed rates and surface finishes
- Improved wear resistance and toughness

Features of LW chip breaker



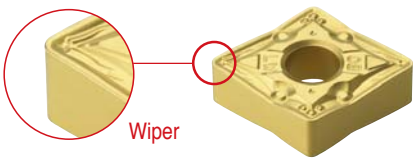
- **Curvilinear cutting edge**
  - Reduces cutting force
- **Cutting edge design able to handle deeper depth of cuts**
  - lower cutting load & reduces heat
- **Greater chip control at shallow depths of cuts**
  - Chip pocket design improves smooth chip flow
- **For shallow depth cutting and low speed machining**
  - 3D design at the corner

Features of VW chip breaker

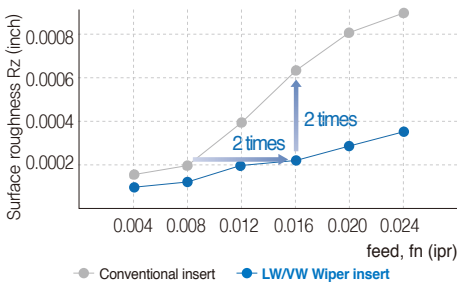


- **Excellent Finishing applications**
  - Excellent chip control
- **Insert design great for stable clmaping**
  - Chip breaker designed close to the cutting edge
- **Similar cutting edge to C/B for medium**
  - strong cutting edge
- **3 Dimensional dot design on cutting corner**
  - reduces cutting force and good chip control at shallow depth of cut

Wiper Insert



- High productivity
- Improved surface roughness
- High feed-reducing machining time
- Improved tool life due to reduce cutting force

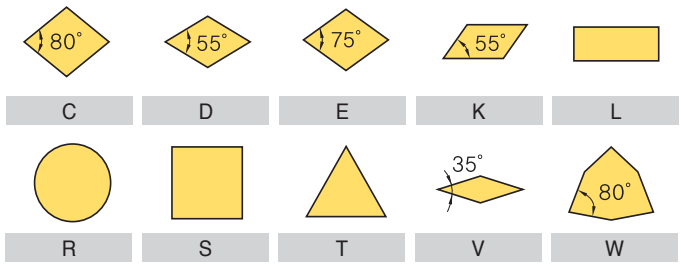


C N M G 3

1	2	3	4	5
Insert Shape	Relief Angle	Tolerance	Cross Section Type	Cutting Edge Length, Diameter of Inscribed Circle

1 Insert Shape

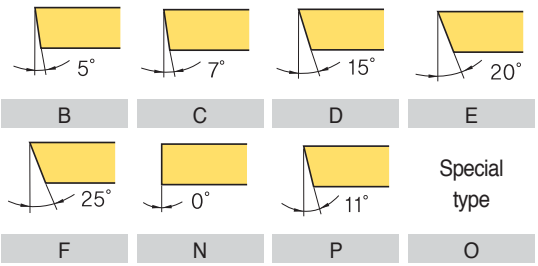
C N M G 3 3 2 - MP



C	D	E	K	L
R	S	T	V	W

2 Relief Angle

C N M G 3 3 2 - MP



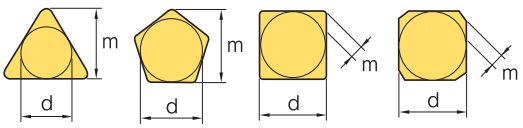
B	C	D	E
F	N	P	O

Special type

3 Tolerance

C N M G 3 3 2 - MP

d : Inscribed circle
t : Thickness
m : Refer to figure



(inch)

Class	d	m	t
A	±0.0010	±0.0002	±0.0010
C	±0.0010	±0.0005	±0.0010
H	±0.0005	±0.0005	±0.0010
E	±0.0010	±0.0010	±0.0010
G	±0.0010	±0.0010	±0.0005
J *	±0.002 ~ ±0.006	±0.0002	±0.0010
K *	±0.002 ~ ±0.006	±0.0005	±0.0010
L *	±0.002 ~ ±0.006	±0.0010	±0.0010
M *	±0.002 ~ ±0.006	±0.003 ~ ±0.008	±0.0005
N *	±0.002 ~ ±0.006	±0.003 ~ ±0.007	±0.0010
U *	±0.003 ~ ±0.010	±0.005 ~ ±0.015	±0.0005

* Sides are based on unground insert

Tolerance on C,E,H,M,O,P,R,S,T,W Insert Shape (Exceptional case)

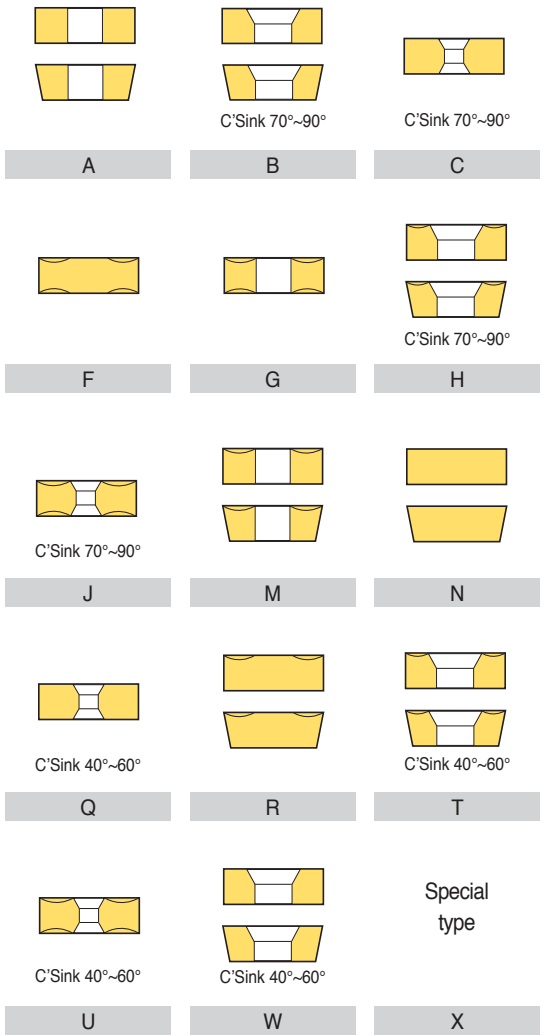
d	Tolerance on d		Tolerance on m	
	J, K, L, M, N	U	M, N	U
6.35	±0.002	±0.003	±0.003	±0.005
9.525	±0.002	±0.003	±0.003	±0.005
12.7	±0.003	±0.005	±0.005	±0.008
15.875	±0.004	±0.007	±0.06	±0.011
19.05	±0.004	±0.007	±0.06	±0.011
25.4	±0.005	±0.01	±0.07	±0.015

Tolerance on D Insert Shape (Exceptional case)

d	Tolerance on d	Tolerance on m
6.35	±0.002	±0.0043
9.525	±0.002	±0.0043
12.7	±0.003	±0.006
15.875	±0.004	±0.007
19.05	±0.004	±0.007

4 Cross Section Type

C N M G 3 3 2 - MP



A	B	C
F	G	H
J	M	N
Q	R	T
U	W	X

Special type

3 2 - MP

6 Height of Cutting Edge | 7 Nose Radius (Nose R) | 8 Chip Breaker for Turning

5 Cutting Edge Length, Diameter of Inscribed Circle

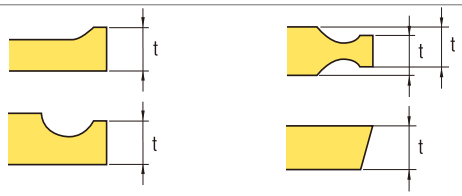
C N M G **3** 3 2 - MP

Symbol							Inch	IC
C	d	S	T	R	V	W		
Metric								d (inch)
03	04	03	06	03	-	02	1.2 (5)	5/32
04	05	04	08	04	08	S3	1.5 (6)	3/16
05	06	05	09	05	09	03	1.8 (7)	7/32
-	-	-	-	06	-	-	-	0.236
06	07	06	11	06	11	04	2	1/4
08	09	07	13	07	13	05	2.5	5/16
-	-	-	-	08	-	-	-	0.315
09	11	09	16	09	16	06	3	3/8
-	-	-	-	10	-	-	-	0.394
11	13	11	19	11	19	07	3.5	7/16
-	-	-	-	12	-	-	-	0.472
12	15	12	22	12	22	08	4	1/2
14	17	14	24	14	24	09	4.5	9/16
16	19	15	27	15	27	10	5	5/8
-	-	-	-	16	-	-	-	0.630
17	21	17	30	17	30	11	5.5	11/16
19	23	19	33	19	33	13	6	3/4
-	-	-	-	20	-	-	-	0.787
22	27	22	38	22	38	15	7	7/8
-	-	-	-	25	-	-	-	0.984
25	31	25	44	25	44	17	8	1
32	38	31	54	31	54	21	10	11/4
-	-	-	-	32	-	-	-	1.260

( ) Symbol for small size insert

6 Height of Cutting Edge

C N M G 3 **2** 3 - MP



Symbol		Height of Cutting Edge (t)	
Metric	Inch	mm	Inch
01	1(2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5(3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8	12.70	1/2

( ) Symbol for small size insert

7 Nose Radius (Nose R)

C N M G 3 3 **2** - MP



Symbol		Corner Radius	
Metric	Inch	Metric	Inch
01	0	0.1	0.004
02	0.5	0.2	0.008
04	1	0.4	1/64
08	2	0.8	1/32
12	3	1.2	3/64
16	4	1.6	1/16
20	5	2.0	5/64
24	6	2.4	3/32
28	7	2.8	7/64
32	8	3.2	1/8
00	-	Round insert (Inch)	
M0	-	Round insert (Metric)	

8 Chip Breaker for Turning

C N M G 3 3 2 - **MP**

Negative Insert Chip Breaker



VL VF VB VC VQ VW



VM VR VH VT VP1 VP2



VP3 VP4 HA GR GH B25



LP MP MM RM MK RK

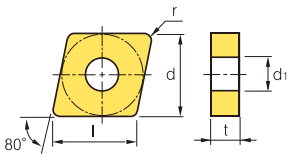
Positive Insert Chip Breaker



VL HMP C25 MP AK AR

CN○○

Rhombic 80° Negative



Dimensions (inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⇕ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VP1	CNGG	430.5-VP1															●		●	●	●		●	●	0.001~0.004	0.004~0.039
			431-VP1															●		●	●	●		●	●	0.002~0.006	0.004~0.059
			432-VP1															●		●	●	●		●	●	0.003~0.008	0.004~0.059
Medium	VP3	CNGG	431-VP3															●		●	●	●		●	●	0.002~0.012	0.004~0.018
			432-VP3															●		●	●	●		●	●	0.004~0.016	0.020~0.177
			433-VP3															●		●	●	●		●	●	0.005~0.020	0.020~0.197
Roughing		CNMA	332																							0.004~0.012	0.020~0.118
			431											●										●		0.006~0.024	0.008~0.197
			432											●										●		0.006~0.025	0.008~0.315
			433											●												0.006~0.028	0.012~0.315
			434											●												0.008~0.039	0.012~0.394
			542											●												0.006~0.031	0.012~0.394
			543											●												0.006~0.031	0.012~0.394
			544											●												0.008~0.039	0.012~0.394
			642											●												0.006~0.024	0.008~0.472
			643											●												0.008~0.031	0.008~0.472
			644											●												0.008~0.039	0.008~0.472
Finishing	VB	CNMG	431-VB	●		●	●	●	●		●		●													0.006~0.024	0.040~0.200
			432-VB	●		●	●	●	●		●		●													0.008~0.028	0.040~0.240
			433-VB	●		●	●	●	●		●		●													0.008~0.020	0.040~0.240
Finishing	VF	CNMG	321-VF							●	●															0.003~0.012	0.020~0.059
			322-VF																							0.005~0.006	0.020~0.059
			431-VF							●			●													0.003~0.012	0.020~0.059
			432-VF										●													0.004~0.016	0.020~0.059
			433-VF																							0.004~0.020	0.024~0.059
Finishing	VP1	CNMG	431-VP1															●		●	●	●		●	●	0.002~0.006	0.004~0.059
			432-VP1															●		●	●	●		●	●	0.003~0.008	0.004~0.059

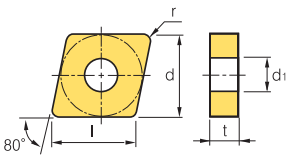
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	MCRNR/L	B166
MCLNR/L	B165	PCBNR/L	B153
MCMNN	B165	PCLNR/L	B154

CN○○

Rhombic 80° Negative



Dimensions (inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts	Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (Mild steel)	VL	CNMG 431-VL	●		●			●		●		●													0.002~0.010	0.004~0.040
		CNMG 432-VL	●		●			●		●		●													0.004~0.014	0.008~0.060
		CNMG 433-VL						●		●		●													0.004~0.014	0.008~0.060
Finishing (wiper)	VW	CNMG 431-VW						●		●		●													0.004~0.012	0.020~0.118
		CNMG 432-VW						●		●		●													0.006~0.020	0.020~0.157
		CNMG 433-VW						●		●		●													0.008~0.020	0.031~0.157
Medium to finishing	HA	CNMG 431-HA							●								●			●		●	●	●	0.002~0.008	0.031~0.138
		CNMG 432-HA							●								●			●		●	●	●	0.004~0.016	0.031~0.138
		CNMG 433-HA																					●	●	0.005~0.022	0.031~0.138
Medium to finishing	LP new	CNMG 332-LP						●		●		●													0.004~0.012	0.012~0.059
		CNMG 431-LP						●		●		●													0.004~0.014	0.012~0.079
		CNMG 432-LP						●		●		●													0.004~0.016	0.020~0.098
		CNMG 433-LP						●		●		●													0.005~0.028	0.031~0.118
Medium to finishing	VC	CNMG 431-VC						●		●		●													0.004~0.014	0.012~0.079
		CNMG 432-VC						●		●		●													0.006~0.016	0.020~0.118
		CNMG 433-VC						●		●															0.008~0.018	0.020~0.118

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	MCRNR/L	B166
MCLNR/L	B165	PCBNR/L	B153
MCMNN	B165	PCLNR/L	B154

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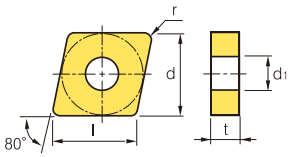
Rhombic 80° Negative



Dimensions (inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16

| Workpiece | | |

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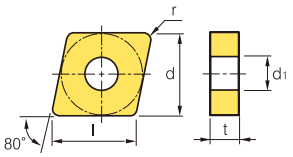
Rhombic 80° Negative



Dimensions (inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16

Workpiece																							
Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱								
Stainless steel	M									⧓	⧓		●	⧓	✱	⧓	✱		●	⧓	⧓		
Cast iron	K	●	⧓	✱	●	⧓	⧓				⧓	⧓										●	⧓
Non-ferrous metal	N																					●	⧓
Heat resistant alloy, Titanium alloy	S										●			●	●	⧓	✱	●	●	⧓		●	⧓
Hardened steel	H																		⧓	✱		●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	MM	CNMG	331-MM												●	●	●	●							0.003~0.014	0.020~0.197
			332-MM												●	●	●	●							0.004~0.016	0.020~0.197
			431-MM												●	●	●	●				●	●		0.004~0.016	0.020~0.217
			432-MM												●	●	●	●				●	●		0.005~0.018	0.020~0.217
			433-MM												●	●	●	●				●	●		0.006~0.024	0.020~0.217
			434-MM													●	●	●				●			0.008~0.026	0.020~0.217
			542-MM												●	●	●	●				●			0.005~0.018	0.020~0.276
			543-MM												●	●	●	●				●	●		0.006~0.024	0.020~0.276
			544-MM													●	●	●				●	●		0.007~0.026	0.020~0.276
			642-MM												●	●	●	●				●			0.005~0.018	0.020~0.335
			643-MM												●	●	●	●				●	●		0.006~0.024	0.020~0.335
			644-MM													●	●	●				●	●		0.007~0.026	0.020~0.335
Medium	MP	CNMG	331-MP						●		●		●												0.004~0.016	0.016~0.150
			332-MP						●		●		●												0.006~0.016	0.020~0.157
			333-MP						●		●		●												0.006~0.020	0.032~0.165
			431-MP						●		●		●		●	●	●			●	●	●			0.004~0.016	0.016~0.150
			432-MP						●		●		●		●	●	●			●	●	●			0.006~0.016	0.020~0.157
			433-MP						●		●		●		●	●	●			●	●				0.006~0.020	0.032~0.165
			434-MP						●		●		●		●	●	●								0.011~0.022	0.039~0.197
			542-MP						●		●		●		●	●	●								0.006~0.020	0.020~0.276
			543-MP						●		●		●		●	●	●								0.007~0.024	0.032~0.276
			544-MP						●		●		●												0.006~0.024	0.031~0.276
			642-MP																						0.006~0.024	0.020~0.335
			643-MP																						0.004~0.016	0.016~0.150
			644-MP												●	●	●								0.006~0.016	0.020~0.157

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	**MCRNR/L**	B166
MCLNR/L	B165	**PCBNR/L**	B153
MCMNN	B165	**PCLNR/L**	B154

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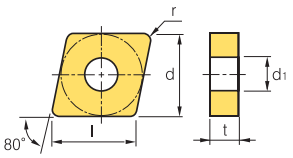
Rhombic 80° Negative



Dimensions (inch)			
Size	d	t	d1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	VM	CNMG	321-VM							●		●														0.002~0.012	0.036~0.138
			322-VM							●		●														0.004~0.018	0.039~0.138
			431-VM	●	●	●				●		●	●					●	●				●			0.002~0.012	0.036~0.197
			432-VM	●	●	●				●		●	●					●	●		●		●			0.004~0.020	0.039~0.197
			433-VM							●		●	●					●	●		●					0.005~0.024	0.051~0.197
			434-VM										●													0.008~0.024	0.059~0.217
			542-VM										●													0.004~0.020	0.039~0.264
			543-VM															●							0.005~0.024	0.051~0.264
			642-VM									●														0.005~0.026	0.051~0.276
			643-VM										●													0.006~0.028	0.059~0.276
			644-VM																							0.007~0.030	0.071~0.276
Medium	VP3	CNMG	431-VP3															●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
			432-VP3															●	●	●	●	●		●	●	0.004~0.016	0.020~0.177
			433-VP3															●	●	●	●	●		●	●	0.005~0.020	0.020~0.197
Medium (wiper)	LW	CNMG	432-LW						●		●		●													0.006~0.024	0.040~0.200
			433-LW						●		●		●													0.008~0.028	0.040~0.240
Medium to roughing	B25	CNMG	431-B25	●	●	●			●		●	●	●					●								0.007~0.018	0.039~0.197
			432-B25	●	●	●			●	●	●	●	●					●	●		●		●			0.009~0.024	0.059~0.197
			433-B25			●			●		●	●	●													0.010~0.024	0.079~0.197
			542-B25						●		●	●	●													0.010~0.024	0.079~0.256
			543-B25						●		●		●													0.011~0.024	0.079~0.256
			544-B25						●		●		●													0.011~0.024	0.079~0.256
			641-B25						●		●	●	●													0.008~0.018	0.118~0.315
			642-B25						●	●	●	●	●													0.010~0.024	0.118~0.315
			643-B25						●	●	●	●	●					●	●		●					0.012~0.024	0.118~0.315
			644-B25						●		●	●	●													0.009~0.028	0.118~0.315
Roughing	GR	CNMG	432-GR							●	●	●	●													0.008~0.020	0.039~0.276
			433-GR							●		●	●													0.010~0.020	0.051~0.276
			434-GR																							0.010~0.024	0.071~0.236
			542-GR									●														0.008~0.028	0.039~0.315
			543-GR						●	●	●	●	●													0.010~0.028	0.051~0.315
			544-GR							●		●														0.010~0.030	0.071~0.315
			642-GR							●		●	●													0.008~0.028	0.067~0.394
			643-GR						●	●	●	●	●													0.012~0.030	0.067~0.394
			644-GR							●		●	●													0.012~0.031	0.071~0.394
			646-GR																							0.014~0.033	0.079~0.472
			856-GR																							0.016~0.039	0.091~0.591
			866-GR									●	●													0.016~0.039	0.091~0.591

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	MCRNR/L	B166
MCLNR/L	B165	PCBNR/L	B153
MCMNN	B165	PCLNR/L	B154

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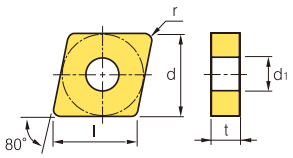
Rhombic 80° Negative



Dimensions (inch)			
Size	d	t	d_1
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16
86	1	3/8	23/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing	RK new	CNMG	431-RK											●												0.008~0.019	0.051~0.236
			432-RK											●												0.008~0.020	0.059~0.236
			433-RK											●												0.011~0.021	0.071~0.236
			434-RK											●												0.011~0.025	0.078~0.236
			542-RK											●												0.011~0.028	0.071~0.276
			543-RK											●												0.011~0.028	0.078~0.315
			544-RK											●												0.011~0.029	0.078~0.315
			643-RK											●												0.014~0.031	0.102~0.374
			644-RK											●												0.014~0.031	0.102~0.394
Roughing	RM new	CNMG	431-RM												●	●	●	●				●	●			0.004~0.020	0.078~0.236
			432-RM												●	●	●	●				●	●			0.006~0.022	0.078~0.236
			433-RM												●	●	●	●				●	●			0.008~0.024	0.078~0.236
			434-RM													●	●	●				●				0.010~0.028	0.078~0.236
			542-RM												●	●	●	●				●				0.006~0.022	0.078~0.315
			543-RM												●	●	●	●				●				0.008~0.024	0.078~0.315
			544-RM													●	●	●				●				0.010~0.028	0.078~0.315
			642-RM												●	●	●	●				●				0.006~0.022	0.078~0.394
			643-RM												●	●	●	●				●				0.008~0.024	0.078~0.394
			644-RM												●	●	●	●				●				0.010~0.028	0.078~0.394
			866-RM																							0.016~0.047	0.157~0.551
Roughing	VP4 new	CNMG	432-VP4															●	●		●	●		●		0.006~0.014	0.039~0.157
			433-VP4															●	●		●	●		●		0.008~0.016	0.039~0.157
			642-VP4															●	●		●	●		●		0.006~0.018	0.039~0.315
			643-VP4															●	●		●	●		●		0.008~0.020	0.047~0.335
Roughing	VR	CNMG	432-VR																							0.010~0.022	0.047~0.276
			433-VR																							0.012~0.024	0.059~0.276
			434-VR																							0.014~0.026	0.067~0.276
			543-VR																							0.014~0.028	0.078~0.315
			544-VR																							0.014~0.030	0.087~0.315
			643-VR																							0.014~0.028	0.078~0.394
			644-VR																							0.014~0.030	0.087~0.394

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	MCRNR/L	B166
MCLNR/L	B165	PCBNR/L	B153
MCMNN	B165	PCLNR/L	B154

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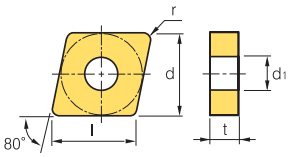
Rhombic 80° Negative



Dimensions (inch)			
Size	d	t	d1
43	1/2	3/16	13/64
53	1/2	3/16	13/64
53	5/8	3/16	1/4
64	3/4	1/4	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬌ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing	GR	CNMM 432-GR																						0.008~0.020	0.039~0.276
		433-GR																						0.010~0.020	0.051~0.276
		643-GR									●													0.012~0.030	0.067~0.394
		644-GR																						0.012~0.031	0.071~0.394
Heavy	GH	CNMM 432-GH						●		●	●	●												0.012~0.024	0.098~0.315
		433-GH						●	●	●	●	●												0.012~0.028	0.098~0.315
		533-GH																						0.012~0.028	0.098~0.315
		536-GH																						0.012~0.047	0.098~0.315
		543-GH									●													0.012~0.035	0.098~0.315
		544-GH																						0.012~0.047	0.098~0.315
		546-GH																						0.012~0.059	0.098~0.315
		642-GH						●				●												0.012~0.024	0.098~0.315
		643-GH						●	●		●	●												0.012~0.028	0.118~0.315
		644-GH						●	●		●	●												0.018~0.035	0.118~0.315
		646-GH						●	●			●												0.022~0.047	0.157~0.354
		854-GH																						0.020~0.039	0.177~0.394
		856-GH						●	●															0.022~0.047	0.197~0.472
		866-GH						●	●		●	●												0.022~0.047	0.197~0.472
		8612.5-GH																						0.026~0.051	0.236~0.472
Heavy (General)	VH	CNMM 643-VH						●																0.020~0.036	0.200~0.400
		644-VH						●																0.020~0.044	0.200~0.400
		646-VH						●																0.024~0.048	0.240~0.480
		856-VH						●																0.028~0.056	0.240~0.600
		866-VH						●																0.028~0.056	0.240~0.600
Heavy (High feed cutting)	VT	CNMM 643-VT						●			●	●												0.024~0.040	0.240~0.520
		644-VT						●																0.024~0.044	0.200~0.400
		646-VT						●																0.024~0.064	0.280~0.520
		856-VT						●																0.030~0.064	0.280~0.680
		866-VT						●																0.030~0.064	0.280~0.680

Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	MCRNR/L	B166
MCLNR/L	B165	PCBNR/L	B153
MCMNN	B165	PCLNR/L	B154

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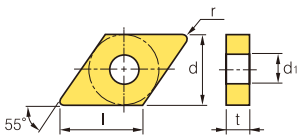
Rhombic 55° Negative



Dimensions (inch)			
Size	d	t	d1
33	3/8	1/8~3/16	5/32
43	1/2	3/16	13/64
44	1/2	1/4	13/64

Workpiece																								
Steel	P	●	⇕	✱	●	⇕	●	⇕	⇕	✱	✱	●	⇕		✱									
Stainless steel	M									⇕	⇕		●	⇕	✱	⇕	✱		●	⇕	⇕			
Cast iron	K	●	⇕	✱	●	⇕	⇕				⇕	⇕										●	⇕	
Non-ferrous metal	N																					●	⇕	
Heat resistant alloy, Titanium alloy	S									●			●	●	✱	✱	●	⇕	⇕			●	⇕	
Hardened steel	H																	⇕	✱			●	⇕	

Machining types
- ● Continuous cutting
- ⇕ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VP1	DNGG	431-VP1															●		●	●	●		●	●	0.002~0.006	0.004~0.059
			432-VP1															●		●	●	●		●	●	0.003~0.008	0.004~0.059
			441-VP1															●		●	●	●		●	●	0.002~0.006	0.004~0.059
			442-VP1															●		●	●	●		●	●	0.003~0.008	0.004~0.059
Medium	VP3	DNGG	431-VP3															●		●	●	●		●	●	0.002~0.012	0.004~0.118
			432-VP3															●		●	●	●		●	●	0.004~0.018	0.020~0.197
			433-VP3															●		●	●	●		●	●	0.005~0.020	0.020~0.197
			441-VP3															●		●	●	●		●	●	0.002~0.012	0.004~0.118
			442-VP3															●		●	●	●		●	●	0.004~0.018	0.020~0.197
			443-VP3															●		●	●	●		●	●	0.005~0.020	0.020~0.197
Roughing		DNMA	332																							0.007~0.018	0.031~0.118
			431											●												0.007~0.022	0.016~0.157
			432											●												0.010~0.022	0.031~0.157
			433											●												0.010~0.026	0.059~0.157
			441											●												0.007~0.022	0.016~0.157
			442											●												0.010~0.022	0.031~0.157
			443											●												0.010~0.026	0.047~0.157
Finishing	VB	DNMG	431-VB	●		●	●	●	●		●		●													0.004~0.014	0.012~0.078
			432-VB	●		●	●	●	●		●		●													0.006~0.018	0.020~0.078
			433-VB	●		●	●	●	●		●		●													0.006~0.018	0.020~0.078
			441-VB	●		●	●	●	●		●		●													0.004~0.014	0.012~0.078
			442-VB	●		●	●	●	●		●		●													0.006~0.018	0.020~0.078
			443-VB	●		●	●	●	●		●		●													0.008~0.020	0.020~0.098

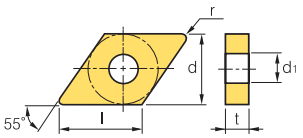
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	**PDJNR/L**	B154, 212
MDNNN	B166	**PDNNR/L**	B155
MDQNR/L	B167	**PDSNR/L**	B187
MDUNR/L	B192	**PDUNR/L**	B188

DN○○

Rhombic 55° Negative



Dimensions (inch)			
Size	d	t	d_1
33	3/8	1/8~3/16	5/32
43	1/2	3/16	13/64
44	1/2	1/4	13/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬌ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VF	DNMG 330.5-VF																							0.002~0.008	0.008~0.039
		331-VF										●													0.003~0.012	0.020~0.059
		332-VF																							0.004~0.016	0.020~0.059
		431-VF							●																0.003~0.012	0.020~0.059
		432-VF							●																0.004~0.016	0.020~0.059
		433-VF																							0.006~0.020	0.024~0.059
		441-VF							●			●													0.005~0.012	0.020~0.059
		442-VF							●			●													0.004~0.016	0.020~0.059
		443-VF																							0.006~0.020	0.024~0.059
Finishing (Mild steel)	VL	DNMG 332-VL						●		●		●													0.002~0.008	0.004~0.040
		431-VL						●		●		●													0.002~0.010	0.004~0.060
		432-VL						●		●		●													0.002~0.012	0.008~0.060
		433-VL						●		●		●													0.004~0.012	0.010~0.060
		441-VL	●					●		●		●													0.002~0.010	0.004~0.060
		442-VL	●					●		●		●													0.002~0.012	0.008~0.060
		443-VL						●		●		●													0.004~0.012	0.010~0.060
Finishing	VP1	DNMG 431-VP1															●		●	●	●		●	●	0.002~0.006	0.004~0.059
		432-VP1															●		●	●	●		●	●	0.002~0.008	0.004~0.059
		441-VP1															●		●	●	●		●	●	0.002~0.006	0.004~0.059
		442-VP1															●		●	●	●		●	●	0.002~0.008	0.004~0.059
Finishing (wiper)	VW	DNMG 431-VW						●		●		●													0.004~0.014	0.012~0.118
		432-VW						●		●		●													0.004~0.016	0.012~0.118
		441-VW						●		●		●													0.004~0.014	0.012~0.118
		442-VW						●		●		●													0.004~0.016	0.012~0.118
Medium to finishing	HA	DNMG 431-HA															●			●		●	●	●	0.002~0.012	0.031~0.138
		432-HA																		●		●	●	●	0.004~0.016	0.031~0.138
		441-HA																					●	●	0.002~0.012	0.031~0.138
		442-HA																					●	●	0.004~0.016	0.031~0.138

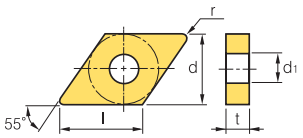
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	**PDJNR/L**	B154, 212
MDNNN	B166	**PDNNR/L**	B155
MDQNR/L	B167	**PDSNR/L**	B187
MDUNR/L	B192	**PDUNR/L**	B188

DN○○

Rhombic 55° Negative



Dimensions (inch)			
Size	d	t	d1
33	3/8	1/8~3/16	5/32
43	1/2	3/16	13/64
44	1/2	1/4	13/64

Workpiece																							
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱								
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌		
Cast iron	K	●	⬌	✱	●	⬌	⬌			⬌	⬌											●	⬌
Non-ferrous metal	N																					●	⬌
Heat resistant alloy, Titanium alloy	S									●			●	●	⬌	✱	●	⬌	⬌			●	⬌
Hardened steel	H																	⬌	✱			●	⬌

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts		Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Mdium to finishing	LP new	DNMG 331-LP						●		●		●													0.002~0.012	0.012~0.059
		332-LP						●		●		●													0.004~0.016	0.012~0.059
		431-LP						●		●		●													0.004~0.014	0.012~0.078
		432-LP						●		●		●													0.004~0.016	0.020~0.098
		433-LP						●		●		●													0.005~0.018	0.032~0.118
		441-LP						●		●		●													0.004~0.014	0.012~0.078
		442-LP						●		●		●													0.004~0.016	0.020~0.098
		443-LP						●		●		●													0.005~0.018	0.032~0.118
Mdium to finishing	VC	DNMG 431-VC																							0.004~0.014	0.012~0.079
		432-VC						●		●		●													0.006~0.016	0.020~0.118
		433-VC																							0.006~0.018	0.020~0.118
		441-VC						●		●															0.004~0.014	0.012~0.079
		442-VC						●		●		●													0.006~0.016	0.020~0.118
		443-VC																							0.006~0.018	0.020~0.118
Mdium to finishing	VP2	DNMG 431-VP2															●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
		432-VP2															●	●	●	●	●		●	●	0.004~0.016	0.020~0.177
		441-VP2															●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
		442-VP2															●	●	●	●	●		●	●	0.004~0.016	0.020~0.177
Mdium to finishing	VQ	DNMG 331-VQ	●		●	●	●																		0.002~0.012	0.020~0.138
		33.52-VQ	●		●	●	●																		0.003~0.016	0.031~0.157
		331-VQ																							0.004~0.016	0.039~0.157
		431-VQ	●	●	●	●	●																		0.002~0.012	0.031~0.138
		432-VQ	●		●	●	●																		0.003~0.016	0.031~0.157
		433-VQ	●		●	●	●																		0.004~0.016	0.020~0.165
		441-VQ	●	●	●	●	●																		0.002~0.012	0.031~0.157
		442-VQ	●	●	●	●	●																		0.003~0.016	0.031~0.157
		443-VQ	●		●	●	●																		0.004~0.016	0.020~0.165

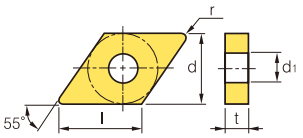
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	**PDJNR/L**	B154, 212
MDNNN	B166	**PDNNR/L**	B155
MDQNR/L	B167	**PDSNR/L**	B187
MDUNR/L	B192	**PDUNR/L**	B188

DN○○

Rhombic 55° Negative



Dimensions (inch)			
Size	d	t	d_1
33	3/8	1/8~3/16	5/32
43	1/2	3/16	13/64
44	1/2	1/4	13/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬌ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	MK new	DNMG	431-MK											●												0.002~0.012	0.036~0.197
			432-MK											●												0.004~0.020	0.039~0.197
			433-MK											●												0.005~0.024	0.051~0.197
			441-MK											●												0.002~0.012	0.036~0.197
			442-MK											●												0.004~0.020	0.039~0.197
			443-MK											●												0.005~0.024	0.051~0.197
Medium	MM new	DNMG	331-MM												●	●	●	●					●			0.003~0.014	0.020~0.197
			332-MM												●	●	●	●					●			0.004~0.016	0.020~0.197
			333-MM																							0.005~0.018	0.020~0.197
			431-MM												●	●	●	●				●	●			0.004~0.016	0.020~0.252
			432-MM												●	●	●	●				●	●			0.005~0.018	0.020~0.252
			433-MM												●	●	●	●				●				0.006~0.024	0.020~0.252
			441-MM												●	●	●	●				●	●			0.004~0.016	0.020~0.252
			442-MM												●	●	●	●				●	●			0.005~0.018	0.020~0.252
			443-MM												●	●	●	●				●	●			0.006~0.024	0.020~0.252
Medium	MP new	DNMG	331-MP						●		●		●													0.004~0.016	0.016~0.150
			332-MP						●		●		●													0.006~0.016	0.020~0.157
			333-MP						●		●		●													0.006~0.020	0.032~0.165
			431-MP						●		●		●		●	●	●					●				0.004~0.016	0.016~0.157
			432-MP						●		●		●		●	●	●				●	●				0.006~0.018	0.020~0.177
			433-MP						●		●		●		●	●	●				●	●				0.006~0.020	0.032~0.197
			441-MP						●		●		●		●	●	●				●	●				0.004~0.016	0.016~0.157
			442-MP						●		●		●		●	●	●				●	●				0.006~0.018	0.020~0.177
			443-MP						●		●		●		●	●	●				●	●				0.006~0.020	0.032~0.197

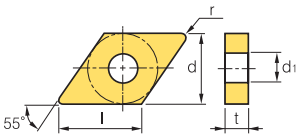
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	**PDJNR/L**	B154, 212
MDNNN	B166	**PDNNR/L**	B155
MDQNR/L	B167	**PDSNR/L**	B187
MDUNR/L	B192	**PDUNR/L**	B188

DN○○

Rhombic 55° Negative



Dimensions (inch)			
Size	d	t	d1
33	3/8	1/8~3/16	5/32
43	1/2	3/16	13/64
44	1/2	1/4	13/64

Workpiece																								
Steel	P	●	⇄	⇅	●	⇄	●	⇄	⇄	⇅	⇅	●	⇄		⇅									
Stainless steel	M									⇄	⇄		●	⇄	⇅	⇄	⇅		●	⇄	⇄			
Cast iron	K	●	⇄	⇅	●	⇄	⇄				⇄	⇄										●	⇄	
Non-ferrous metal	N																					●	⇄	
Heat resistant alloy, Titanium alloy	S										●			●	●	⇄	⇅	●	●	⇄		●	⇄	
Hardened steel	H																		⇄	⇅		●	⇄	

Machining types
- ● Continuous cutting
- ⇄ General cutting
- ⇅ Interrupted cutting

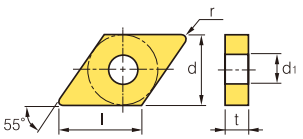
	Inserts	Designation	Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3215	Coated NC3120	Coated NC3225	Coated NC3030	Coated NC5330	Coated NC6315	Coated NC9115	Coated NC9125	Coated NC9135	Coated PC5300	Coated PC5400	Coated PC8105	Coated PC8110	Coated PC8115	Coated PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (ipr)	Cutting Condition ap (inch)
Medium	VM 	DNMG 331-VM																							0.002~0.012	0.035~0.157
		332-VM							●			●													0.004~0.020	0.039~0.157
		333-VM																							0.005~0.020	0.051~0.157
		431-VM	●									●					●	●							0.002~0.012	0.035~0.197
		432-VM	●		●				●		●	●					●	●							0.004~0.020	0.039~0.197
		433-VM										●					●	●							0.005~0.024	0.051~0.197
		441-VM	●		●				●		●	●					●	●				●			0.002~0.012	0.035~0.197
		442-VM	●						●		●	●					●	●				●			0.004~0.020	0.039~0.197
		443-VM										●					●	●							0.005~0.024	0.051~0.197
Medium	VP3 	DNMG 431-VP3															●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
		432-VP3															●	●	●	●	●		●	●	0.004~0.018	0.020~0.197
		433-VP3															●	●	●	●	●		●	●	0.005~0.020	0.020~0.197
		441-VP3															●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
		442-VP3															●	●	●	●	●		●	●	0.004~0.018	0.020~0.197
		443-VP3															●	●	●	●	●		●	●	0.005~0.020	0.020~0.197
Medium (wiper)	LW 	DNMG 432-LW						●		●		●													0.006~0.020	0.028~0.177
		433-LW						●		●		●													0.008~0.024	0.039~0.197
		442-LW						●		●		●													0.006~0.020	0.028~0.177
		443-LW						●		●		●													0.008~0.024	0.039~0.197

Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

●: Korea Stock ●: US Stock

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	PDJNR/L	B154, 212
MDNNN	B166	PDNNR/L	B155
MDQNR/L	B167	PDSNR/L	B187
MDUNR/L	B192	PDUNR/L	B188

DN ○○

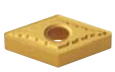


Dimensions (inch)			
Size	d	t	d1
43	1/2	3/16	13/64
44	1/2	1/4	13/64

Rhombic 55° Negative

Workpiece																								
Steel	P	●	⬍	✖	●	⬍	●	⬍	⬍	✖	✖	●	⬍		✖									
Stainless steel	M									⬍	⬍		●	⬍	✖	⬍	✖		●	⬍	⬍			
Cast iron	K	●	⬍	✖	●	⬍	⬍				⬍	⬍										●	⬍	
Non-ferrous metal	N																					●	⬍	
Heat resistant alloy, Titanium alloy	S										●			●	●	⬍	✖	●	●	⬍		●	⬍	
Hardened steel	H																		⬍	✖		●	⬍	

Machining types
- ● Continuous cutting
- ⬍ General cutting
- ✖ Interrupted cutting

Inserts		Designation	Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (ipr)	Cutting Condition ap (inch)
Medium to roughing	B25 	DNMG 430.5-B25																							0.006~0.016	0.020~0.138
		431-B25			●			●		●		●													0.007~0.018	0.039~0.157
		432-B25			●			●		●		●													0.007~0.022	0.059~0.157
		433-B25						●		●		●													0.010~0.022	0.059~0.157
		436.5-B25																							0.014~0.026	0.098~0.217
		440.5-B25																							0.006~0.016	0.020~0.138
		441-B25	●					●		●	●	●													0.007~0.022	0.059~0.157
		442-B25	●					●		●	●	●										●			0.007~0.022	0.059~0.157
		443-B25						●		●		●													0.010~0.022	0.059~0.157
		446.5-B25																							0.014~0.026	0.098~0.217
Roughing	GR 	DNMG 432-GR									●														0.008~0.020	0.039~0.276
		433-GR																							0.010~0.035	0.051~0.276
		434-GR																							0.012~0.030	0.071~0.276
		442-GR									●	●													0.008~0.020	0.039~0.276
		443-GR									●														0.010~0.028	0.051~0.276
		444-GR										●													0.008~0.030	0.071~0.276
Roughing	RK new 	DNMG 432-RK																							0.006~0.020	0.059~0.197
		433-RK											●												0.008~0.024	0.071~0.197
		442-RK											●												0.006~0.020	0.059~0.197
		443-RK											●												0.008~0.024	0.071~0.197

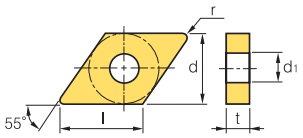
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

●: Korea Stock ●: US Stock

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	PDJNR/L	B154, 212
MDNNN	B166	PDNNR/L	B155
MDQNR/L	B167	PDSNR/L	B187
MDUNR/L	B192	PDUNR/L	B188

DN○○

Rhombic 55° Negative



Dimensions (inch)			
Size	d	t	d1
43	1/2	3/16	13/64
44	1/2	1/4	13/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬣ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing	RM new	DNMG	431-RM													●	●	●				●				0.004~0.020	0.078~0.236
			432-RM												●	●	●	●				●				0.006~0.022	0.078~0.236
			433-RM												●	●	●	●				●				0.008~0.024	0.078~0.236
			441-RM													●	●	●				●	●			0.004~0.020	0.078~0.236
			442-RM												●	●	●						●			0.006~0.022	0.078~0.236
			443-RM												●	●	●									0.008~0.024	0.078~0.236
Roughing	VP4 new	DNMG	432-VP4																							0.006~0.014	0.039~0.157
			433-VP4																							0.008~0.016	0.039~0.157
			442-VP4																			●				0.006~0.014	0.039~0.157
			443-VP4																			●				0.008~0.016	0.039~0.157
Roughing	VR	DNMG	432-VR																							0.010~0.022	0.047~0.276
			433-VR																							0.012~0.024	0.059~0.276
			442-VR																							0.010~0.022	0.047~0.276
			443-VR																							0.012~0.024	0.059~0.276
Medium (Shaft)	SH	DNMX	431R-SH																							0.006~0.012	0.039~0.157
			432R-SH																							0.006~0.020	0.059~0.197
			441R-SH						●		●															0.006~0.012	0.039~0.157
			442R-SH						●		●															0.006~0.020	0.059~0.197
			431L-SH																							0.006~0.012	0.039~0.157
			432L-SH																							0.006~0.020	0.059~0.197
			441L-SH						●		●															0.006~0.012	0.039~0.157
			442L-SH						●		●															0.006~0.020	0.059~0.197

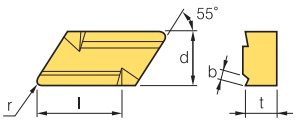
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	PDJNR/L	B154, 212
MDNNN	B166	PDNNR/L	B155
MDQNR/L	B167	PDSNR/L	B187
MDUNR/L	B192	PDUNR/L	B188

KN○○

Parallelogram 55° Negative



Dimensions (inch)		
Size	d	t
16	3/8	3/16

Workpiece		
Steel	P	● ⧓ ✱ ● ⧓ ● ⧓ ⧓ ✱ ⧓ ✱ ● ⧓ ⧓ ✱
Stainless steel	M	⧓ ✱ ● ⧓ ⧓ ✱ ● ⧓ ⧓ ✱ ⧓ ✱ ● ⧓ ⧓
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ⧓ ✱ ● ⧓ ⧓ ● ⧓
Non-ferrous metal	N	⧓ ●
Heat resistant alloy, Titanium alloy	S	✱ ● ● ⧓ ✱ ● ⧓ ⧓ ✱ ● ⧓
Hardened steel	H	⧓ ✱ ● ⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	11	KNUX 160405R11						●	●	●	●	●										●			0.008~0.014	0.039~0.236
		160410R11						●		●	●	●													0.012~0.024	0.059~0.236
		160405L11						●	●	●	●	●													0.008~0.014	0.039~0.236
		160410L11						●		●	●	●													0.012~0.024	0.059~0.236
Roughing	12	KNUX 160405R12						●		●	●	●													0.008~0.014	0.039~0.236
		160410R12						●		●	●	●													0.012~0.024	0.059~0.236
		160405L12																							0.008~0.014	0.039~0.236
		160410L12									●														0.012~0.024	0.059~0.236

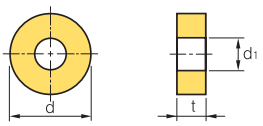
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

●: Korea Stock ●: US Stock

Available tool holders			
Designation	Page	Designation	Page
CKJNR/L	B163	**CKUNR/L**	B192
CKNNR/L	B163		

RN○○

Round Negative



Dimensions (inch)			
Size	d	t	d_1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16
84	1	1/4	23/64
86	1	3/8	23/64
106	1.25	3/8	1/2

Workpiece		
Steel	P	● ⧓ ✱ ● ⧓ ● ⧓ ⧓ ✱ ⧓ ✱ ● ⧓ ⧓ ✱
Stainless steel	M	⧓ ✱ ● ⧓ ⧓ ✱ ● ⧓ ⧓ ✱ ⧓ ✱ ● ⧓ ⧓
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ⧓ ✱ ● ⧓ ⧓ ● ⧓
Non-ferrous metal	N	⧓ ●
Heat resistant alloy, Titanium alloy	S	✱ ● ● ⧓ ✱ ● ⧓ ⧓ ✱ ● ⧓
Hardened steel	H	⧓ ✱ ● ⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

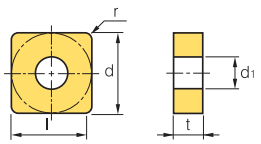
Inserts		Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to roughing	B25	RNMG 32-B25																							0.004~0.035	0.036~0.177
		43-B25									●														0.005~0.047	0.047~0.189
		54-B25									●														0.006~0.059	0.059~0.295
		64-B25																							0.007~0.075	0.075~0.299
		84-B25																							0.010~0.098	0.098~0.394
		86-B25									●														0.010~0.098	0.098~0.394
		106-B25																							0.012~0.098	0.138~0.512

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

●: Korea Stock ●: US Stock

SN○○

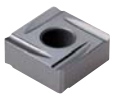
○ Square 90° Negative



Dimensions (inch)			
Size	d	t	d_1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16

Workpiece			P																					
	Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱								
	Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌		
	Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌										●	⬌
	Non-ferrous metal	N																					●	⬌
	Heat resistant alloy, Titanium alloy	S									●			●	●	⬌	✱	●	●	⬌			●	⬌
	Hardened steel	H																	⬌	✱			●	⬌

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts	Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing		SNGA 321																						0.007~0.020	0.020~0.177
		322																						0.007~0.020	0.020~0.177
		431																						0.006~0.024	0.059~0.315
		432																						0.006~0.024	0.059~0.315
		433																						0.008~0.031	0.059~0.315
		542																						0.008~0.031	0.079~0.394
		543																						0.008~0.035	0.079~0.394
		642																						0.006~0.024	0.118~0.472
		643																						0.008~0.031	0.118~0.472
Medium		SNGG 321R																						0.005~0.014	0.039~0.118
		322R																						0.006~0.014	0.039~0.118
		431R		●																				0.006~0.014	0.039~0.157
		432R																						0.006~0.014	0.039~0.157
		433R																						0.006~0.014	0.039~0.157
		321L																						0.005~0.014	0.039~0.118
		322L																						0.006~0.014	0.039~0.118
		431L																						0.006~0.014	0.039~0.157
		432L																						0.006~0.014	0.039~0.157
		433L																						0.006~0.014	0.039~0.157
Medium	VP3 	SNGG 431-VP3															●		●	●	●		●	●	0.002~0.012	0.016~0.157
		432-VP3															●		●	●	●		●	●	0.004~0.018	0.020~0.157
		433-VP3															●		●	●	●		●	●	0.005~0.020	0.020~0.157

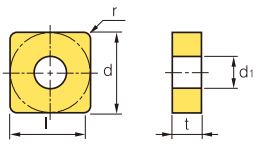
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	MSRNR/L	B168	PSDNN	B157
MSDNN	B167	MSSNR/L	B169	PSKNR/L	B158, 189
MSKNR/L	B168	PSBNR/L	B157	PSSNR/L	B158

SN○○

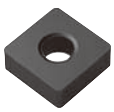
Square 90° Negative



Dimensions (inch)			
Size	d	t	d_1
32	3/8	1/8	5/32
42	1/2	1/8	13/64
43	1/2	3/16	13/64
53	5/8	3/16	1/4

Dimensions (inch)			
Size	d	t	d_1
54	5/8	1/4	1/4
64	3/4	1/4~3/16	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing		SNGN	320.5																						0.002~0.012	0.020~0.157
			321																						0.004~0.014	0.020~0.157
			322																						0.004~0.016	0.039~0.157
			421																						0.005~0.020	0.051~0.197
			422																						0.006~0.024	0.059~0.236
			423																						0.007~0.024	0.067~0.236
			430.5																						0.004~0.018	0.039~0.197
			431																						0.005~0.020	0.051~0.197
			432																						0.006~0.024	0.059~0.236
			433																						0.007~0.024	0.067~0.236
			436																						0.008~0.026	0.079~0.236
			530.5																						0.004~0.020	0.020~0.236
			532																						0.006~0.024	0.059~0.315
			533																						0.007~0.024	0.079~0.315
			534																						0.008~0.026	0.098~0.335
			630.5																						0.004~0.024	0.079~0.335
			633																						0.007~0.028	0.098~0.394
			634																						0.008~0.030	0.098~0.394
			841																						0.012~0.031	0.118~0.472
			844																						0.014~0.039	0.157~0.472
Medium		SNGX	432R																						0.039~0.157	0.006~0.014
Roughing		SNMA	331																						0.004~0.018	0.020~0.177
			332																						0.006~0.020	0.020~0.177
			431																						0.006~0.024	0.039~0.197
			432											●											0.006~0.028	0.039~0.236
			433											●											0.008~0.031	0.059~0.236
			434											●											0.012~0.039	0.079~0.236
			543											●											0.008~0.031	0.079~0.315
			544											●											0.010~0.033	0.098~0.394
			642																						0.008~0.031	0.079~0.394
			643											●											0.008~0.031	0.079~0.394
			644											●											0.010~0.033	0.098~0.394
			856																						0.016~0.039	0.118~0.512
			866																						0.016~0.039	0.118~0.512

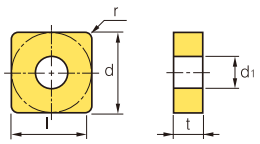
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

SN○○

○ Square 90° Negative



Dimensions (inch)			
Size	d	t	d_1
32	3/8	1/8	5/32
43	1/2	3/16	13/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VB	SNMG	431-VB	●		●	●	●																		0.006~0.014	0.012~0.078
			432-VB	●		●	●	●																		0.006~0.016	0.022~0.078
Finishing	VF	SNMG	321-VF																							0.003~0.012	0.020~0.059
			322-VF																							0.003~0.012	0.020~0.059
			431-VF																							0.003~0.012	0.020~0.059
			432-VF										●													0.004~0.016	0.020~0.059
			433-VF																							0.008~0.020	0.020~0.059
Finishing (Mild steel)	VL	SNMG	432-VL						●		●		●													0.004~0.014	0.008~0.060
Medium to finishing	HA	SNMG	431-HA																					●	●	0.004~0.014	0.031~0.138
			432-HA																					●	●	0.004~0.016	0.031~0.138
			433-HA																							0.005~0.022	0.031~0.138
Medium to finishing	LP new	SNMG	332-LP						●		●		●													0.004~0.012	0.012~0.059
			431-LP						●		●		●													0.004~0.014	0.012~0.078
			432-LP						●		●		●													0.004~0.016	0.022~0.098
			433-LP																							0.005~0.018	0.032~0.118
Medium to finishing	VC	SNMG	432-VC								●		●													0.006~0.016	0.020~0.157
Medium to finishing	VP2	SNMG	431-VP2															●	●	●	●	●		●	●	0.002~0.014	0.004~0.118
			432-VP2															●	●	●	●	●		●	●	0.004~0.018	0.020~0.177
			433-VP2															●	●	●	●	●		●	●	0.004~0.020	0.020~0.197

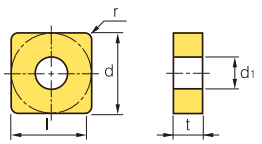
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

SN○○

Square 90° Negative



Dimensions (inch)			
Size	d	t	d_1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
44	1/2	3/16	13/64
64	3/4	1/4	5/16

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬌ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts	Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	VQ	SNMG 321-VQ	●		●	●	●																		0.002~0.012	0.002~0.138
		322-VQ	●		●	●	●																		0.003~0.012	0.003~0.157
		323-VQ																							0.004~0.012	0.039~0.157
		431-VQ	●		●	●	●																		0.002~0.012	0.031~0.157
		432-VQ	●		●	●	●																		0.003~0.016	0.031~0.157
Medium	MK	SNMG 322-MK																							0.006~0.018	0.031~0.138
		431-MK											●												0.003~0.018	0.031~0.157
		432-MK											●												0.004~0.020	0.039~0.197
		433-MK											●												0.005~0.024	0.051~0.197
		434-MK																							0.006~0.025	0.059~0.236
		542-MK																							0.010~0.024	0.071~0.236
		543-MK											●												0.008~0.028	0.071~0.276
		544-MK																							0.009~0.028	0.078~0.295
		642-MK											●												0.012~0.030	0.091~0.374
		643-MK											●												0.013~0.031	0.098~0.394
		644-MK																							0.014~0.031	0.106~0.394
Medium	MM new	SNMG 321-MM																				●			0.003~0.014	0.020~0.197
		322-MM																							0.004~0.016	0.020~0.197
		323-MM																							0.005~0.018	0.020~0.197
		431-MM												●	●	●	●				●	●			0.004~0.016	0.020~0.252
		432-MM												●	●	●	●				●	●			0.005~0.018	0.020~0.252
		433-MM												●	●	●	●				●	●			0.006~0.024	0.020~0.252
		434-MM													●	●									0.007~0.026	0.020~0.252
		542-MM												●	●	●									0.005~0.018	0.020~0.315
		543-MM												●	●	●	●				●	●			0.006~0.024	0.020~0.315
		544-MM													●	●									0.007~0.026	0.020~0.315
		642-MM												●	●	●	●				●				0.005~0.018	0.020~0.374
		643-MM												●	●	●	●				●	●			0.006~0.024	0.020~0.374
		644-MM																				●			0.007~0.026	0.020~0.374

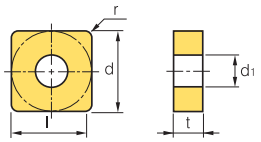
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

SN○○

○ Square 90° Negative



Dimensions (inch)			
Size	d	t	d_1
32	3/8	1/8	5/32
43	1/2	3/16	13/64
44	1/2	3/16	13/64
64	3/4	1/4~3/16	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
	Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱								
	Stainless steel	M									⧓	⧓		●	⧓	✱	⧓	✱		●	⧓	⧓		
	Cast iron	K	●	⧓	✱	●	⧓	⧓				⧓	●										●	⧓
	Non-ferrous metal	N																					●	⧓
	Heat resistant alloy, Titanium alloy	S										●			●	●	⧓	✱	●	⧓	⧓		●	⧓
	Hardened steel	H																		⧓	✱		●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	MP	SNMG	321-MP						●		●		●													0.004~0.016	0.016~0.150
			322-MP						●		●		●													0.006~0.016	0.020~0.157
			431-MP						●		●		●		●	●	●			●	●					0.004~0.016	0.016~0.157
			432-MP						●		●		●		●	●	●			●	●					0.006~0.018	0.020~0.177
			433-MP						●		●		●		●	●	●									0.006~0.020	0.032~0.197
			434-MP						●		●		●													0.007~0.024	0.032~0.276
Medium	VM	SNMG	321-VM																							0.002~0.012	0.035~0.138
			322-VM																							0.004~0.197	0.039~0.138
			431-VM	●									●					●	●							0.002~0.012	0.035~0.197
			432-VM	●						●		●	●					●	●		●		●			0.004~0.020	0.039~0.197
			433-VM										●					●	●							0.005~0.024	0.051~0.197
			643-VM																							0.010~0.024	0.098~0.295
			644-VM																							0.010~0.024	0.098~0.295
Medium	VP3	SNMG	431-VP3															●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
			432-VP3															●	●	●	●	●		●	●	0.004~0.018	0.039~0.197
			433-VP3															●	●	●	●	●		●	●	0.005~0.020	0.039~0.197
Medium to roughing	B25	SNMG	322-B25																							0.007~0.018	0.031~0.138
			431-B25	●		●			●		●	●	●													0.007~0.018	0.039~0.138
			432-B25	●		●			●		●	●	●					●	●				●			0.009~0.024	0.059~0.197
			433-B25			●			●		●	●	●													0.010~0.024	0.079~0.197
			434-B25						●		●	●	●													0.014~0.028	0.098~0.197
			435-B25																							0.016~0.028	0.118~0.197
			542-B25									●														0.010~0.024	0.059~0.236
			543-B25																							0.010~0.024	0.079~0.236
			544-B25																							0.014~0.028	0.079~0.236
			642-B25						●		●	●														0.010~0.024	0.118~0.315
			643-B25						●		●	●	●													0.014~0.028	0.118~0.315
			644-B25						●		●	●									●					0.014~0.028	0.157~0.472
			854-B25																							0.014~0.028	0.157~0.472
			856-B25						●				●													0.020~0.039	0.197~0.472
			866-B25						●																	0.020~0.039	0.217~0.472

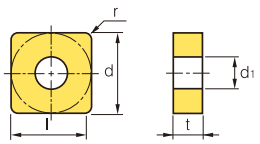
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

●: Korea Stock ●: US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

SN○○

○ Square 90° Negative



Dimensions (inch)			
Size	d	t	d_1
43	1/2	3/16	13/64
44	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts	Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing	GR	SNMG 431-GR										●													0.006~0.018	0.003~0.236
		432-GR									●	●													0.008~0.020	0.039~0.276
		433-GR							●		●														0.008~0.020	0.039~0.276
		542-GR									●														0.010~0.024	0.039~0.276
		543-GR							●		●														0.011~0.030	0.055~0.276
		642-GR									●														0.012~0.031	0.067~0.354
		643-GR							●		●	●													0.012~0.031	0.067~0.354
		644-GR							●		●	●													0.012~0.032	0.075~0.484
		856-GR									●														0.018~0.047	0.102~0.551
		866-GR							●		●														0.020~0.047	0.102~0.551
Roughing	RK new	SNMG 432-RK											●												0.009~0.021	0.059~0.236
		433-RK											●												0.011~0.021	0.071~0.236
		434-RK											●												0.011~0.021	0.078~0.236
		543-RK																							0.008~0.028	0.071~0.276
		544-RK																							0.009~0.028	0.078~0.295
		643-RK																							0.013~0.031	0.098~0.394
		644-RK																							0.014~0.031	0.106~0.394
Roughing	RM new	SNMG 431-RM												●	●	●	●				●				0.004~0.020	0.078~0.236
		432-RM												●	●	●	●				●	●			0.006~0.022	0.078~0.236
		433-RM													●	●	●				●				0.008~0.024	0.078~0.236
		434-RM																							0.010~0.028	0.078~0.236
		543-RM													●	●	●				●				0.008~0.024	0.078~0.315
		544-RM																							0.010~0.028	0.078~0.315
		642-RM													●	●	●				●				0.008~0.024	0.078~0.394
		643-RM													●	●	●				●				0.010~0.028	0.078~0.394
		644-RM																							0.009~0.028	0.078~0.394
		866-RM																							0.016~0.047	0.157~0.551
Roughing	VP4 new	SNMG 432-VP4																			●				0.006~0.014	0.039~0.157
		433-VP4																			●				0.008~0.016	0.039~0.157
		543-VP4																			●				0.008~0.018	0.039~0.197
		642-VP4																			●				0.008~0.020	0.039~0.354
		643-VP4																			●				0.009~0.022	0.039~0.354
		644-VP4																			●				0.010~0.024	0.039~0.354

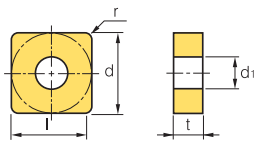
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	MSRNR/L	B168	PSDNN	B157
MSDNN	B167	MSSNR/L	B169	PSKNR/L	B158, 189
MSKNR/L	B168	PSBNR/L	B157	PSSNR/L	B158

SN○○

○ Square 90° Negative



Dimensions (inch)			
Size	d	t	d_1
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16
85	1	5/16	23/64
86	1	3/8	23/64

Workpiece																								
Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱									
Stainless steel	M									⧓	⧓		●	⧓	✱	⧓	⧓	✱		●	⧓	⧓		
Cast iron	K	●	⧓	✱	●	⧓	⧓				⧓	⧓											●	⧓
Non-ferrous metal	N																						●	⧓
Heat resistant alloy, Titanium alloy	S										●			●	●	⧓	✱	●	●	⧓	⧓		●	⧓
Hardened steel	H																		●	⧓	✱		●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing	VR	SNMG	432-VR																					0.010~0.022	0.047~0.276
			433-VR																					0.012~0.024	0.059~0.276
			643-VR																					0.014~0.028	0.078~0.394
			644-VR																					0.014~0.030	0.087~0.394
Roughing	GR	SNMM	432-GR																					0.008~0.020	0.039~0.276
			433-GR									●												0.010~0.026	0.051~0.276
			643-GR									●												0.010~0.026	0.051~0.453
			644-GR																					0.013~0.033	0.071~0.453
Heavy	GH	SNMM	432-GH									●	●											0.012~0.024	0.000~0.001
			433-GH									●												0.012~0.028	0.000~0.001
			543-GH									●												0.012~0.028	0.098~0.315
			643-GH						●	●		●	●											0.012~0.028	0.118~0.315
			644-GH						●	●		●	●											0.018~0.039	0.157~0.354
			646-GH						●	●		●	●											0.022~0.047	0.157~0.354
			856-GH						●	●		●	●											0.022~0.047	0.197~0.472
			866-GH						●	●		●	●											0.022~0.047	0.197~0.472
			868-GH																					0.022~0.047	0.197~0.472
Heavy (General)	VH	SNMM	643-VH						●															0.020~0.036	0.197~0.394
			644-VH						●															0.020~0.043	0.197~0.394
			646-VH						●															0.024~0.047	0.236~0.472
			854-VH						●			●												0.028~0.059	0.236~0.591
			856-VH																					0.028~0.055	0.236~0.591
			865-VH						●															0.028~0.055	0.236~0.591
			866-VH																					0.028~0.055	0.236~0.551
Heavy (High feed cutting)	VT	SNMM	643-VT						●				●											0.024~0.036	0.236~0.512
			644-VT						●			●												0.024~0.043	0.236~0.512
			646-VT						●															0.024~0.063	0.276~0.512
			854-VT						●			●												0.030~0.063	0.276~0.591
			856-VT																					0.030~0.063	0.276~0.591
			865-VT						●			●												0.030~0.063	0.276~0.591
			866-VT																					0.030~0.063	0.276~0.669

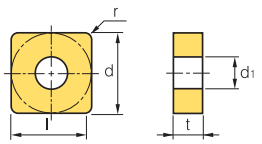
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	MSRNR/L	B168	PSDNN	B157
MSDNN	B167	MSSNR/L	B169	PSKNR/L	B158, 189
MSKNR/L	B168	PSBNR/L	B157	PSSNR/L	B158

SN○○

Square 90° Negative



Dimensions (inch)			
Size	d	t	d_1
42	1/2	1/8	-
43	1/2	3/16	13/64
53	5/8	3/16	-
63	3/4	3/16	-
86	1	5/16	-

Workpiece																								
Steel	P	●	⬍	✱	●	⬍	●	⬍	⬍	✱	✱	●	⬍		✱								
Stainless steel	M									⬍	⬍		●	⬍	✱	⬍	✱		●	⬍	⬍		
Cast iron	K	●	⬍	✱	●	⬍	⬍				⬍	⬍										●	⬍
Non-ferrous metal	N																					●	⬍
Heat resistant alloy, Titanium alloy	S										●			●	●	⬍	✱	●	●	⬍		●	⬍
Hardened steel	H																		⬍	✱		●	⬍

Machining types
- ● Continuous cutting
- ⬍ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to roughing		SNMN	421																							0.007~0.018	0.039~0.138
			422																							0.009~0.024	0.059~0.236
			423																							0.010~0.024	0.079~0.197
			431																							0.007~0.018	0.039~0.138
			432																							0.009~0.024	0.059~0.197
			433																							0.010~0.024	0.079~0.197
			531																							0.008~0.020	0.059~0.236
			532																							0.010~0.024	0.059~0.236
			533																							0.010~0.024	0.079~0.236
			634																							0.014~0.028	0.079~0.236
Medium		SNMX	432R																							0.006~0.014	0.039~0.157
Medium to roughing		SNUN	432																							0.009~0.024	0.059~0.197
			433																							0.010~0.024	0.079~0.197
			633																							0.012~0.039	0.118~0.394
			433TN																							0.010~0.024	0.079~0.197
			866TN																							0.012~0.047	0.118~0.472

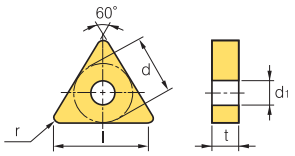
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

●: Korea Stock ●: US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	MSRNR/L	B168	PSDNN	B157
MSDNN	B167	MSSNR/L	B169	PSKNR/L	B158, 189
MSKNR/L	B168	PSBNR/L	B157	PSSNR/L	B158

TN○○

Triangular 60° Negative



Dimensions (inch)			
Size	d	t	d_1
22	1/4	1/8~3/16	3/32
32	3/8	1/8	5/32
33	1/2	3/16	5/32
42	1/2	1/8	13/64
43	1/2	3/16	13/64
54	5/8	1/4	1/4

Workpiece																						Machining types
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱							● Continuous cutting
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌	⬌ General cutting
Cast iron	K	●	⬌	✱	●	⬌	⬌			⬌	⬌										● ⬌	✱ Interrupted cutting
Non-ferrous metal	N																				● ⬌	
Heat resistant alloy, Titanium alloy	S									●			●	●	✱	✱	●	●	⬌		● ⬌	
Hardened steel	H																	⬌	✱		● ⬌	

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing		TNGA	220.5																							0.002~0.012	0.008~0.118
			221																							0.002~0.012	0.016~0.118
			321																							0.004~0.014	0.016~0.157
			330.5																							0.004~0.012	0.008~0.157
			331																							0.004~0.014	0.016~0.197
			332																							0.005~0.016	0.020~0.197
			421																							0.004~0.014	0.020~0.197
			430.5																							0.002~0.012	0.008~0.118
			431																							0.004~0.014	0.016~0.197
			432																							0.004~0.016	0.020~0.197
			433																							0.005~0.018	0.039~0.217
			543																							0.005~0.018	0.039~0.276
			546																							0.008~0.022	0.079~0.276
Finishing	SC 	TNGG	330.5R-SC		●																					0.001~0.008	0.004~0.059
			331R-SC		●																					0.002~0.010	0.012~0.079
			330.5L-SC																							0.001~0.008	0.004~0.059
			331L-SC																							0.002~0.010	0.012~0.079
Medium		TNGG	221R																							0.002~0.012	0.002~0.010
			330.5R		●																					0.003~0.012	0.020~0.138
			331R	●	●																					0.005~0.012	0.039~0.138
			332R		●																					0.006~0.014	0.051~0.138
			431R		●																					0.005~0.012	0.039~0.197
			432R		●																					0.006~0.014	0.051~0.197
			433R																							0.007~0.016	0.059~0.197
			221L																							0.002~0.012	0.002~0.010
			330.5L																							0.003~0.012	0.020~0.138
			331L	●	●																					0.005~0.012	0.039~0.138
			332L		●																					0.006~0.014	0.051~0.138
			431L																							0.005~0.012	0.039~0.197
			432L																							0.006~0.014	0.051~0.197
			433L																							0.007~0.016	0.059~0.197
Medium	VP3 	TNGG	331-VP3															●		●	●	●		●	●	0.002~0.012	0.004~0.118
			332-VP3															●		●	●	●		●	●	0.004~0.018	0.020~0.197

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

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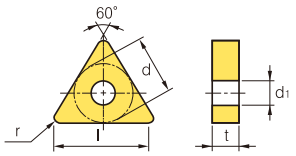
Triangular 60° Negative



Dimensions (inch)			
Size	d	t	d_1
22	1/4	1/8	3/32
32	3/8	1/8	5/32
33	3/8	3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
66	3/4	3/8	5/16

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
	Steel	P	●	⇕	✱	●	⇕	●	⇕	⇕	✱	✱	●	⇕		✱								●	⇕
	Stainless steel	M									⇕	✱		●	⇕	✱	⇕	✱		●	⇕	⇕			
	Cast iron	K	●	⇕	✱	●	⇕	⇕			⇕	✱	●										●	⇕	
	Non-ferrous metal	N																					●	⇕	
	Heat resistant alloy, Titanium alloy	S									●			●	●	⇕	✱	●	●	⇕			●	⇕	
	Hardened steel	H																		⇕	✱		●	⇕	

Machining types
● Continuous cutting
⇕ General cutting
✱ Interrupted cutting

Inserts	Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	TNGN	220.5																							0.002~0.010	0.008~0.098
		221																							0.004~0.012	0.020~0.098
		222																							0.004~0.012	0.031~0.098
		320.5																							0.002~0.012	0.008~0.118
		321																							0.004~0.012	0.020~0.157
		322																							0.004~0.016	0.031~0.157
		331																							0.004~0.016	0.020~0.157
		332																							0.004~0.016	0.039~0.157
		333																							0.004~0.020	0.059~0.177
		431																							0.004~0.014	0.039~0.157
		432																							0.006~0.016	0.059~0.197
		433																							0.008~0.020	0.059~0.197
		434																							0.010~0.022	0.059~0.197
		436																							0.012~0.026	0.079~0.197
		547.5																							0.014~0.028	0.079~0.197
Roughing	TNMA	222																							0.002~0.012	0.020~0.118
		331											●												0.004~0.012	0.039~0.157
		332											●												0.004~0.016	0.039~0.157
		333											●												0.004~0.020	0.059~0.177
		334											●												0.006~0.022	0.059~0.177
		431											●												0.004~0.014	0.039~0.157
		432											●												0.006~0.016	0.059~0.197
		433											●												0.008~0.020	0.059~0.197
		434											●												0.010~0.022	0.059~0.197
		435																							0.012~0.026	0.079~0.197
		438																							0.014~0.028	0.079~0.197
		542																							0.008~0.018	0.079~0.276
		543																							0.010~0.022	0.118~0.276
		544																							0.012~0.026	0.118~0.276
		666																							0.014~0.030	0.118~0.354
Finishing	TNMG	331-VB	●		●	●	●	●		●		●													0.004~0.014	0.012~0.059
		332-VB	●		●	●	●	●		●		●													0.006~0.018	0.020~0.276
		432-VB						●		●		●													0.006~0.018	0.020~0.098
		433-VB						●		●		●													0.008~0.020	0.039~0.276

VB

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

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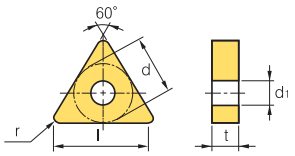
Triangular 60° Negative



Dimensions (inch)			
Size	d	t	d1
22	1/4	1/8	3/32
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Workpiece																							
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱								
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌		
Cast iron	K	●	⬌	✱	●	⬌	⬌			⬌	⬌											●	⬌
Non-ferrous metal	N																					●	⬌
Heat resistant alloy, Titanium alloy	S									●			●	●	⬌	✱	●	⬌	⬌			●	⬌
Hardened steel	H																	⬌	✱			●	⬌

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (Mild steel)	VL	TNMG	331-VL	●					●		●		●													0.002~0.010	0.004~0.039
			332-VL	●					●		●		●													0.004~0.014	0.008~0.059
			333-VL						●		●		●													0.006~0.016	0.008~0.059
			432-VL						●		●		●													0.004~0.014	0.008~0.059
			433-VL						●		●		●													0.004~0.014	0.020~0.078
Finishing	VF	TNMG	221-VF	●	●								●													0.002~0.079	0.008~0.039
			331-VF	●						●			●													0.003~0.012	0.020~0.059
			332-VF						●	●			●													0.004~0.016	0.020~0.059
			333-VF																							0.006~0.020	0.020~0.059
			431-VF										●													0.004~0.016	0.020~0.059
			432-VF																							0.004~0.016	0.020~0.059
Finishing (wiper)	VW	TNMG	331-VW						●		●		●													0.004~0.014	0.012~0.118
			332-VW						●		●		●													0.004~0.016	0.012~0.118
Medium to finishing	HA	TNMG	331-HA																			●	●	●		0.002~0.012	0.031~0.138
			332-HA																			●	●	●		0.004~0.016	0.031~0.138
			333-HA																					●	●	0.005~0.022	0.031~0.138
			432-HA																					●	●	0.004~0.016	0.031~0.209
Medium to finishing	LP	TNMG	331-LP						●		●		●													0.004~0.014	0.012~0.078
			332-LP						●		●		●													0.004~0.016	0.020~0.098
			333-LP						●		●		●													0.005~0.018	0.032~0.118

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

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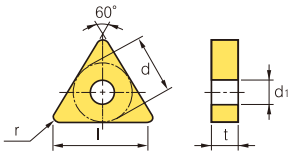
Triangular 60° Negative



Dimensions (inch)			
Size	d	t	d_1
22	1/4	1/8	3/32
33	3/8	3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	VC	TNMG	331-VC								●		●												0.004~0.014	0.012~0.079
			332-VC						●		●		●												0.006~0.016	0.020~0.118
			333-VC								●		●												0.006~0.018	0.020~0.118
			432-VC								●														0.006~0.016	0.020~0.118
			433-VC																						0.006~0.018	0.020~0.118
Medium to finishing	VP2	TNMG	331-VP2															●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
			332-VP2															●	●	●	●	●		●	●	0.004~0.018	0.020~0.197
			333-VP2															●	●	●	●	●		●	●	0.005~0.022	0.032~0.130
			431-VP2															●	●	●	●	●		●	●	0.002~0.012	0.032~0.197
			432-VP2															●	●	●	●	●		●	●	0.004~0.016	0.032~0.197
Medium to finishing	VQ	TNMG	221-VQ	●		●	●	●																		0.002~0.012	0.020~0.138
			331-VQ	●	●	●	●	●																		0.002~0.014	0.020~0.138
			332-VQ	●		●	●	●																		0.003~0.016	0.031~0.157
			333-VQ	●		●	●	●																		0.004~0.016	0.032~0.138
			431-VQ	●		●	●	●																		0.002~0.014	0.020~0.157
Medium	MK	TNMG	331-MK											●												0.002~0.012	0.036~0.138
			332-MK											●												0.004~0.020	0.039~0.157
			333-MK											●												0.005~0.024	0.047~0.177
			334-MK																							0.005~0.024	0.047~0.177
			431-MK											●												0.006~0.018	0.059~0.197
			432-MK											●												0.008~0.020	0.051~0.217
			433-MK											●												0.009~0.020	0.055~0.217
			434-MK																							0.010~0.021	0.063~0.236
			543-MK																							0.010~0.022	0.118~0.276
Medium	MM	TNMG	331-MM												●	●	●	●				●	●			0.004~0.016	0.020~0.189
			332-MM												●	●	●	●				●	●			0.005~0.018	0.020~0.189
			333-MM													●	●						●			0.007~0.026	0.020~0.189
			334-MM																							0.007~0.026	0.020~0.189
			431-MM												●	●	●									0.004~0.016	0.020~0.256
			432-MM												●	●	●	●				●	●			0.005~0.018	0.020~0.256
			433-MM												●	●	●	●				●	●			0.006~0.024	0.020~0.256

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

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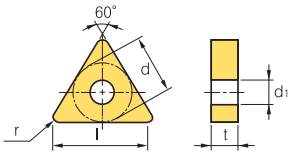
Triangular 60° Negative



Dimensions (inch)			
Size	d	t	d1
22	1/4	1/8	3/32
33	3/8	3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
65	3/4	5/16	5/16
66	3/4	3/8	5/16

Workpiece																								
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱									
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌			
Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌										●	⬌	
Non-ferrous metal	N																					●	⬌	
Heat resistant alloy, Titanium alloy	S									●			●	●	⬌	✱	●	●	⬌			●	⬌	
Hardened steel	H																	⬌	✱			●	⬌	

Machining types
- ● Continuous cutting
- ⬌ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	MP	TNMG	331-MP						●		●		●		●	●	●			●	●					0.004~0.016	0.016~0.138
			332-MP						●		●		●		●	●	●			●	●					0.006~0.018	0.020~0.157
			333-MP						●		●		●		●	●	●			●	●					0.006~0.020	0.032~0.177
			431-MP						●		●		●		●	●	●									0.004~0.014	0.016~0.197
			432-MP						●		●		●		●	●	●									0.006~0.018	0.020~0.217
			433-MP						●		●		●		●	●	●									0.006~0.020	0.032~0.236
			434-MP						●		●		●													0.008~0.022	0.039~0.236
Medium	VM	TNMG	222-VM																							0.002~0.012	0.031~0.157
			331-VM	●						●		●	●					●	●							0.002~0.012	0.035~0.197
			332-VM	●		●			●	●	●	●	●					●	●				●			0.004~0.020	0.039~0.197
			333-VM	●					●	●								●	●							0.005~0.024	0.051~0.197
			431-VM															●	●							0.002~0.012	0.035~0.260
			432-VM							●			●					●	●		●					0.004~0.020	0.039~0.260
			433-VM																							0.005~0.024	0.051~0.260
Medium	VP3	TNMG	331-VP3															●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
			332-VP3															●	●	●	●	●		●	●	0.004~0.018	0.020~0.197
Medium (wiper)	LW	TNMG	332-LW						●		●		●													0.006~0.020	0.028~0.177
			333-LW						●		●		●													0.008~0.024	0.039~0.197
Medium to roughing	B25	TNMG	222-B25																							0.007~0.016	0.059~0.118
			331-B25	●		●			●		●	●	●													0.007~0.018	0.079~0.138
			332-B25	●		●			●		●	●	●										●			0.007~0.022	0.079~0.138
			333-B25			●			●		●		●													0.010~0.022	0.079~0.138
			334-B25																							0.012~0.024	0.098~0.118
			431-B25						●		●	●	●													0.007~0.018	0.059~0.197
			432-B25						●		●	●	●													0.007~0.022	0.079~0.197
			433-B25						●		●	●	●													0.010~0.022	0.079~0.197
			434-B25						●		●		●													0.012~0.024	0.079~0.197
			436-B25																							0.014~0.028	0.118~0.276
			438-B25									●														0.016~0.030	0.138~0.276
			542-B25									●														0.007~0.022	0.079~0.197
			543-B25								●	●	●													0.010~0.022	0.118~0.276
			544-B25									●														0.012~0.024	0.118~0.276
			654-B25						●		●															0.014~0.028	0.118~0.354
			666-B25																							0.016~0.031	0.118~0.354

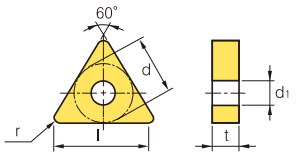
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

●: Korea Stock ●: US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

TN○○

Triangular 60° Negative



Dimensions (inch)			
Size	d	t	d_1
32	3/8	1/8	5/32
33	3/8	3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
66	3/4	3/8	5/16

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
	Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱								
	Stainless steel	M									⧓	✱		●	⧓	✱	⧓	✱		●	⧓	⧓		
	Cast iron	K	●	⧓	✱	●	⧓	●			⧓	✱	●										●	⧓
	Non-ferrous metal	N																					●	⧓
	Heat resistant alloy, Titanium alloy	S									●			●	●	⧓	✱	●	●	⧓	⧓		●	⧓
	Hardened steel	H																		⧓	✱		●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing	GR	TNMG	322-GR									●														0.008~0.020	0.039~0.276
			333-GR																							0.009~0.021	0.047~0.315
			432-GR							●		●	●													0.009~0.024	0.043~0.307
			433-GR							●		●														0.011~0.031	0.047~0.307
			434-GR									●														0.012~0.030	0.059~0.307
			542-GR							●		●														0.012~0.030	0.059~0.307
			543-GR							●		●														0.012~0.030	0.059~0.307
			544-GR									●														0.014~0.039	0.063~0.307
			666-GR									●														0.016~0.039	0.079~0.354
Roughing	RK	TNMG	332-RK											●												0.009~0.021	0.059~0.197
			333-RK											●												0.009~0.021	0.071~0.197
			334-RK											●												0.009~0.021	0.071~0.197
			432-RK											●												0.009~0.021	0.059~0.236
			433-RK											●												0.011~0.021	0.071~0.236
			434-RK											●												0.011~0.021	0.008~0.236
Roughing	RM	TNMG	331-RM												●	●	●	●				●	●			0.004~0.020	0.078~0.217
			332-RM												●	●	●	●				●	●			0.006~0.022	0.078~0.217
			333-RM																							0.008~0.024	0.078~0.217
			432-RM													●	●	●				●				0.004~0.020	0.078~0.295
			433-RM													●	●	●				●				0.006~0.022	0.078~0.295
Roughing	VP4	TNMG	332-VP4																			●				0.006~0.014	0.039~0.157
			333-VP4																			●				0.008~0.016	0.039~0.157
Roughing	VR	TNMG	332-VR																							0.010~0.022	0.047~0.276
			333-VR																							0.014~0.026	0.067~0.276
			334-VR																							0.014~0.028	0.078~0.394
			432-VR																							0.014~0.028	0.078~0.394
			433-VR																							0.014~0.028	0.078~0.394
			434-VR																							0.014~0.030	0.087~0.394

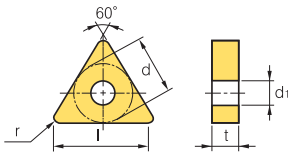
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

TN○○

Triangular 60° Negative



Dimensions (inch)			
Size	d	t	d_1
33	3/8	3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
66	3/4	3/8	5/16

Workpiece																							
Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱								
Stainless steel	M									⧓	⧓		●	⧓	✱	⧓	✱		●	⧓	⧓		
Cast iron	K	●	⧓	✱	●	⧓	⧓				⧓	⧓										●	⧓
Non-ferrous metal	N																					●	⧓
Heat resistant alloy, Titanium alloy	S									●			●	●	⧓	✱	●	⧓	⧓			●	⧓
Hardened steel	H																	⧓	✱			●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

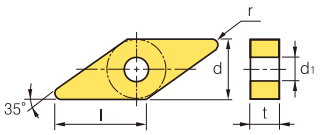
Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing	GR	TNMM	432-GR																					0.009~0.024	0.043~0.307
			433-GR																					0.011~0.031	0.047~0.307
			434-GR																					0.012~0.030	0.059~0.307
Heavy	GH	TNMM	332-GH																					0.008~0.020	0.039~0.276
			432-GH																					0.010~0.024	0.051~0.276
			433-GH																					0.008~0.020	0.039~0.315
			434-GH																					0.010~0.024	0.051~0.315
			544-GH																					0.013~0.028	0.071~0.315
			546-GH																					0.014~0.020	0.071~0.512
			666-GH																					0.014~0.028	0.091~0.512
Medium to roughing		TNMN	332																					0.004~0.012	0.039~0.157
			432																					0.006~0.016	0.059~0.197
			433																					0.008~0.020	0.059~0.197
Medium (Shaft)	SH	TNMX	331R-SH						●		●													0.006~0.012	0.020~0.157
			332R-SH						●		●													0.006~0.018	0.039~0.157
			331L-SH						●		●													0.006~0.012	0.020~0.157
			332L-SH						●		●													0.006~0.018	0.039~0.157
Medium to roughing		TNMX	330.5R		●	●																		0.004~0.012	0.020~0.118
			331R		●					●		●	●											0.005~0.012	0.039~0.138
			332R									●												0.006~0.014	0.051~0.134
			431R																					0.005~0.012	0.039~0.197
			432R																					0.006~0.014	0.051~0.197
			331L							●		●												0.005~0.012	0.039~0.138
			332L							●		●												0.006~0.014	0.051~0.134

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	PTFNR/L	B159, 189	WTJNR/L	B161
MTFNR/L	B169	PTGNR/L	B159	WTXNR/L	B161
MTGNR/L	B170	PTTNR/L	B160		
MTJNR/L	B170	WTENN	B161		

VN○○



Dimensions (mm)			
Size	d	t	d1
16	9.525	4.76	3.81

Rhombic 35° Negative

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓ ● ⧓ ⧓ ✱ ✱ ● ⧓ ✱	● Continuous cutting
Stainless steel	M	✱ ⧓ ⧓ ● ⧓ ✱ ✱ ⧓ ● ⧓ ✱ ✱ ✱ ● ⧓ ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ✱ ⧓ ● ⧓ ✱ ✱ ✱ ● ⧓ ⧓	✱ Interrupted cutting
Non-ferrous metal	N	✱ ⧓ ⧓ ✱ ⧓ ✱ ⧓ ⧓ ✱ ✱ ✱ ✱ ● ⧓ ⧓	
Heat resistant alloy, Titanium alloy	S	✱ ⧓ ⧓ ✱ ⧓ ✱ ⧓ ⧓ ● ✱ ● ● ⧓ ⧓ ⧓	
Hardened steel	H	✱ ⧓ ⧓ ✱ ⧓ ✱ ⧓ ⧓ ✱ ✱ ✱ ⧓ ⧓ ⧓	

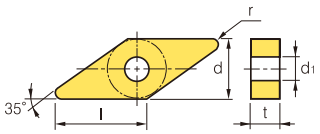
Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	HA	VNGG	332-HA																					●	●	0.004~0.016	0.031~0.138
Medium	VP3	VNGG	331-VP3															●		●	●	●		●	●	0.002~0.012	0.004~0.118
			332-VP3															●		●	●	●		●	●	0.004~0.018	0.020~0.197
Finishing	VB	VNMG	331-VB	●		●	●	●	●		●		●													0.004~0.014	0.012~0.039
			332-VB	●		●	●	●	●		●		●													0.006~0.018	0.020~0.079
			333-VB						●		●		●													0.008~0.018	0.032~0.098
Finishing	VF	VNMG	330.5-VF		●					●																0.002~0.008	0.012~0.039
			331-VF	●	●					●			●													0.003~0.012	0.020~0.059
			332-VF	●						●	●		●													0.004~0.016	0.020~0.059
			333-VF																							0.006~0.020	0.020~0.059
Finishing (Mild steel)	VL	VNMG	331-VL	●		●			●		●		●													0.002~0.008	0.004~0.040
			332-VL	●		●			●		●		●													0.004~0.010	0.008~0.059
			333-VL						●		●		●													0.006~0.012	0.020~0.078
Medium to finishing	HA	VNMG	331-HA																					●	●	0.003~0.014	0.020~0.118
			332-HA																					●	●	0.004~0.016	0.032~0.138
Medium to finishing	LP new	VNMG	331-LP						●		●		●													0.004~0.014	0.012~0.059
			332-LP						●		●		●													0.004~0.016	0.020~0.078
			333-LP						●		●		●													0.004~0.018	0.032~0.098
Medium to finishing	VC	VNMG	331-VC	●			●				●															0.004~0.014	0.012~0.079
			332-VC	●							●															0.006~0.016	0.020~0.118
			333-VC																							0.006~0.016	0.032~0.118

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MVJNR/L	B170	**MVVNN**	B171
MVQNR/L	B171	**MVUNR/L**	B193

VNOO



Dimensions (inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	5/32

Rhombic 35° Negative

Workpiece			Machining types
Steel	P	● ⧓ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱	⧓ General cutting
Cast iron	K	● ⧓ ✱	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓	
Heat resistant alloy, Titanium alloy	S	● ⧓ ✱	
Hardened steel	H	⧓ ✱	

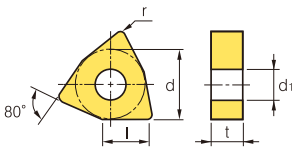
Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing (Cermet)	VQ	VNMG	331-VQ	●	●	●	●	●																	0.004~0.016	0.020~0.138
			332-VQ	●	●	●	●	●																	0.005~0.018	0.020~0.138
			333-VQ																						0.006~0.018	0.032~0.138
Medium	MK new	VNMG	331-MK											●											0.003~0.018	0.020~0.118
			332-MK											●											0.004~0.020	0.039~0.138
			333-MK											●											0.008~0.020	0.059~0.157
Medium	MM new	VNMG	331-MM												●	●	●					●	●		0.004~0.016	0.020~0.189
			332-MM												●	●	●					●	●		0.005~0.018	0.020~0.189
			333-MM																						0.006~0.024	0.020~0.157
Medium	MP new	VNMG	331-MP						●		●		●		●	●	●			●	●				0.004~0.016	0.016~0.138
			332-MP						●		●		●		●	●	●			●	●				0.006~0.018	0.020~0.157
			333-MP						●		●		●												0.006~0.020	0.032~0.177
Medium	RM new	VNMG	331-RM																						0.004~0.020	0.078~0.197
			332-RM																						0.006~0.022	0.078~0.197
			333-RM																						0.008~0.024	0.078~0.197
Medium	VM	VNMG	331-VM	●								●	●					●	●						0.003~0.018	0.020~0.138
			332-VM	●						●	●	●	●					●	●		●		●		0.004~0.020	0.039~0.157
			333-VM																						0.008~0.020	0.059~0.157
			431-VM																						0.003~0.018	0.039~0.197
			432-VM																						0.004~0.020	0.059~0.197
Medium	VP3	VNMG	331-VP3															●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
			332-VP3															●	●	●	●	●		●	●	0.004~0.018	0.020~0.197

Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MVJNR/L	B170	MVVNN	B171
MVQNR/L	B171	MVUNR/L	B193

WN○○



Dimensions (inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	5/32

Trigon **80° Negative**

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

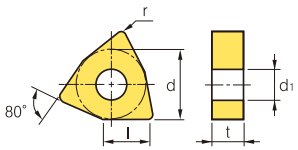
Inserts		Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	VP3	WNGG **431-VP3**															●		●	●	●		●	●	0.004~0.018	0.020~0.197
Roughing		WNMA **331**											●												0.004~0.012	0.020~0.118
		332											●												0.004~0.012	0.020~0.118
		333											●												0.004~0.012	0.039~0.118
		431											●												0.006~0.024	0.039~0.197
		432											●												0.006~0.024	0.039~0.236
		433											●												0.006~0.028	0.059~0.236
		434																							0.006~0.028	0.059~0.236
Finishing	VB	WNMG **431-VB**	●		●	●	●	●		●		●													0.004~0.014	0.012~0.059
		432-VB	●		●	●	●	●		●		●													0.006~0.018	0.020~0.079
		433-VB	●		●	●	●	●		●		●													0.007~0.018	0.032~0.098
Finishing	VF	WNMG **331-VF**		●								●													0.003~0.012	0.020~0.059
		332-VF																							0.004~0.016	0.020~0.059
		431-VF							●			●													0.003~0.012	0.020~0.059
		432-VF										●													0.004~0.016	0.020~0.059
		434-VF																							0.008~0.020	0.020~0.059
Finishing (Mild steel)	VL	WNMG **331-VL**						●		●		●													0.002~0.010	0.008~0.059
		431-VL						●		●		●													0.002~0.010	0.004~0.040
		432-VL						●		●		●													0.004~0.014	0.008~0.060
Finishing (wiper)	VW	WNMG **431-VW**						●		●		●													0.004~0.012	0.020~0.118
		432-VW						●		●		●													0.006~0.020	0.020~0.157
Medium to finishing	HA	WNMG **331-HA**																					●	●	0.002~0.012	0.031~0.098
		332-HA																					●	●	0.004~0.016	0.031~0.098
		431-HA																				●	●	●	0.002~0.012	0.031~0.138
		432-HA															●					●	●	●	0.004~0.016	0.031~0.138
		433-HA																					●	●	0.005~0.022	0.031~0.138

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B171	**WWLNR/L**	B162
PWLNR/L	B190		

WN○○



Dimensions (inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	5/32

Trigon 80° Negative

Workpiece																									
Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱										
Stainless steel	M									⧓	⧓		●	⧓	✱	⧓	✱		●	⧓	⧓				
Cast iron	K	●	⧓	✱	●	⧓	⧓				⧓	⧓												●	⧓
Non-ferrous metal	N																							●	⧓
Heat resistant alloy, Titanium alloy	S									●			●	●	⧓	✱	●	●	⧓					●	⧓
Hardened steel	H																	⧓	✱					●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

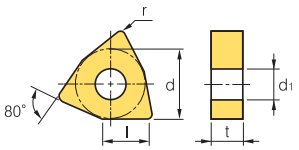
Inserts	Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing	LP new	WNMG 332-LP					●		●		●													0.004~0.012	0.012~0.059
		431-LP					●		●		●													0.004~0.014	0.012~0.078
		432-LP					●		●		●													0.004~0.016	0.020~0.098
		433-LP					●		●		●													0.005~0.018	0.032~0.118
Medium to finishing	VC	WNMG 431-VC																						0.006~0.016	0.006~0.157
		432-VC					●		●															0.006~0.018	0.006~0.177
		433-VC					●		●		●													0.006~0.018	0.006~0.177
Medium to finishing	VP2	WNMG 431-VP2														●	●	●	●	●		●	●	0.004~0.018	0.020~0.197
		432-VP2														●	●	●	●	●		●	●	0.005~0.020	0.020~0.197
		433-VP2														●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
Medium to finishing (Cermet)	VQ	WNMG 331-VQ	●		●	●	●																	0.002~0.012	0.020~0.157
		332-VQ	●		●	●	●																	0.003~0.012	0.032~0.157
		333-VQ					●																	0.004~0.012	0.012~0.157
		431-VQ	●		●	●																		0.002~0.012	0.020~0.157
		432-VQ	●		●	●																		0.003~0.016	0.032~0.157
		433-VQ	●		●	●																		0.004~0.014	0.032~0.138
Medium	MK new	WNMG 332-MK										●												0.003~0.012	0.032~0.098
		431-MK										●												0.004~0.018	0.039~0.118
		432-MK										●												0.004~0.020	0.039~0.138
		433-MK										●												0.004~0.020	0.039~0.157
		434-MK																						0.006~0.020	0.047~0.165
Medium	MM new	WNMG 331-MM											●	●	●						●			0.003~0.014	0.020~0.157
		332-MM											●	●	●						●			0.004~0.016	0.020~0.157
		333-MM											●	●	●						●			0.005~0.018	0.020~0.157
		431-MM											●	●	●	●				●	●			0.004~0.016	0.020~0.157
		432-MM											●	●	●	●				●	●			0.005~0.018	0.020~0.157
		433-MM											●	●	●	●				●	●			0.006~0.024	0.020~0.157

Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B171	WWLNR/L	B162
PWLNR/L	B190		

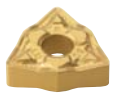
WN○○



Dimensions (inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	5/32

Trigon **80° Negative**

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓ ● ⧓ ⧓ ✱ ✱ ● ⧓ ⧓ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱ ● ⧓ ⧓ ✱ ● ⧓ ⧓ ✱ ⧓ ✱ ⧓ ⧓	⧓ General cutting
Cast iron	K	● ⧓ ✱ ● ⧓ ● ⧓ ✱ ● ⧓ ⧓ ● ⧓	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓	
Heat resistant alloy, Titanium alloy	S	● ✱ ● ⧓ ✱ ⧓ ⧓ ● ⧓ ⧓	
Hardened steel	H	⧓ ✱ ● ⧓	

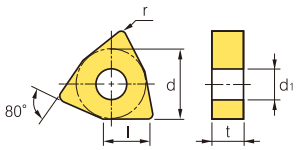
Inserts		Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	MP 	WNMG **331-MP**						●		●		●													0.004~0.016	0.016~0.110
		332-MP						●		●		●													0.006~0.018	0.020~0.118
		333-MP						●		●		●													0.006~0.020	0.032~0.126
		431-MP						●		●		●		●	●	●			●	●	●				0.004~0.016	0.016~0.157
		432-MP						●		●		●		●	●	●			●	●	●				0.006~0.018	0.020~0.177
		433-MP						●		●		●		●	●	●			●	●					0.006~0.020	0.032~0.197
		434-MP						●		●		●													0.007~0.022	0.039~0.197
Medium	VM 	WNMG **330.5-VM**										●					●	●							0.002~0.012	0.035~0.138
		331-VM							●	●		●					●	●							0.004~0.018	0.039~0.138
		332-VM								●															0.004~0.020	0.039~0.157
		333-VM							●			●					●	●							0.005~0.024	0.051~0.157
		431-VM							●		●	●					●	●		●		●			0.002~0.012	0.035~0.197
		432-VM							●			●					●	●							0.004~0.020	0.039~0.197
		433-VM																							0.004~0.020	0.039~0.197
Medium	VP3 	WNMG **431-VP3**															●	●	●	●	●		●	●	0.004~0.018	0.020~0.197
		432-VP3															●	●	●	●	●		●	●	0.005~0.020	0.020~0.197
		433-VP3															●	●	●	●	●		●	●	0.002~0.012	0.004~0.118
Medium (wiper)	LW 	WNMG **332-LW**						●		●		●													0.006~0.024	0.020~0.138
		333-LW						●		●		●													0.008~0.028	0.031~0.138
		432-LW						●		●		●													0.006~0.024	0.039~0.197
		433-LW						●		●		●													0.008~0.028	0.039~0.236
Medium to roughing	B25 	WNMG **431-B25**						●		●		●													0.007~0.018	0.039~0.197
		432-B25						●		●	●	●													0.009~0.024	0.059~0.197
		433-B25						●		●		●													0.010~0.024	0.079~0.197
Roughing	GR 	WNMG **431-GR**																							0.006~0.020	0.003~0.236
		432-GR							●		●	●													0.008~0.020	0.039~0.276
		433-GR							●		●	●													0.010~0.020	0.051~0.276
		434-GR							●																0.010~0.024	0.071~0.236

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B171	**WWLNR/L**	B162
PWLNR/L	B190		

WN○○



Dimensions (inch)			
Size	d	t	d1
33	3/8	3/16	5/32
43	1/2	3/16	13/64
54	5/8	1/4	1/4
64	3/4	1/4	5/16

Trigon 80° Negative

Workpiece																										
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱											
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌					
Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌										●	⬌			
Non-ferrous metal	N																					●	⬌			
Heat resistant alloy, Titanium alloy	S										●			●	●	⬌	✱	●	●	⬌		●	⬌			
Hardened steel	H																		⬌	✱		●	⬌			

Machining types
- ● Continuous cutting
- ⬌ General cutting
- ✱ Interrupted cutting

Inserts		Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Roughing	RK  new	WNMG 431-RM											●												0.009~0.020	0.059~0.236
		432-RM											●												0.009~0.021	0.059~0.236
		433-RM											●												0.011~0.021	0.071~0.236
		434-RM											●												0.010~0.024	0.078~0.236
Roughing	RM  new	WNMG 331-RM																							0.004~0.020	0.059~0.118
		332-RM																							0.006~0.022	0.059~0.118
		333-RM																							0.008~0.024	0.059~0.118
		431-RM													●	●	●				●	●			0.004~0.020	0.078~0.157
		432-RM												●	●	●	●				●	●			0.006~0.022	0.078~0.157
		433-RM												●	●	●	●				●				0.008~0.024	0.078~0.157
Roughing	VP4  new	WNMG 432-VP4																			●				0.006~0.014	0.039~0.157
		433-VP4																			●				0.008~0.016	0.039~0.157
Roughing	VR 	WNMG 432-VR																							0.010~0.022	0.047~0.276
		433-VR																							0.012~0.024	0.059~0.276
Medium to roughing	B25 	WNMM 542-B25									●														0.012~0.031	0.118~0.315
		643-B25																							0.016~0.035	0.157~0.394
Medium (Shaft)	SH 	WNMX 431R-SH																							0.006~0.012	0.039~0.157
		432R-SH																							0.006~0.020	0.059~0.197
		431L-SH																							0.006~0.012	0.039~0.157
		432L-SH																							0.006~0.020	0.059~0.197

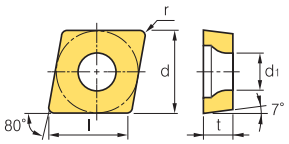
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

●: Korea Stock ●: US Stock

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B171	WWLNR/L	B162
PWLNR/L	B190		

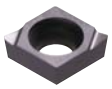
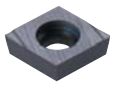
CC○○

Rhombic 80° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
1.2	9/64	7/128	5/64
1.5	11/64	9/128	3/32
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	✱ ✱ ● ⬌ ● ⬌ ⬌ ✱ ⬌ ⬌ ✱ ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ✱ ⬌ ● ⬌ ⬌ ✱ ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	✱ ● ⬌ ✱ ● ⬌ ⬌ ● ⬌ ⬌
Hardened steel	H	⬌ ⬌ ● ⬌

Inserts	Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing		CCET 1.210.05R																						0.001~0.002	0.004~0.012
		1.210R																						0.001~0.002	0.004~0.012
		1.210.5R																						0.001~0.002	0.004~0.012
		1.211R																						0.001~0.002	0.004~0.012
		1.510.05R																						0.001~0.004	0.004~0.020
		1.510R																						0.001~0.004	0.004~0.020
		1.510.5R																						0.001~0.004	0.004~0.020
		1.511R																						0.001~0.004	0.004~0.020
		1.210.05L																						0.001~0.002	0.004~0.012
		1.210L																						0.001~0.002	0.004~0.012
		1.210.5L		●																		●	●	0.001~0.002	0.004~0.012
		1.211L																						0.001~0.002	0.004~0.012
		1.510.05L																						0.001~0.004	0.004~0.020
		1.510L																						0.001~0.004	0.004~0.020
		1.510.5L		●																		●	●	0.001~0.004	0.004~0.020
		1.511L																						0.001~0.004	0.004~0.020
Finishing (High precision)	KF 	CCET 21.5MFR-KF																						~0.002	0.002~0.051
		21.50MFR-KF																		●				0.001~0.003	0.002~0.059
		21.50.5MFR-KF																		●				0.001~0.004	0.002~0.067
		32.5MFR-KF																						0.001~0.003	0.002~0.059
		32.50MFR-KF																		●				0.001~0.004	0.002~0.067
		32.50.5MFR-KF																		●				0.002~0.006	0.003~0.079
		21.5MFL-KF																						~0.002	0.002~0.051
		21.50MFL-KF																						0.001~0.003	0.002~0.059
		21.50.5MFL-KF																						0.001~0.004	0.002~0.067
		32.5MFL-KF																						0.001~0.003	0.002~0.059
		32.50MFL-KF																						0.001~0.004	0.002~0.067
		32.50.5MFL-KF																						0.002~0.006	0.003~0.079
Medium to finishing (High precision)	KM 	CCET 21.5MFR-KM																						~0.002	0.002~0.051
		21.50MFR-KM																		●				0.001~0.003	0.002~0.059
		21.50.5MFR-KM																		●				0.001~0.004	0.002~0.067
		32.5MFR-KM																						0.001~0.003	0.002~0.059
		32.50MFR-KM																		●				0.001~0.004	0.002~0.067
		32.50.5MFR-KM																		●				0.002~0.006	0.003~0.079
		21.5MFL-KM																						~0.002	0.002~0.051
		21.50MFL-KM																						0.001~0.003	0.002~0.059
		21.50.5MFL-KM																						0.001~0.004	0.002~0.067
		32.5MFL-KM																						0.001~0.003	0.002~0.059
		32.50MFL-KM																						0.001~0.004	0.002~0.067
		32.50.5MFL-KM																						0.002~0.006	0.003~0.079

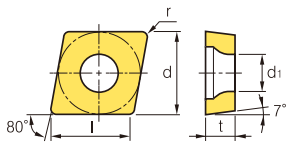
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B109, 172	SCLCR/L	B109, 172, 194, 204

CC○○

Rhombic 80° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	KF	CCGT	21.5R-KF																						~0.002	0.002~0.051
			21.50R-KF																						0.001~0.003	0.002~0.059
			21.50.5R-KF																						0.001~0.004	0.002~0.067
			32.5R-KF																						0.001~0.003	0.002~0.059
			32.50R-KF																						0.001~0.004	0.002~0.067
			32.50.5R-KF																						0.002~0.006	0.003~0.079
			21.5L-KF																						~0.002	0.002~0.051
			21.50L-KF																						0.001~0.003	0.002~0.059
			21.50.5L-KF																						0.001~0.004	0.002~0.067
			32.5L-KF																						0.001~0.003	0.002~0.059
			32.50L-KF																						0.001~0.004	0.002~0.067
			32.50.5L-KF																						0.002~0.006	0.003~0.079
Finishing	VP1	CCGT	21.50-VP1															●		●	●	●		●		0.002~0.003	0.002~0.039
			21.50.5-VP1															●		●	●	●		●		0.001~0.004	0.003~0.059
			21.51-VP1															●		●	●	●		●		0.002~0.005	0.004~0.059
			32.50-VP1															●		●	●	●		●		0.001~0.005	0.002~0.039
			32.50.5-VP1															●		●	●	●		●		0.002~0.008	0.004~0.059
			32.51-VP1															●		●	●	●		●		0.002~0.006	0.003~0.059
Finishing (High precision)	VP1	CCGT	21.50MFN-VP1																		●					~0.002	0.002~0.051
			21.50.5MFN-VP1																		●					0.002~0.003	0.002~0.039
			21.51MFN-VP1																		●					0.002~0.004	0.003~0.059
			32.50MFN-VP1																		●					0.005~0.005	0.004~0.059
			32.50.5MFN-VP1																		●					0.002~0.006	0.003~0.059
			32.51MFN-VP1																		●					0.005~0.008	0.004~0.059
Medium to finishing	KM	CCGT	21.5R-KM																							~0.002	0.002~0.051
			21.50R-KM																							0.001~0.003	0.002~0.059
			21.50.5R-KM																				●			0.001~0.004	0.002~0.067
			32.5R-KM																							0.001~0.003	0.002~0.059
			32.50R-KM																							0.001~0.004	0.002~0.067
			32.50.5R-KM																							0.002~0.006	0.003~0.079
			21.5L-KM																							~0.002	0.002~0.051
			21.50L-KM																							0.001~0.003	0.002~0.059
			21.50.5L-KM																							0.001~0.004	0.002~0.067
			32.5L-KM																							0.001~0.003	0.002~0.059
			32.50L-KM																							0.001~0.004	0.002~0.067
			32.50.5L-KM																							0.002~0.006	0.003~0.079

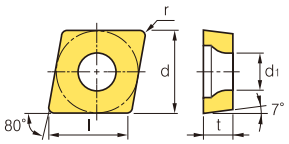
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B109, 172	SCLCR/L	B109, 172, 194, 204

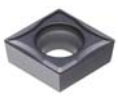
CC○○

Rhombic 80° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
43	1/2	3/16	7/32

Workpiece			Machining types
Steel	P	● ⧓ ✱ ● ⧓ ● ⧓ ⧓ ✱ ✱ ● ⧓ ⧓ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱ ● ⧓ ⧓ ✱ ✱ ⧓ ✱ ✱ ● ⧓
Cast iron	K	● ⧓ ✱ ● ⧓ ⧓ ⧓ ✱ ● ⧓ ✱ ✱ ● ⧓	⧓ General cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	⧓ ● ⧓ ✱ ✱ ● ⧓ ⧓ ● ⧓	✱ Interrupted cutting
Hardened steel	H	⧓ ✱ ● ⧓

Inserts	Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VF 	CCMT 21.50.5-VF								●							●								0.002~0.008	0.001~0.040
		21.51-VF	●		●					●							●								0.004~0.010	0.001~0.040
		32.50.5-VF								●															0.002~0.006	0.003~0.060
		32.51-VF	●	●	●					●							●								0.002~0.008	0.012~0.060
		32.52-VF			●					●		●					●								0.004~0.010	0.012~0.060
		431-VF								●															0.003~0.009	0.004~0.080
Finishing	VL 	CCMT 21.51-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.002~0.004	0.003~0.036
		21.52-VL						●		●		●													0.002~0.005	0.004~0.039
		32.51-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●		●	●	0.002~0.004	0.004~0.039
		32.52-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●		●	●	0.003~0.006	0.004~0.039
Finishing	VP1 	CCMT 32.51-VP1																							0.002~0.008	0.004~0.059
		32.52-VP1																							0.003~0.008	0.020~0.078
		431-VP1																							0.003~0.008	0.008~0.078
		432-VP1																							0.004~0.010	0.020~0.078
		433-VP1																							0.004~0.012	0.032~0.098
Medium to finishing	HMP 	CCMT 21.50.5-HMP																		●					0.001~0.005	0.004~0.059
		21.51-HMP							●		●						●			●		●			0.002~0.007	0.008~0.094
		21.52-HMP															●					●			0.003~0.009	0.016~0.094
		32.50.5-HMP																		●					0.003~0.009	0.004~0.079
		32.51-HMP							●		●						●			●		●			0.003~0.009	0.012~0.118
		32.52-HMP							●		●						●			●		●			0.004~0.012	0.020~0.118
		431-HMP																							0.004~0.011	0.012~0.142
		432-HMP																							0.009~0.014	0.020~0.142
		433-HMP																							0.006~0.017	0.028~0.142

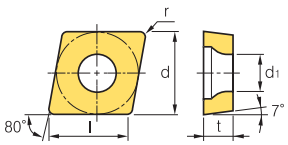
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B109, 172	SCLCR/L	B109, 172, 194, 204

CC○○

Rhombic 80° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
2.5	5/16	3/32	9/64
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
43	1/2	3/16	7/32

Workpiece																							
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱								
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱			●	⬌	⬌		
Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌											●	⬌
Non-ferrous metal	N																						●	⬌
Heat resistant alloy, Titanium alloy	S										●			●	●	⬌	✱	●	●	⬌			●	⬌
Hardened steel	H																			⬌	✱		●	⬌

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	C25	CCMT	21.50.5-C25	●	●	●	●	●	●		●	●	●					●	●		●					0.001~0.005	0.016~0.079
			21.51-C25	●	●	●	●	●	●	●	●	●	●	●				●	●		●		●			0.002~0.006	0.024~0.091
			21.52-C25	●		●	●	●	●		●	●	●	●				●	●		●					0.003~0.008	0.031~0.091
			2.522-C25																							0.003~0.010	0.031~0.091
			32.50.5-C25																							0.002~0.008	0.020~0.098
			32.51-C25	●	●	●	●	●	●	●	●	●	●	●				●	●		●		●			0.003~0.010	0.031~0.118
			32.52-C25	●	●	●	●	●	●	●	●	●	●	●				●	●		●		●			0.004~0.012	0.039~0.118
			431-C25						●		●	●	●	●				●	●		●					0.004~0.013	0.031~0.118
			432-C25	●		●	●	●	●	●	●	●	●	●				●	●		●					0.005~0.014	0.047~0.138
			433-C25						●		●		●	●												0.006~0.016	0.055~0.138
Medium	MP new	CCMT	21.50.5-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.002~0.005	0.008~0.059
			21.51-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.002~0.006	0.012~0.059
			21.52-MP											●												0.003~0.006	0.020~0.078
			32.50.5-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.003~0.006	0.012~0.078
			32.51-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.003~0.010	0.020~0.098
			32.52-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.004~0.012	0.020~0.098
			431-MP											●												0.004~0.012	0.020~0.138
			432-MP											●												0.006~0.014	0.031~0.138
			433-MP																							0.010~0.016	0.039~0.138

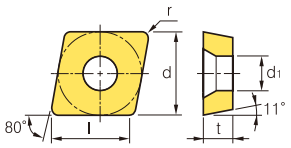
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B109, 172	**SCLCR/L**	B109, 172, 194, 204

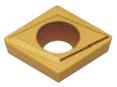
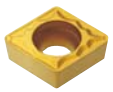
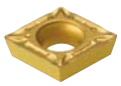
CP○○

Rhombic 80° Positive
Relief Angle: 11°



Dimensions (inch)			
Size	d	t	d1
2.5	5/16	3/32	9/64
32	3/8	1/8	11/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing		CPGT	2.5150.5																						0.002~0.008	0.004~0.079
			2.51.51	●	●																				0.003~0.008	0.012~0.079
			2.51.52																						0.004~0.010	0.020~0.079
			320.5																						0.002~0.008	0.012~0.059
			321	●	●																				0.002~0.010	0.020~0.079
			322																						0.003~0.012	0.028~0.098
Medium to finishing	HMP 	CPGT	322-HMP																						0.002~0.008	0.028~0.079
Finishing	VF 	CPMT	2.51.51-VF																						0.002~0.008	0.012~0.047
			2.51.52-VF																						0.004~0.008	0.012~0.047
			321-VF										●												0.002~0.008	0.012~0.059
			322-VF										●												0.004~0.008	0.012~0.059
Finishing	VL 	CPMT	2.51.51-VL																						0.001~0.003	0.003~0.039
			2.51.52-VL																						0.001~0.005	0.004~0.039
			321-VL																						0.002~0.004	0.004~0.039
			322-VL																						0.003~0.006	0.004~0.039
Medium	C25 	CPMT	21.51-C25																						0.002~0.006	0.024~0.091

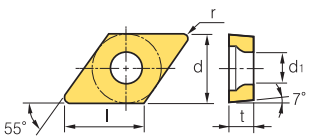
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SCLPR/L	B195		

DC○○

Rhombic 55° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Workpiece																							
Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱								
Stainless steel	M									⧓	⧓		●	⧓	✱	⧓	✱		●	⧓	⧓		
Cast iron	K	●	⧓	✱	●	⧓	⧓			⧓	⧓											●	⧓
Non-ferrous metal	N																					●	⧓
Heat resistant alloy, Titanium alloy	S									●			●	●	✱	✱	●	●	⧓			●	⧓
Hardened steel	H																	⧓	✱			●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

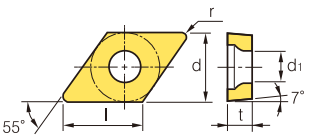
Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (High precision)	KF	DCET	21.5MFR-KF																						~0.002	0.002~0.051
			21.50MFR-KF																		●				0.001~0.003	0.002~0.059
			21.50.5MFR-KF																		●				0.001~0.004	0.002~0.067
			32.5MFR-KF																						0.001~0.003	0.002~0.059
			32.50MFR-KF																		●				0.001~0.004	0.002~0.067
			32.50.5MFR-KF																		●				0.002~0.006	0.003~0.079
			21.5MFL-KF																						~0.002	0.002~0.051
			21.50MFL-KF																		●				0.001~0.003	0.002~0.059
			21.50.5MFL-KF																						0.001~0.004	0.002~0.067
			32.5MFL-KF																						0.001~0.003	0.002~0.059
			32.50MFL-KF																						0.001~0.004	0.002~0.067
			32.50.5MFL-KF																						0.002~0.006	0.003~0.079
Medium to finishing (High precision)	KM	DCET	21.5MFR-KM																						~0.002	0.002~0.051
			21.50MFR-KM																		●				0.001~0.003	0.002~0.059
			21.50.5MFR-KM																		●				0.001~0.004	0.002~0.067
			32.5MFR-KM																						0.001~0.003	0.002~0.059
			32.50MFR-KM																		●				0.001~0.004	0.002~0.067
			32.50.5MFR-KM																		●				0.002~0.006	0.003~0.079
			21.5MFL-KM																						~0.002	0.002~0.051
			21.50MFL-KM																						0.001~0.003	0.002~0.059
			21.50.5MFL-KM																						0.001~0.004	0.002~0.067
			32.5MFL-KM																						0.001~0.003	0.002~0.059
			32.50MFL-KM																						0.001~0.004	0.002~0.067
			32.50.5MFL-KM																						0.002~0.006	0.003~0.079
Finishing	KF	DCGT	21.5R-KF																						~0.002	0.002~0.051
			21.50R-KF																						0.001~0.003	0.002~0.059
			21.50.5R-KF																						0.001~0.004	0.002~0.059
			32.5R-KF																						0.001~0.003	0.002~0.059
			32.50R-KF																						0.001~0.004	0.002~0.067
			32.50.5R-KF																				●		0.002~0.006	0.003~0.079
			21.5L-KF																						~0.002	0.002~0.051
			21.50L-KF																						0.001~0.003	0.002~0.059
			21.50.5L-KF																						0.001~0.004	0.002~0.059
			32.5L-KF																						0.001~0.003	0.002~0.059
			32.50L-KF																						0.001~0.004	0.002~0.067
			32.50.5L-KF																						0.002~0.006	0.003~0.079

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B172	**SDQCR/L**	B196
SDJCR/L	B109, 173	**SDUCR/L**	B197
SDNCN	B110, 173	**SDZCR/L**	B198

DC○○



Dimensions (inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Rhombic 55° Positive
Relief Angle: 7°

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VP1	DCGT	21.50-VP1															●		●	●	●		●		0.001~0.002	0.002~0.039
			21.50.5-VP1															●		●	●	●		●		0.001~0.004	0.003~0.059
			21.51-VP1															●		●	●	●		●		0.002~0.005	0.004~0.059
			32.50-VP1															●			●					0.001~0.005	0.002~0.039
			32.50.5-VP1															●		●	●	●		●		0.002~0.006	0.003~0.059
			32.51-VP1															●		●	●	●		●		0.002~0.008	0.004~0.059
Finishing (High precision)	VP1	DCGT	21.50MFN-VP1																		●					0.002~0.003	0.002~0.039
			21.50.5MFN-VP1																		●					0.002~0.004	0.003~0.059
			21.51MFN-VP1																		●					0.002~0.005	0.004~0.059
			32.50MFN-VP1																		●					0.002~0.005	0.002~0.039
			32.50.5MFN-VP1																		●					0.002~0.006	0.003~0.059
			32.51MFN-VP1																		●					0.005~0.008	0.004~0.059
Medium to finishing	KM	DCGT	21.5R-KM																							~0.002	0.002~0.051
			21.50R-KM																							0.001~0.003	0.002~0.059
			21.50.5R-KM																							0.001~0.004	0.002~0.059
			32.5R-KM																							0.001~0.003	0.002~0.059
			32.50R-KM																							0.001~0.004	0.002~0.067
			32.50.5R-KM																							0.002~0.006	0.003~0.079
			21.5L-KM																							~0.002	0.002~0.051
			21.50L-KM																							0.001~0.003	0.002~0.059
			21.50.5L-KM																							0.001~0.004	0.002~0.059
			32.5L-KM																							0.001~0.003	0.002~0.059
			32.50L-KM																							0.001~0.004	0.002~0.067
			32.50.5L-KM																							0.002~0.006	0.003~0.079
Finishing	VF	DCMT	21.50.5-VF			●					●															0.001~0.004	0.002~0.040
			21.51-VF		●	●					●							●								0.002~0.008	0.012~0.047
			32.50.5-VF	●							●															0.002~0.006	0.003~0.059
			32.51-VF	●	●	●					●							●								0.002~0.008	0.012~0.059
			32.52-VF	●		●												●								0.004~0.010	0.012~0.059

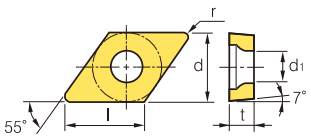
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B172	SDQCR/L	B196
SDJCR/L	B109, 173	SDUCR/L	B197
SDNCN	B110, 173	SDZCR/L	B198

DC○○

Rhombic 55° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Workpiece			Machining types
Steel	P	● ⧓ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱	⧓ General cutting
Cast iron	K	● ⧓ ✱	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓	
Heat resistant alloy, Titanium alloy	S	● ⧓ ✱	
Hardened steel	H	⧓ ✱	

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VL	DCMT	21.51-VL																						0.002~0.004	0.003~0.036
			21.51-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●		●	●	0.002~0.004	0.003~0.036
			21.52-VL						●		●		●					●							0.002~0.005	0.004~0.039
			32.50.5-VL																						0.001~0.004	0.003~0.032
			32.51-VL	●		●	●	●	●		●		●		●	●	●	●	●		●			●	0.002~0.004	0.004~0.039
			32.52-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●		●	0.003~0.006	0.004~0.039
Finishing	VP1	DCMT	32.51-VP1																						0.002~0.008	0.004~0.059
			32.52-VP1																						0.003~0.009	0.004~0.059
Medium to finishing	HMP	DCMT	21.50.5-HMP																						0.001~0.005	0.004~0.059
			21.51-HMP																						0.002~0.007	0.008~0.091
			21.52-HMP																						0.003~0.009	0.016~0.091
			32.50.5-HMP																						0.002~0.009	0.004~0.079
			32.51-HMP															●			●				0.003~0.009	0.012~0.118
			32.52-HMP															●							0.004~0.012	0.020~0.118
Medium	C25	DCMT	21.50.5-C25	●	●	●	●	●	●		●		●					●	●		●				0.001~0.006	0.012~0.079
			21.51-C25	●	●	●	●	●	●		●	●	●	●				●	●		●		●		0.002~0.008	0.020~0.098
			21.52-C25	●		●	●	●	●		●	●		●				●	●		●				0.002~0.010	0.031~0.098
			32.50.5-C25	●	●	●	●	●	●		●		●					●	●		●				0.002~0.010	0.020~0.098
			32.51-C25	●	●	●	●	●	●		●	●	●	●				●	●		●		●		0.003~0.012	0.031~0.118
			32.52-C25	●		●	●	●	●	●	●	●		●				●	●		●		●		0.004~0.012	0.039~0.118
Medium	MP new	DCMT	21.50.5-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.002~0.005	0.005~0.071
			21.51-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.002~0.006	0.012~0.071
			21.52-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.003~0.009	0.012~0.071
			32.50.5-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.002~0.006	0.012~0.078
			32.51-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.002~0.008	0.020~0.091
			32.52-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.003~0.012	0.020~0.091

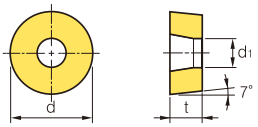
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B172	**SDQCR/L**	B196
SDJCR/L	B109, 173	**SDUCR/L**	B197
SDNCN	B110, 173	**SDZCR/L**	B198

RC○○

Round R° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
08	0.315	1/8	9/64
10	0.394	1/8~5/32	9/64
12	0.472	3/16	11/67
16	0.630	1/4	13/64
20	0.787	1/4	25/97
25	0.984	5/16	9/32
32	1.260	3/8	3/8

Workpiece			Machining types
Steel	P	● ⇕ ✱ ● ⇕ ● ⇕ ⇕ ✱ ✱ ● ⇕ ✱	● Continuous cutting
Stainless steel	M	⇕ ✱ ● ⇕ ● ⇕ ⇕ ✱ ⇕ ✱ ⇕ ● ⇕	⇕ General cutting
Cast iron	K	● ⇕ ✱ ● ⇕ ⇕ ⇕ ✱ ⇕ ● ⇕ ● ⇕	✱ Interrupted cutting
Non-ferrous metal	N	● ⇕
Heat resistant alloy, Titanium alloy	S	● ⇕ ● ⇕ ✱ ✱ ● ⇕
Hardened steel	H	⇕ ✱ ● ⇕

Inserts		Designation	Cermet			Coated		Coated															Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	VM 	RCMT 0803M0-VM																							0.002~0.012	0.031~0.098
		10T3M0-VM																							0.002~0.014	0.036~0.118
		1204M0-VM																							0.004~0.020	0.039~0.138
		1606M0-VM																							0.005~0.024	0.051~0.256
Medium		RCMX 1003M0									●	●	●												0.010~0.020	0.059~0.157
		1204M0							●		●	●	●												0.012~0.024	0.098~0.197
		1606M0									●	●	●												0.016~0.028	0.118~0.276
		2006M0									●		●												0.019~0.035	0.138~0.354
		2507M0									●		●												0.022~0.047	0.157~0.472
		3209M0									●		●												0.026~0.059	0.197~0.591

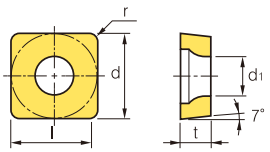
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
PRDCN	B156	PRGCR/L	B156

SC○○

Square 90° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
32.5	3/8	5/32	11/64

Workpiece			Machining types
Steel	P	● ⇕ ✱ ● ⇕ ● ⇕ ⇕ ✱ ✱ ● ⇕ ✱	● Continuous cutting
Stainless steel	M	⇕ ✱ ● ⇕ ● ⇕ ⇕ ✱ ⇕ ✱ ⇕ ● ⇕	⇕ General cutting
Cast iron	K	● ⇕ ✱ ● ⇕ ⇕ ⇕ ✱ ⇕ ● ⇕ ● ⇕	✱ Interrupted cutting
Non-ferrous metal	N	● ⇕
Heat resistant alloy, Titanium alloy	S	● ⇕ ● ⇕ ✱ ✱ ● ⇕
Hardened steel	H	⇕ ✱ ● ⇕

Inserts		Designation	Cermet			Coated		Coated															Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VF 	SCMT 32.51-VF								●							●								0.002~0.008	0.012~0.059

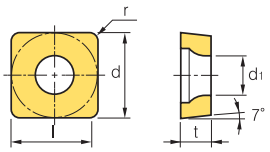
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B174	SSKCR/L	B175, 198
SSDCN	B174	SSSCR/L	B175, 211

SC○○

Square 90° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
21.5	1/4	3/32	11/64
32.5	3/8	5/32	11/64
43	1/2	3/16	7/32

Workpiece																								
Steel	P	●	⇔	✱	●	⇔	●	⇔	⇔	✱	✱	●	⇔		✱									
Stainless steel	M									⇔	⇔		●	⇔	✱	⇔	✱		●	⇔	⇔			
Cast iron	K	●	⇔	✱	●	⇔	⇔				⇔	⇔										●	⇔	
Non-ferrous metal	N																					●	⇔	
Heat resistant alloy, Titanium alloy	S									●			●	●	⇔	✱	●	⇔	⇔			●	⇔	
Hardened steel	H																	⇔	✱			●	⇔	

Machining types
● Continuous cutting
⇔ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VL	SCMT	32.51-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.002~0.004	0.004~0.039
			32.52-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.003~0.006	0.004~0.039
Medium to finishing	HMP	SCMT	32.51-HMP															●								0.003~0.009	0.012~0.118
			32.52-HMP															●								0.004~0.012	0.020~0.118
			431-HMP																							0.004~0.011	0.012~0.142
			432-HMP																							0.005~0.014	0.024~0.142
Medium	C25	SCMT	21.51-C25									●														0.003~0.010	0.016~0.098
			32.51-C25	●	●	●	●	●	●		●	●	●	●				●	●		●				0.003~0.010	0.024~0.118
			32.52-C25	●		●	●	●	●	●	●	●	●	●				●	●		●					0.004~0.012	0.039~0.118
			431-C25	●		●	●	●	●		●		●	●				●	●		●		●			0.004~0.012	0.031~0.150
			432-C25	●		●	●	●	●	●	●	●	●	●				●	●		●		●			0.005~0.015	0.047~0.150
Medium	MP	SCMT	32.51-MP						●		●			●	●	●	●			●	●					0.002~0.010	0.012~0.110
			32.52-MP						●		●		●	●	●	●	●			●	●					0.004~0.012	0.020~0.110
			431-MP																							0.004~0.012	0.020~0.110
			431-MP											●	●	●	●			●	●					0.006~0.014	0.032~0.138

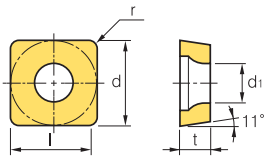
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B174	**SSKCR/L**	B175, 198
SSDCN	B174	**SSSCR/L**	B175, 211

SP○○

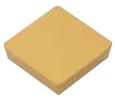
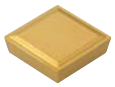
Square **90° Positive**
Relief Angle: 11°



Dimensions (inch)			
Size	d	t	d_1
2.5	5/16	3/32	-
21.5	1/4	3/32	7/64
32	3/8	1/8	11/64
42	1/2	1/8	-

Dimensions (inch)			
Size	d	t	d_1
43	1/2	3/16	-
53	5/8	3/16	-
63	3/4	3/16	-

Workpiece			Machining types
Steel	P	● ⧓ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱	⧓ General cutting
Cast iron	K	● ⧓ ✱	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	● ⧓ ✱
Hardened steel	H	⧓ ✱

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing		SPGA	**21.51**																						0.002~0.010	0.020~0.079
			322T	●	●																				0.004~0.010	0.028~0.118
			322T-Z		●																				0.004~0.010	0.028~0.118
			(Z=Special Nega land)																							
Medium to finishing		SPGN	**2.51.50.5**																						0.001~0.004	0.020~0.079
			2.51.53																						0.004~0.010	0.028~0.118
			320.5																						0.001~0.004	0.020~0.118
			321																						0.003~0.008	0.028~0.138
			322																						0.004~0.010	0.028~0.138
			420.5																						0.001~0.008	0.020~0.118
			421																						0.003~0.008	0.039~0.197
			422									●													0.004~0.010	0.039~0.197
			423																						0.006~0.012	0.039~0.197
			424																						0.007~0.013	0.039~0.197
			430.5																						0.001~0.008	0.020~0.118
			431																						0.003~0.008	0.039~0.197
			432																						0.004~0.010	0.039~0.197
			433																						0.006~0.012	0.039~0.197
			434																						0.007~0.013	0.039~0.197
			437.5																						0.008~0.024	0.079~0.197
			4310																						0.010~0.028	0.118~0.197
			531																						0.003~0.008	0.059~0.276
			532																						0.004~0.010	0.059~0.276
			533																						0.006~0.012	0.059~0.276
			534																						0.007~0.013	0.059~0.276
			535																						0.008~0.018	0.059~0.276
			631																						0.003~0.008	0.059~0.354
			632																						0.004~0.010	0.059~0.354
			633																						0.006~0.018	0.059~0.354
			634																						0.007~0.024	0.059~0.354
			636																						0.010~0.028	0.098~0.354
Finishing	F 	SPGR	**321-F**																						0.004~0.010	0.012~0.079
			421-F																						0.006~0.010	0.020~0.079

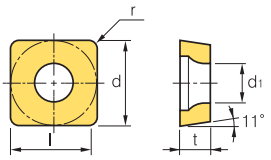
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

●: Korea Stock ●: US Stock

Available tool holders			
Designation	Page	Designation	Page
CSDPN	B163	**SSKPR/L**	B198
CSKPR/L	B164		

SP○○

Square 90° Positive
Relief Angle: 11°



Dimensions (inch)			
Size	d	t	d1
32	3/8	1/8	11/64
42	1/2	1/8	-
53	5/8	3/16	-
63	3/4	3/16	-
84	1	1/4	-

Workpiece																							
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱								
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌		
Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌										●	⬌
Non-ferrous metal	N																					●	⬌
Heat resistant alloy, Titanium alloy	S									●			●	●	⬌	✱	●	⬌	⬌			●	⬌
Hardened steel	H																	⬌	✱			●	⬌

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

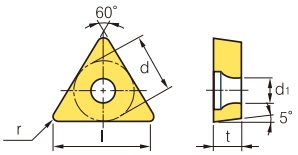
Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	M	SPGR	322-M																						0.004~0.016	0.039~0.138
			422-M																						0.008~0.016	0.059~0.157
Medium to finishing		SPGT	321R																						0.003~0.009	0.012~0.118
			322R																						0.004~0.012	0.020~0.118
			321L		●																				0.003~0.009	0.012~0.118
			322L																						0.004~0.012	0.020~0.118
Finishing	F	SPMR	321-F																						0.002~0.008	0.012~0.079
			421-F									●													0.004~0.010	0.020~0.079
Finishing	VF	SPMT	321-VF																						0.002~0.008	0.012~0.059
			322-VF																						0.004~0.010	0.012~0.059
Medium	M	SPMR	322-M									●													0.004~0.016	0.039~0.138
			422-M									●													0.004~0.016	0.059~0.157
			423-M									●													0.008~0.016	0.059~0.157
Medium to finishing		SPUN	421																						0.004~0.012	0.039~0.197
			422																						0.006~0.016	0.039~0.197
			422SN																						0.006~0.016	0.039~0.197
			533									●													0.008~0.020	0.039~0.197
			633									●													0.008~0.020	0.059~0.276
			634																						0.010~0.024	0.079~0.276
			845																						0.012~0.031	0.118~0.394

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
CSDPN	B163	**SSKPR/L**	B198
CSKPR/L	B164		

TB○○



Dimensions (inch)			
Size	d	t	d_1
52	5/32	1/16	11/128

Triangular **60° Positive**
Relief Angle: 5°

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing		TBGT	**520.5**		●																	●	●		0.002~0.008	0.004~0.051
			521		●																				0.003~0.008	0.004~0.051
Finishing	VL 	TBMT	**520.5-VL**																						0.001~0.002	0.002~0.024

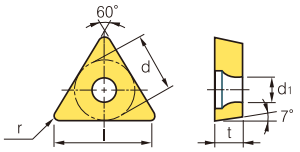
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

●: Korea Stock ●: US Stock

Available tool holders			
Designation	Page	Designation	Page
STUBR/L	B204		

TC○○

Triangular 60° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d_1
1.51	3/16	3/32	3/32
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
73	7/32	3/32	13/128

Workpiece																									
Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱										
Stainless steel	M									⧓	⧓		●	⧓	✱	⧓	✱		●	⧓	⧓				
Cast iron	K	●	⧓	✱	●	⧓	⧓				⧓	●												●	⧓
Non-ferrous metal	N																							●	⧓
Heat resistant alloy, Titanium alloy	S									●			●	●	✱	✱	●	●	⧓					●	⧓
Hardened steel	H																	⧓	✱					●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

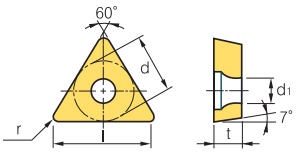
Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	KF	TCGT	1.51.5R-KF																						~0.002	0.002~0.051
			1.51.50R-KF																						0.001~0.003	0.002~0.059
			1.51.50.5R-KF																						0.001~0.004	0.002~0.067
			1.51.5L-KF																						~0.002	0.002~0.051
			1.51.50L-KF																						0.001~0.003	0.002~0.059
			1.51.50.5L-KF																						0.001~0.004	0.002~0.067
Finishing	VP1	TCGT	32.51-VP1																						0.002~0.008	0.004~0.059
			32.52-VP1																						0.003~0.009	0.004~0.059
Finishing	VF	TCMT	21.50.5-VF																						0.001~0.005	0.002~0.028
			21.51-VF		●													●							0.002~0.008	0.012~0.047
			21.52-VF															●							0.004~0.010	0.012~0.047
			32.50.5-VF																						0.002~0.006	0.004~0.051
			32.51-VF								●		●					●							0.002~0.006	0.012~0.059
Finishing (Mild steel)	VL	TCMT	732-VL																						0.003~0.008	0.004~0.047
			21.51-VL																						0.002~0.006	0.004~0.051
			21.52-VL																						0.003~0.008	0.004~0.051
			32.51-VL	●		●	●	●	●		●				●	●	●	●	●	●	●	●			0.002~0.006	0.012~0.059
			32.52-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●			0.002~0.006	0.012~0.059
Finishing	VP1	TCMT	32.51-VP1																						0.002~0.008	0.004~0.059
			32.52-VP1																						0.003~0.009	0.004~0.059
Medium to finishing	HMP	TCMT	731-HMP																						0.002~0.007	0.008~0.091
			732-HMP																						0.003~0.009	0.016~0.091
			21.50.5-HMP																						0.001~0.006	0.004~0.059
			21.51-HMP																		●				0.002~0.007	0.008~0.098
			21.52-HMP															●							0.004~0.010	0.016~0.098
			32.51-HMP							●		●						●							0.003~0.009	0.012~0.118
			32.52-HMP							●		●						●							0.004~0.012	0.020~0.138

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
STACR/L	B110, 175	STTCR/L	B176, 225
STFCR/L	B176, 224	STWCR/L	B213
STGCR/L	B176		

TC○○



Dimensions (inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
73	3/8	3/32~5/32	13/128

Triangular **60° Positive**
Relief Angle: 7°

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
Workpiece	Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱								
	Stainless steel	M									⧓	✱		●	⧓	✱	⧓	✱		●	⧓	⧓		
	Cast iron	K	●	⧓	✱	●	⧓	⧓				⧓	⧓										●	⧓
	Non-ferrous metal	N																					●	⧓
	Heat resistant alloy, Titanium alloy	S									●			●	●	⧓	✱	●	●	⧓	⧓		●	⧓
	Hardened steel	H																		⧓	✱		●	⧓

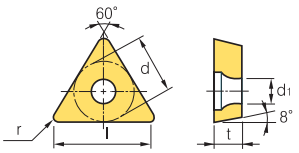
Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium	C25	TCMT	731-C25	●		●	●	●	●		●	●	●	●				●	●		●					0.002~0.007	0.016~0.098
			732-C25	●		●	●	●	●		●		●	●				●	●		●					0.003~0.010	0.031~0.098
			21.50.5-C25	●		●	●	●	●		●		●					●	●		●					0.002~0.005	0.016~0.079
			21.51-C25	●	●	●	●	●	●		●	●	●	●				●	●		●					0.002~0.008	0.024~0.098
			21.52-C25	●		●	●	●	●		●	●	●	●				●	●		●			●		0.003~0.010	0.031~0.098
			32.51-C25	●		●	●	●	●	●	●	●	●	●				●	●		●			●		0.003~0.011	0.031~0.118
			32.52-C25	●		●	●	●	●	●	●	●	●	●				●	●		●			●		0.004~0.012	0.039~0.118
Medium	MP	TCMT	731-MP												●	●	●									0.002~0.007	0.004~0.039
			732-MP												●	●	●									0.003~0.008	0.004~0.047
			21.50.5-MP						●		●		●		●	●	●			●	●					0.001~0.005	0.008~0.059
			21.51-MP						●		●		●		●	●	●			●	●					0.002~0.006	0.008~0.059
			21.52-MP						●		●		●		●	●	●			●	●					0.004~0.011	0.010~0.078
			32.51-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.003~0.008	0.012~0.098
			32.52-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.004~0.012	0.020~0.098
			32.53-MP						●		●		●		●	●	●			●	●	●				0.008~0.016	0.020~0.098

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

TO○○



Dimensions (inch)			
Size	d	t	d1
2.52	10/31	15/128	5/32
52	5/32	1/16	11/128
73	7/32	3/32	7/64

Triangular **60° Positive**
Relief Angle: 8°

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
Workpiece	Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱								
	Stainless steel	M									⧓	✱		●	⧓	✱	⧓	✱		●	⧓	⧓		
	Cast iron	K	●	⧓	✱	●	⧓	⧓				⧓	⧓										●	⧓
	Non-ferrous metal	N																					●	⧓
	Heat resistant alloy, Titanium alloy	S									●			●	●	⧓	✱	●	●	⧓	⧓		●	⧓
	Hardened steel	H																		⧓	✱		●	⧓

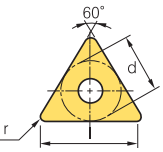
Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

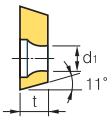
Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing		TOEH	520.5L																							0.002~0.007	0.004~0.059
			731L																							0.002~0.008	0.012~0.098
			2.521L		●																					0.002~0.010	0.012~0.098

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

TP○○



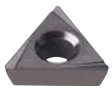


Dimensions (inch)			
Size	d	t	d_1
22	1/4	3/32~1/8	9/64
32	3/8	1/8	-
33	3/8	3/16	-
43	1/2	3/16	-

Dimensions (inch)			
Size	d	t	d_1
53	5/8	3/16	-
54	5/8	1/4	-
63	3/16	3/32	3/32
73	7/32	3/32	-

Triangular **60° Positive**
Relief Angle: 11°

Workpiece			Machining types
Steel	P	● ⧓ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱	⧓ General cutting
Cast iron	K	● ⧓ ✱	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	● ⧓ ✱
Hardened steel	H	⧓ ✱ ● ⧓

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing		TPGH	630.5L		●																				0.001~0.005	0.002~0.067
			631L	●	●																				0.001~0.006	0.003~0.067
			230.5L																						0.002~0.006	0.002~0.079
			231L																						0.003~0.008	0.003~0.118
Medium to finishing		TPGN	731																						0.003~0.008	0.028~0.079
			220.5																						0.002~0.006	0.020~0.079
			221									●												●	0.003~0.008	0.028~0.118
			222									●												●	0.004~0.010	0.039~0.118
			320.5																						0.002~0.007	0.039~0.197
			321									●						●						●	0.003~0.008	0.039~0.197
			322									●						●						●	0.004~0.010	0.039~0.197
			322.5																						0.004~0.010	0.039~0.197
			323																						0.006~0.012	0.039~0.197
			324																						0.006~0.012	0.039~0.197
			331																						0.003~0.008	0.039~0.197
			431									●													0.003~0.008	0.059~0.276
			432									●													0.004~0.010	0.059~0.276
			433									●													0.006~0.012	0.059~0.276
			437.5																						0.012~0.018	0.059~0.276
			4310																						0.012~0.020	0.059~0.276
			532																						0.006~0.010	0.118~0.315
			542																						0.006~0.010	0.118~0.315
Finishing	F 	TPGR	220.5-F																						0.002~0.006	0.004~0.059
			221-F																						0.002~0.008	0.012~0.098
			321-F																						0.003~0.010	0.012~0.098
Medium	M 	TPGR	222-M																						0.005~0.012	0.039~0.118
			322-M																						0.005~0.012	0.039~0.197

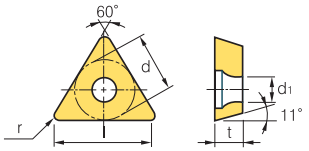
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B200	**STUPR/L**	B205
CTFPR/L	B164	**CTGPR/L**	B164

TP ○○

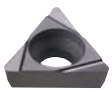
Triangular **60° Positive**
Relief Angle: 11°



Dimensions (inch)			
Size	d	t	d_1
1.5	3/16	3/32	3/32
22	1/4	1/8	9/64
32	3/8	1/8	11/64
33	3/8	3/16	11/64
63	3/16	3/32	3/32
73	7/32	3/32	0.118

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
	Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱								
	Stainless steel	M									⧓	✱	●	⧓	●	⧓	✱	⧓	✱	●	⧓	⧓		
	Cast iron	K	●	⧓	✱	●	⧓	⧓			⧓	✱	●										●	⧓
	Non-ferrous metal	N																					●	⧓
	Heat resistant alloy, Titanium alloy	S									●			●	●	⧓	✱	●	●	⧓	⧓		●	⧓
	Hardened steel	H																		⧓	✱		●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

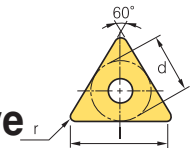
Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing		TPGT	630.5R																						0.002~0.008	0.012~0.059
			220.5R																						0.002~0.008	0.012~0.059
			221R		●																				0.002~0.008	0.020~0.079
			222R																						0.003~0.010	0.020~0.079
			331R		●																				0.002~0.008	0.028~0.118
			332R																						0.002~0.008	0.028~0.118
			1.51.50.5L		●																	●	●		0.002~0.008	0.012~0.059
			220.5L																						0.002~0.008	0.012~0.059
			221L	●	●																				0.002~0.008	0.020~0.079
			222L																						0.003~0.010	0.020~0.079
			331L		●																				0.002~0.008	0.028~0.118
			332L																						0.002~0.008	0.028~0.118
Medium to finishing		TPGX	730.5L																						0.004~0.008	0.012~0.039
			731L			●																			0.004~0.010	0.020~0.039
			732L																						0.004~0.012	0.039~0.039
			221L																						0.004~0.010	0.020~0.047
Finishing	F 	TPMR	730.5-F																						0.002~0.006	0.004~0.039
			731-F																						0.002~0.006	0.004~0.039
			220.5-F																						0.002~0.006	0.004~0.059
			221-F							●		●		●								●			0.002~0.008	0.012~0.059
			222-F																						0.002~0.010	0.012~0.059
			321-F							●		●	●								●	●			0.003~0.010	0.020~0.079
			322-F																						0.003~0.010	0.020~0.118
Medium	M 	TPMR	221-M																						0.004~0.010	0.028~0.118
			222-M									●	●												0.005~0.012	0.039~0.118
			321-M									●	●												0.004~0.010	0.039~0.197
			322-M							●		●	●												0.005~0.012	0.039~0.197
			323-M									●													0.006~0.014	0.039~0.197
			432-M									●													0.005~0.012	0.059~0.276

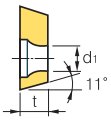
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B200	**STUPR/L**	B205
CTFPR/L	B164	**CTGPR/L**	B164

TP○○





Triangular **60° Positive**
Relief Angle: 11°

Dimensions (inch)			
Size	d	t	d1
21.5	1/4	3/32	-
22	1/4	1/8	9/64
32	3/8	1/8	-
33	3/8	3/16	11/64

Dimensions (inch)			
Size	d	t	d1
43	1/2	3/16	-
64	3/4	1/4	-
73	7/32	1/8	-

Workpiece																							
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱								
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌		
Cast iron	K	●	⬌	✱	●	⬌	⬌			⬌	⬌	●										●	⬌
Non-ferrous metal	N																					●	⬌
Heat resistant alloy, Titanium alloy	S									●			●	●	⬌	✱	●	●	⬌			●	⬌
Hardened steel	H																	⬌	✱			●	⬌

Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

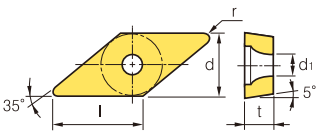
Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	VF	TPMT	221-VF		●						●		●					●							0.002~0.008	0.012~0.059
			222-VF								●		●												0.004~0.010	0.012~0.059
			331-VF																						0.002~0.008	0.012~0.079
			332-VF																						0.004~0.010	0.012~0.079
Finishing	VL	TPMT	731-VL																						0.002~0.004	0.004~0.036
			732-VL																						0.002~0.005	0.004~0.039
			221-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●			0.002~0.006	0.004~0.051
			222-VL																						0.003~0.008	0.004~0.051
			321-VL																						0.002~0.008	0.012~0.059
			322-VL																						0.002~0.008	0.012~0.059
Medium to finishing	MP	TPMT	221-MP	●		●	●	●										●	●						0.002~0.008	0.008~0.059
			222-MP																						0.004~0.011	0.012~0.078
			321-MP																						0.003~0.008	0.012~0.098
			322-MP																						0.004~0.012	0.020~0.098
Medium to finishing		TPUN	732																						0.004~0.012	0.020~0.079
			21.52																						0.006~0.016	0.039~0.118
			221																						0.004~0.012	0.039~0.118
			222																						0.006~0.016	0.039~0.118
			321									●													0.004~0.012	0.039~0.197
			322									●						●							0.006~0.016	0.039~0.197
			322TN																						0.006~0.016	0.039~0.197
			323																						0.008~0.020	0.059~0.197
			323TN																						0.008~0.020	0.059~0.197
			431																						0.004~0.012	0.059~0.276
			432									●											●		0.006~0.016	0.059~0.276
			433																						0.008~0.020	0.059~0.276
			433TN																						0.008~0.020	0.059~0.276
			645									●													0.012~0.028	0.118~0.394

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B200	**STUPR/L**	B205
CTFPR/L	B164	**CTGPR/L**	B164

VB○○



Dimensions (inch)			
Size	d	t	d_1
22	1/4	1/8	7/64~1/9
33	3/8	3/16	11/64

Rhombic **35° Positive**
Relief Angle: 5°

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

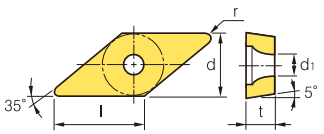
Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing	KF	VBGT	22R-KF																						~0.002	0.002~0.051
			220R-KF																						0.001~0.003	0.002~0.059
			220.5R-KF																			●			0.001~0.005	0.002~0.067
			22L-KF																						~0.002	0.002~0.051
			220L-KF																						0.001~0.003	0.002~0.059
			220.5L-KF																						0.001~0.005	0.002~0.067
Finishing	VP1	VBGT	330.5-VP1																						0.002~0.008	0.006~0.059
			331-VP1																						0.002~0.008	0.007~0.071
Medium to finishing		VBGT	331																						0.003~0.008	0.020~0.059
			332																						0.006~0.010	0.028~0.079
Medium to finishing	KM	VBGT	22R-KM																						~0.002	0.002~0.051
			220R-KM																						0.001~0.003	0.002~0.059
			220.5R-KM																						0.001~0.005	0.002~0.067
			331R-KM																						0.002~0.006	0.020~0.078
			22L-KM																						~0.002	0.002~0.051
			220L-KM																						0.001~0.003	0.002~0.059
			220.5L-KM																						0.001~0.005	0.002~0.067
			331L-KM																						0.002~0.006	0.020~0.078
Finishing	VB	VBMT	331-VB	●		●					●														0.002~0.008	0.008~0.059
			332-VB	●		●					●														0.004~0.009	0.020~0.059
Finishing	VF	VBMT	331-VF	●	●	●					●		●					●			●				0.002~0.008	0.012~0.040
			332-VF	●	●	●												●							0.004~0.010	0.012~0.040

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B177	**SVVBN**	B178
SVHBR/L	B177	**SVQBR/L**	B202
SVJBR/L	B111, 177	**SVUBR/L**	B202

VB○○



Dimensions (inch)			
Size	d	t	d1
22	1/4	1/8	7/64~1/9
33	3/8	3/16	11/64

Rhombic 35° Positive
Relief Angle: 5°

Workpiece																												
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱													
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌							
Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌										●	⬌					
Non-ferrous metal	N																					●	⬌					
Heat resistant alloy, Titanium alloy	S										●			●	●	⬌	✱	●	●	⬌		●	⬌					
Hardened steel	H																		⬌	✱		●	⬌					

Machining types
- ● Continuous cutting
- ⬌ General cutting
- ✱ Interrupted cutting

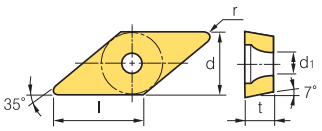
	Inserts	Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (Mild steel)	VL 	VBMT	331-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.002~0.008	0.012~0.059
			332-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.004~0.008	0.012~0.059
			333-VL												●	●	●		●	●	●					0.004~0.010	0.012~0.059
Finishing	VP1 	VBMT	330.5-VP1																							0.002~0.008	0.006~0.059
			331-VP1																							0.002~0.008	0.007~0.071
			332-VP1																							0.002~0.008	0.008~0.071
Medium to finishing		VBMT	331		●					●		●											●			0.003~0.008	0.020~0.059
			332							●		●											●			0.006~0.010	0.028~0.079
Medium to finishing	HMP 	VBMT	221-HMP																							0.001~0.008	0.006~0.106
			222-HMP																							0.002~0.010	0.016~0.106
			331-HMP							●		●									●					0.003~0.008	0.008~0.106
			332-HMP																		●					0.004~0.011	0.020~0.106
			333-HMP																							0.004~0.013	0.020~0.106
Medium	MP new 	VBMT	221-MP																							0.002~0.006	0.008~0.059
			222-MP																							0.004~0.011	0.012~0.078
			331-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.002~0.008	0.012~0.078
			332-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.004~0.010	0.020~0.091
			333-MP	●		●			●		●		●		●	●	●	●	●	●	●	●				0.004~0.014	0.020~0.091

Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

●: Korea Stock ●: US Stock

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B177	SVVBN	B178
SVHBR/L	B177	SVQBR/L	B202
SVJBR/L	B111, 177	SVUBR/L	B202

VC○○



Dimensions (inch)			
Size	d	t	d1
22	1/4	1/8	7/64~1/9
33	3/8	3/16	11/64

Rhombic **35° Positive**
Relief Angle: 7°

Workpiece			Machining types
Steel	P	● ⧓ ✱	● Continuous cutting
Stainless steel	M	⧓ ✱	⧓ General cutting
Cast iron	K	● ⧓ ✱	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	● ⧓ ✱
Hardened steel	H	⧓ ✱

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (High precision)	KF	VCET	22MFR-KF																		●					0.001~0.002	0.002~0.051
			220MFR-KF																		●					0.001~0.003	0.002~0.059
			220.5MFR-KF																		●					0.001~0.005	0.002~0.067
			22MFL-KF																							0.001~0.002	0.002~0.051
			220MFL-KF																							0.001~0.003	0.002~0.059
			220.5MFL-KF																							0.001~0.005	0.002~0.067
Medium to finishing (High precision)	KM	VCET	22MFR-KM																		●					0.001~0.002	0.002~0.051
			220MFR-KM																		●					0.001~0.003	0.002~0.059
			220.5MFR-KM																		●					0.001~0.005	0.002~0.067
			22MFL-KM																							0.001~0.002	0.002~0.051
			220MFL-KM																							0.001~0.003	0.002~0.059
			220.5MFL-KM																							0.001~0.005	0.002~0.067
Finishing	KF	VCGT	22R-KF																							0.001 ~0.002	0.002~0.051
			220R-KF																							0.001~0.003	0.002~0.059
			220.5R-KF																				●			0.001~0.005	0.002~0.067
			22L-KF																							0.001~0.002	0.002~0.051
			220L-KF																							0.001~0.003	0.002~0.059
			220.5L-KF																							0.001~0.005	0.002~0.067
Finishing	KM	VCGT	22R-KM																							0.001~0.002	0.002~0.051
			220R-KM																							0.001~0.003	0.002~0.059
			220.5R-KM																				●			0.001~0.005	0.002~0.067
			22L-KM																							0.001~0.002	0.002~0.051
			220L-KM																							0.001~0.003	0.002~0.059
			220.5L-KM																							0.001~0.005	0.002~0.067
Finishing	VP1	VCGT	220-VP1															●		●	●	●		●		0.001~0.006	0.002~0.006
			220.5-VP1															●		●	●	●		●		0.001~0.007	0.004~0.039
			221-VP1															●		●	●	●		●		0.001~0.007	0.006~0.047
			331-VP1																							0.002~0.008	0.007~0.071
			332-VP1																							0.002~0.008	0.008~0.071

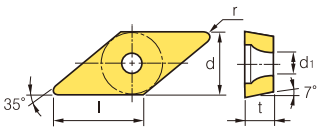
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B111, 178, 201	**SVQCR/L**	B202
SVVCN	B178	**SVUCR/L**	B202

VC○○

Rhombic 35° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
1.5	3/16	3/32	3/32
22	1/4	1/8	9/64~7/64
33	3/8	3/16	11/64

Workpiece																									
Steel	P	●	⧓	✱	●	⧓	●	⧓	⧓	✱	✱	●	⧓		✱										
Stainless steel	M									⧓	⧓		●	⧓	✱	⧓	✱			●	⧓	⧓			
Cast iron	K	●	⧓	✱	●	⧓	⧓				⧓	⧓												●	⧓
Non-ferrous metal	N																							●	⧓
Heat resistant alloy, Titanium alloy	S										●			●	●	✱	✱	●	●	⧓				●	⧓
Hardened steel	H																		⧓	✱				●	⧓

Machining types
● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (High precision)	VP1	VCGT	220MFN-VP1																		●					0.001~0.006	0.002~0.006
			220.5MFN-VP1																		●					0.001~0.007	0.004~0.039
			221MFN-VP1																		●					0.001~0.007	0.006~0.047
Finishing (High precision)	VP1	VCGX	120300MFR-VP1																							0.001~0.004	0.002~0.020
			120301MFR-VP1																							0.001~0.006	0.002~0.020
			120302MFR-VP1																							0.001~0.007	0.004~0.039
Finishing	VF	VCMT	1.51.50.5-VF																							0.002~0.008	0.012~0.039
			1.51.51-VF										●													0.004~0.010	0.012~0.039
			221-VF								●															0.001~0.007	0.006~0.047
			331-VF								●		●													0.002~0.008	0.006~0.060
Finishing (Mild steel)	VL	VCMT	1.51.50.5-VL						●		●		●					●								0.001~0.003	0.004~0.032
			1.51.51-VL						●		●		●					●								0.002~0.004	0.004~0.036
			331-VL						●		●				●	●	●			●	●					0.002~0.008	0.012~0.059
			332-VL						●		●				●	●	●			●	●					0.002~0.008	0.012~0.059
			333-VL																							0.004~0.010	0.012~0.059
Finishing	VP1	VCMT	331-VP1																							0.002~0.008	0.007~0.071
			332-VP1																							0.002~0.008	0.008~0.071
Medium to finishing	HMP	VCMT	331-HMP																							0.002~0.008	0.012~0.106
			332-HMP															●								0.004~0.014	0.020~0.138
Medium	MP new	VCMT	1.51.50.5-MP																							0.001~0.006	0.004~0.039
			1.51.51-MP																							0.002~0.007	0.004~0.039
			331-MP						●		●			●	●	●	●			●	●					0.002~0.007	0.012~0.078
			332-MP						●		●			●	●	●	●			●	●					0.004~0.009	0.020~0.091
			333-MP											●	●	●	●			●	●					0.004~0.013	0.020~0.091

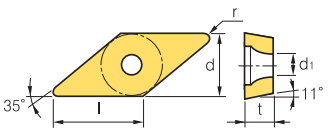
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B111, 178, 201	SVQCR/L	B202
SVVCN	B178	SVUCR/L	B202

VP○○

Triangular 60° Positive
Relief Angle: 11°



Dimensions (inch)			
Size	d	t	d1
22	1/4	1/8	7/64
63	3/16	3/32	6/64

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬌ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Finishing (High precision)	KF	VPET	63013MFR-KF																						0.001~0.002	0.002~0.059
			630MFR-KF																		●				0.001~0.003	0.002~0.059
			630.5MFR-KF																		●				0.001~0.005	0.002~0.067
			63013MFL-KF																						0.001~0.002	0.002~0.059
			630MFL-KF																						0.001~0.003	0.002~0.059
			630.5MFL-KF																						0.001~0.005	0.002~0.067
			630MFN-KF																						0.001~0.006	0.002~0.020
			630.5MFN-KF																						0.001~0.007	0.004~0.039
Medium to finishing (High precision)	KM	VPET	63013MFR-KM																						0.001~0.002	0.002~0.059
			630MFR-KM																		●				0.001~0.003	0.002~0.059
			630.5MFR-KM																		●				0.001~0.005	0.002~0.067
			63013MFL-KM																						0.001~0.002	0.002~0.059
			630MFL-KM																						0.001~0.003	0.002~0.059
			630.5MFL-KM																						0.001~0.005	0.002~0.067
Finishing	VP1	VPGT	220-VP1															●		●	●	●		●		0.001~0.006	0.002~0.006
			220.5-VP1															●		●	●	●		●		0.001~0.007	0.004~0.039
			221-VP1															●		●	●	●		●		0.001~0.007	0.006~0.047
Finishing (High precision)	VP1	VPGT	220MFN-VP1																		●					0.001~0.006	0.002~0.006
			220.5MFN-VP1																		●					0.001~0.007	0.004~0.039
			221MFN-VP1																		●					0.001~0.007	0.006~0.047

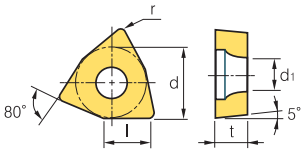
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B177	**SVVBN**	B178
SVJBR/L	B111, 177		

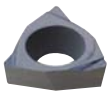
WB○○

Trigon 80° Positive
Relief Angle: 5°



Dimensions (inch)			
Size	d	t	d1
52	5/32	1/6	11/128
63	3/16	3/32	3/32

Workpiece																						Machining types
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱							● Continuous cutting
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌	⬌ General cutting
Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌									●	✱ Interrupted cutting
Non-ferrous metal	N																				●	
Heat resistant alloy, Titanium alloy	S									●			●	●	⬌	✱	●	●	⬌		●	
Hardened steel	H																	⬌	✱		●	

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (ipr)	ap (inch)
Medium to finishing		WBGT	520.5R																						~0.002	0.004~0.012
			631R																						~0.004	0.004~0.020
			520.5L		●																		●	●	~0.003	0.004~0.016
			630.5L																						~0.003	0.004~0.016
			631L																						~0.004	0.004~0.020

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SWUBR/L	B206		

Technical Information for Aluminum

AK special chip breaker for aluminum

- Unique and 3-dimensional rake angle controls chip breaking and chip flow ensuring longer tool life and reducing cutting load
- High rake angle at cutting edge part reduces cutting load to increase tool life
- Buffed finish on top face controls chip flow reducing built-up edge



1. High rake angle & tabby pattern chip pocket - Low cutting load
2. Unique rake angle design - Effective chip breaking and good chip flow
3. Unique and 3-dimensional top face - Longer tool life & Excellent surface roughness
4. Tabby pattern & Sharp cutting edge - Distributing cutting load, long tool life
5. Buffed on top face - Excellent machining, Reducing built-up edge, Excellent chip flow

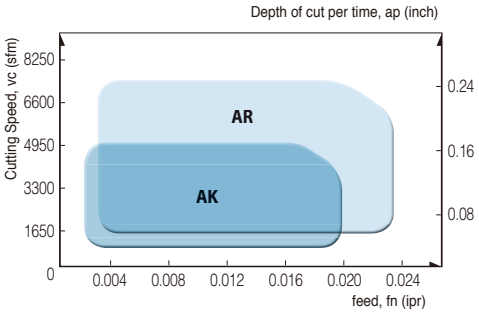
AR special chip breaker for aluminum

- AR chip breaker ensures reliability and good cutting performance at high feed, speed and interrupted machining

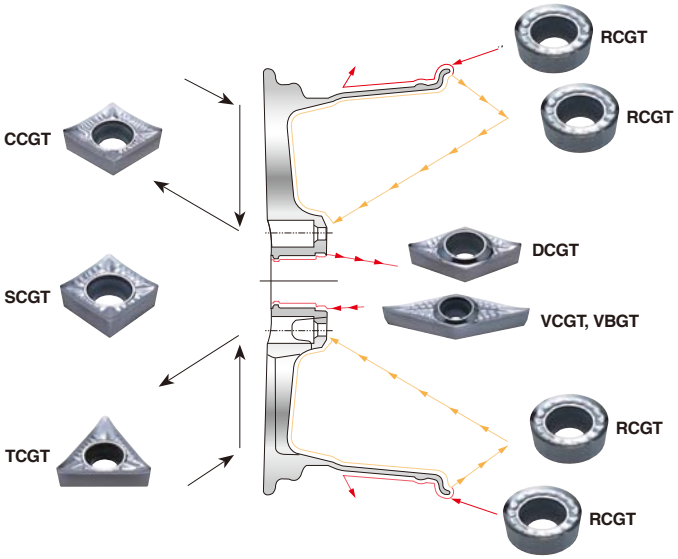


1. Flat corner cutting edge improved productivity at high feed machining and ensures good surface roughness and reliability owing to strong cutting edge
2. Specially buffed on top face controls chip flow reducing built-up edge
3. KORLOY's own technology applied for cutting edge and corner shape controlling chip flow ensures longer tool life
4. KORLOY special chip breaker design controls chip flow at high speed machining

AK and AR chip breaker specially developed for aluminum



	Recommendation range	Grades
AK	ap=0.004~0.20 inch fn=0.001~0.020 ipr	H01 (Uncoated cemented carbides K10~K20) ND1000 (Diamond coating)
AR	ap=0.004~0.20 inch fn=0.001~0.020 ipr	H01 (Uncoated cemented carbides K10~K20) ND1000 (Diamond coating) PD1000 (DLC coating)



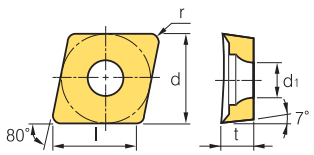
Features of H01 and cutting conditions

- Useful for aluminum and alloyed steel machining
- Buffed on top face reduced built-up edge
- 3-dimensional design reduced cutting load and shows good performance at high feed and speed machining

Workpiece		Hardness (HB)	kc (MPa)	vc (sfm)	fn (ipr)
Aluminum alloy (forged)	before heat treatment	50~70	500~600	3300~8250	0.004~0.024
	after heat treatment	90~110	700~900	990~3300	0.004~0.020
Aluminum alloy (cast)	before heat treatment	70~80	700~800	990~3300	0.004~0.024
	after heat treatment	80~100	800~950	660~1980	0.004~0.016
Copper alloy	-	90~110	700	820~1980	0.004~0.020
Non-ferrous metal, etc	-	100	1700	490~990	0.004~0.024

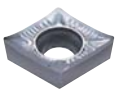
CC ○○

Rhombic 80° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
43	1/2	3/16	7/32

Workpiece							Machining types
Steel	P						● Continuous cutting
Stainless steel	M						◓ General cutting
Cast iron	K						✱ Interrupted cutting
Non-ferrous metal	N	✱	●	◓	✱		
Heat resistant alloy, Titanium alloy	S						
Hardened steel	H						

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (ipr)	ap (inch)
AK 	CCGT	21.50.5-AK	●		●		0.001~0.005	0.002~0.118
		21.51-AK	●		●		0.001~0.006	0.004~0.118
		21.52-AK			●		0.001~0.008	0.004~0.157
		32.50.5-AK	●		●		0.001~0.008	0.002~0.118
		32.51-AK	●		●		0.001~0.012	0.004~0.197
		32.52-AK	●		●		0.001~0.020	0.004~0.197
		430.5-AK			●		0.001~0.012	0.002~0.157
		431-AK	●		●		0.001~0.020	0.004~0.197
		432-AK			●		0.002~0.031	0.004~0.217
AR 	CCGT	21.50.5-AR			●		0.001~0.012	0.012~0.157
		21.51-AR					0.001~0.014	0.020~0.177
		21.52-AR					0.002~0.020	0.020~0.177
		32.50.5-AR			●		0.001~0.018	0.012~0.157
		32.51-AR			●		0.002~0.020	0.020~0.177
		32.52-AR			●		0.002~0.024	0.020~0.236
		430.5-AR					0.002~0.020	0.012~0.197
		431-AR			●		0.002~0.024	0.020~0.236
		432-AR			●		0.002~0.026	0.020~0.236
		433-AR					0.003~0.028	0.020~0.256

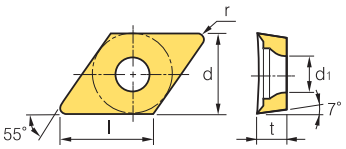
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B109, 172	**SCLCR/L**	B109, 172, 194

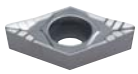
DC ○○

Rhombic 55° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64

Workpiece						
Steel	P					Machining types
Stainless steel	M					
Cast iron	K					● Continuous cutting
Non-ferrous metal	N	✱	●	◒	✱	◒ General cutting
Heat resistant alloy, Titanium alloy	S					✱ Interrupted cutting
Hardened steel	H					

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (ipr)	ap (inch)
AK 	DCGT	**21.50.5-AK**	●		●		0.001~0.008	0.002~0.118
		21.51-AK	●		●		0.001~0.012	0.004~0.157
		21.52-AK	●		●		0.001~0.016	0.004~0.157
		32.50.5-AK	●		●		0.001~0.012	0.002~0.157
		32.51-AK	●	●	●		0.001~0.020	0.004~0.197
		32.52-AK	●		●		0.001~0.020	0.004~0.197
		32.53-AK			●		0.002~0.024	0.006~0.197
AR 	DCGT	**21.50.5-AR**			●		0.001~0.012	0.012~0.157
		21.51-AR			●		0.001~0.016	0.020~0.197
		21.52-AR			●		0.002~0.020	0.020~0.197
		32.50.5-AR					0.001~0.018	0.012~0.236
		32.51-AR			●		0.002~0.020	0.020~0.236
		32.52-AR			●		0.002~0.024	0.020~0.236
		32.53-AR			●		0.003~0.026	0.020~0.256

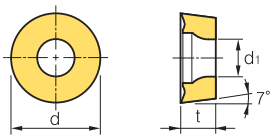
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B172	**SDQCR/L**	B196
SDJCR/L	B109, 173	**SDUCR/L**	B197
SDNCN	B110, 173	**SDZCR/L**	B198

RC ○○

Round **Positive**
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d_1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
73	7/32	3/32	7/64

Workpiece						
Steel	P					
Stainless steel	M					
Cast iron	K					
Non-ferrous metal	N	✱	●	◖	✱	
Heat resistant alloy, Titanium alloy	S					
Hardened steel	H					

Machining types
● Continuous cutting
◖ General cutting
✱ Interrupted cutting

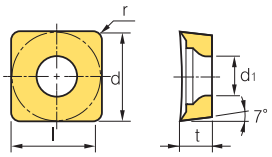
Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (ipr)	ap (inch)
AK 	RCGT	**0602M0-AK**			●		0.002~0.008	0.020~0.079
		0803M0-AK			●		0.002~0.010	0.020~0.098
		1003M0-AK			●		0.004~0.012	0.039~0.118
		10T3M0-AK					0.004~0.012	0.039~0.118
		1204M0-AK			●		0.004~0.014	0.039~0.138
AR 	RCGT	**0602M0-AR**					0.002~0.008	0.020~0.079
		0803M0-AR					0.002~0.010	0.020~0.098
		1003M0-AR			●		0.004~0.012	0.039~0.118
		10T3M0-AR					0.004~0.012	0.039~0.118
		1204M0-AR					0.004~0.014	0.039~0.138

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SRDCN	B173	**SRGCR/L**	B174

SC ○○



Dimensions (inch)			
Size	d	t	d_1
32.5	8/3	5/32	11/64
43	1/2	3/16	7/32

Square **90° Positive**
Relief Angle: 7°

Workpiece						
Steel	P					
Stainless steel	M					
Cast iron	K					
Non-ferrous metal	N	✱	●	◒	✱	
Heat resistant alloy, Titanium alloy	S					
Hardened steel	H					

Machining types
● Continuous cutting
◒ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (ipr)	ap (inch)
AK 	SCGT	**32.50.5-AK**	●				0.001~0.012	0.004~0.157
		32.51-AK	●		●		0.002~0.016	0.004~0.197
		32.52-AK			●		0.001~0.016	0.004~0.197
		431-AK			●		0.001~0.020	0.004~0.197
		432-AK			●		0.002~0.024	0.004~0.217
		434-AK					0.002~0.024	0.004~0.217
AR 	SCGT	**32.50.5-AR**					0.001~0.016	0.020~0.197
		32.51-AR			●		0.002~0.020	0.020~0.236
		32.52-AR					0.002~0.020	0.020~0.256
		431-AR			●		0.002~0.024	0.020~0.256
		432-AR					0.002~0.024	0.020~0.276
		434-AR					0.002~0.024	0.020~0.276

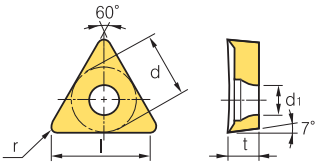
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B174	**SSKCR/L**	B175
SSDCN	B174	**SSSCR/L**	B175

TC ○○

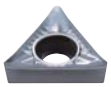
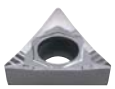
Triangular 60° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d_1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
73	7/32	3/32	13/128

Workpiece						
Steel	P					
Stainless steel	M					
Cast iron	K					
Non-ferrous metal	N	✱	●	◒	✱	
Heat resistant alloy, Titanium alloy	S					
Hardened steel	H					

Machining types
● Continuous cutting
◒ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (ipr)	ap (inch)
AK 	TCGT	730.5-AK			●		0.000~0.005	0.002~0.118
		731-AK			●		0.001~0.006	0.004~0.157
		21.50.5-AK	●		●		0.001~0.008	0.002~0.157
		21.51-AK	●		●		0.001~0.012	0.004~0.157
		21.52-AK			●		0.001~0.016	0.004~0.197
		32.50.5-AK			●		0.001~0.012	0.002~0.197
		32.51-AK			●		0.001~0.016	0.004~0.217
		32.52-AK			●		0.001~0.020	0.004~0.217
		32.53-AK			●		0.002~0.024	0.006~0.217
		32.54-AK			●		0.002~0.031	0.006~0.217
		32.56.3-AK					0.002~0.035	0.008~0.276
AR 	TCGT	730.5-AR					0.001~0.007	0.012~0.118
		731-AR			●		0.001~0.010	0.012~0.197
		21.50.5-AR					0.001~0.012	0.012~0.157
		21.51-AR			●		0.001~0.016	0.012~0.197
		21.52-AR					0.002~0.018	0.020~0.236
		32.50.5-AR			●		0.001~0.018	0.012~0.197
		32.51-AR			●		0.002~0.020	0.020~0.236
		32.52-AR			●		0.002~0.024	0.020~0.236
		32.53-AR					0.002~0.026	0.020~0.236
		32.54-AR					0.003~0.028	0.020~0.256
		32.56.3-AR					0.004~0.039	0.031~0.276

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

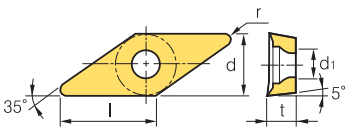
● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
STACR/L	B110	**STTCR/L**	B176, 225
STFCR/L	B176, 212	**STWCR/L**	B213
STGCR/L	B176		

VB ○○



Rhombic **35° Positive**
Relief Angle: 5°



Dimensions (inch)			
Size	d	t	d_1
22	1/4	1/8	7/64
33	3/8	3/16	11/64

Workpiece							Machining types
	Steel	P					● Continuous cutting
	Stainless steel	M					◓ General cutting
	Cast iron	K					✱ Interrupted cutting
	Non-ferrous metal	N	✱	●	◓	✱	
	Heat resistant alloy, Titanium alloy	S					
	Hardened steel	H					

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (ipr)	ap (inch)
AK 	VBGT	220.5-AK			●		0.001~0.006	0.002~0.118
		221-AK			●		0.001~0.006	0.004~0.157
		222-AK					0.001~0.007	0.004~0.197
		330.5-AK					0.001~0.012	0.002~0.157
		331-AK			●		0.001~0.016	0.004~0.197
		332-AK			●		0.001~0.020	0.004~0.197
		333-AK					0.002~0.024	0.004~0.217
AR 	VBGT	220.5-AR					0.001~0.014	0.012~0.118
		221-AR					0.001~0.018	0.012~0.157
		222-AR					0.001~0.020	0.020~0.236
		330.5-AR					0.002~0.018	0.012~0.197
		331-AR			●		0.002~0.020	0.020~0.236
		332-AR			●		0.002~0.024	0.020~0.236
		333-AR					0.002~0.028	0.020~0.256

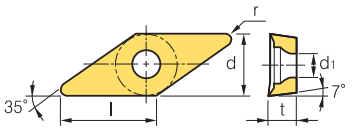
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B177	**SVVBN**	B178
SVHBR/L	B177	**SVQBR/L**	B201
SVJBR/L	B111, 177	**SVUBR/L**	B202

VC ○○

Rhombic 35° Positive
Relief Angle: 7°



Dimensions (inch)			
Size	d	t	d_1
2.5	5/16	1/8	7/64~9/64
22	1/4	1/8	7/64
33	3/8	3/16	11/64
44.5	1/2	7/32	7/32

Workpiece							
	Steel	P					Machining types
	Stainless steel	M					
	Cast iron	K					● Continuous cutting
	Non-ferrous metal	N	✱	●	⬣	✱	⬣ General cutting
	Heat resistant alloy, Titanium alloy	S					✱ Interrupted cutting
	Hardened steel	H					

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (ipr)	ap (inch)
AK 	VCGT	220-AK					0.001~0.006	0.002~0.118
		220.5-AK	●		●		0.001~0.008	0.002~0.118
		221-AK	●		●		0.001~0.010	0.004~0.157
		222-AK			●		0.001~0.012	0.004~0.197
		2.520.5-AK	●		●		0.001~0.014	0.004~0.197
		2.521-AK	●		●		0.001~0.014	0.004~0.197
		2.522-AK					0.002~0.016	0.004~0.197
		330.5-AK			●		0.001~0.012	0.002~0.197
		331-AK		●	●		0.001~0.016	0.004~0.197
		332-AK			●		0.001~0.020	0.004~0.197
		333-AK			●		0.001~0.020	0.004~0.197
		43.54-AK			●		0.001~0.024	0.004~0.276
		43.56.3-AK					0.002~0.028	0.004~0.276
		43.57.5-AK			●		0.003~0.039	0.004~0.276
AR 	VCGT	220-AR					0.001~0.008	0.004~0.118
		220.5-AR			●		0.001~0.010	0.012~0.118
		221-AR			●		0.001~0.014	0.012~0.157
		222-AR					0.002~0.018	0.020~0.236
		2.520.5-AR					0.001~0.016	0.020~0.118
		2.521-AR			●		0.001~0.018	0.020~0.157
		2.522-AR					0.002~0.020	0.020~0.197
		330.5-AR			●		0.001~0.016	0.012~0.197
		331-AR			●		0.002~0.020	0.020~0.236
		332-AR			●		0.002~0.024	0.020~0.236
		333-AR					0.002~0.026	0.020~0.256
		43.54-AR					0.004~0.026	0.031~0.256
		43.56.3-AR					0.004~0.028	0.031~0.276
		43.57.5-AR			●		0.005~0.030	0.039~0.276

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Korea Stock ● : US Stock

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B111, 178, 201	**SVQCR/L**	B202
SVVCN	B178	**SVUCR/L**	B202

cBN

Multi-Corner Type (Negative)

Dimensions (inch)			
Size	d	t	d_1
33	3/8	3/16	5/32
43	1/2	3/16	13/64
44			

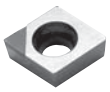
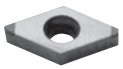
Inserts	Designation		Uncoated										Available tool holders			
			DNC250	DNC350	DNC400	KB1000	KB2000	KB400	KB320	KB330	KB370	KB420	Designation		Page	
CN○○ 80° Nega	2NU-CNGA	431	●	●		●	●				●		DCBNR/L	DCLNR/L	B148	B148
		431F	●	●			●						MCKNR/	MCLNR/L	B165	B165
		431T	●			●	●						MCMNN	PCBNR/L	B165	B153
		431W	●	●									PCLNR/L		B153	
		431WF	●													
		432	●	●		●	●				●					
		432F	●				●									
		432T	●	●		●	●									
		432W	●	●		●	●				●					
		432WF	●				●									
		432WT				●	●									
		433	●	●		●	●			●						
		433F	●													
		433T	●	●		●	●									
		433W	●			●	●				●					
		433WF	●				●									
		433WT				●	●									
	T-2NU-CNGA	432	●													
	2NU-CNMA	431							●							
		432							●							
	2NS-CNGA	432			●			●								
DN○○ 55° Nega	2NU-DNGA	431	●	●		●	●		●		●		DDJNR/L	MDJNR/L	B149	B166
		431F	●				●						MDNNN	MDQNR/L	B166	B167
		431T	●			●	●						MDUNR/L	PDJNR/L	B192	B154
		432	●	●		●	●		●		●		PDNNR/L	PDSNR/L	B155	B187
		432F	●				●						PDUNR/L		B188	
		432T	●			●	●									
		433	●	●			●									
		433F	●													
		433T	●													
		442										●				
	T-2NU-DNGA	443	●													
	2NS-DNGA	442			●			●								
SN○○ 90° Nega	4NU-SNGA	431	●			●	●				●		DSBNR/L	MSBNR/L	B149	B167
		431F					●						MSDNN	MSKNR/L	B167	B168
		431T				●	●						MSRNR/L	MSSNR/L	B168	B169
		432	●			●	●				●		PSBNR/L	PSDNN	B157	B157
		432F					●						PSKNR/L		B158	
		432T				●	●									
		433									●					
	2NS-SNGA	432			●			●								
TN○○ 60° Nega	3NU-TNGA	331	●	●		●	●		●		●		MTENN	MTFNR/L	B169	B169
		331F	●				●						MTGNR/	MTJNR/L	B170	B170
		331T	●			●	●						PTFNR/L	PTGNR/L	B159	B159
		332	●	●		●	●		●		●		PTTNR/L	WTENN	B160	B161
		332F	●				●						WTJNR/L	WTXNR/L	B161	B161
		332T	●			●	●									
		333		●												
	2NS-TNGA	332			●			●								
VN○○ 35° Nega	2NU-VNGA	331	●	●		●	●		●		●		MVJNR/L		B170	
		331F	●				●						MVQNR/L		B171	
		331T	●			●	●						MVUNR/L		B193	
		332	●	●		●	●		●		●		MVVNN		B171	
		332F	●			●	●									
		332T	●			●	●									
	2NS-VNGA	332			●			●								

● : Korea Stock ● : US Stock

cBN

Multi-Corner Type (Positive)

Dimensions (inch)			
Size	d	t	d_1
21.5	1/4	3/32	7/64
32.5	3/8	5/32	11/64
73	7/32	3/32	7/64

Inserts	Designation		Uncoated									Available tool holders	
			DNC250	DNC350	DNC400	KB1000	KB2000	KB400	KB320	KB330	KB370	KB420	Designation	Page
CC○○ 80° Posi 	2NU-CCGW	21.50.5	●										SCACR/L	B172
		21.50.5F	●										SCLCR/L	B172
		21.50.5T	●											
		21.51	●			●	●							
		21.51F	●				●							
		21.51T	●			●	●							
		21.52		●		●	●				●			
		21.52F	●				●							
		21.52T				●	●							
		32.51	●	●		●	●		●		●			
		32.51F	●				●							
		32.51T	●			●	●							
		32.52	●	●		●	●		●		●			
		32.52F	●			●	●				●			
		32.52T	●			●	●							
		32.52W	●											
		32.52WF	●											
DC○○ 55° Posi 	2NU-DCGW	21.51				●	●						SDACR/L	B172
		21.51F					●						SDJCR/L	B173
		21.51T				●	●						SDNCN	B173
		21.52				●	●						SDQCR/L	B196
		21.52F					●						SDUCR/L	B197
		21.52T				●	●						SDZCR/L	B198
		32.51	●	●		●	●		●		●			
		32.51F	●				●							
		32.51T	●			●	●							
		32.52	●	●		●	●		●		●			
		32.52F	●				●							
		32.52T	●			●	●							
	T-2NU-DCGW	32.51	●											
TC○○ 60° Posi 	3NU-TCGW	731	●										STACR/L	B175
		731F	●										STFCR/L	B176
		731T	●										STGCR/L	B176
													STTCR/L	B176

● : Korea Stock ● : US Stock

cBN

Multi-Corner Type (Positive)

Dimensions (inch)			
Size	d	t	d_1
22	1/4	1/8	7/64
33	3/8	3/16	11/64

Inserts	Designation		Uncoated										Available tool holders		
			DNC250	DNC350	DNC400	KB1000	KB2000	KB400	KB320	KB330	KB370	KB420	Designation	Page	
TP○○ 60° Posi	3NU-TPGB	221	●						●				CTFPR/L	B164	
		221F	●										CTGPR/L	B164	
		221T	●												
		222	●						●						
		222F	●												
		222T	●												
	3NU-TPGN	221				●	●						CTFPR/L	B164	B191
		221F					●						CTGPR/L	B164	
		221T				●	●								
		222				●	●								
		222F					●								
		222T				●	●								
		331	●	●											
		332	●	●											
	3NU-TPGW	221	●	●		●	●				●				
		221F	●				●								
		221T	●			●	●								
		222	●	●		●	●				●				
		222F	●				●								
		222T	●			●	●								
VB○○ 35° Posi	2NU-VBGW	331	●	●		●	●		●		●		SVABR/L	B177	
		331F	●				●						SVHBR/L	B177	
		331T	●			●	●						SVJBR/L	B177	
		332	●	●		●	●		●		●		SVQBR/L	B201	
		332F	●				●						SVUBR/L	B202	
		332T	●			●	●								
VC○○ 35° Posi	2NU-VCGW	331	●	●		●	●				●				
		331F	●				●								
		331T	●			●	●								
		332	●	●		●	●				●				
		332F	●				●								
		332T	●			●	●								

● : Korea Stock ● : US Stock

cBN

Regrinding Type (Negative/Positive)

Dimensions (inch)			
Size	d	t	d_1
22	1/4	1/8	-
32.5	3/8	5/32	11/64

Dimensions (inch)			
Size	d	t	d_1
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Inserts	Designation		Uncoated									Available tool holders			
			DNC250	DNC350	DNC400	KB1000	KB2000	KB400	KB320	KB330	KB370	KB420	Designation		Page	
CN○○ 80° Nega	CNMA	431							●				DCBNR/L	MCKNR/L	B148	B165
		432							●			●	DCLNR/L	MCLNR/L	B148	B165
	T-CNMA	432							●				PCBNR/L	MCMNN	B153	B165
													PCLNR/L		B153	
DN○○ 55° Nega	DNMA	431							●				DDJNR/L	MDJNR/L	B149	B166
		432							●	●			MDNNN	MDQNR/L	B166	B167
													MDUNR/L	PDJNR/L	B192	B154
													PDNNR/L	PDSNR/L	B155	B187
													PDUNR/L		B188	
SN○○ 90° Nega	SNMA	431							●				DSBNR/L	MSBNR/L	B149	B167
		432							●				MSDNN	MSKNR/L	B167	B168
													MSRNR/L	MSSNR/L	B168	B169
													PSBNR/L	PSDNN	B157	B157
													PSKNR/L		B158	
TN○○ 60° Nega	TNMA	331							●				MTENNS	MTFNR/L	B169	B169
		332							●				MTGNR/L	MTJNR/L	B170	B170
													PTFNR/L	PTGNR/L	B159	B159
													PTTNR/L	WTENN	B160	B161
													WTJNR/L	WTXNR/L	B161	B161
VN○○ 35° Nega	VNMA	331							●				MVJNR/L		B170	
		332							●				MVQNR/L		B171	
	T-VNMA	331							●				MVUNR/L		B193	
													MVVNN		B171	
CC○○ CP○○ 80° Posi (CCMW)	CCMW	32.51							●				SCACR/L		B172	
													SCLCR/L		B172	
DC○○ 50° Posi	DCGW	32.52							●				SDACR/L		B172	
	T-DCGW	32.52							●				SDJCR/L		B173	
													SDNCN/L		B173	
TP○○ 60° Posi	TPGB	221							●	●			CTFPR/L		B164	B191
		222							●				CTGPR/L		B164	
VB○○ 35° Posi	VBMW	331							●				SVABR/L		B177	
		332							●				SVHBR/L		B177	
													SVJBR/L		B177	
													SVQBR/L		B201	
													SVUBR/L		B202	

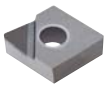
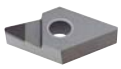
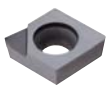
● : Korea Stock ● : US Stock

PCD

Insert (Negative/Positive)

Dimensions (inch)			
Size	d	t	d_1
2.5	5/16	3/32	5/32
21.5	1/4	3/32	7/64
32	3/8	1/8	11/64

Dimensions (inch)			
Size	d	t	d_1
32.5	3/8	5/32	11/64
33	3/8	3/16	5/32
43	1/2	3/16	13/64

Inserts	Designation		PCD			Available tool holders			
			DP90	DP150	DP200	Designation		Page	
CN○○ 80° Nega  (CNMX)	CNMM	431		●		DCBNR/L	DCLNR/L	B148	B148
		432		●		MCKNR/L	MCLNR/L	B165	B165
		433				MCMNN	PCBNR/L	B165	B153
	CNMX	431				PCLNR/L		B153	
		432							
		433							
DN○○ 55° Nega  (DNMX)	DNMM	431		●		DDJNR/L	MDJNR/L	B149	B166
		432		●		MDNNN	MDQNR/L	B166	B167
		433				MDUNR/L	PDJNR/L	B192	B154
	DNMX	431				PDNNR/L	PDSNR/L	B155	B187
		432				PDUNR/L		B188	
		433							
TN○○ 60° Nega 	TNMX	331				MTENNS	MTFNR/L	B169	B169
		332				MTGNR/L	MTJNR/L	B170	B170
		333				PTFNR/L	PTGNR/L	B159	B159
						PTTNR/L	WTENN	B160	B161
						WTJNR/L	WTXNR/L	B161	B161
VN○○ 35° Nega 	VNMX	431				MVJNR/L		B170	
		432				MVQNR/L		B171	
		433				MVUNR/L		B193	
						MVVNN		B171	
CC○○ CP○○ 80° Posi 	CCMT	21.50.5		●		SCACR/L		B172	
		21.51		●		SCLCR/L		B172	
		21.52							
		32.51		●					
		32.52		●					
		32.53							
	CPMT	2.51.51							
		2.51.52							
		2.51.53							
		321							
		322							
		323							
DC○○ 55° Posi 	DCMT	21.50.5		●		SDACR/L		B172	
		21.51		●		SDJCR/L		B173	
		21.52				SDNCN		B173	
		32.50.5				SDQCR/L		B196	
		32.51		●		SDUCR/L		B197	
		32.52		●		SDZCR/L		B198	
SC○○ SP○○ 90° Posi  (SCMT)	SCMT	32.51				SSBCR/L		B174	
		32.52				SSDCN		B174	
		32.53				SSKCR/L		B175	
	SPGW	32.50.5				SSSCR/L		B175	
		32.51							
		32.52							

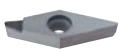
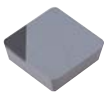
● : Korea Stock ● : US Stock

PCD

Insert (Positive)

Dimensions (inch)			
Size	d	t	d_1
22	1/4	1/8	7/64
23	1/4	3/32	7/64
32	3/8	1/8	-
33	3/8	3/16	11/64

Dimensions (inch)			
Size	d	t	d_1
42	1/2	1/8	-
52	5/32	1/16	7/64
63	3/16	3/32	3/32
73	7/32	3/32	3/32

Inserts	Designation		PCD			Available tool holders	
			DP90	DP150	DP200	Designation	Page
TB○○ TC○○ TP○○ 60° Posi  (TBGN)	TBGW	520.5				STUBR/L	B204
		521					
	TCMT	730				STACR/L	B175
		730.5				STFCR/L	B176
		731				STFPR/L	B200
		230				STGCR/L	B176
		230.5				STTCR/L	B176
		231					
	TPGB	631					
		632					
		731		●			
		732		●			
		221					
		222					
	TPGW	630.5					
		631					
		731					
		732					
		220.5					
		221		●			
		222		●			
		331					
		332					
	TPGT	220.5				STFPR/L	B200
		221				STUPR/L	B205
VB○○ VC○○ 35° Posi 	VBMT	220.5				SVABR/L	B177
		221		●		SVHBR/L	B177
		222		●		SVJBR/L	B177
		330.5				SVQBR/L	B201
		331		●		SVUBR/L	B202
		332		●			
		333		●			
	VCMT	220.5				SVJCR	B178
		221		●		SVVCN	B178
		222		●			
		331		●			
		332		●			
		333					
TP○○ 60° Posi 	TPGN	731				CTFPR/L	B164
		732				CTGPR/L	B164
		220.5					
		221		●			
		222		●			
		320.5					
		321					
		322					
SP○○ 90° Posi 	SPGN	321		●		CSDPN	B163
		322				CSKPR/L	B164
		421					
		422		●			

● : Korea Stock ● : US Stock

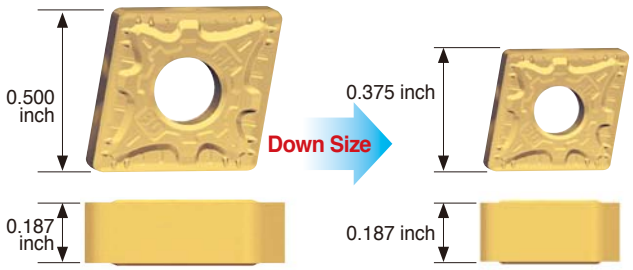
Economical small insert with powerful cutting performance

SAVE TURN

- Strongly recommended turning insert for machining smaller diameter than Ø3.937 inch
- Small but powerful and economical insert which performs the same like standard-sized inserts under the depth of cut of 0.118 inch

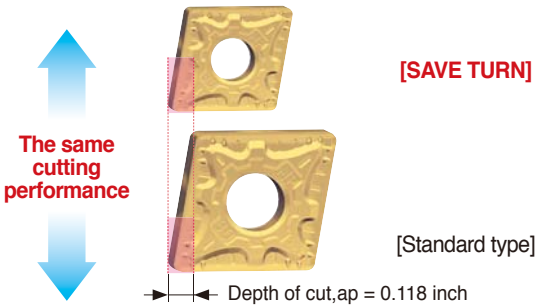
Features

Comparison of insert sizes



- Optimized size of the same performance like the standard type

Comparison of cutting performance

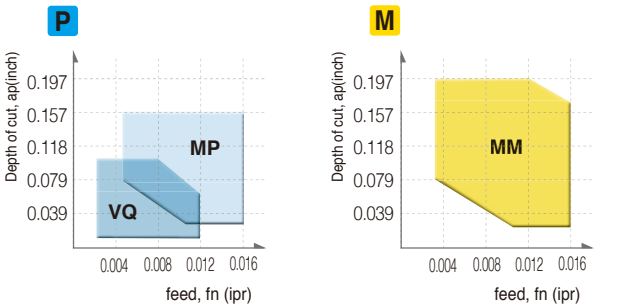


- Performs the same like standard type inserts under the depth of cut of 0.118 inch

Features of chip breaker

Insert shape	Cutting edge	Features
VQ		• For finishing steel • Efficient chip breaking and low cutting resistance • Various application available at low depth of cut • Recommended depth of cut: 0.020~0.098 inch
MP		• For medium cutting of steel • 4 dots for improved chip control in medium cutting to finishing • Stable chip evacuation at high depth of cut • Stable tool life due to lower cutting loads at high feed • Recommended depth of cut: 0.020~0.157 inch
MM		• For medium cutting of stainless steel • Limits plastic deformation caused by heat • Stable tool life thanks to the balanced cutting performance and toughness • Stable chip flow at high speeds and feeds • Recommended depth of cut: 0.020~0.197 inch

Application area of chip breaker



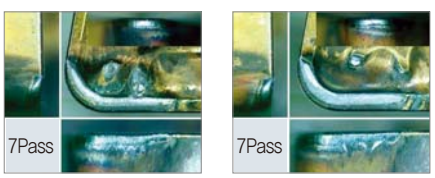
VQ : Depth of cut, ap = 0.020~0.098 inch / feed, fn = 0.002~0.012 ipr
MP : Depth of cut, ap = 0.020~0.157 inch / feed, fn = 0.006~0.016 ipr
MM : Depth of cut, ap = 0.020~0.197 inch / feed, fn = 0.004~0.016 ipr

Application example (NC3220)

Alloy steel (SCM4140)

■ **Cutting conditions** vc (sfm) = 820, fn (ipr) = 0.010
ap (inch) = 0.097~0.118, continuous cutting, wet

■ **Cutting Result**



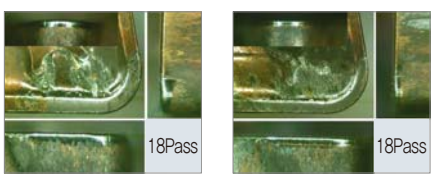
CNMG332-HM
SAVE TURN

CNMG432-HM
Standard type

Alloy steel (SCM4140)

■ **Cutting conditions** vc (sfm) = 820, fn (ipr) = 0.010
ap (inch) = 0.079~0.118, interrupted cutting, wet

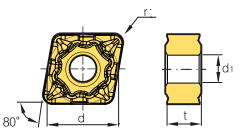
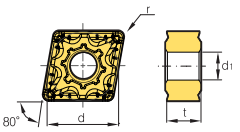
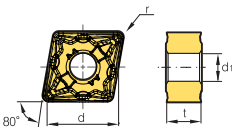
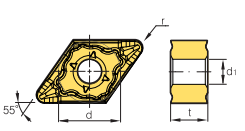
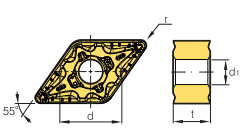
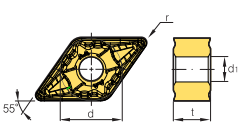
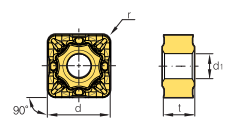
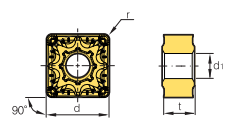
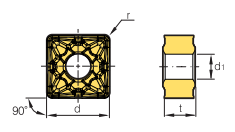
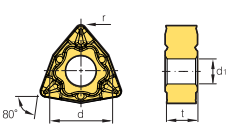
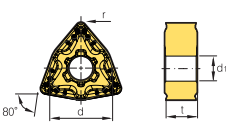
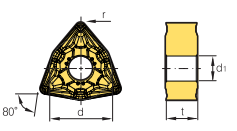
■ **Cutting Result**



CNMG332-HM
SAVE TURN

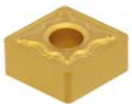
CNMG432-HM
Standard type

Insert

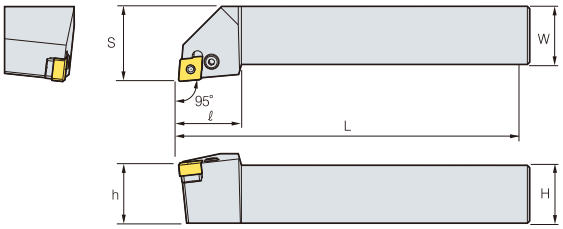
Type	Picture	Designation		Coated			Dimensions (inch)				cutting conditions		Configuration	Available tool holders page
				NC3215	NC3225	NC5330	d	t	r	d_1	ap (inch)	fn (ipr)		
C type	CNMG-VQ	CNMG	332-VQ			●	0.375	3/16	1/32	1/8	0.020~0.098	0.003~0.012		B102 B105
			333-VQ			●	0.375	3/16	3/64	1/8	0.020~0.098	0.004~0.012		
	CNMG-MP	CNMG	331-MP				0.375	3/16	1/64	1/8	0.020~0.157	0.004~0.016		B102 B105
			332-MP				0.375	3/16	1/32	1/8	0.020~0.157	0.006~0.016		
			333-MP				0.375	3/16	3/64	1/8	0.020~0.157	0.006~0.018		
	CNMG-MM	CNMG	331-MM				0.375	3/16	1/64	1/8	0.020~0.197	0.003~0.012		B102 B105
			332-MM				0.375	3/16	1/32	1/8	0.020~0.197	0.004~0.016		
			333-MM				0.375	3/16	3/64	1/8	0.020~0.197	0.005~0.018		
D type	DNMG-VQ	DNMG	33.52-VQ			●	0.375	7/32	1/32	1/8	0.020~0.098	0.003~0.012		B102 B103 B105 B106
			33.53-VQ			●	0.375	7/32	3/64	1/8	0.020~0.098	0.004~0.012		
	DNMG-MP	DNMG	33.51-MP				0.375	7/32	1/64	1/8	0.020~0.157	0.004~0.016		B102 B103 B105 B106
			33.52-MP				0.375	7/32	1/32	1/8	0.020~0.157	0.006~0.016		
			33.53-MP				0.375	7/32	3/64	1/8	0.020~0.157	0.006~0.018		
	DNMG-MM	DNMG	33.51-MM				0.375	7/32	1/64	1/8	0.020~0.197	0.003~0.012		B102 B103 B105 B106
			33.52-MM				0.375	7/32	1/32	1/8	0.020~0.197	0.004~0.016		
			33.53-MM				0.375	7/32	3/64	1/8	0.020~0.197	0.005~0.018		
S type	SNMG-VQ	SNMG	332-VQ			●	0.375	3/16	1/32	1/8	0.020~0.098	0.003~0.012		B103 B104 B106
			333-VQ			●	0.375	3/16	3/64	1/8	0.020~0.098	0.004~0.012		
	SNMG-MP	SNMG	331-MP				0.375	3/16	1/64	1/8	0.020~0.157	0.004~0.016		B103 B104 B106
			332-MP				0.375	3/16	1/32	1/8	0.020~0.157	0.006~0.016		
			334-MP				0.375	3/16	3/64	1/8	0.020~0.157	0.006~0.018		
	SNMG-MM	SNMG	331-MM				0.375	3/16	1/64	1/8	0.020~0.197	0.003~0.012		B103 B104 B106
			332-MM				0.375	3/16	1/32	1/8	0.020~0.197	0.004~0.016		
			333-MM				0.375	3/16	3/64	1/8	0.020~0.197	0.005~0.018		
W type	WNMG-VQ	WNMG	331-VQ				0.375	3/16	1/64	1/8	0.012~0.078	0.002~0.012		B105 B106
			332-VQ				0.375	3/16	1/32	1/8	0.020~0.078	0.003~0.012		
			333-VQ				0.375	3/16	3/64	1/8	0.020~0.078	0.004~0.012		
	WNMG-MP	WNMG	331-MP	●	●	●	0.375	3/16	1/64	1/8	0.020~0.138	0.004~0.016		B105 B106
			332-MP	●	●	●	0.375	3/16	1/32	1/8	0.020~0.138	0.006~0.016		
			333-MP				0.375	3/16	3/64	1/8	0.020~0.138	0.006~0.018		
	WNMG-MM	WNMG	331-MM				0.375	3/16	1/64	1/8	0.020~0.157	0.003~0.012		B105 B106
			332-MM				0.375	3/16	1/32	1/8	0.020~0.157	0.004~0.016		
			333-MM				0.375	3/16	3/64	1/8	0.020~0.157	0.005~0.018		

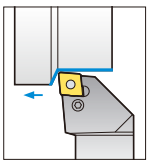
●: Korea Stock ●: US Stock

PCLNR/L



CN□□





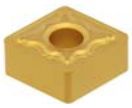
95°

• R type insert
(inch)

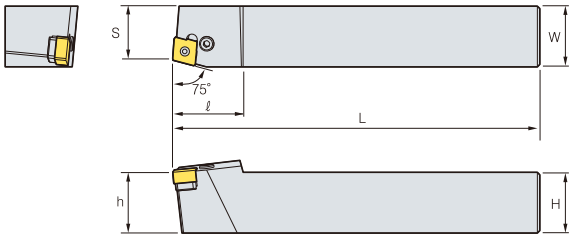
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PCLNR/L	10-3A-3N	5/8	5/8	4	0.787	0.625	0.787	CN□□33□□	LV3N	VHX0617N	SC32N	SP3	HW25L	LSP3
	12-3B-3N	3/4	3/4	4 1/2	1.000	0.787	1.000							
	16-3D-3N	1	1	6	1.250	1.000	1.063							

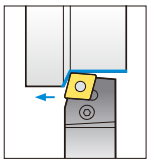
Applicable inserts **B22**

PCBNR/L



CN□□





75°

• R type insert
(inch)

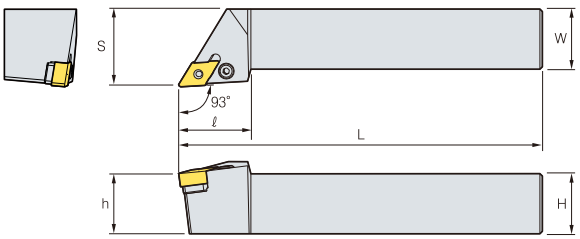
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PCBNR/L	12-3B-3N	3/4	3/4	4 1/2	0.669	0.787	1.063	CN□□33□□	LV3N	VHX0617N	SC32N	SP3	HW25L	LSP3
	16-3D-3N	1	1	6	0.866	1.000	1.142							

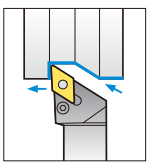
Applicable inserts **B101**

PDJNR/L



DN□□





93°

• R type insert
(inch)

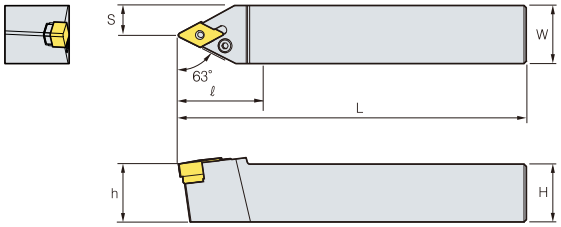
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PDJNR/L	12-3B-3.5N	3/4	3/4	4 1/2	1.000	0.787	1.000	DN□□33.5□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSPS3
	16-3D-3.5N	1	1	6	1.260	1.000	1.181							

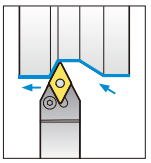
Applicable inserts **B101**

PDNNR/L



DN□□





63°

• R type insert
(inch)

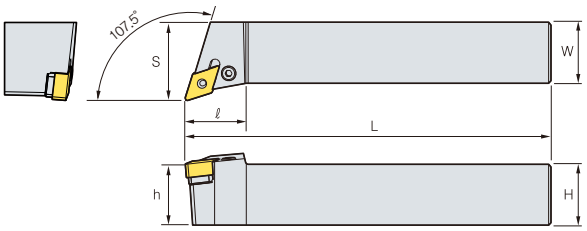
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PDNNR/L	12-3B-3.5N	3/4	3/4	4 1/2	1.000	0.787	1.181	DN□□33.5□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSPS3
	16-3D-3.5N	1	1	6	1.260	1.000	1.181							

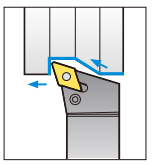
Applicable inserts **B101**

PDQNR/L



DN□□





107.5°

• R type insert
(inch)

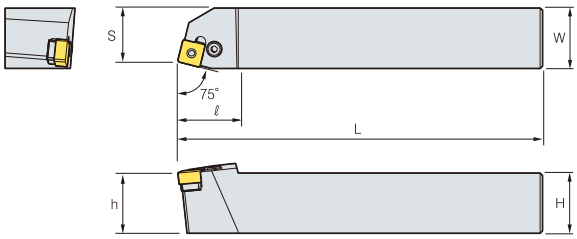
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PDQNR/L	12-3B-3.5N	3/4	3/4	4 1/2	1.000	0.787	1.181	DN□□33.5□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSPS3
	16-3D-3.5N	1	1	6	1.260	1.000	1.181							

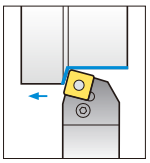
Applicable inserts **B101**

PSBNR/L



SN□□





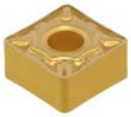
75°

• R type insert
(inch)

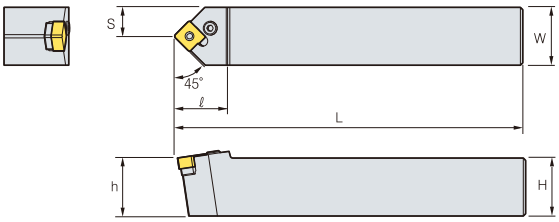
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PSBNR/L	12-3B-3N	3/4	3/4	4 1/2	0.669	0.787	1.000	SN□□33□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	16-3D-3N	1	1	6	0.866	1.000	1.000							

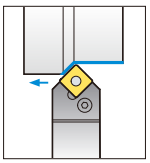
Applicable inserts **B101**

PSDNN



SN□□





45°

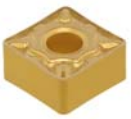
• R type insert

(inch)

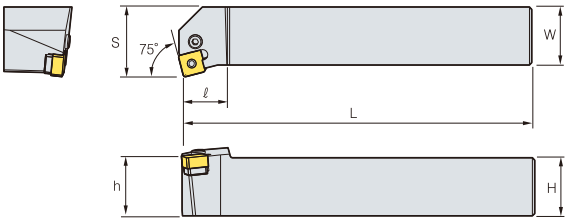
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PSDNN	12-3B-3N	3/4	3/4	4 1/2	0.669	0.787	1.000	SN□□33□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	16-3D-3N	1	1	6	0.866	1.000	1.000							

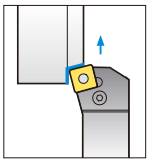
Applicable inserts **B101**

PSKNR/L



SN□□





75°

• R type insert

(inch)

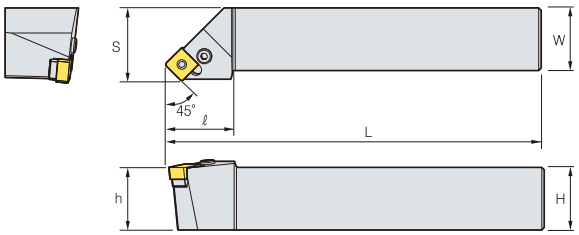
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PSKNR/L	12-3B-3N	3/4	3/4	4 1/2	0.669	0.787	1.000	SN□□33□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	16-3D-3N	1	1	6	0.866	1.000	1.000							

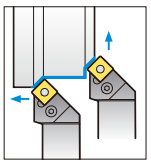
Applicable inserts **B101**

PSSNR/L



SN□□





45°

• R type insert

(inch)

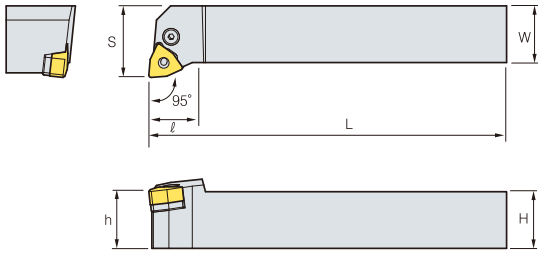
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PSSNR/L	12-3B-3N	3/4	3/4	4 1/2	0.669	0.787	1.000	SN□□33□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	16-3D-3N	1	1	6	0.866	1.000	1.000							

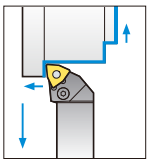
Applicable inserts **B101**

PWLNR/L



WN□□





95°

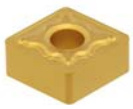
• R type insert

(inch)

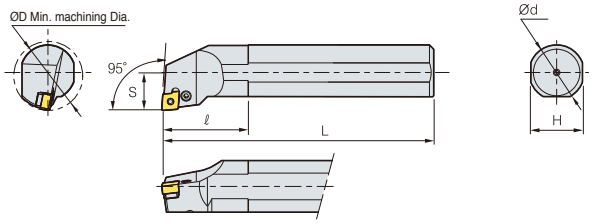
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PWLNR/L	**10-3A**	5/8	5/8	4	0.750	0.625	0.787	WN□□33□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.787							
	16-3D	1	1	6	1.250	1.000	0.787							

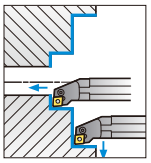
Applicable inserts **B101**

PCLNR/L



CN□□





95°

• R type insert

(inch)

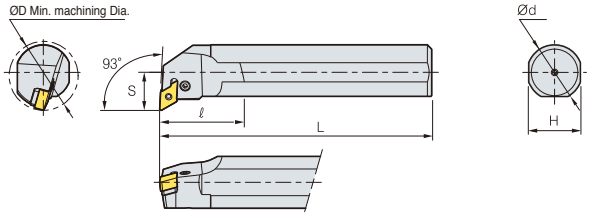
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
S20Q-PCLNR/L-3-3N	1.000	1 1/4	0.709	7	0.512	1.969	CN□□33□□	LV3B	VHX0512B	–	–	HW20L	–
S25R-PCLNR/L-3-3N	1.260	1	0.906	8	0.669	1.969		LV3B	VHX0512B	SC32N	SP3	HW20L	–
S32S-PCLNR/L-3-3N	1.575	2	1.181	10	0.866	1.969		LV3N	VHX0617N	SC32N	SP3	HW25L	–

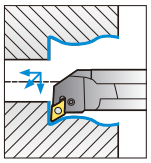
Applicable inserts **B101**

PDUNR/L



DN□□





93°

• R type insert

(inch)

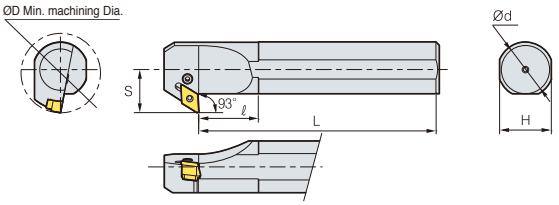
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
S32S-PDUNR/L-3-3.5N	1.575	1	1.181	8	0.866	1.181	DN□□33.5□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	–
S40T-PDUNR/L-3-3.5N	1.969	2 1/2	1.496	12	1.063	1.969							

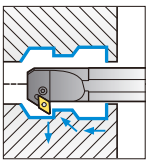
Applicable inserts **B101**

PDZNR/L



DN□□





93°

• R type insert

(inch)

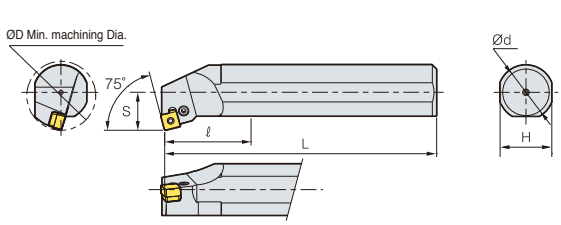
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
S32S-PDZNR/L-3-3.5N	1.575	1	1.181	8	0.866	1.181	DN□□33.5□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	–
S40T-PDZNR/L-3-3.5N	1.969	2 1/2	1.496	12	1.063	1.969							

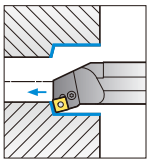
Applicable inserts **B101**

PSKNR/L



SN□□





75°

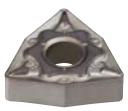
• R type insert

(inch)

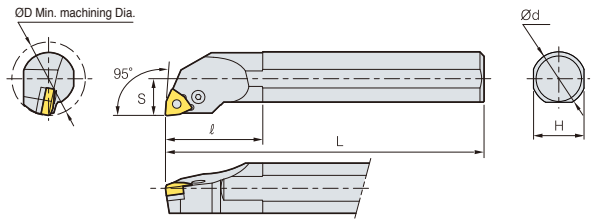
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
S25R-PSKNR/L-3-3N	1.260	1	0.906	8	0.669	1.260	SN□□33□□	LV3B	VHX0512B	–	–	HW20L	–
S32S-PSKNR/L-3-3N	1.575	2	1.181	10	0.866	1.260		LV3N	VHX0617N	SS32N	–	HW25L	–

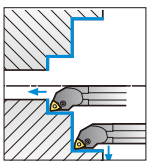
Applicable inserts **B101**

PWLNR/L



WN□□





95°

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
S12S-PWLNR/L3	0.930	3/4	0.671	10	0.500	1.574	WN□□33□□	LV3B	VHX0512B	–	–	–	–
S16T-PWLNR/L3	1.200	1	0.921	12	0.640	1.575							
S20U-PWLNR/L3	1.470	1 1/4	1.171	14	0.765	1.772		LV3B	VHX0613B	SW317	SW317	HW25L	LSPS3

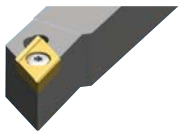
Applicable inserts **B101**

Excellent for precision machining

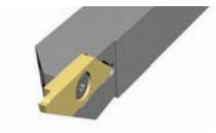
Auto Tools

- High precision machining of small parts and complex forms, etc.
- High quality products through stable machining
- Exclusive insert for automatic lathes

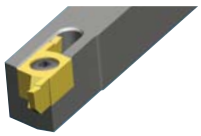
Type



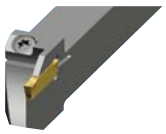
ISO



Blade



Multi utility

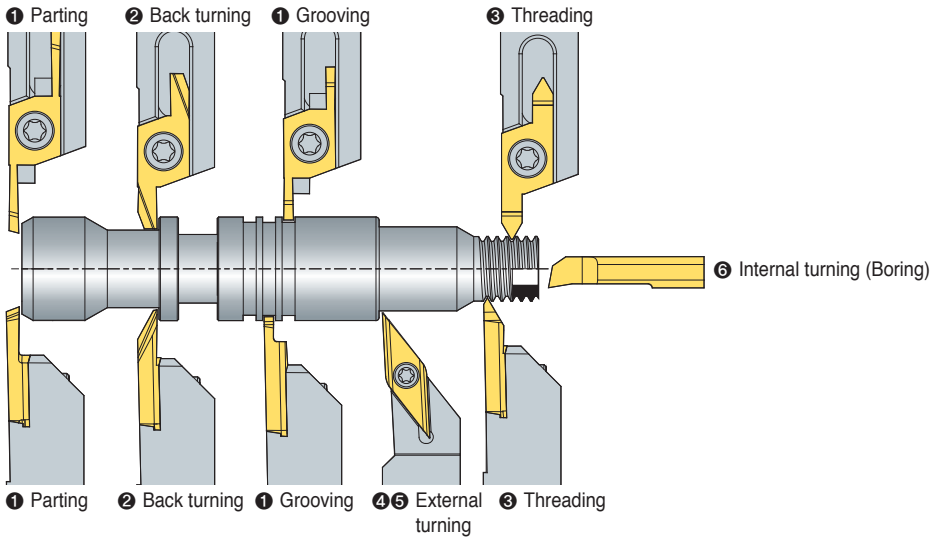


MGT

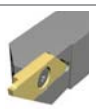
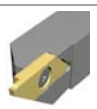


MSB tools

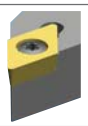
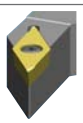
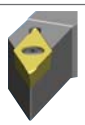
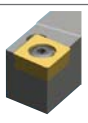
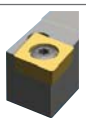
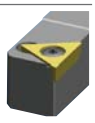
Application example



Index

Specification	❶ Parting and Grooving						❷ Back turning		
Holder	SXGNR/L	SXGNR/L	MGEHR/L	SBHR/L	SBHR/L	MGEHR/L	SXGNR/L	SXGNR/L	SBHR/L
Insert	SG	SC	MGMN	SBG	SBC	MGMN	SB	SGB	SBB
Holder size	0.39~0.79inch	0.39~0.79inch	0.39~0.63inch	0.39~0.63inch	0.39~0.63inch	0.39~0.63inch	0.39~0.79inch	0.39~0.79inch	0.39~0.63inch
Insert shape									
Cutting width	0.04~0.12inch	0.04~0.12inch	0.06~0.10inch	0.09~0.08inch	0.09~0.08inch	0.06~0.13inch	0.08~0.16inch	0.08~0.12inch	0.13inch
ØDmax	Ø0.71	Ø0.71	Ø1.26	Ø0.63	Ø0.63	Ø1.26	Tmax 0.32	Tmax 0.34	Tmax 0.32
Page	B119	B119	B123	B116	B116	B123	B119	B119	B116

Specification	❸ Threading	
Holder	SXGNR/L	SBHR/L
Insert	ST	SBT
Holder size	0.39~0.79inch	0.39~0.63inch
Insert shape		
Screw ranges	Pitch ranges 0.02~0.06 / 0.06~0.12	Pitch ranges 0.01~0.06 / 0.04~0.08
Insert	B119	B116

Specification	❹ External turning and Copy machining				❺ External turning and Facing		
Holder	SDJCR/L	SDNCN	SVJBR/L	SVJCR/L	SCACR/L	SCLCR/L	STACR/L
Insert	DC□T	DC□T	VB□T	VC□T	CC□T	CC□T	TC□T
Holder size	0.32~0.63inch	0.32~0.63inch	0.39~0.63inch	0.39~0.63inch	0.32~0.63inch	0.32~0.63inch	0.32~0.39inch
Insert shape							
Feature	Offset "0"				Offset "0"		
Page	B109	B110	B111	B111	B109	B109	B110

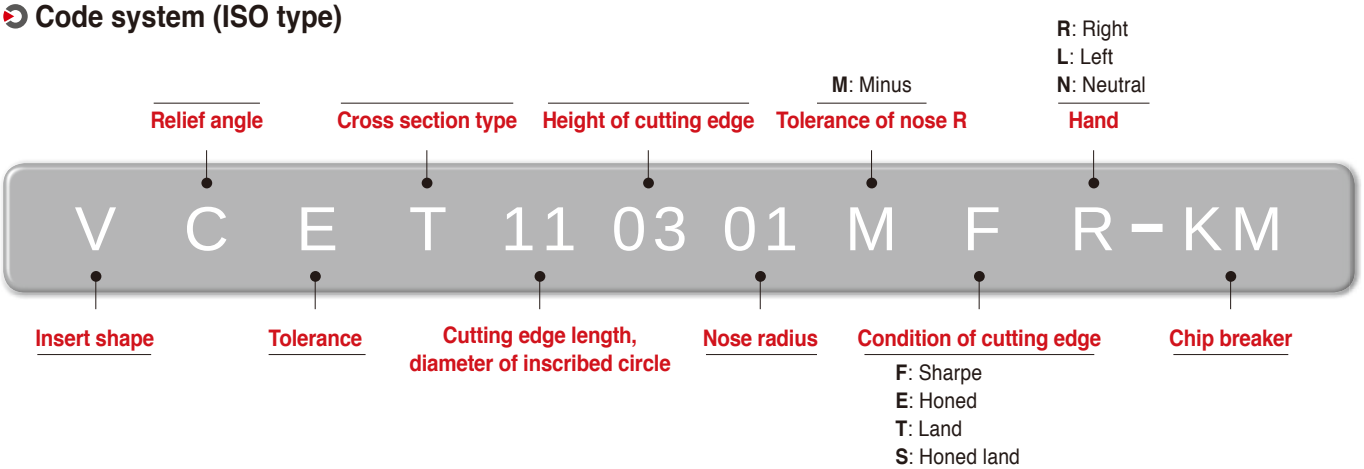
Specification	❻ Internal turning (Boring)				
Holder	SCLCR/L	STUBR/L	STUPR/L	SWUBR/L	MSB
Insert	CC□T	TB□T	TP□T	WB□T	-
Shank diameter	Ø0.16~Ø0.39	Ø0.32	Ø0.32	Ø0.20~Ø0.32	Ø0.16~Ø0.24
Insert shape					
ØDmin	Ø0.20	Ø0.32	Ø0.39	Ø0.22	Ø0.09
Page	B204	B204	B205	B206	B126~B130

Auto Tools (ISO type)

- ISO inserts for automatic lathes
- Precise R shape with the use of minus tolerance of nose R
- Tolerance class precise enough in no need for adjusting tools with the use of accurate cutting edge height
- Sharp blade for excellent chip control and surface roughness with low cutting force
- High precision tools for electrical/ electronics instruments and medical instruments



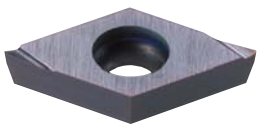
Code system (ISO type)



KF/KM chip breaker, ground type for grooving

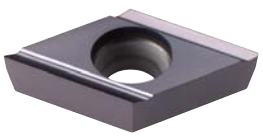
- Ground chip breaker with sharp cutting edge
- High precision insert of E-class tolerance with accurate nose radius

KF



- For finishing
- Low cutting loads with sharp cutting edges
- Longer tool life due to lower chip evacuation resistance at high speed
- Excellent surface roughness

KM



- For medium cutting to finishing
- Better chip flow due to wide chip pockets
- Longer tool life and better cutting action due to improved chip evacuation
- Excellent surface roughness

VP1 chip breaker

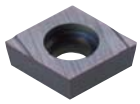
- Exclusive chip breaker for hard-to-cut materials such as titanium alloy, Inconel, stainless steel, etc.
- Minimized cutting heat by reducing contact area between chips and rake surface with the use of high positive blade

VP1

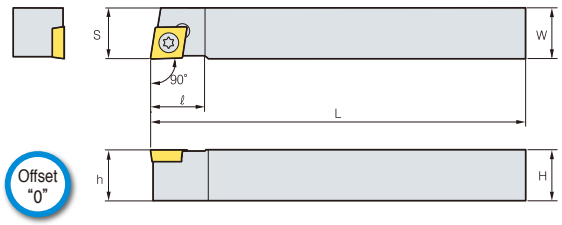


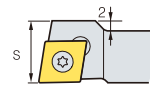
- **Sharp cutting edge**
  - Excellent chip control
  - Low cutting resistance
  - High precision machining
- **High positive angle of rake surface**
  - Chip breaking at low depth of cut
  - Stable chip control at high depth of cut
  - Wide cutting area available with the use of optimized chip breaker width according to depth of cuts

SCACR/L

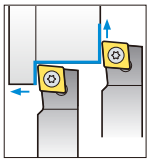


CC□T





※ Only SCACR/L06-X3A is designed as above picture.



90°

• R type insert

(inch)

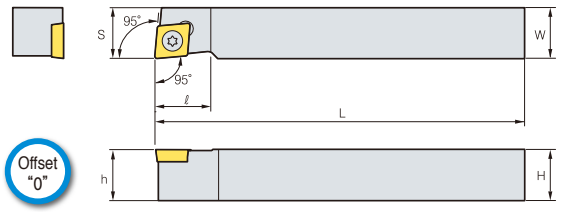
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SCACR/L	05-X2A	5/16	5/16	4 1/2	0.313	0.313	0.394	CC□T21.5□	FTKA02565	TW 07P
	06-X2A	3/8	3/8	4 1/2	0.375	0.375	0.394			
	06-X3A	3/8	3/8	4 1/2	0.500	0.500	0.512	CC□T32.5□	FTKA0410	TW 15P
	08-X3A	1/2	1/2	4 1/2	0.500	0.500	0.630			
	10-X3A	5/8	5/8	4 1/2	0.625	0.625	0.630			

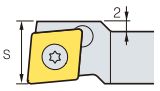
Applicable inserts **B62~B65, B87**

SCLCR/L

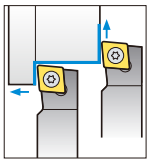


CC□T





※ Only SCLCR/L06-X3A is designed as above picture.



95°

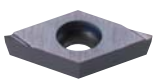
• R type insert

(inch)

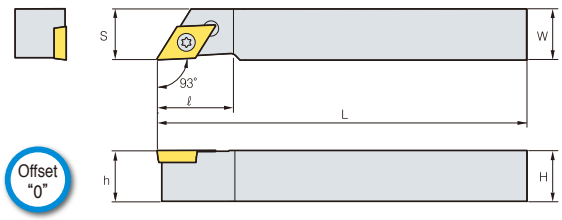
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SCLCR/L	05-X2A	5/16	5/16	4 1/2	0.313	0.313	0.394	CC□T21.5□	FTKA02565	TW 07P
	06-X2A	3/8	3/8	4 1/2	0.375	0.375	0.394			
	06-X3A	3/8	3/8	4 1/2	0.500	0.500	0.512	CC□T32.5□	FTKA0410	TW 15P
	08-X3A	1/2	1/2	4 1/2	0.500	0.500	0.630			
	10-X3A	5/8	5/8	4 1/2	0.625	0.625	0.630			

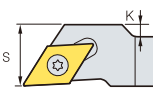
Applicable inserts **B62~B65, B87**

SDJCR/L

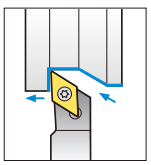


DC□T





※ Only SDJCR/L05-X2A, 1010-X11A, 1212-X11A is designed as above picture.



93°

• R type insert

(inch)

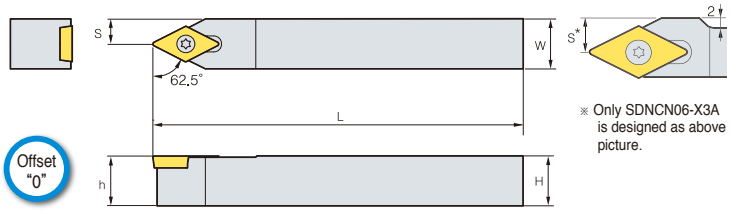
Designation		H	W	L	S	h	K	ℓ	Insert	Screw	Wrench
SDJCR/L	05-X2A	5/16	5/16	4 1/2	0.375	0.313	0.078	0.709	DC□T21.5□	FTKA02565	TW 07P
	06-X2A	3/8	3/8	4 1/2	0.375	0.375	-	0.590			
	06-X3A	3/8	3/8	4 1/2	0.550	0.375	0.157	0.709	DC□T32.5□□	FTKA0410	TW 15P
	08-X3A	1/2	1/2	4 1/2	0.550	0.500	0.078	0.709			
	10-X3A	5/8	5/8	4 1/2	0.625	0.625	-	0.866			

Applicable inserts **B67~B69, B88**

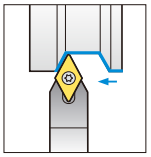
SDNCN



DC□T



※ Only SDNCN06-X3A is designed as above picture.



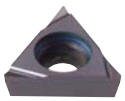
62.5°

• R type insert
(inch)

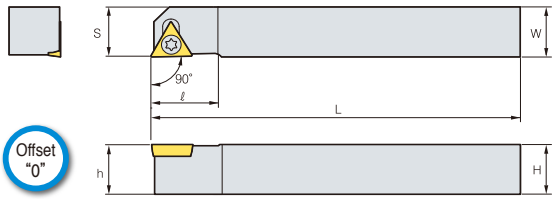
Designation		H	W	L	S	h	Insert	Screw	Wrench
SDNCN	05-X2A	5/16	5/16	4 1/2	0.125	0.313	DC□T21.5□	FTKA02565	TW 07P
	06-X2A	3/8	3/8	4 1/2	0.158	0.375			
	06-X3A	3/8	3/8	4 1/2	0.276	0.375	DC□T32.5□	FTKA0410	TW 15P
	08-X3A	1/2	1/2	4 1/2	0.250	0.500			
	10-X3A	5/8	5/8	4 1/2	0.313	0.625			

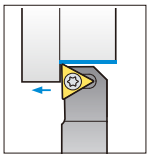
Applicable inserts **B67~B69, B88**

STACR/L



TC□T





90°

• R type insert
(inch)

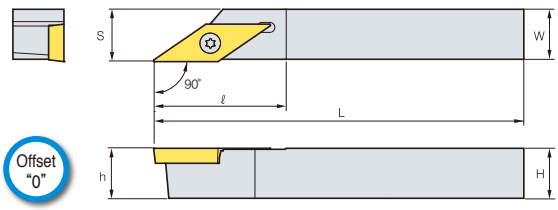
Designation		H	W	L	S	h	K	ℓ	Insert	Screw	Wrench
STACR/L	05-X1.5A	5/16	5/16	4 1/2	0.313	0.313	0.039	0.472	TC□T51.5□	FTNA 0206	TW 06P
	06-X1.5A	3/8	3/8	4 1/2	0.375	0.375	0.118	0.472			

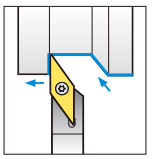
Applicable inserts **B75~B76**

SVACR/L



VC□□





90°

• R type insert
(inch)

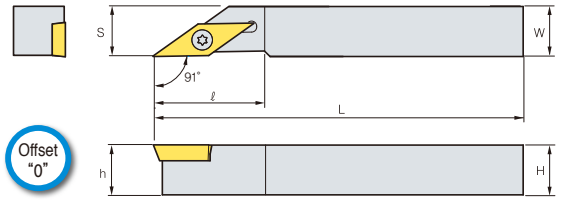
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVACR/L	05-X12C	5/16	5/16	4 1/2	0.313	0.313	1.024	VC□□X1203□□	FTKA 02565	TW 07P
	06-X12C	3/8	3/8	4 1/2	0.375	0.375	1.024			
	08-X12C	1/2	1/2	4 1/2	0.472	0.472	1.024			
	10-X12C	5/8	5/8	4 1/2	0.630	0.630	1.024			

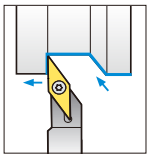
Applicable inserts **B82~B83, B93**

SVAPR/L



VP□T





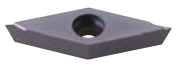
91°

• R type insert
(inch)

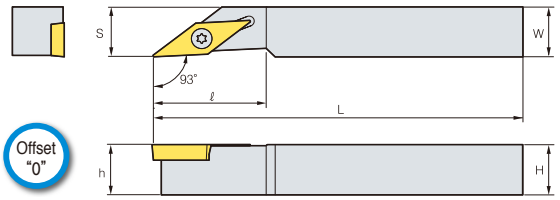
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVAPR/L	05-X2A	5/16	5/16	4 1/2	0.313	0.313	0.866	VP□T22□□	FTKA 02565	TW 07P
	06-X2A	3/8	3/8	4 1/2	0.375	0.375	0.866			
	08-X2A	1/2	1/2	4 1/2	0.472	0.472	0.866			
	10-X2A	5/8	5/8	4 1/2	0.630	0.630	0.945			

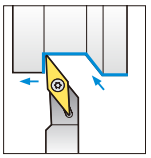
Applicable inserts **B84**

SVJBR/L



VB□T





93°

• R type insert
(inch)

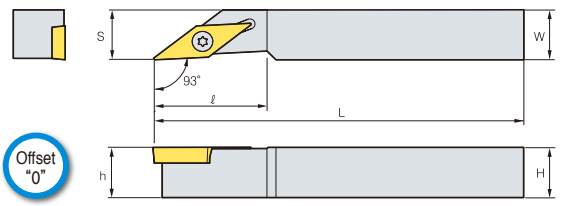
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVJBR/L	06-X2A	3/8	3/8	4 1/2	0.375	0.375	0.866	VB□T22□	FTKA 02565	TW 07P
	08-X2A	1/2	1/2	4 1/2	0.500	0.500	0.866			
	10-X2A	5/8	5/8	4 1/2	0.625	0.625	0.945			

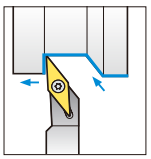
Applicable inserts **B80~B81, B92**

SVJCR/L



VC□T





93°

• R type insert
(inch)

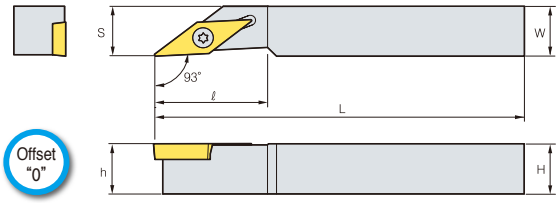
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVJCR/L	06-X2A	3/8	3/8	4 1/2	0.375	0.375	0.866	VC□T22□	FTKA 02565	TW 07P
	08-X2A	1/2	1/2	4 1/2	0.500	0.500	0.866			
	10-X2A	5/8	5/8	4 1/2	0.625	0.625	0.945			
SVJCR/L	05-X12A	5/16	3/8	4 1/2	0.313	0.313	1.024	VC□□X1203□□	FTKA 02565	TW 07P
	06-X12A	3/8	3/8	41/2	0.375	0.375	1.024			
	08-X12A	1/2	1/2	4 1/2	0.472	0.472	1.024			
	10-X12A	5/8	5/8	4 1/2	0.630	0.630	1.024			

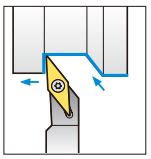
Applicable inserts **B82~B83, B93**

SVJPR/L



VP□T





93°

• R type insert

(inch)

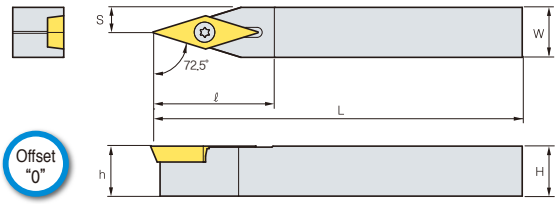
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVJPR/L	05-X2A	5/16	3/8	4 1/2	0.313	0.375	0.866	VP□T22□□	FTKA 02565	TW 07P
	06-X2A	3/8	3/8	4 1/2	0.375	0.375	0.866			
	08-X2A	1/2	1/2	4 1/2	0.472	0.472	0.866			
	10-X2A	5/8	5/8	4 1/2	0.630	0.630	0.945			

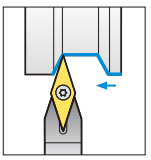
Applicable inserts **B84**

SVVPN



VP□T





72.5°

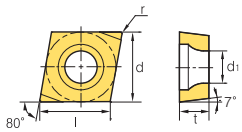
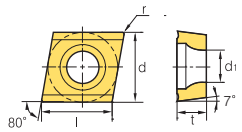
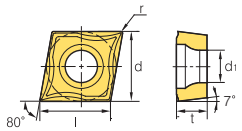
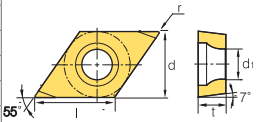
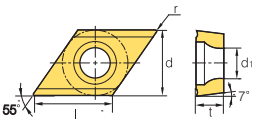
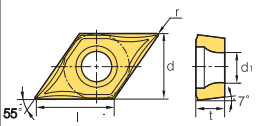
• R type insert

(inch)

Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVVPN	05-X2A	5/16	3/8	4 1/2	0.157	0.315	0.945	VP□T22 □□	FTKA 02565	TW 07P
	06-X2A	3/8	3/8	4 1/2	0.197	0.375	0.945			
	08-X2A	1/2	1/2	4 1/2	0.236	0.472	0.945			
	10-X2A	5/8	5/8	4 1/2	0.313	0.630	1.102			

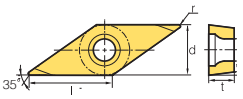
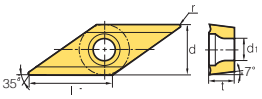
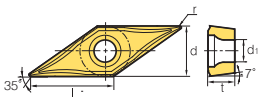
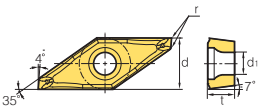
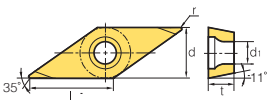
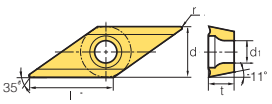
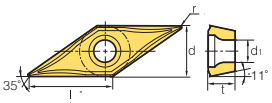
Applicable inserts **B84**

Insert

Picture	Designation	Coated				Uncoated	Dimensions (inch)					Configuration
		PC5300	PC8105	PC8110	PC8115	H01	l	d	t	r	d1	
CCET-KF Finishing (High precision)	21.5MFR-KF						0.260	1/4	3/32	1/512	7/64	
	21.50MFR-KF			●			0.252	1/4	3/32	1/256	7/64	
	21.50.5MFR-KF			●			0.244	1/4	3/32	1/128	7/64	
	32.5MFR-KF						0.386	3/8	5/32	1/512	11/64	
	32.50MFR-KF			●			0.378	3/8	5/32	1/256	11/64	
	32.50.5MFR-KF			●			0.362	3/8	5/32	1/128	11/64	
	21.5MFL-KF						0.260	1/4	3/32	1/512	7/64	
	21.50MFL-KF						0.252	1/4	3/32	1/256	7/64	
	21.50.5MFL-KF						0.244	1/4	3/32	1/128	7/64	
	32.5MFL-KF						0.386	3/8	5/32	1/512	11/64	
	32.50MFL-KF						0.378	3/8	5/32	1/256	11/64	
	32.50.5MFL-KF						0.362	3/8	5/32	1/128	11/64	
CCET-KM Medium to finishing (High precision)	21.5MFR-KM						0.260	1/4	3/32	1/512	7/64	
	21.50MFR-KM			●			0.252	1/4	3/32	1/256	7/64	
	21.50.5MFR-KM			●			0.244	1/4	3/32	1/128	7/64	
	32.5MFR-KM						0.386	3/8	5/32	1/512	11/64	
	32.50MFR-KM			●			0.378	3/8	5/32	1/256	11/64	
	32.50.5MFR-KM			●			0.362	3/8	5/32	1/128	11/64	
	21.5MFL-KM						0.260	1/4	3/32	1/512	7/64	
	21.50MFL-KM						0.252	1/4	3/32	1/256	7/64	
	21.50.5MFL-KM						0.244	1/4	3/32	1/128	7/64	
	32.5MFL-KM						0.386	3/8	5/32	1/512	11/64	
	32.50MFL-KM						0.378	3/8	5/32	1/256	11/64	
	32.50.5MFL-KM						0.362	3/8	5/32	1/128	11/64	
CCGT-VP1 Finishing (High precision)	21.50MFN-VP1			●			0.260	1/4	3/32	1/256	7/64	
	21.50.5MFN-VP1			●			0.252	1/4	3/32	1/128	7/64	
	21.51MFN-VP1			●			0.244	1/4	3/32	1/64	7/64	
	32.50MFN-VP1			●			0.386	3/8	5/32	1/256	11/64	
	32.50.5MFN-VP1			●			0.378	3/8	5/32	1/128	11/64	
	32.51MFN-VP1			●			0.362	3/8	5/32	1/64	11/64	
DCET-KF Finishing (High precision)	21.5MFR-KF						0.307	1/4	3/32	1/512	7/64	
	21.50MFR-KF			●			0.307	1/4	3/32	1/256	7/64	
	21.50.5MFR-KF			●			0.307	1/4	3/32	1/128	7/64	
	32.5MFR-KF						0.457	3/8	5/32	1/512	11/64	
	32.50MFR-KF			●			0.457	3/8	5/32	1/256	11/64	
	32.50.5MFR-KF			●			0.457	3/8	5/32	1/128	11/64	
	21.5MFL-KF						0.307	1/4	3/32	1/512	7/64	
	21.50MFL-KF			●			0.307	1/4	3/32	1/256	7/64	
	21.50.5MFL-KF						0.307	1/4	3/32	1/128	7/64	
	32.5MFL-KF						0.457	3/8	5/32	1/512	11/64	
	32.50MFL-KF						0.457	3/8	5/32	1/256	11/64	
	32.50.5MFL-KF						0.457	3/8	5/32	1/128	11/64	
DCET-KM Medium to finishing (High precision)	21.5MFR-KM						0.307	1/4	3/32	1/512	7/64	
	21.50MFR-KM			●			0.307	1/4	3/32	1/256	7/64	
	21.50.5MFR-KM			●			0.307	1/4	3/32	1/128	7/64	
	32.5MFR-KM						0.457	3/8	5/32	1/512	11/64	
	32.50MFR-KM			●			0.457	3/8	5/32	1/256	11/64	
	32.50.5MFR-KM			●			0.457	3/8	5/32	1/128	11/64	
	21.5MFL-KM						0.307	1/4	3/32	1/512	7/64	
	21.50MFL-KM						0.307	1/4	3/32	1/256	7/64	
	21.50.5MFL-KM						0.307	1/4	3/32	1/128	7/64	
	32.5MFL-KM						0.457	3/8	5/32	1/512	11/64	
	32.50MFL-KM						0.457	3/8	5/32	1/256	11/64	
	32.50.5MFL-KM						0.457	3/8	5/32	1/128	11/64	
DCGT-VP1 Finishing (High precision)	21.50MFN-VP1			●			0.307	1/4	3/32	1/256	7/64	
	21.50.5MFN-VP1			●			0.307	1/4	3/32	1/128	7/64	
	21.51MFN-VP1			●			0.307	1/4	3/32	1/64	7/64	
	32.50MFN-VP1			●			0.457	3/8	5/32	1/256	11/64	
	32.50.5MFN-VP1			●			0.457	3/8	5/32	1/128	11/64	
	32.51MFN-VP1			●			0.457	3/8	5/32	1/64	11/64	

●: Korea Stock ●: US Stock

Insert

Picture	Designation	Coated				Uncoated	Dimensions (inch)					Configuration
		PC5300	PC8105	PC8110	PC8115	H01	l	d	t	r	d1	
VCET-KF  Finishing (High precision)	22MFR-KF						0.433	1/4	1/8	1/512	7/64	
	220MFR-KF			●			0.433	1/4	1/8	1/256	7/64	
	220.5MFR-KF			●			0.433	1/4	1/8	1/128	7/64	
	22MFL-KF						0.433	1/4	1/8	1/512	7/64	
	220MFL-KF						0.433	1/4	1/8	1/256	7/64	
	220.5MFL-KF						0.433	1/4	1/8	1/128	7/64	
VCET-KM  Medium to finishing (High precision)	22MFR-KM						0.433	1/4	1/8	1/512	7/64	
	220MFR-KM			●			0.433	1/4	1/8	1/256	7/64	
	220.5MFR-KM			●			0.433	1/4	1/8	1/128	7/64	
	22MFL-KM						0.433	1/4	1/8	1/512	7/64	
	220MFL-KM						0.433	1/4	1/8	1/256	7/64	
	220.5MFL-KM						0.433	1/4	1/8	1/128	7/64	
VCGT-VP1  Finishing (High precision)	220MFN-VP1			●			0.433	1/4	1/8	1/256	7/64	
	220.5MFN-VP1			●			0.433	1/4	1/8	1/128	7/64	
	221MFN-VP1			●			0.433	1/4	1/8	1/64	7/64	
VCGX-VP1 (Chamfer type)  Finishing (High precision)	120300MFR-VP1						0.433	0.295	1/8	0.0	7/64	
	120301MFR-VP1						0.433	0.295	1/8	1/256	7/64	
	120302MFR-VP1						0.433	0.295	1/8	1/128	7/64	
	120304MFR-VP1						0.433	0.295	1/8	1/64	7/64	
	120308MFR-VP1						0.433	0.295	1/8	1/32	7/64	
VPET-KF  Finishing (High precision)	63013MFR-KF						0.315	3/16	3/32	1/512	6/64	
	630MFR-KF			●			0.315	3/16	3/32	1/256	6/64	
	630.5MFR-KF			●			0.315	3/16	3/32	1/128	6/64	
	63013MFL-KF						0.315	3/16	3/32	1/512	6/64	
	630MFL-KF						0.315	3/16	3/32	1/256	6/64	
	630.5MFL-KF						0.315	3/16	3/32	1/128	6/64	
VPET-KM  Medium to finishing (High precision)	63013MFR-KM						0.315	3/16	3/32	1/512	6/64	
	630MFR-KM			●			0.315	3/16	3/32	1/256	6/64	
	630.5MFR-KM			●			0.315	3/16	3/32	1/128	6/64	
	63013MFL-KM						0.315	3/16	3/32	1/512	6/64	
	630MFL-KM						0.315	3/16	3/32	1/256	6/64	
	630.5MFL-KM						0.315	3/16	3/32	1/128	6/64	
VPGT-VP1  Finishing (High precision)	220MFN-VP1			●			0.433	1/4	1/8	1/256	7/64	
	220.5MFN-VP1			●			0.433	1/4	1/8	1/128	7/64	
	221MFN-VP1			●			0.433	1/4	1/8	1/64	7/64	

●: Korea Stock ●: US Stock

Auto tools (Blade type) new

- Blade insert for automatic lathes
- For external machining of precise small parts
- 4 types - SSB(for back turning), SGB(for grooving), SBT(for threading), SBC(for parting off)
- Convenient use of one holder to all blade inserts
- Exclusive holder for close cutting action to the sub spindle

Code system of auto tools insert (Blade type)

Turning (Back turning)

SB	B	R	25	005
Small blade	Back turning	Hand	Length of insert	Nose radius
		R: Right L: Left		

Grooving

SB	G	R	25	20
Small blade	Grooving	Hand	Length of insert	Width of cutting edge
		R: Right L: Left		

Threading

SB	T	R	25	60	–	N	–	010
Small blade	Threading	Hand	Length of insert	Angle of thread		Hand of thread		Nose radius
		R: Right L: Left				R: Right L: Left N: Neutral		

Parting

SB	C	R	25	20	16	–	N
Small blade	Cut off / Parting	Hand	Length of insert	Width of cutting edge	Max. machining diameter		Hand of thread
		R: Right L: Left					R: Right L: Left N: None T: C/B none

Code system of auto tools holder (Blade type)

SB	H	R	10	10	–	K25	–	X
Small blade	Holder	Hand	Height of shank	Width of shank		Length of insert		Sub spindle
		R: Right L: Left						

Types of blade insert

Possible to apply various types of blade inserts to one holder



SBB: For back turning

- Approach angle: 59°
- Max. cutting depth: 0.157 inch
- Nose R: 0.002, 0.004, 0.008 inch



SBG: For grooving

- Width: 0.02~0.1 inch
- Nose R: 0.002 inch



SBT: For threading

- V profile: 60°
- Pitch: 0.008~0.04 inch
- Nose R: 0.002 inch



SBC: For cut off/Parting

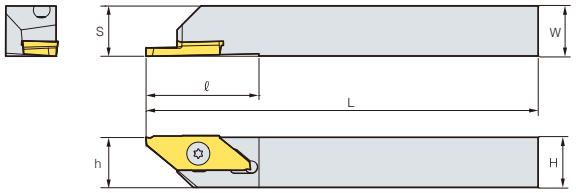
- Cutting width: 0.028~0.079 inch
- D Max.: 0.63 inch
- Nose R: 0.002 inch

SBHR/L



SBBR SBGR
SBTR SBCR

Offset "0"



(inch)

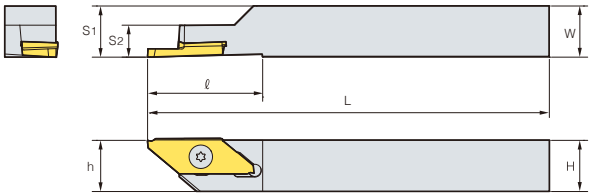
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SBHR/L	06-K25	3/8	3/8	4 1/2	0.394	0.394	1.063	SB□R/L25	FTKA0409S	T9
	08-K25	1/2	1/2	4 1/2	0.472	0.472	1.063			
	10-K25	5/8	5/8	4 1/2	0.63	0.63	1.063			

SBHR/L-X (sub spindle)



SBBR SBGR
SBTR SBCR

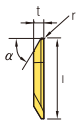
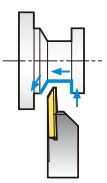
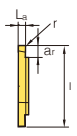
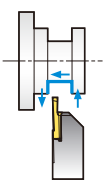
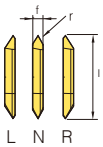
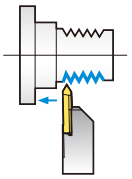
Offset "0"



(inch)

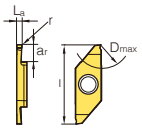
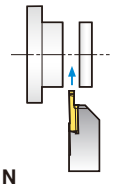
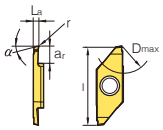
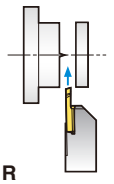
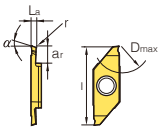
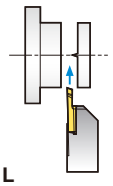
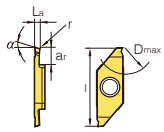
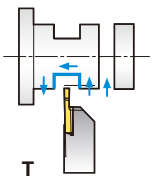
Designation		H	W	L	S1	S2	h	ℓ	Insert	Screw	Wrench
SBHR/L	06-K25-X	3/8	3/8	4 1/2	0.394	0.295	0.394	1.063	SB□R/L25	FTKA0407S	T9
	08-K25-X	1/2	1/2	4 1/2	0.472	0.295	0.472	1.063			

Insert

Application	Picture	Designation		Coated PC8110 R	Coated PC8110 L	Dimensions (inch) l	α	t	r	La	ar	f	D-MAX	Pitch range Min.	Pitch range Max.	Configuration	Feed direction
Back turning	 SBBR/L	SBBR/L	25005	●		0.984	59°	0.125	0.002	-	-	-	-	-	-		
			25010	●		0.984	59°	0.125	0.004	-	-	-	-	-	-		
			25020	●		0.984	59°	0.125	0.008	-	-	-	-	-	-		
Grooving	 SBGR/L	SBGR/L	2505	●		0.984	0°	-	0.002	0.020	0.053	-	-	-	-		
			2510	●		0.984	0°	-	0.002	0.039	0.108	-	-	-	-		
			2515	●		0.984	0°	-	0.002	0.059	0.148	-	-	-	-		
			2520	●		0.984	0°	-	0.002	0.079	0.148	-	-	-	-		
			2525	●		0.984	0°	-	0.002	0.098	0.148	-	-	-	-		
Threading	 SBTR/L	SBTR/L	2560-N-005	●		0.984	-	-	0.002	-	-	0.063	-	0.008	0.079	 L N R	
			2560-N-010	●		0.984	-	-	0.004	-	-	0.063	-	0.039	0.079		
			2560-R-005	●		0.984	-	-	0.002	-	-	0.024	-	0.008	0.059		
			2560-R-010	●		0.984	-	-	0.004	-	-	0.024	-	0.039	0.059		
			2560-L-005	●		0.984	-	-	0.002	-	-	0.024	-	0.008	0.059		
			2560-L-010	●		0.984	-	-	0.004	-	-	0.024	-	0.039	0.059		

● : Korea Stock ● : US Stock

KGT Insert

Application	Picture	Designation		Coated PC8110 R	Coated PC8110 L	Dimensions (inch) l	α	t	r	La	ar	f	D-MAX	Pitch range Min.	Pitch range Max.	Configuration	Feed direction
Parting off	 SBCR/L	SBCR/L	250708-N	●		0.984	0°	-	0.002	0.028	0.169	-	0.315	-	-		 N
			251012-N	●		0.984	0°	-	0.002	0.039	0.248	-	0.472	-	-		
			251512-N	●		0.984	0°	-	0.002	0.059	0.248	-	0.472	-	-		
			252016-N	●		0.984	0°	-	0.002	0.079	0.335	-	0.630	-	-		
			250708-R	●		0.984	15°	-	0.002	0.028	0.169	-	0.315	-	-		 R
			251012-R	●		0.984	15°	-	0.002	0.039	0.248	-	0.472	-	-		
			251512-R	●		0.984	15°	-	0.002	0.059	0.248	-	0.472	-	-		
			252016-R	●		0.984	15°	-	0.002	0.079	0.335	-	0.630	-	-		
			250708-L	●		0.984	15°	-	0.002	0.028	0.169	-	0.315	-	-		 L
			251012-L	●		0.984	15°	-	0.002	0.039	0.248	-	0.472	-	-		
			251512-L	●		0.984	15°	-	0.002	0.059	0.248	-	0.472	-	-		
			252016-L	●		0.984	15°	-	0.002	0.079	0.335	-	0.630	-	-		
			251012-T	●		0.984	0°	-	0.002	0.039	0.248	-	0.472	-	-		 T
			251512-T	●		0.984	0°	-	0.002	0.059	0.248	-	0.472	-	-		
			252016-T	●		0.984	0°	-	0.002	0.079	0.335	-	0.630	-	-		

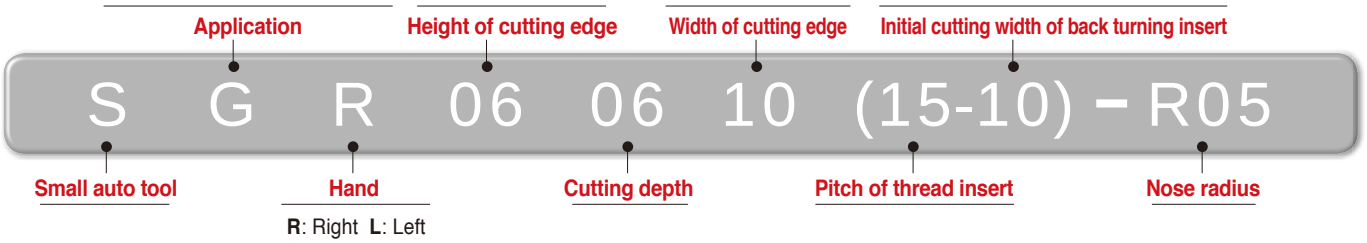
●: Korea Stock ●: US Stock

Auto tools (For multi utility)

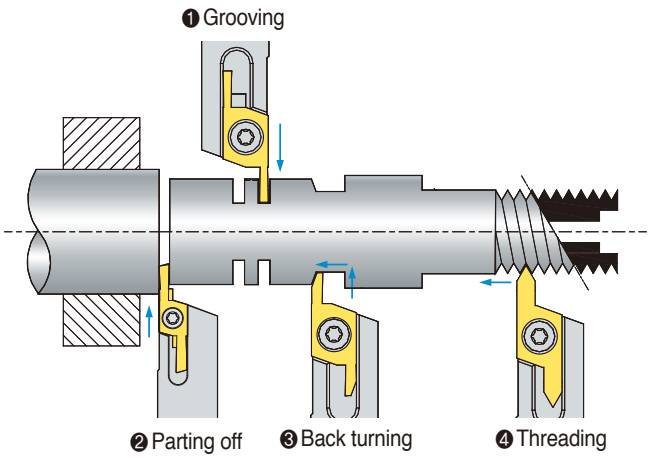
- Multifunctional insert for automatic lathes
- For external machining of precise small parts
- 5 types - SB(for back turning), SG(for grooving), ST(for threading), SC(for parting off), SGB(for grooving and back turning)
- Convenient use of one holder to all inserts
- Offset "0" to all ISO type holders

Insert code system (Multi utility type)

B: Back turning **G**: Grooving
C: Parting off **T**: Threading
GB : Grooving and back turning

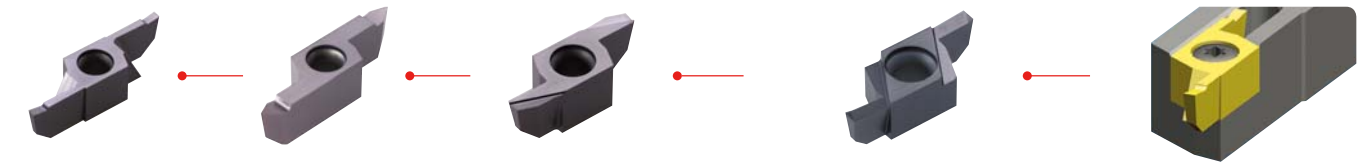


Application example



Types of multifunctional insert

Possible to apply various types of blade inserts to one holder (Ex: All designations of 06 size inserts can be applied to one 06 size holder.)

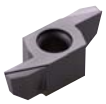


SG: Grooving | ST: Threading | SB: Back turning | SGB: Grooving and back turning | SC: Parting off

Recommended cutting conditions

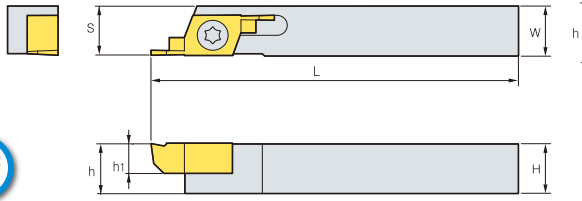
Workpiece	Turning		Grooving		Parting off		Back turning	
	Cutting speed, vc (sfm)	Feed, fn (ipr)	Cutting speed, vc (sfm)	Feed, fn (ipr)	Cutting speed, vc (sfm)	Feed, fn (ipr)	Cutting speed, vc (sfm)	Feed, fn (ipr)
Stainless steel	160~400	0.0008~0.0079	100~400	0.0008~0.0020	160~400	0.0008~0.0020	100~400	0.0008~0.0079
Carbon steel	160~490	0.0004~0.0098	160~490	0.0008~0.0031	160~490	0.0008~0.0031	160~490	0.0004~0.0098
Free cutting steel	100~490	0.0008~0.0098	100~490	0.0008~0.0031	100~490	0.0008~0.0031	100~490	0.0004~0.0098
Non-ferrous metal	230~660	0.0012~0.0098	230~660	0.0012~0.0039	230~660	0.0012~0.0039	230~660	0.0012~0.0118

SXGNR/L



SBR, SGBR
SCR, STR, SGR

Offset "0"



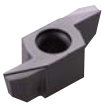
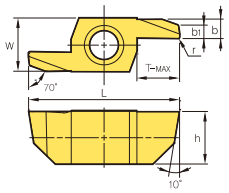
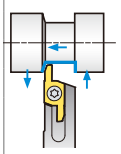
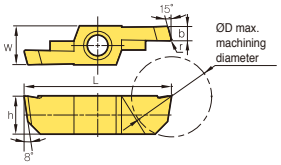
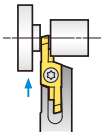
· SXGNR/L08-X8A follows the configuration above.

· R type insert

(mm)

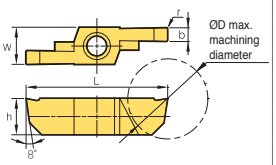
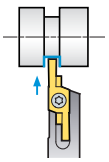
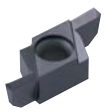
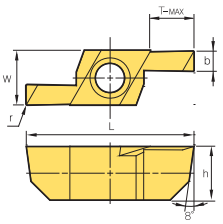
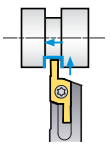
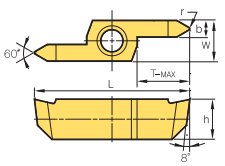
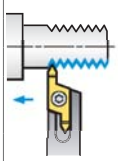
Designation		H	W	L	S	h	h1	Insert	Screw	Wrench
SXGNR/L	06-X6A	3/8	3/8	4 1/2	0.375	0.375	0.236	S□R/L06	FTNA 0408	TW 15P
	08-X6A	1/2	1/2	4 1/2	0.472	0.500	0.236			
	10-X6A	5/8	5/8	4 1/2	0.625	0.625	0.236			
	12-X6A	3/4	3/4	4 1/2	0.750	0.750	0.236			
	08-X8A	1/2	1/2	4 1/2	0.500	0.500	0.315	S□R/L08	FTNA 0411	TW 15P
	10-X8A	5/8	5/8	4 1/2	0.625	0.625	0.315			
	12-X8A	3/4	3/4	4 1/2	0.750	0.750	0.315			

Insert

Application	Picture	Designation		Coated PC9030 R	Coated PC9030 L	Dimensions (inch) b1	b	W	L	r	h	T-MAX	ØD	Configuration	Feed direction
Back turning	SBR/L 	SBR/L	060520-10-R00			0.039	0.079	0.315	0.866	S.P	0.236	0.217	-		
			060520-10-R05			0.039	0.079	0.315	0.866	0.002	0.236	0.217	-		
			060520-10-R10			0.039	0.079	0.315	0.866	0.004	0.236	0.217	-		
			060630-20-R00			0.079	0.118	0.315	0.945	S.P	0.236	0.256	-		
			060630-20-R05			0.079	0.118	0.315	0.945	0.002	0.236	0.256	-		
			060630-20-R10			0.079	0.118	0.315	0.945	0.004	0.236	0.256	-		
			080630-20-R00			0.079	0.118	0.315	0.906	S.P	0.315	0.256	-		
			080630-20-R05			0.079	0.118	0.315	0.906	0.002	0.315	0.256	-		
			080630-20-R10			0.079	0.118	0.315	0.906	0.004	0.315	0.256	-		
			080840-20-R00			0.079	0.157	0.315	1.063	S.P	0.315	0.335	-		
			080840-20-R05			0.079	0.157	0.315	1.063	0.002	0.315	0.335	-		
			080840-20-R10			0.079	0.157	0.315	1.063	0.004	0.315	0.335	-		
Parting off	SCR/L 	SCR/L	060610-R00			-	0.039	0.315	0.945	S.P	0.236	-	0.433		
			060610-R05	●		-	0.039	0.315	0.945	0.002	0.236	-	0.433		
			060610-R10	●		-	0.039	0.315	0.945	0.004	0.236	-	0.433		
			060615-R00			-	0.059	0.315	0.945	S.P	0.236	-	0.433		
			060615-R05	●		-	0.059	0.315	0.945	0.002	0.236	-	0.433		
			060615-R10	●		-	0.059	0.315	0.945	0.004	0.236	-	0.433		
			060620-R00			-	0.079	0.315	0.945	S.P	0.236	-	0.433		
			060620-R05	●		-	0.079	0.315	0.945	0.002	0.236	-	0.433		
			060620-R10	●		-	0.079	0.315	0.945	0.004	0.236	-	0.433		
			081015-R00			-	0.059	0.315	1.22	S.P	0.315	-	0.709		
			081015-R05			-	0.059	0.315	1.22	0.002	0.315	-	0.709		
			081015-R10			-	0.059	0.315	1.22	0.004	0.315	-	0.709		
			081020-R00			-	0.079	0.315	1.22	S.P	0.315	-	0.709		
			081020-R05			-	0.079	0.315	1.22	0.002	0.315	-	0.709		
			081020-R10	●		-	0.079	0.315	1.22	0.004	0.315	-	0.709		
			081025-R00			-	0.098	0.315	1.22	S.P	0.315	-	0.709		
			081025-R05	●		-	0.098	0.315	1.22	0.002	0.315	-	0.709		
			081025-R10	●		-	0.098	0.315	1.22	0.004	0.315	-	0.709		
			081030-R00			-	0.118	0.315	1.22	S.P	0.315	-	0.709		
			081030-R05	●		-	0.118	0.315	1.22	0.002	0.315	-	0.709		
			081030-R10			-	0.118	0.315	1.22	0.004	0.315	-	0.709		

● : Korea Stock ● : US Stock

Insert

Application	Picture	Designation		Coated PC9030 R	Coated PC9030 L	Dimensions (inch) b	W	L	r	h	T-MAX	ØD	Pitch	Configuration	Feed direction
Grooving	SGR/L 	SGR/L	060610-R00			0.039	0.315	0.945	S.P	0.236	-	0.433	-		
			060610-R05	●		0.039	0.315	0.945	0.002	0.236	-	0.433	-		
			060610-R10	●		0.039	0.315	0.945	0.004	0.236	-	0.433	-		
			060615-R00			0.059	0.315	0.945	S.P	0.236	-	0.433	-		
			060615-R05	●		0.059	0.315	0.945	0.002	0.236	-	0.433	-		
			060615-R10	●		0.059	0.315	0.945	0.004	0.236	-	0.433	-		
			060620-R00			0.079	0.315	0.945	S.P	0.236	-	0.433	-		
			060620-R05	●		0.079	0.315	0.945	0.002	0.236	-	0.433	-		
			060620-R10	●		0.079	0.315	0.945	0.004	0.236	-	0.433	-		
			081015-R00			0.059	0.315	1.220	S.P	0.315	-	0.709	-		
			081015-R05			0.059	0.315	1.220	0.002	0.315	-	0.709	-		
			081015-R10			0.059	0.315	1.220	0.004	0.315	-	0.709	-		
			081020-R00			0.079	0.315	1.220	S.P	0.315	-	0.709	-		
			081020-R05	●		0.079	0.315	1.220	0.002	0.315	-	0.709	-		
			081020-R10			0.079	0.315	1.220	0.004	0.315	-	0.709	-		
			081025-R00			0.098	0.315	1.220	S.P	0.315	-	0.709	-		
			081025-R05			0.098	0.315	1.220	0.002	0.315	-	0.709	-		
			081025-R10			0.098	0.315	1.220	0.004	0.315	-	0.709	-		
			081030-R00			0.118	0.315	1.220	S.P	0.315	-	0.709	-		
			081030-R05			0.118	0.315	1.220	0.002	0.315	-	0.709	-		
			081030-R10			0.118	0.315	1.220	0.004	0.315	-	0.709	-		
Grooving and back turning	SGBR/L 	SGBR/L	0604520-R00			0.079	0.315	0.866	S.P	0.236	0.217	-	-		
			0604520-R05			0.079	0.315	0.866	0.002	0.236	0.217	-	-		
			0604520-R10			0.079	0.315	0.866	0.004	0.236	0.217	-	-		
			0604525-R00			0.098	0.315	0.866	S.P	0.236	0.217	-	-		
			0604525-R05			0.098	0.315	0.866	0.002	0.236	0.217	-	-		
			0604525-R10			0.098	0.315	0.866	0.004	0.236	0.217	-	-		
			0605530-R00			0.118	0.315	0.945	S.P	0.236	0.256	-	-		
			0605530-R05			0.118	0.315	0.945	0.002	0.236	0.256	-	-		
			0605530-R10			0.118	0.315	0.945	0.004	0.236	0.256	-	-		
			0805525-R00			0.098	0.315	0.945	S.P	0.315	0.276	-	-		
			0805525-R05			0.098	0.315	0.945	0.002	0.315	0.276	-	-		
			0805525-R10			0.098	0.315	0.945	0.004	0.315	0.276	-	-		
			0806530-R00			0.118	0.315	1.024	S.P	0.315	0.315	-	-		
			0806530-R05			0.118	0.315	1.024	0.002	0.315	0.315	-	-		
			0806530-R10			0.118	0.315	1.024	0.004	0.315	0.315	-	-		
Threading	STR/L 	STR/L	06073215			0.126	0.315	0.984	0.002	0.236	0.276	-	0.5-1.5		
			06073230			0.126	0.315	0.984	0.007	0.236	0.276	-	1.5-3.0		
			08103215			0.126	0.315	1.220	0.002	0.315	0.413	-	0.5-1.5		
			08103230			0.126	0.315	1.220	0.007	0.315	0.413	-	1.5-3.0		

●: Korea Stock ●: US Stock

Auto tools (KGT/MGT type)

- Grooving insert for automatic lathes
- Exclusive holder for automatic lathes
- Economic double sided insert
- Strong clamping system secures stable machining and precision.
- A wide selection of chip breakers according to various cutting conditions such as low/high feed, continuous/interrupted machining, etc.

Insert code system (KGT/MGT type)

KG M N 300 - 04 - T

System code	Tolerance	Hand	Width of cutting edge	Corner nose radius of insert	Chip breaker
KG SYSTEM (KORLOY Grooving) MG SYSTEM (Multi Grooving)	**M**: Pressed class **G**: Ground class	**N**: Neutral **R**: Right **L**: Light **I**: Internal	0.079~0.315 inch	0.008 inch 0.012 inch 0.016 inch	L/R/T/C/ LP/RP

Holder code system (KGT/MGT type)

KG E H R/L 16 - 3 T15

System code	Application	Holder type	Hand	Shank size	Cutting width	Max. cutting diameter
KG SYSTEM (KORLOY Grooving) MG SYSTEM (Multi Grooving)	**E**: External machining **I**: Internal machining	**H**: Horizontal type **V**: Vertical type **U**: Undercut type	**R**: Right **L**: Light	Height 1 inch, width 1 inch (For internal machining: Min. machining diameter)	0.079~0.315 inch	0.315~1.417 inch

Chip breaker line-up

KGT Type

KGMN-L



- Sharp cutting edge
- For low feed machining
- For small diameter parts

KGMN-R



- Reinforced cutting edge
- For high feed machining
- For interrupted cutting

KGMN-T



- Sharp cutting edge
- Stronger chip control
- For turning and grooving

KGMR/L-LP



- Sharp cutting edge
- For low feed machining
- Small diameter component
- Right / Left handed
- Low carbon steel

KGMR/L-RP



- Strong cutting edge
- For high feed machining
- For iInterrupted cutting
- Right / Left handed

KRMN-C



- Improved chip control
- Copying
- Relief

MGT Type

MGM(G)N-M



- Easier chip control by narrowing chip width with the use of chip breaker on rake surface center
- Smooth chip flow by small dots in external machining
- Available for both external machining and grooving

MGMN-G



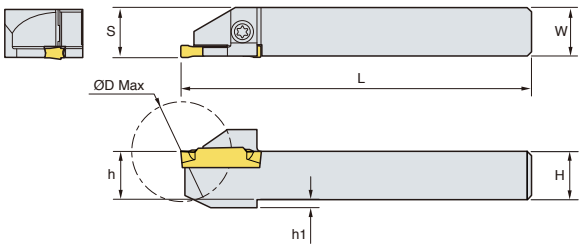
- Specially designed chip breaker allows narrower chips to promote better chip flow with the use of center dots
- Exclusive chip breaker for grooving

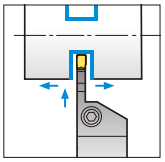
KGEHR/L-D00A

Grooving, turning, parting off



KGGN KGMN KGMR/L





• R type insert

(inch)

Designation		H = (h)	W	L	S	h1	ØD Max	Insert	Screw	Wrench
KGEHR/L	06-2-D20A	3/8	3/8	5	0.383	0.079	0.787	KGMN200-□-□ KGMR/L200-□-□ KRMN200-C KGGN200-□-□	ETNA0412	TW15L
	08-2-D25A	1/2	1/2	5	0.508	0.079	0.984			
	10-2-D32A	5/8	5/8	5	0.633	-	1.260			
	08-3-D25A	1/2	1/2	5	0.508	0.079	0.984	KGMN300-□-□ KGMR/L300-□-□ KRMN300-C KGGN200-□-□		
	10-3-D32A	5/8	5/8	5	0.633	-	1.260			

KGT Insert

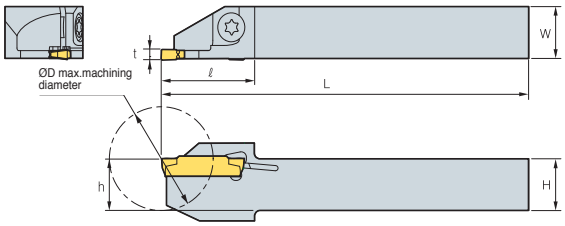
Application	Picture	Designation		Coated NC3120	NC3225	NC5330	NC6315	PC5300	PC9030	Dimensions (inch) b	r	l	d	α °	Configuration
Grooving	KGMN-L	KGMN	200-02-L		●	●		●	●	0.079	1/128	0.787	0.067	-	
			300-02-L		●	●		●	●	0.118	1/128	0.787	0.091	-	
Grooving· Parting off	KGMN-R	KGMN	200-02-R		●	●		●	●	0.079	1/128	0.787	0.067	-	
			300-02-R		●	●		●	●	0.118	1/128	0.787	0.091	-	
Grooving· turning	KGMN-T	KGMN	200-02-T		●	●	●	●	●	0.079	1/128	0.787	0.067	-	
			300-02-T		●	●	●	●	●	0.118	1/128	0.787	0.091	-	
			300-04-T		●	●	●	●	●	0.118	1/64	0.787	0.091	-	
Parting off (Right handed)	KGMR-LP	KGMR	200-6D-LP			●		●		0.079	1/128	0.787	0.067	6	
			200-15D-LP			●		●		0.079	1/128	0.787	0.067	15	
			300-6D-LP			●		●		0.118	1/128	0.787	0.091	6	
			300-15D-LP			●		●		0.118	1/128	0.787	0.091	15	
Parting off (Right handed)	KGMR-RP	KGMR	200-6D-RP			●		●		0.079	1/128	0.787	0.067	6	
			200-15D-RP			●		●		0.079	1/128	0.787	0.067	15	
			300-6D-RP			●		●		0.118	1/128	0.787	0.091	6	
			300-15D-RP			●		●		0.118	1/128	0.787	0.091	15	
Parting off (Left handed)	KGML-LP	KGML	200-6D-LP							0.079	1/128	0.787	0.067	6	
			200-15D-LP							0.079	1/128	0.787	0.067	15	
			300-6D-LP							0.118	1/128	0.787	0.091	5	
			300-15D-LP							0.118	1/128	0.787	0.091	15	
Parting off (Left handed)	KGML-RP	KGML	200-6D-RP							0.079	1/128	0.787	0.067	6	
			200-15D-RP							0.079	1/128	0.787	0.067	15	
			300-6D-RP							0.118	1/128	0.787	0.091	6	
			300-15D-RP							0.118	1/128	0.787	0.091	15	
Grooving· Turning	KRMN-C	KRMN	200-C		●	●	●	●		0.079	3/64	0.787	0.067	-	
			300-C		●	●	●	●		0.118	1/14	0.787	0.087	-	

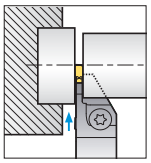
● : Korea Stock ● : US Stock

MGEHR/L



MGMN

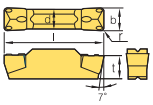
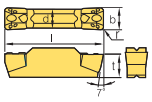




• R type insert
(inch)

Designation		ØD	H = (h)	W	L	ℓ	t	Insert	Screw	Wrench
MGEHR/L	06-X15A	0.787	3/8	3/8	4.5	0.709	0.059	MGMN150-G	ETNA 0412	TW 15L
	08-X15A	0.984	1/2	1/2	4.5	0.768	0.059			
	06-X20A	0.787	3/8	3/8	4.5	0.709	0.079	MGMN200-M MGMN200-G	ETNA 0412	TW 15L
	08-X20A	0.984	1/2	1/2	4.5	0.768	0.079			
	10-X20A	1.260	5/8	5/8	4.5	0.984	0.079			
	06-X25A	0.787	3/8	3/8	4.5	0.787	0.098	MGMN250-M MGMN250-G	ETNA 0412	TW 15L
	08-X25A	0.984	1/2	1/2	4.5	0.787	0.098			
	10-X25A	1.260	5/8	5/8	4.5	0.984	0.098			

MGT Insert

Application	Picture	Designation		Coated							Uncoated			Dimensions (inch)					Configuration
				NC3120	NC3225	NC5330	NC6315	NC3030	PC5300	PC9030	H01	G10	ST30A	b	r	l	d	t	
Grooving	MGMN-G	MGMN	150-G					●	●	●	●			0.059	0.006	0.630	0.047	0.138	
			200-G	●				●	●	●	●			0.079	0.008	0.630	0.047	0.138	
			250-G					●	●	●				0.098	0.008	0.728	0.079	0.152	
Grooving	MGMN-M	MGMN	200-M	●		●		●	●	●	●			0.079	0.008	0.630	0.047	0.138	
			250-M	●				●	●	●				0.098	0.008	0.728	0.079	0.152	

● : Korea Stock ● : US Stock

Auto tool (MSB tool)

- High hardness grade guarantees longer tool life
- Various kinds of machining (Fitting, Valve, Medical parts, Automobile component, and Semiconductor equipment) are available
- Various types of MSB tools (Boring, Grooving, Threading)

Code system

Application

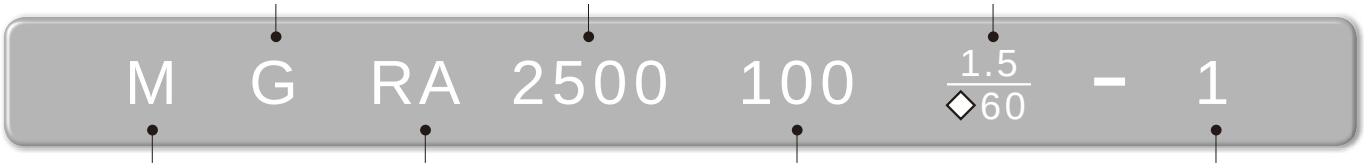
B : Boring
BC : Copying
BB : Back Boring
BF : Chamfering
G : Square Grooning
GR : Round Grooving
GF : Face Grooving
T : Threading

Shank Dia.

1250 : 0.1250
1875 : 0.1875
2500 : 0.2500
3125 : 0.3125
4375 : 0.4375

Machining size

Boring		No Code	
Copying		Width of Groove	
Threading		60°	55°
		Pitch	tpi
◇	F	0.25~1.0	72~24
	A	0.5~1.5	48~16
	AG	0.5~3.0	48~8



Type

M: Micro

Hand

RA: Right
LA: Left

Max. aspect ratio

038 : 0.38
063 : 0.63
075 : 0.75
100 : 1.00
138 : 1.38

Cutting edge

1 : Single ended
None : Double ended

MSB tool code system

Types		Application		Designation
01	Boring	Boring		MBR/L○○☆☆
02		Copying		MBCR/L○○☆☆
03		Back Boring		MBBR/L○○☆☆
04		Chamfering		MBFR/L○○☆☆
05	Grooving	Square Grooning		MGR/L○○☆☆-□□
06		Round Grooving		MGRR/L○○☆☆-□□
07		Face Grooving		MGFR/L○○00-□□
08	Threading	Partial	60°	MTR/L○○☆☆-◇60
			55°	MTR/L○○☆☆-◇55

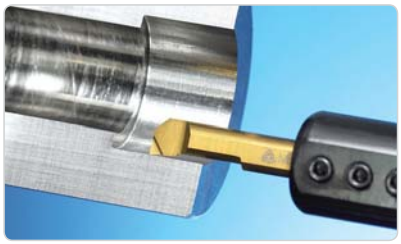
Details

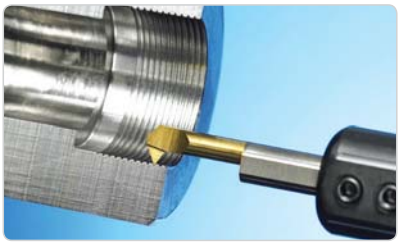
Marks	○○	Shank Dia.			
	☆☆	Max. depth of boring			
	□□	Width of groove			
	◇	Pitch / tpi	F	0.25~1.0	72~24
			A	0.5~1.5	48~16
			AG	0.5~3.0	48~8

Grades

Grades	Coating	Application and features
Z12M	Carbide	Ultra fine grain substrate ensures superior wear resistance and toughness Application: Cast iron, Aluminum alloy and Non-ferrous metals machining
PC30M	TiN coating	TiN coated ultra fine grain substrate ensures long tool life Application: Stainless steel, heat resisting alloy and hard-to-cut material machining

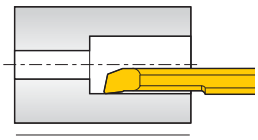
Machining types



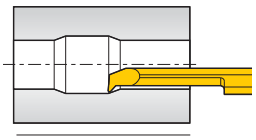


Types

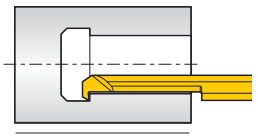
Boring



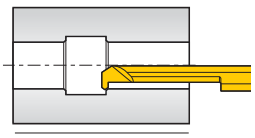
Boring
Min. dia. of machining: Ø0.13



Copying
Min. dia. of machining: Ø0.20

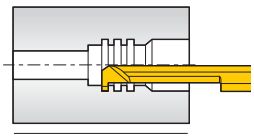


Back Boring
Min. dia. of machining: Ø0.13

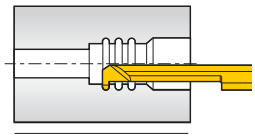


Chamfering
Min. dia. of machining: Ø0.20

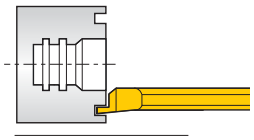
Grooving



Square Grooving
Min. dia. of machining: Ø0.13

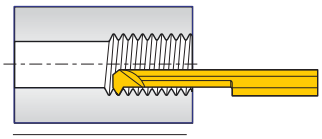


Round Grooving
Min. dia. of machining: Ø0.13



Face Grooving
Min. dia. of machining: Ø0.27

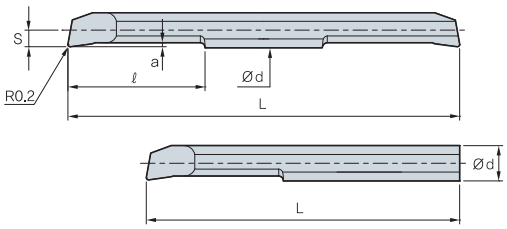
Threading

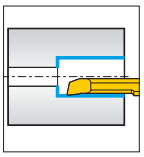


Threading
Min. dia. of machining: Ø0.13

Boring







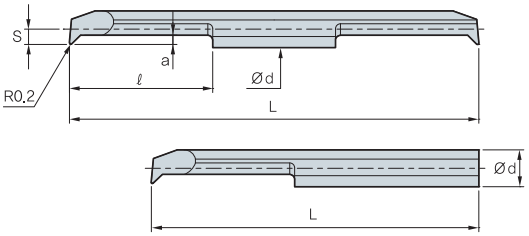
(mm)

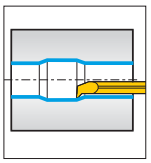
Twin Edge				Single Edge				Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge	
Designation		Coated PC30M	Uncoated Z12M	Designation		Coated PC30M	Uncoated Z12M				L		a	S
											Double ended	Single ended		
MBR	0310	●		MBR	0310-1			3.0	3.2	10	40	35	0.5	1.4
	0315	●			0315-1					15	50	45		
	0410	●			0410-1			4.0	4.2	10	40	35	0.6	1.9
	0415	●			0415-1					15	50	45		
	0420	●			0420-1					20	60	50		
	0610				0610-1			6.0	6.2	10	45	40	0.75	2.9
	0615	●			0615-1					15	55	45		
	0620	●			0620-1					20	65	50		
	0810				0810-1			8.0	8.2	10	50	45	0.8	3.9
	0820	●			0820-1					20	70	60		
	0830				0830-1					30	80	70		
	1015				1015-1			10.0	10.2	15	60	60	1.0	4.9
	1025	●			1025-1					25	80	70		
	1035				1035-1					35	100	80		

●: Korea Stock ●: US Stock

Copying







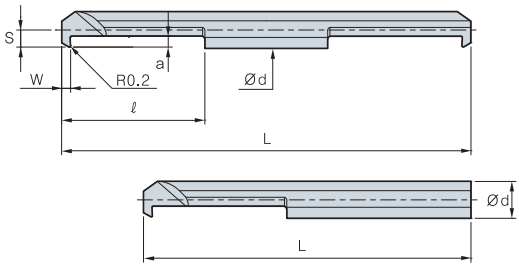
(mm)

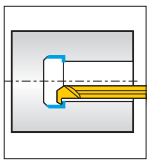
Twin Edge				Single Edge				Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge	
Designation		Coated PC30M	Uncoated Z12M	Designation		Coated PC30M	Uncoated Z12M				L		a	S
											Double ended	Single ended		
MBCR	0410			MBCR	0410-1			4.0	4.2	10	40	35	1.0	1.9
	0415	●			0415-1					15	50	45		
	0420	●			0420-1					20	60	50		
	0610				0610-1			6.0	6.2	10	45	40	1.3	2.9
	0615	●			0615-1					15	55	45		
	0620	●			0620-1					20	60	50		

●: Korea Stock ●: US Stock

Back Boring







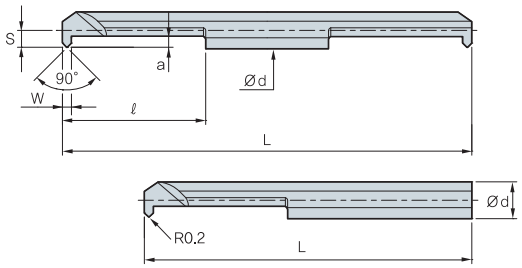
(mm)

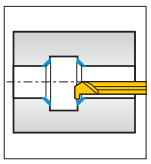
Twin Edge			Single Edge			Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge		
Designation	Coated PC30M	Uncoated Z12M	Designation	Coated PC30M	Uncoated Z12M				L		W	a	S
									Double ended	Single ended			
MBBR 0310			MBBR 0310-1			3.0	3.2	10	40	35	1.5	0.8	1.4
0315			0315-1					15	50	45			
0410			0410-1			4.0	4.2	10	40	35	2.0	1.3	1.9
0415			0415-1					15	50	45			
0420			0420-1					20	60	50			
0610			0610-1			6.0	6.2	10	45	40	2.0	1.9	2.9
0615			0615-1					15	55	45			
0620			0620-1					20	65	50			

●: Korea Stock ●: US Stock

Chamfering







(mm)

Twin Edge			Single Edge			Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge		
Designation	Coated PC30M	Uncoated Z12M	Designation	Coated PC30M	Uncoated Z12M				L		W	a	S
									Double ended	Single ended			
MBFR 0410			MBFR 0410-1			4.0	4.2	10	40	35	0.8	1.0	1.9
0415			0415-1					15	50	45			
0420			0420-1					20	60	50			
0610			0610-1			6.0	6.2	10	45	40	1.4	1.2	2.9
0615			0615-1					15	55	45			
0620			0620-1					20	65	50			

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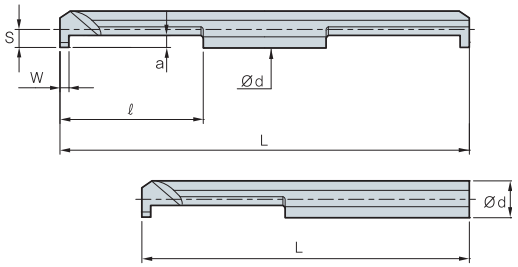
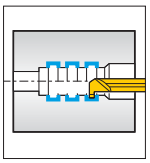
Square Grooving







(mm)

Twin Edge				Single Edge				Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge		
Designation		Coated	Uncoated	Designation		Coated	Uncoated				L		W	a	S
		PC30M	Z12M			PC30M	Z12M				Double ended	Single ended			
MGR	0310-1.0			MGR	0310-1.0-1			3.0	3.2	10	40	35	1.0	0.8	1.4
	0315-1.0				0315-1.0-1					15	50	45			
	0310-1.5				0310-1.5-1					10	40	35	1.5		
	0315-1.5				0315-1.5-1					15	50	45			
	0410-1.0				0410-1.0-1			4.0	4.2	10	40	35	1.0	1.4	1.9
	0420-1.0				0420-1.0-1					20	60	50			
	0410-1.5				0410-1.5-1					10	40	35	1.5		
	0420-1.5				0420-1.5-1					20	60	50			
	0410-2.0				0410-2.0-1					10	40	35	2.0		
	0420-2.0				0420-2.0-1					20	60	50			
	0610-1.0	●			0610-1.0-1			6.0	6.2	10	45	40	1.0	1.8	2.9
	0620-1.0	●			0620-1.0-1					20	65	50			
	0610-1.5				0610-1.5-1					10	45	40	1.5		
	0620-1.5				0620-1.5-1					20	65	50			
	0610-2.0				0610-2.0-1					10	45	40	2.0		
	0620-2.0				0620-2.0-1					20	65	50			
	0610-2.5				0610-2.5-1					10	45	40	2.5	2.0	
	0620-2.5				0620-2.5-1					20	65	50			
	0820-1.5				0820-1.5-1			8.0	8.2	20	70	60	1.5	2.5	3.9
	0820-2.0				0820-2.0-1								2.0		
	0820-2.5				0820-2.5-1								2.5	3.5	
	0820-3.0				0820-3.0-1								3.0		
	1025-1.5				1025-1.5-1			10.0	10.2	25	80	70	1.5	2.5	4.9
	1025-2.0				1025-2.0-1								2.0		
	1025-2.5				1025-2.5-1								2.5	3.5	
	1025-3.0				1025-3.0-1								3.0		

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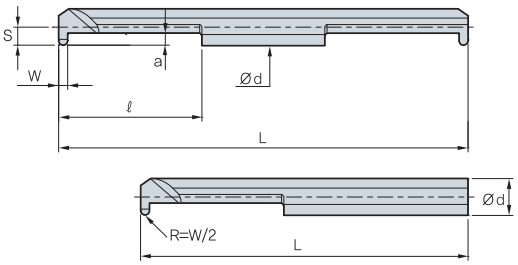
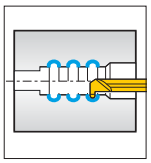
Round Grooving







(mm)

Twin Edge				Single Edge				Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge		
Designation		Coated PC30M	Uncoated Z12M	Designation		Coated PC30M	Uncoated Z12M				L		W	a	S
											Double ended	Single ended			
MGRR	0310-0.8			MGRR	0310-0.8-1			3.0	3.2	10	40	35	0.8	0.8	1.4
	0315-0.8				0315-0.8-1					15	50	45			
	0410-1.0				0410-1.0-1			4.0	4.2	10	40	35	1.0	1.0	1.9
	0420-1.0				0420-1.0-1					20	60	50			
	0610-1.0				0610-1.0-1			6.0	6.2	10	45	40	1.0	2.0	2.9
	0620-1.0				0620-1.0-1					20	65	50			
	0610-1.5				0610-1.5-1					10	45	40	1.5		
	0620-1.5				0620-1.5-1					20	65	50			
	0610-2.0				0610-2.0-1					10	45	40	2.0		
	0620-2.0				0620-2.0-1					20	65	50			
	0820-1.0				0820-1.0-1			8.0	8.2	20	70	60	1.0	2.3	3.9
	0820-1.5				0820-1.5-1								1.5		
	0820-2.0				0820-2.0-1								2.0		
	1025-1.0				1025-1.0-1			10.0	10.2	25	80	70	1.0	2.8	4.9
	1025-1.5				1025-1.5-1								1.5		
	1025-2.0				1025-2.0-1								2.0		

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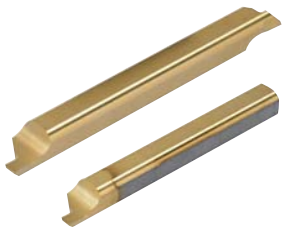
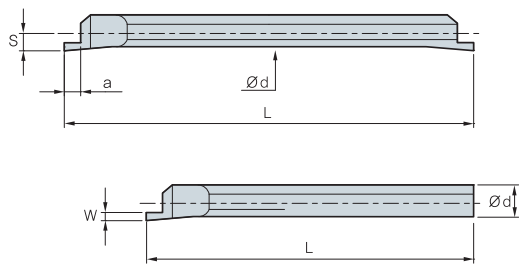
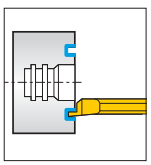
Face Grooving







(mm)

Twin Edge				Single Edge				Ød	Min.dia. of machining	Overall length		Detailed cutting edge		
Designation		Coated PC30M	Uncoated Z12M	Designation		Coated PC30M	Uncoated Z12M			L		W	a	S
										Double ended	Single ended			
MGFR	0400-1.0			MGFR	0400-1.0-1			4.0	6.0	50	45	1.0	1.5	1.8
	0400-1.5				0400-1.5-1							1.5	2.0	
	0600-1.0				0600-1.0-1			6.0	8.5	50	45	1.0	1.5	2.9
	0600-1.5				0600-1.5-1							1.5	2.0	
	0600-2.0	●			0600-2.0-1							2.0	2.5	
	0800-1.0				0800-1.0-1			8.0	10.4	70	60	1.0	1.5	3.9
	0800-1.5				0800-1.5-1							1.5	2.0	
	0800-2.0				0800-2.0-1							2.0	2.5	
	1000-2.0				1000-2.0-1			10.0	12.4	80	70	2.0	2.5	4.9
	1000-2.5				1000-2.5-1							2.5	3.0	
	1000-3.0				1000-3.0-1							3.0	3.5	
	1000-3.5				1000-3.5-1							3.5	4.0	
	1000-4.0				1000-4.0-1							4.0	4.5	
	1000-4.5				1000-4.5-1							4.5	5.0	

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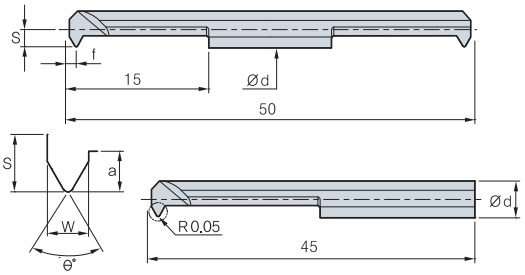
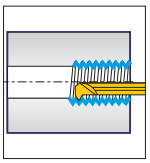
Threading







(mm)

Twin Edge				Single Edge				Ød	Min.dia. of machining	Threading			Detailed cutting edge		
Designation		Coated PC30M	Uncoated Z12M	Designation		Coated PC30M	Uncoated Z12M			W	Pitch / tpi	θ°	S	a	f
MTR	0315-F60			MTR	0315-F60-1			3.0	3.3	1.2	0.5~1.0	60°	1.45	1.2	0.6
	0415-F60				0415-F60-1			4.0	4.3				1.95		
	0615-A60				0615-A60-1			6.0	6.2	2.0	0.5~1.5		2.90	2.2	1.0
	0315-F55				0315-F55-1			3.0	3.3	1.2	48~24	55°	1.45	1.2	0.6
	0415-F55				0415-F55-1			4.0	4.3				1.95		
	0615-A55				0615-A55-1			6.0	6.2	2.0	28~16		2.90	2.2	1.0

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SLEEVE

SL (SLEEVE)

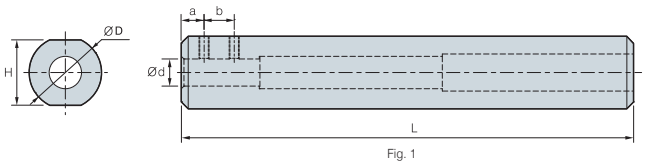


Fig. 1

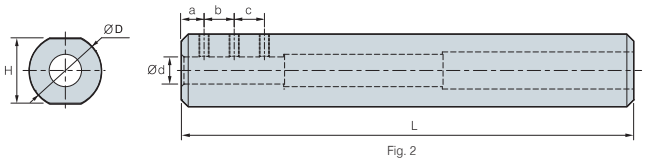


Fig. 2

(mm)

Designation	Ød	a	b	c	ØD	H	L	Screw	Wrench	Fig.
SL1603	3	5	-	-	16	14	100	M3	HW15L	1
SL1604	4	5	6	-	16	14	100	M4	HW20L	
SL1605	5	5	8	-	16	14	100	M4	HW20L	
SL1606	6	5	6	6	16	14	100	M4	HW20L	2
SL1607	7	5	6	8	16	14	100	M4	HW20L	
SL2008	8	5	10	10	20	18	100	M4	HW20L	2
SL2010	10	5	10	10	20	18	100	M5	HW20L	

※ Fine tolerance and surface roughness

Multi Turn

Holder code system

MT 20 R - 2.25D

- MT — Brand Name
- 20 — Tool Dia.
- R — Hand
- 2.25D — Aspect ratio

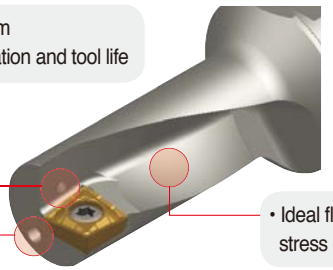
Insert code system

Q C M T 08 03 04 - CM

- Q — Insert shape
- C — Relief angle
- M — Tolerance
- T — Cross Section Type
- 08 — Cutting Edge Length
- 03 — Height of Cutting Edge
- 04 — Nose Radius
- CM — Chip Breaker

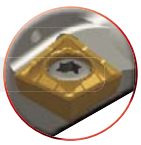
Tool design by FEM analysis

- Double coolant system
- Excellent chip evacuation and tool life

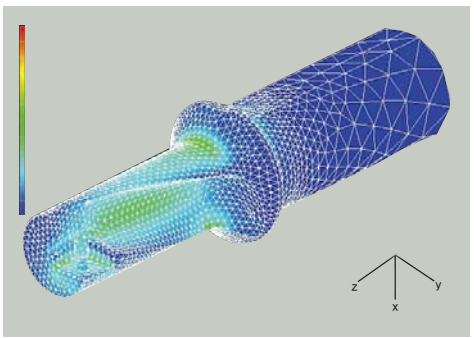


- Ideal flute design minimizing stress concentrations

※ Clamping tip



Correct: High cutting edge position
Wrong: Low cutting edge position



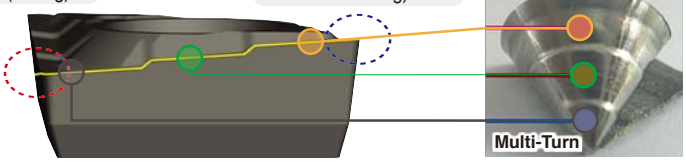
- Minimized stress during cutting, prevented damage from vibration and longer tool life

Optimized design

Creative stepping cutting edge

Drilling edge (Drilling)

Turning edge (Internal, external and face turning)





- Special chip formed by edge geometry better chip
- evacuation due to small radius width of chip curl

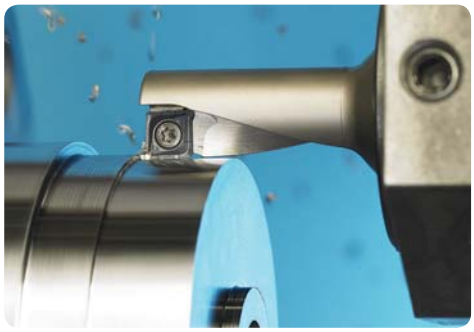




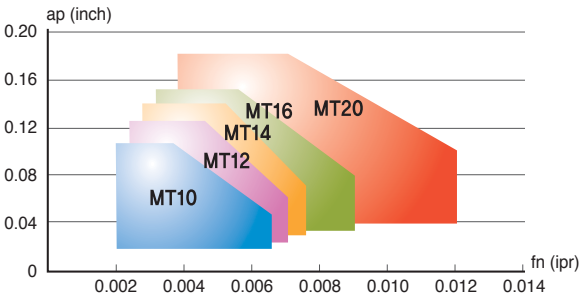
Comparison	Multi turn	Competitor A	Competitor B
Feed fn (ipr) = 0.003			
Feed fn (ipr) = 0.004			
Chip width (rate)	80%	100%	120%

User's guide

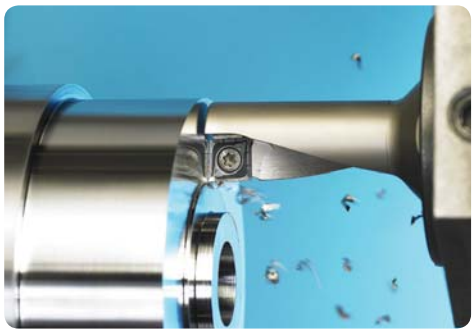
External / Internal turning



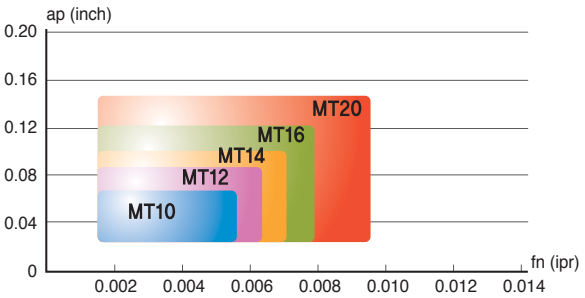
Application range



Facing



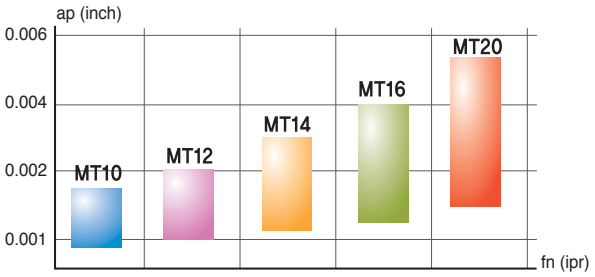
Appication ranges of facing



Drilling

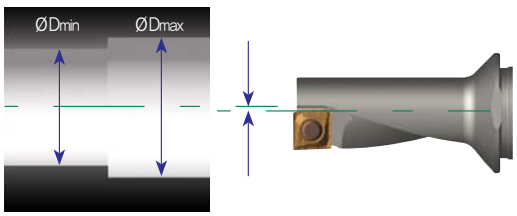


Drilling feed range by designation



Offset (Diameter compensation)

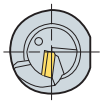
Disignation	Machined diameter (inch)	ØDmin (inch)	ØDmax (inch)
MT10R/L-2.25D	0.394	0.388	0.407
MT12R/L-2.25D	0.472	0.467	0.486
MT14R/L-2.25D	0.551	0.545	0.565
MT16R/L-2.25D	0.630	0.624	0.644
MT20R/L-2.25D	0.787	0.781	0.801
MT25R/L-2.25D	0.984	0.978	0.998
MT32R/L-2.25D	1.260	1.254	1.274

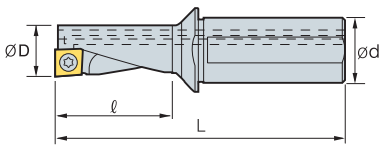


Drill diameter is adjustable by the offset compensation

MT (Multi-Turn)





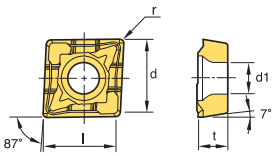
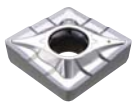
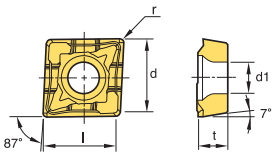


(inch)

Designation		ØD	Ød	ℓ	L	Insert	Screw	Wrench
MT	10R/L-2.25D	0.394	0.472	0.886	2.736	QC□T050204	FTNA0204S	TW06P
	12R/L-2.25D	0.472	0.630	1.063	3.071	QC□T060204	FTNA02205S	TW06P
	14R/L-2.25D	0.551	0.630	1.240	3.287	QC□T070304	FTKA02555	TW07P
	16R/L-2.25D	0.630	0.787	1.417	3.701	QC□T080304	FTNA0306	TW09P
	20R/L-2.25D	0.787	0.984	1.772	4.370	QC□T10T304	FTNA03508	TW15P
	25R/L-2.25D	0.984	1.260	2.224	5.118	QC□T130408	FTNC04509	TW20S
	32R/L-2.25D	1.260	1.575	2.835	6.229	QC□T170508	FTNC04511	TW20S

Applicable inserts **B133**

Insert

Picture	Designation		Coated				Uncoated		Dimensions (inch)					Configuration
			NC3120	NC3225	NC6315	PC5300	H01	H05	l	d	t	r	Ød1	
	QCMT	050204-CM		●	●	●			0.197	0.213	0.038	0.016	0.091	
		060204-CM		●	●	●			0.236	0.252	0.094	0.016	0.098	
		070304-CM		●	●	●			0.276	0.291	0.125	0.016	0.110	
		080304-CM		●	●	●			0.315	0.331	0.125	0.016	0.134	
		10T304-CM		●	●	●			0.394	0.409	0.156	0.016	0.157	
		130408-CM		●	●	●			0.500	0.531	0.187	0.031	0.217	
		170508-CM		●	●	●			0.657	0.689	0.219	0.031	0.217	
	QCGT	050204-CA					●		0.197	0.213	0.038	0.016	0.091	
		060204-CA					●		0.236	0.252	0.094	0.016	0.098	
		070304-CA					●		0.276	0.291	0.125	0.016	0.110	
		080304-CA					●		0.315	0.331	0.125	0.016	0.134	
		10T304-CA					●		0.394	0.409	0.156	0.016	0.157	
		130408-CA					●		0.500	0.531	0.187	0.031	0.217	
		170508-CA					●		0.657	0.689	0.219	0.031	0.217	

● : Korea Stock ● : US Stock

Bearing Solution

Holder code system

Clamping Method	Holder Style	Hand (R: Right, L: Left)	Width of Shank	Length of Holder	Application	Height of Shank	Relief Angle	Insert shape	Additional information of holder (B: Bearing)	Length of cutting edge	Minimum diameter for machining
S	R	C	P	R	25	25	B	M	16	B	D32

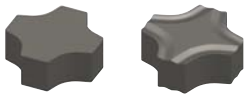
Application:
- B : Internal machining
- E : External machining
- F : Face machining
- RW : Raceway
- BS : Bearing Shield

Insert code system for race way and bearing shield machining

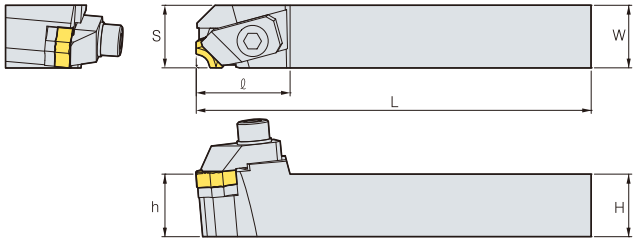
Manufacture of Bearing	Designation of Bearing	Machining type of Insert	Customer
ABC	EC6000AHL	BS	USER

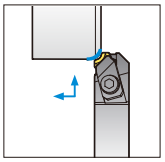


CMSN...F Type



MC12□□ MC12□□-BR
MC15□□

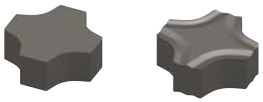




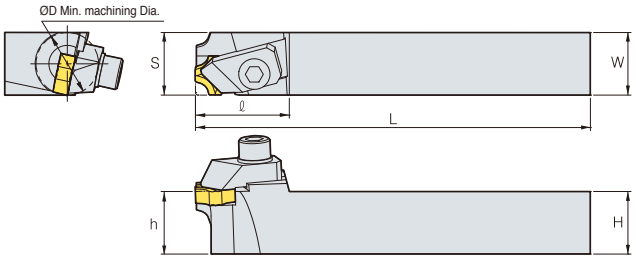
• R type insert
(mm)

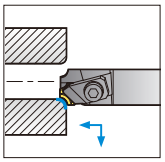
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CMSNR/L	2020B-L12F	20	20	140	21	20	33	MC12□□ MC12□□-BR	CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L
	2023B-L12F	20	23	140	24	20	33						
	2525B-L15F	25	25	140	26	25	35	MC15□□	CH6R/L1B	BHA0620	SX52CB	SS0408	HW50L

CMSN...B Type



MC12□□ MC12□□-BR

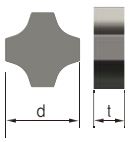
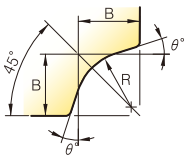
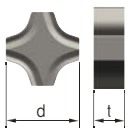




• R type insert
(mm)

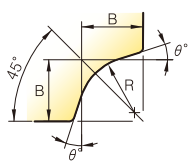
Designation		ØD	H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CMSNR/L	2020B-L12B-D28	28	20	20	140	21	20	33	MC12□□ MC12□□-BR	CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L
	2525B-L12B-D28	28	25	25	140	26	25	33		CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L
	1620B-L12B-D20	20	16	20	140	18	16	32		CH6R/L1B	BHA0620	-	-	HW50L
	2023B-L12B-D28	28	20	23	140	24	20	33		CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L

Insert

Application	Picture	Designation	Cermet	Dimensions (inch)					Configuration
			CN2000	R	θ°	B	d	t	
R-Chamfering		MC0906		0.6	12	1.8	9.525	3.18	
		MC0910		1.0	12	2.4	9.525	3.18	
		MC1206		0.6	18	1.8	12.7	4.76	
		MC1210		1.0	18	2.4	12.7	4.76	
		MC1212		1.2	18	2.2	12.7	4.76	
		MC1215		1.5	18	3.0	12.7	4.76	
		MC1220		2.0	18	3.8	12.7	4.76	
		MC1225		2.5	18	2.8	12.7	4.76	
		MC1525		2.5	18	4.0	15.875	5.56	
		MC1530		3.0	18	4.7	15.875	5.56	
		MC1540		4.0	20	4.7	15.875	5.56	
		MC1206-BR		0.6	18	1.8	12.7	4.76	
		MC1210-BR		1.0	18	2.4	12.7	4.76	
		MC1212-BR		1.2	18	2.2	12.7	4.76	
		MC1215-BR		1.5	18	3.0	12.7	4.76	
		MC1220-BR		2.0	18	3.2	12.7	4.76	
		MC1230-BR		3.0	18	3.7	12.7	4.76	
		MC1235-BR		3.5	18	3.9	12.7	4.76	

● : Korea Stock ● : US Stock

Special order-form



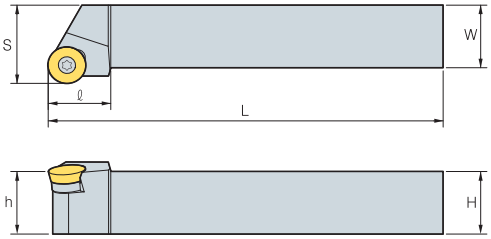
Designation	CN1000	CN2000	R	θ°	B	d	t	Configuration
MC...								

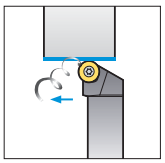
SRGP...E Type



RPGT1203M0
RPGT1604M0
RPGT2004M0







• R type insert

(mm)

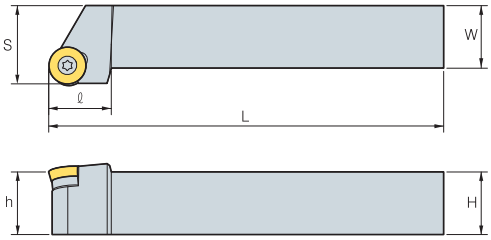
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SRGPR/L	2020B-L12E	20	20	140	25	20	20	RPGT1203M0	FTKA0410	SR1203S	SHXN0609F	TW15P
	2020B-L16E	20	20	140	25	20	20	RPGT1604M0	FTNA0513	SR16T3S	SHXN0712F	TW20P
	2525B-L20E	25	25	140	32	25	30	RPGT2004M0	FTNA0513	SR20T3S	SHXN0712F	TW20P

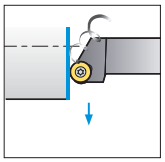
SRGP...F Type



RPGT1203M0
RPGT1604M0
RPGT2004M0







• R type insert

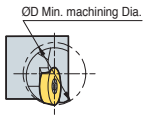
(mm)

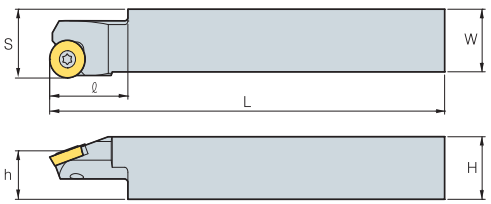
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SRGPR/L	2020B-L12F	20	20	140	25	20	20	RPGT1203M0	FTKA0410	SR1203S	SHXN0609F	TW15P
	2020B-L16F	20	20	140	25	20	20	RPGT1604M0	FTNA0513	SR16T3S	SHXN0712F	TW20P
	2525B-L20F	25	25	140	32	25	30	RPGT2004M0	FTNA0513	SR20T3S	SHXN0712F	TW20P

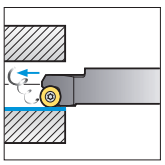
SRCP...B Type



RPGT0802M0
RPGT1203M0
RPGT1604M0







• R type insert

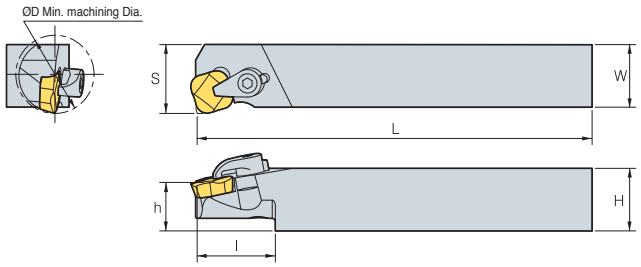
(mm)

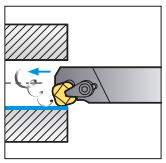
Designation		ØD	H	W	L	S	h	ℓ	Insert	Screw	Wrench
SRCPR/L	2020B-L08B-D12	12	20	20	140	21.5	15.5	25	RPGT0802M0	FTKA0305	TW09P
	1919B-L12B-D15	15	19	19	140	21	16	25	RPGT1203M0	FTNA0408	TW15P
	2020B-L12B-D20	20	20	20	140	22	15.5	25	RPGT1203M0	FTNA0408	TW15P
	2525B-L16B-D32	32	25	25	140	27	20	30	RPGT1604M0	FTKA0510	TW20P

CSKP...B Type



SPGR120440L



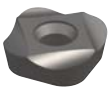


• R type insert

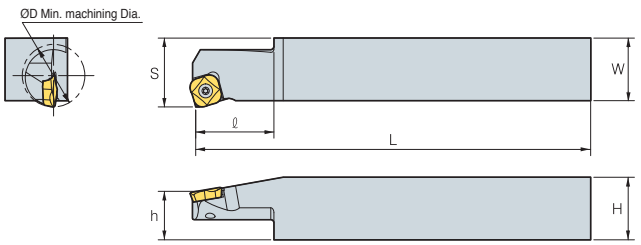
(mm)

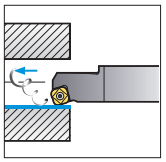
Designation		ØD	H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Wrench
CSKPR/L	2022B-L12B-D30	30	20	22	140	27	20	37	SPGR120440R/L	CH5R1	CHX0510	HW30L

SSKP...B Type



SPGH090330L



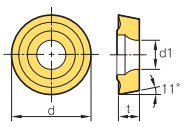
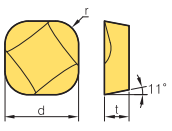
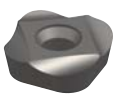
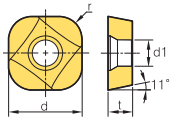


• R type insert

(mm)

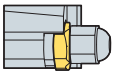
Designation		ØD	H	W	L	S	h	ℓ	Insert	Screw	Wrench
SSKPR/L	2020B-L09B-D12	12	20	20	140	21.7	19	20	SPGH090330R/L	FTNA0307	TW09P
	2020B-L09B-D13	13	20	20	140	21.7	19	20			
	2020B-L09B-D20	20	20	20	140	21.7	19	20			

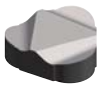
Insert

Application	Picture	Designation	Cermet	Dimensions (mm)				Configuration
			CN2000	r	d	d_1	t	
Internal turning		RPGT0802M0		-	8	3.4	2.38	
		RPGT1203M0		-	12	4.4	3.18	
		RPGT1604M0		-	16	5.5	4.76	
		RPGT2004M0		-	20	5.5	4.76	
		SPGR120440L		4.0	12..7	-	4.76	
		SPGH090330L		3.0	9.525	3.4	3.18	

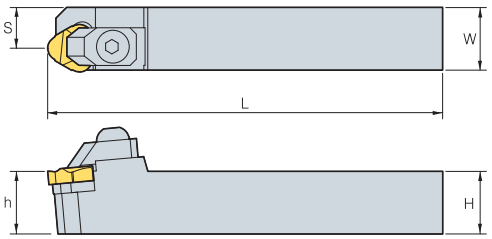
●: Korea Stock ●: US Stock

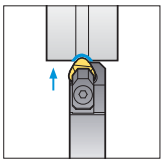
CKFN...RW Type





KORIC



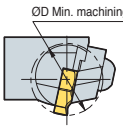


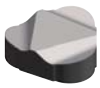
• R type insert

(mm)

Designation		H	W	L	S	h	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CKFNR/L	2020B-L22RW	20	20	140	12.5	20	KORIC2204R/L	CH6N1B	BHA0620	ST42CB	SS0408	HW50L
	2022B-L27RW	20	22	140	13	20	KORIC2704R/L	CH8R/L1B	BHA0820	ST52CB	SS0408	HW60L
	2025B-L33RW	20	25	140	16	20	KORIC3306R/L	CH8R/L1B	BHA0820	ST62CB	SS0408	HW60L
	2533B-L44RW	25	33	140	21	25	KORIC4408R/L	CH8R/L1B	BHA0820	ST82CB	SS0408	HW60L

CKGN...RW Type





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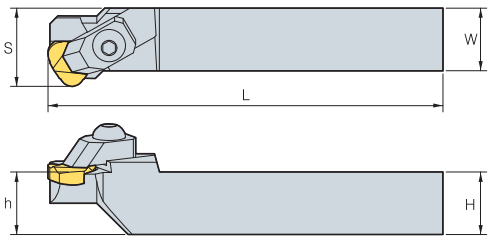
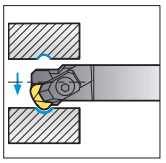


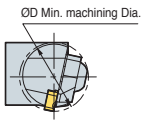


• R type insert

(mm)

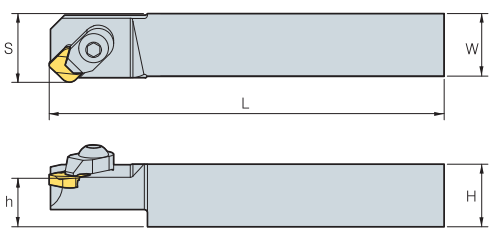
Designation		ØD	H	W	L	S	h	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CKGNR	2022B-L22RW-D23	23	20	22	140	30	20	KORIC2204R/L	CH6R/L3B	BHA0620	ST42CB	SS0408	HW50L
	2022B-L27RW-D29	29	20	22	140	34	20	KORIC2704R/L	CH6R/L7B	BHA0620	ST52CB	SS0408	HW50L
	2025B-L33RW-D38	38	20	25	140	33	20	KORIC3306R/L	CH6R/L5B	BHA0620	ST62CB	SS0408	HW50L
	2528B-L38RW-D50	50	25	28	140	46	25	KORIC3806R/L	CH8R/L2B	BHA0820	ST72CB	SS0408	HW60L
	2528B-L44RW-D52	52	25	28	140	50	25	KORIC4408R/L	CH8R/L2B	BHA0820	ST82CB	SS0408	HW60L

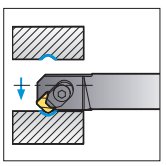
CSGN...RW Type





SNGN



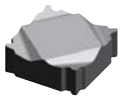


• R type insert

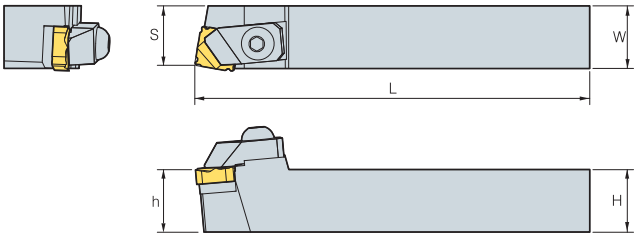
(mm)

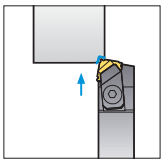
Designation		ØD	H	W	L	S	h	Insert	Clamp	Clamp Screw	Wrench
CSGNR/L	2020B-L09RW-D17	17	20	20	140	22	20	SNGN0903WR/L	CH5R1	CHX0510	HW30L
	2020B-L09RW-D22	22	20	20	140	22	20	SNGN0903WR/L	CH5R1	CHX0510	HW30L

CSBN...BS Type



SNGN

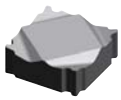




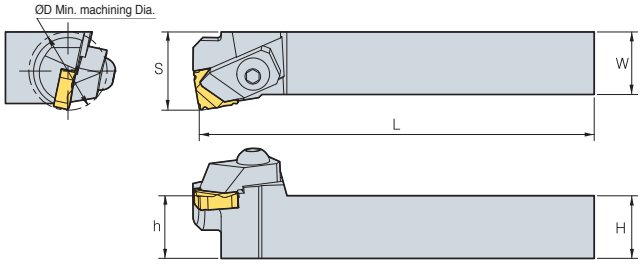
• R type insert
(mm)

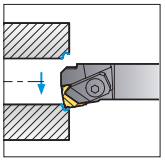
Designation		H	W	L	S	h	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CSBNR/L	2023B-L12BS	20	23	140	21	20	SNGN1204SR/L	CH6N1B	BHA0620	SS42CB	SS0308	HW50L
	2525B-L15BS	25	25	140	23	25	SNGN1504SR/L	CH6N1B	BHA0620	SS52CB	SS0408	HW50L

CSKN...BS Type



SNGN

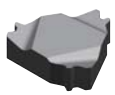




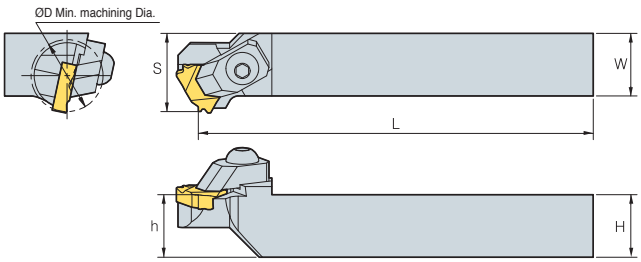
• R type insert
(mm)

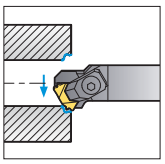
Designation		ØD	H	W	L	S	h	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CSKNR/L	1622B-L09BS-D14	14	16	22	140	16	16	SNGN0903SR/L	CH6R/L2B	BHA0620	-	-	HW50L
	2022B-L12BS-D26	26	20	22	140	27	20	SNGN1204SR/L	CH6R/L1B	BHA0620	SS42CB	SS0308	HW50L
	2525B-L15BS-D35	35	25	25	140	31	25	SNGN1504SR/L	CH6R/L3B	BHA0620	SS52CB	SS0408	HW50L

CTGN...BS Type



TNGN

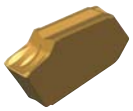




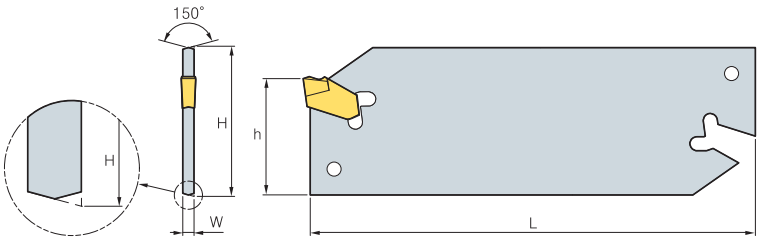
• R type insert
(mm)

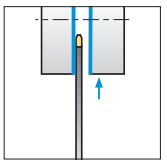
Designation		ØD	H	W	L	S	h	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CTGNR/L	2021B-K22BS-D25	25	20	21	140	30	20	TNGN2204SR/L	CH6R/L7B	BHA0620	ST42CB	SS0408	HW50L

SPB-S Type



SP

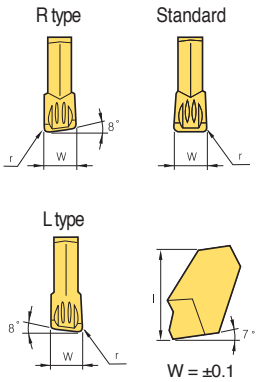




(inch)

Designation		H	W	L	h	Insert	Wrench
SPBA-S	100-S-2	1	1/16	4 3/8	0.827	SP200, 200R/L	SW15S
	100-S-3	1	3/32	4 3/8	0.827	SP300, 300R/L	
	100-S-4	1	1/8	4 3/8	0.827	SP400, 400R/L	
	100-S-5	1	5/32	4 3/8	0.827	SP500, 500R/L	
	100-S-6	1	13/64	4 3/8	0.827	SP600, 600R/L	
	125-S-2	1 1/4	1/16	6	0.984	SP200, 200R/L	
	125-S-3	1 1/4	3/32	6	0.984	SP300, 300R/L	
	125-S-4	1 1/4	1/8	6	0.984	SP400, 400R/L	
	125-S-5	1 1/4	5/32	6	0.984	SP500, 500R/L	
	125-S-6	1 1/4	13/64	6	0.984	SP600, 600R/L	

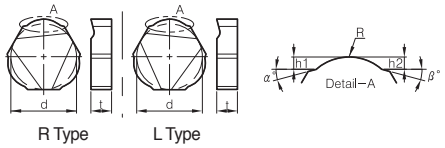
Insert

Application	Picture	Designation		Coated									Un-coated	Dimensions (inch)			Configuration
				NCM325	NC3120	NC3225	NC3030	NC5330	PC3500	PC8105	PC8110	PC5300	PC9030	ST30A	W	l	r	
Parting tools		SP	160												0.063	0.307	0.006	
			180												0.071	0.366	0.006	
			200	●			●	●			●	●	●		0.087	0.366	0.008	
			200R				●						●		0.087	0.366	0.008	
			200L										●		0.087	0.366	0.008	
			300	●	●		●	●			●	●	●	●	0.122	0.445	0.008	
			300R	●			●				●				0.122	0.445	0.008	
			300L				●								0.122	0.445	0.008	
			400	●	●		●	●			●	●	●		0.161	0.445	0.010	
			400R				●				●				0.161	0.445	0.010	
			400L				●								0.161	0.445	0.010	
			500	●			●	●			●	●			0.201	0.449	0.012	
			500R												0.201	0.449	0.012	
			500L												0.201	0.449	0.012	
			600				●	●				●			0.252	0.449	0.014	
			600R												0.252	0.449	0.014	
			600L												0.252	0.449	0.014	

●: Korea Stock ●: US Stock

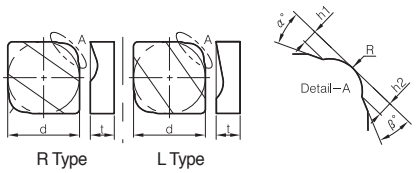
Machining Race-way

KORIC... R/L Type



		d	t	R	h1	h2	α°	β°
KORIC	2204R/L	12.7	4.76					
	2704R/L	15.875	4.76					
	3306R/L	19.05	6.0					
	3806R/L	22.225	6.0					
	4408R/L	25.4	8.0					

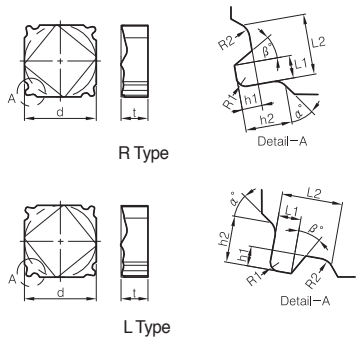
SNGN... WR/L Type



		d	t	R	h1	h2	α°	β°
SNGN	0903WR/L	9.525	3.18					
	1504WR/L	15.875	4.76					
	1905WR/L	19.05	5.56					

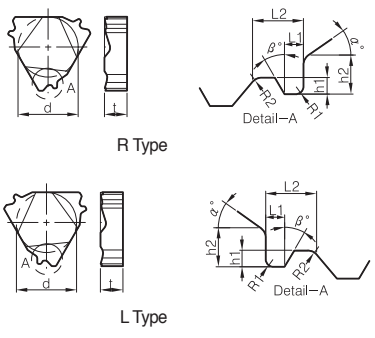
Machining for Bearing shield

KORIC... R/L Type



		d	t	L1	L2	h1	h2	R1	R2	α°	β°
SNGN	0903SR/L	9.525	3.18								
	1204SR/L	12.7	4.76								
	1504SR/L	15.875	4.76								

TNGN...SR/L Type



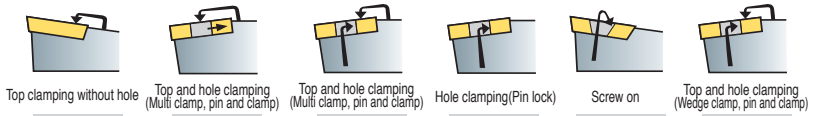
		d	t	L1	L2	h1	h2	R1	R2	α°	β°
TNGN	02204SR/L	12.7	4.76								

P S K N R 16 - 4 D

1	2	3	4	5	6	7	8
Clamping Method of Insert	Insert Shape	Holder Style	Clearance Angle of Insert	Hand	Height of Shank	Length of Insert Cutting Edge	Length of Holder

1 Clamping Method of Insert

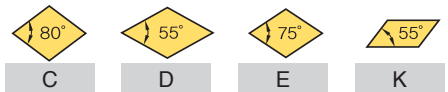
P S K N R 16 - 4 D



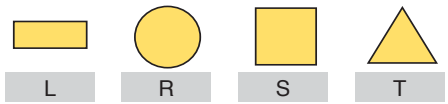
Top clamping without hole	Top and hole clamping (Multi clamp, pin and clamp)	Top and hole clamping (Multi clamp, pin and clamp)	Hole clamping(Pin lock)	Screw on	Top and hole clamping (Wedge clamp, pin and clamp)
C	D	M	P	S	W

2 Insert Shape

P S K N R 16 - 4 D



C	D	E	K



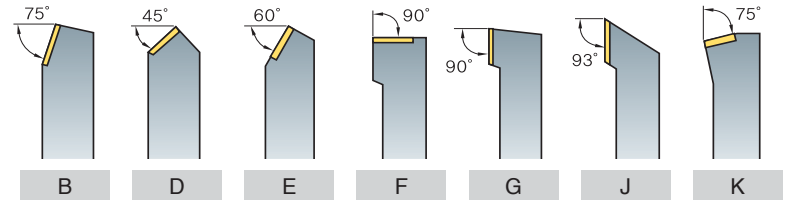
L	R	S	T



V	W

3 Holder Style

P S K N R 16 - 4 D

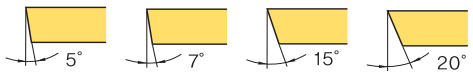


B	D	E	F	G	J	K

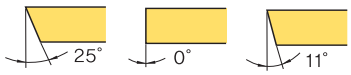
L	N	R	S	T	V	Y

4 Clearance Angle of Insert

P S K N R 16 - 4 D



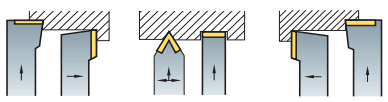
B	C	D	E
5°	7°	15°	20°



F	N	P
25°	0°	11°

5 Hand

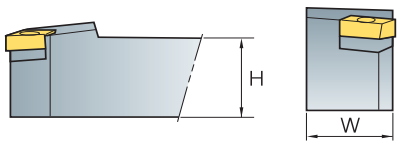
P S K N R 16 - 4 D



L	N	R

6 Height of Shank

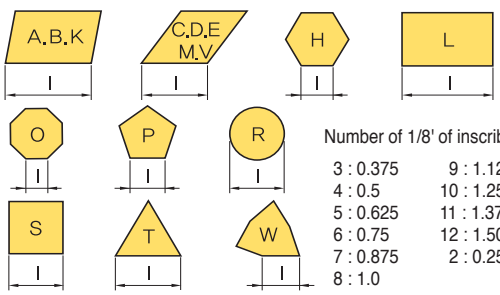
P S K N R 16 - 4 D



No.	width	Height	No.	width	Height
10	0.625	0.625	06	0.375	0.375
12	0.75	0.75	05	0.3125	0.3125
16	1.00	1.00	64	0.75	1.00
20	1.25	1.25	66	1.75	1.50
24	1.50	1.50	85	1.00	1.25
32	2.00	2.00	86	1.00	1.50
08	0.50	0.50	91	1.25	1.50

7 Length of Insert Cutting Edge

P S K N R 16 - 4 D

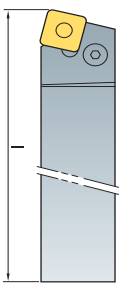


Number of 1/8' of inscribed circle

3 : 0.375	9 : 1.125
4 : 0.5	10 : 1.250
5 : 0.625	11 : 1.375
6 : 0.75	12 : 1.50
7 : 0.875	2 : 0.25
8 : 1.0	

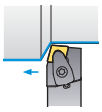
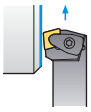
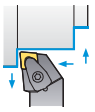
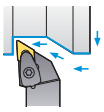
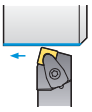
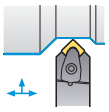
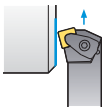
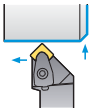
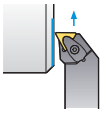
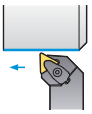
8 Length of Holder

P S K N R 16 - 4 D



A : Qualified back and end 4' long	R : Qualified back and end 6' long
B : Qualified back and end 4.5' long	S : Qualified back and end 7' long
C : Qualified back and end 5' long	T : Qualified back and end 8' long
D : Qualified back and end 6' long	G : Qualified back and end 10' long
E : Qualified back and end 7' long	H : Qualified back and end 12' long
F : Qualified back and end 8' long	I : Qualified back and end 2.5' long
M : Qualified back and end 4' long	J : Qualified back and end 2.75' long
N : Qualified back and end 4.5' long	K : Qualified back and end 3.15' long
P : Qualified back and end 5' long	x : Special

Double Clamp System

Cutting Shape										
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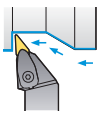
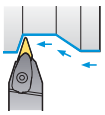
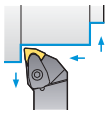
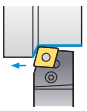
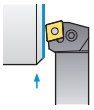
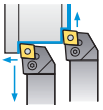
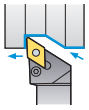
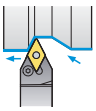
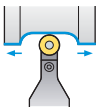
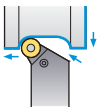
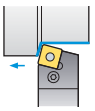
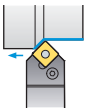
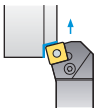
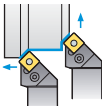
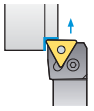
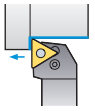
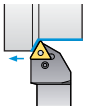
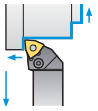
Approach angle	75°	75°	95°	93°	75°	45°	75°	45°	90°	90°
Page	B148	B148	B148	B149	B149	B150	B150	B150	B151	B151
Turning	●		●	●	●	●		●		●
Copying				●						
Facing		●	●				●	●	●	
Chamfering						●				
Back turning			●	●						

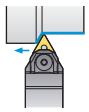
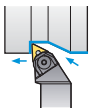
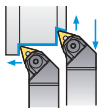
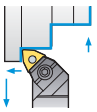
Cutting Shape			
Designation	DVJNR/L	DVVNN	DWLNR/L
Approach angle	93°	72.5°	95°
Page	B151	B152	B152
Turning	●	●	●
Copying	●	●	
Facing			●
Chamfering			
Back turning	●		●

Lever Lock System

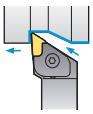
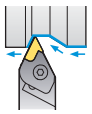
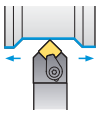
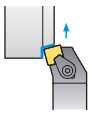
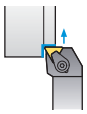
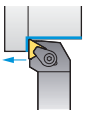
Cutting Shape										
Designation	PCBNR/L	PCKNR/L	PCLNR/L	PDJNR/L	PDNNR/L	PRDCN	PRGCR/L	PSBNR/L	PSDNN	PSKNR/L
Approach angle	75°	75°	95°	93°	62.5°	-	-	75°	45°	75°
Page	B153	B153	B154	B154	B155	B156	B156	B157	B157	B158
Turning	●	●	●	●	●	●	●	●	●	
Copying				●	●	●	●			
Facing			●							●
Chamfering										
Back turning			●	●						

Cutting Shape					
Designation	PSSNR/L	PTFNR/L	PTGNR/L	PTTNR/L	PWLNR/L
Approach angle	45°	90°	90°	60°	95°
Page	B158	B159	B159	B160	B160
Turning	●		●	●	●
Copying					
Facing	●	●			●
Chamfering				●	
Back turning					●

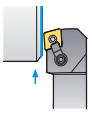
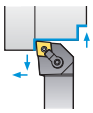
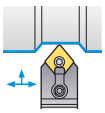
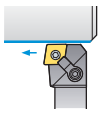
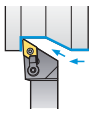
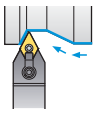
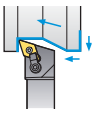
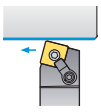
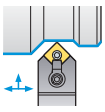
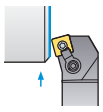
Wedge Clamp System

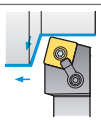
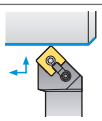
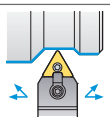
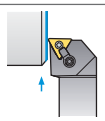
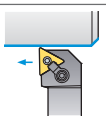
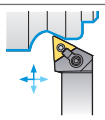
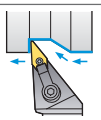
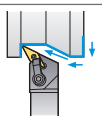
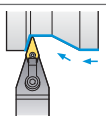
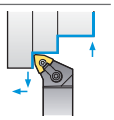
Cutting Shape										
Designation	WTENN	WTJNR/L	WTXNR/L	WWLNR/L						
Approach angle	60°	93°	105°	95°						
Page	B161	B161	B161	B162						
Turning	●	●	●	●						
Copying	●	●	●							
Facing				●						
Chamfering										
Back turning		●	●	●						

Clamp on System

Cutting Shape										
Designation	CKJNR/L	CKNNR/L	CSDPN	CSKPR/L	CTFPR/L	CTGPR/L				
Approach angle	93°	62.5°	45°	75°	90°	90°				
Page	B163	B163	B163	B164	B164	B164				
Turning	●	●	●			●				
Copying	●	●								
Facing				●	●					
Chamfering										
Back turning	●									

Multi Lock System

Cutting Shape										
Designation	MCKNR/L	MCLNR/L	MCMNN	MCRNR/L	MDJNR/L	MDNNN	MDQNR/L	MSBNR/L	MSDNN	MSKNR/L
Approach angle	75°	95°	50°	75°	93°	62.5°	107.5°	75°	45°	75°
Page	B165	B165	B165	B166	B166	B166	B167	B167	B167	B168
Turning		●	●	●	●	●	●	●	●	
Copying					●	●	●			
Facing	●	●								●
Chamfering										
Back turning		●			●		●			

Cutting Shape										
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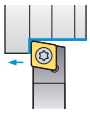
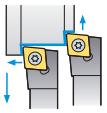
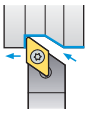
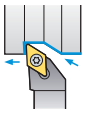
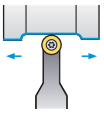
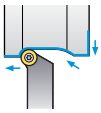
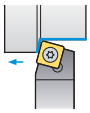
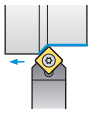
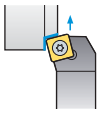
Page	B168	B169	B169	B169	B170	B170	B170	B171	B171	B171
Turning	●	●	●		●	●	●	●	●	●
Copying			●			●	●	●	●	
Facing		●		●		●				●
Chamfering										
Back turning						●	●	●		●

Screw on System

Cutting Shape										
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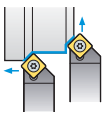
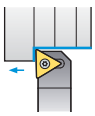
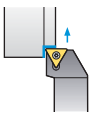
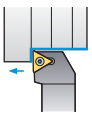
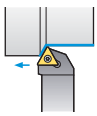
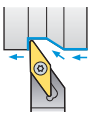
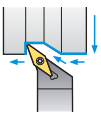
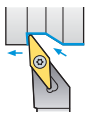
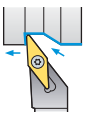
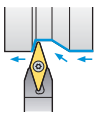
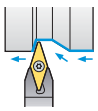
Approach angle	90°	95°	90°	93°	62.5°	-	-	75°	45°	75°
Page	B172	B172	B172	B173	B173	B173	B174	B174	B174	B175
Turning	●	●	●	●	●	●	●	●	●	
Copying			●	●	●	●	●			
Facing		●								●
Chamfering										
Back turning		●		●						

Cutting Shape										
Designation	SSSCR/L	STACR/L	STFCR/L	STGCR/L	STTCR/L	SVABR/L	SVHBR/L	SVJBR/L	SVJCR/L	SVVBN
Approach angle	45°	90°	90°	90°	60°	90°	107.5°	93°	93°	72.5°
Page	B175	B175	B176	B176	B176	B177	B177	B177	B178	B178
Turning	●	●		●	●	●	●	●	●	●
Copying						●	●	●	●	●
Facing	●		●							
Chamfering										
Back turning						●	●	●	●	

Cutting Shape										
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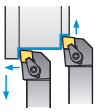
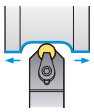
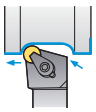
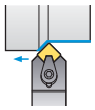
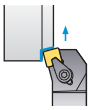
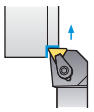
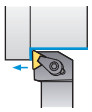
Approach angle	72.5°									
Page	B178									
Turning	●									
Copying	●									
Facing										
Chamfering										
Back turning										

Ceramic Holder

Cutting Shape										
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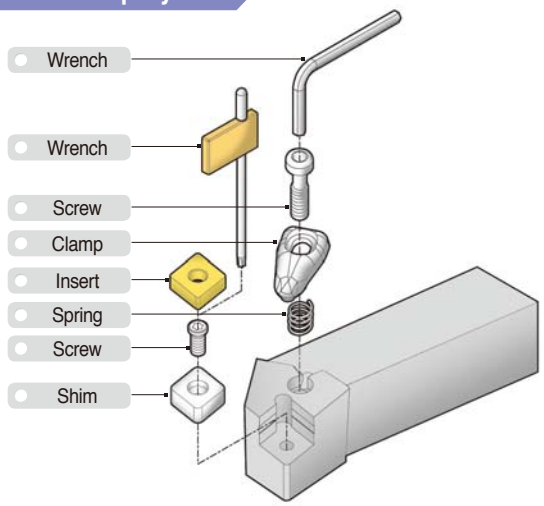
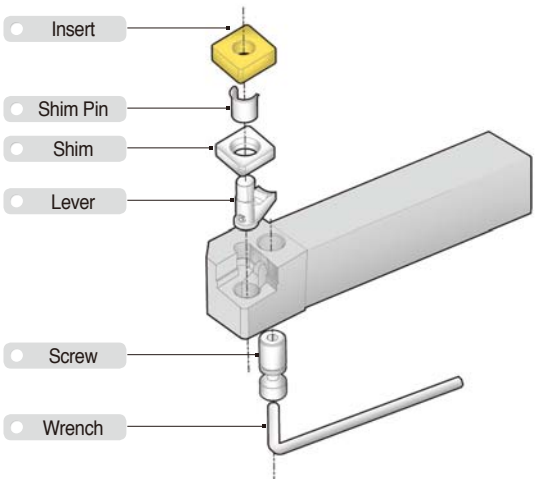
Approach angle	95°	-	-	45°	75°	90°	90°			
Page	B179	B179	B179	B179	B180	B180	B180			
Turning	●	●	●	●			●			
Copying			●							
Facing	●				●	●				
Chamfering										
Back turning	●									

Instruction of External Holder

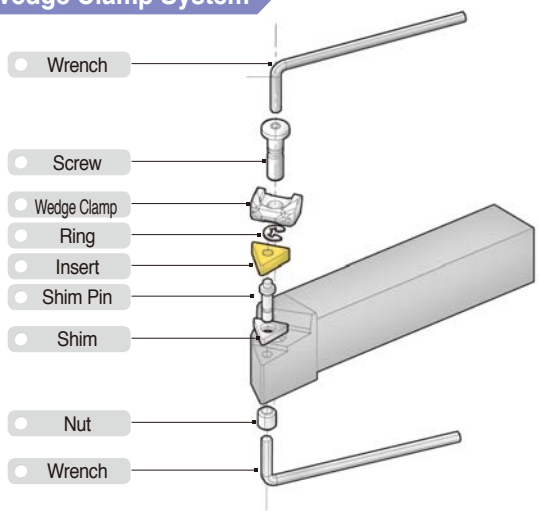
Double Clamp System



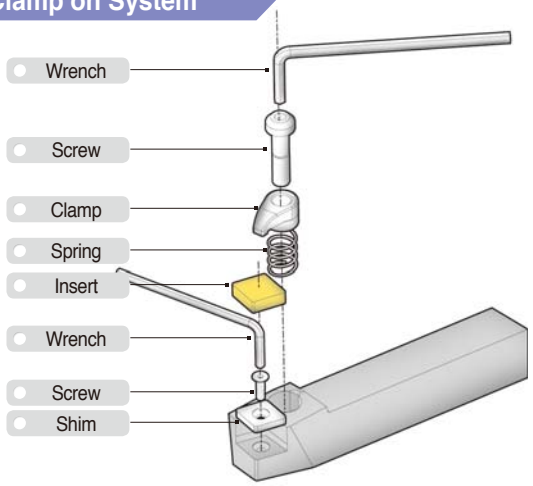
Lever Lock System



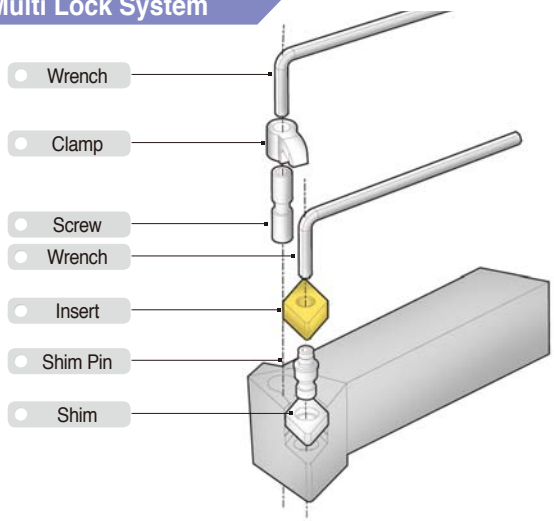
Wedge Clamp System



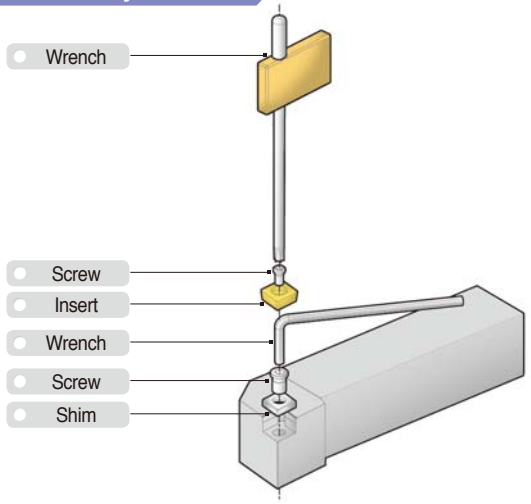
Clamp on System



Multi Lock System



Screw on System

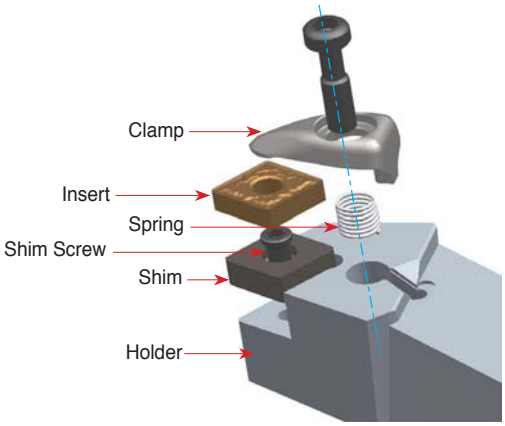


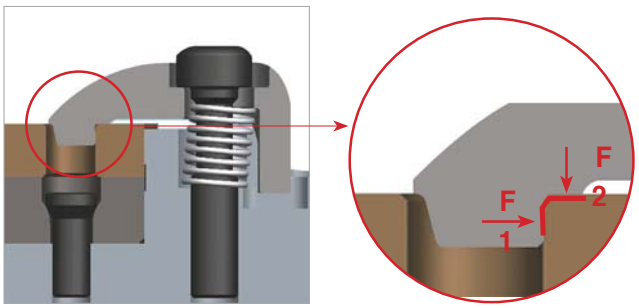
Double Clamp System

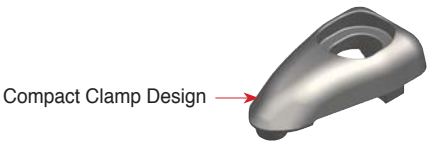
Stable clamping with double clamp system

Features

- Simple and powerful clamping system operated by only a single clamp screw
- The powerful double-clamping system (upper and internal) is suitable for machining in very tough cutting conditions
- The holder offers precision due to the special design in the rear of the clamp
- Compact and optimized design for avoiding chip interference with a powerful clamp





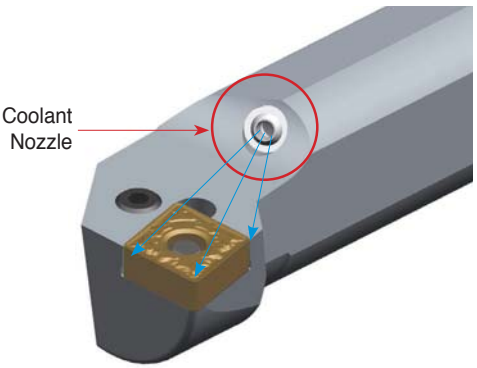


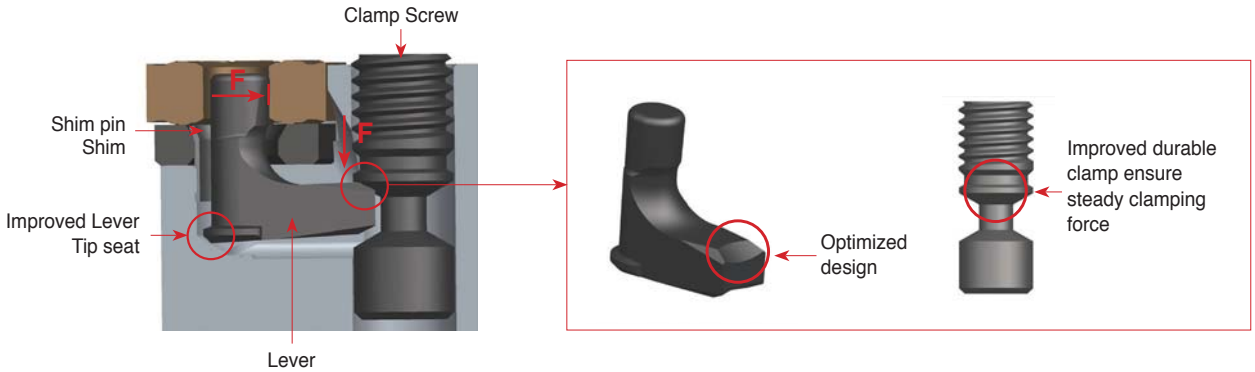
Lever Lock System

Stable clamping with double clamp system

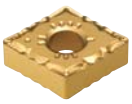
Features

- The holder offers precision due to the special design due to the improved Lever tip seat
- The durability of parts has been improved
- Superior tool life due to powerful clamping system and optimized design of part
- Part designation on holder body makes it easy to check the right part description for each product
- Adjustable coolant nozzle gives the option to change the direction of the coolant to optimize chip control and improve tool life

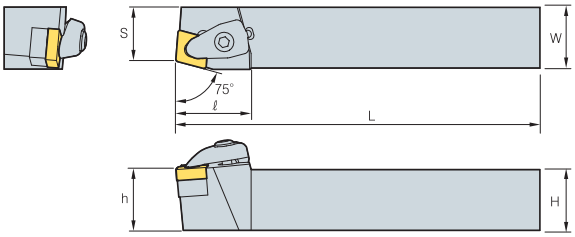


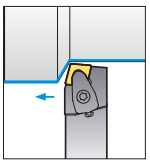


DCBNR/L



CN□□





75°

• R type insert
(inch)

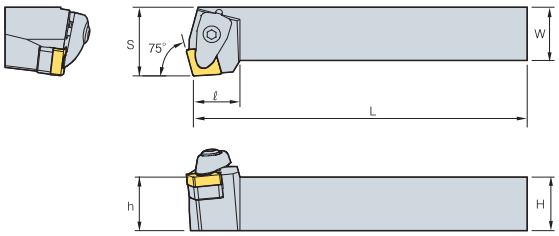
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DCBNR/L	12-4B	3/4	3/4	4 1/2	0.600	0.750	1.220	CN□□43□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	0.790	0.790	1.220							
	85-4D	1 1/4	1	6	1.250	1.063	1.220							
	16-5D	1	1	6	0.790	1.000	1.417	CN□□54□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	HW40L
	20-5D	1 1/4	1 1/4	6	0.990	1.250	1.417							
	20-6D	1 1/4	1 1/4	6	0.990	1.250	1.574	CN□□64□	CVH6	CHX0622	SC63V	FTNA0511	SPR0811	HW40L
	24-6E	1 1/2	1 1/2	7	1.186	1.500	1.574							

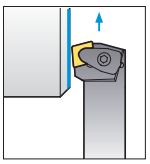
Applicable inserts **B26~B32**

DCKNR/L



CN□□





75°

• R type insert
(inch)

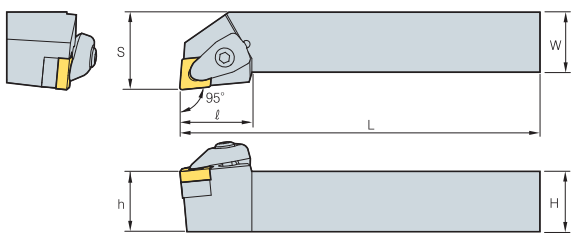
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DCKNR/L	12-4B	3/4	3/4	4 1/2	0.790	0.750	0.827	CN□□43□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	1.063	0.790	0.827							
	85-4D	1 1/4	1	6	1.063	1.063	0.827							
	20-5D	1 1/4	1 1/4	6	1.500	1.063	1.024	CN□□54□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	HW40L
	24-5D	1 1/2	1 1/2	7	2.000	1.500	1.024							

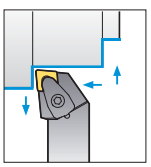
Applicable inserts **B26~B32**

DCLNR/L



CN□□





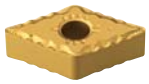
95°

• R type insert
(inch)

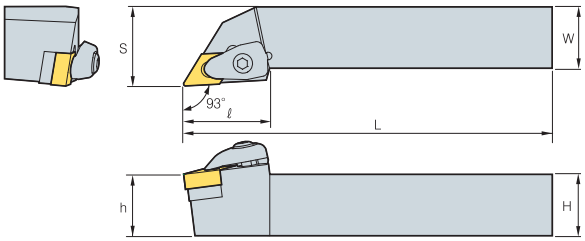
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DCLNR/L	12-3B	3/4	3/4	4/12	1.000	0.750	0.964	CN□□32□	CVH3	CHX0415	SC32V	FTKA0307	SPR0510	HW25P
	16-3D	1	1	6	1.250	1.000	0.964							
	12-4B	1	1	6	1.250	1.000	1.181	CN□□43□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	1.250	1.250	1.181							
	85-4D	1 1/4	1	6	1.500	1.250	1.181							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.181							
	16-5D	1	1	6	1.250	1.000	1.417	CN□□54□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	HW40L
	85-5D	1 1/4	1	6	1.250	1.250	1.417							
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.417							
	16-6D	1	1	6	1.250	1.000	1.575	CN□□64□	CVH6	CHX0622	SC63V	FTNA0511	SPR0811	HW40L
	85-6D	1 1/4	1	6	1.250	1.250	1.575							
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.575							
	24-6D	1 1/2	1 1/2	6	2.000	1.250	1.575							

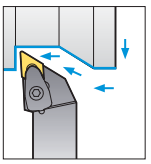
Applicable inserts **B26~B32**

DDJNR/L



DN□□





93°

• R type insert
(inch)

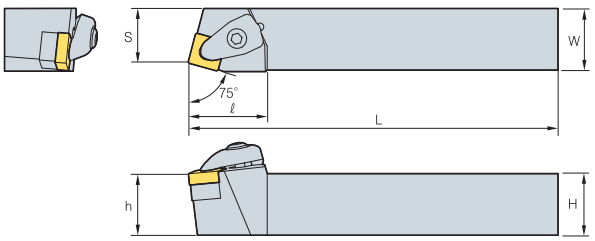
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DDJNR/L	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.181	DN□□33□	CVH3	CHX0415	15SD32V	FTKA0307	SPR0510	HW25P
	16-3D	1	1	6	1.250	1.000	1.181							
	85-3D	1 1/4	1	6	1.250	1.250	1.181							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.181							
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□44□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	1.250	1.000	1.378							
	85-4D	1 1/4	1	6	1.250	1.250	1.378							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.378							
	12-4B-3	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□43□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	HW30P
	16-4D-3	1	1	6	1.250	1.000	1.378							
	20-4D-3	1 1/4	1 1/4	6	1.500	1.250	1.378							

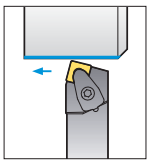
Applicable inserts **B33~B39**

DSBNR/L



SN□□





75°

• R type insert
(inch)

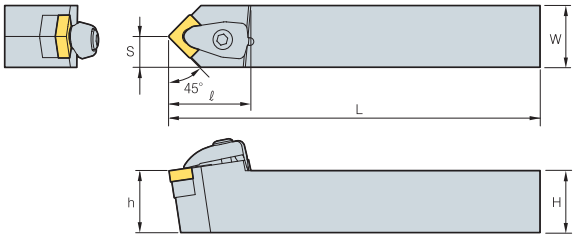
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DSBNR/L	**12-3B**	3/4	3/4	4 1/2	0.600	0.750	0.984	SN□□32□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	16-3B	1	1	6	0.790	1.000	0.984							
	12-4B	3/4	3/4	4 1/2	0.600	0.750	1.260	SN□□43□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	0.790	1.000	1.260							
	85-4D	1 1/4	1	6	0.790	1.250	1.260							
	20-4D	1 1/4	1 1/4	6	0.990	1.250	1.260							
	16-5D	1	1	6	0.790	1.000	1.496	SN□□54□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW40L
	85-5D	1 1/4	1	6	0.790	1.250	1.496							
	20-5D	1 1/4	1 1/4	6	0.990	1.250	1.496							
	20-6D	1 1/4	1 1/4	6	0.990	1.250	1.693	SN□□64□	CVH6	CHX0622	SS64V	FTNA0511	SPR0811	HW40L
	24-6E	1 1/2	1 1/2	7	1.186	1.500	1.693							

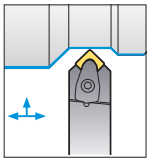
Applicable inserts **B41~B48**

DSDNN



SN□□





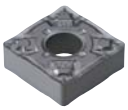
45°

• R type insert
(inch)

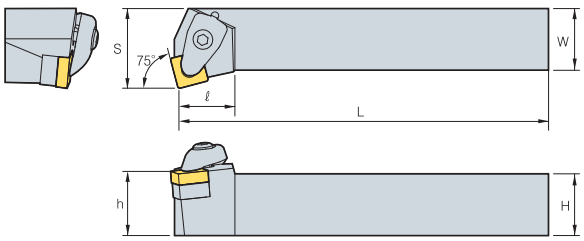
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DSDNN	12-3B	3/4	3/4	4 1/2	0.375	0.750	1.043	SN□□32□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	12-4B	3/4	3/4	4 1/2	0.375	0.750	1.299	SN□□43□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	0.500	1.000	1.299							
	85-4D	1 1/4	1	6	0.500	1.000	1.299							
	20-4D	1 1/4	1 1/4	6	0.625	1.250	1.299							
	16-5D	1 1/4	1 1/4	6	0.500	1.000	1.551	SN□□54□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW25P
	20-5D	1 1/4	1 1/4	6	0.625	1.250	1.496							
	20-6D	1 1/4	1 1/4	6	0.625	1.250	1.693	SN□□64□	CVH6	CHX0622	SS64V	FTNA0511	SPR0811	HW40L
	24-6E	1 1/2	1 1/2	7	0.750	1.500	1.771							

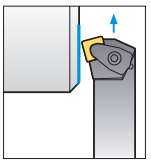
Applicable inserts **B41~B48**

DSKNR/L



SN□□





75°

• R type insert
(inch)

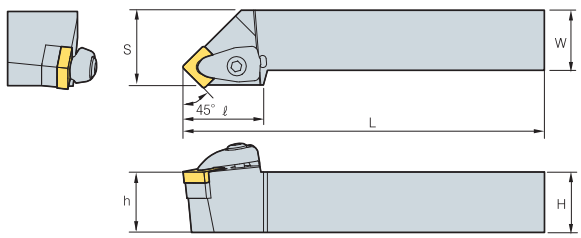
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DSKNR/L	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.787	SN□□32□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	12-4B	3/4	3/4	4 1/2	1.000	0.750	0.906	SN□□43□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	1.250	1.000	0.906							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	0.906							
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.102	SN□□54□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW40L
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.378	SN□□64□	CVH6	CHX0622	SC64V	FTNA0511	SPR0811	HW40L
	25-6E	1 1/2	1 1/2	7	2.000	1.500	1.693							

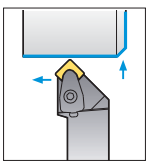
Applicable inserts **B41~B48**

DSSNR/L



SN□□





45°

• R type insert
(inch)

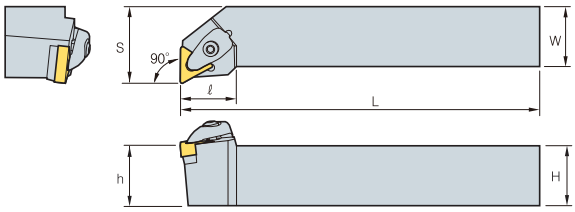
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DSSNR/L	12-3B	3/4	3/4	4 1/2	0.600	0.750	1.220	SN□□32□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	12-4B	3/4	3/4	4 1/2	0.600	0.750	1.378	SN□□43□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	0.790	1.000	1.378							
	85-4D	1 1/4	1	6	0.790	1.250	1.378							
	20-4D	1 1/4	1 1/4	6	0.990	1.250	1.378							
	16-5D	1	1	6	0.790	1.000	1.516	SN□□54□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW40L
	20-5D	1 1/4	1 1/4	6	0.990	1.250	1.516							
	20-6D	1 1/4	1 1/4	6	0.990	1.250	1.811	SN□□64□	CVH6	CHX0622	SS64V	FTNA0511	SPR0811	HW40L
	24-6E	1 1/2	1 1/2	7	1.186	1.500	1.811							

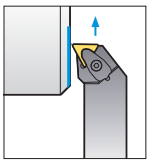
Applicable inserts **B41~B48**

DTFNR/L



TN□□





90°

• R type insert

(inch)

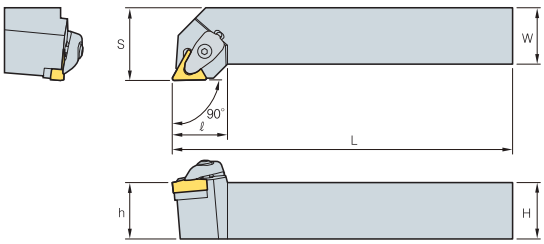
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DTFNR/L	12-3B	3/4	3/4	4 1/2	0.600	0.750	0.965	TN□□33□	CVH3	CHX0415	ST32V	FTKA0307	SPR0510	HW25P
	16-3D	1	1	6	0.790	1.000	0.965							
	20-3D	1 1/4	1 1/4	6	0.990	1.250	0.965							
	16-4D	1	1	6	0.790	1.000	1.299	TN□□43□	CVH4	CHX0518	ST44V	FTKA0410	SPR0714	HW30P
	85-4D	1 1/4	1	6	0.790	1.250	1.299							
	20-4D	1 1/4	1 1/4	6	0.990	1.250	1.299							

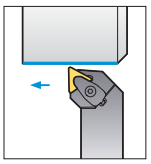
Applicable inserts **B49~B55**

DTGNR/L



TN□□





90°

• R type insert

(inch)

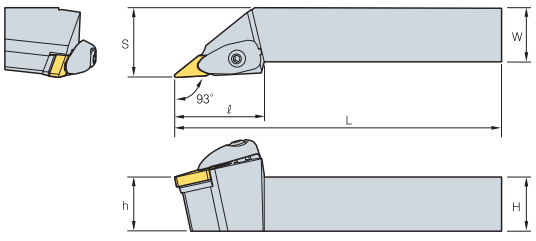
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DTGNR/L	12-3B	3/4	3/4	4 1/2	0.600	0.750	0.965	TN□□33□	CVH3	CHX0415	ST32V	FTKA0307	SPR0510	HW25P
	16-3D	1	1	6	0.790	1.000	0.965							
	20-3D	1 1/4	1 1/4	6	0.990	1.250	0.965							
	16-4D	1	1	6	0.790	1.000	1.283	TN□□43□	CVH4	CHX0518	ST44V	FTKA0410	SPR0714	HW30P
	85-4D	1 1/4	1	6	0.790	1.250	1.283							
	20-4D	1 1/4	1 1/4	6	0.990	1.250	1.283							

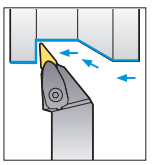
Applicable inserts **B49~B55**

DVJNR/L



VN□□





93°

• R type insert

(inch)

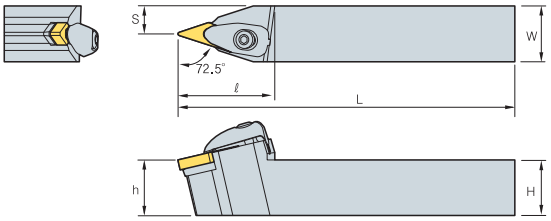
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DVJNR/L	12-3B	3/4	3/4	4 1/2	0.600	0.750	1.634	VN□□33□	CVH3V	CHX0518	SV32V	FTNA03508	SPR0714	HW30P
	16-3D	1	1	6	0.790	1.000	1.634							
	20-3D	1 1/4	1 1/4	6	0.990	1.250	1.634							

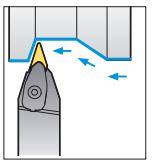
Applicable inserts **B56~B57**

DVVNN



VN□□





72.5°

• R type insert

(inch)

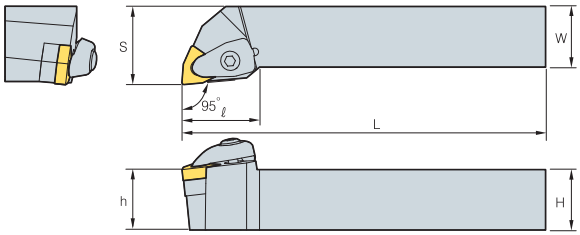
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DVVNN	**12-3B**	3/4	3/4	4 1/2	0.375	0.750	1.575	VN□□33□	CVH3V	CHX0518	SV32V	FTNA03508	SPR0714	HW30P
	16-3D	1	1	6	0.500	1.000	1.575							
	20-3D	1 1/4	1 1/4	6	0.625	1.250	1.575							

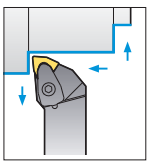
Applicable inserts **B56~B57**

DWLNR/L



WN□□





95°

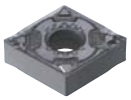
• R type insert

(inch)

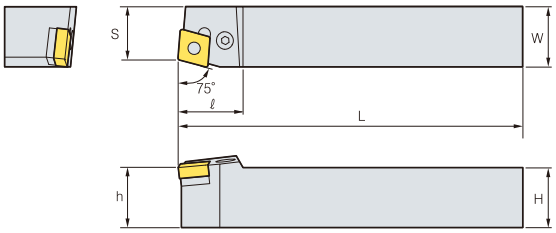
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DWLNR/L	**12-3B**	3/4	3/4	4 1/2	0.600	0.750	1.024	WN□□33□	CVH3	CHX0415	SW32V	FTKA0307	SPR0510	HW25P
	16-3D	1	1	6	0.790	1.000	1.024							
	12-4B	3/4	3/4	4 1/2	0.600	0.750	1.260	WN□□43□	CVH4	CHX0518	SW44V	FTKA0410	SPR0714	HW30P
	16-4D	1	1	6	0.790	1.000	1.260							

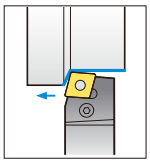
Applicable inserts **B58~B61**

PCBNR/L



CN□□





75°

• R type insert
(inch)

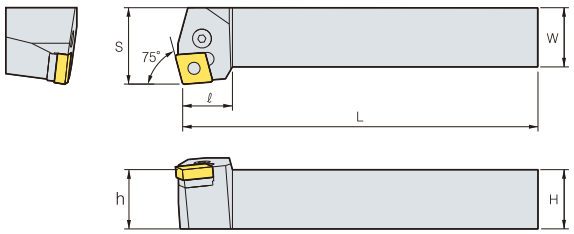
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PCBNR/L	12-4B	3/4	3/4	4 1/2	0.600	0.750	1.063	CN□□ 43□	LV4	VHX0821	SC42	SP4	HW30L	LSPS4
	16-4D	1	1	6	0.790	0.790	1.000							
	85-4D	1/4	1	6	1.250	1.063	1.063							
	16-5D	1	1	6	0.790	1.000	1.299	CN□□ 54□	LV5	VHX0825	SC53	SP5	HW30L	LSPS6
	20-5D	1 1/4	1 1/4	6	0.990	1.250	1.299							
	20-6D	1 1/4	1 1/4	6	0.990	1.250	1.496	CN□□ 64□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS6
	24-6E	1 1/2	1 1/2	7	1.186	1.500	1.496							
	24-8E	1 1/2	1 1/2	7	1.186	1.500	1.772	CN□□ 86□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
	24-8E-5	1 1/2	1 1/2	7	1.186	1.500	1.772	CN□□ 85□						
	32-8G	2	2	8	1.693	2.000	1.772	CN□□ 86□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
PCBNR/L	12-4BN	3/4	3/4	4 1/2	0.600	0.750	1.063	CN□□ 43□	LV4N	VHX0820N	SC42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	0.790	0.790	1.000							
	85-4DN	1/4	1	6	1.250	1.063	1.063							
	16-5DN	1	1	6	0.790	1.000	1.299	CN□□ 54□	LV5N	VHX0820AN	SC53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	0.990	1.250	1.299							
	20-6DN	1 1/4	1 1/4	6	0.990	1.250	1.496	CN□□ 1906□□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS8
	24-6EN	1 1/2	1 1/2	7	1.186	1.500	1.496	CN□□ 64□						

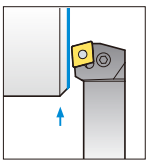
Applicable inserts **B26~B32**

PCKNR/L



CN□□





95°

• R type insert
(inch)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PCKNR/L	12-4B	3/4	3/4	4 1/2	0.984	0.787	1.063	CN□□ 43□	LV4	VHX0821	SC42	SP4	HW30L	LSPS4
	16-4D	1	1	6	1.260	0.984	1.063							
	85-4D	1/4	1	6	1.500	1.260	1.181							
	20-5D	1 1/4	1 1/4	6	1.500	1.260	1.023	CN□□ 54□□	LV5	VHX0825	SC53	SP5	HW30L	HW30L
	24-5E	1 1/2	1 1/2	7	2.000	1.500	0.984							
PCKNR/L	12-4BN	3/4	3/4	4 1/2	0.984	0.787	1.063	CN□□ 43□□	LV4N	VHX0820N	SC42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	1.260	0.984	1.063							
	85-4DN	1/4	1	6	1.500	1.260	1.181							
	20-5DN	1 1/4	1 1/4	6	1.500	1.260	1.023	CN□□ 54□	LV5N	VHX0820AN	SC53N	SP5N	HW30L	LSPS5
	24-5EN	1 1/2	1 1/2	7	2.000	1.500	0.984							

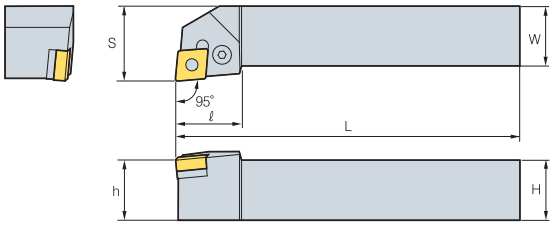
Applicable inserts **B26~B32**

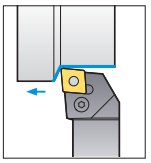
- **Improved holders and parts ensure performance and durability**
- **"N" stand for New type (Holders and parts)**

PCLNR/L



CN□□





95°

• R type insert

(inch)

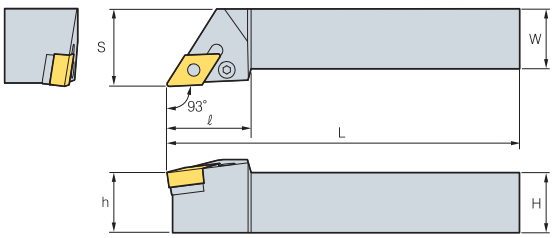
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PCLNR/L	10-3A	5/8	5/8	4	1.000	0.625	0.787	CN□□ 32□	LV3	VHX0617	SC32	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.866							
	16-3D	1	1	6	1.250	1.000	0.866							
	10-4A	5/8	5/8	4	1.000	0.625	1.102	CN□□ 43□	LV4	VHX082	SC42	SP4	HW30L	LSPS4
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.102							
	16-4D	1	1	6	1.250	1.000	1.102							
	85-4D	1 1/4	1	6	1.250	1.250	1.102							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.102							
	16-5D	1	1	6	1.250	1.000	1.299	CN□□ 54□	LV5	VHX0825	SC53	SP5	HW30L	LSPS5
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.299							
	16-6D	1	1	6	1.250	1.000	1.496	CN□□ 64□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS6
	85-6D	1 1/4	1	6	1.250	1.250	1.496							
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.496							
	24-6D	1 1/2	1 1/2	6	2.000	1.500	1.496							
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.496							
	24-8E	1 1/2	1 1/2	7	2.000	1.500	1.772	CN□□ 86□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
	32-8G	2	2	8	2.500	2.000	1.772							
	24-8E-5	1 1/2	1 1/2	7	2.000	1.500	1.772	CN□□ 85□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
	32-8G-5	2	2	8	2.500	2.000	1.772							
PCLNR/L	10-3AN	5/8	5/8	4	1.000	0.625	0.787	CN□□ 32□	LV3N	VHX0617N	SC32N	SP3	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	1.000	0.750	0.866							
	16-3DN	1	1	6	1.250	1.000	0.866							
	10-4AN	5/8	5/8	4	1.000	0.625	1.102	CN□□ 43□	LV4N	VHX0817N / VHX0820N	SC42N	SP4N	HW30L	LSPS4
	12-4BN	3/4	3/4	4 1/2	1.000	0.750	1.102							
	16-4DN	1	1	6	1.250	1.000	1.102							
	20-4DN	1 1/4	1 1/4	6	1.500	1.250	1.102							
	16-5DN	1	1	6	1.250	1.000	1.299	CN□□ 54□	LV5N	VHX0820AN	SC53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	1.500	1.250	1.299							
	16-6DN	1	1	6	1.250	1.000	1.500	CN□□ 64□□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS6
	24-6EN	1 1/2	1 1/2	7	1.970	1.570	1.417							

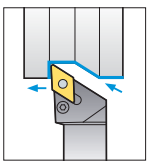
Applicable inserts **B26~B32**

PDJNR/L



DN□□





93°

• R type insert

(inch)

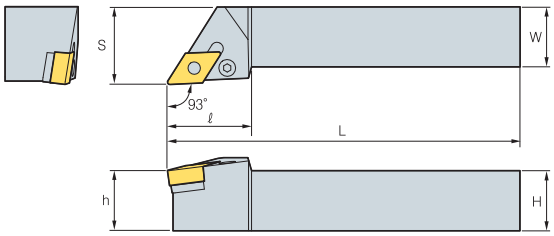
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PDJNR/L	10-3A	5/8	5/8	4	0.875	0.625	0.984	DN□□ 33□	LV3	VHX0617	SD317	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.984							
	16-3D	1	1	6	1.250	1.000	1.181							
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□ 44□	LV4B	VHX0821	SD42	SP4	HW30L	LSPS4
	16-4D	1	1	6	1.250	1.000	0.984							
	85-4D	1 1/4	1	6	1.250	1.250	1.378							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.378							
	12-4B-3	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□ 43□	LV4	VHX0821	SD42	SP4	HW30L	LSPS4
	16-4D-3	1	1	6	1.250	1.000	1.378							
	20-4D-3	1 1/4	1 1/4	6	1.500	1.250	1.378							

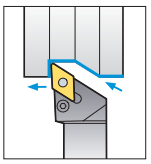
Applicable inserts **B33~B39**

PDJNR/L



DN□□





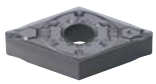
93°

• R type insert
(inch)

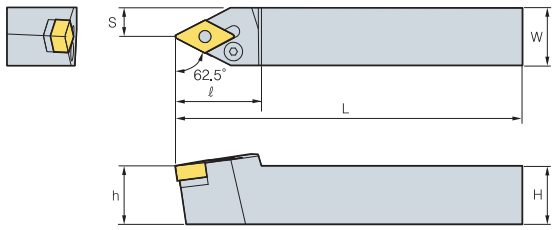
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PDJNR/L	**10-3AN**	5/8	5/8	4	0.875	0.625	0.984	DN□□33□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	1.000	0.750	0.984							
	16-3DN	1	1	6	1.250	1.000	1.181							
	12-4BN	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□44□	LV4BN	VHX0821N	SD42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	1.250	1.000	0.984							
	85-4DN	1 1/4	1	6	1.250	1.250	1.378							
	20-4DN	1 1/4	1 1/4	6	1.500	1.250	1.378							
	12-4B-3N	3/4	3/4	4 1/2	1.000	0.750	1.378	DN□□43□	LV4BN	VHX0821N	SD43N	SP4N	HW30L	LSPS4
	16-4D-3N	1	1	6	1.250	1.000	1.378							
	20-4D-3N	1 1/4	1 1/4	6	1.500	1.250	1.378							

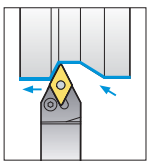
Applicable inserts **B33~B39**

PDNNR/L



DN□□





62.5°

• R type insert
(inch)

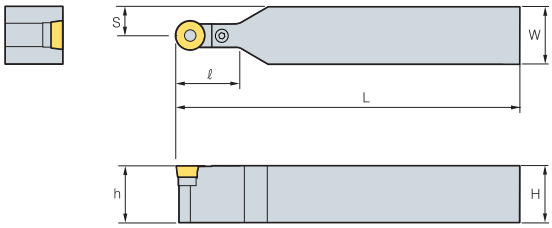
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PDNNR/L	**12-4B**	3/4	3/4	4 1/2	0.320	0.750	1.457	DN□□44□	LV4B	VHX0821	SD42	SP4	HW30L	LSPS4
	16-4D	1	1	6	0.500	1.000	1.457							
	86-4D	1 1/2	1	6	0.500	1.500	1.457							
	20-4D	1 1/4	1 1/4	6	0.625	1.250	1.457							
	16-4D-3	1	1	6	0.500	1.000	1.457	DN□□43□	LV4	VHX0821	SD42	SP4	HW30L	LSPS4
	86-4D-3	1 1/2	1	6	0.500	1.500	1.457							
PDNNR/L	**12-4BN**	3/4	3/4	4 1/2	0.320	0.750	1.457	DN□□44□	LV4BN	VHX0821N	SD42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	0.500	1.000	1.457							
	20-4DN	1 1/2	1	6	0.500	1.500	1.457							
	16-4D-3N	1	1	6	0.500	1.000	1.457	DN□□43□	LV4BN	VHX0821N	SD43N	SP4N	HW30L	LSPS4
	20-4D-3N	1 1/2	1	6	0.500	1.500	1.457							

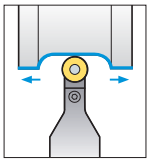
Applicable inserts **B33~B39**

PRDCN



RCMX





(inch)

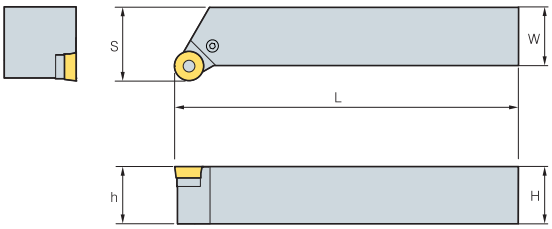
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PRDCN	**12-10D**	3/4	3/4	6	0.375	0.750	0.866	RCMX 1003M0	LR10	VHX0514	SR10	SP3	HW20L	LSPS3
	16-10D	1	1	6	0.689	1.000	0.945							
	16-12D	1	1	6	0.500	1.000	0.945	RCMX 1204M0	LR12	VHX0617	SR12	SP3	HW25L	LSPS3
	12-12C	3/4	3/4	5	0.630	0.750	0.945							
	85-12E	1 1/4	1	7	0.728	1.250	0.945							
	16-16E	1	1	7	0.807	1.000	1.181	RCMX 1606M0	LR16	VHX0621	SR16	SP4	HW25L	LSPS4
	85-16E	1 1/4	1	7	0.708	1.250	1.181							
	20-16E	1 1/4	1 1/4	7	0.945	1.250	1.378							
	20-20E	1 1/4	1 1/4	7	1.024	1.250	1.500	RCMX 2006M0	LR20	VHX0823	SR20	SP20	HW30L	LSPS5
	24-25E	1 1/2	1 1/2	7	1.250	1.500	1.653	RCMX 2507M0	LR25	VHX1030	SR25	SP6N	HW40L	LSPS6
	24-25H	1 1/2	1 1/2	7	1.250	1.500	1.653							
	32-32H	2	2	7	1.500	2.000	2.047	RCMX 3209M0	LR32	VHX1236	SR32	SP8N	HW50L	LSPS8

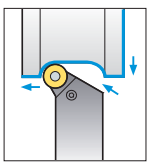
Applicable inserts **B70**

PRGCR/L



RCMX





• R type insert

(inch)

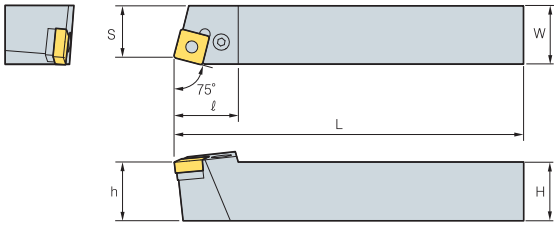
Designation		H	W	L	S	h	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PRGCR/L	**12-10B**	3/4	3/4	4 1/2	1.000	0.750	RCMX 1003M0	LR10	VHX0514	SR10	SP3	HW20L	LSPS3
	16-10D	1	1	6	1.250	1.000							
	12-12B	3/4	3/4	4 1/2	1.000	0.750	RCMX 1204M0	LR12	VHX0617	SR12	SP3	HW25L	LSPS3
	16-12D	1	1	6	1.250	1.000							
	85-12D	1 1/4	1	6	1.250	1.250							
	16-16D	1	1	6	1.250	1.000	RCMX 1606M0	LR16	VHX0621	SR16	SP4	HW25L	LSPS4
	85-16D	1 1/4	1	6	1.250	1.250							
	20-20D	1 1/4	1 1/4	6	1.500	1.250	RCMX 2006M0	LR20	VHX0823	SR20	SP5-1	HW30L	LSPS5
	24-25D	1 1/2	1 1/2	7	2.000	1.500	RCMX 2507M0	LR25	VHX1030	SR25	SP6N	HW40L	LSPS6

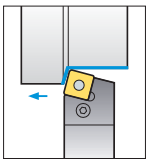
Applicable inserts **B70**

PSBNR/L



SN□□





75°

• R type insert

(inch)

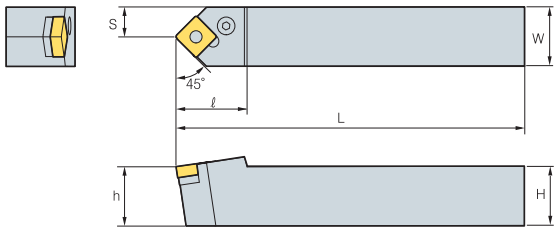
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PSBNR/L	10-3A	5/8	5/8	4	0.500	0.625	0.827	SN□□54□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	0.600	0.750	0.906							
	12-4B	3/4	3/4	4 1/2	0.600	0.750	1.102	SN□□54□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	16-4D	1	1	6	0.790	1.000	1.102							
	85-4D	1 1/4	1	6	0.790	1.250	1.102							
	20-4D	1 1/4	1 1/4	6	0.990	1.250	1.102							
	16-5D	1	1	6	0.790	1.000	1.378	SN□□64□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	20-5D	1 1/4	1 1/4	6	0.990	1.250	1.378							
	20-6D	1 1/4	1 1/4	6	0.990	1.250	1.575	SN□□64□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	24-6E	1 1/2	1 1/2	7	1.186	1.500	1.575							
	24-8E	1 1/2	1 1/2	7	1.186	1.500	2.000	SN□□85□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	24-8E-6	1 1/2	1 1/2	7	1.186	1.500	2.000	SN□□86□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	32-8E	2	2	8	1.382	2.000	2.000	SN□□85□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	32-8E-6	2	2	8	1.382	2.000	2.000	SN□□86□	LV8N	VHX1026N	SS84N	SP8N	HW50L	LSPS8
PSBNR/L	10-3AN	5/8	5/8	4	0.500	0.625	0.827	SN□□54□	LV3N	VHX0617N	SS32N	SP3	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	0.600	0.750	0.906							
	12-4BN	3/4	3/4	4 1/2	0.600	0.750	1.102	SN□□54□	LV4N	VHX0820N	SS42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	0.790	1.000	1.102							
	85-4DN	1 1/4	1	6	0.790	1.250	1.102							
	20-4DN	1 1/4	1 1/4	6	0.990	1.250	1.102							
	16-5DN	1	1	6	0.790	1.000	1.378	SN□□64□	LV5N	VHX0820AN	SS53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	0.990	1.250	1.378							

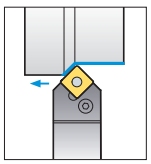
Applicable inserts **B41~B48**

PSDNN



SN□□





45°

(inch)

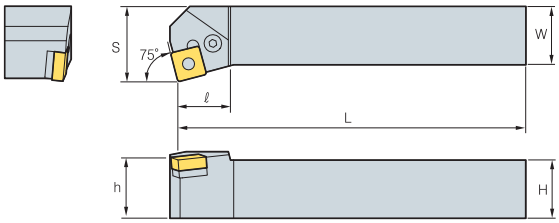
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PSDNN	10-3A	5/8	5/8	4	0.313	0.625	0.906	SN□□32□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	12-4B	3/4	3/4	4 1/2	0.375	0.750	1.181	SN□□43□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	16-4D	1	1	6	0.500	1.000	1.181							
	85-4D	1 1/4	1	6	0.500	1.250	1.181							
	20-4D	1 1/4	1 1/4	6	0.625	1.250	1.575							
	16-5D	1 1/4	1 1/4	6	0.500	1.000	1.575	SN□□54□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	20-5D	1 1/4	1 1/4	6	0..625	1.250	1.575							
	85-6D	1 1/4	1	6	0.500	1.250	1.575	SN□□64□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	20-6D	1 1/4	1 1/4	6	0.625	1.250	1.575							
	24-6E	1 1/2	1 1/2	7	0.750	1.500	1.575							
	24-8E	1 1/2	1 1/2	7	0.750	1.500	1.969	SN□□85□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	32-8E	2	2	8	1.000	2.000	1.969							
	24-8E-6	1 1/2	1 1/2	7	0.750	1.500	1.969	SN□□86□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	32-8E-6	2	2	8	1.000	2.000	1.969							
PSDNN	10-3AN	5/8	5/8	4	0.313	0.625	0.906	SN□□32□	LV3N	VHX0617N	SS32N	SP3	HW25L	LSPS3
	12-4BN	3/4	3/4	4 1/2	0.375	0.750	1.181	SN□□43□	LV4N	VHX0820N	SS42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	0.500	1.000	1.181							
	85-4DN	1 1/4	1 1/4	6	0.500	1.250	1.181							
	20-4DN	1 1/4	1 1/4	6	0.625	1.250	1.575							
	16-5DN	1 1/4	1 1/4	6	0.500	1.000	1.575	SN□□54□	LV5N	VHX0820AN	SS53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	0..625	1.250	1.575							

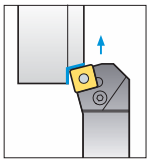
Applicable inserts **B41~B48**

PSKNR/L



SN□□





75°

• R type insert

(inch)

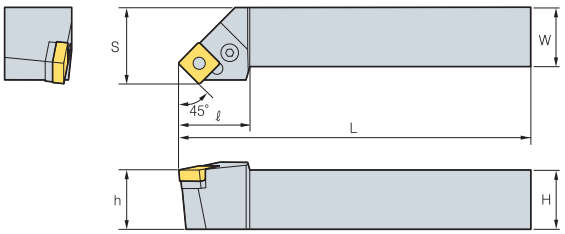
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PSKNR/L	10-3A	5/8	5/8	4	0.750	0.625	0.669	SN□□32□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.787							
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.024	SN□□43□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	16-4D	1	1	6	1.250	1.000	1.024							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.024							
	16-5D	1	1	6	1.250	1.000	1.260	SN□□54□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.260							
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.417	SN□□64□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.575							
	24-8E	1 1/2	1 1/2	7	2.000	1.500	1.732	SN□□85□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	24-8E-6	1 1/2	1 1/2	7	2.000	1.500	1.732	SN□□86□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	32-8E-6	2	2	8	2.500	2.000	1.476	SN□□86□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
PSKNR/L	10-3AN	5/8	5/8	4	0.750	0.625	0.669	SN□□32□□	LV3N	VHX0617N	SS32N	SP3	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	1.000	0.750	0.787							
	12-4BN	3/4	3/4	4 1/2	1.000	0.750	1.024	SN□□43□□	LV4N	VHX0820N	SS42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	1.250	1.000	1.024							
	20-4DN	1 1/4	1 1/4	6	1.500	1.250	1.024							
	16-5DN	1	1	6	1.250	1.000	1.260	SN□□54□□	LV5N	VHX0820AN	SS53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	1.500	1.250	1.260							

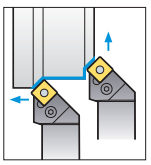
Applicable inserts **B41~B48**

PSSNR/L



SN□□





45°

• R type insert

(inch)

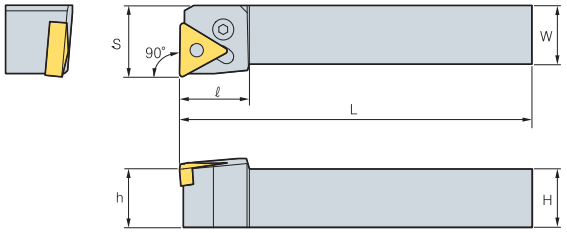
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PSSNR/L	10-3A	5/8	5/8	4	0.750	0.625	0.984	SN□□32□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.181	SN□□43□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	16-4D	1	1	6	1.250	1.000	1.417							
	85-4D	1 1/4	1	6	1.250	1.250	1.417							
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.575							
	16-5D	1	1	6	1.250	1.000	1.417	SN□□54□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.772							
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.772	SN□□64□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	24-6F	1 1/2	1 1/2	8	2.000	1.500	1.772							
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.772							
	24-8E	1 1/2	1 1/2	7	2.000	1.500	1.969	SN□□85□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	24-8E-6	1 1/2	1 1/2	7	2.000	1.500	1.969	SN□□86□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
PSSNR/L	10-3AN	5/8	5/8	4	0.750	0.625	0.984	SN□□32□	LV3N	VHX0617N	SS32N	SP3	HW25L	LSPS3
	12-4BN	3/4	3/4	4 1/2	1.000	0.750	1.181	SN□□43□	LV4N	VHX0821N	SS42N	SP4N	HW30L	LSPS4
	16-4DN	1	1	6	1.250	1.000	1.417							
	85-4DN	1 1/4	1	6	1.500	1.000	1.417							
	20-4DN	1 1/4	1 1/4	6	1.250	1.000	1.772							
	16-5DN	1	1	6	1.500	1.250	1.575	SN□□54□	LV5N	VHX08209N	SS53N	SP5N	HW30L	LSPS5
	20-5DN	1 1/4	1 1/4	6	1.250	1.000	1.417							

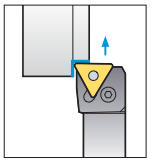
Applicable inserts **B41~B48**

PTFNR/L



TN□□





90°

• R type insert
(inch)

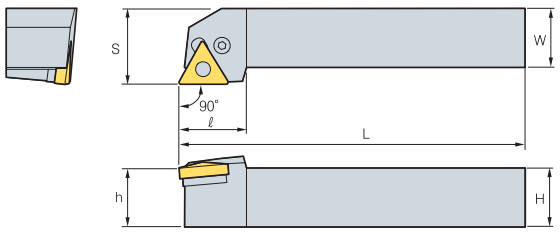
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PTFNR/L	10-3A	5/8	5/8	4	0.750	0.625	0.787	TN□□33□	LV3	VHX0617	ST317	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.787							
	16-3D	1	1	6	1.250	1.000	0.787							
	16-4D	1	1	6	1.250	1.000	0.984	TN□□43□	LV4	VHX0821	ST42	SP4	HW30L	LSPS4
	20-4D	1 1/4	1 1/4	6	1.500	1.250	0.984							
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.339	TN□□54□	LV5	VHX0825	ST53	SP5	HW30L	LSPS5
	24-5E	1 1/2	1 1/2	7	2.000	1.500	1.339							
PTFNR/L	10-3AN	5/8	5/8	4	0.750	0.625	0.787	TN□□33□	LV3N	VHX0617N	ST317N	SP3	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	1.000	0.750	0.787							
	16-3DN	1	1	6	1.250	1.000	0.787							
	16-4DN	1	1	6	1.250	1.000	0.984	TN□□43□	LV4N	VHX0820N	ST42N	SP4N	HW30L	LSPS4
	20-4DN	1 1/4	1 1/4	6	1.500	1.250	0.984							
	20-5DN	1 1/4	1 1/4	6	1.500	1.250	1.339	TN□□54□	LV5AN	VHX0823N	ST53N	SP5N	HW30L	LSPS5
	24-5EN	1 1/2	1 1/2	7	2.000	1.500	1.339							

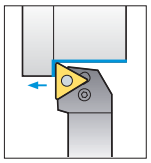
Applicable inserts **B49~B55**

PTGNR/L



TN□□





90°

• R type insert
(inch)

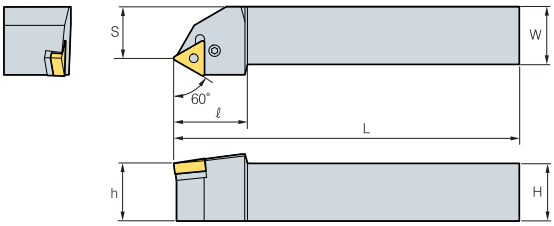
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PTGNR/L	08-2K	1/2	1/2	3 3/20	0.625	0.500	0.630	TN□□21.5□	LV2	VHX0509B	-	-	HW20L	-
	10-2A	5/8	5/8	4	0.750	0.625	0.709							
	12-2B	3/4	3/4	4 1/2	0.100	0.750	0.748							
	16-2D	1	1	6	1.250	1.000	0.787							
	10-3A	5/8	5/8	4	0.750	0.625	0.787	TN□□33□	LV3	VHX0617	ST317	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.787							
	16-3D	1	1	6	1.250	1.000	0.787							
	20-3D	1 1/4	1 1/4	6	1.500	1.250	0.787							
	16-4D	1	1	6	1.250	1.000	1.102	TN□□43□	LV4	VHX0821	ST42	SP4	HW30L	LSPS4
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.102							
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.299	TN□□54□	LV5	VHX0825	ST53	SP5	HW30L	LSPS5
	24-5E	1 1/2	1 1/2	7	2.000	1.500	1.299							
PTGNR/L	10-3AN	5/8	5/8	4	0.750	0.625	0.709	TN□□33□	LV3N	VHX0617N	ST317N	SP3N	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	0.100	0.750	0.748							
	16-3DN	1	1	6	1.250	1.000	0.787							
	20-3DN	1 1/4	1 1/4	6	1.500	1.250	0.787							
	16-4DN	1	1	6	1.250	1.000	1.102	TN□□43□	LV4N	VHX0820N	ST42N	SP4N	HW30L	LSPS4
	20-4DN	1 1/4	1 1/4	6	1.500	1.250	1.102							
	20-5DN	1 1/4	1 1/4	6	1.500	1.250	1.299	TN□□54□	LV5AN	VHX0823N	ST53N	SP5N	HW30L	LSPS5
	24-5EN	1 1/2	1 1/2	7	2.000	1.500	1.299							

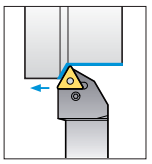
Applicable inserts **B49~B55**

PTTNR/L



TN□□





60°

• R type insert

(inch)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PTTNR/L	**10-3A**	5/8	5/8	4	0.511	0.625	0.984	TN□□33□	LV3	VHX0617	ST317	SP3	HW25L	LSPS3
	12-3B	3/4	3/4	4 1/2	0.669	0.750	0.984							
	16-3D	1	1	6	0.866	1.000	1.260							
	16-4D	1	1	6	0.866	1.000	1.260	TN□□43□	LV4	VHX0821	ST42	SP4	HW30L	LSPS4
PTTNR/L	**10-3AN**	5/8	5/8	4	0.511	0.625	0.984	TN□□33□	LV3N	VHX0617N	ST317N	SP3	HW25L	LSPS3
	12-3BN	3/4	3/4	4 1/2	0.669	0.750	0.984							
	16-3DN	1	1	6	0.866	1.000	1.260							
	16-4DN	1	1	6	0.866	1.000	1.260	TN□□43□	LV4N	VHX0820N	ST42N	SP4N	HW30L	LSPS4

Applicable inserts **B49~B55**

PWLNR/L



WN□□

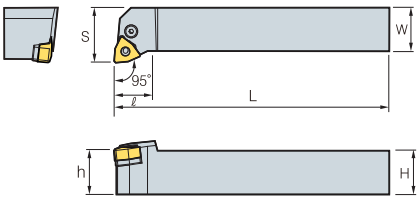


Fig.1

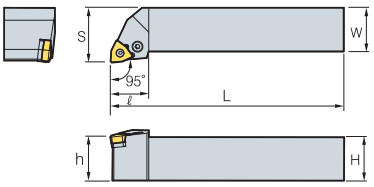
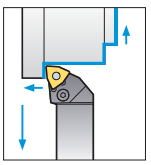


Fig.2



95°

• R type insert

(inch)

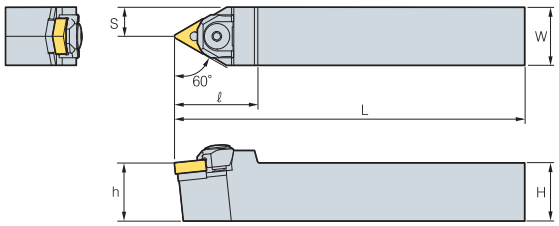
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch	Fig.
PWLNR/L	**10-3A**	5/8	5/8	4	0.750	0.625	0.787	WN□□33□	LV3	VHX0617	SW317	SP3	HW25L	LSPS3	1
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.787								
	16-3D	1	1	6	1.250	1.000	0.787								
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.024	WN□□43□	LV4	VHX0821	SW42	SP4	HW30L	LSPS4	2
	16-4D	1	1	6	1.250	1.000	1.024								
PWLNR/L	**10-3AN**	5/8	5/8	4	0.750	0.625	0.787	WN□□33□	LV3N	VHX0617N	SW317N	SP3	HW25L	LSPS3	1
	12-3BN	3/4	3/4	4 1/2	1.000	0.750	0.787								
	16-3DN	1	1	6	1.250	1.000	0.787								
	12-4BN	3/4	3/4	4 1/2	1.000	0.750	1.024	WN□□43□	LV4N	VHX0820N	SW42N	SP4N	HW30L	LSPS4	2
	16-4DN	1	1	6	1.250	1.000	1.024								

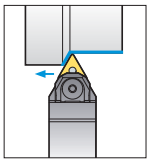
Applicable inserts **B58~B61**

WTENN



TN□□





60°

• R type insert
(inch)

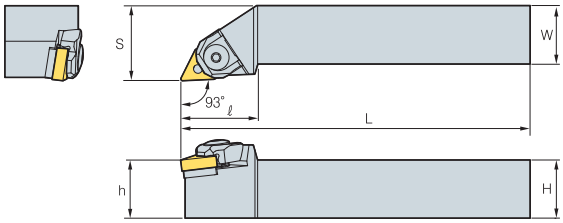
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	Stopper Ring	Shim	Shim Pin	Nut	Wrench
WTENN	**12-3C**	3/4	3/4	5	0.375	0.750	1.417	TN□□33□	CMH6R6	MHX0626	ER04	ST32M	SP3M-1 / SP3M	N0407	HW30L
	16-3D	1	1	6	0.500	1.000	1.417								
	16-4D	1	1	6	0.500	1.000	1.654	TN□□43□	CMH6R1	MHX0626	ER04	ST43M	SP4M	N0508	HW30L
	20-4E	1 1/4	1 1/4	7	0.625	1.250	1.654								

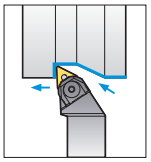
Applicable inserts **B49~B55**

WTJNR/L



TN□□





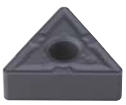
93°

• R type insert
(inch)

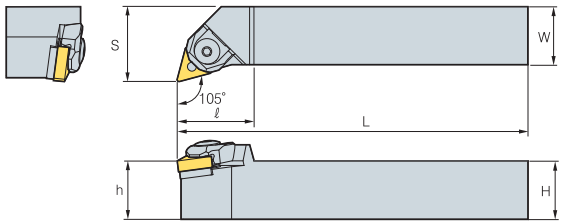
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	Stopper Ring	Shim	Shim Pin	Nut	Wrench
WTJNR/L	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.299	TN□□33□	CMH6R6	MHX0626	ER04	ST32M	SP3M-1 / SP3M	N0407	HW30L
	16-3D	1	1	6	1.250	1.000	1.299								
	20-3D	1 1/4	1 1/4	6	1.500	1.250	1.299								
	16-4D	1	1	6	1.250	1.000	1.387	TN□□43□	CMH6R1	MHX0626	ER04	ST43M	SP4M	N0508	HW30L
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.387								

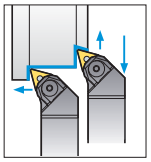
Applicable inserts **B49~B55**

WTXNR/L



TN□□





105°

• R type insert
(inch)

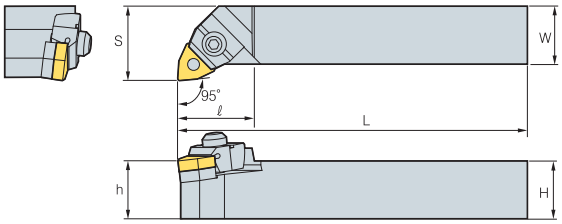
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	Stopper Ring	Shim	Shim Pin	Nut	Wrench
WTXNR/L	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.181	TN□□33□	CMH6R6	MHX0626	ER04	ST32M	SP3M-1 / SP3M	N0407	HW25L / HW30L
	16-3D	1	1	6	1.250	1.000	1.299								
	20-3D	1 1/4	1 1/4	6	1,500	1,250	1,299								

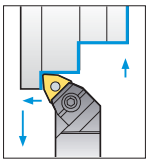
Applicable inserts **B49~B55**

WWLNR/L



WN□□





95°

• R type insert

(inch)

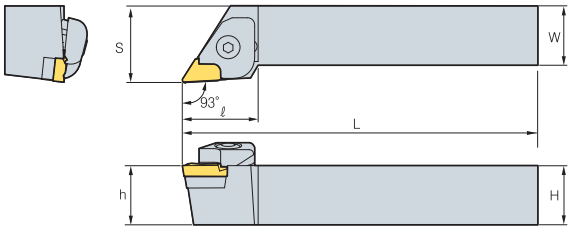
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	Stopper Ring	Shim	Shim Pin	Nut	Wrench
WWLNR/L	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.260	WN□□43□	CMH6R/L3	MHX0630	CR05	SW43M	SP2M	N0508	HW30L
	16-4D	1	1	6	1.250	1.000	1.299		CMH6R2				SP4M		HW40L
	20-4F	1 1/4	1 1/4	6	1.500	1.250	1.299		CMH6R2						

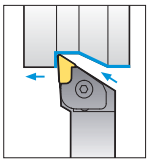
Applicable inserts **B58~B61**

CKJNR/L



KN□□





93°

• R type insert
(inch)

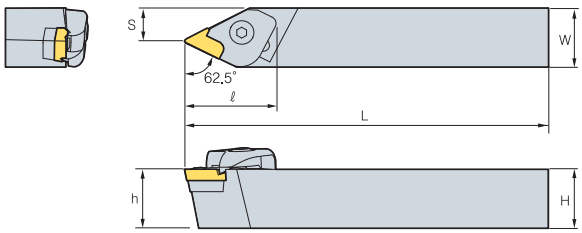
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Spring	Shim	Pin + Spring	Shim Screw	Wrench
CKJNR	**12-3B**	3/4	3/4	4 1/2	1.120	0.750	1.260	KN□□1604□□R	CTH6R1	CHX0625	SR3	SK33C	PN0515 SR4	SHX0310	HW20L HW40L
	16-3D	1	1	6	1.250	1.000	1.260								
	85-3D	1 1/4	1	6	1.250	1.250	1.260								
	85-3E	1 1/4	1	7	1.250	1.250	1.260								
	20-3D	1 1/4	1 1/4	6	1.500	1.250	1.260								
	24-3E	1 1/2	1 1/2	7	2.000	1.500	1.260								
CKJNL	**12-3B**	3/4	3/4	4 1/2	1.000	0.750	1.260	KN□□1604□□L	CTH6L1	CHX0625	SR3	SK33CL	PN0515 SR4	SHX0310	HW20L HW40L
	16-3D	1	1	6	1.250	1.000	1.260								
	20-3D	1 1/4	1 1/4	6	1.500	1.250	1.260								
	24-3E	1 1/2	1 1/2	7	2.000	1.500	1.260								

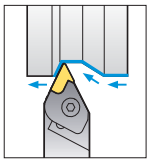
Applicable inserts **B40**

CKNNR/L



KN□□





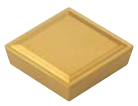
62.5°

• R type insert
(inch)

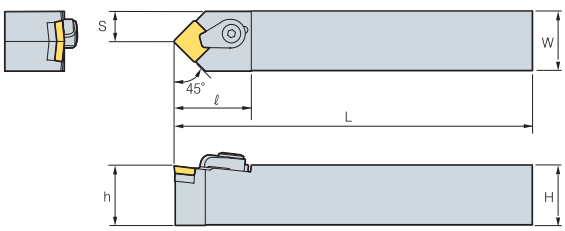
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Spring	Shim	Pin + Spring	Shim Screw	Wrench
CKNNR	**16-3D**	1	1	6	0.570	1.000	1.457	KN□□1604□□R	CTH6R1	CHX0625	SR3	SK33C	PN0515 SR4	SHX0310	HW20L HW40L
	20-3D	1 1/4	1 1/4	6	0.660	1.250	1.457								
CKNNL	**16-3D**	1	1	6	0.570	1.000	1.457	KN□□1604□□L	CTH6L1	CHX0625	SR3	SK33CL	PN0515 SR4	SHX0310	HW20L HW40L
	20-3D	1 1/4	1 1/4	6	0.660	1.250	1.457								

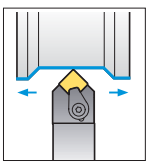
Applicable inserts **B40**

CSDPN



SP□R





45°

• R type insert
(inch)

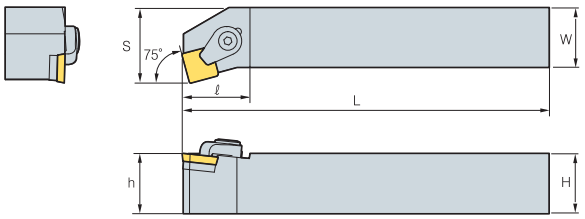
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-Ring	Wrench
CSDPN	**10-3A**	5/8	5/8	4	0.313	0.625	1.181	SP□R32□	CH53R1	CH0515C	SS32C	SP3C	CR03C	HW25L
	16-4D	1	1	6	0.500	1.000	1.378	SP□R42□	CH6R5	CHX0622C	SS42C	SP3C	CR04C	HW30L

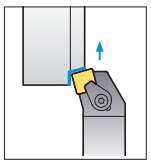
Applicable inserts **B72~B73**

CSKPR/L



SP□R





75°

• R type insert
(inch)

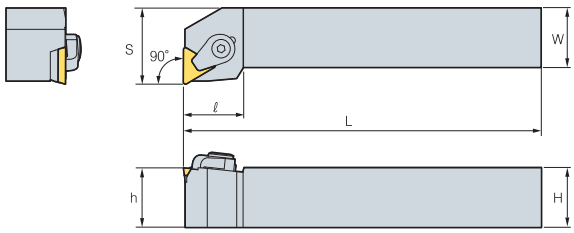
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-Ring	Wrench
CSKPR/L	16-4D	1	1	6	1.250	0.750	1.260	SP□R42□	CH6R5	CHX0414C	SS42C	SP3C	CR04C	HW30L

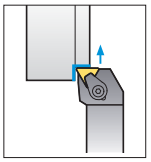
Applicable inserts B72~B73

CTFPR/L



TP□R





90°

• R type insert
(inch)

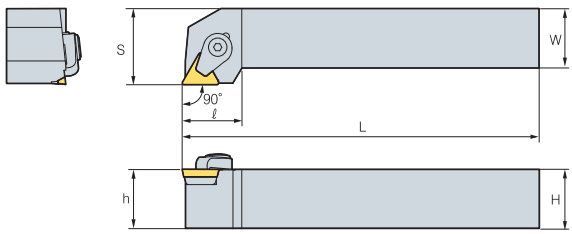
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-Ring	Wrench
CTFPR/L	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.260	TP□R32□	CH6R5	CHX0622C	ST32C	SP3C	CR04C	HW30L
	16-4D	1	1	6	1.250	1.000	1.260							

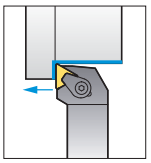
Applicable inserts B77~B79

CTGPR/L



TP□R





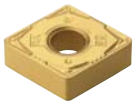
90°

• R type insert
(inch)

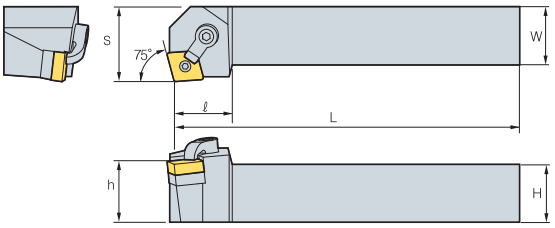
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-Ring	Wrench
CTGPR/L	08-2K	1/2	1/2	3 1/8	0.625	0.500	0.787	TP□R22□	CH53R1	CHX0515C	-	-	CR03C	HW25L
	10-2K	5/8	5/8	3 1/8	0.750	0.625	0.787							
	12-2B	5/8	5/8	4	0.750	0.625	0.787							
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.984	TP□R32□	CH6R5	CHX0622C	ST32C	SP3C	CR04C	HW30L
	16-3D	1	1	6	1.250	1.000	0.984							
	16-4D	1	1	6	1.250	1.000	1.260	TP□R43□	CH83R1	CHX0823C	ST43C	SP4C	CR05C	HW40L
	20-4D	1 1/4	1 1/4	7	1.500	1.250	1.260							

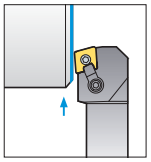
Applicable inserts B77~B79

MCKNR/L



CN□□





75°

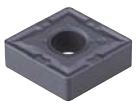
• R type insert

(inch)

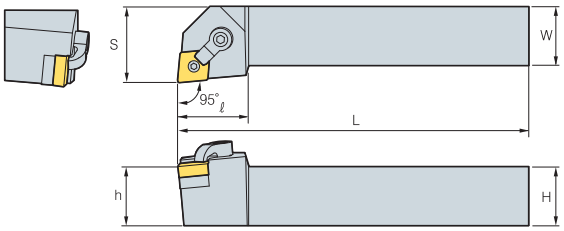
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MCKNR/L	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.250	CN□□R42□	CDH6N	DHA1/4-25	SC43D	SP4D	HW31.8L HW23.8L
	16-4D	1	1	6	1.250	1.000	1.250						
	20-4D	1 1/4	1 1/4	6	1.400	1.250	1.250						

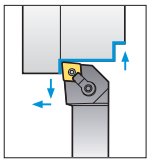
Applicable inserts B26~B32

MCLNR/L



CN□□





95°

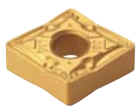
• R type insert

(inch)

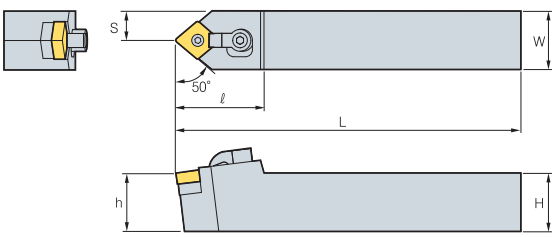
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MCLNR/L	10-3A	5/8	5/8	4	0.875	0.625	1.000	CN□□32□	CDH7N	DHA10-32-19	SC32D	SP3DS	HW23.8L HW19.8L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.000						
	16-3C	1	1	5	1.250	1.000	1.000						
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.250	CN□□43□	CDH6N	DHA1/4-25	SC43D	SP4D	HW31.8L HW23.8L
	16-4D	1	1	6	1.250	1.000	1.250						
	85-4D	1	1 1/4	6	1.250	1.250	1.250						
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.250						
	16-5D	1	1	6	1.250	1.000	1.299	CN□□54□	CDH8N	DHA5/16-32	SC53D	SP5D	HW39.7L HW31.8L
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.299						
	24-5E	1 1/2	1 1/2	7	2.000	1.500	1.299						
	16-6D	1	1	6	1.250	1.000	1.102	CN□□64□	CDH8N	DHA5/16-32	SC63D	SP6D	HW39.7L HW35.7L
	20-6D	1 1/4	1 1/4	6	1.500	1.250	1.102						
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.102						
	26-8E	1 1/2	1 1/2	7	2.000	1.500	1.102	CN□□85□	CDH8N3	DHA3/8-35	SC84D	SP8D	HW39.7L HW47.6L

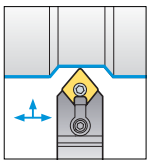
Applicable inserts B26~B32

MCMNN



CN□□





50°

• R type insert

(inch)

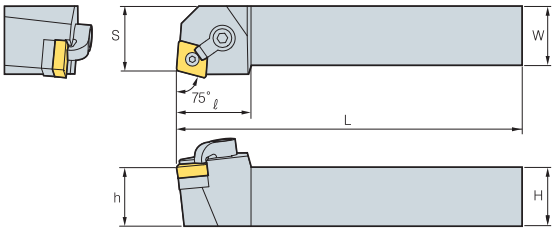
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MCMNN	12-4B	1 1/4	1 1/4	4 1/2	0.375	0.750	1.250	CN□□43□	CDH6N	DHA1/4-25	SC43D	SP4D	HW31.8L HW23.8L
	16-4D	1	1	6	0.500	1.000	1.250						
	20-4D	1 1/4	1 1/4	6	0.625	1.250	1.250						
	16-5D	1	1	6	0.500	1.000	1.500	CN□□54□	CDH8N	DHA5/16-32	SC53D	SP5D	HW39.7L HW31.8L
	20-5D	1 1/4	1 1/4	6	0.625	1.250	1.500						
	20-6D	1 1/4	1 1/4	6	0.625	1.250	1.500	CN□□64□	CDH8N	DHA5/16-32	SD63D	SP6D	HW39.7L HW35.7L
	24-6E	1 1/2	1 1/2	7	0.750	1.500	1.728						

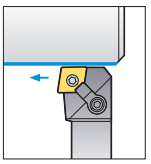
Applicable inserts B26~B32

MCRNR/L



CN□□





75°

• R type insert

(inch)

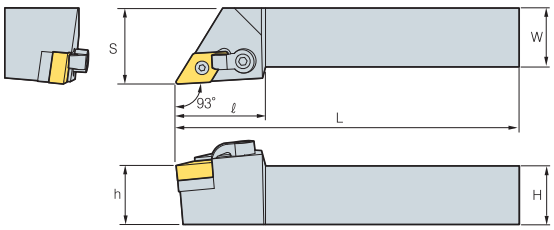
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MCRNR/L	12-4B	3/4	3/4	4 1/2	0.751	0.750	1.250	CN□□43□	CDH8N1	DHA5/16-32	SC43D	SP4D	HW39.7L HW23.8L
	16-4D	1	1	6	1.251	1.000	1.250						
	16-5D	1	1	6	1.251	1.000	1.299	CN□□54□	CDH8N1	DHA5/16-32	SC53D	SP5D	HW39.7L HW31.8L
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.299						
	20-6D	1 1/4	1 1/4	6	1.501	1.250	1.514	CN□□64□	CDH8N1	DHA5/16-32	SC63D	SP6D	HW39.7L HW35.7L
	24-6E	1 1/2	1 1/2	7	2.001	1.500	1.514						

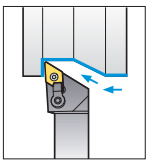
Applicable inserts **B26~B32**

MDJNR/L



DN□□





93°

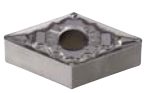
• R type insert

(inch)

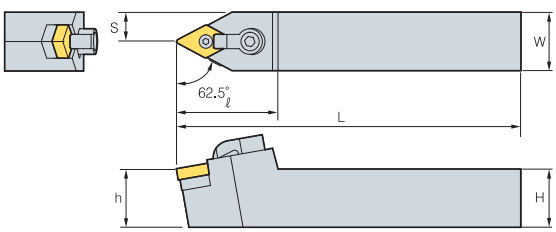
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MDJNR/L	12-3B	1 1/4	1 1/4	4 1/2	1.000	0.750	1.250	DN□□33□	CDH6N	DHA1/4-19	SD32D	SP3D	HW31.8L HW19.8L
	16-3D	1	1	6	1.250	1.000	1.250						
	12-4B-3	3/4	3/4	4 1/2	1.000	0.750	1.420	DN□□43□	CDH6N	DHA1/4-25	SD43D	SP4D	HW31.8L HW23.8L
	16-4B-3	1	1	4 1/2	1.250	1.000	1.420						
	20-4D-3	1 1/4	1 1/4	6	1.500	1.250	1.420						
	12-4B	3/4	3/4	4 1/2	1.000	0.750	1.420	DN□□42□	CDH6N	DHA1/4-25	SD43D	SP4DL	HW31.8L HW23.8L
	16-4D	1	1	6	1.250	1.000	1.420						
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.420						

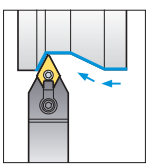
Applicable inserts **B33~B39**

MDNNN



DN□□





62.5°

(inch)

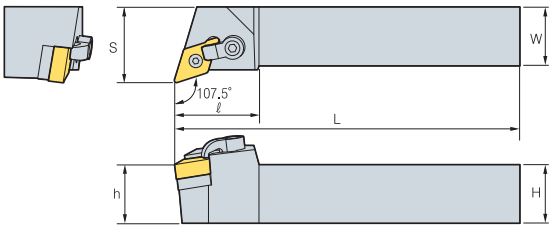
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MDNNN	16-4D-3	1	1	6	0.500	1.000	1.614	DN□□43□	CDH8N	DHA5/16-32	SD43D	SP4D	HW39.7L HW23.8L
	16-4D	1	1	6	0.500	1.000	1.614	DN□□44□	CDH8N	DHA5/16-32	SD43D	SP4DL	HW39.7L HW23.8L

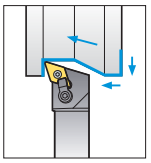
Applicable inserts **B33~B39**

MDQNR/L



DN□□





107.5°

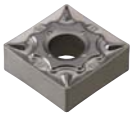
• R type insert

(inch)

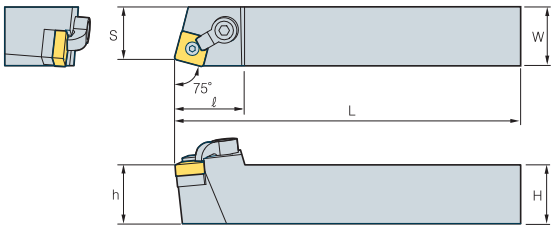
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MDQNR/L	16-4D	1	1	6	1.250	0.750	1.614	DN□□44□	CDH6N	DHA1/4-25	SD43D	SP4D	HW31.8L HW23.8L
	20-4D	1 1/4	1 1/4	6	1.500	1.000	1.614						
	16-4D-3	1	1	6	1.250	0.750	1.614	DN□□43□	CDH6N	DHA1/4-25	SD43D	SP4DL	HW31.8L HW23.8L
	20-4D-3	1 1/4	1 1/4	6	1.500	1.000	1.614						

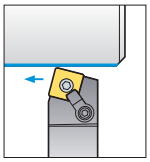
Applicable inserts **B33~B39**

MSBNR/L



SN□□





75°

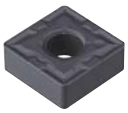
• R type insert

(inch)

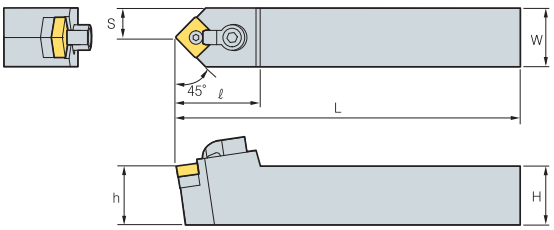
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSBNR/L	12-4B	3/4	3/4	4 1/2	0.669	0.750	1.250	SN□□43□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L HW23.8L
	16-4D	1	1	6	0.866	1.000	1.250						
	16-5D	1	1	6	0.866	1.000	1.378	SN□□54□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L HW31.8L
	20-5D	1 1/4	1 1/4	6	0.866	1.250	1.378						
	20-6D	1 1/4	1 1/4	6	1.063	1.250	1.500	SN□□64□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L HW35.7L
	24-6E	1 1/2	1 1/2	7	1.378	1.500	1.500						

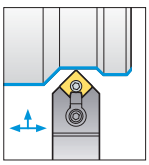
Applicable inserts **B41~B48**

MSDNN



SN□□





45°

(inch)

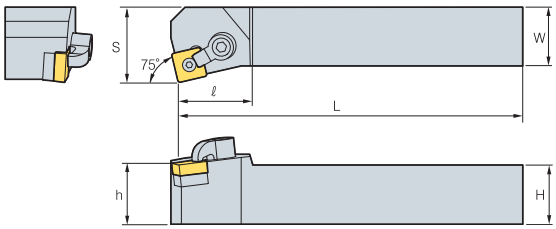
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSDNN	10-3A	5/8	5/8	4	0.313	0.625	1.102	SN□□32□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L HW23.8L
	12-3B	3/4	3/4	4 1/2	0.375	0.750	1.102						
	12-4B	3/4	3/4	4 1/2	0.375	0.750	1.250	SN□□43□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L HW23.8L
	16-4D	1	1	6	0.500	1.000	1.250						
	85-4D	1 1/4	1	6	0.500	1.250	1.250						
	16-5D	1	1	6	0.500	1.000	1.378	SN□□54□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L HW31.8L
	85-5D	1 1/4	1	6	0.500	1.250	1.378						
	20-5D	1 1/4	1 1/4	6	0.625	1.250	1.378						
	24-5E	1 1/2	1 1/2	7	0.750	1.500	1.378						
	20-6D	1 1/4	1 1/4	6	0.625	1.250	1.728	SN□□64□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L HW35.7L
	24-6E	1 1/2	1 1/2	7	0.750	1.500	1.728						

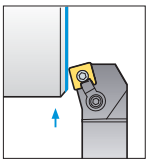
Applicable inserts **B41~B48**

MSKNR/L



SN□□





75°

• R type insert

(inch)

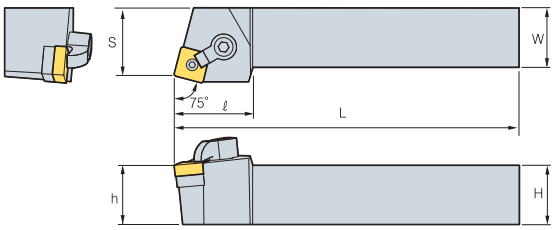
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSKNR/L	10-3A	5/8	5/8	4	0.875	0.625	1.102	SN□□32□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L HW23.8L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.102						
	12-4D	3/4	3/4	6	1.000	0.750	1.250	SN□□43□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L HW23.8L
	16-4D	1	1	6	1.250	1.000	1.250						
	85-4D	1 1/4	1	6	1.250	1.250	1.250						
	16-5D	1	1	6	1.250	1.000	1.378	SN□□54□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L HW31.8L
	20-5D	1 1/4	1 1/4	6	1.250	1.250	1.378						
	20-6D	1 1/4	1 1/4	6	1.250	1.250	1.500	SN□□64□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L HW35.7L
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.500						
	24-8E	1 1/2	1 1/2	7	2.000	1.500	1.500	SN□□85□	CDH8N3	DHA3/8-35	SS84D	SP8D	HW47.6L HW39.7L

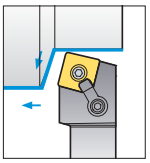
Applicable inserts **B41~B48**

MSRNR/L



SN□□





75°

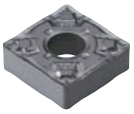
• R type insert

(inch)

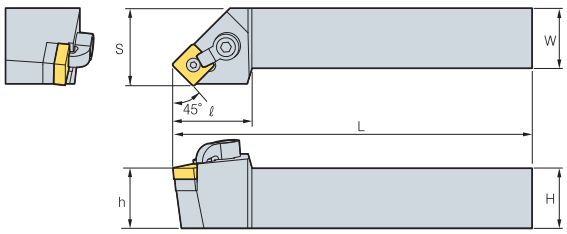
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSRNR/L	10-3A	5/8	5/8	4	0.738	0.625	1.102	SN□□32□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L HW23.8L
	12-3B	3/4	3/4	4 1/2	0.878	0.750	1.102						
	12-4B	3/4	3/4	4 1/2	0.878	0.750	1.250	SN□□43□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L HW23.8L
	16-4D	1	1	6	1.128	1.000	1.250						
	16-5D	1	1	6	1.100	1.000	1.378	SN□□54□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L HW31.8L
	20-5D	1 1/4	1 1/4	6	1.350	1.250	1.378						
	85-6D	1 1/4	1	6	1.068	1.250	1.500						
	20-6D	1 1/4	1 1/4	6	1.318	1.250	1.500	SN□□64□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L HW35.7L
	24-6E	1 1/2	1 1/2	7	1.818	1.500	1.500						
	24-8E	1 1/2	1 1/2	7	1.762	1.500	1.500	SN□□85□	CDH8N3	DHA3/8-35	SS84D	SP8D	HW47.6L HW39.7L

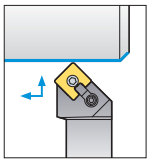
Applicable inserts **B41~B48**

MSSNR/L



SN□□





45°

• R type insert

(inch)

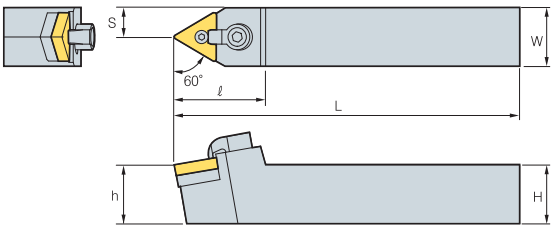
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSSNR/L	10-3A	5/8	5/8	4	0.516	0.625	1.102	SN□□32□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L HW23.8L
	12-3B	3/4	3/4	4 1/2	0.641	0.750	1.102						
	12-4B	3/4	3/4	4 1/2	0.662	0.750	1.250	SN□□43□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L HW23.8L
	16-4D	1	1	6	0.912	1.000	1.250						
	16-5D	1	1	6	0.828	1.000	1.378	SN□□54□	CDH8N1	DHA5/16-32	SS53D	SP5D	HW39.7L HW31.8L
	20-5D	1 1/4	1 1/4	6	1.078	1.250	1.378						
	20-6D	1 1/4	1 1/4	6	0.992	1.250	1.500	SN□□64□	CDH8N1	DHA5/16-32	SS63D	SP6D	HW39.7L HW35.7L
	24.6E	1 1/2	1 1/2	7	1.492	1.500	1.500						

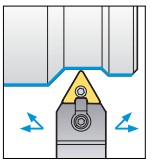
Applicable inserts **B41~B48**

MTENN



TN□□





60°

(inch)

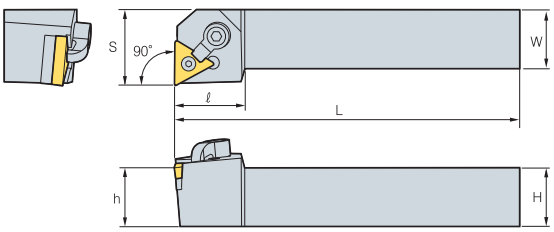
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTENN	12-3B	3/4	3/4	4 1/2	0.375	0.750	1.250	TN□□33□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	16-3D	1	1	6	0.500	1.000	1.250						
	16-4D	1	1	6	0.500	1.000	1.378	TN□□43□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	20-5D	1 1/4	1 1/4	6	0.625	1.250	1.378	TN□□54□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	24-6E	1 1/2	1 1/2	7	0.750	1.500	1.500	TN□□65□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

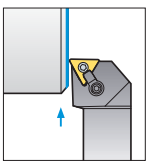
Applicable inserts **B49~B55**

MTFNR/L



TN□□





90°

• R type insert

(inch)

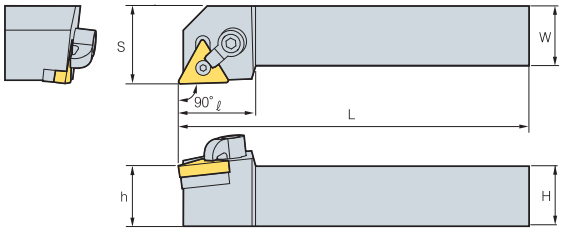
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTFNR/L	10-3A	5/8	5/8	4	0.875	0.625	1.250	TN□□33□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.250						
	16-3D	1	1	6	1.250	1.000	1.250						
	16-4D	1	1	6	1.250	1.000	1.250	TN□□43□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.250						
	24-4E	1 1/2	1 1/2	7	2.000	1.500	1.250						
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.378	TN□□54□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	24-5E	1 1/2	1 1/2	7	2.000	1.500	1.378						
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.500	TN□□65□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

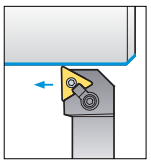
Applicable inserts **B49~B55**

MTGNR/L



TN□□





90°

• R type insert

(inch)

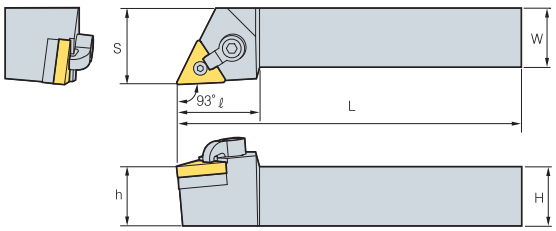
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTGNR/L	10-3A	5/8	5/8	4	0.875	0.625	1.250	TN□□33□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.250						
	16-3D	1	1	6	1.250	1.000	1.250						
	16-4D	1	1	6	1.250	1.000	1.250	TN□□43□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.250						
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.378	TN□□54□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	24-5E	1 1/2	1 1/2	7	2.000	1.500	1.378						
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.500	TN□□65□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

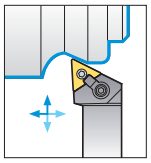
Applicable inserts **B49~B55**

MTJNR/L



TN□□





93°

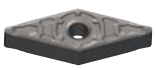
• R type insert

(inch)

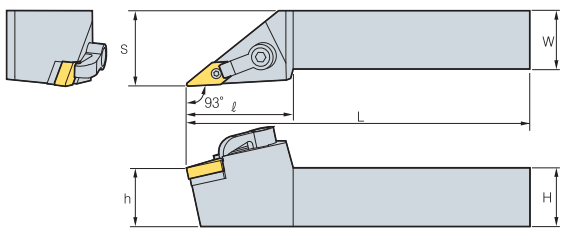
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTJNR/L	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.250	TN□□33□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	16-3D	1	1	6	1.250	1.000	1.250						
	16-4D	1	1	6	1.250	1.000	1.250	TN□□43□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	20-4D	1 1/4	1 1/4	6	1.500	1.250	1.250						
	20-5D	1 1/4	1 1/4	6	1.500	1.250	1.378	TN□□54□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	24-5E	1 1/2	1 1/2	7	2.000	1.250	1.378						
	24-6E	1 1/2	1 1/2	7	2.000	1.500	1.500	TN□□65□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

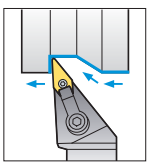
Applicable inserts **B49~B55**

MVJNR/L



VN□□





93°

• R type insert

(inch)

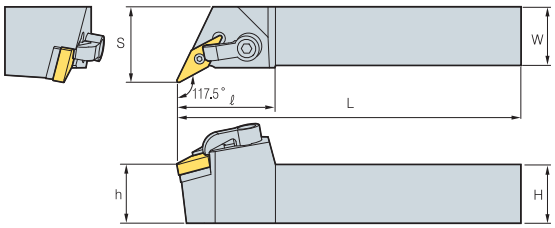
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MVJNR/L	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.467	VN□□33□	CDH8N2	DHA5/16-32	SV32D	SP3D	HW39.7L HW19.8L
	16-3D	1	1	6	1.250	1.000	1.467						
	20-3D	1 1/4	1 1/4	6	1.500	1.250	1.467						
	16-4D	1	1	6	1.250	1.000	2.000	VN□□43□	CDH8N2	DHA5/16-32	SV43D	SP4D	HW39.7L HW23.8L
	20-4D	1 1/4	1 1/4	6	1.500	1.250	2.000						
	24-4E	1 1/2	1 1/2	7	2.000	1.500	2.000						

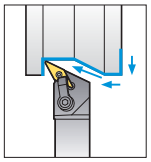
Applicable inserts **B56~B57**

MVQNR/L



VN□□





117.5°

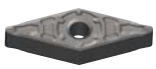
• R type insert

(inch)

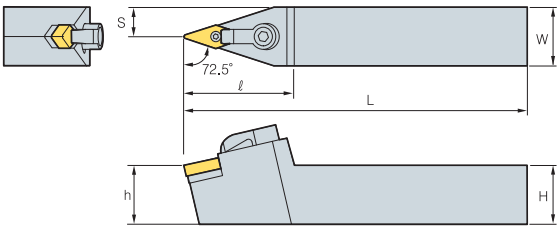
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MVQNR/L	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.467	VN□□33□	CDH8N2	DHA5/16-32	SV32D	SP3D	HW39.7L HW19.8L
	16-3D	1	1	6	1.250	1.000	1.467						
	20-3D	1 1/4	1 1/4	6	1.500	1.500	1.467						

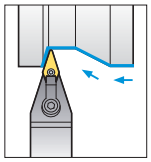
Applicable inserts **B56~B57**

MVVNN



VN□□





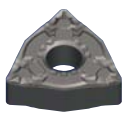
72.5°

(inch)

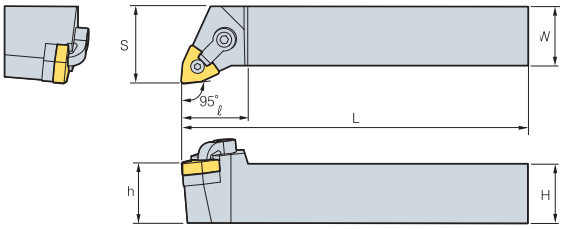
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MVVNN	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.728	VN□□33□	CDH8N2	DHA5/16-32	SV32D	SP3D	HW39.7L HW19.8L
	16-3D	1	1	6	1.250	1.000	1.728						

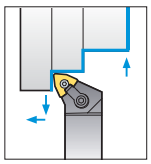
Applicable inserts **B56~B57**

MWLNR/L



WN□□





95°

• R type insert

(inch)

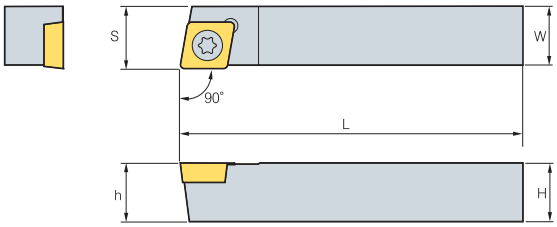
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MWLNR/L	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.250	WN□□33□	CDH7N	DHA10-32-19	SW32D	SP3D	HW19.8L HW23.8L
	16-3D	1	1	6	1.250	1.000	1.250						
	20-3D	1 1/4	11/4	6	1.500	1.250	1.250						
	12-4B	3/4	3/4	4 1/2	1.000	1.750	1.250	WN□□43□	CDH6N	DHA1/4-21	SW43D	SP4D	HW31.8L HW23.8L
	16-4D	1	1	6	1.250	1.000	1.250						
	20-4D	1 1/4	11/4	6	1.500	1.250	1.250						

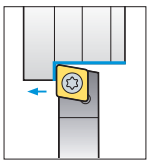
Applicable inserts **B58~B61**

SCACR/L



CC□□





90°

• R type insert
(inch)

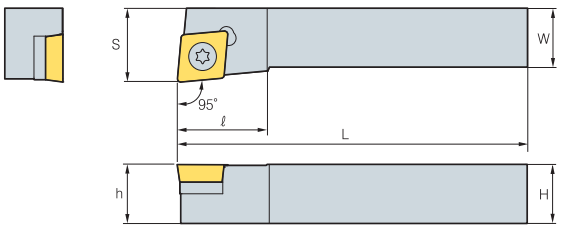
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SCACR/L	**06-2J**	3/8	3/8	2 3/4	0.375	0.375	CC□T21.5□	FTKA02565	-	-	TW07P
	08-3K	1/2	1/2	3 1/8	0.500	0.500	CC□T32.5□	FTKA03508	-	-	TW15P

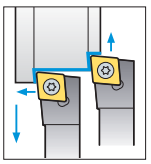
Applicable inserts **B62~B65, B87**

SCLCR/L



CC□□





95°

• R type insert
(inch)

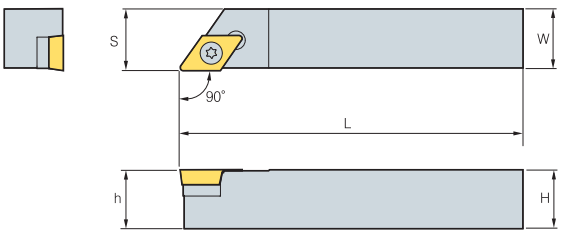
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SCLCR/L	**05-2I**	5/16	5/16	2 1/2	0.375	0.313	0.394	CC□T21.5□	FTKA02565	-	-	TW07P
	06-2J	3/8	3/8	2 3/4	0.500	0.375	0.394					
	08-3K	1/2	1/2	3 1/8	0.625	0.500	0.630	CC□T32.5□	CDH7N	-	-	TW15P
	10-3A	5/8	5/8	4	0.750	0.625	0.630					
	12-3C	3/4	3/4	5	1.000	0.750	0.630					
	16-3D	1	1	6	1.250	1.000	1.024	CC□□T43□□	FTGA0411F	SC42S	SHXN0610F	TW15P
	12-4B	3/4	3/4	4 1/2	1.000	0.750	0.984	CC□□T32.5□□	FTGA03508	-	-	TW156P
	16-4D	1	1	6	1.250	1.000	1.024	CC□□T43□□	FTGA0411F	SC42S	SHXN0610F	HW40L

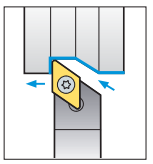
Applicable inserts **B62~B65, B87**

SDACR/L



DC□□





90°

• R type insert
(inch)

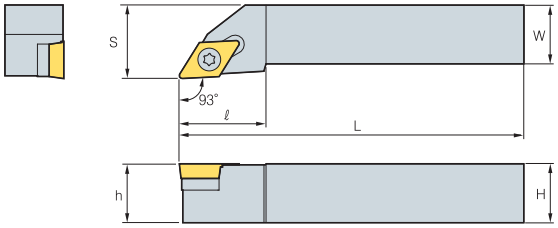
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SDACR/L	**06-2J**	3/8	3/8	2 3/4	0.375	0.375	DC□T21.5□	FTKA02565	-	-	TW07P
	08-3K	1/2	1/2	3 1/8	0.500	0.500	DC□T32.5□	FTKA03508	-	-	TW15P
	10-3A	5/8	5/8	4	0.625	0.625		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L

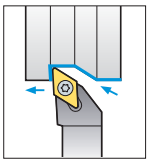
Applicable inserts **B67~B69, B88**

SDJCR/L



DC□□





93°

• R type insert

(inch)

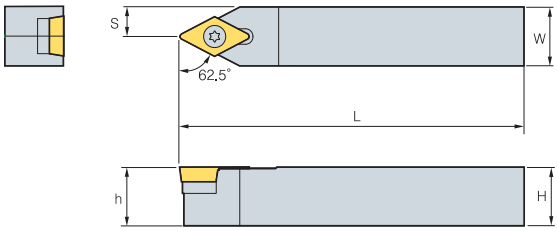
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SDJCR/L	06-2J	3/8	3/8	2 3/4	0.500	0.375	0.591	DC□T21.5□	FTKA02565	-	-	TW07P
	08-2K	1/2	1/2	3 1/8	0.625	0.500	0.591					
	10-2A	5/8	5/8	4	0.750	0.625	0.709					
	12-2B	3/4	3/4	4 1/2	1.000	0.750	0.787					
	08-3K	1/2	1/2	3 1/8	0.625	0.500	0.591	DC□T32.5□	FTGA03512	-	-	TW15P, HW35L
	10-3A	5/8	5/8	4	0.750	0.625	0.945					
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.945					
	16-3D	1	1	6	1.250	1.000	1.142					
	16-4D	1	1	6	1.250	1.000	1.417	DC□T43□	FTGA0411F	-	-	TW15P, HW40L

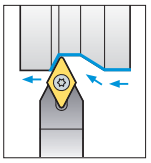
Applicable inserts **B67~B69, B88**

SDNCN



DC□□





62.5°

(inch)

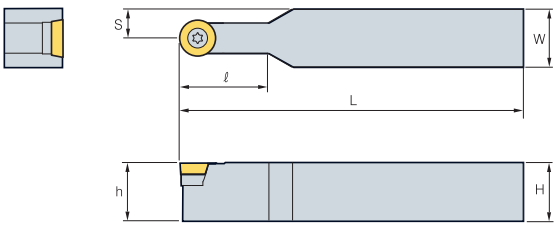
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SDNCN	06-2J	3/8	3/8	2 3/4	0.185	0.375	DC□T21.5□	FTKA02565	-	-	TW07P
	08-2K	1/2	1/2	3 1/8	0.250	0.500					
	08-3A	1/2	1/2	4	0.250	0.500	DC□T32.5□	FTGA03508	-	-	TW15P
	10-3A	5/8	5/8	4	0.313	0.625	DC□T32.5□	FTGA03512	SD32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	0.375	0.750					
	12-3D	1	1	6	0.492	0.984	DC□T32.5□	FTGA03512	SD32S	SHXN0509F	TW25P, HW35L

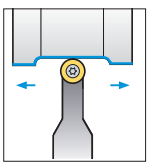
Applicable inserts **B67~B69, B88**

SRDCN



RCGT





(inch)

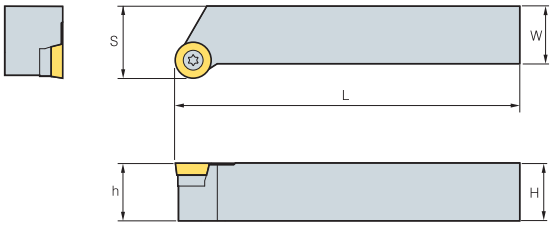
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SRDCN	06-06J	3/8	3/8	2 3/4	0.200	0.375	0.394	RC□T21.5M0	FTKA02565	-	-	TW07P
	08-06K	1/2	1/2	3 1/8	0.236	0.500	0.472					
	10-06A	5/8	5/8	4	0.315	0.625	0.472					
	16-06D	1	1	6	0.500	0.984	0.787					
	10-08A	5/8	5/8	4	0.315	0.630	0.630	RC□T2.52M0	FTNA0307	-	-	TW09P
	12-08B	3/4	3/4	4 1/2	0.375	0.787	0.787					
	16-08D	1	1	6	0.500	0.984	0.787					
	10-10A	5/8	5/8	4	0.315	0.630	0.984	RC□T32M0	FTKA03511A	SR10S	SHXN0509F	TW15P HW35L
	12-10B	3/4	3/4	4 1/2	0.375	0.787	0.984					
	16-10D	1	1	6	0.500	0.984	0.984					
	12-12B	3/4	3/4	4 1/2	0.375	0.787	1.102	RC□T43M0	FTGA03512	SR12S	SHXN0509F	TW15P HW35L
	16-12D	1	1	6	0.500	0.984	1.102					

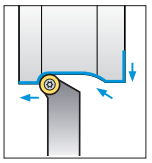
Applicable inserts **B89**

SRGCR/L



RCGT





• R type insert

(inch)

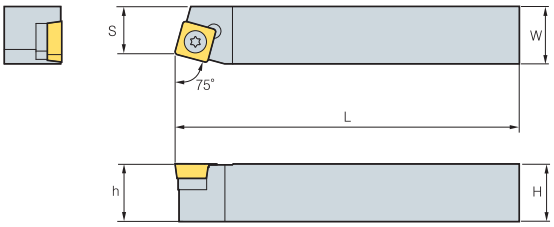
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SRGCR/L	06-06J	3/8	3/8	2 3/4	0.500	0.375	RC□T21.5M0	FTKA02565	-	-	TW07P
	08-06K	1/2	1/2	3 1/8	0.625	0.500					
	10-06A	5/8	5/8	4	0.750	0.625					
	10-08A	5/8	5/8	4	0.750	0.630	RC□T2.52M0	FTNA0307	-	-	TW09P
	12-08B	3/4	3/4	4 1/2	1.000	0.787					
	16-08D	1	1	6	1.250	0.984					
	10-10A	5/8	5/8	4	0.750	0.630	RC□T32M0	FTKA03511A	SR10S	SHXN0509F	TW15P HW35L
	12-10B	3/4	3/4	4 1/2	1.000	0.787					
	16-10D	1	1	6	1.250	0.984					
	12-12B	3/4	3/4	4 1/2	1.000	0.787	RC□T43M0	FTGA03512	SR12S	SHXN0509F	TW15P HW35L
	16-12D	1	1	6	1.250	0.984					

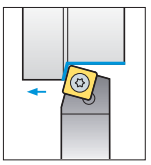
Applicable inserts **B89**

SSBCR/L



SC□□





75°

• R type insert

(inch)

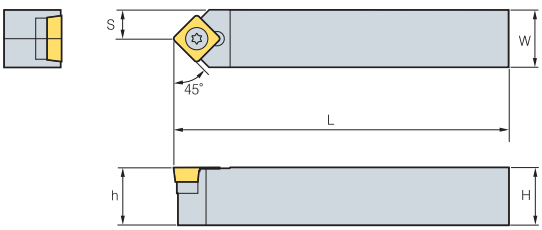
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SSBCR/L	08-3K	1/2	1/2	3 1/8	0.450	0.500	SC□T32.5□	FTGA03508	-	-	TW15P
	10-3A	5/8	5/8	4	0.500	0.625		FTGA03512	SS32S	SHXN0509F	TW15P, HW35L
	12-4B	3/4	3/4	4 1/2	0.600	0.750	SC□T43□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L

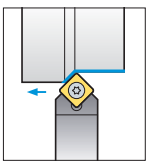
Applicable inserts **B70~B71, B90**

SSDCN



SC□□





45°

(inch)

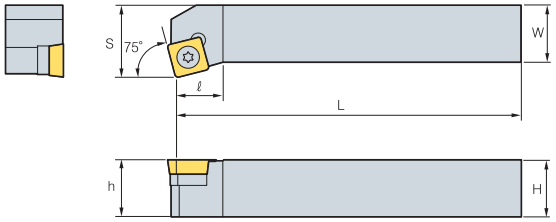
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SSDCN	08-3K	1/2	1/2	3 1/8	0.250	0.500	SC□T32.5□	FTGA03508	-	-	TW15P
	10-3A	5/8	5/8	4	0.313	0.625		FTGA03512	SS32S	SHXN0509F	TW15P, HW35L

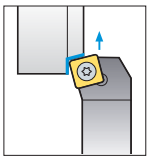
Applicable inserts **B70~B71, B90**

SSKCR/L



SC□□





75°

• R type insert
(inch)

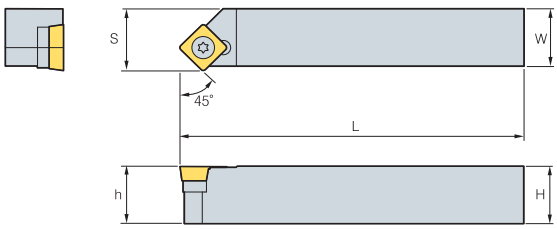
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SSKCR/L	**10-3A**	5/8	5/8	4	0.750	0.625	0.512	SC□T32.5□	FTGA03512	SS32S	SHXN0509F	TW15P, HW35L

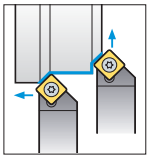
Applicable inserts **B70~B71, B90**

SSSCR/L



SC□□





45°

• R type insert
(inch)

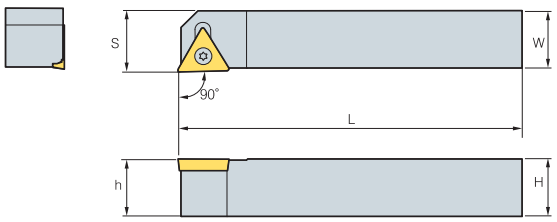
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SSSCR/L	**10-3A**	5/8	5/8	4	0.670	0.625	SC□T32.5□	FTGA03512	SS32S	SHXN0509F	TW15P, HW35L
	12-4B	3/4	3/4	4 1/2	0.827	0.750	SC□T43□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L
	16-4D	1	1	6	1.024	0.984	SC□□43□□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L

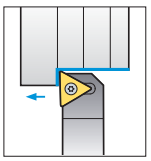
Applicable inserts **B70~B71, B90**

STACR/L



TC□□





90°

• R type insert
(inch)

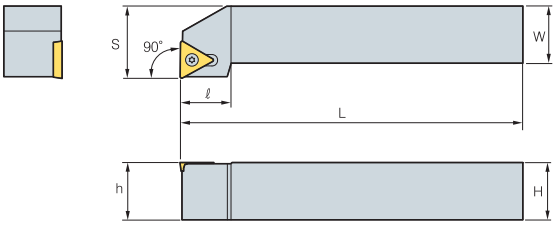
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
STACR/L	**06-1.8J**	3/8	3/8	2 3/4	0.375	0.375	TC□T1.81.5□	FTKA02206	-	-	TW06P
	08-2K	1/2	1/2	3 1/8	0.500	0.500	TC□T21.5□	FTKA02565	-	-	TW07P

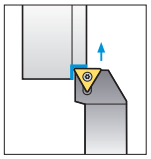
Applicable inserts **B75~B76, B91**

STFCR/L



TC□□





90°

• R type insert
(inch)

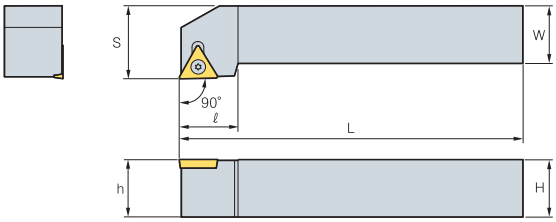
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
STFCR/L	06-1.8J	3/8	3/8	2 3/4	0.500	0.375	0.394	TC□T1.81.5□	FTKA02206	-	-	TW06P
	08-2K	1/2	1/2	3 1/8	0.625	0.500	0.551	TC□T21.5□	FTKA02565	-	-	TW07P
	10-2A	5/8	5/8	4	0.750	0.625	0.551					
	10-3A	5/8	5/8	4	0.750	0.625	0.748	TC□T32.5□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.748					
	16-3D	1	1	6	1.250	1.000	0.992	TC□16T3□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L

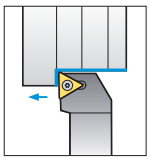
Applicable inserts **B75~B76, B91**

STGCR/L



TC□□





90°

• R type insert
(inch)

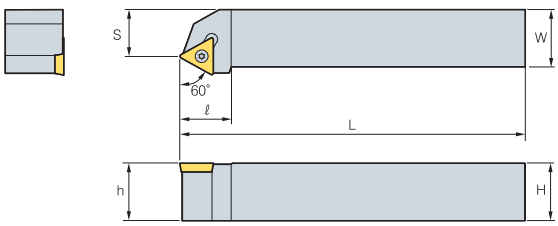
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
STGCR/L	05-1.8I	5/16	5/16	2 1/2	0.370	0.313	0.433	TC□T1.81.5□	FTKA02206	-	-	TW06P
	06-1.8J	3/8	3/8	2 3/4	0.500	0.375	0.433					
	08-2K	1/2	1/2	3 1/8	0.625	0.500	0.551	TC□T21.5□	FTKA02565	-	-	TW07P
	10-2A	5/8	5/8	4	0.750	0.625	0.630					
	10-3A	5/8	5/8	4	0.750	0.625	0.827	TC□T32.5□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	0.827					
	16-3D	1	1	6	1.250	1.000	0.827					

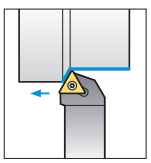
Applicable inserts **B75~B76, B91**

STTCR/L



TC□□





60°

• R type insert
(inch)

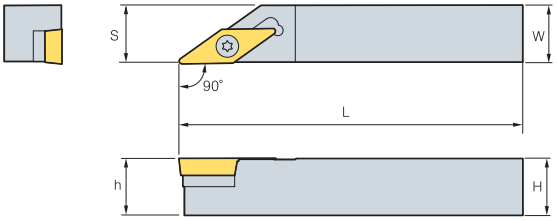
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
STTCR/L	10-2A	5/8	5/8	4	0.500	0.625	0.551	TC□T21.5□	FTKA02565	-	-	TW07P
	10-3A	5/8	5/8	4	0.500	0.625	0.748	TC□T32.5□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	0.670	0.750	0.748					

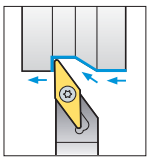
Applicable inserts **B75~B76, B91**

SVABR/L



VB□□





90°

• R type insert
(inch)

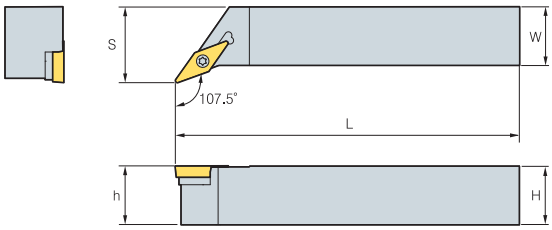
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SVABR/L	10-3A	5/8	5/8	4	0.630	0.625	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	0.755	0.750					

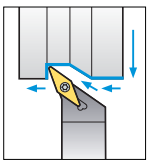
Applicable inserts **B80~B81, B92**

SVHBR/L



VB□□





107.5°

• R type insert
(inch)

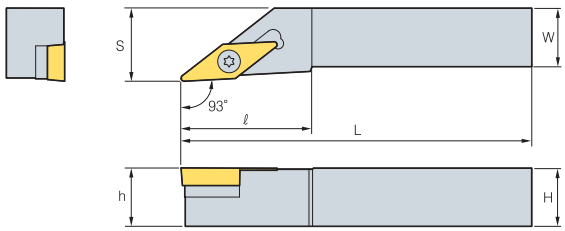
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SVHBR/L	16-3D	1	1	6	1.250	1.000	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	20-3D	1 1/4	1 1/4	6	1.250	1.250					

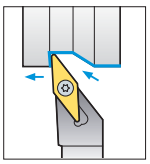
Applicable inserts **B80~B81, B92**

SVJBR/L



VB□□





93°

• R type insert
(inch)

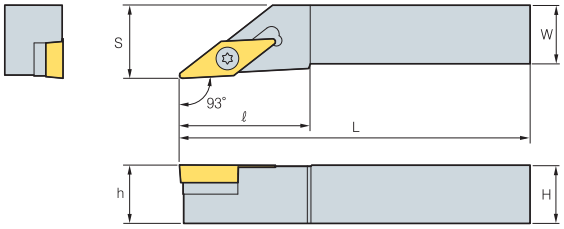
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SVJBR/L	08-2K	1/2	1/2	3 1/8	0.625	0.500	1.063	VB□T21.5□	FTKA02565	-	-	TW07P
	10-2A	5/8	5/8	4	0.750	0.625	1.063					
	12-2B	3/4	3/4	4 1/2	1.000	0.750	1.063					
	10-3A	5/8	5/8	4	0.750	0.625	1.417	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/8	4 1/2	1.000	0.750	1.614					
	16-3D	1	1	6	1.250	1.000	1.614	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	20-3D	1 1/4	1	6	1.250	1.250	2.165					
	85-3D	1 1/4	1 1/4	6	1.575	1.299	2.165					

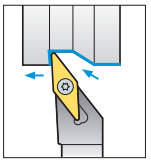
Applicable inserts **B80~B81, B92**

SVJCR/L



VC□□





93°

• R type insert

(inch)

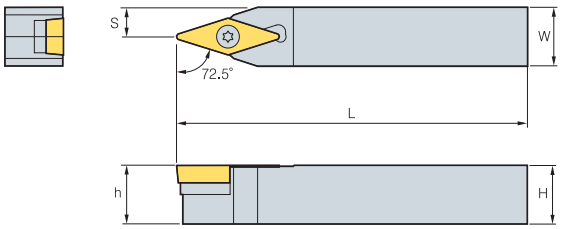
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SVJCR/L	08-2K	1/2	1/2	3 1/8	0.625	0.500	0.984	VC□T22□	FTKA02565	-	-	TW07P
	10-2A	5.8	5/8	4	0.750	0.625	0.984					
	12-2B	3/4	3/4	4 1/2	1.000	0.750	0.984					
	08-2.5K	1/2	1/2	3 1/8	0.625	0.500	1.260	VC□T2.52□	FTKA0307	-	-	TW09P
	10-2.5A	5/8	5/8	4	0.750	0.625	1.260					
	12-2.5B	3/4	3/4	4 1/2	1.000	0.750	1.260					
	10-3A	5/8	5/8	4	0.750	0.625	1.575	VC□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	1.000	0.750	1.575					
	16-3D	1	1	6	1.250	1.000	1.575					

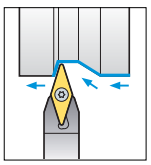
Applicable inserts **B82~B83, B93**

SVVBN



VB□□





72.5°

(inch)

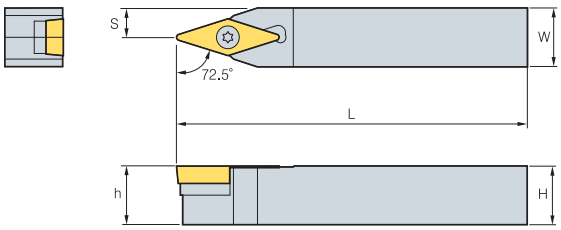
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SVVBN	08-2K	1/2	1/2	3 1/8	0.250	0.500	VB□T21.5□	FTKA02565	-	-	TW07P
	10-2A	5/8	5/8	4	0.313	0.625					
	12-2B	3/4	3/4	4 1/2	0.375	0.750					
	10-3A	5/8	5/8	4	0.313	0.625	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	0.375	0.750					
	16-3D	1	1	6	0.500	1.000					
	85-3D	1 1/4	1	6	0.500	1.250					

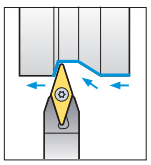
Applicable inserts **B80~B81, B92**

SVVCN



VC□□





72.5°

(inch)

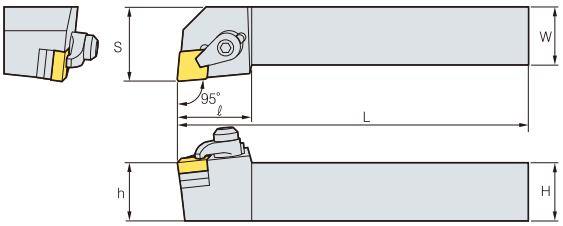
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SVVCN	08-2K	1/2	1/2	3 1/8	0.250	0.500	VC□T21.5□	FTKA02565	-	-	TW07P
	10-2A	5/8	5/8	4	0.313	0.625					
	12-2B	3/4	3/4	4 1/2	0.375	0.750					
	08-2.5K	1/2	1/2	3 1/8	0.250	0.500	VC□T2.51.5□	FTNA0307	-	-	TW09P
	10-2.5A	5/8	5/8	4	0.313	0.625					
	12-2.5B	3/4	3/4	4 1/2	0.375	0.750					
	10-3A	5/8	5/8	4	0.313	0.625	VC□T33□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	12-3B	3/4	3/4	4 1/2	0.375	0.750					
	16-3D	1	1	6	0.500	1.000					

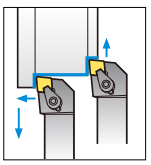
Applicable inserts **B82~B83, B93**

CCLNR/L



CN□N





95°

• R type insert

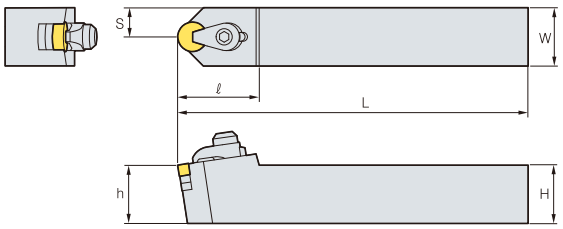
(inch)

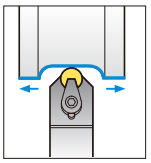
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CCLNR/L 16-4D	1	1	6	1.250	1.000	1.260	CN□N 43□ 45□	CH6R3	MHX0630 SHX0310	SC42CC	SR3	HW40L HW20L

CRDNN



RN□N





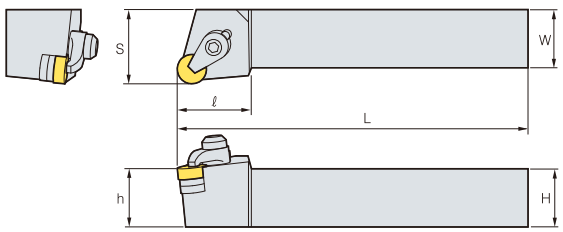
(inch)

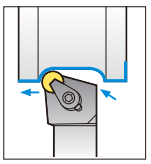
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CRDNN 16-4D	1	1	6	0.500	1.000	1.378	RN□N43□ 45□	CH6R3	MHX0630 SHX0310	SC42CC	SR3	HW40L HW20L

CRGNR/L



RN□N





• R type insert

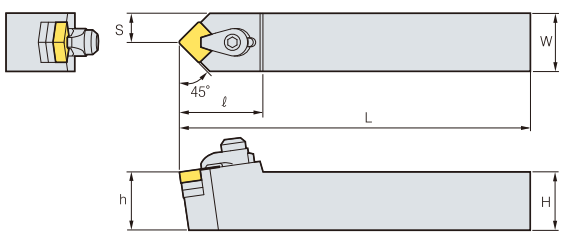
(inch)

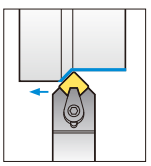
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CRGNR/L 16-4D	1	1	6	1.250	1.000	1.260	RN□N43□ 45□	CH6R3	MHX0630 SHX0310	SC42CC	SR3	HW40L HW20L

CSDNN



SN□N



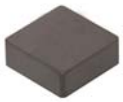


45°

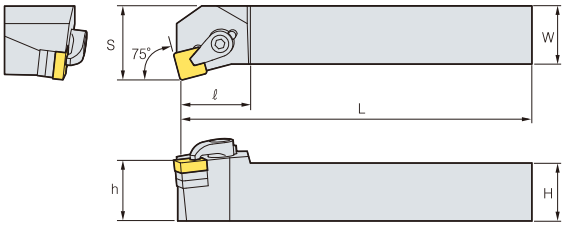
(inch)

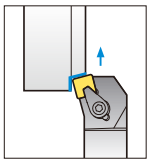
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CSDNN 16-4D	1	1	6	0.500	1.000	1.378	SN□N43□	CH6R3	MHX0630 SHX0310	SS42CC	SR3	HW40L HW20L

CSKNR/L



SN□N





75°

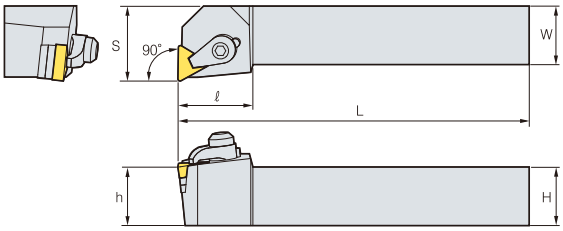
• R type insert
(inch)

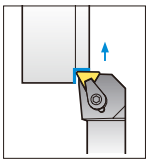
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CSKNR/L 16-4D	1	1	6	1.250	1.000	1.102	SN□N43□ 45□	CH6R3	MHX0630 SHX0310	SS42CC	SR3	HW40L HW20L

CTFNR/L



TN□N





90°

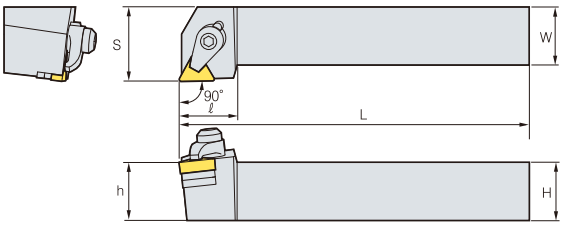
• R type insert
(inch)

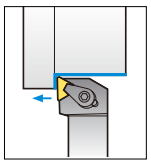
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CTFNR/L 16-4D	1	1	6	1.250	1.000	1.260	TN□N33□ 35□	CH6R3	MHX0630 SHX0310	ST32CC	SR3	HW40L HW20L

CTGNR/L



TN□N





90°

• R type insert
(inch)

Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CTGNR/L 16-4D	1	1	6	1.250	1.000	0984	TN□N32□ 35□	CH6R3	MHX0630 SHX0310	ST32CC	SR3	HW40L HW20L

Note) Generally, two shims are clamped to a Ceramic Holder.
However, only one shim is used in clamping 45□□ and 35□□ sized inserts.

S 24 U - M C L N R 4 □

1	2	3	4	5	6	7	8	9	10
Type of Bar	Bar Diameter	Bar Length	Method of Mounting Insert	Insert Shape	Lead Angle of Boring Bar	Relief Angle of Insert	Hand of Bar	Length of Cutting Edge	Manufacturing option

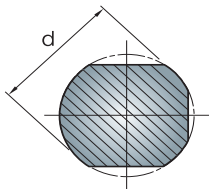
1 Type of Bar

S 24 U - M C L N R 4 □

A : Soild Steel with coolant hole
B : Soild Steel with anti-vibration
C : Carbide bar with fixed steel head
D : Soild Steel bar with anti-vibration device and coolant hole
E : Carbide bar with fixed steel head and coolant hole
G : Carbide bar with fixed steel head and anti-vibration device and coolant hole
H : Solid heavy metal with coolant
J : Solid heavy metal with coolant
S : Soild Steel bar
X : Special bar

2 Bar Diameter

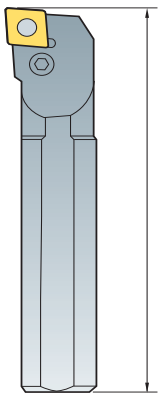
S 24 U - M C L N R 4 □



03 : 0.1875	16 : 1.000
04 : 0.2500	20 : 1.250
05 : 0.3125	24 : 1.500
06 : 0.3700	28 : 1.750
08 : 0.5000	32 : 2.000
10 : 0.6250	36 : 2.250
12 : 0.7500	40 : 2.500

3 Bar Length

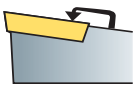
S 24 U - M C L N R 4 □

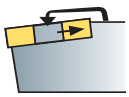


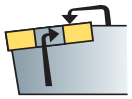
length(L)	(inch)
F	3
G	3.5
H	4
J	4.5
K	5.0
L	5.5
M	6
N	6.5
P	6.75
Q	7.0
R	8.0
S	10.0
T	12.0
U	14.0
V	16.0
W	18.0
Y	20.0
X	Special length

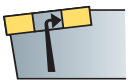
4 Method of Mounting Insert

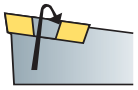
S 24 U - M C L N R 4 □


Top clamping
C


Top and hole clamping
D

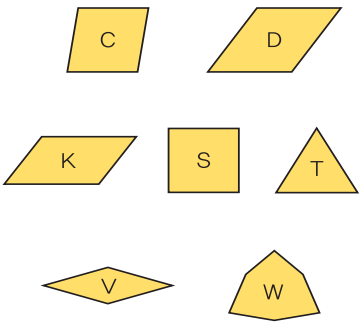

Top and hole clamping
M


Hole clamping
P


Screw on
S

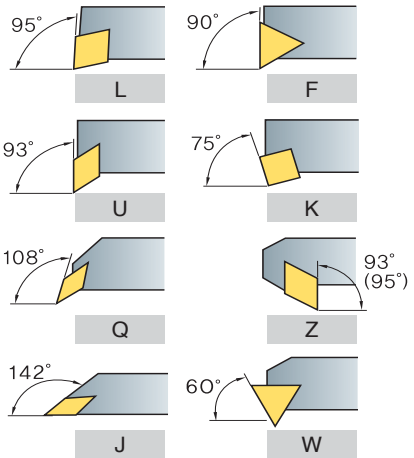
5 Insert Shape

S 24 U - M C L N R 4 □



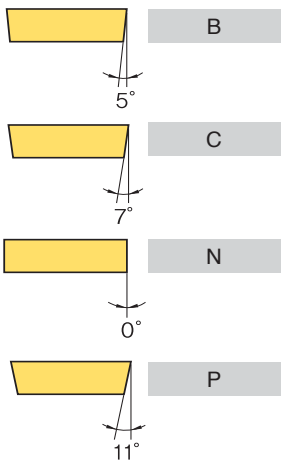
6 Lead Angle of Boring Bar

S 24 U - M C L N R 4 □



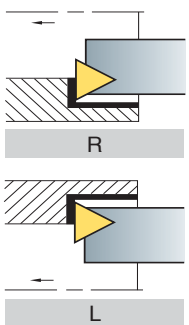
7 Relief Angle of Insert

S 24 U - M C L N R 4 □



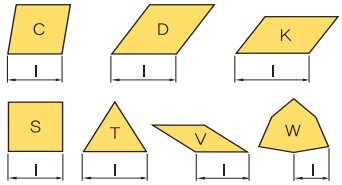
8 Hand of Bar

S 24 U - M C L N R 4 □



9 Length of Cutting Edge

S 24 U - M C L N R 4 □

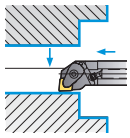
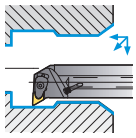
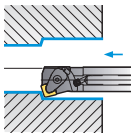
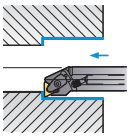
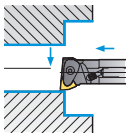


10 Manufacturing option

S 24 U - M C L N R 4 □

Manufacturing option

Double Clamp System

Cutting Shape								
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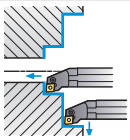
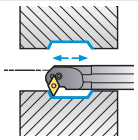
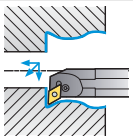
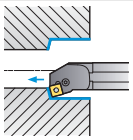
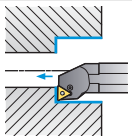
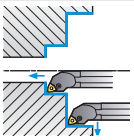
Lever Lock System

Cutting Shape								
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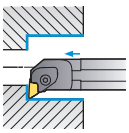
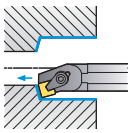
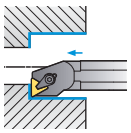
Clamp on System

Cutting Shape								
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Copying								
Facing								
Back turning	●							
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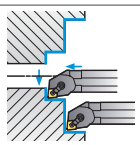
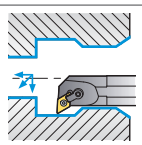
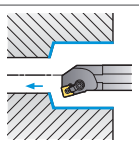
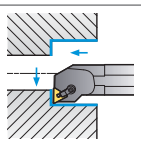
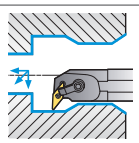
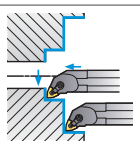
Multi Lock System

Cutting Shape								
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Back turning		●			●			
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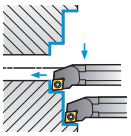
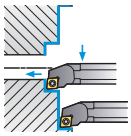
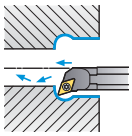
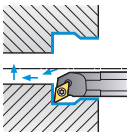
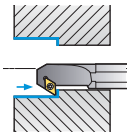
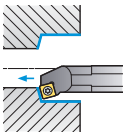
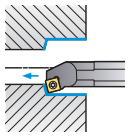
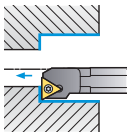
Screw on System

Cutting Shape								
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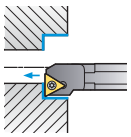
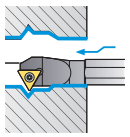
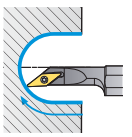
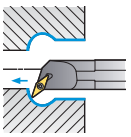
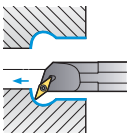
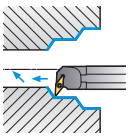
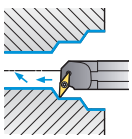
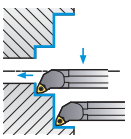
Cutting Shape								
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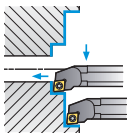
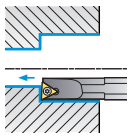
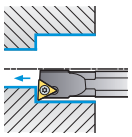
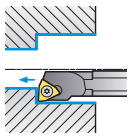
Compact Mini

Cutting Shape								
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Copying								
Facing	●	●						
Back turning			●					
Turning	●	●	●	●				

Carbide Shank Boring Bar

Designation	SCLCR/L	SCLPR/L	SDQCR/L	SDUCR/L	STFCR/L
Approach angle	95°	95°	107.5°	93°	90°
Page	B194	B195	B196	B197	B199

Designation	STFPR/L	STUBR/L	STUPR/L	SWUBR/L	-
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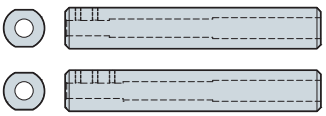
Sleeve

Shape	
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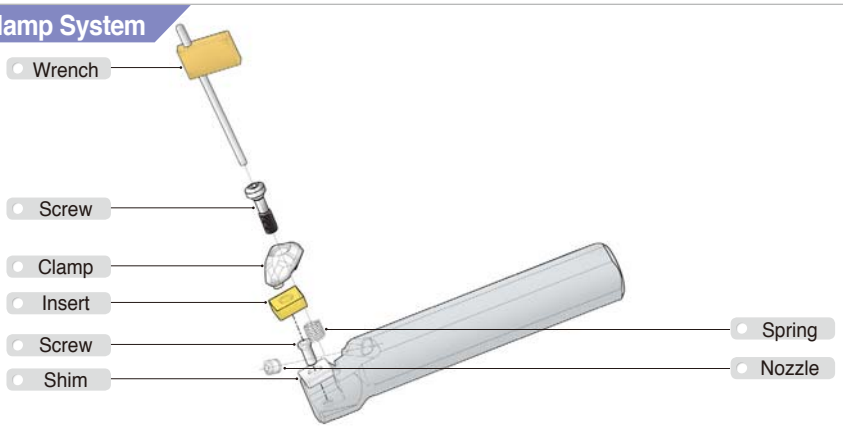
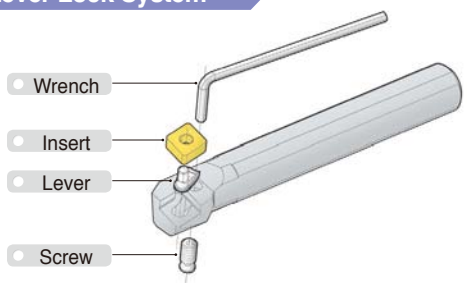
Instructions of Boring Bar assembly

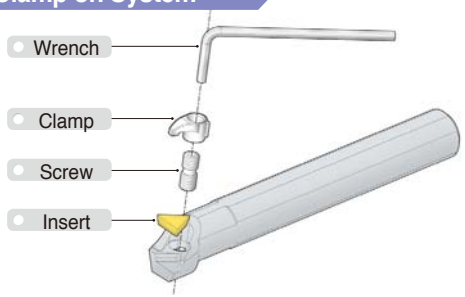
Double Clamp System



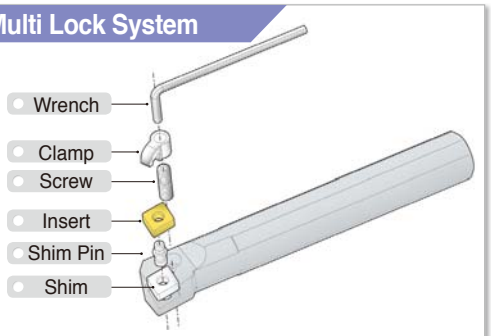
Lever Lock System



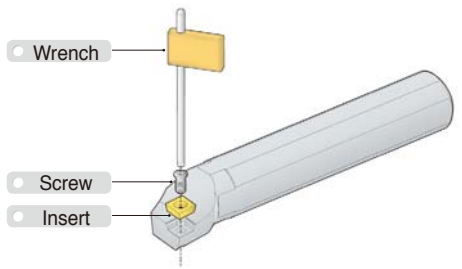
Clamp on System



Multi Lock System



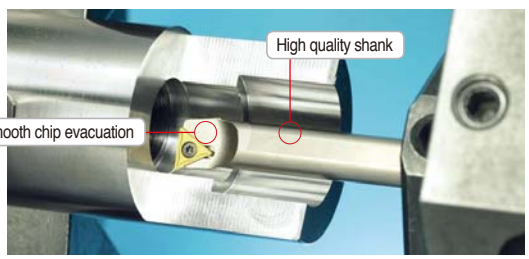
Screw on System



Carbide Shank Boring Bar

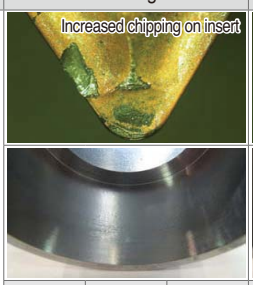
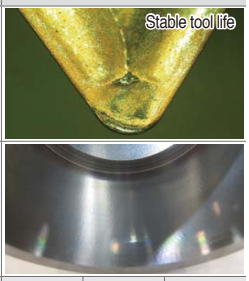
- Excellent cutting performance even in internal machining with chattering
- Available for various workpieces such as steel, stainless steel, cast iron, etc.
- Improved tool life and surface roughness

Features



Higher strength and durability than steel shank, special surface treatment applied

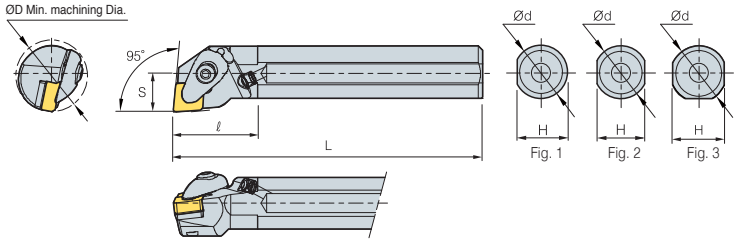
Comparison of chipping

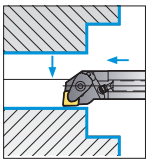
Specifications	Steel boring bar			Carbide boring bar		
AISI 4140 vc(sfm) = 656 ap(inch) = 0.016 fn(ipr) = 0.006 Cutting depth : 5D						
	Rmax	Rz	Ra	Rmax	Rz	Ra
	4.67	3.68	0.62	3.07	2.76	0.53

DCLNR/L



CN□□





95°

• R type insert
(inch)

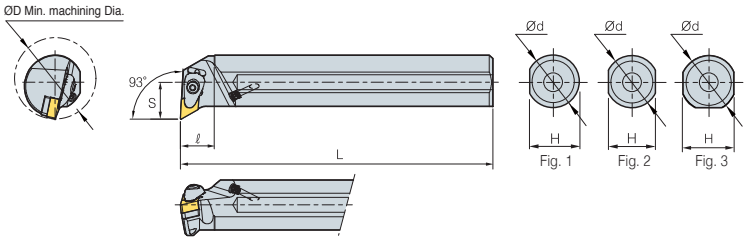
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Nozzle	Wrench	Fig.
A16R-DCLNR/L-3	1.2	1	0.921	8	0.640	1.063	CN□□33□	CVH3	CHX0415	SC32V	FTKA0307	SPR0510	CN0605	HW25P	1
A16R-DCLNR/L-4	1.2	1	0.921	8	0.640	1.102	CN□□43□	CVH4	CHX0518	SC42V	FTKA0410	SPR0714	CN0605	HW30P	1
A20S-DCLNR/L-4	1.47	1 1/4	1.171	10	0.765	1.063									3
A24T-DCLNR/L-4	1.76	1 1/2	1.382	12	0.890	1.181									
A32U-DCLNR/L-5	2.4	2	1.882	14	1.281	1.575	CN□□53□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	CN0605	HW40L	3

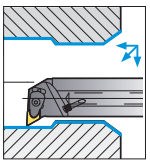
Applicable inserts **B26~B32**

DDUNR/L



DN□□





93°

• R type insert
(inch)

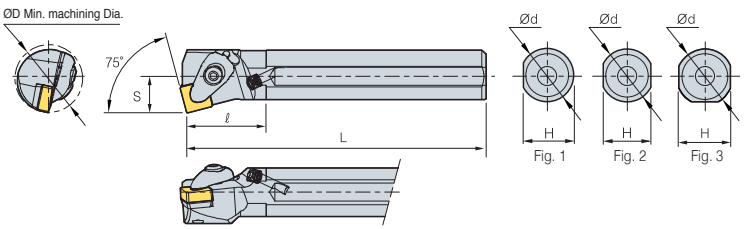
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Nozzle	Wrench	Fig.
A24T-DDUNR/L-4	2	1 1/2	1.382	12	1.125	0.984	DN□□44□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	CN0605	HW30P	3
A32U-DDUNR/L-4	2.4	2	1.882	14	1.281	1.181									
A24T-DDUNR/L-4-3	2	1 1/2	1.382	12	1.125	0.984	DN□□43□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	CN0605	HW30P	3
A32U-DDUNR/L-4-3	2.4	2	1.882	14	1.281	1.181									

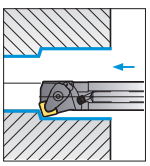
Applicable inserts **B33~B39**

DSKNR/L



SN□□





75°

• R type insert
(inch)

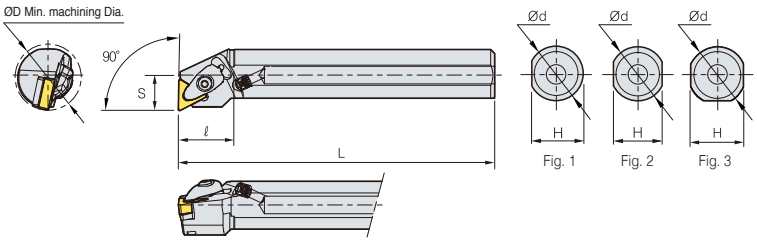
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Nozzle	Wrench	Fig.
A16R-DSKNR/L-3	1.2	1	0.921	12	0.640	1.063	SN□□32□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	CN0605	HW25P	1
A16R-DSKNR/L-4	1.2	1	0.921	12	0.640	1.102	SN□□43□	CVH4	CHX0518	SS42V	FTKA0410	SPR0714	CN0605	HW30P	1
A20S-DSKNR/L-4	1.47	1 1/4	1.171	14	0.765	1.102									3
A24T-DSKNR/L-4	1.76	1 1/2	1.382	16	0.890	1.102									

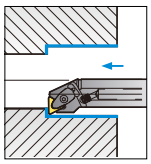
Applicable inserts **B41~B48**

DTFNR/L



TN□□





90°

• R type insert
(inch)

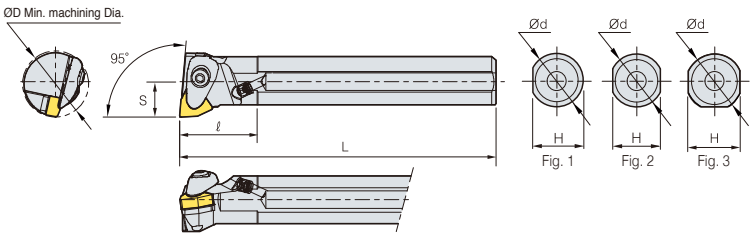
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Nozzle	Wrench	Fig.
A16R-DTFNR/L-3	1.2	1	0.961	8	0.640	1.063	TN□□33□	CVH3	CHX0415	ST32V	FTKA0307	SPR0510	CN0605	HW25P	1
A20S-DTFNR/L-3	1.47	1 1/4	1.211	10	0.765	1.063									3
A24T-DTFNR/L-4	1.76	1 1/2	1.382	16	0.890	1.299	TN□□43□	CVH4	CHX0518	ST44V	FTKA0410	SPR0714	CN0605	HW30P	3
A32U-DTFNR/L-4	2.4	2	1.882	14	1.281	1.299									

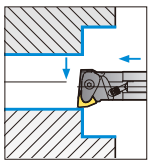
Applicable inserts **B49~B55**

DWLNR/L



WN□□





95°

• R type insert
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Nozzle	Wrench	Fig.
A16R-DWLNR/L-3	1.2	1	0.921	12	0.640	0.748	WN□□33□	CVH3	CHX0415	SW32V	FTKA0307	SPR0510	CN0605	HW25P	1
A20S-DWLNR/L-3	1.47	1 1/4	1.171	14	0.765	0.787									3
A24T-DWLNR/L-3	1.76	1 1/2	1.382	16	0.890	0.984									
A16R-DWLNR/L-4	1.2	1	0.921	12	0.640	0.787	WN□□43□	CVH4	CHX0518	SW42V	FTKA0410	SPR0714	CN0605	HW30P	1
A20S-DWLNR/L-4	1.47	1 1/4	1.171	14	0.765	0.945									3
A24T-DWLNR/L-4	1.76	1 1/2	1.382	16	0.890	0.984									
A32U-DWLNR/L-4	2.4	2	1.882	14	1.281	1.260									

Applicable inserts **B58~B61**

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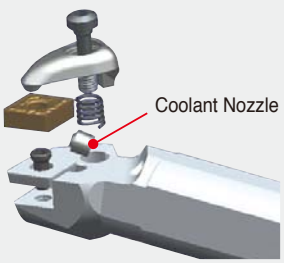
Features of Double Clamp (Boring bar)

Longer tool life and excellent surface finish can be achieved with the adjustable Coolant Nozzle

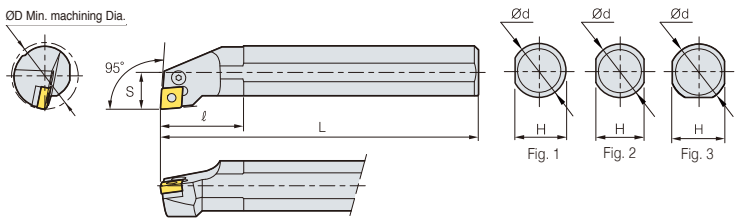


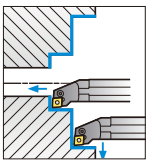


PCLNR/L



CN□□





95°

• R type insert
(inch)

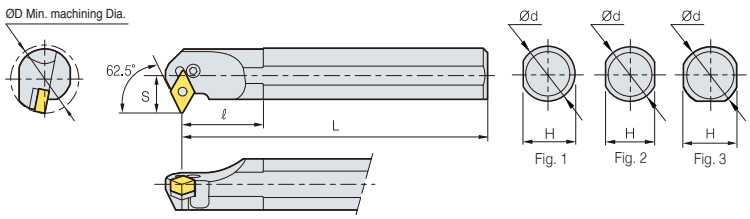
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S10R-PCLNR/L-3	0.770	5/8	0.586	8	0.406	1.102	CN□□33□	LV3C	VHX0509B	-	-	-	HW20L	2
S12S-PCLNR/L-3	0.930	3/4	0.671	10	0.500	1.260								
S16R-PCLNR/L-3	1.200	1	0.921	8	0.640	1.417								3
S16R-PCLNR/L-4	1.200	1	0.921	8	0.640	1.575	CN□□43□	LV4A	VHX0613A	-	-	-	HW25L	3
S20S-PCLNR/L-4	1.470	1 1/4	0.171	10	0.765	1.969		LV4	VHX0821	SC42B	SP4	LSPS4	HW30L	
S24T-PCLNR/L-4	1.760	1 1/2	1.382	12	0.890	2.165								
S32U-PCLNR/L-4	2.400	2	1.882	14	1.281	2.205								
S32U-PCLNR/L-6	2.400	2	1.882	14	1.281	2.480	CN□□64□	LV6	VHX1027	SC63	SP6	LSPS6	HW40L	3
A16R-PCLNR/L-4	1.200	1	0.961	8	0.640	1.575	CN□□43□	LV4A	VHX0613A	-	-	-	HW25L	1
A20S-PCLNR/L-4	1.470	1 1/4	1.211	10	0.765	1.969		LV4	VHX0821	SC42B	SP4	LSPS4	HW30L	3
A24T-PCLNR/L-4	1.760	1 1/2	1.882	12	0.890	2.362								
S10R-PCLNR/L-3N	0.770	5/8	0.586	8	0.406	0.984	CN□□33□	LV3CN	VHX0509BN	-	-	-	HW20L	2
S12S-PCLNR/L-3N	0.930	3/4	0.671	10	0.500	0.984								
S16R-PCLNR/L-3N	1.200	1	0.921	8	0.640	0.984								3
S16R-PCLNR/L-4N	1.200	1	0.921	8	0.640	0.984	CN□□43□	LV4AN	VHX0613N	-	-	-	HW25L	3
S16T-PCLNR/L-4N	1.200	1	0.921	12	0.640	0.984								
S20S-PCLNR/L-4N	1.470	1 1/4	1.171	10	0.765	1.181		LV4N	VHX0820N	SC42N	SP4N	LSPS4	HW30L	
S20U-PCLNR/L-4N	1.470	1 1/4	1.171	14	0.765	1.181								
S24T-PCLNR/L-4N	1.760	1 1/2	1.382	12	0.890	1.181								
S32U-PCLNR/L-4N	2.400	2	1.882	14	1.281	1.181								
S32U-PCLNR/L-6N	2.400	2	1.882	14	1.281	1.181	CN□□64□	LV6N	VHX1027N	SC63N	SP6N	LSPS6	HW40L	3
A10R-PCLNR/L-3N	0.770	5/8	0.586	8	0.406	1.102	CN□□33□	LV3CN	VHX0509BN	-	-	-	HW20L	1
A12S-PCLNR/L-3N	0.930	3/4	0.671	10	0.500	0.984								
A16R-PCLNR/L-3N	1.200	1	0.921	8	0.640	0.984								
A16R-PCLNR/L-4N	1.200	1	0.921	8	0.640	0.984	CN□□43□	LV4AN	VHX0613N	-	-	-	HW25L	1
A20S-PCLNR/L-4N	1.470	1 1/4	1.171	10	0.765	1.181		LV4N	VHX0820N	SC42N	SP4N	LSPS4	HW30L	3
A24T-PCLNR/L-4N	1.760	1 1/2	1.382	12	0.890	1.181								
A32U-PCLNR/L-4N	2.400	2	1.882	14	1.281	1.181								
A32U-PCLNR/L-6N	2.400	2	1.882	14	1.281	1.181	CN□□64□	LV6N	VHX1027N	SC63N	SP6N	LSPS6	HW40L	3

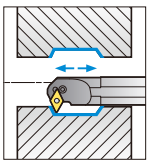
Applicable inserts **B33~B39**

PDSNR/L



DN□□





62.5°

• R type insert
(inch)

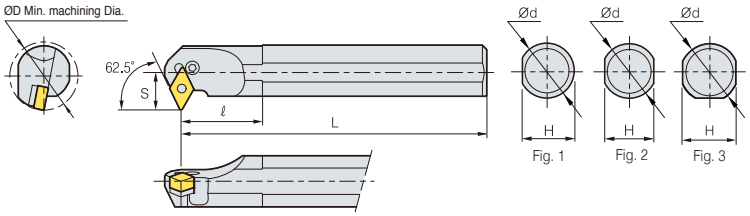
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S20S-PDSNR/L-4	1.705	1 1/4	1.171	10	1.000	1.772	DN□□44□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L	3
S24T-PDSNR/L-4	2.000	1 1/2	1.382	12	1.125	1.693								
S20S-PDSNR/L-4-3	1.705	1 1/4	1.171	10	1.000	1.772	DN□□43□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L	
S24T-PDSNR/L-4-3	2.000	1 1/2	1.382	12	1.125	1.693								
A20S-PDSNR/L-4	1.705	1 1/4	1.211	10	1.000	1.772	DN□□44□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L	
A20S-PDSNR/L-4-3	1.705	1 1/4	1.211	10	1.000	1.772	DN□□43□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L	

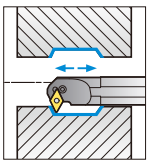
Applicable inserts **B33~B39**

PDSNR/L



DN□□





62.5°

• R type insert

(inch)

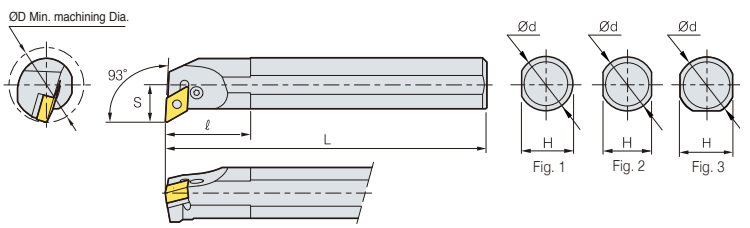
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S20S-PDSNR/L-4N	1.705	1 1/4	1.171	10	1.000	0.590	DN□□44□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L	3
S24T-PDSNR/L-4N	2.000	1 1/2	1.382	12	1.125	0.590								
S20S-PDSNR/L-4-3N	1.705	1 1/4	1.171	10	1.000	0.590	DN□□43□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L	
S24T-PDSNR/L-4-3N	2.000	1 1/2	1.382	12	1.125	0.590								
A20S-PDSNR/L-4N	1.705	1 1/4	1.171	10	1.000	0.590	DN□□44□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L	
A24T-PDSNR/L-4N	2.000	1 1/2	1.382	12	1.125	0.590								
A20S-PDSNR/L-4-3N	1.705	1 1/4	1.171	10	1.000	0.590	DN□□43□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L	
A24T-PDSNR/L-4-3N	2.000	1 1/2	1.382	12	1.125	0.590								

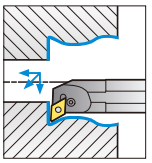
Applicable inserts **B33~B39**

PDUNR/L



DN□□





93°

• R type insert

(inch)

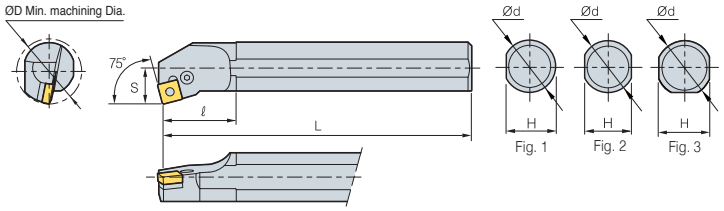
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S12S-PDUNR/L3	0.930	3/4	0.671	10	1.181	1.181	DN□□33□	LV3D	VHX0512B	-	-	-	HW20L	2
S16R-PDUNR/L3	1.200	1	0.921	8	1.378	1.378		LV3DN	VHX0512B	-	-	-	HW20L	3
S20S-PDUNR/L3	1.470	1 1/4	1.171	10	1.575	1.575		LV3	VHX0617	SD317	SP3	LSPS3	HW25L	3
S20S-PDUNR/L4	1.705	1 1/4	1.171	10	1.969	1.969	DN□□44□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L	3
S24T-PDUNR/L4	2.000	1 1/2	1.382	12	1.969	1.969								
S32U-PDUNR/L4	2.400	2	1.882	14	2.480	2.480								
S20S-PDUNR/L4-3	1.705	1 1/4	1.171	10	1.969	1.969	DN□□43□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L	3
S24T-PDUNR/L4-3	2.000	1 1/2	1.382	12	1.969	1.969								
A20S-PDUNR/L4	1.705	1 1/4	1.211	10	1.969	1.969	DN□□44□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L	3
A20S-PDUNR/L4-3	1.705	1 1/4	1.211	10	1.969	1.969	DN□□43□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L	3
S12S-PDUNR/L3N	0.930	3/4	0.671	10	1.181	0.984	DN□□33□	LV3DN	VHX0512BN	-	-	-	HW20L	2
S16R-PDUNR/L3N	1.200	1	0.921	8	1.378	1.378								3
S20S-PDUNR/L3N	1.470	1 1/4	1.171	10	1.575	1.575		LV3AN	VHX0617N	SD32N	SP3	LSPS3	HW30L	
S20S-PDUNR/L4N	1.705	1 1/4	1.171	10	1.969	1.969	DN□□44□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	HW30L	3
S20U-PDUNR/L4N	1.705	1 1/4	1.171	14	1.969	1.969								
S24T-PDUNR/L4N	2.000	1 1/2	1.382	12	1.969	1.969								
S32U-PDUNR/L4N	2.400	2	1.882	14	2.480	1.969								
S20S-PDUNR/L4-3N	1.705	1 1/4	1.171	10	1.969	1.969	DN□□44□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	HW30L	3
S24T-PDUNR/L4-3N	2.000	1 1/2	1.382	12	1.969	1.969								
A12S-PDUNR/L3N	0.930	3/4	0.671	10	1.181	0.984	DN□□33□	LV3DN	VHX0512BN	-	-	-	HW20L	1
A16R-PDUNR/L3N	1.200	1	0.921	8	1.378	1.378								3
A20S-PDUNR/L3N	1.470	1 1/4	1.171	10	1.575	1.575		LV3AN	VHX0617N	SD32N	SP3	LSPS3	HW30L	
A20S-PDUNR/L4N	1.705	1 1/4	1.171	10	1.969	1.969	DN□□44□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	HW30L	3
A24T-PDUNR/L4N	2.000	1 1/2	1.382	12	1.969	1.969								
A32U-PDUNR/L4N	2.400	2	1.882	14	2.480	1.969								
A20S-PDUNR/L4-3N	1.705	1 1/4	1.171	10	1.969	1.969	DN□□44□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	HW30L	3
A24T-PDUNR/L4-3N	2.000	1 1/2	1.382	12	1.969	1.969								

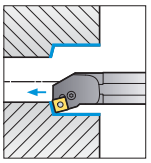
Applicable inserts **B33~B39**

PSKNR/L



SN□□





75°

• R type insert

(inch)

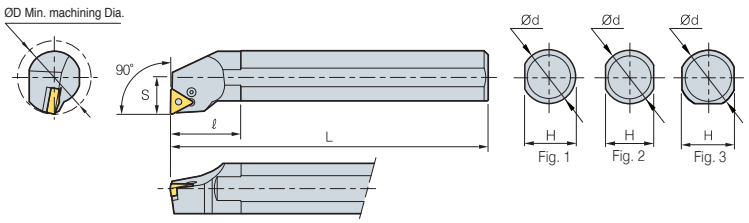
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S16T-PSKNR/L4	1.200	1	0.921	12	0.640	1.654	SN□□43□	LV4A	VHX0613A	-	-	-	HW30L	3
S20U-PSKNR/L4	1.470	1 1/4	1.171	14	0.765	1.772		LV4	VHX0821	SS42B	SP4	LSPS4	HW30L	
S24V-PSKNR/L4	1.760	1 1/2	1.382	16	0.890	1.969								
A16T-PSKNR/L4	1.200	1	0.961	12	0.640	1.654	SN□□43□	LV4A	VHX0613A	-	SP4	-	HW25L	1
A20U-PSKNR/L4	1.470	1 1/4	1.211	14	0.765	1.969		LV4	VHX0821	SS42B	SP4	LSPS4	HW30L	3
S16T-PSKNR/L4N	1.200	1	0.921	12	0.640	0.984	SN□□43□	LV4AN	VHX0613N	-	-	-	HW25L	3
S20U-PSKNR/L4N	1.470	1 1/4	1.171	14	0.765	1.181		LV4N	VHX0821N	SS42N	SP4N	LSPS4	HW30L	
S24V-PSKNR/L4N	1.760	1 1/2	1.382	16	0.890	1.181								
A16T-PSKNR/L4N	1.200	1	0.921	12	0.640	0.984	SN□□43□	LV4AN	VHX0613N	-	-	-	HW25L	1
A20U-PSKNR/L4N	1.470	1 1/4	1.171	14	0.765	1.181		LV4N	VHX0821N	SS42N	SP4N	LSPS4	HW30L	3
A24V-PSKNR/L4N	1.760	1 1/2	1.382	16	0.890	1.181								

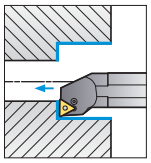
Applicable inserts **B41~B48**

PTFNR/L



TN□□





90°

• R type insert

(inch)

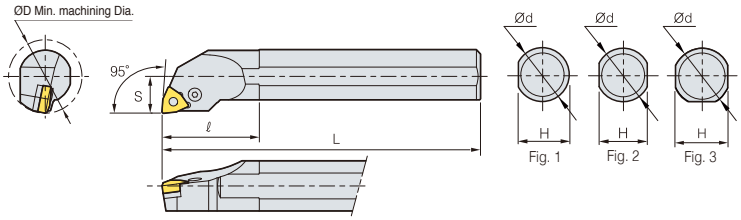
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S10R-PTFNR/L2	0.770	5/8	0.586	12	0.406	1.102	TN□□32□	LV2	VHX0509B	-	-	-	HW25L	1
S12S-PTFNR/L2	0.930	3/4	0.671	14	0.500	1.299								
S16T-PTFNR/L2	1.200	1	0.921	12	0.640	1.417								3
S16T-PTFNR/L3N	1.200	1	0.921	12	0.640	1.654	TN□□33□	LV3B	VHX0512B	-	-	-	HW20L	3
S20R-PTFNR/L3N	1.470	1 1/4	1.171	14	0.765	1.969		LV3	VHX0617	ST317B	SP3	LSPS3	HW25L	
S24S-PTNFR/L3N	1.760	1 1/2	1.382	16	0.890	2.165								
A16T-PTFNR/L3N	1.200	1	0.961	12	0.640	1.575								1
A20R-PTFNR/L3N	1.470	1 1/4	1.211	14	0.765	1.969								3
S16S-PTFNR/L3N	1.200	1	0.921	16	0.640	1.575	TN□□33□	LV3B	VHX0512B	-	-	-	HW20L	3
S20R-PTFNR/L3N	1.470	1 1/4	1.171	14	0.765	1.969		LV3N	VHX0617N	ST317N	SP3N	LSPS3	HW25L	3
S24S-PTNFR/L3N	1.760	1 1/2	1.382	16	0.890	2.165								

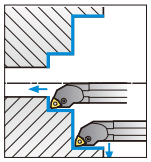
Applicable inserts **B49~B55**

PWLNR/L



WN□□





95°

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S16R-PWLNR/L3	0.787	1	0.551	12	0.433	0.984	WN□□33□	LV3B	VHX0512B	-	-	-	HW20L	2
S12S-PWLNR/L3	0.930	3/4	0.671	14	0.500	1.574	WN□□33□	LV3B	VHX0512B	-	-	-	HW20L	2
S16T-PWLNR/L3	1.200	1	0.921	12	0.640	1.575								3
S20U-PWLNR/L3	1.470	1 1/4	1.171	14	0.765	1.772		LV3	VHX0617	SW317	SP3	LSPS3	HW25L	
S16T-PWLNR/L4	1.200	1	0.921	12	0.640	1.772	WN□□43□	LV4A	VHX0613A	-	-	-	HW25L	3
S20U-PWLNR/L4	1.470	1 1/4	1.171	14	0.765	1.969		LV4	VHX0821	SW42	SP4	LSPS3	HW30L	
S20U-PWLNR/L3N	1.470	1 1/4	1.171	14	0.765	1.772	WN□□33□	LV3N	VHX0617N	SW317N	SP3	LSPS3	HW25L	3
S16T-PWLNR/L4N	1.200	1	0.921	12	0.640	0.984	WN□□43□	LV4AN	VHX0613N	-	-	-	HW25L	
S20U-PWLNR/L4N	1.470	1 1/4	1.171	14	0.765	0.984		LV4N	VHX0820N	SW42N	SP4N	LSPS4	HW30L	

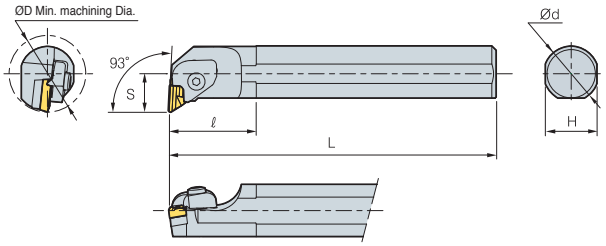
Applicable inserts **B58~B61**

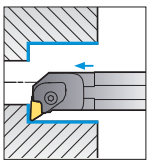
- **Improved holders and parts ensure performance and durability**
- **"N" stand for New type (parts)**

CKUNR/L



KN□□





93°

• R type insert

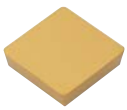
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Spring	Shim	Pin+Spring	Shim Screw	Wrench
S20S-CKUNR3	1.705	1 1/4	1.171	10	1.000	2.756	KN□□33□L	CTH6LI	CHX0625	SR3	SK33CL	PN0515 SR4	SHX0310	HW40L HW20L
S24T-CKUNR3	2.000	1 1/2	1.382	12	1.125	2.362								
S32U-CKUNR3	2.500	2	1.693	14	1.377	2.165								
S20S-CKUNL3	1.705	1 1/4	1.171	10	1.000	2.756	KN□□33□R	CTH6RI	CHX0625	SR3	SK33C	PN0515 SR4	SHX0310	HW40L HW20L
S24T-CKUNL3	2.000	1 1/2	1.382	12	1.125	2.362								
S32U-CKUNL3	2.500	2	1.693	14	1.377	2.165								

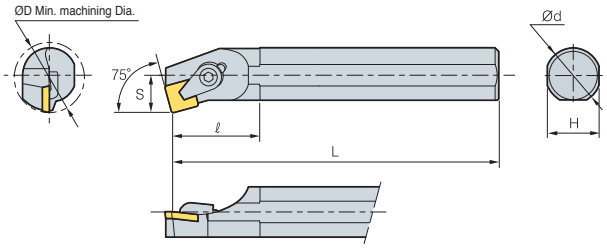
Applicable inserts **B40**

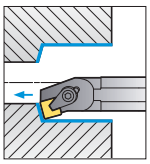
• Use left handed insert for right handed holder

CSKPR/L



SP□□





75°

• R type insert

(inch)

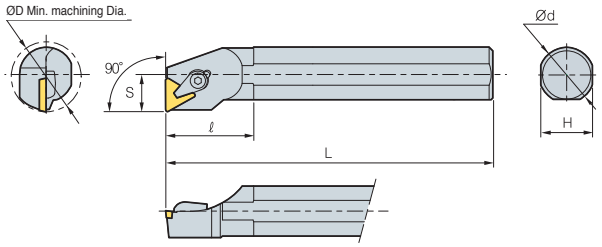
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	C-ring	Wrench
S10R-CSKPR3	0.770	5/8	0.586	8	0.406	1.181	SP□□R32□	CH4R1C	CHX0414C	CR02C	HW25L
S12S-CSKPR3	0.930	3/4	0.671	10	0.500	1.417		CH5R5C	CHX0519C	CR03C	HW30L
S12S-CSKPR4	0.930	3/4	0.671	10	0.500	1.102	SP□□R42□	CH6R5	CH0616	CR04C	HW30L
S16R-CSKPR4	1.260	1	0.905	12	0.670	1.575					

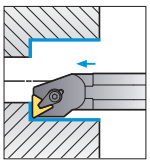
Applicable inserts **B72~B73**

CTFPR/L



TP□□





90°

• R type insert

(inch)

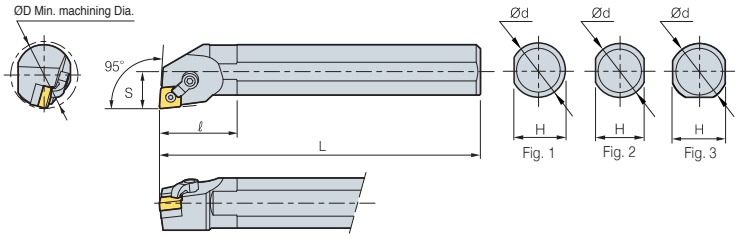
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	C-ring	Shim	Shim pin	Wrench
S08M-CTFPR/L2	0.600	1/2	0.461	6	0.312	1.024	TP□□22□	CH4R1C	CHX0414C	CR02C	-	-	HW25L
S10R-CTFPR/L2	0.770	5/8	0.586	8	0.406	1.575							
S12S-CTFPR/L2	0.930	3/4	0.671	10	0.500	1.575							
S10R-CTFPR/L3	0.770	5/8	0.586	8	0.406	1.575	TP□□32□	CH5R5C	CHX0519C	CR03C	-	-	HW30L
S12S-CTFPR/L3	0.930	3/4	0.671	10	0.500	1.575							
S16R-CTFPR/L3	1.200	1	0.921	8	0.640	1.575		CH6R5	CHX0622C	CR04C	ST32C	SP3C	
S20S-CTFPR/L3	1.470	1 1/4	1.171	10	0.765	1.772							
S24T-CTFPR/L3	1.760	1 1/2	1.382	12	0.890	2.362							
S24T-CTFPR/L4	1.760	1 1/2	1.382	12	0.890	2.362	TP□□43□	CH83R1	CH0823C	CR05C	ST43C	SP4C	HW40L

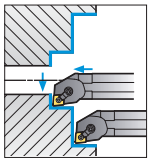
Applicable inserts **B77~B79**

MCLNR/L



CN□□





95°

• R type insert

(inch)

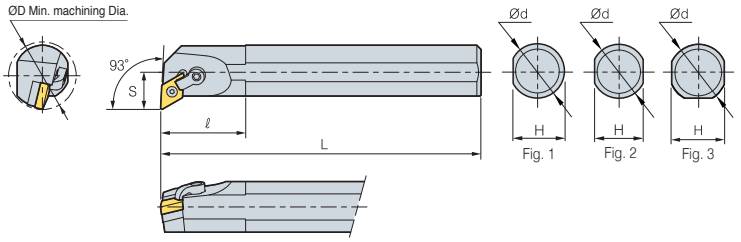
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S12S-MCLNR/L3	0.930	3/4	0.671	10	0.500	1.417	CNMG322	CDH7N	DHA10/32-19	-	SP3D3	HW19.8L	2
S16R-MCLNR/L3	1.200	1	0.921	8	0.640	1.417						HW23.8L	3
S16R-MCLNR/L4	1.200	1	0.921	8	0.640	1.417	CNMG432	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L	3
S20S-MCLNR/L4	1.705	1 1/4	1.171	10	0.765	1.969				SC43D	SP4D		
S24T-MCLNR/L4	2.000	1 1/2	1.382	12	0.890	2.362							
A16R-MCLNR/L4	1.200	1	0.921	8	0.640	1.575	CNMG432	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L	1
A20S-MCLNR/L4	1.705	1 1/4	1.171	10	0.765	1.969				SC43D	SP4D	HW23.8L	3

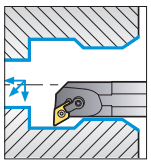
Applicable inserts **B26~B32**

MDUNR/L



DN□□





93°

• R type insert

(inch)

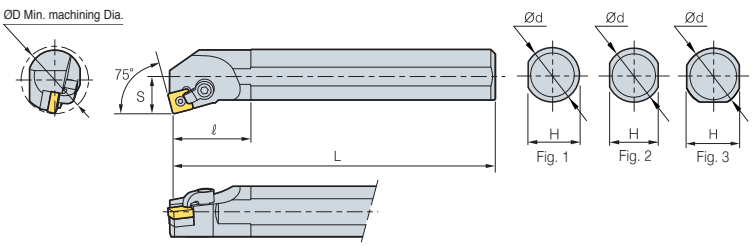
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S20S-MDUNR/L4-3	1.705	1 1/4	1.171	10	0.765	1.969	DNMG432	CDH6N	DHA1/4-21	SD43D	SP4D	HW31.8L HW23.8L	3
S24T-MDUNR/L4-3	2.000	1 1/2	1.382	12	0.890	2.362							
A20S-MDUNR/L4-3	1.705	1 1/4	1.171	10	0.765	1.969							

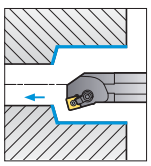
Applicable inserts **B33~B39**

MSKNR/L



SN□□





75°

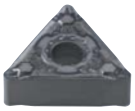
• R type insert

(inch)

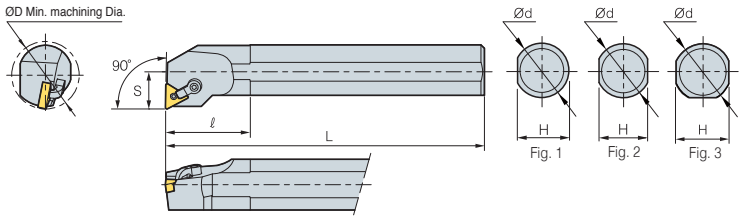
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S16R-MSKNR/L4	1.200	1	0.921	12	0.640	1.417	SNMG432	CDH8N1	DHA5/16-28	-	SP4DS	HW39.7L HW23.8L	3
S20S-MSKNR/L4	1.705	1 1/4	1.171	14	0.765	1.969				SS43D	SP4D		
S24T-MSKNR/L4	2.000	1 1/2	1.382	16	0.890	2.362							
A16R-MSKNR/L4	1.200	1	0.921	8	0.640	1.575	SNMG432	CDH8N1	DHA5/16-28	-	SP4DS	HW39.7L HW23.8L	1
A20S-MSKNR/L4	1.705	1 1/4	1.171	10	0.765	1.969				SS43D	SP4D		3
A24T-MSKNR/L4	2.000	1 1/2	1.382	12	0.890	2.362							

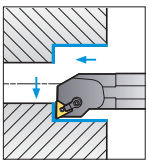
Applicable inserts **B41~B48**

MTFNR/L



TN□□





90°

• R type insert
(inch)

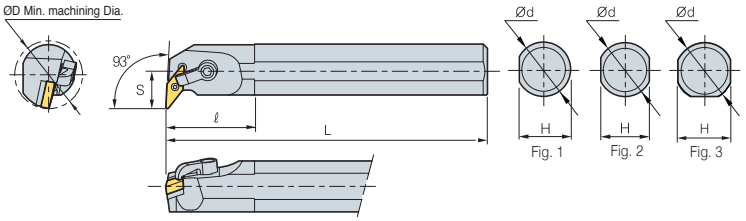
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S16R-MTFNR/L3	1.200	1	0.921	12	0.640	1.417	TNMG332	CDH7N1	DHA10-32-19	-	SP3D3	HW23.8L	3
S20S-MTFNR/L3	1.705	1 1/4	1.171	14	0.765	1.969		CDH7N1	DHA10-32-19	ST32D	SP3D	HW19.8L	
S24T-MTFNR/L3	2.000	1 1/2	1.382	14	0.890	2.362							
A16R-MTFNR/L3	1.200	1	0.921	8	0.640	1.575	TNMG332	CDH7N1	DHA10-32-19	-	SP3D3	HW23.8L	1
A20S-MTFNR/L3	1.705	1 1/4	1.171	10	0.765	1.969		CDH7N1	DHA10-32-19	ST32D	SP3D	HW19.8L	3

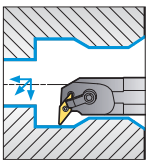
Applicable inserts **B49~B55**

MVUNR/L



VN□□





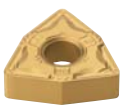
93°

• R type insert
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S20S-MVUNR/L3	1.705	1 1/4	1.171	10	0.765	1.969	VNMG332	CDH8N2	DHA5/16-28	SV32D	SP3D	HW39.7L HW19.8L	3
S24T-MVUNR/L3	2.000	1 1/2	1.382	12	0.890	2.362							
A20S-MVUNR/L3	1.705	1 1/4	1.171	10	0.765	1.969	VNMG332	CDH8N2	DHA5/16-28	SV32D	SP3D	HW39.7L HW19.8L	3
A24T-MVUNR/L3	2.000	1 1/2	1.382	12	0.890	2.362							

Applicable inserts **B56~B57**

MWLNR/L



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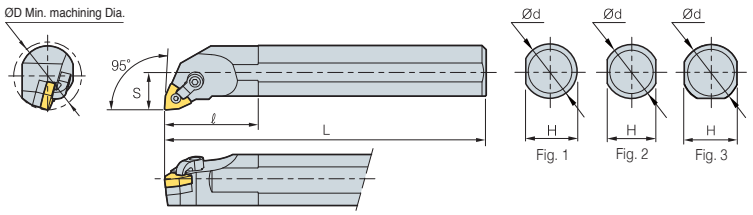
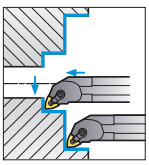




95°

• R type insert
(inch)

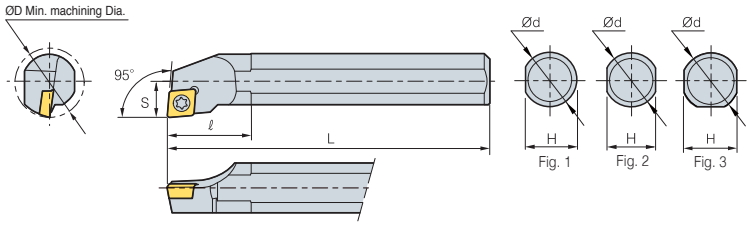
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S16R-MWLNR/L3	1.200	1	0.921	8	0.640	1.417	WNMG332	CDH7N	DHA10/32-19	-	SP3D3	HW23.8L HW19.8L	3
S20S-MWLNR/L3	1.705	1 1/4	1.171	10	0.765	1.969				SW32D	SP3D		
S24T-MWLNR/L3	2.000	1 1/2	1.382	12	0.890	2.362							
S16R-MWLNR/L4	1.200	1	0.921	8	0.640	1.417	WNMG432	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L	3
S20S-MWLNR/L4	1.705	1 1/4	1.171	10	0.765	1.969				SW43D	SP4D		
S24T-MWLNR/L4	2.000	1 1/2	1.382	12	0.890	2.362							
A16R-MWLNR/L3	1.200	1	0.921	8	0.640	1.575	WNMG332	CDH7N	DHA10/32-19	-	SP3D3	HW31.8L HW19.8L	1
A20S-MWLNR/L3	1.705	1 1/4	1.171	10	0.765	1.969				SW32D	SP3D		3
A16R-MWLNR/L4	1.200	1	0.921	8	0.640	1.575	WNMG432	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L	1
A20S-MWLNR/L4	1.705	1 1/4	1.171	10	0.765	1.969				SW43D	SP4D		3

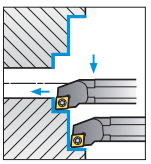
Applicable inserts **B58~B61**

SCLCR/L



CC□□





95°

• R type insert

Steel shank type

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S05K-SCLCR/L2	0.415	5/16	0.273	5	0.219	0.551	CC□T21.5□	FTKA02555			TWO7	2
S06K-SCLCR/L2	0.480	3/8	0.336	5	0.250	0.551		FTKA02565	-	-	TWO7P	
S06M-SCLCR/L2	0.480	3/8	0.336	6	0.250	0.551						
S08M-SCLCR/L2	0.600	1/2	0.461	6	0.312	0.984						
S10R-SCLCR/L2	0.770	5/8	0.586	8	0.406	1.260						
S08M-SCLCR/L3	0.600	1/2	0.461	6	0.312	0.984	CC□T32.5□	FTGA03508	-	-	TW15P	2
S10R-SCLCR/L3	0.770	5/8	0.586	8	0.406	1.280						
S12S-SCLCR/L3	0.930	3/4	0.671	10	0.500	1.496						
S16R-SCLCR/L3	1.200	1	0.921	8	0.640	1.772		FTGA03510			TW15P	3
S16R-SCLCR/L4	1.200	1	0.921	8	0.640	1.772	CC□T43□	FTGA0411F	-	-	TW15P	3
S20S-SCLCR/L4	1.470	1 1/4	1.171	10	0.765	1.969		FTGA0411F	SC42S	SHXN0610F	HW40L TW15P	
S24T-SCLCR/L4	1.760	1 1/2	1.382	12	0.890	2.362						
A05F-SCLCR/L2	0.415	5/16	0.293	3	0.219	0.551	CC□T21.5□	FTKA02555	-	-	TW07P	1
A06H-SCLCR/L2	0.480	3/8	0.355	4	0.250	0.551		FTKA02565	-	-	TW07P	
A08K-SCLCR/L2	0.600	1/2	0.480	5	0.312	0.984						
A08K-SCLCR/L3	0.600	1/2	0.480	5	0.312	0.984	CC□T32.5□	FTGA03508	-	-	TW15P	1
A10M-SCLCR/L3	0.770	5/8	0.605	6	0.406	1.280						
A12Q-SCLCR/L3	0.930	3/4	0.711	7	0.500	1.496						
A16R-SCLCR/L3	1.200	1	0.961	8	0.640	1.772		FTGA03510	-	-	TW15P	
A16R-SCLCR/L4	1.200	1	0.961	8	0.640	1.772	CC□T43□	FTGA0411F	-	-	TW15P	1
A20S-SCLCR/L4	1.470	1 1/4	1.211	10	0.765	1.969		FTGA0411F	SC42S	SHXN0610F	HW40L,TW15P	3

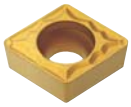
Carbide shank type

(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C025G-SCLCR/L1.2	0.197	5/32	0.150	3.5	0.098	CC□T1.21□	FTNA01633	TW06P	1
C3H-SCLCR/L1.2	0.260	3/16	0.168	4	0.126				
C04H-SCLCR/L1.5	0.293	1/4	0.230	4	0.156	CC□T1.51□	FTNA0238	TW06P	
C045H-SCLCR/L1.5	0.313	9/32	0.252	5	0.158				
C05K-SCLCR/L2	0.415	5/16	0.273	5	0.219	CC□T2.15□	FTKA02555	TW07P	2
C06K-SCLCR/L2	0.480	3/8	0.336	5	0.250		FTKA02565	TW07P	
C06M-SCLCR/L2	0.480	3/8	0.336	6	0.250				
C08M-SCLCR/L-2	0.551	1/2	0.461	6	0.312				
C08Q-SCLCR/L2	0.551	1/2	0.461	7	0.312				
C08M-SCLCR/L3	0.590	1/2	0.461	6	0.312	CC□T32.5□	FTGA03508	TW15P	
C08Q-SCLCR/L3	0.590	1/2	0.461	7	0.312				
C10R-SCLCR/L3	0.770	5/8	0.586	8	0.406				
C10S-SCLCR/L3	0.770	5/8	0.586	10	0.406				
C12R-SCLCR/L3	0.930	3/4	0.671	8	0.500				
C12S-SCLCR/L3	0.930	3/4	0.671	10	0.500				
C16T-SCLCR/L4	1.200	1	0.921	12	0.640	CC□T43□	FTGA0411F	TW15P	
E04H-SCLCR/L1.5	0.321	1/4	0.230	4	0.156	CC□T1.51□	FTNA0238	TW06P	1
E045K-SCLCR/L1.5	0.315	9/32	0.252	5	0.158				
E05K-SCLCR/L2	0.415	5/16	0.273	5	0.219	CC□T2.15□	FTKA02555	TW07P	2
E06K-SCLCR/L2	0.480	3/8	0.336	5	0.250		FTKA02565	TW07P	
E06M-SCLCR/L2	0.480	3/8	0.336	6	0.250				
E08M-SCLCR/L2	0.551	1/2	0.461	6	0.312				
E08Q-SCLCR/L2	0.551	1/2	0.461	7	0.312				
E08M-SCLCR/L3	0.590	1/2	0.461	6	0.312	CC□T32.5□	FTGA03508	TW15P	
E08Q-SCLCR/L3	0.590	1/2	0.461	7	0.312				
E10R-SCLCR/L3	0.770	5/8	0.586	8	0.406				
E10S-SCLCR/L3	0.770	5/8	0.586	10	0.406				
E12R-SCLCR/L3	0.930	3/4	0.671	8	0.500				
E12S-SCLCR/L3	0.930	3/4	0.671	10	0.500				
E16T-SCLCR/L4	1.200	1	0.921	12	0.640	CC□□T43□	FTGA0411F	TW15P	

Applicable inserts **B62~B64**

SCLPR/L



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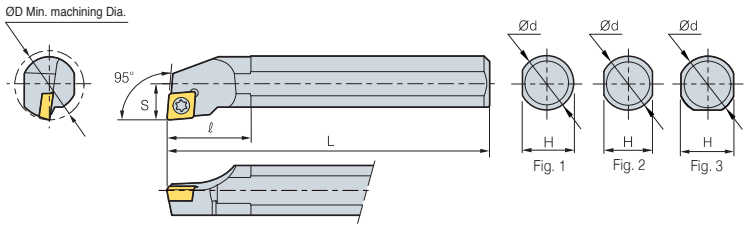
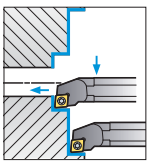




95°

Steel shank type

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S06M-SCLPR/L2.5	0.480	3/8	0.336	6	0.250	-	CP□T2.51.5□	FTNA0305	TW09P	2
S08M-SCLPR/L2.5	0.600	1/2	0.461	6	0.312	0.591		FTNA0307	TW09P	
S10N-SCLPR/L3	0.770	5/8	0.586	7	0.406	0.591	CP□T32□	FTNA0408	TW15P	2
S10R-SCLPR/L3	0.770	5/8	0.586	8	0.406	0.591				
S12N-SCLPR/L3	0.930	3/4	0.671	7	0.500	0.787				
S12S-SCLPR/L3	0.930	3/4	0.671	10	0.500	0.787				3
A06H-SCLPR/L2.5	0.480	3/8	0.355	4	0.250	-	CP□R2.51.5□	FTNA0305	TW09P	1
A08K-SCLPR/L2.5	0.600	1/2	0.480	5	0.312	0.787		FTNA0307	TW09P	
A10M-SCLPR/L3	0.770	5/8	0.605	6	0.406	0.591	CP□T32□	FTNA0408	TW15P	1
A12Q-SCLPR/L3	0.930	3/4	0.711	7	0.500	0.787				3

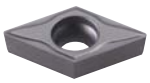
Carbide shank type

(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C60K-SCLPR/L2.5	0.480	3/8	0.336	5	0.250	CP□T2.51.5□	FTNA0305	TW09P	2
C06M-SCLPR/L2.5	0.480	3/8	0.336	6	0.250				
C08M-SCLPR/L2.5	0.590	1/2	0.461	6	0.312		FTNA0306	TW09P	
C08Q-SCLPR/L2.5	0.590	1/2	0.461	7	0.312				
C08M-SCLPR/L3	0.590	1/2	0.461	6	0.312	CP□T32□	FTNA0408	TW15P	
C08Q-SCLPR/L3	0.590	1/2	0.461	7	0.312				
C10R-SCLPR/L3	0.770	5/8	0.586	8	0.406				
C10S-SCLPR/L3	0.770	5/8	0.586	10	0.406				
C12R-SCLPR/L3	0.930	3/4	0.471	8	0.500				
C12S-SCLPR/L3	0.930	3/4	0.471	10	0.500				
E06K-SCLPR/L2.5	0.480	3/8	0.336	5	0.250	CP□T2.51.5□	FTNA0305	TW09P	
E06M-SCLPR/L2.5	0.480	3/8	0.336	6	0.250				
E08M-SCLPR/L2.5	0.590	1/2	0.461	6	0.312				
E08Q-SCLPR/L2.5	0.590	1/2	0.461	7	0.312				
E08M-SCLPR/L3	0.590	1/2	0.461	6	0.312		FTNA0407	TW09P	2
E08Q-SCLPR/L3	0.590	1/2	0.461	7	0.312				
E10R-SCLPR/L3	0.770	5/8	0.586	8	0.406	CP□T32□	FTNA0408	TW15P	
E10S-SCLPR/L3	0.770	5/8	0.586	10	0.406				
E12R-SCLPR/L3	0.930	3/4	0.471	8	0.500				
E12S-SCLPR/L3	0.930	3/4	0.471	10	0.500				

Applicable inserts **B66**

SDQCR/L



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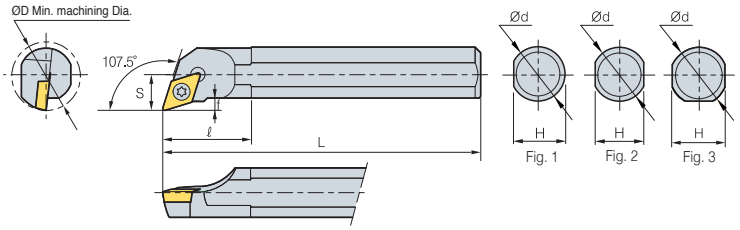
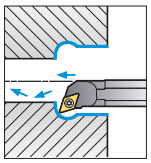




107.5°

Steel shank type

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S06M-SDQCR/L2	0.600	3/8	0.336	6	0.375	0.787	DC□T21.5□	FTKA02555	TW07P	2
S08M-SDQCR/L2	0.730	1/2	0.461	6	0.437	0.866		FTKA02565	TW07P	
S10R-SDQCR/L2	0.850	5/8	0.586	8	0.500	1.063				
S10R-SDQCR/L3	0.850	5/8	0.586	8	0.500	1.260	DC□T32.5□	FTGA03508	TW15P	2
S12S-SDQCR/L3	0.980	3/4	0.671	10	0.562	1.260				
S16R-SDQCR/L3	1.300	1	0.921	8	0.640	1.260		FTGA03510	TW15P	3
A06H-SDQCR/L2	0.600	3/8	0.355	6	0.375	0.787	DC□T21.5□	FTKA02555	TW07P	1
A08K-SDQCR/L2	0.730	1/2	0.480	6	0.437	0.866		FTKA02565	TW07P	1
A10M-SDQCR/L3	0.850	5/8	0.605	8	0.500	1.063	DC□T32.5□	FTGA03508	TW15P	1
A12Q-SDQCR/L3	0.980	3/4	0.711	10	0.562	1.260				
A16R-SDQCR/L3	1.300	1	0.961	12	0.640	1.260		FTGA03510	TW15P	1

Carbide shank type

(inch)

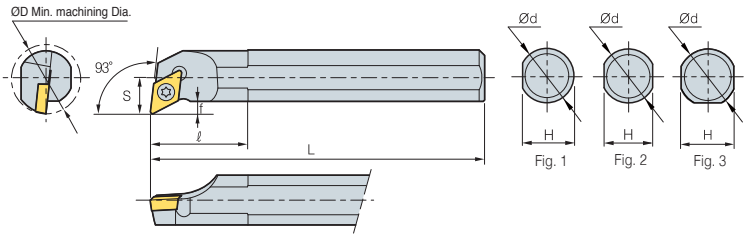
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C05K-SDQCR/L2	0.393	5/16	0.273	5	0.219	DC□T2.15□□	FTKA02555	TW07P	2
C06K-SDQCR/L2	0.600	3/8	0.336	5	0.375				
C08M-SDQCR/L2	0.730	1/2	0.461	6	0.437		FTKA02565	TW07P	
C10R-SDQCR/L2	0.850	5/8	0.586	8	0.500				
C10R-SDQCR/L3	0.850	5/8	0.586	8	0.500	DC□T32.5□□	FTGA03508	TW15P	
C12R-SDQCR/L3	0.980	3/4	0.671	8	0.562				
C12S-SDQCR/L3	0.980	3/4	0.671	10	0.562				
E05K-SDQCR/L2	0.393	5/16	0.273	5	0.219	DC□T2.15□□	FTKA02555	TW07P	2
E06K-SDQCR/L2	0.600	3/8	0.336	5	0.375				
E08M-SDQCR/L2	0.730	1/2	0.461	6	0.437		FTKA02565	TW07P	
E10R-SDQCR/L2	0.850	5/8	0.586	8	0.500				
E10R-SDQCR/L3	0.850	5/8	0.586	8	0.500	DC□T32.5□□	FTGA03508	TW15P	
E12R-SDQCR/L3	0.980	3/4	0.671	8	0.562				
E12S-SDQCR/L3	0.980	3/4	0.671	10	0.562				

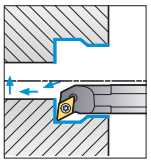
Applicable inserts **B67~B69, B88**

SDUCR/L



DC□□





93°

Steel shank type

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S06M-SDUCR/L2	0.600	3/8	0.336	6	0.375	-	DC□T21.5□	FTKA02555	TW07P	2
S08M-SDUCR/L2	0.730	1/2	0.461	6	0.437	0.866		FTKA02565	TW07P	2
S10R-SDUCR/L2	0.850	5/8	0.586	8	0.500	1.063				
S10R-SDUCR/L3	0.850	5/8	0.586	8	0.500	1.063	DC□T32.5□	FTGA03508	TW15P	2
S12S-SDUCR/L3	0.980	3/4	0.671	10	0.562	1.575				
S16R-SDUCR/L3	1.300	1	0.921	8	0.640	1.811		FTGA03510	TW15P	3
S20S-SDUCR/L3	1.470	1 1/4	1.171	10	0.765	1.969				
A06H-SDUCR/L2	0.600	3/8	0.355	6	0.375	-	DC□T21.5□	FTKA02555	TW07P	1
A08K-SDUCR/L2	0.730	1/2	0.480	6	0.437	0.866		FTKA02565	TW07P	1
A10M-SDUCR/L2	0.850	5/8	0.605	8	0.500	1.063				
A12Q-SDUCR/L3	0.980	3/4	0.711	10	0.562	1.378	DC□T32.5□	FTGA03508	TW15P	1
A16R-SDUCR/L3	1.300	1	0.961	12	0.640	1.811		FTGA03510	TW15P	

Carbide shank type

(inch)

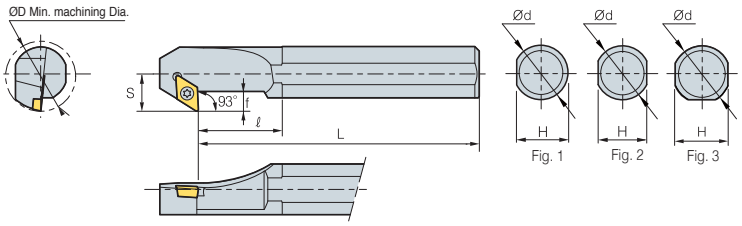
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C06K-SDUCR/L2	0.600	3/8	0.336	5	0.375	DC□T21.5□□	FTKA02555	TW07P	2
C06M-SDUCR/L2	0.600	3/8	0.336	6	0.375				
C08M-SDUCR/L2	0.730	1/2	0.461	6	0.437		FTKA02565	TW07P	
C08Q-SDUCR/L2	0.730	1/2	0.461	7	0.437				
C10R-SDUCR/L2	0.850	5/8	0.586	8	0.500				
C10S-SDUCR/L2	0.850	5/8	0.586	10	0.500				
C10R-SDUCR/L3	0.850	5/8	0.586	8	0.500	DC□T32.5□	FTGA03508	TW15P	
C10S-SDUCR/L3	0.850	5/8	0.586	10	0.500				
C12R-SDUCR/L3	0.980	3/4	0.671	8	0.562				
C12S-SDUCR/L3	0.980	3/4	0.671	10	0.562				
C16T-SDUCR/L3	1.300	1	0.921	12	0.640		FTGA03510	TW15P	
E06K-SDUCR/L2	0.600	3/8	0.336	5	0.375	DC□T21.5□□	FTKA02555	TW07P	2
E06M-SDUCR/L2	0.600	3/8	0.336	6	0.375				
E08M-SDUCR/L2	0.730	1/2	0.461	6	0.437		FTKA02565	TW07P	
E08Q-SDUCR/L2	0.730	1/2	0.461	7	0.437				
E10R-SDUCR/L2	0.850	5/8	0.586	8	0.500				
E10S-SDUCR/L2	0.850	5/8	0.586	10	0.500				
E10R-SDUCR/L3	0.850	5/8	0.586	8	0.500	DC□T32.5□	FTGA03508	TW15P	
E10S-SDUCR/L3	0.850	5/8	0.586	10	0.500				
E12R-SDUCR/L3	0.980	3/4	0.671	8	0.562				
E12S-SDUCR/L3	0.980	3/4	0.671	10	0.562				
E16T-SDUCR/L3	1.300	1	0.921	12	0.640		FTGA03510	TW15P	

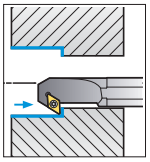
Applicable inserts **B67~B69, B88**

SDZCR/L



DC□□





93°

• R type insert

(inch)

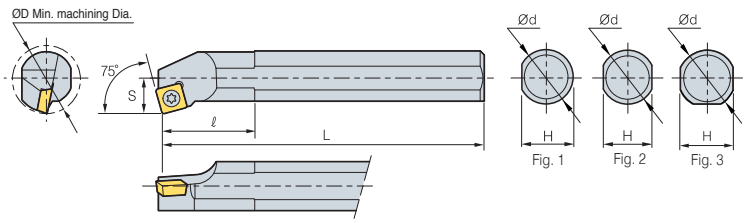
Designation	ØD	Ød	H	L	S	ℓ	f	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S10R-SDZCR/L2	0.850	5/8	0.586	8	0.500	0.787	0.157	DC□T21.5□	FTKA02565	-	-	TW07P	2
S12S-SDZCR/L2	0.980	3/4	0.671	10	0.562	0.984	0.177						
S16R-SDZCR/L3	1.200	1	0.921	8	0.640	1.181	0.272	DC□T32.5□	FTGA03510	-	-	TW15P	3
S20S-SDZCR/L3	1.470	1 1/4	1.171	10	0.765	1.535	0.331		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L	
S24T-SDZCR/L3	1.760	1 1/2	1.382	12	0.890	1.850	0.370						
A16R-SDZCR/L3	1.200	1	0.961	8	0.640	1.181	0.177		FTGA03510	-	-	TW15P	1
A20S-SDZCR/L3	1.470	1 1/4	1.211	10	0.765	1.535	0.236		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L	3

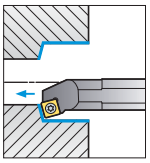
Applicable inserts **B67~B69, B88**

SSKCR/L



SC□□





75°

• R type insert

(inch)

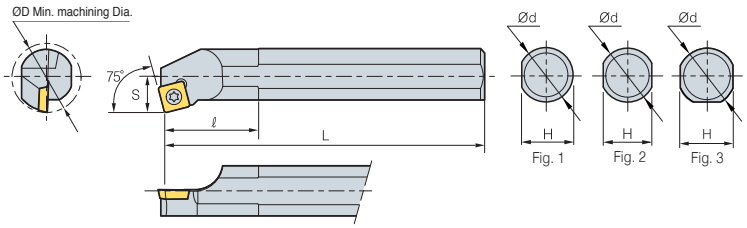
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S08M-SSKCR/L3	0.600	1/2	0.461	6	0.312	1.024	SC□T32.5□	FTGA03507	-	-	TW15P	2
S10R-SSKCR/L3	0.770	5/8	5.860	8	0.406	1.260		FTGA03508	-	-	TW15P	
S12S-SSKCR/L3	0.930	3/4	0.671	10	0.500	1.339						
S16R-SSKCR/L4	1.200	1	0.921	8	0.640	1.417	SC□T43□	FTGA0411F	-	-	TW15P	3
S20S-SSKCR/L4	1.470	1 1/4	1.171	10	0.765	1.693		FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L	
A08K-SSKCR/L3	0.600	1/2	0.480	5	0.312	1.024	SC□T32.5□	FTGA03507	-	-	TW15P	1
A10M-SSKCR/L3	0.770	5/8	0.605	6	0.406	1.260		FTGA03508	-	-	TW15P	
A12Q-SSKCR/L3	0.930	3/4	0.711	7	0.500	1.339						
A16R-SSKCR/L4	1.200	1	0.961	8	0.640	1.417	SC□T43□	FTGA0411F	-	-	TW15P	
A20S-SSKCR/L4	1.470	1 1/4	1.211	10	0.765	1.693		FTGA0411F	SS42S	SFXN0610F	TW15P, HW40L	3

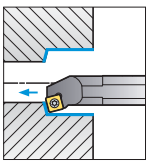
Applicable inserts **B70~B71, B90**

SSKPR/L



SP□□





75°

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S08M-SSKPR/L3	0.600	1/2	0.461	6	0.312	0.709	SP□T32□R/L	FTNA0307	TW09P	2
S10N-SSKPR/L3	0.770	5/8	0.586	7	0.406	1.181				
S10R-SSKPR/L3	0.770	5/8	0.586	8	0.406	1.260				
S12N-SSKPR/L3	0.930	3/4	0.671	7	0.500	1.280				
S12S-SSKPR/L3	0.930	3/4	0.671	10	0.500	1.378				
A08K-SSKPR/L3	0.600	1/2	0.480	5	0.312	0.827	SP□T32□R/L	FTNA0307	TW09P	1
A10M-SSKPR/L3	0.770	5/8	0.605	6	0.408	1.181				
A12Q-SSKPR/L3	0.930	3/4	0.711	7	0.500	1.260				

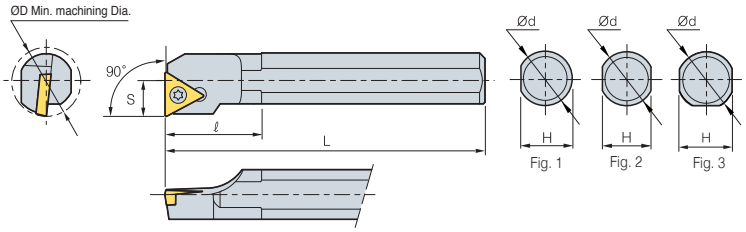
Applicable inserts **B72~B73**

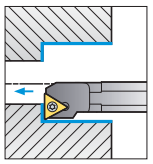
• Use left handed insert for right handed holder

STFCR/L



TC□□





90°

Steel shank type

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S06M-STFCR/L1.8	0.480	3/8	0.336	6	0.250	0.906	TC□T81.5□	FTKA02206	-	-	TW06P	2
S08M-STFCR/L1.8	0.600	1/2	0.461	6	0.312	1.102						
S08M-STFCR/L2	0.600	1/2	0.461	6	0.312	1.181	TC□T21.5□	FTKA02565	-	-	TW07P	2
S10R-STFCR/L2	0.770	5/8	0.586	8	0.406	1.378						
S12S-STFCR/L2	0.930	3/4	0.671	10	0.500	1.417						
S12S-STFCR/L3	0.930	3/4	0.671	10	0.500	1.575	TC□T32.5□	FTGA03510	-	-	TW15P	2
S16R-STFCR/L3	1.200	1	0.921	8	0.640	1.929						3
S20S-STFCR/L3	1.470	1 1/4	1.171	10	0.765	1.969	TC□T32.5□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L	3
S24T-STFCR/L3	1.760	1 1/2	1.382	12	0.890	2.362						
A06H-STFCR/L1.8	0.480	3/8	0.355	4	0.250	0.906	TC□T1.81.5□	FTKA02206	-	-	TW06P	1
A08K-STFCR/L1.8	0.600	1/2	0.480	5	0.312	1.102						
A08K-STFCR/L2	0.600	1/2	0.480	5	0.312	1.181						
A10M-STFCR/L2	0.770	5/8	0.605	6	0.406	1.378	TC□T21.5□	FTKA02565	-	-	TW07P	1
A12Q-STFCR/L2	0.930	3/4	0.711	7	0.500	1.417						
A16R-STFCR/L3	1.200	1	0.961	8	0.640	1.929	TC□T32.5□	FTKA03510	-	-	TW15P	1
A20S-STFCR/L3	1.470	1 1/4	1.211	10	0.765	1.969		FTGA03512	ST32S	SHXN0509F	TW15P, HW35L	3

Carbide shank type

(inch)

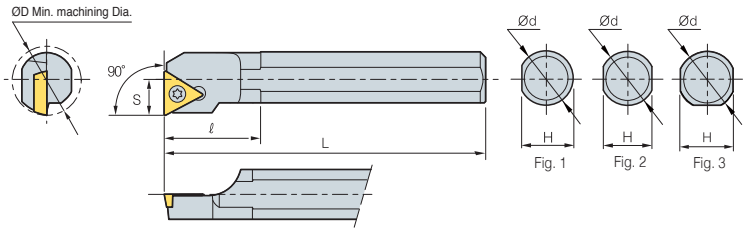
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C05K-STFCR/L1.8	0.415	5/16	0.273	5	0.219	TC□T1.81.5□	FTKA02206	TW06P	2
C06K-STFCR/L1.8	0.480	3/8	0.336	5	0.250				
C06K-STFCR/L2	0.480	3/8	0.336	5	0.250	TC□T21.5□	FTKA02565	TW07P	
C08M-STFCR/L2	0.600	1/2	0.461	6	0.312				
C10R-STFCR/L2	0.770	5/8	0.586	8	0.406				
C12R-STFCR/L2	0.930	3/4	0.671	8	0.500				
C12S-STFCR/L2	0.930	3/4	0.671	10	0.500				
C12R-STFCR/L3	0.930	3/4	0.671	8	0.500	TC□T32.5□	FTGA03510	TW15P	
C12S-STFCR/L3	0.930	3/4	0.671	10	0.500				
E05K-STFCR/L1.8	0.415	5/16	0.273	5	0.219	TC□T1.81.5□	FTKA02206	TW06P	
E06K-STFR/L1.8	0.480	3/8	0.336	5	0.250				
E06K-STFCR/L2	0.480	3/8	0.336	5	0.250	TC□T21.5□	FTKA02565	TW07P	2
E08M-STFCR/L2	0.600	1/2	0.461	6	0.312				
E10R-STFCR/L2	0.770	5/8	0.586	8	0.406				
E12R-STFCR/L2	0.930	3/4	0.671	8	0.500				
E12S-STFCR/L2	0.930	3/4	0.671	10	0.500				
E12R-STFCR/L3	0.930	3/4	0.671	8	0.500	TC□T32.5□	FTGA03510	TW15P	
E12S-STFCR/L3	0.930	3/4	0.671	10	0.500				

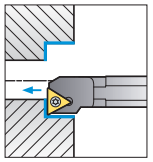
Applicable inserts **B75~B76, B91**

STFPR/L



TP□□





90°

Steel shank type

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S06M-STFPR/L2	0.480	3/8	0.336	6	0.250	-	TP□T22□	FTGA03507	TW15P	2
S08M-STFPR/L2	0.600	1/2	0.461	6	0.312	0.394		FTGA03508	TW15P	2
S10N-STFPR/L2	0.770	5/8	0.586	7	0.406	0.474				
S10R-STFPR/L2	0.770	5/8	0.586	8	0.406	0.474				
S12N-STFPR/L3	0.930	3/4	0.671	7	0.500	0.551	TP□T33□	FTGA0411F	TW15P	2
S12S-STFPR/L3	0.930	1/4	0.671	10	0.500	0.551				
A06H-STFPR/L2	0.480	3/8	0.355	4	0.250	-	TP□T22□	FTGA03507	TW15P	1
A08K-STFPR/L2	0.600	1/2	0.480	5	0.312	0.394		FTGA03508	TW15P	1
A10M-STFPR/L2	0.770	5/8	0.605	6	0.406	0.474				
A12Q-STFPR/L3	0.930	3/4	0.711	7	0.500	0.551	TP□T33□	FTGA0411F	TW15P	1

Carbide shank type

(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C05K-STFPR/L1.5	0.393	5/16	0.273	5	0.219	TP□T1.51.5□	FTNA02205	TW06P	2
C06K-STFPR/L2	0.480	3/8	0.336	5	0.250	TP□T22□	FTNA0305	TW09P	
C06M-STFPR/L2	0.480	3/8	0.336	6	0.250				
C08M-STFPR/L2	0.590	1/2	0.461	6	0.312		FTNA0307	TW09P	
C08Q-STFPR/L2	0.590	1/2	0.461	7	0.312				
C10R-STFPR/L2	0.850	5/8	0.586	8	0.500				
C10S-STFPR/L2	0.850	5/8	0.586	10	0.500				
C12R-STFPR/L2	0.930	3/4	0.671	8	0.500				
C12S-STFPR/L2	0.930	3/4	0.671	10	0.500				
C12R-STFPR/L3	0.930	3/4	0.671	8	0.500	TP□T33□	FTNA0408	TW15P	
C12S-STFPR/L3	0.930	3/4	0.671	10	0.500				
C16T-STFPR/L3	1.300	1	0.921	12	0.640				
E05K-STFPR/L1.5	0.393	5/16	0.273	5	0.219	TP□T1.51.5□	FTNA02205	TW06P	2
E06K-STFPR/L2	0.480	3/8	0.336	5	0.250	TP□T22□	FTNA0305	TW09P	
E06M-STFPR/L2	0.480	3/8	0.336	6	0.250				
E08M-STFPR/L2	0.590	1/2	0.461	6	0.312		FTNA0307	TW09P	
E08Q-STFPR/L2	0.590	1/2	0.461	7	0.312				
E10R-STFPR/L2	0.850	5/8	0.586	8	0.500				
E10S-STFPR/L2	0.850	5/8	0.586	10	0.500				
E12R-STFPR/L2	0.930	3/4	0.671	8	0.500				
E12S-STFPR/L2	0.930	3/4	0.671	10	0.500				
E12R-STFPR/L3	0.930	3/4	0.671	8	0.500	TP□T33□	FTNA0408	TW15P	
E12S-STFPR/L3	0.930	3/4	0.671	10	0.500				
E16T-STFPR/L3	1.300	1	0.921	12	0.640				

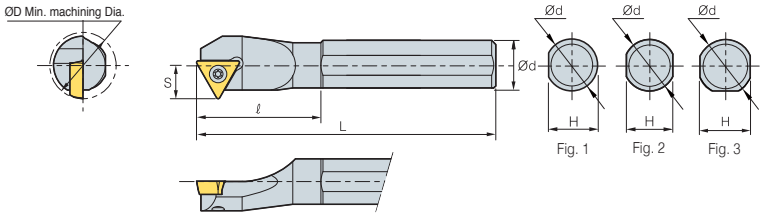
Applicable inserts **B77~B79**

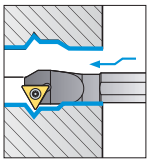
• Use left handed insert for right handed holder

STWPR/L



TP□□





60°

• R type insert

(inch)

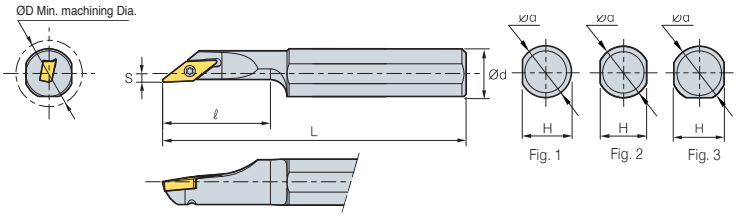
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S06M-STWPR/L2	0.480	3/8	0.336	6	0.250	0.905	TC□T21.5□	FTNA0305	TW09P	2
S08M-STWPR/L2	0.600	1/2	0.461	6	0.312	1.181	TP□T22□	FTNA0306	TW09P	
S10R-STWPR/L2	0.770	5/8	0.586	7	0.406	1.378				
S12R-STWPR/L2	0.930	3/4	0.748	8	0.492	1.575				

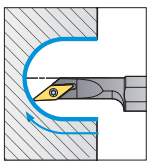
Applicable inserts **B77~B79**

SVJCR/L



VC□□





142°

• R type insert

(inch)

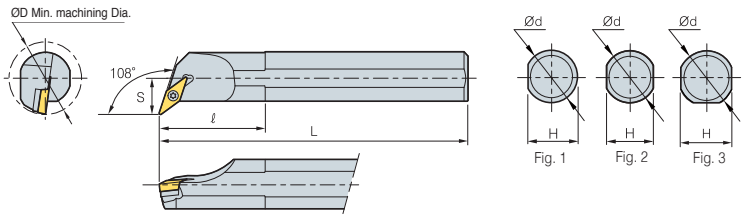
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S8M-SVJCR/L1.5	0.600	1/2	0.461	6	0.079	1.024	VCMT1.5(1.5)□□	FTNA0204	TW06P	2
S10Q-SVJCR/L1.5	0.770	5/8	0.586	7	0.079	1.417				

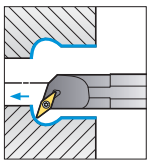
Applicable inserts **B82~B83**

SVQBR/L



VB□□





108°

• R type insert

(inch)

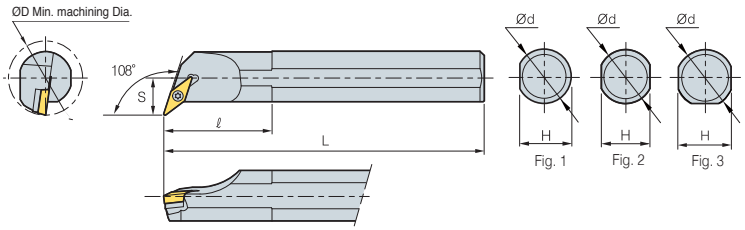
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S20S-SVQBR/L3	1.705	1 1/4	1.171	250	1.000	0.331	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P HW35L	3
S24T-SVQBR/L3	2.000	1 1/2	1.382	300	1.125	0.370						
A20S-SVQBR/L3	1.705	1 1/4	1.211	250	1.000	0.331						

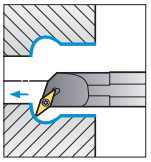
Applicable inserts **B80~B81, B92**

SVQCR/L



VC□□





108°

• R type insert
(inch)

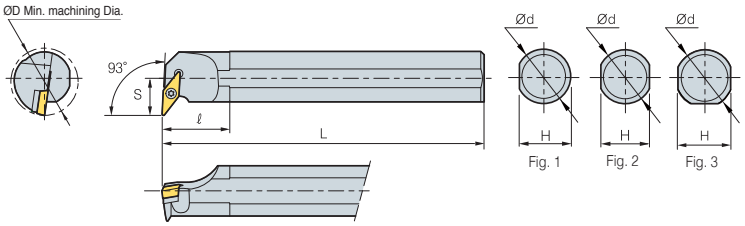
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S10R-SVQCR/L2	0.850	5/8	0.586	8	0.500	1.378	VC□T22□	FTKA02565	-	-	TW07P	2
S12S-SVQCR/L2	0.980	3/4	0.671	10	0.562	1.496						
S16R-SVQCR/L2	1.300	1	0.921	8	0.640	1.654						3
S12S-SVQCR/L2.5	0.980	3/4	0.671	10	0.562	1.654	VC□T2.52□	FTKA0307	-	-	TW07P	2
S16R-SVQCR/L2.5	1.300	1	0.921	8	0.640	1.772						3
S16R-SVQCR/L3	1.300	1	0.921	8	0.640	1.969	VC□T33□	FTGA03510	-	-	TW15P	3
S20S-SVQCR/L3	1.705	1 1/4	1.171	10	1.000	2.205		FTGA03512	SV32S	SHXN0509F	TW15P HW35L	
S24T-SVQCR/L3	2.000	1 1/2	1.382	12	1.125	2.520						

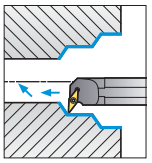
Applicable inserts **B82~B83, B93**

SVUBR/L



VB□□





93°

• R type insert
(inch)

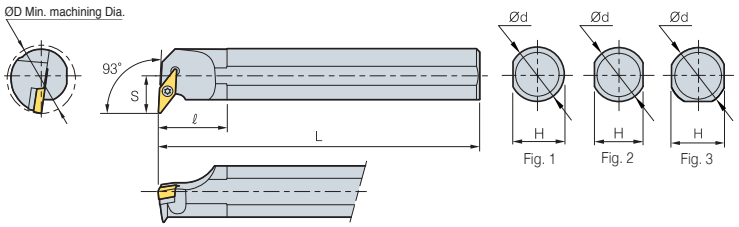
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S20S-SVUBR/L3	1.705	1 1/4	1.171	10	1.000	1.929	VB□T33□	FTGA03512	SV32S	SHXN0509F	TW15P HW35L	3
S24T-SVUBR/L3	2.000	1 1/2	1.382	12	1.125	2.205						
A20S-SVUBR/L3	1.705	1 1/4	1.211	10	1.000	1.929						

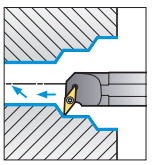
Applicable inserts **B80~B81, B92**

SVUCR/L



VC□□





93°

• R type insert
(inch)

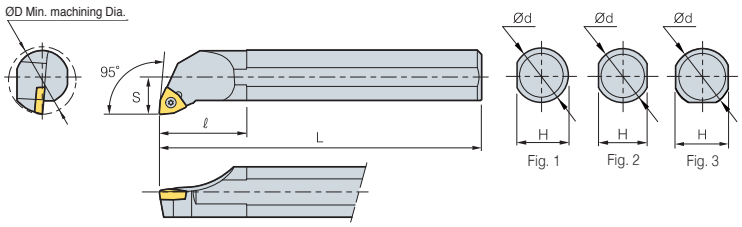
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S10R-SVUCR/L2	0.850	5/8	0.586	8	0.500	1.181	VC□T22□	FTKA02565	-	-	TW07P	2
S12S-SVUCR/L2	0.980	3/5	0.671	10	0.562	1.299						
S16T-SVUCR/L2	1.300	1	0.921	12	0.640	1.496						3
S12S-SVUCR/L2.5	0.980	3/4	0.671	10	0.562	1.378	VC□T2.52□	FTKA0307	-	-	TW09P	2
S16R-SVUCR/L2.5	1.300	1	0.921	8	0.640	1.575						3
S16R-SVUCR/L3	1.300	1	0.921	8	0.640	1.969	VC□T33□	FTGA03510	-	-	TW15P	3
S20S-SVUCR/L3	1.705	1 1/4	1.171	10	1.000	2.205		FTGA03512	SV32S	SHXN0509F	TW15P HW35L	
S24T-SVUCR/L3	2.000	1 1/2	1.382	12	1.125	2.520						

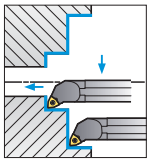
Applicable inserts **B82~B83, B93**

SWLCR/L



TP□□





95°

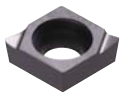
• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S16R-SWLCR/L4	1.200	1	0.921	8	0.640	1.811	WC□T43□	FTGA0411F	TW15P	3
S20S-SWLCR/L4	1.470	1 1/4	1.171	10	0.765	2.008				
A16R-SWLCR/L4	1.200	1	0.961	8	0.640	1.811	WC□T43□	FTGA0411F	TW15P	1
A20S-SWLCR/L4	1.470	1 1/4	1.211	10	0.765	2.008				3

Applicable inserts **B77~B79**

SCLCR/L



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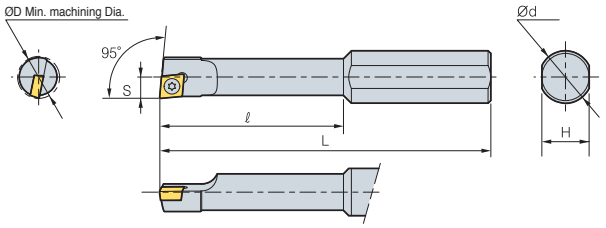
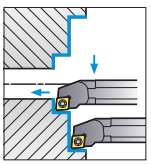




95°

• R type insert
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S06H-SCLCR/L1202	0.219	3/8	0.336	4	0.098	0.984	CCET1.21□□	FTNA01633	TW06P
S06H-SCLCR/L1203	0.250	3/8	0.336	4	0.118	0.984			
S06J-SCLCR/L1504	0.293	3/8	0.336	4	0.138	1.181	CCET1.51□□	FTNA0238	TW06P
S06J-SCLCR/L1505	0.313	3/8	0.336	4	0.157	1.181			

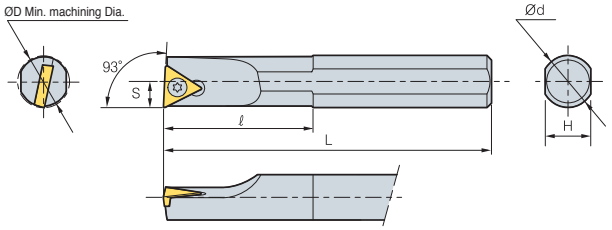
Applicable inserts **B62**

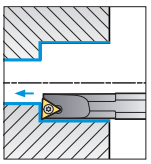
• Use left handed insert for right handed holder

STUBR/L



TB□□





93°

Steel shank type

• R type insert
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S05K-STUBR/L1.2	0.415	5/16	0.273	5	0.219	1.181	TB□□1.21□R/L	FTNA0204	TW06P
A05F-STUBR/L1.2	0.415	5/16	0.293	3	0.219	1.181			

Carbide shank type

(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench
C05K-STUBR/L1.2	0.393	5/16	0.273	5	0.219	TB□T1.21□	FTNA0204	TW06P
C06K-STUBR/L1.2	0.480	3/8	0.336	5	0.250			
E05K-STUBR/L1.2	0.393	5/19	0.273	5	0.219	TB□T1.21□	FTNA0204	TW06P
E06K-STUBR/L1.2	0.480	3/8	0.336	5	0.250			

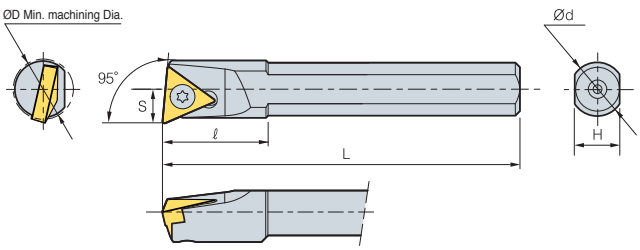
Applicable inserts **B74**

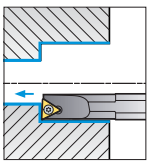
• Use left handed insert for right handed holder

STLBR/L



TB□□





95°

Steel shank type

• R type insert
(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S06H-STLBR/L1.2	0.315	3/8	0.197	4	0.150	0.472	TB□□1.21	FTNA0204	TW06P

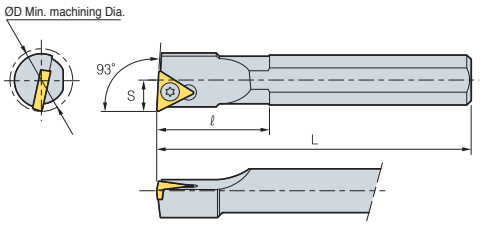
Applicable inserts **B74**

• Use left handed insert for right handed holder

STUPR/L



TP□□



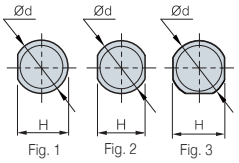
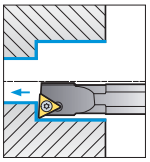


Fig. 1 Fig. 2 Fig. 3



93°

Steel shank type

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S05K-STUPR/L1.5	0.415	5/16	0.273	5	0.219	0.709	TP□□1.51.5□R/L	FTNA02205	TW06P	2
A05F-STUPR/L1.5	0.415	5/16	0.293	3	0.219	0.709				

Carbide shank type

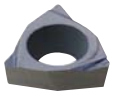
(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C05K-STUPR/L1.5	0.415	5/16	0.273	5	0.219	TP□T1.51.5□	FTNA02205	TW06P	2
C06K-STUPR/L2	0.480	3/8	0.336	5	0.250	TP□T22□	FTNA0305	TW09P	
C06M-STUPR/L2	0.480	3/8	0.336	6	0.250				
C08M-STUPR/L2	0.600	1/2	0.461	6	0.312		FTNA0307	TW09P	
C08Q-STUPR/L2	0.600	1/2	0.461	7	0.312				
C10R-STUPR/L2	0.850	5/8	0.586	8	0.500				
C10S-STUPR/L2	0.850	5/8	0.586	10	0.500				
C12R-STUPR/L2	0.930	3/4	0.671	8	0.500				
C12S-STUPR/L2	0.930	3/4	0.671	10	0.500				
C12R-STUPR/L3	0.930	3/4	0.671	8	0.500	TP□T33□	FTNA0408	TW15P	
C12S-STUPR/L3	0.930	3/4	0.671	10	0.500				
C16T-STUPR/L3	1.300	1	0.921	12	0.640				
E05K-STUPR/L1.5	0.415	5/16	0.273	5	0.219	TP□T1.51.5□	FTNA02205	TW06P	2
E06K-STUPR/L2	0.480	3/8	0.336	5	0.250	TP□T22□	FTNA0305	TW09P	
E06M-STUPR/L2	0.480	3/8	0.336	6	0.250				
E08M-STUPR/L2	0.600	1/2	0.461	6	0.312		FTNA0307	TW09P	
E08Q-STUPR/L2	0.600	1/2	0.461	7	0.312				
E10R-STUPR/L2	0.850	5/8	0.586	8	0.500				
E10S-STUPR/L2	0.850	5/8	0.586	10	0.500				
E12R-STUPR/L2	0.930	3/4	0.671	8	0.500				
E12S-STUPR/L2	0.930	3/4	0.671	10	0.500				
E12R-STUPR/L3	0.930	3/4	0.671	8	0.500	TP□T33□	FTNA0408	TW15P	
E12S-STUPR/L3	0.930	3/4	0.671	10	0.500				
E16T-STUPR/L3	1.300	1	0.921	12	0.640				

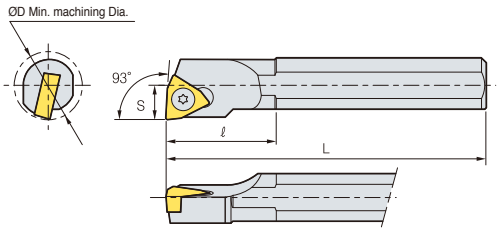
Applicable inserts **B77~B79**

• Use left handed insert for right handed holder

SWUBR/L



WB□T



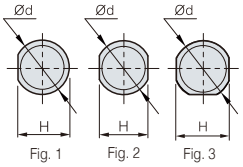
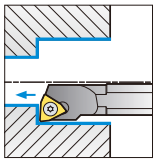


Fig. 1 Fig. 2 Fig. 3



93°

Steel shank type

• R type insert

(inch)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S03H-SWUBR/L1.2	0.260	3/16	0.177	4	0.126	-	WBGT1.21□R/L	FTNA0203	TW06P	2
S05K-SWUBR/L1.2	0.415	5/16	0.273	5	0.219	1.181		FTNA02033		
S05K-SWUBR/L1.5	0.415	5/16	0.273	5	0.219	0.709	WBGT1.51.5□R/L	FTNA02205	TW06P	
A05F-SWUBR/L1.2	0.415	5/16	0.273	3	0.219	1.181	WBGT1.21□R/L	FTNA0203	TW06P	
A05F-SWUBR/L1.5	0.415	5/16	0.273	3	0.219	0.630	WBGT1.51.5□R/L	FTNA02205	TW06P	

Carbide shank type

(inch)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C03H-SWUBR/L1.2	0.260	3/16	0.173	4	0.126	WB□T1.21□	FTNA0203	TW06P	1
C04H-SWUBR/L1.2	0.321	1/4	0.213	4	0.156				
C05K-SWUBR/L1.2	0.415	5/16	0.273	5	0.219		FTNA02033	TW06P	2
C05K-SWUBR/L1.5	0.415	5/16	0.273	5	0.219	WB□T1.51.5□	FTNA02205	TW06P	
E04H-SWUBR/L1.2	0.321	1/4	0.213	4	0.156	WB□T1.21□	FTNA0203	TW06P	1
E05K-SWUBR/L1.2	0.415	5/16	0.273	5	0.219		FTNA02033	TW06P	2
E05K-SWOBR/L1.5	0.415	5/16	0.273	5	0.219	WB□T1.51.5□	FTNA02205	TW06P	

Applicable inserts **B85**

• Use left handed insert for right handed holder

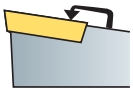
※ See page B130 for applicable sleeves

S T F C R 12 C A - 16

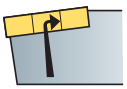
1	2	3	4	5	6	7	8	9
Method of Mounting Insert	Insert Shape	Holder Style	Relief Angle of Insert	Hand	Height of Cutting Edge	Cartridge Code	Type of Cartridge	Length of Cutting Edge

1 Method of Mounting Insert

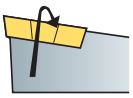
S T F C R 12 C A - 16



Top Clamping — C



Hole clamping — P



Screw on — S

2 Insert Shape

S T F C R 12 C A - 16



C



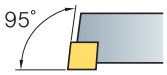
S



T

3 Holder Style

S T F C R 12 C A - 16



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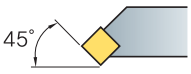

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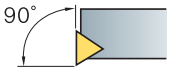

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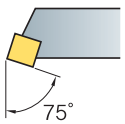

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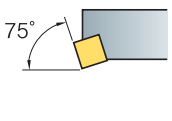

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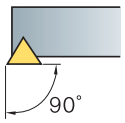

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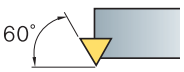

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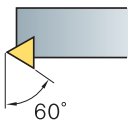
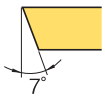


T

4 Relief Angle of Insert

S T F C R 12 C A - 16



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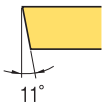

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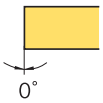
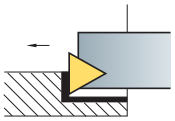
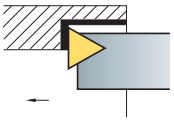


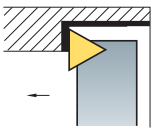
N

5 Hand

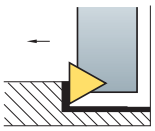
S T F C R 12 C A - 16







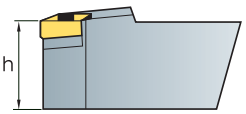
R



L

6 Height of Cutting Edge

S T F C R 12 C A - 16



7 Cartrige Code

S T F C R 12 C A - 16

C (Cartridge)

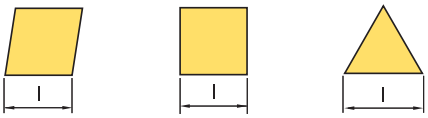
8 Type of Cartridge

S T F C R 12 C A - 16

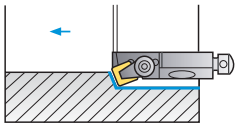
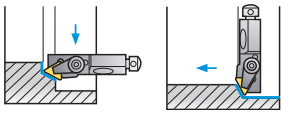
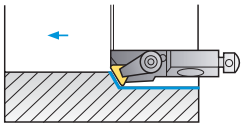
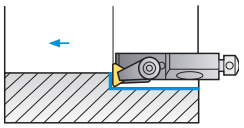
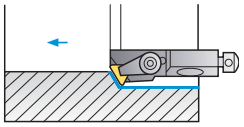
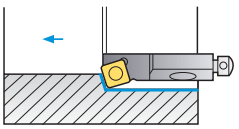
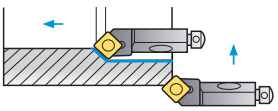
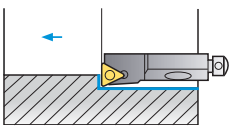
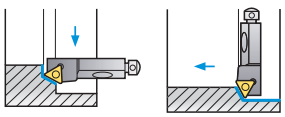
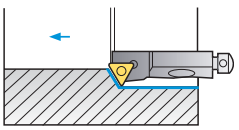
A (ISO5611)

9 Length of Cutting Edge

S T F C R 12 C A - 16

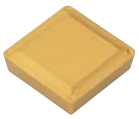


M This is metric size. We can also provide in inch type

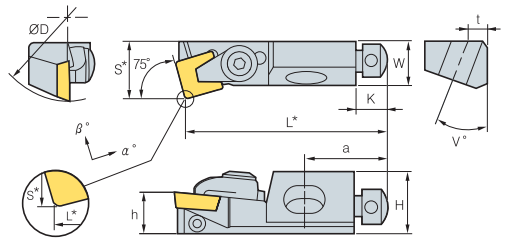
	Cutting Shape			Turning	Copying	Facing	Chamfering	Applicable inserts	Page
Clamp on System	**CSKPR/L**		10CA–09 12CA–12	●				SP□R 0903□□ 1203□□	B222
	CTTPR/L		10CA–11 12CA–16	●				TP□R 1103□□ 1603□□	B223
	CTWPR/L		10CA–11 12CA–16	●				TP□R 1103□□ 1603□□	B223
	CTFPR/L		10CA–11 12CA–16	●		●		TP□R 1103□□ 1603□□	B222
	CTSPR/L		10CA–11 12CA–16	●				TP□R 1103□□ 1603□□	B222
Screw on System	**SSKCR/L**		10CA–09 12CA–12	●				SC□T 09T3□□ 1204□□	B224
	SSSCR/L		10CA–09 12CA–12	●			●	SC□T 09T3□□ 1204□□	B224
	STFCR/L		10CA–11 12CA–16	●		●		TC□T 1102□□ 16T3□□	B224
	STTCR/L		10CA–11 12CA–16	●		●		TC□T 1102□□ 16T3□□	B225
	STWCR/L		10CA–11 12CA–16	●				TC□T 1102□□ 16T3□□	B225

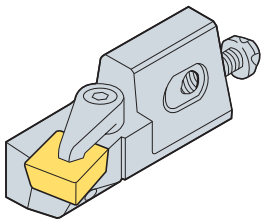
M This is metric size. We can also provide in inch type

CSKPR/L



SP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CSKPR/L	10CA-09	40	15	11	50	14	10	8	6	0	20	5	20	SP□R0903□□
	12CA-12	50	20	15	55	20	12	8	6	0	20	6	20	1203□□

Applicable inserts **B72~B73**

· a base Insert : r = 0.8 D = ØD Min. machining Dia.

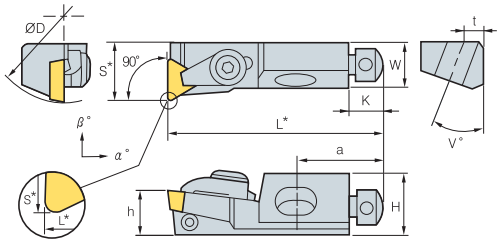
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CSKPR/L	10CA-09	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-12	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

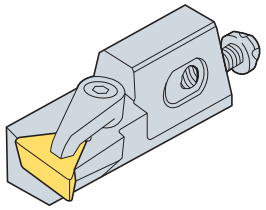
M This is metric size. We can also provide in inch type

CTFPR/L



TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTFPR/L	10CA-11	40	15	11	50	14	10	8	6	0	20	5	20	TP□R1103□□
	12CA-16	50	20	15	55	20	12	8	6	0	20	6	20	1603□□

Applicable inserts **B77~B79**

· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = ØD Min. machining Dia.

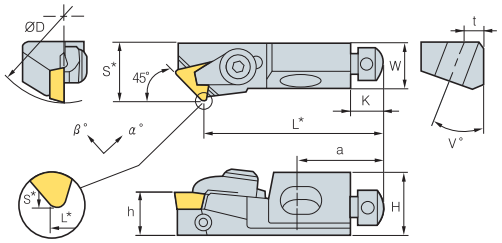
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CTFPR/L	10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

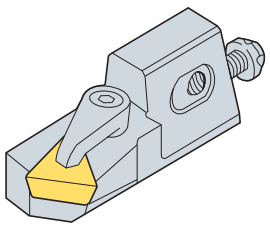
M This is metric size. We can also provide in inch type

CTSPR/L



TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTSPR/L	10CA-11	40	15	11	44	14	10	8	4	0	20	5	20	TP□R1103□□
	12CA-16	50	20	15	47	20	12	8	5	0	20	6	20	1603□□

Applicable inserts **B77~B79**

· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = ØD Min. machining Dia.

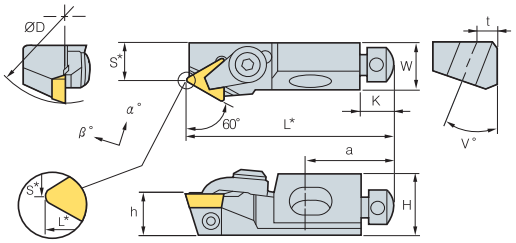
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CTSPR/L	10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

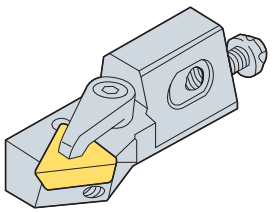
M This is metric size. We can also provide in inch type

CTTPR/L



TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTTPR/L	10CA-11	40	15	11	50	9	10	8	5	0	20	5	20	TP□R1103□□
	12CA-16	50	20	15	55	20	12	8	5	0	20	6	20	1603□□

Applicable inserts **B77~B79** · a base Insert : r = 0.8 D = ØD Min. machining Dia.

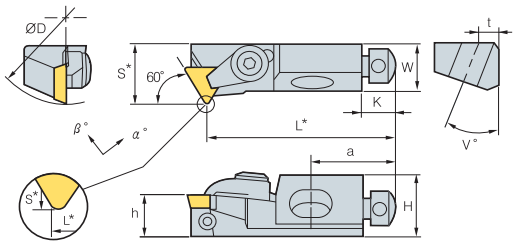
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CTTPR/L	10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

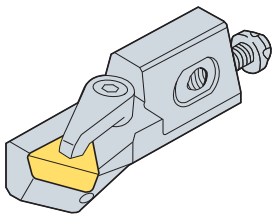
M This is metric size. We can also provide in inch type

CTWPR/L



TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTWPR/L	10CA-11	40	15	11	44	14	10	8	5	0	20	5	20	TP□R1103□□
	12CA-16	50	20	15	47	20	12	8	5	0	20	6	20	1603□□

Applicable inserts **B77~B79** · a base Insert : r = 0.8 D = ØD Min. machining Dia.

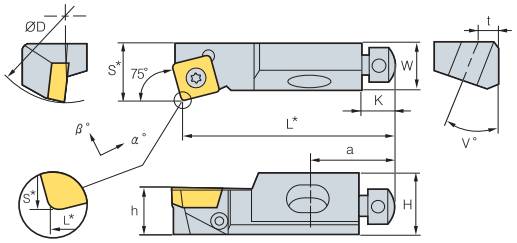
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CTWPR/L	10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

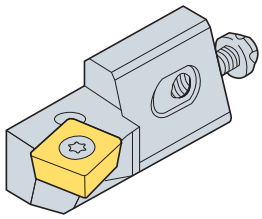
M This is metric size. We can also provide in inch type

SSKCR/L



SC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
SSKCR/L	**10CA-09**	40	15	11	50	14	10	8	0	-4	20	5	20	SC□□09T3□□ SC□□1204□□
	12CA-12	50	20	15	55	20	12	8	0	-4	20	6	20	

Applicable inserts **B70~B71, B90**

· a base Insert : r = 0.8 D = ØD Min. machining Dia.

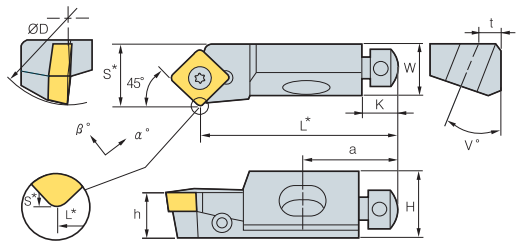
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
SSKCR/L	**10CA-09**	FTGA03508	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-12	FTGA0411F	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

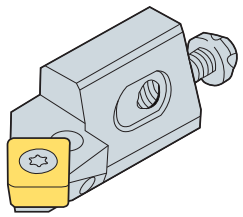
M This is metric size. We can also provide in inch type

SSSCR/L



SC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
SSSCR/L	**10CA-09**	40	15	11	44	14	10	8	-5	0	20	5	20	SC□□09T3□□ SC□□1204□□
	12CA-12	50	20	15	47	20	12	8	-5	0	20	6	20	

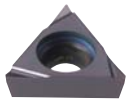
Applicable inserts **B70~B71, B90**

· a base Insert : r = 0.8 D = ØD Min. machining Dia.

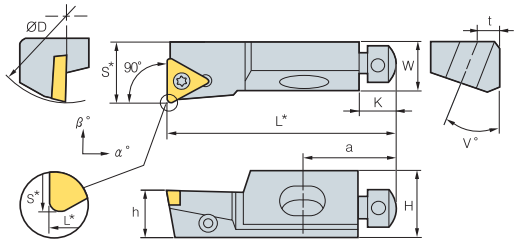
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
SSSCR/L	**10CA-09**	FTGA03508	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-12	FTGA0411F	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

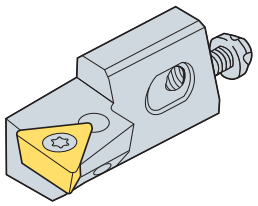
M This is metric size. We can also provide in inch type

STFCR/L



TC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
STFCR/L	10CA-11	40	15	11	50	14	10	8	0	-3	20	5	20	TC□□1102□□ TC□□16T3□□
	12CA-16	50	20	15	55	20	12	8	0	-3	20	6	20	

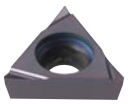
Applicable inserts **B75~B76, B91**

· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = Min. machining Dia.

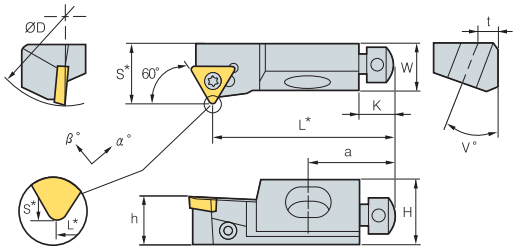
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
STFCR/L	10CA-11	FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

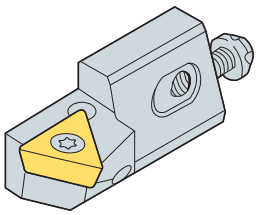
M This is metric size. We can also provide in inch type

STTCR/L



TC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
STTCR/L	10CA-11	40	15	11	50	9	10	8	-5	0	20	5	20	TC□□1102□□ TC□□16T3□□
	12CA-16	50	20	15	47	20	12	8	-3	0	20	6	20	

Applicable inserts **B75~B76, B91**

· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = Min. machining Dia.

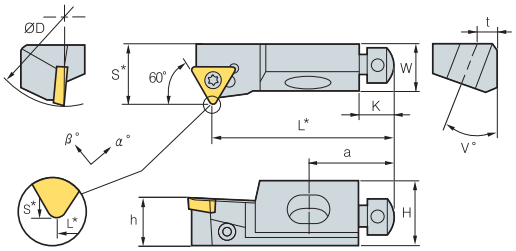
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
STTCR/L	10CA-11	FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 07P	HW20L
	12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

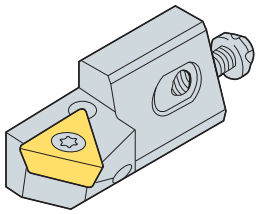
M This is metric size. We can also provide in inch type

STWCR/L



TC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
STWCR/L	**10CA-11**	40	15	11	44	14	10	8	0	-4	20	5	20	TC□□1102□□ TC□□16T3□□
	12CA-16	50	20	15	47	20	12	8	-5	0	20	6	20	

Applicable inserts **B75~B76, B91**

· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = Min. machining Dia.

Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
STWCR/L	**10CA-11**	FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

M This is metric size. We can also provide in inch type

C

MULTI-FUNCTIONAL TOOLS

Korloy Multi-functional tools can be used for machining in grooving, parting-off, facing and forming applications. Its design ensures superior machinability and productivity.



Application Example

C02 Application Example
C04 Technical Information for Multi-Functional Tools Series

KGT

C07 Technical Information for KGT
C12 Available Insert for KGT
C14 KGT Holder
C23 KGT Blade for Parting off

MGT

C24 Technical Information for MGT
C26 Available Insert for MGT
C28 MGT Holder
C33 MGT Holder (Face Grooving)
C36 MGT Cartridge

MGT Aluminum Wheel Series

C39 Technical Information for MGT Aluminum Wheel
C40 Available Insert for MGT Aluminum Wheel
C41 MGT Aluminum Wheel

TB/TB-M

C43 Technical Information for TB/TB-M
C47 Available Insert for TB/TB-M
C50 TB/TB-M Holder

Saw-man

C51 Technical Information for Saw-man
C52 Saw-man

Fine Tools

C54 Technical Information for Fine Tools
C55 Available Insert for Fine Tools
C56 Fine Tools Holder

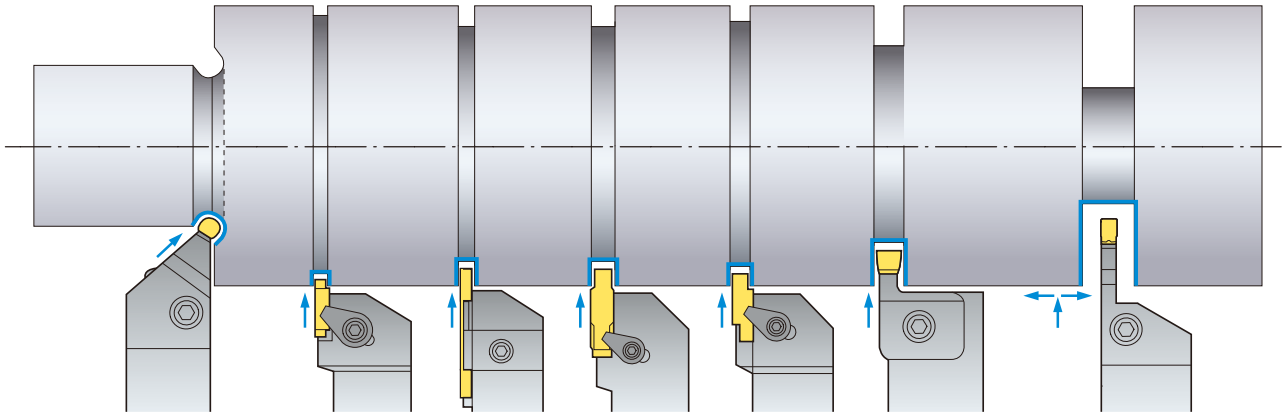
Grooving / Parting off

C57 IGH
C57 DBH
C58 GFT
C58 GFIP
C59 GH
C59 GFIK
C60 EH
C60 PH

Special Order Form

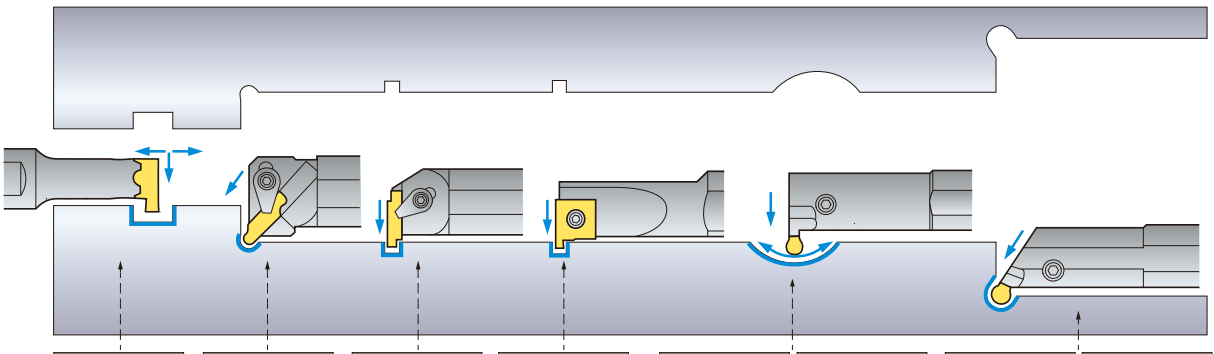
C61 Special Order Form for MGT
C62 Special Order Form for V-Pulley Insert

For external machining



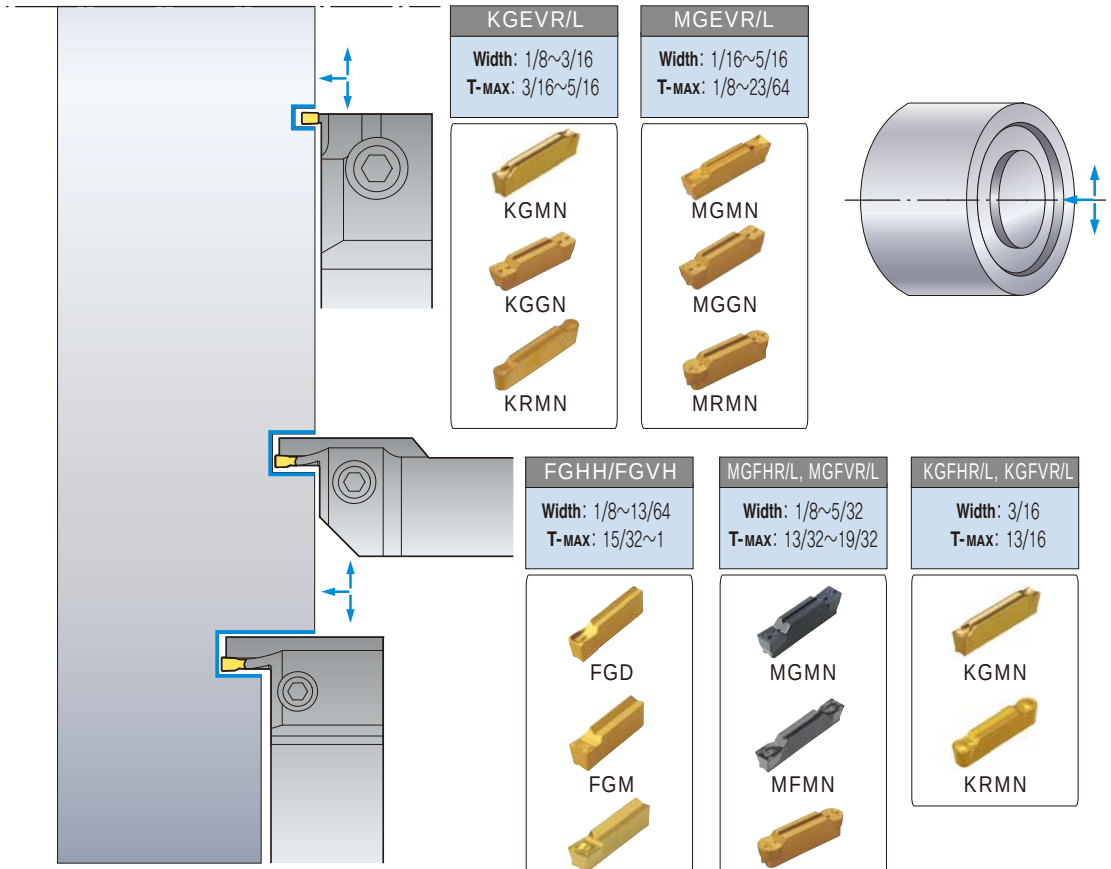
KGEUR/L	MGEUR/L	TBH	PH	GH	GFT	DBH	KGEHR/L	MGEHR/L
Width: 1/16~5/16 T-MAX: 1/8	Width: 5/64~5/16 T-MAX: 1/8~13/64	Width: 3/64~11/64 T-MAX: 1/16~13/64	Width: 1/8~13/64 ØD-MAX: 13/16~2	Width: 3/64~11/64 T-MAX: 1/16~5/32	Width: 3/64~5/16 T-MAX: 5/64~23/64	Width: 1/8~5/16 T-MAX: 35/64	Width: 1/16~5/16 T-MAX: 11/16~1 7/16	Width: 1/16~5/16 T-MAX: 13/32~13/32
KRMN	MRMN	TB TB-M	POB	GO GS	GW BF	DC DB	KGMN KRMN KGGN KRGN	MGMN MRMN MGGN MRGN

For internal machining

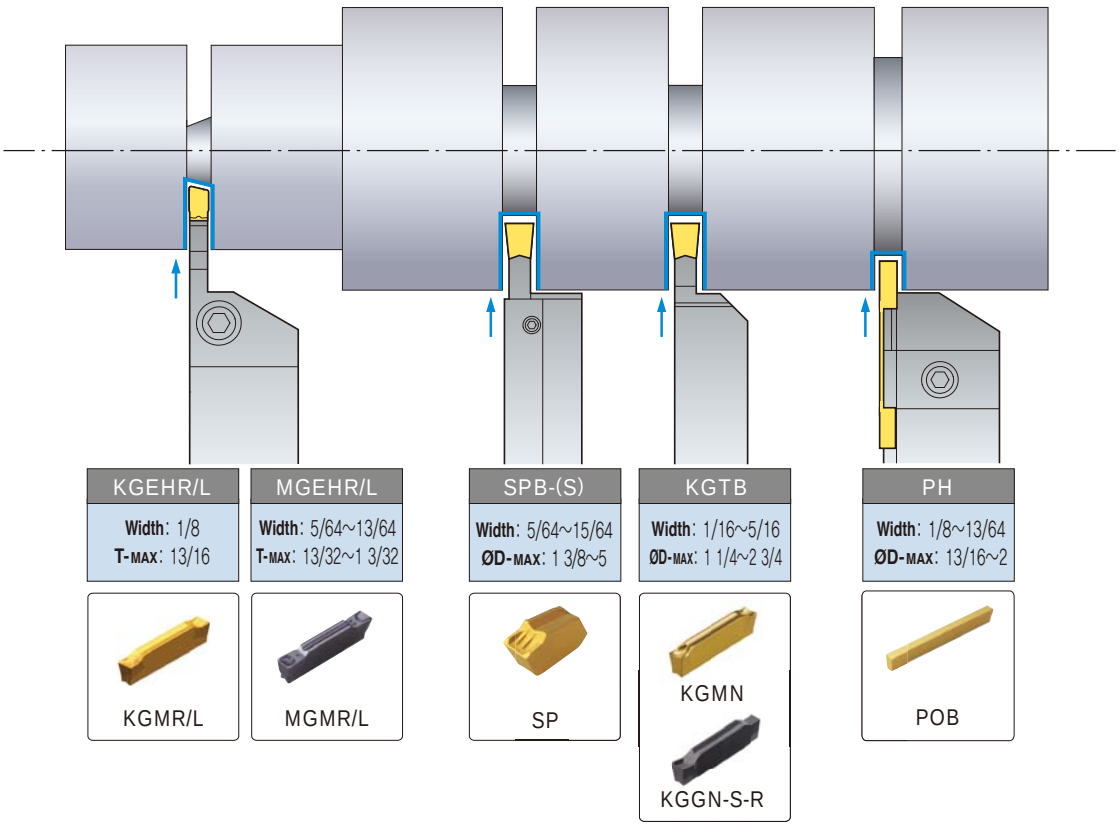


NFTIH	GFIK	GFIP	IGH	KGIVR/L	MGIVR/L	KGIUR/L	MGIUR/L
Width: 1/32~5/32 T-MAX: 3/16~13/32	Width: 5/64~5/16 T-MAX: 5/64~5/16	Width: 3/64~5/16 T-MAX: 5/64~23/64	Width: 3/64~7/64 T-MAX: 1/16~3/32	Width: 1/16~3/16 T-MAX: 1/4~5/16	Width: 1/16~5/16 T-MAX: 5/32~13/32	Width: 1/8 T-MAX: 1/8	Width: 1/8~5/16 T-MAX: 9/64~1/4
NFTG NFTF NFTT	GR	GW BF	IG	KGMI KRMN	MGMN MRMN MGGN MRGN	KRMN	MRMN

For face grooving

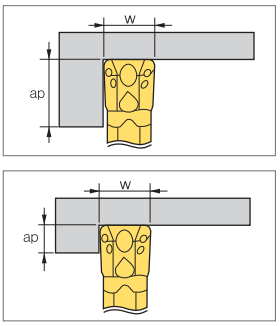


For parting off



Turning and Grooving

Selection of insert



- Feed rate
  - Decide maximum feed rate after considering the insert's characteristics and machine capabilities (Fmax = W x 0.075)
  - Max feed rate should not be larger than the corner radius of the insert
  - In grooving applications, chip evacuation problems can be remedied by using step feed methods at small intervals
- Depth of cut
  - The minimum depth of cut should be bigger than corner radius of insert
  - When deciding on the max depth of cut please consider the machine's cutting load
  - Depending on the shape of the insert, deflection of work piece and clearance angle can be changed

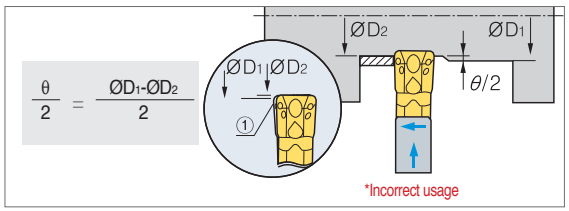
Notice for turning

- KGT/MGT tools are designed to incur side cutting force from its clearance angle; this feature gives you advantage over a standard ISO insert
- The standard MGT insert also provides a "wiper" effect to improve surface roughness

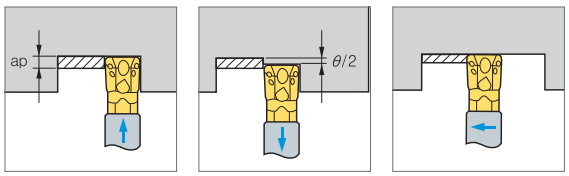
Notice for finishing (offset need final quality)

- After desired diameter is grooved, continuous turning operation might cause some deflection of the workpiece. In these cases follow the given formula, offsetting these factors enables the desired diameter that you want

$$\frac{\theta}{2} = \frac{ØD_1 - ØD_2}{2}$$

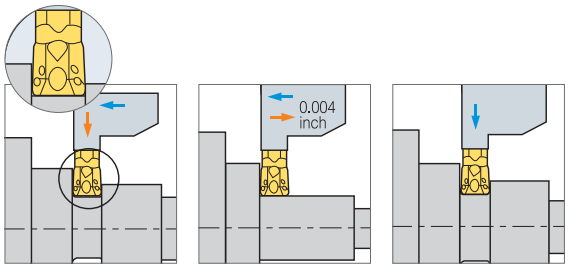


- To eliminate the difference in the machined diameter by utilizing the clearance angle (which is commonly generated during the final turning operation) follow the directions above when machining
  To obtain a good surface roughness without offsetting in an application follows the directions below
  1) Groove to the desired diameter
  2) Pull the tool backs a total distance of θ/2
  3) Continue the external turning operation to desired diameter

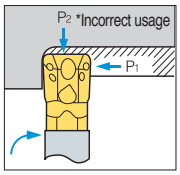


Notice for MGT turning applications

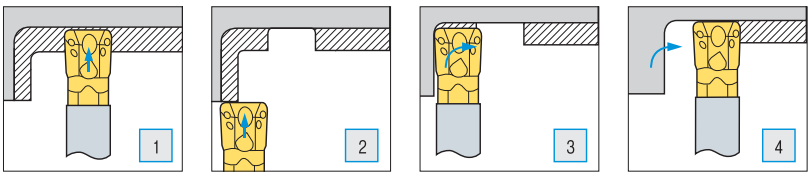
- KGT/MGT tools are available for grooving and turning as a multifunctional tool. When using a M.G.T tool keep in mind that the tool imitates a standard ISO turning application. The application uses a positive clearance angle where a tool's cutting force and depth of cut are all applied in an application. This might create normal wear on the insert, after turning, a grooving process might not meet the desired diameter on the work piece. To off set this, adjust the tool 0.004 inches and return to the original position of the grooving application



Machining workpiece with a radius bigger than the insert's corner radius

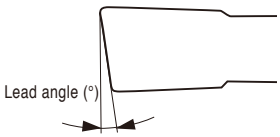
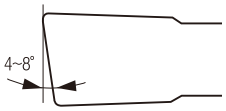
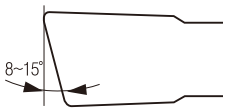


Stabilize your tool pressure. KGT/MGT tools create a cutting load when machining a workpiece with a radius larger than the corner radius of insert (shown in the picture). The unequal cutting force might initially break the insert or holder



Parting off & Grooving

Insert

Lead angle applications	Lead angle 0° (Neutral)	Lead angle 4°~ 8°	Lead angle 8°~15°
			
• 4°- Pipe (Tubing and hollow bar) • 6°- Pipe and solid bar • 8°- Solid bar • 15°- Small diameter Solid bar	• Parting off on solid bar type • Occurring the center stub when parting off • Prevent to be deflected workpiece by cutting direction during parting off • Available for use deep parting depth	• Reduce the center stub when parting off on solid bar type • Reduce the burr when parting off on tubing or hollow bar type	• Parting off on small diameter and hollow bar type • Reduce the burr and center stub when parting off on small diameter solid bar type

※ Available Inserts: MGMR/L□□□ – □□ – LP/RP, KGMR/L□□□ – □□ – PS/PT
(Lead angle) (Lead angle)

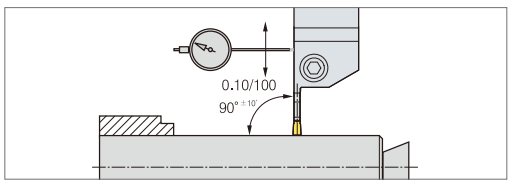
Selection of Insert



- To properly match the insert and cutting condition, the following factors should be considered
  - Width of insert • Chip breaker • Grade and nose R
- The relationship between the cutting width and cutting depth
  - Neutral type, inserts with a 0-degree lead angle are best when used an applications maximum depth of cut
  - In general alloy steel, the maximum depth of cut = W x 0.8
- Insert with lead angle
  - To reduce burrs, we recommend using insert with a lead angle.
  - Insert that have larger lead angles reduce burrs but will also decreases tool life
  - In the case where burrs are acceptable, we recommend using a neutral type insert

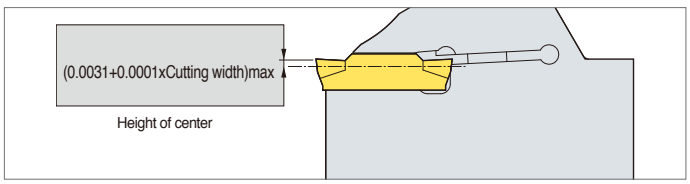
Setting of holders

- The cutting position should be exactly mounted on machined axis in order to create a perpendicular direction or 90 to minimize vibration



Setting of parting off

- The edge height of an insert should be set within ±0.039 inch based on the center line
  - Parting off should be done as close to the chuck as possible to minimize vibration



Notice

- Keep a consistent cutting speed and feed
- Use proper amounts of coolant for better performance
- Properly clean the insert pocket before mounting insert

Usage

- If insert is worn, immediately replace with a new insert. This is to prevent the damage on the workpiece
- If the holder seat is worn or damaged replace with a new one immediately for stable clamping
- Do not grind or regrind the holder seat

Selection of chip breaker

- Our chip breakers are designed to narrow chips during grooving operations. Narrow chips usually offer the following advantages
- Decreases friction between chips and the workpiece. This usually gives a better surface roughness finish
- With better chip flow, a machinist is able to increase feed rates due to a reduced cutting load

Face grooving tools

For shallow grooving

- Economical tools utilizing a double ended cutting edge system
- Newly designed chip breakers that help ensure chip control for various face grooving applications
- Korloy face grooving tools provide various holder line-ups to give you more options and benefits

MFMN300	MGMN400	Horizontal MGFHR	Vertical MGFVR
			
Cutting Width 0.118 inch	Cutting Width 0.158 inch	Machining Dia. Ø0.945~7.874 inch	Machining Dia. Ø0.945~2.362 inch

KGMN300~600	Horizontal KGFHR	Vertical KGFVR
		
Cutting Width 0.118~0.236 inch	Machining Dia. Ø1.339~8.661 inch	Machining Dia. Ø1.732~7.874 inch

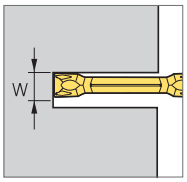
For deep grooving

- These tools are suitable for deep grooving with a single cutting edge (Tmax 0.984 inch)
- A variety of chip breakers enable a machinist to apply a wide range of functions in machining
- A variety of holders ensures multiple application ranges

FGD	FGM	FMM	Horizontal FGHH	Vertical FGVH
				
Deep face grooving (G class)	Wide face grooving turning (G class)	Wide face grooving turning (M class)	Machining Dia. Ø0.984~5.512 inch	Machining Dia. Ø0.984~5.512 inch

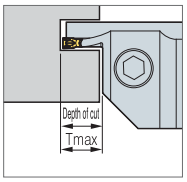
Selection system of holder

- Follow these 3 simple directions to choose the right insert and holder for your application



Insert and holder

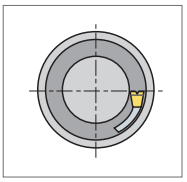
Choose an insert and holder that best applies to your application according to the cutting width and part of workpiece to be machined.



Holder Tmax

Choose the holder with the shortest overhang that will still meet the cutting depth required

Notice: To minimize chattering, use the shortest holder according to Tmax.

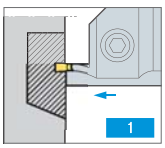


Machining Dia.

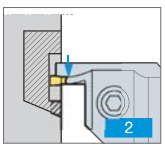
Choose the largest size of shank depending on the initial grooving diameter required in the application

Optimization of face grooving

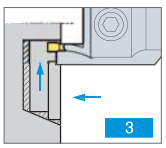
Roughing: When face grooving decreases the cutting speed 40% below a normal face turning operation



• Grooving at the initial diameter

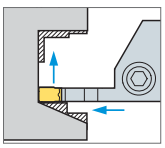


• Face turning away from center

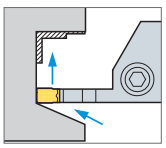


• Face turning to center

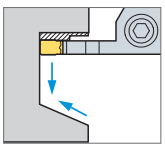
Finishing: When face grooving decreases the cutting speed 40% below a normal face turning operation



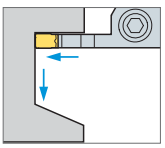
• Grooving at the initial diameter to the final cutting depth and face turning away from center



• Radius operation toward final dimension at the bottom



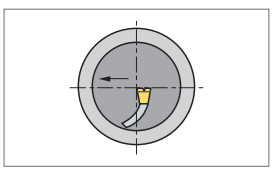
• Face turning to center



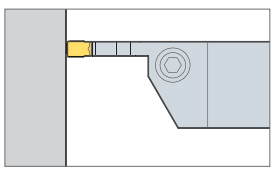
• Grooving for the right dimension you want

Notice for face grooving

- Before machining, check and adjust the following holder position



- Check the cutting edge height at the center of the workpiece
- Machine towards the center and check for burrs



- For better surface roughness, set up the insert in order to perpendicular at center line

Multi-functional machining with strong clamping system and new technology

KGT

- Double-sided inserts of KGT reduces machining cost
- Strong clamping system ensures stable and accurate machining
- New grade and new technology provide superior tool life
- Various tooling solutions of the KGT improve productivity
- The foreside and clearance face of the KGT insert having cutting edges are optimal for grooving, parting-off, turning and facing with reducing processing time
- Three-dimensional chip breaker ensures excellent chip control in various applications
- The KGT inserts with various chip breakers are available for wide application range
- Special cutting edges are available for quotation

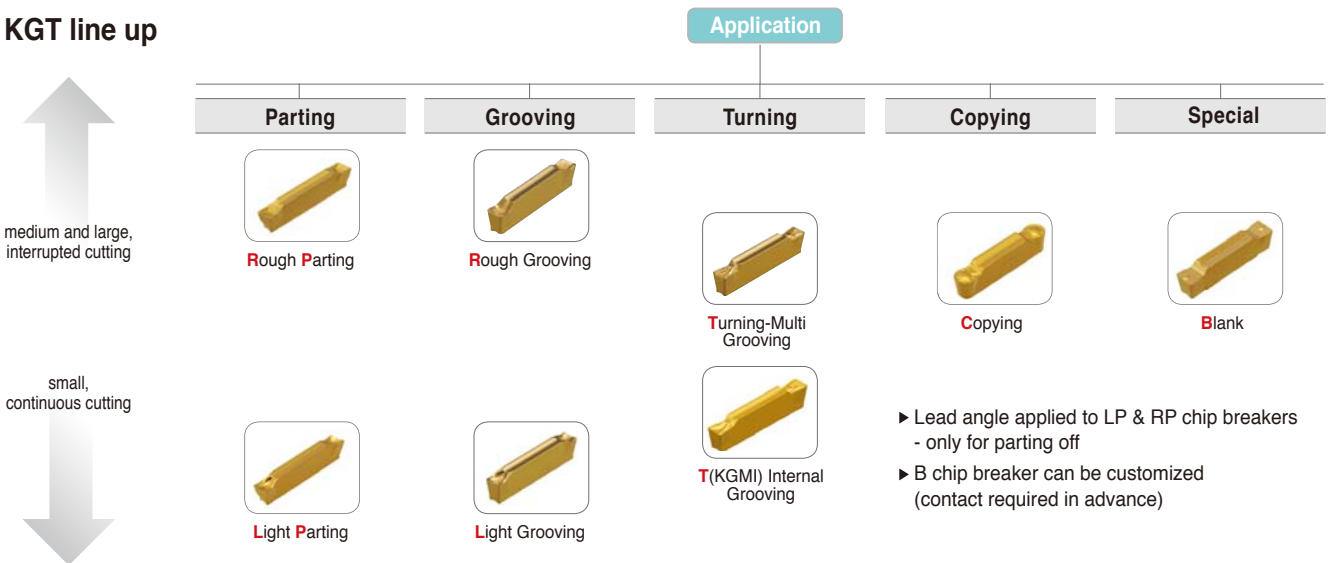
Insert code system

KG	M	N	300	-	(S)	04	-	T
KG SYSTEM (KORLOY Grooving)	Tolerance M class G class	Hand N: Neutral R: Right L: Left I: Internal	Width of cutting edge 0.079~0.315 inch		1 Corner	Nose Radius 1/128 inch 3/256 inch 1/64 inch 1/32 inch		Chip Breaker L/R/T/C /LP/RP/B/A

Holder code system

KG	E	H	R/L	16	-	3	T15
KG SYSTEM (KORLOY Grooving)	Working Style E: External Process I: Internal Process F: Facing Process	Holder Style H: Horizontal V: Vertical U: Undercut	Hand R: Right L: Left	Shank standard Height 1 inch Width 1 inch (For Internal machining : Minimum diameter for machining)		Cutting Width 0.079~0.315 inch	Maximum Depth 0.315~1.417 inch

KGT line up



- Lead angle applied to LP & RP chip breakers - only for parting off
- B chip breaker can be customized (contact required in advance)

Recommended insert

Designation	Geometry	Picture	Application									
			For external machining			For face grooving		For Internal machining		Copying	For reliefing	Special machining
			Parting	Grooving	Turning	Grooving	Turning	Grooving	Turning	Copying	Reliefing	Special
KGMN	L Light Grooving		○	◎		○						
	R Rough Grooving		○	◎		○						
	T Turning-Multi Grooving		○	◎	◎	◎	◎					
KGMI	T Internal Grooving							◎	◎			
KRMN	C Copying									◎	◎	
KGMR/L	LP Light Parting		◎									
	RP Rough Parting		◎									
KGGN	B Blank			○								◎
	A Aluminum Grooving		○	◎	○							
KRGN	A Aluminum Profiling									◎	◎	

◎ First choice, ○ Second choice

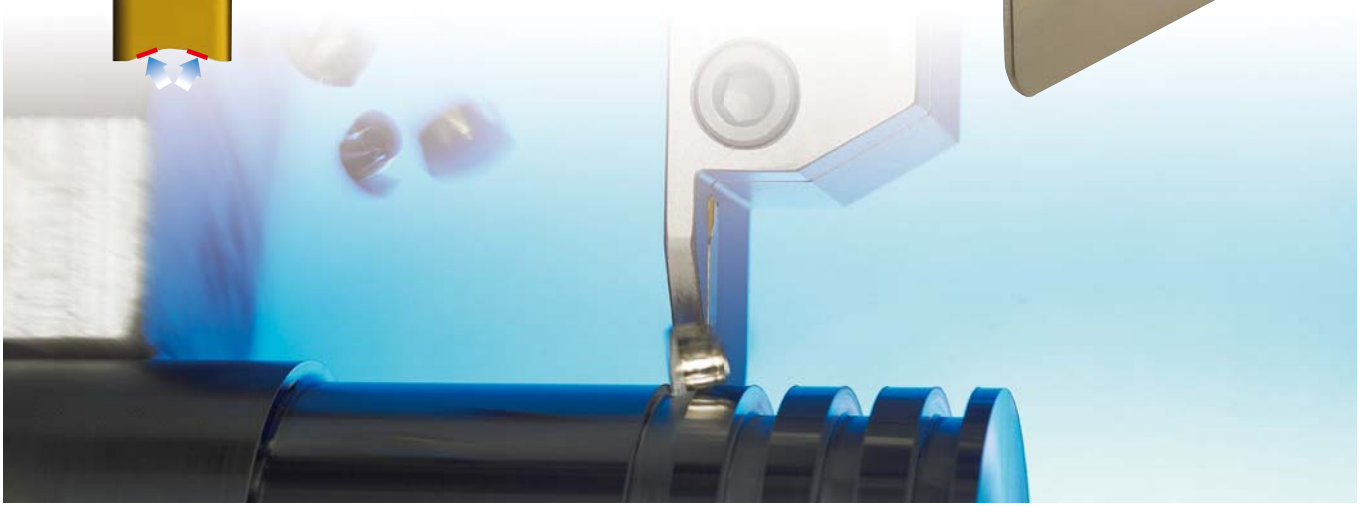
Features

Front View



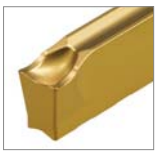
- Strong clamping ➜ Higher machining reliability
- Self-centering ➜ Higher accuracy
- Anti-chattering design ➜ Fine surface finish

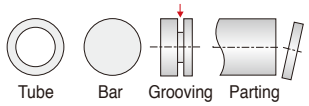




C/B guide

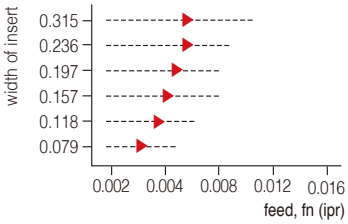
L For Light Grooving



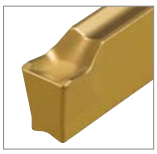


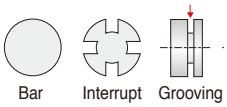
- Sharp cutting edge
- Low feed machining
- Small diameter component

- Low carbon steel
- Alloy steel
- Stainless



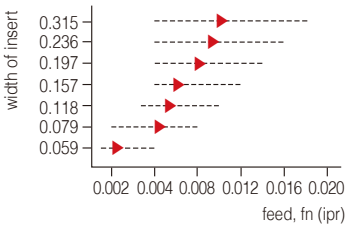
R For Rough Grooving



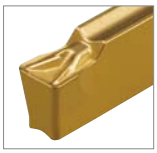


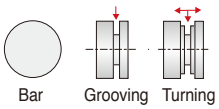
- Strong cutting edge
- High feed machining
- Interrupted cutting

- Carbon steel
- Alloy steel
- Stainless
- Cast iron



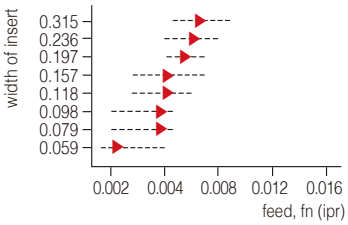
T For Turning and Multi Grooving





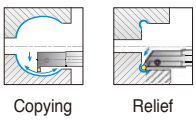
- Sharp cutting edge
- Improved chip control
- Turning & grooving machining

- Carbon steel
- Alloy steel
- Stainless
- Cast iron



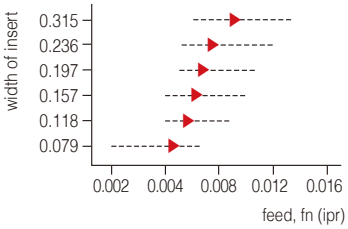
C For Copying and Relief



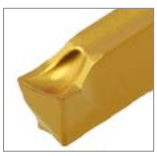


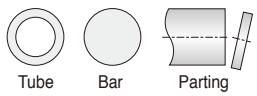
- Improved chip control
- Copying
- Relief

- Carbon steel
- Alloy steel
- Stainless
- Cast iron



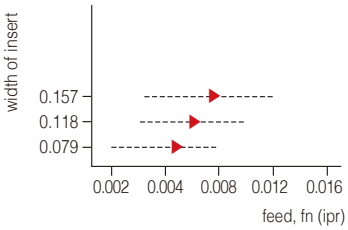
LP For Light Parting



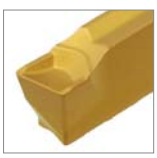


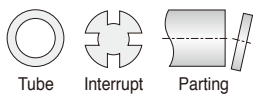
- Sharp cutting edge
- Low feed machining
- Small diameter component
- Right/left handed

- Low carbon steel
- Carbon steel
- Alloy steel
- Stainless



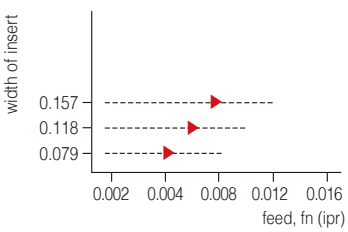
RP For Rough Parting



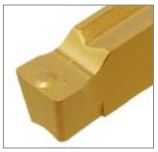


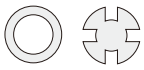
- Strong cutting edge
- High feed machining
- Interrupted cutting
- Right/left handed

- Carbon steel
- Alloy steel
- Cast iron



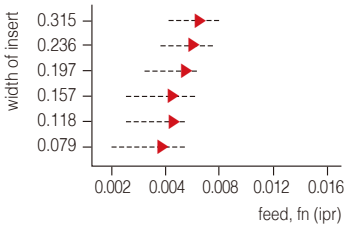
B For Precision Grooving





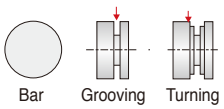
- Ground insert
- Precise tolerance
- Various cutting edge length, Nose R

- Carbon steel
- Alloy steel
- Stainless
- Cast iron



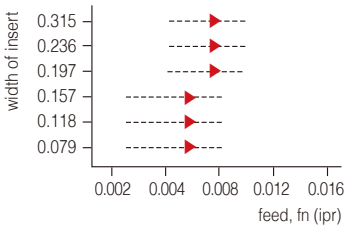
A For Aluminum Grooving





- Sharp cutting edge
- Precise tolerance

- Aluminum alloy
- Copper alloy



Grades for recommended application range

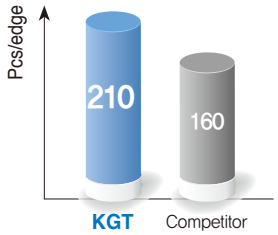
Workpiece		Grade	Order of recommended grade	Recommended cutting speed (sfm) 160 – 320 – 480 – 640 – 2560
P	Steel	PC5300	1	230 – 395
		NC3225	2	430 – 725
		NC5330	3	395 – 660
	Alloy Steel	PC5300	1	200 – 345
		NC3225	2	430 – 725
		NC5330	3	295 – 590
M	Stainless steel	PC5300	1	230 – 395
		PC9030	2	230 – 380
		NC5330	3	250 – 410
K	Cast iron	PC5300	1	180 – 295
		NC5330	2	315 – 525
N	Non-ferrous metal	H01	1	650 – 2600
S	HRSA	PC5300	1	65 – 115

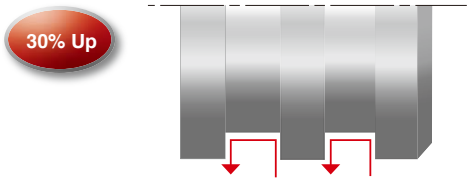
Application examples

Multi-function machining — Turning + Grooving repetition

Optimized geometry for turning + grooving - High efficiency.

- **Workpiece** AISI1045
- **Cutting condition** vc = 560 (sfm)
  fn = 0.006 (ipr)
  ap = 0.079 inch
  W = 0.118 inch
  wet
- **Designation** KGMN300-04-T (PC5300)

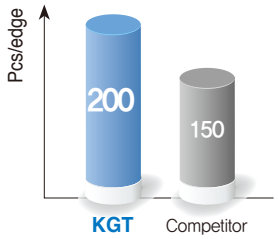


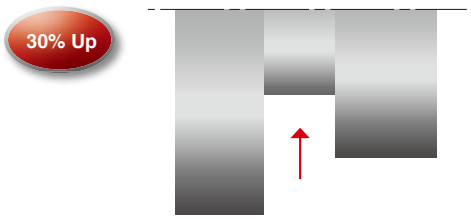


Grooving — Shoulder Grooving

Tough geometry for interrupted and deep grooving.

- **Workpiece** AISI304
- **Cutting condition** vc = 390 (sfm)
  fn = 0.005 (ipr)
  ap = 0.197 inch
  W = 0.157 inch
  wet
- **Designation** KGMN400-03-R (PC5300)

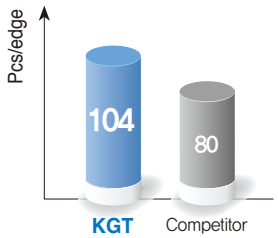


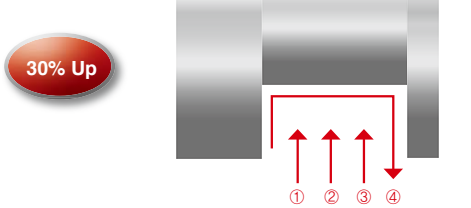


Shaft machining — Grooving (Roughing) & Turning (Finishing)

Excellent chip control for higher efficiency.

- **Workpiece** AISI4140
- **Cutting condition** vc = 490 (sfm)
  fn = 0.006 (ipr)
  ap = 0.197 inch
  W = 0.118 inch x 3
  wet
- **Designation** KGMN300-04-T (PC5300)

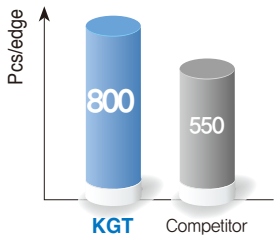


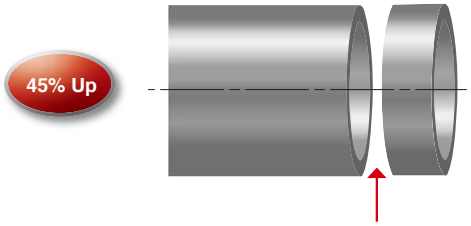


Parting off — Pipe Parting-off

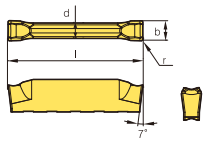
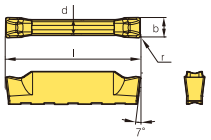
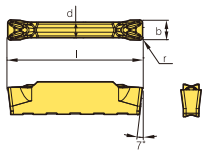
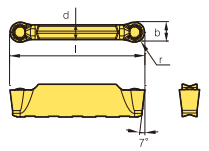
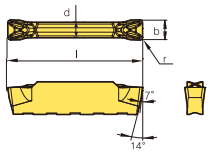
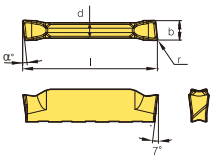
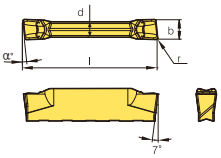
Exclusive parting-off chip breaker for longer tool life. / Sharp geometry for less burr.

- **Workpiece** AISI304
- **Cutting condition** vc = 460 (sfm)
  fn = 0.006 (ipr)
  ap = 0.079 inch
  W = 0.118 inch
  wet
- **Designation** KGMR300-6D-LP (PC5300)



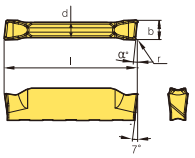
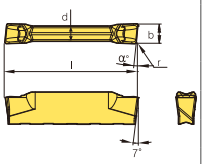
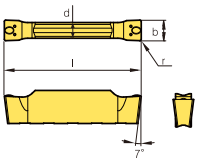
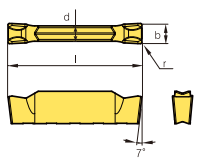
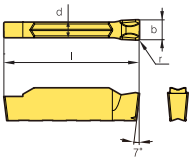
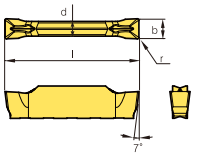
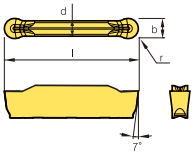


Insert

Application	Picture	Designation		Coated					Dimensions (inch)					Configuration	Page
				NC3215	NC3225	NC5330	PC5300	PC9030	b	r	l	d	α°		
Grooving	KGMN-L	KGMN	200-02-L						0.079	1/128	0.787	0.067	-		C14~20 C22
			300-02-L						0.118	1/128	0.787	0.091	-		
			400-02-L						0.157	1/128	0.787	0.130	-		
			500-03-L						0.197	3/256	0.984	0.161	-		
			600-03-L						0.236	3/256	0.984	0.200	-		
Grooving · Parting off	KGMN-R	KGMN	150-015-R						0.059	3/512	0.630	0.047	-		C14~20 C22
			200-02-R						0.079	1/128	0.787	0.067	-		
			300-02-R				●		0.118	1/128	0.787	0.091	-		
			400-03-R						0.157	3/256	0.787	0.130	-		
			500-03-R						0.197	3/256	0.984	0.161	-		
			600-03-R						0.236	3/256	0.984	0.200	-		
			800-04-R						0.315	1/64	1.181	0.240	-		
Grooving · Turning	KGMN-T	KGMN	150-015-T						0.059	3/512	0.630	0.047			C14~20 C22
			200-02-T						0.079	1/128	0.787	0.067	-		
			250-02-T						0.098	1/128	0.787	0.079			
			300-02-T				●		0.118	1/128	0.787	0.091	-		
			300-04-T			●	●		0.118	1/64	0.787	0.091	-		
			400-04-T			●	●		0.157	1/64	0.787	0.130	-		
			400-08-T						0.157	1/32	0.787	0.130	-		
			500-04-T						0.197	1/64	0.984	0.161	-		
			500-08-T						0.197	1/32	0.984	0.161	-		
			600-04-T						0.236	1/64	0.984	0.200	-		
			600-08-T						0.236	1/32	0.984	0.200	-		
			800-08-T						0.315	1/32	1.181	0.240	-		
Profiling	KRMN-C	KRMN	200-C						0.079	3/64	0.787	0.067	-		C14~21
			300-C						0.118	1/14	0.787	0.087	-		
			400-C						0.157	5/64	0.787	0.126	-		
			500-C						0.197	3/32	0.984	0.157	-		
			600-C						0.236	1/8	0.984	0.197	-		
			800-C						0.315	5/32	1.181	0.236	-		
Grooving · Internal	KGMI-T	KGMI	200-02-T						0.079	1/128	0.787	0.067	-		C22
			300-04-T						0.118	1/64	0.787	0.091	-		
			400-04-T						0.157	1/64	0.787	0.130	-		
Parting off (Right handed)	KGMR-LP	KGMR	200-6D-LP						0.079	1/128	0.787	0.067	6		C14 C16
			200-8D-LP						0.079	1/128	0.787	0.067	8		
			200-15D-LP						0.079	1/128	0.787	0.067	15		
			300-6D-LP						0.118	1/128	0.787	0.091	6		
			300-15D-LP						0.118	1/128	0.787	0.091	15		
			400-4D-LP						0.157	3/256	0.787	0.130	4		
			400-15D-LP						0.157	3/256	0.787	0.130	15		
			500-4D-LP						0.197	3/256	0.984	0.161	4		
Parting off (Right handed)	KGMR-RP	KGMR	200-6D-RP						0.079	1/128	0.787	0.067	6		C14 C16
			200-8D-RP						0.079	1/128	0.787	0.067	8		
			200-15D-RP						0.079	1/128	0.787	0.067	15		
			300-6D-RP						0.118	1/128	0.787	0.091	6		
			300-15D-RP						0.118	1/128	0.787	0.091	15		
			400-4D-RP						0.157	3/256	0.787	0.130	4		
			400-15D-RP						0.157	3/256	0.787	0.130	15		
			500-4D-RP						0.197	3/256	0.984	0.161	4		

● : Korea Stock ● : US Stock

Insert

Application	Picture	Designation		Coated				Uncoated		Dimensions (inch)					Configuration	Page
				NC3215	NC5330	PC5300	PC9030	H01	H05	b	r	l	d	α°		
Parting off (Left handed)	KGML-LP	KGML	200-6D-LP							0.079	1/128	0.787	0.067	6		C14 C16
			200-15D-LP							0.079	1/128	0.787	0.067	15		
			300-6D-LP							0.118	1/128	0.787	0.091	5		
			300-15D-LP							0.118	1/128	0.787	0.091	16		
			400-4D-LP							0.157	1/128	0.787	0.130	4		
			400-15D-LP							0.157	1/128	0.787	0.130	15		
Parting off (Left handed)	KGML-RP	KGML	200-6D-RP							0.079	1/128	0.787	0.067	6		C14 C16
			200-15D-RP							0.079	1/128	0.787	0.067	15		
			300-6D-RP							0.118	1/128	0.787	0.091	6		
			300-15D-RP							0.118	1/128	0.787	0.091	15		
			400-4D-RP							0.157	1/128	0.787	0.130	4		
			400-15D-RP							0.157	1/128	0.787	0.130	15		
Grooving(Ground insert)	KGGN-B	KGGN	265-015-B							0.104	3/512	0.787	0.091	-		C14 C16 C17
			300-020-B							0.118	1/128	0.787	0.091	-		
			300-040-B							0.118	1/64	0.787	0.091	-		
			315-015-B							0.124	3/512	0.787	0.091	-		
			400-040-B							0.157	1/64	0.787	0.130	-		
			400-080-B							0.157	1/32	0.787	0.130	-		
			415-015-B							0.163	3/512	0.787	0.130	-		
			478-055-B							0.188	11/512	0.787	0.130	-		
			500-080-B							0.197	1/32	0.984	0.161	-		
			515-015-B							0.203	3/512	0.984	0.161	-		
			600-080-B							0.236	1/32	0.984	0.200	-		
			600-120-B							0.236	3/64	0.984	0.200	-		
			800-080-B							0.315	1/32	1.181	0.240	-		
			800-120-B							0.315	3/64	1.181	0.240	-		
Grooving · Parting off (Ground insert)	KGGN-R (new)	KGGN	200-02-R							0.079	1/128	0.787	0.067	-		C14~20
			300-02-R							0.118	1/128	0.787	0.091	-		
			400-03-R							0.157	3/256	0.787	0.130	-		
			500-03-R							0.197	3/256	0.984	0.161	-		
			600-03-R							0.236	3/256	0.984	0.200	-		
			800-04-R							0.315	1/64	1.181	0.240	-		
Grooving · Parting off (Single insert)	KGGN-R (new)	KGGN	200S-02-R							0.079	1/128	0.760	0.067	-		C23
			300S-02-R							0.118	1/128	0.785	0.091	-		
			400S-03-R							0.157	3/256	0.785	0.130	-		
			500S-03-R							0.197	3/256	0.982	0.161	-		
			600S-03-R							0.236	3/256	0.982	0.200	-		
			800S-04-R							0.315	1/64	1.178	0.240	-		
Aluminum Grooving	KGGN-A (new)	KGGN	200-02-A							0.079	1/128	0.787	0.067	-		C14~20
			300-02-A							0.118	1/128	0.787	0.091	-		
			400-04-A							0.157	1/64	0.787	0.130	-		
			500-04-A							0.197	1/64	0.984	0.161	-		
			600-04-A							0.236	1/64	0.984	0.200	-		
Aluminum Profiling	KRGN-A (new)	KRGN	300-A							0.118	1/16	0.787	0.091	-		C14~19
			400-A							0.157	5/64	0.787	0.130	-		
			500-A							0.197	3/32	0.984	0.161	-		
			600-A							0.236	1/8	0.984	0.200	-		
			800-A							0.315	5/32	1.181	0.240	-		

• Chip breaker 'B' : User self-grind type.

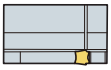
● : Korea Stock ● : US Stock

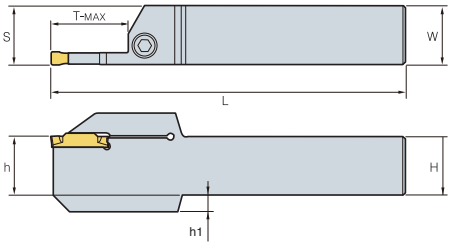
KGEHR/L

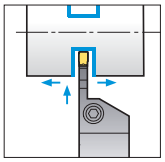
For Grooving, Turning, Parting off, Reliefing machining



KGGN KGMN
KGMR/L KRMN
KRGN







• R type insert

(inch)

Designation		H = (h)	W	L	S	h1	T-MAX	Inserts	Screw	Wrench
KGEHR/L	10-1.5-T14	5/8	5/8	4	0.638	-	0.551	KGMN150-□-□	MHA0512	HW40L
	12-1.5-T14	3/4	3/4	5	0.795	-	0.551			
	16-1.5-T14	1	1	6	0.795	-	0.551			
	08-2-T08	1/2	1/2	4	0.48	-	0.315	KGMN200-□-□ KGMR/L200-□-□ KRMN200-C KGGN200-□-□	MHA0512	HW40L
	10-2-T08	5/8	5/8	4	0.633	-	0.315			
	12-2-T08	3/4	3/4	5	0.758	-	0.315			
	16-2-T08	1	1	6	1.008	-	0.315			
	10-2-T12	5/8	5/8	4	0.633	-	0.472			
	12-2-T12	3/4	3/4	5	0.758	-	0.472			
	16-2-T12	1	1	6	1.008	-	0.472			
	10-2-T17	5/8	5/8	4	0.633	-	0.669			
	12-2-T17	3/4	3/4	5	0.758	-	0.669			
	16-2-T17	1	1	6	1.008	-	0.669			
	10-2.5-T17	5/8	5/8	4	0.642	-	0.669	KGMN250-□-□	MHA0512	HW40L
	12-2.5-T17	3/4	3/4	5	0.642	-	0.669			
	16-2.5-T17	1	1	6	0.642	-	0.669			
	10-3-T10	5/8	5/8	4	0.641	-	0.394	KGMN300-□-□ KGMR/L300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	12-3-T10	3/4	3/4	5	0.766	-	0.394			
	16-3-T10	1	1	6	1.016	-	0.394			
	20-3-T10	1 1/4	1 1/4	6 3/4	1.276	-	0.394			
	10-3-T13	5/8	5/8	4	0.641	-	0.512			
	12-3-T13	3/4	3/4	5	0.766	-	0.512			
	16-3-T13	1	1	6	1.016	-	0.512			
	10-3-T20	5/8	5/8	4	0.641	-	0.787			
	12-3-T20	3/4	3/4	5	0.766	-	0.787			
	16-3-T20	1	1	6	1.016	-	0.787			
	20-3-T20	1 1/4	1 1/4	6 3/4	1.266	-	0.787			
	16-3-T25	1	1	6	1.016	-	0.984			
	10-4-T10	5/8	5/8	4	0.641	-	0.394	KGMN400-□-□ KGMR/L400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	12-4-T10	3/4	3/4	5	0.766	-	0.394			
	16-4-T10	1	1	6	1.016	-	0.394			
	20-4-T10	1 1/4	1 1/4	6 3/4	1.276	-	0.394			
	10-4-T15	5/8	5/8	4	0.641	-	0.591			
	12-4-T15	3/4	3/4	5	0.766	-	0.591			
	16-4-T15	1	1	6	1.016	-	0.591			
	10-4-T20	5/8	5/8	4	0.641	-	0.787			
	12-4-T20	3/4	3/4	5	0.766	-	0.787			
	16-4-T20	1	1	6	1.016	-	0.787			
	20-4-T20	1 1/4	1 1/4	6 3/4	1.266	-	0.787			
	10-4-T25	5/8	5/8	4	0.641	-	0.984			
	12-4-T25	3/4	3/4	5	0.766	-	0.984			
	16-4-T25	1	1	6	1.016	-	0.984			

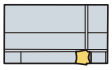
Applicable inserts C12~C13

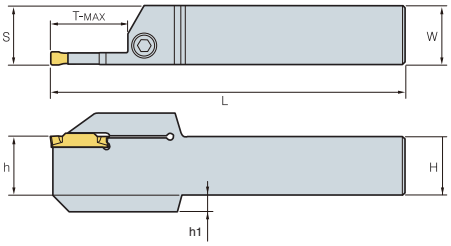
KGEHR/L

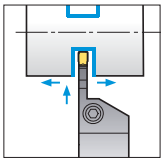
For Grooving, Turning, Parting off, Reliefing machining



KGGN KGMN
KGMR/L KRMN
KRGN







• R type insert

(inch)

Designation		H = (h)	W	L	S	h_1	T-MAX	Inserts	Screw	Wrench
KGEHR/L	12-5-T12	3/4	3/4	5	0.770	-	0.472	KGMN500-□-□ KRMN500-C KGGN500-□-□ KRGN500-□	BHA0616	HW50L
	16-5-T12	1	1	6	1.020	-	0.472			
	12-5-T15	3/4	3/4	5	0.807	-	0.591			
	16-5-T15	1	1	6	1.004	-	0.591			
	20-5-T15	1 1/4	1 1/4	6 3/4	1.280	-	0.591			
	12-5-T20	3/4	3/4	5	0.770	-	0.787			
	16-5-T20	1	1	6	1.020	-	0.787			
	20-5-T20	1 1/4	1 1/4	6 3/4	1.270	-	0.787		BHA0620	HW50L
	16-5-T32	1	1	6	1.020	0.276	1.260			
	12-6-T12	3/4	3/4	5	0.770	-	0.472	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	16-6-T12	1	1	6	1.020	-	0.472			
	16-6-T15	1	1	6	1.004	-	0.591			
	20-6-T15	1 1/4	1 1/4	6 3/4	1.280	-	0.591			
	12-6-T20	3/4	3/4	5	0.770	-	0.787			
	16-6-T20	1	1	6	1.020	-	0.787			
	20-6-T20	1 1/4	1 1/4	6 3/4	1.270	-	0.787		BHA0620	HW50L
	16-6-T32	1	1	6	1.020	0.276	1.260			
	16-8-T16	1	1	6	1.020	-	0.630	KGMN800-□-□ KRMN800-C KGGN800-□-□ KRGN800-□	BHA0616	HW50L
	20-8-T16	1 1/4	1 1/4	6 3/4	1.299	-	0.630			
	16-8-T25	1	1	6	1.039	-	0.984			
	20-8-T25	1 1/4	1 1/4	6 3/4	1.289	-	0.984		BHA0620	HW50L
	16-8-T36	1	1	6	1.039	0.276	1.417			
	20-8-T36	1 1/4	1 1/4	6 3/4	1.289	-	1.417			

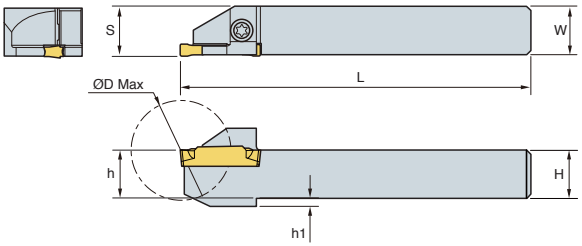
Applicable inserts **C12~C13**

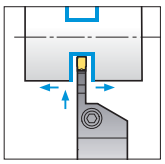
KGEHR/L-D00A (Auto Tool)

For Grooving, Turning, Parting off machining



KGGN KGMN
KGMR/L KRMN
KRGN





• R type insert

(inch)

Designation		H = (h)	W	L	S	h1	ØD Max	Inserts	Screw	Wrench
KGEHR/L	06-2-D20A	3/8	3/8	5	0.383	0.079	0.787	KGMN200-□-□ KGMR/L200-□-□ KRMN200-C KGGN200-□-□	ETNA0412	TW15L
	08-2-D25A	1/2	1/2	5	0.508	0.079	0.984			
	09-2-D25A	5/9	5/9	5	0.559	-	0.984			
	10-2-D32A	5/8	5/8	5	0.633	-	1.260			
	08-3-D25A	1/2	1/2	5	0.508	0.079	0.984	KGMN300-□-□ KGMR/L300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□		
	10-3-D32A	5/8	5/8	5	0.633	-	1.260			

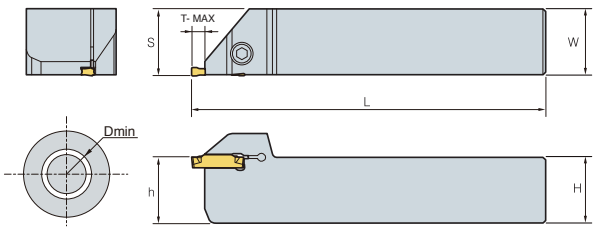
Applicable inserts **C12~C13**

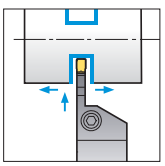
KGEHR/L-T00

For Grooving, Turning, Face grooving machining



KGMN KRMN
KGGN KRGN





• R type insert

(inch)

Designation		H = (h)	W	L	S	ØD Min	T-MAX	Inserts	Screw	Wrench
KGEHR/L	10-3-T00	5/8	5/8	4	0.646	3.150	0.189	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	12-3-T00	3/4	3/4	5	0.803	3.150	0.189			
	16-3-T00	1	1	6	1.016	3.150	0.189			
	10-4-T00	5/8	5/8	4	0.641	3.150	0.189	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	12-4-T00	3/4	3/4	5	0.766	3.150	0.189			
	16-4-T00	1	1	6	1.016	3.150	0.189			
	12-6-T00	3/4	3/4	5	0.770	3.150	0.236	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	16-6-T00	1	1	6	1.020	3.150	0.236			

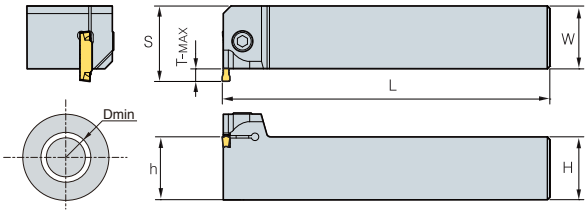
Applicable inserts **C12~C13**

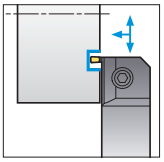
KGEVR/L-T00

For Grooving, Turning, Face grooving machining



KGMN KRMN
KRGN KGGN





• R type insert

(inch)

Designation		H = (h)	W	L	S	ØD Min	T-MAX	Inserts	Screw	Wrench
KGEVR/L	12-1.5-T00	3/4	3/4	5	0.925	4.724	0.118	KGMN150-□-□	MHA0512	HW40L
	16-1.5-T00	1	1	6	1.122	4.724	0.118			
	20-1.5-T00	1 1/4	1 1/4	6 3/4	1.398	4.724	0.118			
	12-2-T00	3/4	3/4	5	0.925	4.724	0.118	KGMN200-□-□ KRMN200-C KGGN200-□-□-□	MHA0512	HW40L
	16-2-T00	1	1	6	1.122	4.724	0.118			
	20-2-T00	1 1/4	1 1/4	6 3/4	1.398	4.724	0.118			
	12-2.5-T00	3/4	3/4	5	0.965	3.150	0.157	KGMN250-□□	MHA0512	HW40L
	16-2.5-T00	1	1	6	1.161	3.150	0.157			
	20-2.5-T00	1 1/4	1 1/4	6 3/4	1.437	3.150	0.157			
	12-3-T00	3/4	3/4	5	0.947	3.150	0.189	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	16-3-T00	1	1	6	1.197	3.150	0.189			
	20-3-T00	1 1/4	1 1/4	6 3/4	1.457	3.150	0.189			
	12-4-T00	3/4	3/4	5	0.947	3.150	0.189	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	16-4-T00	1	1	6	1.197	3.150	0.189			
	20-4-T00	1 1/4	1 1/4	6 3/4	1.457	3.150	0.189			
	12-5-T00	3/4	3/4	5	1.161	2.362	0.236	KGMN500-□-□ KRMN500-C KGGN500-□-□ KRGN500-□	BHA0616	HW50L
	16-5-T00	1	1	6	1.240	2.362	0.236			
	20-5-T00	1 1/4	1 1/4	6 3/4	1.516	2.362	0.236			
	12-6-T00	3/4	3/4	5	1.043	2.362	0.236	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	16-6-T00	1	1	6	1.256	3.150	0.236			
	20-6-T00	1 1/4	1 1/4	6 3/4	1.516	2.362	0.236			
	16-8-T00	1	1	6	1.319	1.969	0.315	KGMN800-□-□ KRMN800-C KGGN800-□-□ KRGN800-□	BHA0616	HW50L
	20-8-T00	1 1/4	1 1/4	6 3/4	1.516	1.969	0.315			

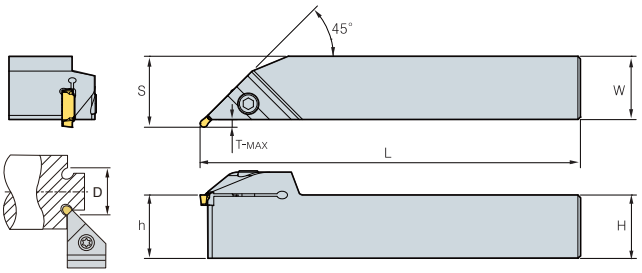
Applicable inserts **C12~C13**

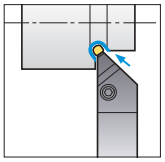
KGEUR/L

For Reliefing machining



KRMN
KRGN





• R type insert

(inch)

Designation		H = (h)	W	L	S	ØD Min	T-MAX	Inserts	Screw	Wrench
KGEUR/L	10-3	5/8	5/8	4	0.748	1.575	0.110	KRMN300-C KRGN300-□	MHA0512	HW40L
	12-3	3/4	3/4	5	0.906	1.575	0.110			
	16-3	1	1	6	1.102	1.575	0.110			
	20-3	1 1/4	1 1/4	6 3/4	1.378	1.575	0.110			
	10-4	5/8	5/8	4	0.748	1.575	0.110	KRMN400-C KRGN400-□	BHA0616	HW50L
	12-4	3/4	3/4	5	0.906	1.575	0.110			
	16-4	1	1	6	1.102	1.575	0.110			
	20-4	1 1/4	1 1/4	6 3/4	1.378	1.575	0.110			
	12-5	3/4	3/4	5	0.925	1.969	0.130	KRMN500-C KRGN500-□	BHA0616	HW50L
	16-5	1	1	6	1.122	1.969	0.130			
	20-5	1 1/4	1 1/4	6 3/4	1.398	1.969	0.130			
	12-6	3/4	3/4	5	0.925	1.969	0.130	KRMN600-C KRGN600-□	BHA0616	HW50L
	16-6	1	1	6	1.122	1.969	0.130			
	20-6	1 1/4	1 1/4	6 3/4	1.398	1.969	0.130			
	16-8	1	1	6	1.122	2.559	0.130	KRMN800-C KRGN800-□	BHA0616	HW50L
	20-8	1 1/4	1 1/4	6 3/4	1.398	2.559	0.130			

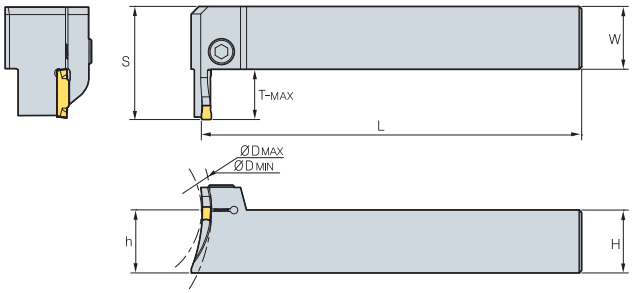
Applicable inserts **C12~C13**

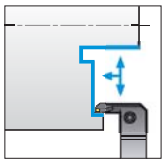
KGFVR/L

For Face grooving machining



KGMN KRMN
KGGN KRGN





• R type insert

(inch)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
KGFVR/L	16-3-13/19-T10	1	1	6	1.417	0.394	1.338	1.968	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	16-3-17/23-T15	1	1	6	1.614	0.590	1.732	2.362			
	16-3-21/33-T15	1	1	6	1.614	0.590	2.126	3.346			
	16-4-12/19-T15	1	1	6	1.614	0.590	1.260	1.968	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	16-4-16/23-T15	1	1	6	1.614	0.590	1.653	2.362			
	16-4-20/33-T15	1	1	6	1.614	0.590	2.047	3.346			
	16-4-17/27-T20	1	1	6	1.807	0.787	1.732	2.756			
	16-4-23/47-T20	1	1	6	1.807	0.787	2.362	4.724			
	16-4-44/78-T20	1	1	6	1.807	0.787	4.409	7.874			
	16-5-19/31-T20	1	1	6	1.811	0.787	1.968	3.149	KGMN500-□-□ KRMN500-C KGGN500-□-□ KRGN500-□	BHA0616	HW50L
	16-5-27/43-T20	1	1	6	1.811	0.787	2.756	4.331			
	16-5-39/59-T20	1	1	6	1.811	0.787	3.937	5.905			
	16-5-55/78-T20	1	1	6	1.811	0.787	5.512	7.874			
	16-5-78-T20	1	1	6	1.811	0.787	7.874	∞			
	16-6-18/33-T20	1	1	6	1.811	0.787	1.889	3.346	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	16-6-28/59-T20	1	1	6	1.811	0.787	2.874	5.905			
	16-6-54/98-T20	1	1	6	1.811	0.787	5.433	9.842			
	16-6-98-T20	1	1	6	1.811	0.787	9.842	∞			

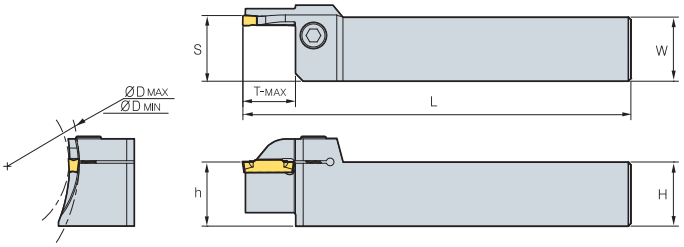
Applicable inserts C12~C13

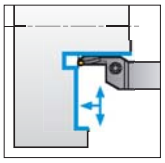
KGFHR/L

For Face grooving machining



KGMN KRMN
KGGN KRGN





• R type insert

(inch)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
KGFHR/L	12-3-13/19-T10	3/4	3/4	6	0.807	0.394	1.338	1.968	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	12-3-17/27-T15	3/4	3/4	6	0.807	0.590	1.732	2.756			
	12-3-25/39-T15	3/4	3/4	6	0.807	0.590	2.520	3.937			
	16-3-13/19-T10	1	1	6	1.004	0.394	1.339	1.969			
	16-3-17/27 T15	1	1	6	1.004	0.591	1.732	2.756			
	16-3-25/39-T15	1	1	6	1.004	0.591	2.520	3.937			
	12-4-13/19-T16	3/4	3/4	6	0.807	0.630	1.338	1.968	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	12-4-16/27-T16	3/4	3/4	6	0.807	0.630	1.653	2.756			
	12-4-24/47-T16	3/4	3/4	6	0.807	0.630	2.441	4.724			
	12-4-44/78-T16	3/4	3/4	6	0.807	0.630	4.409	7.874			
	16-4-13/19-T20	1	1	6	1.008	0.787	1.338	1.968			
	16-4-15/23-T10	1	1	6	1.008	0.394	1.575	2.362			
	16-4-17/27-T20	1	1	6	1.016	0.787	1.732	2.756			
	16-4-23/47-T20	1	1	6	1.016	0.787	2.362	4.724			
	16-4-33/36-T20	1	1	6	1.008	0.787	3.307	3.622			
	16-4-44/78-T20	1	1	6	1.016	0.787	4.409	7.874			
	16-4-78-T20	1	1	6	1.008	0.787	7.874	∞			
	16-5-19/31-T15	1	1	6	1.008	0.591	1.968	3.149	KGMN500-□-□ KRMN500-C KGGN500-□-□ KRGN500-□	BHA0616	HW50L
	16-5-19/31-T25	1	1	6	1.008	0.984	1.968	3.149			
	16-5-27/43-T15	1	1	6	1.008	0.591	2.756	4.331			
	16-5-27/43-T25	1	1	6	1.008	0.984	2.756	4.331			
	16-5-39/59-T25	1	1	6	1.008	0.984	3.937	5.905			
	16-5-55/78-T25	1	1	6	1.008	0.984	5.512	7.874			
	16-5-74/86-T10	1	1	6	1.008	0.394	7.480	8.661			
	16-5-78-T25	1	1	6	1.008	0.984	7.874	∞			
	16-6-66/74-T10	1	1	6	1.008	0.394	6.693	7.480	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	16-6-74/86-T10	1	1	6	1.008	0.394	7.480	8.661			

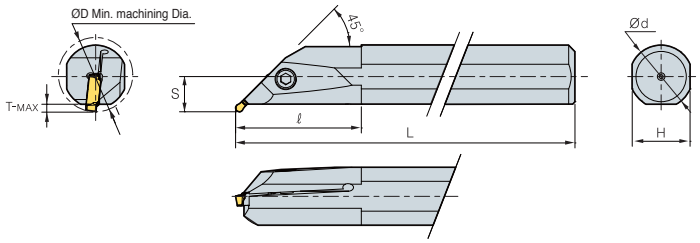
Applicable inserts C12~C13

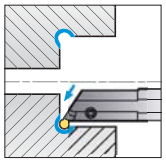
KGIUR/L

For Reliefing machining



KRMN
KRGN





• R type insert

(inch)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
KGIUR/L	13-12-3	1.378	3/4	6	1.772	0.138	0.709	0.512	KRMN300-C KRGN300-□	MHA0512	HW40L
	13-12-4	1.378	3/4	6	1.772	0.138	0.709	0.512			
	15-16-3	1.575	1	8	1.969	0.138	0.906	0.610			
	19-20-3	1.969	1 1/4	10	2.559	0.138	1.181	0.748	KRMN400-C KRGN400-□	MHA0512	HW40L
	15-16-4	1.575	1	8	1.969	0.138	0.906	0.610			
	19-20-4	1.969	1 1/4	10	2.559	0.138	1.181	0.748			
	15-16-5	1.575	1	8	1.969	0.138	0.906	0.610	KRMN500-C KRGN500-□	MHA0512	HW40L
	19-20-5	1.969	1 1/4	10	2.559	0.138	1.181	0.748			
	15-16-6	1.575	1	8	1.969	0.138	0.906	0.610	KRMN600-C KRGN600-□	MHA0512	HW40L
	19-20-6	1.969	1 1/4	10	2.559	0.138	1.181	0.748			
	15-16-8	1.575	1	8	1.969	0.138	0.906	0.610	KRMN800-C KRGN800-□	MHA0512	HW40L
	19-20-8	1.969	1 1/4	10	2.559	0.138	1.181	0.748			

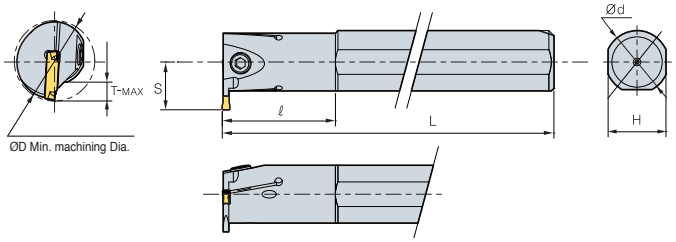
Applicable inserts **C12~C13**

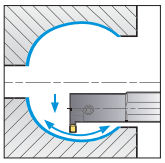
KGIVR/L

For Grooving, Turning, Profiling machining



KGMI
KGMN





• R type insert

(inch)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
KGIVR/L	07-10-1.5	0.787	5/8	5	1.378	0.157	0.591	0.472	KGMN150-□-□	MHB0410	HW30L
	09-12-1.5	0.984	3/4	6	1.772	0.236	0.709	0.610		MHB0410	
	12-16-1.5	1.260	1	8	1.772	0.276	0.906	0.748		MHA0512	HW40L
	09-10-2	0.984	5/8	5	1.378	0.256	0.591	0.551	KGMI200-□-T	MHB0410	HW30L
	09-12-2	0.984	3/4	6	1.772	0.256	0.709	0.610			
	12-16-2	1.260	1	8	1.772	0.276	0.906	0.748		MHB0512	HW40L
	09-10-2.5	0.984	5/8	5	1.378	0.256	0.591	0.551	KGMN250-□-□	MHB0410	HW30L
	09-12-2.5	0.984	3/4	6	1.772	0.256	0.709	0.610			
	12-16-2.5	1.260	1	8	1.772	0.276	0.906	0.748		MHA0512	HW40L
	09-12-3	0.984	3/4	6	1.772	0.256	0.709	0.610	KGMI300-□-T	MHB0410	HW30L
	12-16-3	1.260	1	8	1.772	0.276	0.906	0.748		MHA0512	HW40L
	15-20-3	1.575	1 1/4	10	2.165	0.295	1.181	0.886		BHA0616	HW50L
	09-12-4	0.984	3/4	6	1.772	0.256	0.709	0.610	KGMI400-□-T	MHB0410	HW30L
	12-16-4	1.260	1	8	1.772	0.276	0.906	0.748		MHA0512	HW40L
	15-20-4	1.575	1 1/4	10	2.165	0.295	1.181	0.886		BHA0616	HW50L
	12-16-5	1.260	1	8	1.772	0.295	0.906	0.768	KGMN500-□-□	MHA0512	HW40L
	15-20-5	1.575	1 1/4	10	2.165	0.335	1.181	0.925		BHA0616	HW50L
	12-16-6	1.260	1	8	1.772	0.295	0.906	0.768	KGMN600-□-□	MHA0512	HW40L
	15-20-6	1.575	1 1/4	10	2.165	0.335	1.181	0.925		BHA0616	HW50L
	15-20-8	1.575	1 1/4	10	2.165	0.335	1.181	0.925	KGMN800-□-□	BHA0616	HW50L
	17-24-8	1.772	1 1/2	12	2.756	0.335	1.457	1.043		BHA0616	HW50L

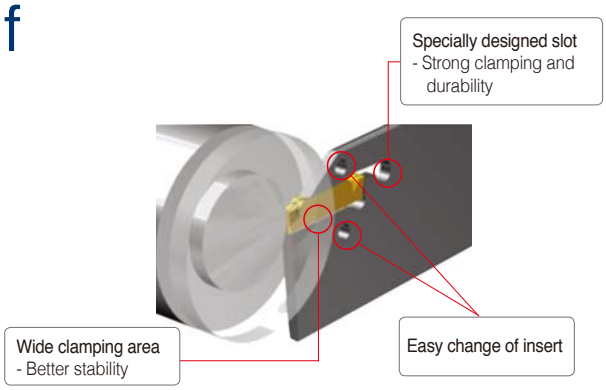
Applicable inserts **C12~C13**

• External insert: Min. machining Dia (ØD) is over 1.969 inch.

KGT Blade for Parting off

Features

- Parting application with the use of existing KGT inserts
- Economical machining with a double sided insert
- Specially designed slot for strong and stable clamping
- Easy change of insert with the use of exclusive wrench



Code system

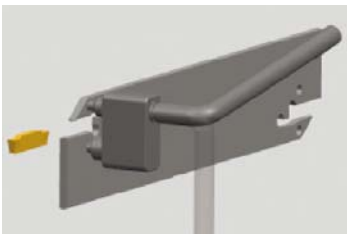
KGTBA 125 8 (S)

- KGTBA: KGTB system
- 125: Height of shank
- 8: Cutting width
- (S): S: Single pocket

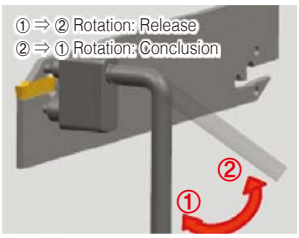
How to clamp insert



① Insert the pin of wrench into the hole of blade.



② Clamp the insert on its seat after turning the handle to 45˚~160˚ for loosening the seat.



③ Finish clamp by removing the wrench after moving it back to its original state.

KGTB



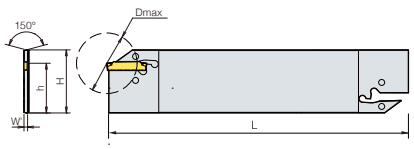


Fig. 1

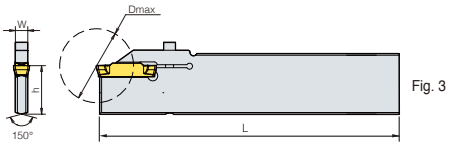


Fig. 3

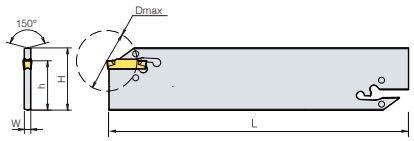


Fig. 2

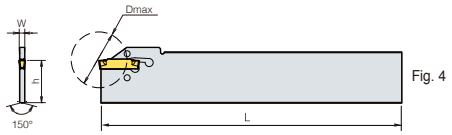


Fig. 4

(inch)

Designation		H	W	W'	L	h	ØD Max(2)	ØD Max(3)	Inserts	Wrench	Fig.
KGTBA	100-1.5-S	1	3/32	0.039	6	0.827	-	1.024	KG□□150-□-□	EW1203 (Separately ordered)	4
	100-2-S	1	3/32	0.071	6	0.827	1.968	1.535	KG□□200-□-□ KG□□200S-□-R(4)		
	100-3-S	1	3/32	-	6	0.827	3.937	1.535	KG□□300-□-□ KG□□300S-□-R(4)		
	100-4-S	1	1/8	-	6	0.827	3.937	1.535	KG□□400-□-□ KG□□400S-□-R(4)		
	125-1.5	1 1/4	3/32	0.039	6	0.984	-	1.024	KG□□150-□-□		1
	125-2	1 1/4	3/32	0.071	6	0.984	1.968	1.535	KG□□200-□-□ KG□□200S-□-R(4)		
	125-3	1 1/4	3/32	-	6	0.984	3.937	1.535	KG□□300-□-□ KG□□300S-□-R(4)		2
	125-4	1 1/4	1/8	-	6	0.984	3.937	1.535	KG□□400-□-□ KG□□400S-□-R(4)		
	125-5	1 1/4	5/32	-	6	0.984	4.724	1.929	KG□□500-□-□ KG□□500S-□-R(4)		
	125-6	1 1/4	13/64	-	6	0.984	4.724	1.929	KG□□600-□-□ KG□□600S-□-R(4)		
	125-8-S(1)	1 1/4	1/4	-	6	0.984	3.149	2.323	KG□□800-□-□ KG□□800S-□-R(4)	HW30L	3

Applicable inserts C12~C13

(1) Screw clamping (2) 1 corner use (3) 2 corner use (4) 1 corner insert

Inserts are offered with two edges, for better economical machining

MGT

- Inserts are offered with two edges, for better economical machining
- Multi-function operations - Reduce cycle time & increase productivity with the ability to groove, turn, face or copy in an application
- Shorten time & save on tool cost - Korloy's MGT system allows a machinist to apply one tool against many applications, reducing the number of tools
- Flat Cutting Edge - MGT tools have a flat geometry on its cutting edge to ensure excellent surface finishes. Even in high Feed applications by using a wiper function, Korloy ensures excellent surface finishes in roughing operations

Insert code system

MG M N 300 - 04 - T

System Code	Tolerance	Hand	Cutting Edge Width	Nose Radius (Nose R)	Chip Breaker
MG: Multi Grooving MR: Multi Grooving Round	M: Pressed G: Ground	N: Neutral R: Right L: Left I: Internal	0.059~0.315 inch	1/128 inch 3/256 inch 1/64 inch 1/32 inch	L/R/T/M/ PS/PT/A

Holder code system

MG E H R/L 16N - 3 T15

System Code	Application	Holder Type	Hand	Shank Size	Cutting Width	Maximum Depth of Cut
MG: Multi Grooving	E: External machining I: Internal machining	H: Horizontal V: Vertical U: Undercut	R: Right L: Left	Height: 1 inch Width: 1 inch (For internal machining: Minimum diameter for machining)	0.059~0.315 inch	0.590~0.984 inch

Geometry of chip breaker

MGM(G)N-M



- Specially designed chip breaker allows a smoother chip flow versus conventional flat-top geometries through the use of a central chip breaker
- Specially placed convex dots assists with chip control in external machining, for a smoother chip flow
- Chip breaker designed for turning & grooving applications

MGMN-G



- Specially designed chip breaker allows narrower chips to promote better chip flow
- Specifically designed for grooving applications

MRMN-M



- Full radius geometry for applications that require profiling
- Available for relief machining

MFMN300



- Specially designed chip breaker allows narrower chips to promote better chip flow
- Chip breaker specially designed for face-grooving

MRGN-A



- Specially designed high positive geometry, ideal for machining aluminum
- The chip breaker's super buffed, high rake angle allows optimal chip flow of aluminum

MGMR-PS



- Sharply designed cutting edge.
- Recommended in machining low carbon steel and stainless steel
- Specially designed chip breaker allows narrower chips to promote better chip flow.
- Able to machine Feed rates and small diameter cutting

MGMR-PT



- Stronger cutting edge with a negative land for tougher applications
- Able to machine at Feed rates as high and bar stock
- Chip breaker design helps narrows chips for better flow

MGGN-A



- Smooth chip flow
- Reduced build up on cutting edge

MGMN-L



- Sharp cutting edge
- Low cutting resistance
- For auto CNC machine
- For small Dia. processing

MGMN-R



- Strong cutting edge
- For high Feed rate processing

MGMN-T



- For turning & grooving
- Reduced chip width & smooth chip control by dot designed on the top corner

Parting off (MGMN/MGMR/L)

Workpiece	Cutting Speed (vc = sfm)											Feed (fn = ipr)				
	CVD					PVD					Uncoated	Cutting width (inch)				
	NC3120	NC3030	NCM325	NC5330	NC500H	PC230	PC8110	PC5300	PC3500	PC6510	ST30A	0.079	0.118	0.157	0.197	0.236
SM□□C	260~590			260~590		260~590						0.001~0.006	0.001~0.008	0.003~0.012	0.004~0.016	0.005~0.020
SCM	230~490	230~490	230~490	230~490	230~490	230~490			230~490			0.001~0.006	0.001~0.008	0.003~0.012	0.004~0.016	0.005~0.020
GC/GCD				160~330						160~330	160~330	0.002~0.005	0.004~0.010	0.004~0.012	0.004~0.014	0.004~0.016
STS			160~390	160~390			160~390	200~460				0.001~0.004	0.001~0.006	0.003~0.010	0.004~0.014	0.005~0.016
Non-ferrous metal (Al, Copper)											660~1480	0.002~0.004	0.002~0.008	0.002~0.012	0.002~0.012	0.002~0.014

Facing (FGD/FGM/FMM/MFMN/MGMN)

Workpiece	Cutting Speed (vc = sfm)								Feed (fn = ipr)		
	CVD				PVD			Uncoated	Cutting width (inch)		
	NC6110	NC3030	NC5330	NC3120	PC3500	PC215K	PC8110/PC5300	H01	0.118	0.157	0.197
SM□□C			330~530	330~530					0.002~0.004	0.002~0.005	0.002~0.006
SCM		160~430	160~430	160~430	160~430				0.002~0.004	0.002~0.005	0.002~0.006
GC/GCD	390~490		390~490			390~490			0.002~0.004	0.002~0.005	0.002~0.006
STS			200~490				200~490		0.002~0.004	0.002~0.005	0.002~0.006
Non-ferrous metal (Al, Copper)								660~2620	0.002~0.006	0.003~0.006	0.003~0.006

Grooving, Turning (MGMN/MRMN)

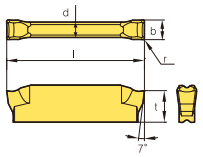
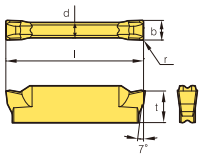
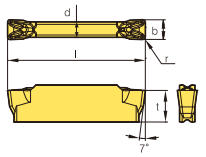
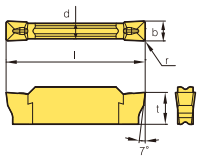
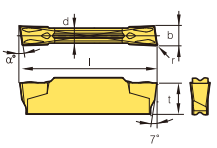
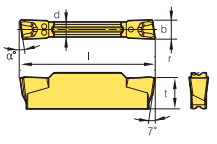
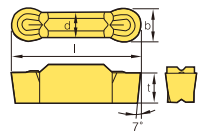
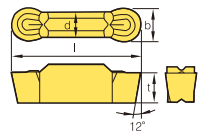
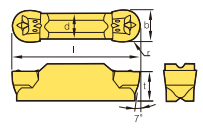
Workpiece	Cutting Speed (vc = sfm)										Feed (fn = ipr)					
	CVD			PVD				Cermet	Uncoated		Cutting width (inch)					
	NC3120	NC3030	NC5330	PC215K	PC5300	PC230	PC3500	CN2000	ST30A	ST20	0.020~0.039	0.039~0.079	0.079~0.118	0.118~0.157	0.157~0.197	0.236~0.315
SM□□C	260~660		260~660		260~590	260~660		260~390		260~390	0.001~0.003	0.002~0.004	0.002~0.004	0.002~0.005	0.002~0.006	0.002~0.006
SCM	260~590	260~590	260~590		260~530	260~590	260~590	260~390	260~390	260~390	0.001~0.003	0.002~0.003	0.002~0.003	0.002~0.004	0.002~0.005	0.002~0.006
GC/GCD			200~430		200~430						0.001~0.003	0.002~0.003	0.002~0.003	0.002~0.004	0.002~0.004	0.002~0.005
STS			200~330	200~330					200~330		0.001~0.003	0.002~0.004	0.002~0.004	0.002~0.005	0.002~0.005	0.002~0.006
Non-ferrous metal (Al, Copper)				490~980					490~1310		0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.006	0.003~0.006	0.004~0.008

Insert

Application	Picture	Designation		Coated							Uncoated	Dimensions (inch)					Configuration	Page
				NC3030	NC3120	NC3225	NC5330	NC6315	PC5300	PC8110	PC9030	H01	b	r	l	d	t	
Face Grooving	FGD	FGD	300R-03										0.118	3/256	0.590	0.079	0.157	C34 C35
			400R-04										0.157	1/64	0.590	0.118	0.177	
			500R-04										0.197	1/64	0.590	0.157	0.197	
	FGM	FGM	300R-03										0.118	3/256	0.590	0.079	0.157	C34 C35
			400R-04										0.157	1/64	0.590	0.118	0.177	
			500R-04										0.197	1/64	0.590	0.157	0.197	
	FMM	FMM	300R-03										0.118	3/256	0.590	0.079	0.154	C34 C35
			400R-04										0.157	1/64	0.590	0.118	0.156	
			500R-04										0.197	1/64	0.590	0.157	0.174	
Face Grooving	MFMN	MFMN	300										0.118	1/128	0.709	0.079	0.118	C33 C38
Grooving · Turning	MGGN-M	MGGN	300-02-M										0.118	1/128	0.827	0.093	0.189	C28 C30 C32 C38
			300-04-M										0.118	1/64	0.827	0.093	0.189	
			300-08-M										0.118	1/32	0.827	0.093	0.189	
			400-02-M										0.157	1/128	0.827	0.130	0.189	
			400-04-M										0.157	1/26	0.827	0.130	0.189	
			400-08-M										0.157	1/32	0.827	0.130	0.189	
			500-02-M										0.197	1/128	1.024	0.161	0.228	
			500-04-M										0.197	1/64	1.024	0.161	0.228	
			500-08-M										0.197	1/32	1.024	0.161	0.228	
			600-02-M										0.236	1/128	1.024	0.197	0.228	
			600-04-M										0.236	1/64	1.024	0.197	0.228	
			600-08-M										0.236	1/32	1.024	0.197	0.228	
Grooving	MGMN-G	MGMN	150-G										0.059	0.006	0.630	0.047	0.138	C28 C30 C32 C38
			200-G						●				0.079	1/128	0.630	0.063	0.138	
			250-G										0.098	1/128	0.728	0.079	0.152	
			300-G						●				0.118	1/64	0.827	0.093	0.189	
			400-G		●								0.157	1/64	0.827	0.13	0.189	
			500-G										0.197	1/32	1.024	0.161	0.228	
			600-G										0.236	1/32	1.024	0.197	0.228	
Grooving · Turning	MGMN-M	MGMN	200-M		●				●				0.079	1/128	0.630	0.047	0.138	C28 C30 C32 C38
			250-M										0.098	1/128	0.728	0.079	0.152	
			300-02-M										0.118	1/128	0.827	0.093	0.189	
			300-M	●	●				●	●			0.118	1/64	0.827	0.093	0.189	
			350-03-M										0.138	3/256	0.827	0.130	0.189	
			400-02-M										0.157	1/128	0.827	0.130	0.189	
			400-M	●	●				●				0.157	1/64	0.827	0.130	0.189	
			500-04-M										0.197	1/64	1.024	0.161	0.228	
			500-M										0.197	1/32	1.024	0.161	0.228	
			600-M										0.236	1/32	1.024	0.197	0.228	
			800-M										0.315	1/32	1.220	0.236	0.256	

●: Korea Stock ●: US Stock

Insert

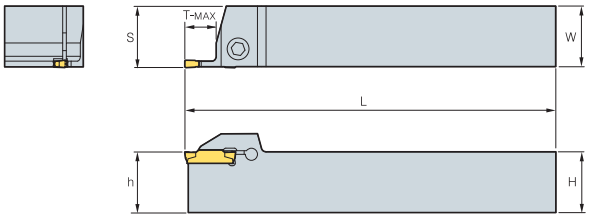
Application	Picture	Designation		Coated								Uncoated		Dimensions (inch)						Configuration	Page
				NC3030	NC3120	NC3225	NC5330	NC6315	PC5300	PC8100	PC9030	H01	H05	b	r	l	d	t	α°		
Grooving	MGMN-L	MGMN	200-02-L											0.079	1/128	0.630	0.063	0.138	-		C28 C30 C32 C33
			300-02-L											0.079	1/64	0.787	0.067	0.138	-		
			400-02-L											0.118	1/128	0.827	0.093	0.189	-		
			200-04-L											0.118	1/64	0.787	0.091	0.157	-		
			300-04-L											0.157	1/128	0.827	0.130	0.189	-		
			400-04-L											0.156	1/64	0.787	0.130	0.157	-		
			500-04-L											0.197	1/64	1.024	0.161	0.228	-		
Grooving · Parting off	MGMN-R	MGMN	200-02-R											0.079	1/128	0.630	0.063	0.138	-		C28 C30 C32 C33
			300-02-R											0.079	1/64	0.787	0.067	0.138	-		
			400-02-R											0.118	1/128	0.827	0.093	0.189	-		
			200-04-R											0.118	1/64	0.787	0.091	0.157	-		
			300-04-R											0.157	1/128	0.827	0.130	0.189	-		
			400-04-R											0.156	1/64	0.787	0.130	0.157	-		
			500-04-R											0.197	1/64	1.024	0.161	0.228	-		
Grooving · Turning	MGMN-T	MGMN	200-T											0.079	1/128	0.630	0.063	0.138	-		C28 C30 C32 C33
			300-T											0.118	1/64	0.827	0.093	0.189	-		
			400-T											0.157	1/64	0.827	0.130	0.189	-		
			500-T											0.197	1/32	1.024	0.161	0.228	-		
Grooving	MGGN-A	MGGN	300-02-A											0.118	1/128	0.827	0.093	0.189	-		C28 C30 C32 C38
			300-04-A											0.118	1/64	0.827	0.093	0.189	-		
			300-08-A											0.118	1/32	0.827	0.093	0.189	-		
			400-02-A											0.157	1/128	0.827	0.130	0.189	-		
			400-04-A											0.157	1/64	0.827	0.130	0.189	-		
			400-08-A											0.157	1/32	0.827	0.130	0.189	-		
			500-02-A											0.197	1/128	1.024	0.161	0.228	-		
			500-04-A											0.197	1/64	1.024	0.161	0.228	-		
			500-08-A											0.197	1/32	1.024	0.161	0.228	-		
Parting off	MGMR/L-PS	MGMR/L	300-6D-PS											0.118	0.008	0.827	0.098	0.118	0.189		C28 C30
			300-8D-PS											0.118	0.008	0.827	0.098	0.118	0.189		
			300-15D-PS											0.118	0.008	0.827	0.098	0.118	0.189		
			400-4D-PS											0.157	0.012	0.827	0.130	0.157	0.189		
			500-4D-PS											0.197	0.012	1.024	0.161	0.197	0.228		
Parting off	MGMR/L-PT	MGMR/L	200-6D-PT											0.079	0.008	0.630	0.063	0.079	0.142		C28 C30
			300-6D-PT											0.118	0.008	0.827	0.093	0.118	0.189		
			300-8D-PT											0.118	0.008	0.827	0.093	0.118	0.189		
			300-15D-PT											0.118	0.008	0.827	0.093	0.118	0.189		
			400-4D-PT											0.157	0.012	0.827	0.130	0.157	0.189		
			500-4D-PT											0.197	0.012	1.024	0.161	0.197	0.228		
Aluminum	MRGN-A	MRGN	400-A											0.157	5/64	0.827	0.130	0.157	-		C28 C29 C31 C32
			500-A											0.197	3/32	1.024	0.161	0.197	-		
	MRGN-A	MRGN	600-A											0.236	15/64	1.024	0.197	0.236	-		C28 C29 C31 C32
			800-A											0.315	5/32	1.220	0.236	0.315	-		
Reliefing Profiling	MRMN-M	MRMN	200-M											0.079	3/64	0.630	0.059	0.079	-		C28 ~32 C38
			300-M											0.118	1/14	0.827	0.093	0.118	-		
			400-M	●										0.157	5/64	0.827	0.130	0.157	-		
			500-M											0.197	3/32	1.024	0.161	0.197	-		
			600-M											0.236	1/8	1.024	0.197	0.236	-		
			800-M											0.315	5/32	1.220	0.236	0.315	-		

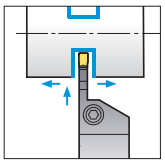
●: Korea Stock ●: US Stock

MGEHR/L

For Grooving, Turning, Parting off, Reliefing, Profiling machining







MGMN MGMR
MGGN MRMN
MRGN

• R type insert

(inch)

Designation		H = (h)	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	10-1.5	5/8	5/8	4	0.635	0.57	MGMN150-G	LTX0514	TW20L
	12-1.5	3/4	3/4	5	0.760	0.57			
	16-1.5	1	1	6	1.010	0.57			
	08-2	1/2	1/2	4	0.589	0.57	MGMN200-G MGMN200-M MGMR200-□□-□□	MHA0512	HW40L
	10-2	5/8	5/8	4	0.635	0.57			
	12-2	3/4	3/4	5	0.760	0.57			
	16-2	1	1	6	1.010	0.57			
	10-2.5	5/8	5/8	4	0.637	0.65	MGMN250-G MGMN250-M	MHA0512	HW40L
	12-2.5	3/4	3/4	5	0.762	0.65			
	16-2.5	1	1	6	1.012	0.65			
	10-3	5/8	5/8	4	0.639	0.72	MGMN300-M/T MGGN300-□□-M MRMN300-M MGMR300-□□-□□ MGMN300-□□-L/R	BHA0616	HW50L
	12-3	3/4	3/4	5	0.764	0.70			
	12-3-T03	3/4	3/4	5	0.764	0.39			
	16-3	1	1	6	1.014	0.70			
	16-3-T03	1	1	6	1.014	0.39			
	20-3	1 1/4	1 1/4	6 3/4	1.264	0.70			
	20-3-T03	1 1/4	1 1/4	6 3/4	1.264	0.39			
	12-4	3/4	3/4	5	0.766	0.70	MGMN400-M/T MGGN400-□□-M MRMN400-M MGMR400-□□-□□ MGMN400-□□-L/R		
	12-4-T03	3/4	3/4	5	0.766	0.39			
	16-4	1	1	6	1.016	0.70			
	16-4-T03	1	1	6	1.016	0.39			
	20-4	1 1/4	1 1/4	6 3/4	1.266	0.70			
	20-4-T03	1 1/4	1 1/4	6 3/4	1.266	0.39			
	12-5	3/4	3/4	5	0.770	0.90	MGMN500-M/T MGGN500-□□-M MRMN500-M MGMR500-□□-□□ MGMN500-□□-L/R		
	12-5-T05	3/4	3/4	5	0.770	0.59			
	16-5	1	1	6	1.020	0.90			
	16-5-T05	1	1	6	1.020	0.59			
	20-5	1 1/4	1 1/4	6 3/4	1.270	0.90			
	20-5-T05	1 1/4	1 1/4	6 3/4	1.270	0.59			
	12-6	3/4	3/4	5	0.774	0.90	MGMN600-M MGGN600-□□-M MRMN600-M		
	12-6-T05	3/4	3/4	5	0.774	0.59			
	16-6	1	1	6	1.024	0.90			
	16-6-T05	1	1	6	1.024	0.59			
	20-6	1 1/4	1 1/4	6 3/4	1.274	0.90			
	20-6-T05	1 1/4	1 1/4	6 3/4	1.274	0.59			
	16-8	1	1	6	1.043	1.10	MRMN800-M MGMN800-M		
	16-8-T05	1	1	6	1.043	0.59			
	20-8	1 1/4	1 1/4	6 3/4	1.293	1.10			
	20-8-T05	1 1/4	1 1/4	6 3/4	1.293	0.59			
	16-6A	1	1	6	1.024	0.90	MRGN600-A		
	16-6A-T05	1	1	6	1.024	0.59			
	20-6A	1 1/4	1 1/4	6 3/4	1.274	0.90			
	20-6A-T05	1 1/4	1 1/4	6 3/4	1.293	0.59			
	16-8A	1	1	6	1.043	1.10	MRGN800-A		
	16-8A-T05	1	1	6	1.043	0.59			
	20-8A	1 1/4	1 1/4	6 3/4	1.293	1.10			
	20-8A-T05	1 1/4	1 1/4	6 3/4	1.293	0.59			

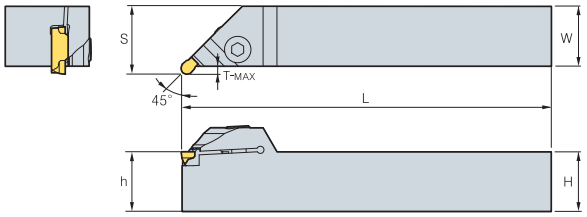
Applicable inserts C26~C27

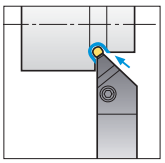
MGEUR/L

For Reliefing, Profiling machining



MRMN
MRGN





• R type insert

(inch)

Designation		H = (h)	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEUR/L	12-3	3/4	3/4	5	0.967	0.11	MRMN300-M	BHA0616	HW50L
	16-3	1	1	6	1.217	0.11			
	20-3	1 1/3	1 1/4	6 3/4	1.467	0.11			
	12-4	3/4	3/4	5	0.967	0.11	MRMN400-M		
	16-4	1	1	6	1.217	0.11			
	20-4	1 1/4	1 1/4	6 3/4	1.467	0.11			
	12-5	3/4	3/4	5	1.026	0.15	MRMN500-M		
	16-5	1	1	6	1.276	0.15			
	20-5	1 1/4	1 1/4	6 3/4	1.526	0.15			
	12-6	3/4	3/4	5	1.222	0.15	MRMN600-M		
	16-6	1	1	6	1.276	0.15			
	20-6	1 1/4	1 1/4	6 3/4	1.526	0.15			
	16-8	1	1	6	1.354	0.19	MRMN800-M		
	20-8	1 1/4	1 1/4	6 3/4	1.604	0.19			
	16-6A	1	1	6	1.276	0.15	MRGN600-A		
	20-6A	1 1/4	1 1/4	6 3/4	1.526	0.15			
	16-8A	1	1	6	1.354	0.19	MRGN800-A		
	20-8A	1 1/4	1 1/4	6 3/4	1.604	0.19			

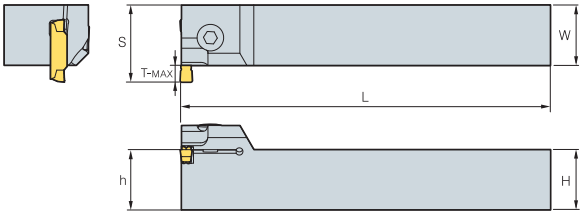
Applicable inserts **C26~C27**

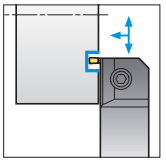
MGEVR/L

For Grooving, Turning, Profiling machining



MGMN MGGN
MRMN MRGN





• R type insert

(inch)

Designation		H = (h)	W	L	S	T-MAX	Min. machining Dia. (ØD)	Inserts	Screw	Wrench
MGEVR/L	12-1.5	3/4	3/4	5	0.868	0.11	10	MGMN150-G	LTX0514	TW20L
	16-1.5	1	1	6	1.118	0.11	10			
	20-1.5	1 1/4	1 1/4	6 3/4	1.368	0.11	10			
	12-2	3/4	3/4	5	0.888	0.13	5 1/8	MGMN200-M MGMN200-G	BHA0616	HW50L
	16-2	1	1	6	1.138	0.13	5 1/8			
	20-2	1 1/4	1 1/4	6 3/4	1.388	0.13	5 1/8			
	12-2.5	3/4	3/4	5	0.907	0.15	4	MGMN250-M MGMN250-G		
	16-2.5	1	1	6	1.157	0.15	4			
	20-2.5	1 1/4	1 1/4	6 3/4	1.407	0.15	4			
	12-3	3/4	3/4	5	0.967	0.21	4 5/16	MGMN300-M/T MGGN300-□□-M MRMN300-M MGMN300-□□-L/R		
	16-3	1	1	6	1.217	0.21	4 5/16			
	20-3	1 1/4	1 1/4	6 3/4	1.467	0.21	4 5/16			
	12-4	3/4	3/4	5	0.967	0.21	4	MGMN400-M/T MGGN400-□□-M MRMN400-M MGMN400-□□-L/R		
	16-4	1	1	6	1.217	0.21	4			
	20-4	1 1/4	1 1/4	6 3/4	1.467	0.21	4			
	12-5	3/4	3/4	5	1.026	0.27	4	MGMN500-M/T MGGN500-□□-M MRMN500-M MGMN500-□□-L/R		
	16-5	1	1	6	1.276	0.27	4			
	20-5	1 1/4	1 1/4	6 3/4	1.526	0.27	4			
	12-6	3/4	3/4	5	1.222	0.27	3 1/2	MGMN600-M MGGN600-□□-M MRMN600-M		
	16-6	1	1	6	1.276	0.27	3 1/2			
	20-6	1 1/4	1 1/4	6 3/4	1.526	0.27	3 1/2			
	16-8	1	1	6	1.354	0.35	2	MRMN800-M MGMN800-M		
	20-8	1 1/4	1 1/4	6 3/4	1.604	0.35	2			
	16-8A	1	1	6	1.276	0.27	3 1/2	MRGN600-A		
	20-8A	1 1/4	1 1/4	6 3/4	1.526	0.27	3 1/2			
	16-8A	1	1	6	1.354	0.35	2	MRGN800-A		
	20-8A	1 1/4	1 1/4	6 3/4	1.604	0.35	2			

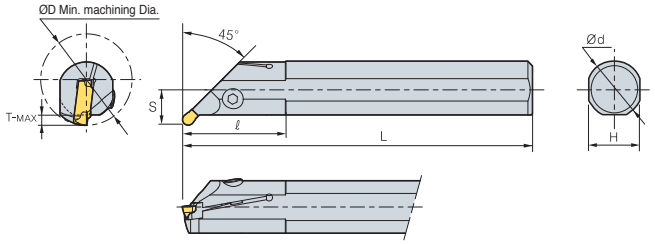
Applicable inserts **C26~C27**

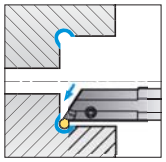
MGIUR/L

For Reliefing, Profiling machining



MRMN
MRGN





• R type insert

(inch)

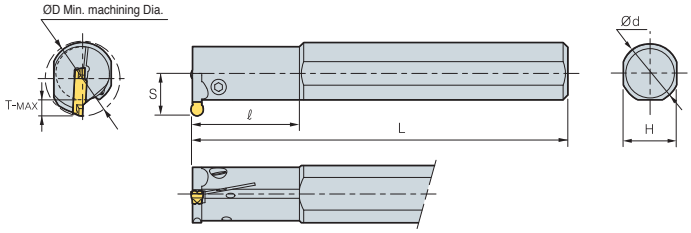
Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIUR/L	23-12-3	1 7/16	3/4	6	1.772	0.13	0.670	0.512	MRMN300-M	MHA0512	HW40L
	26-16-3	1 5/8	1	8	1.772	0.13	0.920	0.610			
	32-20-3	2	1 1/4	10	2.559	0.13	1.170	0.748			
	23-12-4	1 7/16	3/4	6	1.772	0.13	0.670	0.512	MRMN400-M		
	26-16-4	1 5/8	1	8	1.772	0.13	0.920	0.610			
	32-20-4	2	1 1/4	10	2.559	0.13	1.170	0.748			
	26-16-5	1 5/8	1	8	1.772	0.13	1.920	0.610	MRMN500-M	BHA0616	HW50L
	32-20-5	2	1 1/4	8	1.772	0.13	1.170	0.748		BHA0620	
	26-16-6	1 5/8	1	10	2.559	0.13	1.920	0.748	MRMN600-M	BHA0616	
	32-20-6	2	1 1/4	10	2.559	0.13	1.170	0.748		BHA0620	
	26-16-8	1 5/8	1	8	1.772	0.13	0.920	0.610	MRMN800-M	BHA0616	
	32-20-8	2	1 1/4	10	2.559	0.25	1.170	0.748		BHA0620	
	26-16-6A	1 5/8	1	8	1.772	0.25	0.920	0.610	MRGN600-A	BHA0616	
	32-20-6A	2	1 1/4	10	2.559	0.13	1.170	0.748		BHA0620	
	26-16-8A	1 5/8	1	8	1.772	0.25	0.920	0.728	MRGN800-A	BHA0616	
	32-20-8A	2	1 1/4	10	2.559	0.25	1.170	0.866		BHA0620	

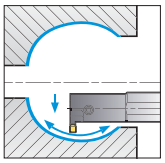
Applicable inserts **C26~C27**

MGIVR/L

For Grooving, Turning, Profiling machining







MGMN MRMN
MGGN MRGN

• R type insert

(inch)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIVR/L	12-10-1.5	3/4	5/8	5	1.378	0.15	0.545	0.445	MGMN150-G	MHB0310	HW25L
	16-12-1.5	1	3/4	6	1.772	0.15	0.670	0.516		MHA0512	HW40L
	18-16-1.5	1 1/4	1	8	1.772	0.15	0.920	0.638			
	12-10-2	3/4	5/8	5	1.378	0.19	0.545	0.448	MGMN200-G	MHB0310	HW25L
	16-12-2	1	3/4	6	1.772	0.19	0.670	0.551	MGMN200-M	MHA0512	HW40L
	18-16-2	1 1/4	1	8	1.772	0.19	0.920	0.677	MRMN200-M		
	12-10-2.5	3/4	5/8	5	1.378	0.23	0.545	0.482	MGMN250-G	MHB0310	HW25L
	16-12-2.5	1	3/4	6	1.772	0.23	0.670	0.594	MGMN250-M	MHA0512	HW40L
	18-16-2.5	1 1/4	1	8	1.772	0.23	0.920	0.717			
	16-12-3	1	3/4	6	1.772	0.23	0.670	0.614	MGMN300-M/G/T MGGN300-□□-M MRMN300-M MGMN300-□□-L/R	MHA0512	HW40L
	20-16-3	1 1/4	1	8	1.772	0.23	0.920	0.744			
	24-20-3	1 1/2	1 1/4	10	2.559	0.23	1.170	0.846			
	16-12-4	1	3/4	6	1.772	0.23	0.670	0.614	MGMN400-M/G/T MGGN400-□□-M MRMN400-M MGMN400-□□-L/R		
	20-16-4	1 1/4	1	8	1.772	0.23	0.920	0.744			
	24-20-4	1 1/2	1 1/4	10	2.559	0.23	1.170	0.846			
	20-16-5	1 1/4	1	8	1.772	0.31	0.920	0.764	MGMN500-M/G/T MGGN500-□□-M MRMN500-M MGMN500-□□-L/R	BHA0616	HW50L
	24-20-5	1 1/2	1 1/4	10	2.559	0.31	1.170	0.846		BHA0620	
	20-16-6	1 1/4	1	8	1.772	0.31	0.920	0.764	MGMN600-MG MGGN600-□□-M MRMN600-M	BHA0616	
	24-20-6	1 1/2	1 1/4	10	2.559	0.31	1.170	0.846		BHA0620	
	29-24-8	1 1/2	1 1/4	10	2.559	0.39	1.170	0.921	MRMN800-M		
	29-24-8	1 13/16	1 1/2	12	2.756	0.39	1.380	1.071	MGMN800-M		
	20-16-6A	1 1/4	1	8	1.772	0.31	0.920	0.764	MRGN600-A	BHA0616	
	24-20-6A	1 1/2	1 1/4	10	2.559	0.31	1.170	0.846		BHA0620	
	24-20-8A	1 1/2	1 1/4	10	2.559	0.39	1.170	0.921	MRGN800-A		
	29-24-8A	1 13/16	1 1/2	12	2.756	0.39	1.380	1.071			

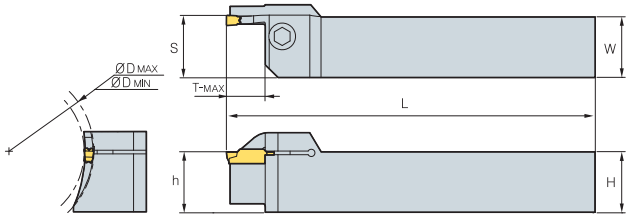
Applicable inserts **C26~C27**

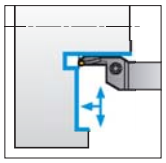
MGFHR/L

For Face Grooving machining



MFMN
MGMN





• R type insert

(inch)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
MGFHR/L	16-3-09/13-T03	1	1	6	1.008	0.393	0.945	1.378	MFMN300	BHA0616	HW50L
	16-3-11/15-T03	1	1	6	1.008	0.393	1.142	1.575			
	16-3-13/19-T03	1	1	6	1.008	0.393	1.339	1.969			
	16-3-17/27-T03	1	1	6	1.008	0.393	1.732	2.756			
	16-3-25/38-T03	1	1	6	1.008	0.393	2.520	3.898			
	16-4-16/24-T15	1	1	6	1.008	0.591	1.653	2.480	MGMN400-M/T MGMN400-□□-L/R		
	16-4-24/47-T05	1	1	6	1.008	0.393	2.441	4.724			
	16-4-44/78-T05	1	1	6	1.008	0.393	4.409	7.874			

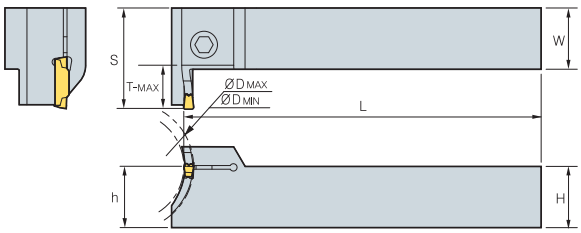
Applicable inserts C26~C27

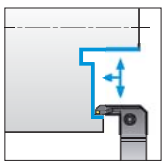
MGFVR/L

For Face Grooving machining



MFMN
MGMN





• R type insert

(inch)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
MGFVR/L	16-3-09/13-T03	1	1	6	1.417	0.393	0.945	1.378	MFMN300	MHA0512	HW40L
	16-3-11/15-T03	1	1	6	1.417	0.393	1.142	1.575			
	16-3-13/19-T03	1	1	6	1.417	0.393	1.339	1.969			
	16-3-17/27-T03	1	1	6	1.417	0.393	1.732	2.755			
	16-3-25/38-T03	1	1	6	1.417	0.393	2.519	3.897			
	16-4-17/25-T03	1	1	6	1.614	0.590	1.732	2.362	MGMN400-M/T MGMN400-□□-L/R	BHA0616	HW50L
	16-4-23/47-T05	1	1	6	1.614	0.590	2.362	4.724			
	16-4-44/78-T05	1	1	6	1.614	0.590	4.409	7.874			

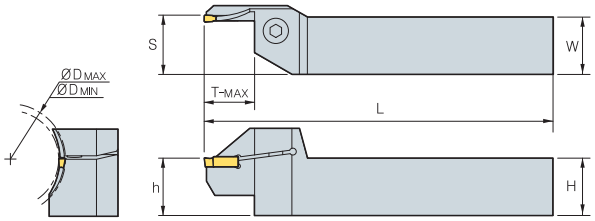
Applicable inserts C26~C27

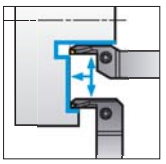
FGHH

For Face Grooving, Turning machining



FGD FGM FMM





• R type insert

(inch)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
FGHH	12R-3 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM300R-03	BHA0616	HW50L
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/18	3/4	3/4	5	0.774	0.472	1.378	1.890			
	18/23	3/4	3/4	5	0.774	0.866	1.890	2.362	FGD300R-03 FGM300R-03		
	23/29	3/4	3/4	5	0.774	0.866	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.866	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.866	3.937	5.512			
	16R-3 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM300R-03		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/18	1	1	6	1.024	0.472	1.378	1.890			
	18/23	1	1	6	1.024	0.866	1.890	2.362	FGD300R-03 FGM300R-03		
	23/29	1	1	6	1.024	0.866	2.362	2.953			
	29/39	1	1	6	1.024	0.866	2.953	3.937			
	39/55	1	1	6	1.024	0.866	3.937	5.512			
	12R-4 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM400R-04		
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/18	3/4	3/4	5	0.774	0.472	1.378	1.890			
	18/23	3/4	3/4	5	0.774	0.984	1.890	2.362	FGD400R-04 FGM400R-04		
	23/29	3/4	3/4	5	0.774	0.984	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.984	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.984	3.937	5.512			
	16R-4 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM400R-04		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/18	1	1	6	1.024	0.472	1.378	1.890			
	18/23	1	1	6	1.024	0.984	1.890	2.362	FGD400R-04 FGM400R-04		
	23/29	1	1	6	1.024	0.984	2.362	2.953			
	29/39	1	1	6	1.024	0.984	2.953	3.937			
	39/55	1	1	6	1.024	0.984	3.937	5.512			
	12R-5 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM500R-04		
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/15	3/4	3/4	5	0.774	0.787	1.378	1.575			
	15/18	3/4	3/4	5	0.774	0.787	1.575	1.890			
	18/23	3/4	3/4	5	0.774	0.984	1.890	2.362	FGD500R-04 FGM500R-04		
	23/29	3/4	3/4	5	0.774	0.984	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.984	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.984	3.937	5.512			
	16R-5 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM500R-04		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/15	1	1	6	1.024	0.787	1.378	1.575			
	15/18	1	1	6	1.024	0.787	1.575	1.890			
	18/23	1	1	6	1.024	0.984	1.890	2.362	FGD500R-04 FGM500R-04		
	23/29	1	1	6	1.024	0.984	2.362	2.953			
	29/39	1	1	6	1.024	0.984	2.953	3.937			
	39/55	1	1	6	1.024	0.984	3.937	5.512			

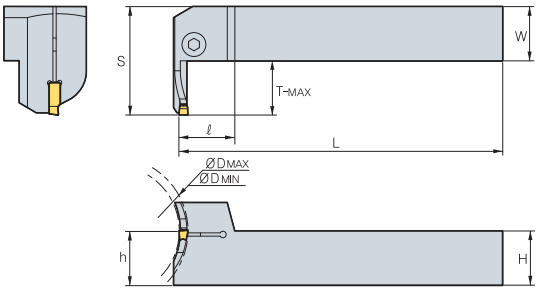
Applicable inserts C26~C27

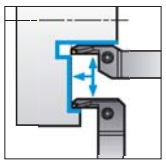
FGVH

For Face Grooving, Turning machining



FGD FGM FMM





• R type insert

(inch)

Designation		H = (h)	W	L	S	T-MAX	ØD Min	ØD Max	Inserts	Screw	Wrench
FGVH	12R-3 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM300R-03	BHA0616	HW50L
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/18	3/4	3/4	5	0.774	0.472	1.378	1.890			
	18/23	3/4	3/4	5	0.774	0.866	1.890	2.362	FGD300R-03 FGM300R-03		
	23/29	3/4	3/4	5	0.774	0.866	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.866	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.866	3.937	5.512			
	16R-3 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM300R-03		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/18	1	1	6	1.024	0.472	1.378	1.890			
	18/23	1	1	6	1.024	0.866	1.890	2.362	FGD300R-03 FGM300R-03		
	23/29	1	1	6	1.024	0.866	2.362	2.953			
	29/39	1	1	6	1.024	0.866	2.953	3.937			
	39/55	1	1	6	1.024	0.866	3.937	5.512			
	12R-4 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM400R-04		
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/18	3/4	3/4	5	0.774	0.472	1.378	1.890			
	18/23	3/4	3/4	5	0.774	0.984	1.890	2.362	FGD400R-04 FGM400R-04		
	23/29	3/4	3/4	5	0.774	0.984	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.984	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.984	3.937	5.512			
	16R-4 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM400R-04		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/18	1	1	6	1.024	0.472	1.378	1.890			
	18/23	1	1	6	1.024	0.984	1.890	2.362	FGD400R-04 FGM400R-04		
	23/29	1	1	6	1.024	0.984	2.362	2.953			
	29/39	1	1	6	1.024	0.984	2.953	3.937			
	39/55	1	1	6	1.024	0.984	3.937	5.512			
	12R-5 09/11	3/4	3/4	5	0.774	0.472	0.984	1.181	FMM500R-04		
	11/13	3/4	3/4	5	0.774	0.472	1.181	1.378			
	13/15	3/4	3/4	5	0.774	0.787	1.378	1.575			
	15/18	3/4	3/4	5	0.774	0.787	1.575	1.890			
	18/23	3/4	3/4	5	0.774	0.984	1.890	2.362	FGD500R-04 FGM500R-04		
	23/29	3/4	3/4	5	0.774	0.984	2.362	2.953			
	29/39	3/4	3/4	5	0.774	0.984	2.953	3.937			
	39/55	3/4	3/4	5	0.774	0.984	3.937	5.512			
	16R-5 09/11	1	1	6	1.024	0.472	0.984	1.181	FMM500R-04		
	11/13	1	1	6	1.024	0.472	1.181	1.378			
	13/15	1	1	6	1.024	0.787	1.378	1.575			
	15/18	1	1	6	1.024	0.787	1.575	1.890			
	18/23	1	1	6	1.024	0.984	1.890	2.362	FGD500R-04 FGM500R-04		
	23/29	1	1	6	1.024	0.984	2.362	2.953			
	29/39	1	1	6	1.024	0.984	2.953	3.937			
	39/55	1	1	6	1.024	0.984	3.937	5.512			

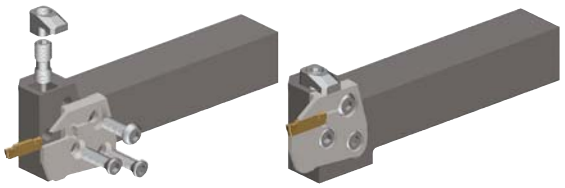
Applicable inserts C26~C27

MGT cartridge

Features

- Compatible and Economical due to divided cartridge & exclusive holder system from existing single body system
- Interchangeable cartridge
  - Various assembly depends on working style
  - Reduce cutting tool costs by over 30%
  - Setting with upper clamp & side screw
- Strong & Stable setting force
  - Simultaneous assembly of insert & cartridge
  - Easy assembly & tool exchange
- Stable assembly system
  - Simple & Superior setting force

Stable Assembly thanks to double screw & clamp



Simple & Strong Setting

Holder code system

MC	H	R/L	25	25
MGT-Cartridge System	Holder Style	Hand	Height	Width

H: Horizontal
V: Vertical

Holder

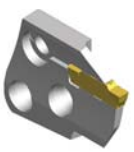
	Horizontal Type		Vertical Type	
				
	MCHR	MCHL	MCVR	MCVL
Available cartridge	External process: MCER Facing process: MCFL	External process: MCEL Facing process: MCFR	External process: MCEL Facing process: MCFR	External process: MCER Facing process: MCFL

Cartridge code system

MC	F	R/L	3	24/35	T16
MGT-Cartridge System	Working Style	Hand	Cutting Width	Facing Dia.	Maximum Depth

E: External Process
F: Facing Process

Cartridge

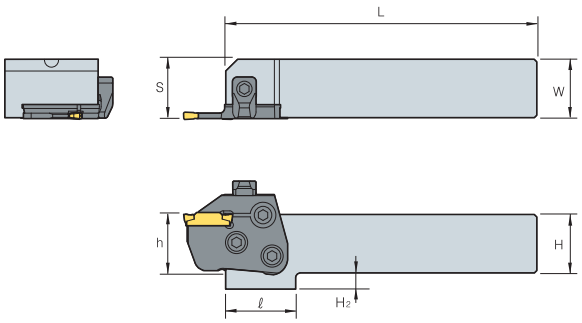
External Process		Facing Process	
			
MCER	MCEL	MCFR	MCFL

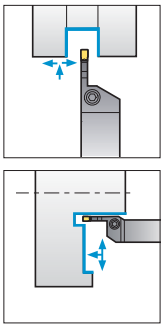
MCHR/L (Holder)

For Grooving, Turning, Parting off, Reliefing, Profiling machining



MCER/L
MCFR/L





• R type insert

(inch)

Designation		H = (h)	W	L	S	ℓ	H2	Cartridge	Clamp	Clamp Screw	Hinge Screw	Clamping Screw	Wrench
MCHR/L	2020	0.787	0.787	5.236	0.815	1.181	0.472	MCER/L MCFR/L	CXH8N	DHA0818F	RHA0613	FHGA0618	HW40L
	2525	0.984	0.984	5.236	1.012	1.181	0.276						
	3232	1.260	1.260	6.024	1.287	-	-						

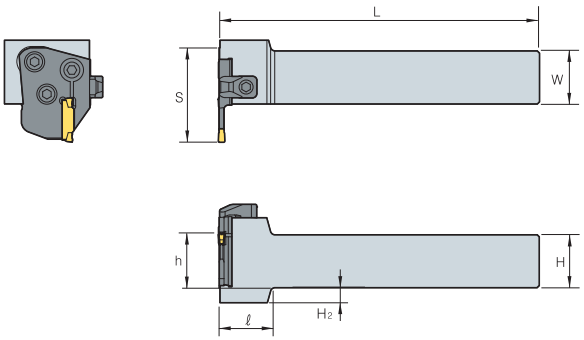
Applicable inserts C38

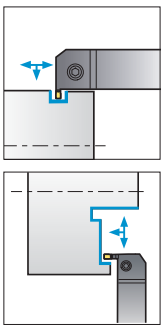
MCVR/L (Holder)

For Face Grooving, Turning machining



MCER/L
MCFR/L





• R type insert

(inch)

Designation		H = (h)	W	L	S	ℓ	H2	Cartridge	Clamp	Clamp Screw	Hinge Screw	Clamping Screw	Wrench
MCVR/L	2020	0.787	0.787	5.906	1.469	1.181	0.472	MCER/L MCFR/L	CXH8N	DHA0818F	RHA0613	FHGA0618	HW40L
	2525	0.984	0.984	5.906	1.693	1.181	0.276						
	3232	1.260	1.260	6.693	1.969	-	-						

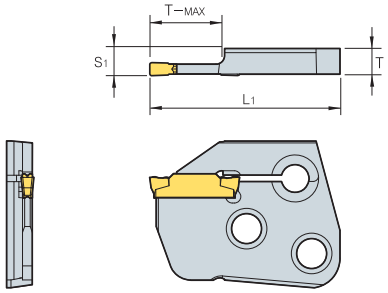
Applicable inserts C38

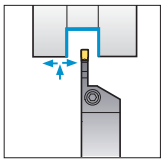
MCER/L (Cartridge)

For Grooving, Turning, Parting off, Reliefing, Profiling machining



MGMN MGMR
MGGN MRMN





• R type insert

(inch)

Designation		T	L1	S1	T-MAX	Inserts		Holder
						Width	Designation	
MCER/L	3-T16	0.236	1.752	0.250	0.630	0.118	MGMN	MCVR/L MCHR/L
	4-T16	0.235	1.752	0.250	0.630	0.157	MGMR/L	
	5-T20	0.231	1.909	0.250	0.787	0.197	MGGN	
	6-T20	0.229	1.909	0.250	0.787	0.236	MRMN	

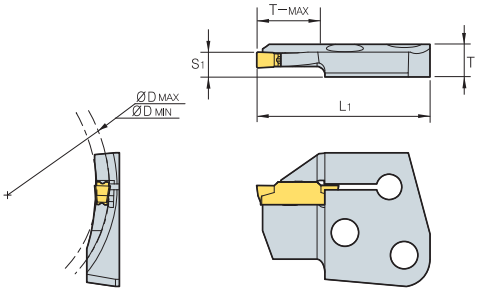
Applicable inserts C26~C27

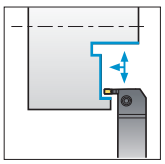
MCFR/L (Cartridge)

For Face Grooving, Turning machining



MFNM
MGMN





• R type insert

(inch)

Designation		T	L1	S1	T-MAX	ØD		Inserts		Holder
						Min	Max	Width	Designation	
MCFR/L	3-24/35-T16	0.315	1.752	0.250	0.630	0.944	1.378	0.118	MFMN300	MCVR/L MCHR/L
	3-29/40-T16	0.315	1.752	0.250	0.630	1.142	1.575	0.118		
	3-34/50-T16	0.315	1.752	0.250	0.630	1.339	1.969	0.118		
	3-44/70-T16	0.315	1.752	0.250	0.630	1.732	2.756	0.118		
	3-64/99-T16	0.315	1.752	0.250	0.630	2.519	3.898	0.118		
	4-44/60-T16	0.314	1.752	0.250	0.630	1.339	2.362	0.157	MGMN400	
	4-60/120-T16	0.314	1.752	0.250	0.630	2.362	4.724	0.157		
	4-112/200-T16	0.314	1.752	0.250	0.630	4.409	7.874	0.157		

Applicable inserts C26~C27

MGT - Machining aluminum wheels

Features

- Optimally designed inserts for aluminum wheel machining
- Longer tool life when matched with the best grade for application
- Unique clamping mechanism places a strong clamp over the insert
- A variety of insert types for multi application functions

Insert code system

MR G N 6 - A

System Code	Tolerance	Hand	Cutting Edge Width	Chip Breaker
MR: Multi Grooving Round shape MV: Multi Grooving V shape	G: Ground	N: Neutral	0.236 inch 0.315 inch	A/AM/AP/A5

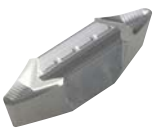
Holder code system

MG E H R/L 16N - 8 A - MR

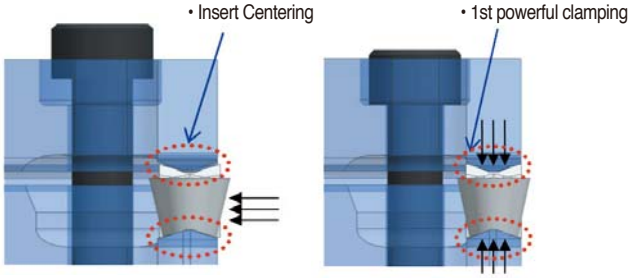
System Code	Application	Holder Type	Hand	Shank Size	Cutting Width	Chip Breaker	Insert Type
MG: Multi Grooving	E: External machining I: Internal machining	H: Horizontal V: Vertical U: Undercut X: Special	R: Right L: Left	Height: 1 inch Width: 1 inch (For internal machining: Minimum diameter for machining)	0.236 inch 0.315 inch	A/AM/ AP/A5	MR: ROUND shape MV: V shape

Various insert types

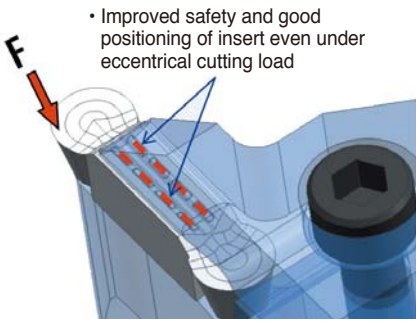
MRGN type : Full "Round" geometry

MRGN-A (For general)	MRGN-A5 (For copying)	MRGN-AM (Medium finishing)	MRGN-AP (PCD)	MVGN-A (For fine finishing)
				
High rake angle, Sharp cutting edge	Reinforced clamping force	For ductile cast iron	Improved chip control	High rake and relief angle

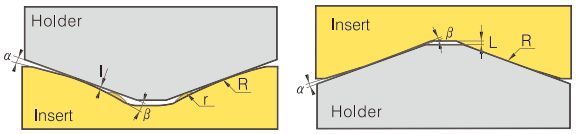
New clamping system



•Reinforcing the clamping force due to radius designed on the top & bottom side of insert and convex"DOT"on the top of insert

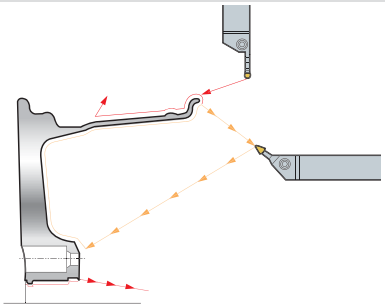
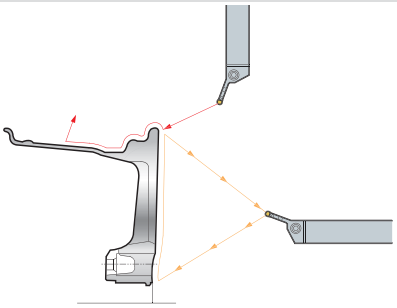
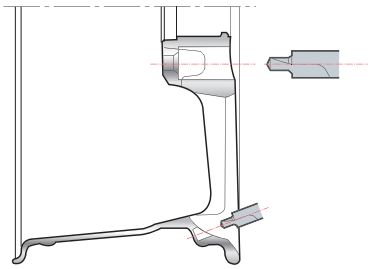


PATENT



Available Insert for MGT Aluminum Wheel

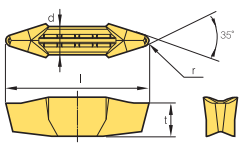
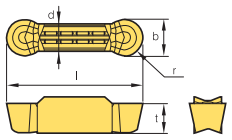
Application of aluminum wheels

Machining A	Machining B	Machining C
		

Recommended cutting condition

Workpiece		Hardness Brinell (HB)	kc (MPa)	vc (sfm)	fn (ipr)
Aluminum alloy (Forged)	Unhardened	50~70	500~600	3,300~8,300	0.004~0.024
	Hardened	90~110	700~900	1,000~3,300	0.004~0.020
Aluminum alloy (Cast)	Unhardened	70~80	700~800	1,000~3,300	0.004~0.020
	Hardened	80~110	800~950	650~2,000	0.004~0.016
Copper alloy		90~110	700~900	1,000~2,600	0.004~0.020
Magnesium alloy		70~80	700~800	1,000~3,300	0.004~0.020

Insert

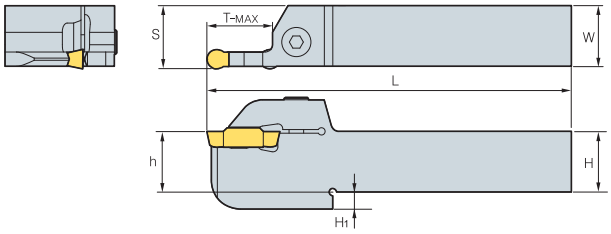
Application	Picture	Designation		Coated	Uncoated	Dimensions (inch)					Configuration	Page
				DP150	G10	b	r	l	d	t		
For Aluminum Wheel	MVGN 	MVGN	8N-A-R1.2			-	3/64	1.181	0.315	0.272		C40
			8N-A-R1.6			-	1/16	1.181	0.315	0.272		
	MRGN-A 	MRGN	6N-A		●	0.236	1/8	1.024	0.283	0.232		C39 C40
			6N-AM			0.236	1/8	1.024	0.283	0.232		
			6N-AP			0.236	1/8	1.024	0.283	0.232		
			6N-A5		●	0.236	1/8	1.024	0.283	0.232		
			8N-A			0.315	5/32	1.181	0.315	0.256		
			8N-AM			0.315	5/32	1.181	0.315	0.256		
			8N-AP			0.315	5/32	1.181	0.315	0.256		
			8N-A5		●	0.315	5/32	1.181	0.315	0.256		

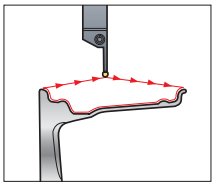
● : Korea Stock ● : US Stock

MGEHR/L



MRGN





• R type insert

(inch)

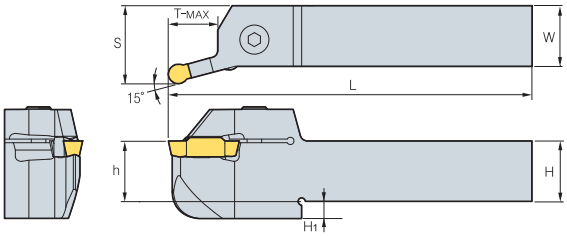
Designation		H = (h)	H1	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	16N-6A	1	1	1	6	1.006	0.93	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
	20N-6A	1 1/4	1 1/4	1 1/4	6	1.281	1.06			
	16N-6A5	1	1	1	6	1.006	0.93	MRGN6N-A5		
	20N-6A5	1 1/4	1 1/4	1 1/4	6	1.281	1.06			
	16N-8A	1	1	1	6	1.006	0.93	MRGN8N-A MRGN8N-AP MRGN8N-AM		
	20N-8A	1 1/4	1 1/4	1 1/4	6	1.281	1.06			
	16N-8A5	1	1	1	6	1.006	0.93	MRGN8N-A5		
	20N-8A5	1 1/4	1 1/4	1 1/4	6	1.281	1.06			

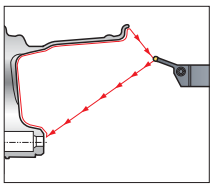
Applicable inserts **C40**

MGEHR/L-15



MRGN





• R type insert

(inch)

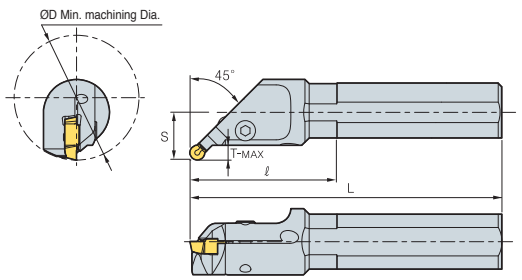
Designation		H = (h)	H1	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	16N-6A-15	1	0.276	1	6	1.268	0.79	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
	20N-6A-15	1 1/4	0.315	1 1/4	6	1.543	0.98			
	16N-6A5-15	1	0.276	1	6	1.268	0.79	MRGN6N-A5		
	20N-6A5-15	1 1/4	0.315	1 1/4	6	1.543	0.98			
	16N-8A-15	1	0.276	1	6	1.268	0.79	MRGN8N-A MRGN8N-AP MRGN8N-AM		
	20N-8A-15	1 1/4	0.315	1 1/4	6	1.543	0.98			
	16N-8A5-15	1	0.276	1	6	1.268	0.79	MRGN8N-A5		
	20N-8A5-15	1 1/4	0.315	1 1/4	6	1.543	0.98			

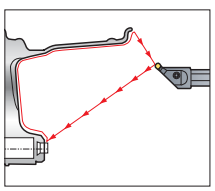
Applicable inserts **C40**

MGIUR/L-MR



MRGN





• R type insert

(inch)

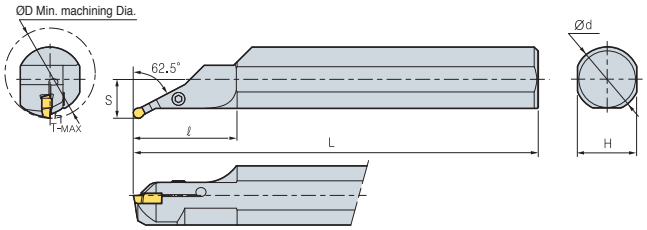
Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIUR/L	4420-8A-MR	2 43/64	1 1/4	7	2.560	0.315	1.181	1.023	MRGN8N-A/AM/AP MRGN8N-A5	BHA0620	HW50L
	4420-8A5-MR	2 43/64	1 1/4	7	2.560	0.315	1.181	1.023			

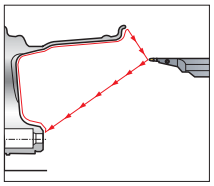
Applicable inserts **C40**

MGIXR/L-MR



MRGN





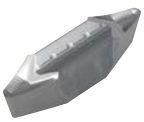
• R type insert

(inch)

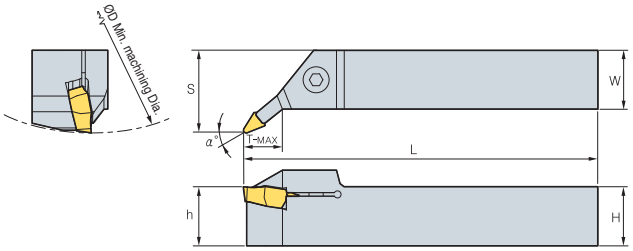
Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIXR/L	4632-8A-MR	2 3/4	2	14	3.150	0.303	1.811	1.188	MRGN8N-A/AM/AP MRGN8N-A5	BHA0620	HW50L
	4632-8A5-MR	2 3/4	2	14	3.150	0.303	1.811	1.188			

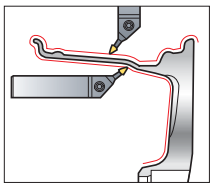
Applicable inserts **C40**

MGEXR/L



MVGN





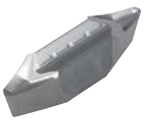
• R type insert

(inch)

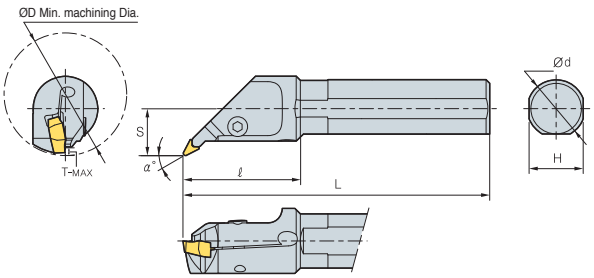
Designation		H = (h)	W	L	S	T-MAX	α°	Inserts	Screw	Wrench
MGEXR/L	16N-8A-5V	1	1	6	1.142	0.98	51	MVGN8N-A-R1.2 MVGN8N-A-R1.6	BHA0620	HW50L
	16N-8A-22.5V	1	1	6	1.378	1.06	22.5			

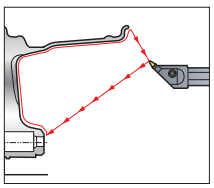
Applicable inserts **C40**

MGIUR/L-MV



MVGN





• R type insert

(inch)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	α°	Inserts	Screw	Wrench
MGIUR/L	4420-8A-NV	2 43/64	1 1/4	7	2.560	0.315	1.181	1.023	27.5	MVGN8N-A-R1.2 MVGN8N-A-R1.6	BHA0620	HW50L

Applicable inserts **C40**

Economical 3-corner insert for high precision grooving

TB/TB-M



- Economical 3-corner insert for grooving
- Various cutting edge size ranging from 0.019~0.177 inch
- High accuracy ground insert ensures high precision machining
- Stable chip control optimized for automated grooving process

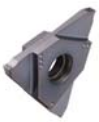
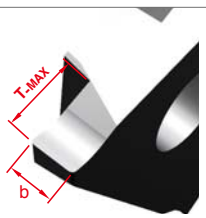
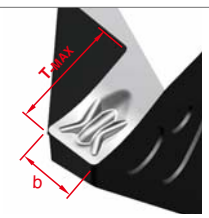
Insert code system

TB	5	150	N	-	010	-	M
Triangle Blade	Inscribed circle	Cutting edge width	Hand		Nose R		Chip breaker
	3: 3/8 inch 4: 1/2 inch 5: 5/8 inch	0.02~0.177 inch	N: Neutral R: Right L: Left		0.000~0.016 inch		None M

Holder code system

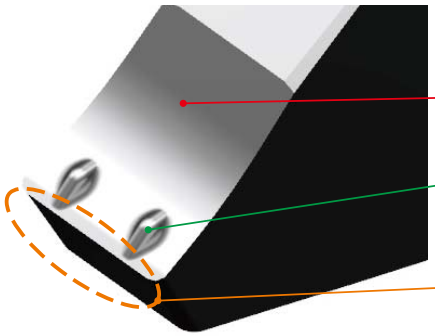
TBH	16	R	5
Triangle Blade Holder	Shank size	Hand	Inscribed circle
	06~16	R: Right L: Left	3: 3/8 inch 4: 1/2 inch 5: 5/8 inch

TB/TB-M

Specification		TB3000R/L, TB4000R/L	TB4000R-M	TB5000N-000-M
Designation		TB3125R/L~TB3430R/L (Inscribed circle of 0.375 inch) TB4125R/L~TB4430R/L (Inscribed circle of 0.5 inch)	TB4150R-M ~TB4450R-M (Inscribed circle of 0.5 inch)	TB5050N-000-M ~ TB5318N-020-M (Inscribed circle of 0.625 inch)
Insert shape				
Features	Chip breaker	Ground chip breaker	Pressed chip breaker	Pressed chip breaker
	Hand	Right/Left-handed	Right-handed	Neutral
	Cutting edge width (b)	TB3000: 0.049~0.169 inch TB4000: 0.049~1.177 inch	0.059~0.177 inch	0.02~0.125 inch
	Depth of cut (T-MAX)	TB3000: ~0.138 inch TB4000: ~0.197 inch	~0.197 inch	~0.256 inch
	Shape	○	X	X
	Cutting edge width	○	○	○
Chip breaker shape				
Application range		P	P, M, K	P, M, K
Grade		CN2000, PC5300	CN2000, PC5300	PC5300

TB-M chip breaker

- Minimized cutting force at high speed and high feed → Smooth chip evacuation outside each groove
- High precision cutting performance → Exceptional surface finish and accurate dimensions
- Excellent chip flow and cutting results → Ideal for automated and unmanned production

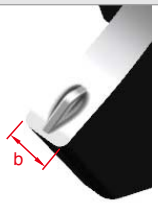


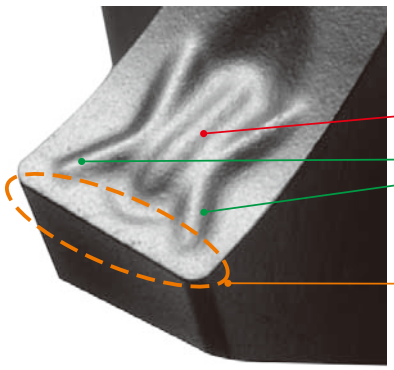
TB5-M Chip breaker

Lowered back area: Minimizes chip frictions to prevent overload when evacuating chips

Beveled protruding dots: Facilitate smooth chip evacuation outside each groove. Minimize chip control work load at high depth of cuts. Form chip curls at regular intervals

Cutting edge land: Prevents chipping and improves machining stability in interrupted cutting

Designation	TB5050N-M ~TB5120N-M	TB5140N-M ~TB5178N-M	TB5196N-M ~TB5239N-M	TB5247N-M ~TB5287N-M	TB5300N-M ~TB5318N-M
Shape					
Cutting edge width (b)	0.02~0.047 inch	0.055~0.07 inch	0.077~0.094 inch	0.097~0.113 inch	0.118~0.125 inch

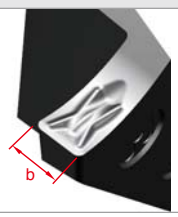
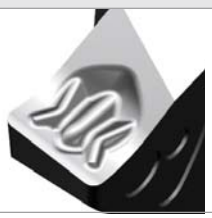


TB4-M Chip breaker

Sub dots: Control stability of chip curls at high feed

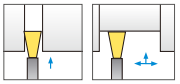
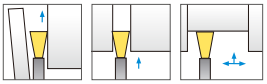
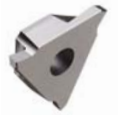
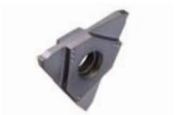
Main dots: Show exceptional chip control in turning and chamfering applications. Facilitate smooth chip evacuation outside each groove . Form chip curls at regular intervals

Sharp cutting edges: Deliver sharp cutting performance

Designation	TB4150R·M~TB4185R·M	TB4200R·M~TB4228R·M	TB4300R·M~TB4350R·M	TB4400R·M~TB4450R·M
Shape				
Cutting edge width (b)	0.059~0.073 inch	0.079~0.11 inch	0.118~0.138 inch	0.157~0.177 inch

Guide for TB

(inch)

TB				TB3/TB4	TB4-M	TB5-M
Recommended machining method						
Cutting edge width W	Depth of cut T-MAX			Recommended feed rate (ipr)			
	TB3/TB4	TB4-M	TB5-M				
0.020	-	-	0.098	0.002 (0.001~ 0.004)			
0.031	-	-	0.063				
0.039	-	-	0.138				
0.041	-	-	0.079				
0.047	-	-	0.079				
0.049	0.079	-	0.079				
0.055	0.079	-	0.256	0.004 (0.001~ 0.006)			
0.057	0.079	-	-				
0.058	-	-	0.256				
0.059	0.138	0.138	0.256				
0.062	-	-	0.256				
0.067	-	-	0.256				
0.069	0.138	0.138	-				
0.070	-	-	0.256				
0.073	0.138	0.138	-				
0.077	-	-	0.256				
0.079	0.138	0.138	0.256				
0.085	0.138	0.138	-	0.005 (0.001~ 0.008)			
0.087	0.256	-	0.256				
0.091	0.138	0.138	0.256				
0.094	-	-	0.256				
0.097	-	-	0.256				
0.098	0.157	0.157	0.256				
0.104	0.157	0.157	0.256				
0.106	-	-	0.256				
0.110	0.157	0.157	-				
0.113	-	-	0.256				
0.118	0.157	0.157	0.256				
0.124	-	-	0.256	0.006 (0.002~ 0.008)			
0.125	-	-	0.256				
0.130	0.157	-	-				
0.138	0.197	0.197	-				
0.157	0.197	0.197	-				
0.169	0.197	0.197	-				
0.177	0.197	0.197	-				

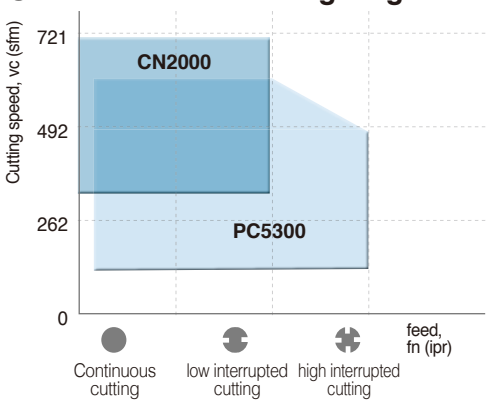
● : Korea Stock ● : US Stock

Recommended cutting conditions

Workpiece		CN2000 (Cermet)			PC5300 (Coated)		
		Min.	Recommended	Max.	Min.	Recommended	Max.
P	SMOOC type	328	**524**	721	262	**459**	656
	SCM type	328	**492**	656	262	**426**	590
M	STS type	-	-	-	131	**262**	492
K	GC, GCD type	-	-	-	262	**426**	590

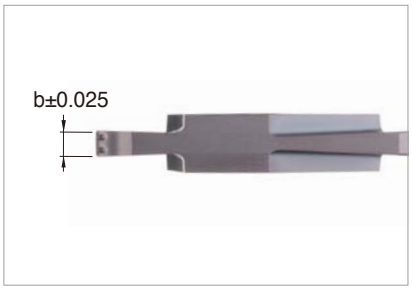
Recommended cutting speed, vc (sfm)

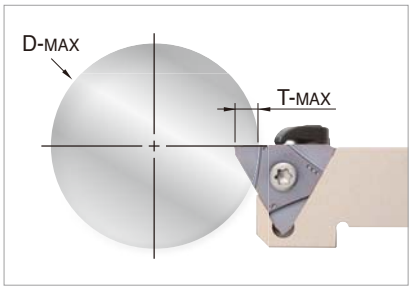
Recommended cutting range

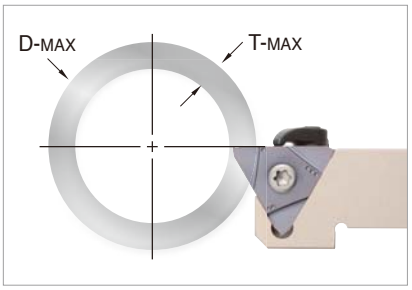


TB5-M machining range

- There is a limit to cutting diameters of TB5-M when depth of cuts are over 0.197 inch
  (e.g. When cutting with a TB5200N-020-M insert at the depth of 0.244 inch, Ø2.362 D-MAX is available)
- N.L = No limit



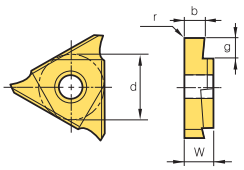
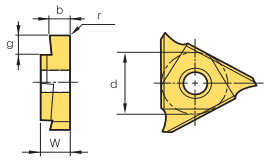




(inch)

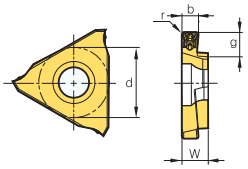
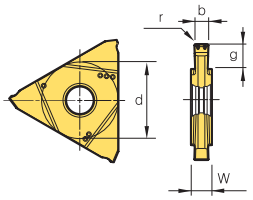
Designation		b	r	g (T-MAX)	ØD-MAX								
					T≤ 0.118	T≤ 0.138	T≤ 0.157	T≤ 0.177	T≤ 0.197	T≤ 0.217	T≤ 0.236	T≤ 0.252	T≤ 0.256
TB	5050N-000-M	0.020	0.000	0.039	-	-	-	-	-	-	-	-	-
	5050N-004-M	0.020	0.002	0.098	-	-	-	-	-	-	-	-	-
	5080N-000-M	0.031	0.000	0.063	-	-	-	-	-	-	-	-	-
	5100N-006-M	0.039	0.002	0.138	-	-	-	-	-	-	-	-	-
	5104N-000-M	0.041	0.000	0.079	-	-	-	-	-	-	-	-	-
	5120N-000-M	0.047	0.000	0.079	-	-	-	-	-	-	-	-	-
	5140N-000-M	0.055	0.000	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5147N-000-M	0.058	0.000	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5150N-010-M	0.059	0.004	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5150N-015-M	0.059	0.006	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5157N-015-M	0.062	0.006	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5170N-010-M	0.067	0.004	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5178N-018-M	0.070	0.007	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5196N-015-M	0.077	0.006	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5200N-020-M	0.079	1/128	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5222N-015-M	0.087	0.006	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5230N-020-M	0.091	1/128	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5239N-015-M	0.094	0.006	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5247N-020-M	0.097	1/128	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5250N-020-M	0.098	1/128	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5270N-010-M	0.106	0.004	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5287N-020-M	0.113	1/128	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5300N-000-M	0.118	0.000	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5300N-020-M	0.118	1/128	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5300N-040-M	0.118	1/64	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5315N-015-M	0.124	0.006	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575
	5318N-020-M	0.125	1/128	0.256	N.L	N.L	N.L	N.L	N.L	Ø11.811	Ø6.693	Ø2.362	Ø1.575

Insert

Shape	Designation		Dimensions (inch) b	g (T-MAX)	r	w	d	Coated PC5300	Cermet CN2000	Configuration
	TB (Right-handed)	3125R	0.049	0.059	1/128	3/16	3/8			
		3145R	0.057							
		3175R	0.069	0.098						
		3185R	0.073							
		3200R	0.079							
		3230R	0.091	0.138	0.012					
		3280R	0.110							
		3330R	0.130							
		3430R	0.169		1/64					
		4125R	0.049	0.079	1/128	3/16	1/2			
		4145R	0.057							
		4150R	0.059	0.138						
		4175R	0.069							
		4185R	0.073							
		4200R	0.079							
		4215R	0.085							
		4230R	0.091							
		4250R	0.098	0.157	0.012					
		4265R	0.104							
		4280R	0.110							
		4300R	0.118							
		4330R	0.130							
		4350R	0.138	0.197	1/64					
		4400R	0.157							
		4430R	0.169							
		4450R	0.177							
	TB (Left-handed)	3125L	0.049	0.059	1/128	3/16	3/8			
		3145L	0.057							
		3175L	0.069	0.098						
		3185L	0.073							
		3200L	0.079							
		3230L	0.091	0.138	0.012					
		3280L	0.110							
		3330L	0.130							
		3430L	0.169		1/64					
		4125L	0.049	0.079	1/128	3/16	1/2			
		4145L	0.057							
		4150L	0.059	0.138						
		4175L	0.069							
		4185L	0.073							
		4200L	0.079							
		4215L	0.085							
		4230L	0.091							
		4250L	0.098	0.157	0.012					
		4265L	0.104							
		4280L	0.110							
		4300L	0.118							
		4330L	0.130							
		4350L	0.138	0.197	1/64					
		4400L	0.157							
		4430L	0.169							
		4450L	0.177							

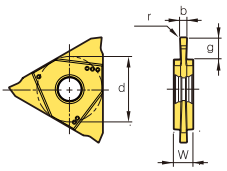
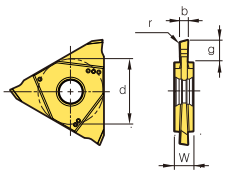
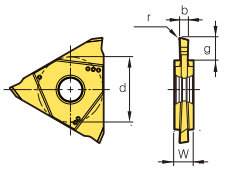
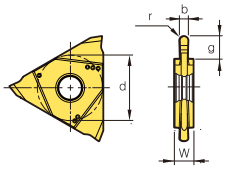
● : Korea Stock ● : US Stock

Insert

Shape	Designation		Dimensions (inch)					Coated	Cermet	Configuration
			b	g (T-MAX)	r	w	d	PC5300	CN2000	
	TB (Right-handed)	4150R-M	0.059	0.138	1/128	3/16	1/2			
		4175R-M	0.069							
		4185R-M	0.073							
		4200R-M	0.079							
		4215R-M	0.085							
		4230R-M	0.091							
		4250R-M	0.098	0.157	0.012					
		4265R-M	0.104							
		4280R-M	0.110							
		4300R-M	0.118							
		4330R-M	0.130							
		4350R-M	0.138	0.197						
		4400R-M	0.157		1/64					
		4430R-M	0.169							
		4450R-M	0.177							
	TB (Neutral)	5050N-000-M	0.020	0.039	0.000	0.177	5/8			
		5050N-004-M		0.098	0.002					
		5080N-000-M	0.031	0.063	0.000					
		5100N-006-M	0.039	0.138	0.002					
		5104N-000-M	0.041	0.079	0.000					
		5120N-000-M	0.047							
		5140N-000-M	0.055	0.256						
		5147N-000-M	0.058							
		5150N-010-M	0.059		0.004					
		5150N-015-M			0.006					
		5157N-015-M	0.062							
		5170N-010-M	0.067		0.004					
		5178N-018-M	0.070		0.007					
		5196N-015-M	0.077		0.006					
		5200N-020-M	0.079		1/128					
		5222N-015-M	0.087		0.006					
		5230N-020-M	0.091		1/128					
		5239N-015-M	0.094		0.006					
		5247N-020-M	0.097		1/128					
		5250N-020-M	0.098							
		5270N-010-M	0.106		0.004					
		5287N-020-M	0.113		1/128					
		5300N-000-M	0.118		0.000					
		5300N-020-M			1/128					
		5300N-040-M			1/64					
		5315N-015-M	0.124		0.006					
		5318N-020-M	0.125		1/128					

●: Korea Stock ●: US Stock

Insert

Shape	Designation		Dimensions (inch)						Coated	Cermet	Configuration
			b	g (T-MAX)	r	a°	w	d	PC5300	CN2000	
	TB (Neutral)	5050N-004-P	0.020	0.039	0.002	-	0.177	5/8			
		5100N-010-P	0.039	0.138	0.004						
		5150N-010-P	0.059	0.256							
		5150N-020-P			1/128						
		5200N-010-P	0.079		0.004						
		5200N-020-P			1/128						
		5239N-015-P	0.094		0.006						
		5250N-020-P	0.098		1/128						
		5300N-020-P	0.091								
	TB (Neutral, Right cutting)	5100R-6D-P	0.039	0.138	0.002	6	0.177	5/8			
		5100R-15D-P				15					
		5150R-6D-P	0.059	0.256		6					
		5150R-15D-P				15					
		5200R-6D-P	0.079		0.004	6					
		5200R-15D-P				15					
	TB (Neutral, Left cutting)	5100L-6D-P	0.039	0.138	0.002	6	0.177	5/8			
		5100L-15D-P				15					
		5150L-6D-P	0.059	0.256		6					
		5150L-15D-P				15					
		5200L-6D-P	0.079		0.004	6					
		5200L-15D-P				15					
	TB (Neutral, Round shape)	5157N-079-P	0.062	0.256	0.031	-	0.177	5/8			
		5200N-100-P	0.079		0.039						
		5239N-120-P	0.094		0.047						
		5300N-150-P	0.118		0.059						

TBH



TB3000R/L
TB4000R-M

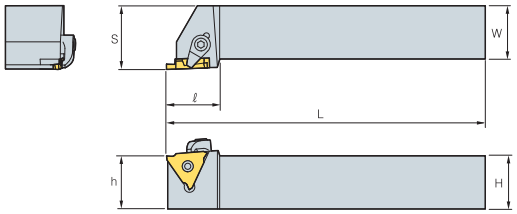
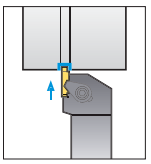


Fig. 1



• R type insert



TB5000N- □□□-M

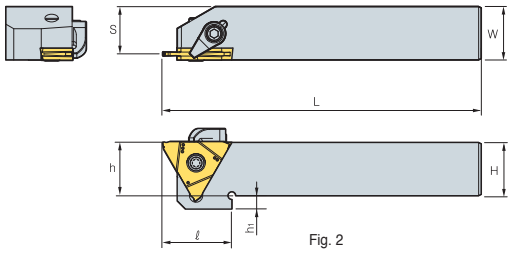


Fig. 2

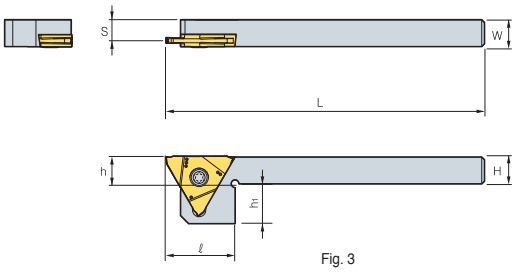


Fig. 3

(inch)

Designation		H = (h)	W	L	ℓ	h1	S	Applicable insert	Clamp	Clamp screw	Screw	Wrench	Fig.
TBH	**12R/L-3-23**	3/4	3/4	5	1.004	-	0.947	TB3125~3230R/L	CS6R1	DHA0617	-	HW30L	1
	12R/L-3-33	3/4	3/4	5	1.004	-	0.947	TB3280~3330R/L					
	12R/L-3-43	3/4	3/4	5	1.004	-	0.947	TB3430R/L					
	16R/L-3-23	1	1	6	1.004	-	1.197	TB3125~3230R/L					
	16R/L-3-33	1	1	6	1.004	-	1.197	TB3280~3330R/L					
	16R/L-3-43	1	1	6	1.004	-	1.197	TB3430R/L					
	12R/L-4-23	3/4	3/4	5	1.004	-	0.947	TB4125~4230R/L					
	12R/L-4-33	3/4	3/4	5	1.004	-	0.947	TB4250~4330R/L					
	12R/L-4-45	3/4	3/4	5	1.004	-	0.947	TB4350~4450R/L					
	16R/L-4-23	1	1	6	1.004	-	1.197	TB4125~4230R/L					
	16R/L-4-33	1	1	6	1.004	-	1.197	TB4250~4330R/L					
	16R/L-4-45	1	1	6	1.004	-	1.197	TB4350~4450R/L					
TBH	**06R/L-5**	3/8	3/8	5	0.984	0.591	0.307	TB5050~5318N	-	-	FTNA0512	TW20L	3
	08R/L-5	1/2	1/2	5	0.984	0.512	0.386						
	10R/L-5	5/8	5/8	5	1.024	0.354	0.543		CS6R1	DHA0617	FTNA0516	HW30L, TW20L	2
	12R/L-5	3/4	3/4	5	1.024	0.197	0.701						
	16R/L-5	1	1	6	-	-	0.898						

For deep hole grooving/parting off

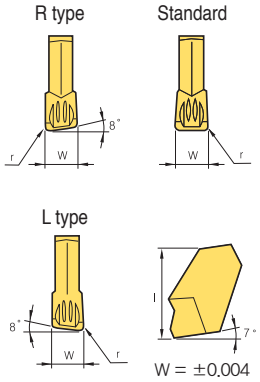
Saw-man

Features of parting insert

- Possible to machine a wide range of workpieces such as steel, cast iron, stainless steel, etc.
- Extended tool life due to low resistance rake angle
- Minimized burr due to minimal Nose R
- Various lead angle available
- Narrow chip curl due to dots on rake surface of insert

Workpiece	Cutting Speed (vc = sfm)										Feed (fn = ipr)				
	CVD					PVD				Uncoated	Cutting width (inch)				
	NC3120	NC3030	NCM325	NC5330	NC3225	PC8110	PC5300	PC9030	PC6510	ST30A	0.079	0.118	0.157	0.197	0.236
SM□□C	260~590	260~528		260~590	260~660		260~590				0.001~0.006	0.001~0.008	0.003~0.012	0.004~0.016	0.005~0.020
SCM	230~490	230~490	230~490	230~490	230~490		230~490				0.001~0.006	0.001~0.008	0.003~0.012	0.004~0.016	0.005~0.020
GC/GCD				160~330					160~330	160~330	0.002~0.005	0.004~0.010	0.004~0.012	0.004~0.014	0.004~0.016
STS			160~390	160~390		160~390	200~460	200~460			0.001~0.004	0.001~0.006	0.003~0.010	0.004~0.014	0.005~0.016
Non-ferrous metal (Al, Copper)										660~1480	0.002~0.004	0.002~0.008	0.002~0.012	0.002~0.012	0.002~0.014

Insert

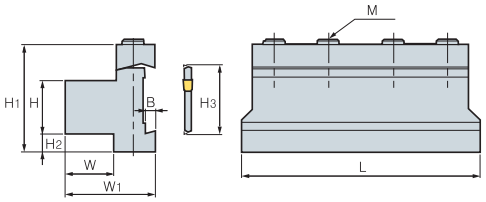
Application	Picture	Designation		Coated									Uncoated	Dimensions (inch)			Configuration
				NC3120	NC3225	NC3030	NCM325	NC5330	PC3500	PC8105	PC8110	PC5300	PC9030	ST30A	W	l	r	
Parting tools		SP	160												0.063	0.307	0.006	
			180												0.071	0.366	0.006	
			200			●									0.087	0.366	0.008	
			200R												0.087	0.366	0.008	
			200L												0.087	0.366	0.008	
			300	●		●					●	●	●		0.122	0.445	0.008	
			300R			●									0.122	0.445	0.008	
			300L												0.122	0.445	0.008	
			400			●						●			0.161	0.445	0.010	
			400R												0.161	0.445	0.010	
			400L												0.161	0.445	0.010	
			500			●						●			0.201	0.449	0.012	
			500R												0.201	0.449	0.012	
			500L												0.201	0.449	0.012	
			600			●									0.252	0.449	0.014	
			600R												0.252	0.449	0.014	
			600L												0.252	0.449	0.014	

●: Korea Stock ●: US Stock

SMBBA (Block)



SPBA□□□(-S)
KGTB□□□□32

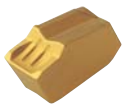


(inch)

Designation		H	W	H3	L	H1	H2	W1	B	M	Blades	Wrench
SMBBA	0610	5/8	5/8	1.024	3	1.496	0.472	0.181	0.157	3-M6	SPBA□□□(-S) KGTB□□□□	HW50L
	0710	3/4	3/4	1.024	3 3/8	1.693	0.354	1.496	0.209	3-M6		
	0712	3/4	3/4	1.260	4	1.969	0.512	1.496	0.209	4-M6		
	1010	1	29/32	1.024	4 3/8	1.693	0.157	1.654	0.209	4-M6		
	1212	1	29/32	1.260	4 3/8	1.969	0.315	1.654	0.209	4-M6		
	1212	1 1/4	1 3/16	1.260	4 3/8	2.126	0.197	1.890	0.209	4-M6		

Applicable inserts C51

SPBA/SPBA-S (Blades)



SP

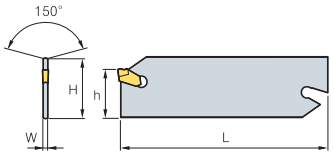


Fig. 1

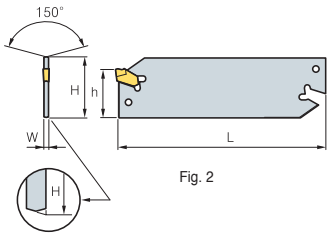
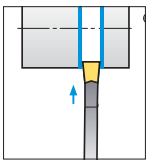


Fig. 2



(inch)

Designation		H	W	L	h	Inserts	Wrench		Fig.
SPBA	100-2	1	1/16	4 3/8	0.827	SP200, 200R/L	SW50L	-	1
	100-3	1	3/32	4 3/8	0.827	SP300, 300R/L			
	100-4	1	1/8	4 3/8	0.827	SP400, 400R/L			
	100-5	1	5/32	4 3/8	0.827	SP500, 500R/L			
	100-6	1	13/64	4 3/8	0.827	SP600, 600R/L			
	125-2	1 1/4	1/16	6	0.984	SP200, 200R/L			
	125-3	1 1/4	3/32	6	0.984	SP300, 300R/L			
	125-4	1 1/4	1/8	6	0.984	SP400, 400R/L			
	125-5	1 1/4	5/32	6	0.984	SP500, 500R/L			
	125-6	1 1/4	13/64	6	0.984	SP600, 600R/L			
SPBA	100-S-2	1	1/16	4 3/8	0.827	SP200, 200R/L	-	SW15S (Separately ordered)	2
	100-S-3	1	3/32	4 3/8	0.827	SP300, 300R/L			
	100-S-4	1	1/8	4 3/8	0.827	SP400, 400R/L			
	100-S-5	1	5/32	4 3/8	0.827	SP500, 500R/L			
	100-S-6	1	13/64	4 3/8	0.827	SP600, 600R/L			
	125-S-2	1 1/4	1/16	6	0.984	SP200, 200R/L			
	125-S-3	1 1/4	3/32	6	0.984	SP300, 300R/L			
	125-S-4	1 1/4	1/8	6	0.984	SP400, 400R/L			
	125-S-5	1 1/4	5/32	6	0.984	SP500, 500R/L			
	125-S-6	1 1/4	13/64	6	0.984	SP600, 600R/L			

Applicable inserts C51

SPHA/SPHA-S (Holder)



SP

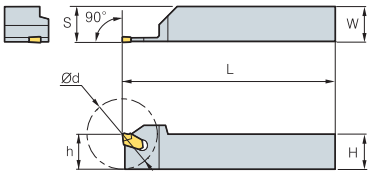


Fig. 1

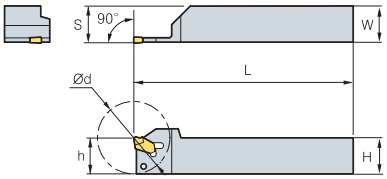
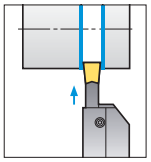


Fig. 2



• R type insert

(inch)

Designation		H = (h)	W	L	Ød	S	Inserts	Wrench		Fig.
SPHA	**062-3**	5/8	5/8	4	1.260	0.637	SP300, 300R/L	SW50L	-	1
	075-3	3/4	3/4	4 3/4	1.575	0.762	SP300, 300R/L			
	075-4	3/4	3/4	4 3/4	1.969	0.766	SP400, 400R/L			
	075-5	3/4	3/4	4 3/4	2.362	0.770	SP500, 500R/L			
	100-3	1	1	6	1.969	1.012	SP300, 300R/L			
	100-4	1	1	6	2.362	1.016	SP400, 400R/L			
	100-5	1	1	6	2.756	1.020	SP500, 500R/L			
SPHA-S	**062-S-3**	5/8	5/8	4	1.260	0.637	SP300, 300R/L	-	SW15S (Separately ordered)	2
	075-S-3	3/4	3/4	4 3/4	1.575	0.726	SP300, 300R/L			
	075-S-4	3/4	3/4	4 3/4	1.969	0.766	SP400, 400R/L			
	075-S-5	3/4	3/4	4 3/4	2.326	0.770	SP500, 500R/L			
	100-S-3	1	1	6	1.969	1.012	SP300, 300R/L			
	100-S-4	1	1	6	2.362	1.016	SP400, 400R/L			
	100-S-5	1	1	6	2.756	1.020	SP500, 500R/L			

Applicable inserts **C51**

Six kinds of inserts can be used in one holder for various operations

Fine Tools

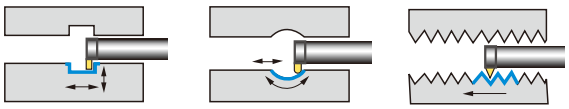


- Strong clamping system and specially designed insert are suitable for small diameter machining
- Six kinds of inserts can be clamped in one holder for various operations
- Guaranteed long tool life due to good toughness substrate with new TiAlN
- High accuracy ground insert ensures high precision machining

Application range

• Internal grooving, Profiling, Threading and Boring at Ø0.315 inch~Ø0.630 inch

Features



(Grooving, Turning) (Forming) (Threading)

Code system

NFTIH 31 50 C - 2

- 31: Minimum Diameter
- 50: Overhang (ℓ /ØD)
- C: Shank Type — S: Steel, C: Carbide
- 2: Shank Dia.

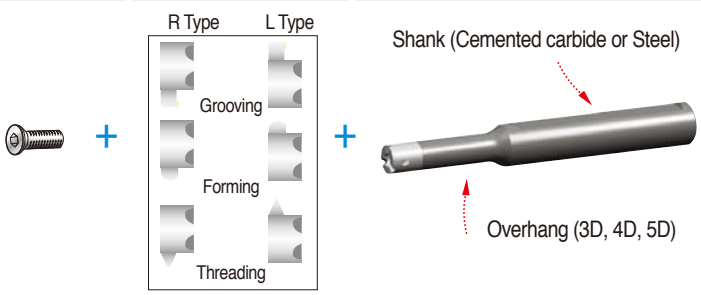
Recommended cutting condition

Workpiece	Grade	Cutting Condition				
		Min. machining Dia.				
	PC130		Ø5/16	Ø7/16	Ø35/64	Ø5/8
Carbon steel	◎	vc (sfm)	100~260	100~330	99~330	100~330
		fn (ipr)	0.0004~0.0016	0.0004~0.0020	0.0008~0.0020	0.0008~0.0024
Alloy steel	◎	vc (sfm)	100~260	100~330	100~330	100~330
		fn (ipr)	0.0004~0.0008	0.0004~0.0016	0.0008~0.0016	0.0008~0.0020
Cast iron	○	vc (sfm)	100~260	100~330	100~330	100~330
		fn (ipr)	0.0004~0.0020	0.0004~0.0020	0.0008~0.0020	0.0008~0.0020
Non-ferrous alloy	○	vc (sfm)	230~490	330~490	330~490	330~490
		fn (ipr)	0.0008~0.0024	0.0008~0.0024	0.0008~0.0024	0.0008~0.0024

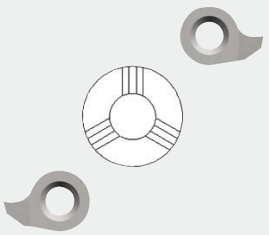
Note
- In case of chattering, reduce the cutting speed and feed
- To find the optimal cutting conditions, advise to gradually increase from the lowest cutting condition of the above recommendation
- In case of the unilateral grooving depth over 1 mm, work to the step feed rate

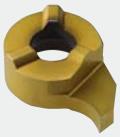
Clamping system

Screw + **Insert** + **Holder**

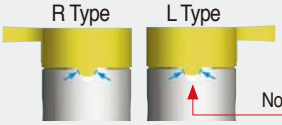


• Available R/L type insert with one holder



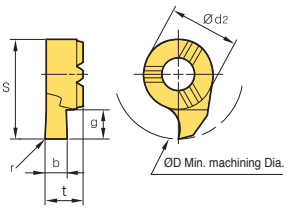
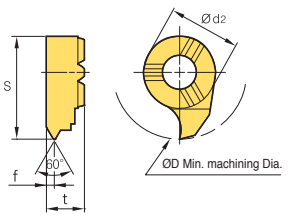


Stable clamping according to the tripod structure



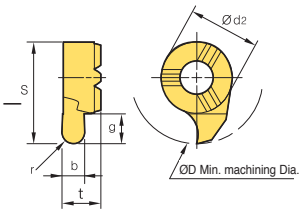
No-Spin-System design for strong clamping

Insert

Application	Picture	Designation		Coated PC5300 R	Coated PC5300 L	Dimensions (inch) ØD	b	r	S	g	Ød2	t	Pitch	f	Configuration
Grooving		NFTG	08075R/L			5/16	0.030	-	0.305	0.051	0.232	0.152	-	-	
			08085R/L			5/16	0.033	-	0.305	0.051	0.232	0.152	-	-	
			08095R/L			5/16	0.037	-	0.305	0.051	0.232	0.152	-	-	
			08121R/L			5/16	0.048	-	0.305	0.051	0.232	0.152	-	-	
			08141R/L			5/16	0.056	-	0.305	0.051	0.232	0.152	-	-	
			08152R/L			5/16	0.060	-	0.305	0.051	0.232	0.152	-	-	
			08171R/L			5/16	0.067	-	0.305	0.051	0.232	0.152	-	-	
			08202R/L			5/16	0.080	-	0.305	0.051	0.232	0.152	-	-	
			11075R/L			7/16	0.030	1/128	0.421	0.071	0.315	0.193	-	-	
			11085R/L			7/16	0.033	1/128	0.421	0.071	0.315	0.193	-	-	
			11095R/L			7/16	0.037	1/128	0.421	0.071	0.315	0.193	-	-	
			11121R/L			7/16	0.048	1/128	0.421	0.102	0.315	0.193	-	-	
			11141R/L			7/16	0.056	1/128	0.421	0.102	0.315	0.193	-	-	
			11152 R/L			7/16	0.060	1/128	0.421	0.102	0.315	0.193	-	-	
			11171R/L			7/16	0.067	1/128	0.421	0.102	0.315	0.193	-	-	
			11202R/L			7/16	0.080	1/128	0.421	0.102	0.315	0.193	-	-	
			11202R/L-02			7/16	0.080	1/128	0.421	0.102	0.315	0.193	-	-	
			11252R/L			7/16	0.099	1/128	0.421	0.102	0.315	0.193	-	-	
			11302R/L			7/16	0.119	1/128	0.421	0.102	0.315	0.193	-	-	
			14075R/L			35/64	0.030	-	0.531	0.071	0.354	0.230	-	-	
			14085R/L			35/64	0.033	-	0.531	0.071	0.354	0.230	-	-	
			14095R/L			35/64	0.037	-	0.531	0.071	0.354	0.230	-	-	
			14121R/L			35/64	0.048	-	0.531	0.169	0.354	0.230	-	-	
			14141R/L			35/64	0.056	-	0.531	0.169	0.354	0.230	-	-	
			14152R/L			35/64	0.060	-	0.531	0.169	0.354	0.230	-	-	
			14171R/L			35/64	0.067	-	0.531	0.169	0.354	0.230	-	-	
			14202R/L			35/64	0.080	-	0.531	0.169	0.354	0.230	-	-	
			14252R/L			35/64	0.099	-	0.531	0.169	0.354	0.230	-	-	
			14302R/L			35/64	0.119	-	0.531	0.169	0.354	0.230	-	-	
			16075R/L			5/8	0.030	-	0.618	0.071	0.433	0.228	-	-	
			16085R/L			5/8	0.033		0.618	0.071	0.433	0.228	-	-	
			16095R/L			5/8	0.037	-	0.618	0.071	0.433	0.228	-	-	
			16121R/L			5/8	0.048	-	0.618	0.181	0.433	0.228	-	-	
			16141R/L			5/8	0.056	-	0.618	0.181	0.433	0.228	-	-	
			16171R/L			5/8	0.067	-	0.618	0.181	0.433	0.228	-	-	
			16202R/L			5/8	0.080	-	0.618	0.181	0.433	0.228	-	-	
			16252R/L			5/8	0.099	-	0.618	0.181	0.433	0.228	-	-	
			16302R/L			5/8	0.119	-	0.618	0.181	0.433	0.228	-	-	
			16352R/L			5/8	0.139	-	0.618	0.181	0.433	0.228	-	-	
			16402R/L			5/8	0.158	-	0.618	0.181	0.433	0.228	-	-	
Threading		NFTT	0805MR/L			5/16	-	-	0.305	-	0.236	0.152	0.5	0.039	
			0810MR/L			5/16	-	-	0.305	-	0.236	0.152	1.0	0.039	
			0815MR/L			5/16	-	-	0.305	-	0.236	0.152	1.5	0.047	
			1110MR/L			7/16	-	-	0.421	-	0.315	0.193	1.0	0.047	
			1115MR/L			7/16	-	-	0.421	-	0.315	0.193	1.5	0.047	
			1120MR/L			7/16	-	-	0.421	-	0.315	0.193	2.0	0.047	
			1125MR/L			7/16	-	-	0.421	-	0.315	0.193	2.5	0.047	
			1410MR/L			35/64	-	-	0.531	-	0.354	0.230	1.0	0.047	
			1415MR/L			35/64	-	-	0.531	-	0.354	0.230	1.5	0.047	
			1420MR/L			35/64	-	-	0.531	-	0.354	0.230	2.0	0.047	
			1425MR/L			35/64	-	-	0.531	-	0.354	0.230	2.5	0.047	
			1610MR/L			5/8	-	-	0.618	-	0.433	0.228	1.0	0.047	
			1615MR/L			5/8	-	-	0.618	-	0.433	0.228	1.5	0.047	
			1620MR/L			5/8	-	-	0.618	-	0.433	0.228	2.0	0.047	
			1625MR/L			5/8	-	-	0.618	-	0.433	0.228	2.5	0.047	
			1630MR/L			5/8	-	-	0.618	-	0.433	0.228	3.0	0.059	
			1635MR/L			5/8	-	-	0.618	-	0.433	0.228	3.5	0.063	
			1640MR/L			5/8	-	-	0.618	-	0.433	0.228	4.0	0.071	

● : Korea Stock ● : US Stock

Insert

Application	Picture	Designation		Coated PC5300 R	Coated PC5300 L	D	b	r	S	g	Ød2	t	Configuration
Profiling		NFTF	08082R/L			5/16	0.032	0.016	0.031	0.051	0.236	0.152	
			08122R/L			5/16	0.048	0.024	0.031	0.051	0.236	0.152	
			08182R/L			5/16	0.072	0.036	0.031	0.051	0.236	0.152	
			11082R/L			7/16	0.032	0.016	0.421	0.102	0.315	0.193	
			11122R/L			7/16	0.048	0.024	0.421	0.102	0.315	0.193	
			11182R/L			7/16	0.072	0.036	0.421	0.102	0.315	0.193	
			11202R/L			7/16	0.080	0.040	0.421	0.102	0.315	0.193	
			11302R/L			7/16	0.119	0.059	0.421	0.102	0.315	0.193	
			14122R/L			35/64	0.048	0.024	0.531	0.169	0.354	0.230	
			14182R/L			35/64	0.072	0.036	0.531	0.169	0.354	0.230	
			14202R/L			35/64	0.080	0.040	0.531	0.169	0.354	0.230	
			14222R/L			35/64	0.087	0.044	0.531	0.169	0.354	0.230	
			14302R/L			35/64	0.119	0.059	0.531	0.169	0.354	0.230	
			16182R/L			5/8	0.072	0.036	0.618	0.181	0.433	0.228	
			16222R/L			5/8	0.087	0.044	0.618	0.181	0.433	0.228	
			16302R/L			5/8	0.119	0.059	0.618	0.181	0.433	0.228	
			16402R/L			5/8	0.158	0.079	0.618	0.181	0.433	0.228	

●: Korea Stock ●: US Stock

NFTIH



NFTF
NFTT
NFTG

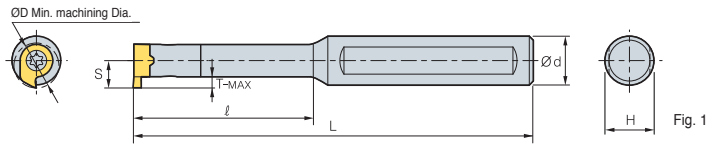


Fig. 1

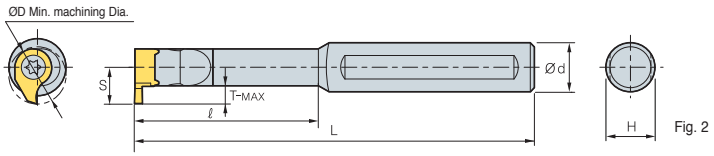


Fig. 2

• For NFTIH14~.
• R type insert

(inch)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts NFTG: Grooving NFTT: Threading NFTF: Forming	Screw	Wrench	Fig.
NFTIHA	3125C-2	5/16	1/4	2.559	-	0.0394	0.157	0.189	NFTG08□□□R/L NFTT08□□□R/L NFTF08□□□R/L	PTKA02508	TW08P	1
	3150C-2	5/16	1/2	2.756	0.610	0.0394	0.394	0.189				
	3150C-3	5/16	1/2	3.150	0.945	0.0394	0.394	0.189				
	3150S-3	5/16	1/2	3.150	0.945	0.0394	0.394	0.189				
	3150C-4	5/16	1/2	3.453	1.260	0.0394	0.394	0.189				
	3150C-5	5/16	1/2	3.947	1.575	0.0394	0.394	0.189				
	4330C-2	7/16	5/16	3.150	-	0.0906	0.276	0.264	NFTG11□□□R/L NFTT11□□□R/L NFTF11□□□R/L	PTKA03510	TW15P	2
	4350C-2	7/16	1/2	2.953	0.787	0.0906	0.433	0.264				
	4350C-3	7/16	1/2	3.740	1.299	0.0906	0.433	0.264				
	4350S-3	7/16	1/2	3.740	1.299	0.0906	0.433	0.264				
	4350C-4	7/16	1/2	4.331	1.732	0.0906	0.433	0.264				
	4350C-5	7/16	1/2	4.724	2.165	0.0906	0.433	0.264				
	5550C-0	35/64	1/2	2.953	0.787	0.1575	0.433	0.354	NFTG14□□□R/L NFTT14□□□R/L NFTF14□□□R/L	PTKA0412	TW15P	2
	5562C-0	35/64	5/8	2.953	0.787	0.1575	0.591	0.354				
	5550C-1	35/64	1/2	3.937	1.339	0.1575	0.433	0.354				
	5562C-1	35/64	5/8	3.937	1.339	0.1575	0.591	0.354				
	5550C-2	35/64	1/2	4.331	1.772	0.1575	0.433	0.354				
	5562C-2	35/64	5/8	4.331	1.772	0.1575	0.591	0.354				
	5550C-3	35/64	1/2	5.118	2.520	0.1575	0.433	0.354				
	5562C-3	35/64	5/8	5.118	2.520	0.1575	0.591	0.354				
	6350C-3	5/8	1/2	5.118	1.890	0.1693	0.433	0.402	NFTG16□□□R/L NFTT16□□□R/L NFTF16□□□R/L	PTKA0512	TW20P	2
	6350S-3	5/8	1/2	5.118	1.890	0.1693	0.433	0.402				
	6350C-4	5/8	1/2	5.118	2.520	0.1693	0.433	0.402				
	6350C-5	5/8	1/2	5.906	3.150	0.1693	0.433	0.402				
	6362C-3	5/8	5/8	5.118	1.890	0.1693	0.591	0.402				
	6362C-4	5/8	5/8	5.118	2.520	0.1693	0.591	0.402				
	6362C-5	5/8	5/8	5.906	3.150	0.1693	0.591	0.402				

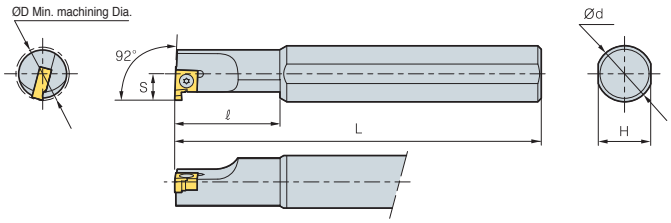
Applicable inserts **C55~C56**

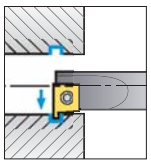
●: Korea Stock ●: US Stock

IGH For Internal grooving



IG





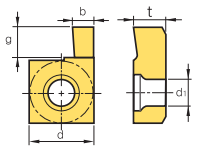
• R type insert

(inch)

Designation		ØD	Ød	H	L	ℓ	S	Inserts	Screw	Wrench
IGH	0910-2	9/16	5/8	0.585	6	0.984	0.260	IG125~280	FTKA02565	TW07P
	1110-2	11/16	5/8	0.585	6	1.181	0.299			
	1310-2	3/4	3/4	0.710	8	1.575	0.378			

Applicable inserts C57

Insert

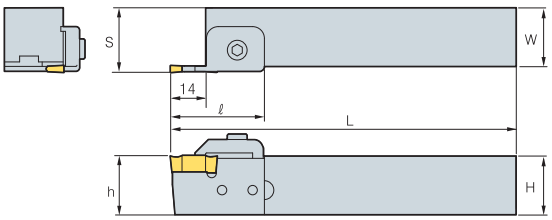
Application	Picture	Designation		Coated			Uncoated			Dimensions (inch)					Configuration
				NC3215	NC3120	NC3225	H01	G10	ST30A	b	g	t	d	d1	
Internal grooving		IG	125							0.049	0.059	1/8	1/4	0.110	
			145							0.048	0.059	1/8	1/4	0.110	
			175							0.069	0.059	1/8	1/4	0.110	
			200							0.079	0.091	1/8	1/4	0.110	
			230							0.091	0.091	1/8	1/4	0.110	
			280							0.110	0.091	1/8	1/4	0.110	

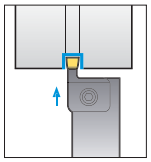
● : Korea Stock ● : US Stock

DBH For Deep and Wide grooving



DB DC





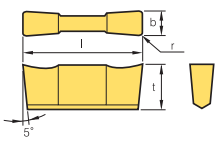
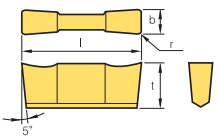
• R type insert

(inch)

Designation		H = (h)	W	L	ℓ	S		Inserts		Clamp	Clamp Screw	Screw	Locator	Wrench	
						*	**	*	**						
DBH	12R/L-3	3/4	3/4	6	1.575	0.841	0.860	DB300 DC300	DB400 DC400	CGH5R1	MHA0512	MHB0410	LD34	HW30L	HW40L
	16R/L-3	1	1	6	1.575	1.091	1.110								
	12R/L-5	3/4	3/4	6	1.575	0.900	0.919	DB500 DC500	DB600	CGH5R2	MHA0512	MHB0410	LD56	HW30L	HW40L
	16R/L-5	1	1	6	1.575	1.150	1.169								
	12R/L-7	3/4	3/4	6	1.575	0.978	0.998	DB700	DB800	CGH5R3	MHA0512	MHB0410	LD78	HW30L	HW40L
	16R/L-7	1	1	6	1.575	1.228	1.248								

Applicable inserts C57

Insert

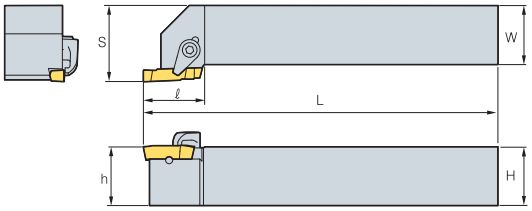
Application	Picture	Designation		Cermet	Coated			Uncoated		Dimensions (inch)				Configuration
				CN2000	NC3215	NC3120	NC3225	H01	G10	b	l	t	r	
Grooving		DB	300							0.118	0.787	0.295	0.008	
			400							0.157	0.787	0.295	0.008	
			500							0.197	0.787	0.295	0.008	
			600							0.236	0.787	0.295	0.008	
			700							0.276	0.787	0.295	0.008	
			800							0.315	0.787	0.295	0.008	
		DC	300							0.118	0.787	0.295	0.008	
			400							0.157	0.787	0.295	0.010	
			500							0.197	0.787	0.295	0.012	

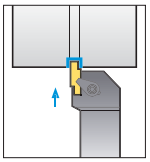
● : Korea Stock ● : US Stock

GFT For External grooving



GW BF





• R type insert

(inch)

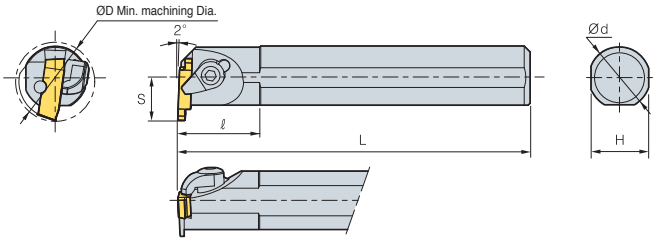
Designation		H = (h)	W	L	ℓ	S	Inserts	Clamp	Screw	Pin	Wrench
GFT	12R/L-3	1	1	5	0.925	1.197	GW110~300R/L,BF3	CS5R1	DHA0514	PN0310	HW25L
	16R/L-3	1	1	6	0.925	1.276					
	16R/L-5	1	1	6	1.004	1.276	GW315~500R/L,BF5	CS6R1	DHA0617	PN0310	HW30L
	16R/L-8	1	1	6	1.122	1.276	GW600~800R/L,BF8	CS8R1	DHA0820	PN0314	HW40L

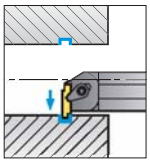
Applicable inserts **C58** • Use right-hand insert for left-hand holder

GFIP For Internal grooving



BF GW





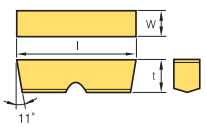
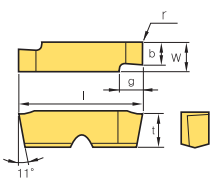
• R type insert

(inch)

Designation		ØD	Ød	H	L	ℓ	S	Inserts	Clamp	C-ring	Screw	Pin	Wrench
GFIP	1310-3	13/16	5/8	0.585	6	0.669	0.433	GW110~300R/L,BF3	CH5R2	CR04	CHX0513	PN0310	HW25L
	1712-3	1 1/16	3/4	0.670	6	0.866	0.531						
	2116-3	1 5/16	1	0.920	8	0.866	0.669		CH6R2	CR05	CHX0616	PN0310	HW30L
	3224-3	2	1 1/2	1.380	12	1.260	1.063						
	2116-5	1 5/16	1	0.920	8	0.866	0.669	GW315~500R/L,BF5					
	3224-5	2	1 1/2	1.380	12	1.260	1.063						
	3224-8	2	1 1/2	1.380	12	1.260	1.063	GW600~800R/L,BF8	CS8R1	-	DHA0820	PN0314	HW40L

Applicable inserts **C58** • Use right-hand insert for left-hand holder

Insert

Application	Picture	Designation		Uncoated ST30A		Dimensions (inch) b	g	W	l	t	r	Configuration
Blank		BF	-3			-	-	0.122	0.646	0.207	-	
			-5			-	-	0.201	0.882	0.246	-	
			-8			-	-	0.319	1.079	0.286	-	
				R	L							
Grooving		GW	110R/L			0.043	0.083	0.122	0.630	0.197	1/128	
			130R/L			0.051	0.091	0.122	0.630	0.197	1/128	
			160R/L			0.063	0.102	0.122	0.630	0.197	1/128	
			185R/L			0.073	0.114	0.122	0.630	0.197	1/128	
			215R/L			0.073	0.114	0.122	0.630	0.197	1/128	
			265R/L			0.104	0.146	0.122	0.630	0.197	1/128	
			300R/L			0.118	0.157	0.122	0.630	0.197	1/128	
			315R/L			0.124	0.165	0.201	0.866	0.236	0.012	
			415R/L			0.124	0.165	0.201	0.866	0.236	0.012	
			500R/L			0.197	0.236	0.201	0.866	0.236	0.012	
			600R/L			0.236	0.276	0.319	1.063	0.276	0.012	
			800R/L			0.315	0.354	0.319	1.063	0.276	0.012	

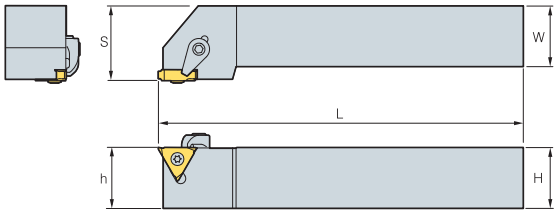
● : Korea Stock ● : US Stock

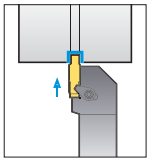
GH

For O-ring grooving
Snap-ring grooving



GO GS





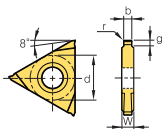
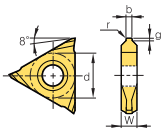
• R type insert

(inch)

Designation		H = (h)	W	L	S	Inserts	Clamp	Clamp Screw	Screw	Wrench
GH	12-3	3/4	3/4	5	0.829	GS125~280	CS6R1	DHA0617	PTMA03508	TW09P-HW30L
	16-3	1	1	6	1.079	GO250				
	12-4	3/4	3/4	5	0.789	GS330/430				
	16-4	1	1	6	1.039	GO320/410				

Applicable inserts C59

Insert

Application	Picture	Designation		Coated NC3120	Coated NC3225	Uncoated H01	Uncoated ST20	Uncoated ST30A	b	g	W	r	d	Configuration
Grooving(Narrow · O-ring · Snap-ring)		GO	250						0.098	0.059	0.130	0.014	3/8	
			320						0.126	0.079	0.150	0.014	3/8	
			410						0.161	0.098	0.177	0.026	3/8	
		GS	125						0.048	0.059	0.098	1/128	3/8	
			145						0.056	0.059	0.098	1/128	3/8	
			175						0.068	0.079	0.098	1/128	3/8	
			185						0.072	0.079	0.098	1/128	3/8	
			200						0.080	0.098	0.098	1/128	3/8	
			230						0.090	0.138	0.110	1/128	3/8	
			280						0.109	0.138	0.130	0.012	3/8	
			330						0.129	0.157	0.150	0.012	3/8	
			430						0.169	0.157	0.177	1/64	3/8	

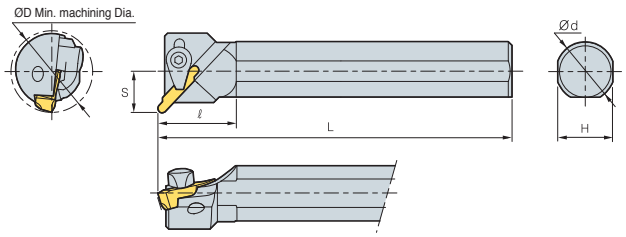
●: Korea Stock ●: US Stock

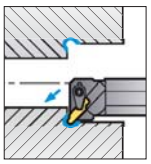
GFIK

For Reliefing



GR





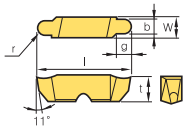
• R type insert

(inch)

Designation		ØD	Ød	H	L	ℓ	S	Inserts	Clamp	C-ring	Screw	Pin	Wrench
GFIK	1410-3	7/8	5/8	0.585	6	0.846	0.433	GR3□□	CH5R2	CR04	CHX0513	PN0310	HW25L
	2116-3	1 5/16	1	0.920	8	0.846	0.669						
	3224-3	2	1 1/2	1.380	12	1.394	1.063		CS5R1	-	DHA0514	PN0310	HW25L
	2116-5	1 5/16	1	0.920	8	1.083	0.669	GR5□□	CS6R1	-	DHA0617	PN0314	HW30L
	3224-5	2	1 1/2	1.380	12	1.555	1.063						
	3224-8	2	1 1/2	1.380	12	1.646	1.063	GR8□□	CS8R1	-	DHA0820	PN0314	HW40L

Applicable inserts C59

Insert

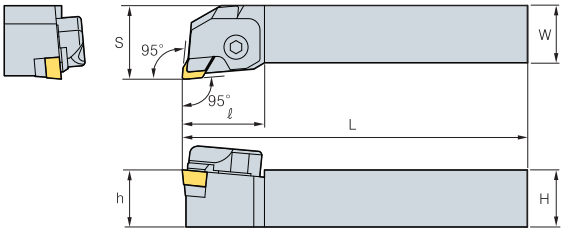
Application	Picture	Designation		Coated NC3120	Coated NC3225	Uncoated H01	Uncoated ST20	Uncoated ST30A	b	g	W	l	t	r	Configuration
Reliefing		GR	310R						0.079	0.079	0.122	0.626	0.197	0.039	
			315R						0.118	0.114	0.122	0.626	0.197	0.059	
			520R						0.157	0.157	0.201	0.862	0.236	0.079	
			525R						0.197	0.197	0.201	0.858	0.236	0.098	
			830R						0.236	0.236	0.319	1.055	0.276	0.118	
			840R						0.315	0.315	0.319	1.051	0.276	0.157	

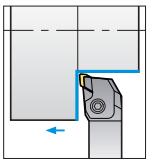
●: Korea Stock ●: US Stock

EH Regrinding type insert



ESB





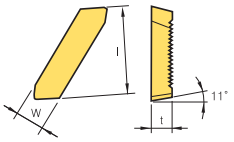
• R type insert

(inch)

Designation		H = (h)	W	L	ℓ	S	Inserts	Clamp	Clamp Screw	Chip Breaker	Shim	Shim Screw	Wrench
EH	620R	3/4	3/4	5	1.420	1.060	ESB34	CTH6R2	BHA0616	CB20	SES33C	SHX0310	HW50L HW20L
	625R	1	1	6	1.420	1.250							

Applicable inserts C60

Insert

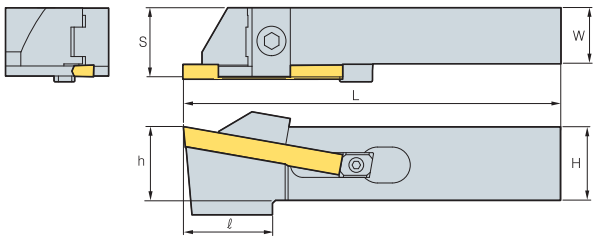
Application	Picture	Designation	Uncoated ST10	Uncoated ST20	Dimensions (inch) W	Dimensions (inch) I	Dimensions (inch) t	Configuration
General Machining		ESB 34			3/8	1.181	1/4	

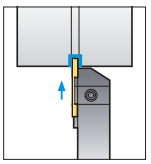
●: Korea Stock ●: US Stock

PH For Parting off Deep grooving



POB





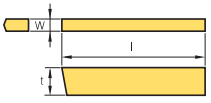
• R type insert

(inch)

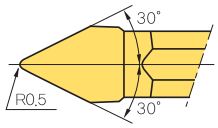
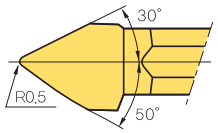
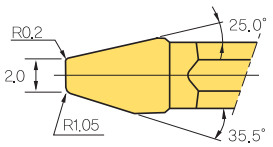
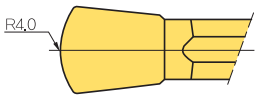
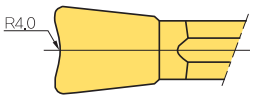
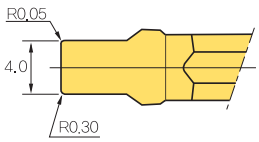
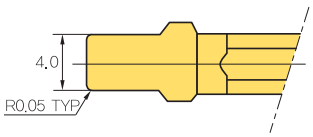
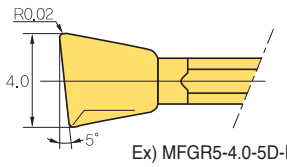
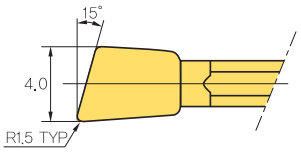
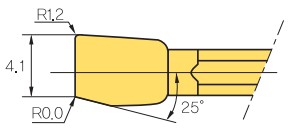
Designation		H	W	L	ℓ	S	h	Max (Ø)	Inserts	Clamp	Clamp Screw	Stopper	Stopper Screw	Wrench
PH	12-3R	3/4	3/4	6	1.339	0.890	3/4	1.181	POB300	CGH6R1	BHA0616	STP5	KHD0510	HW25L-HW50L
	64-3R	1	3/4	6	1.339	0.890	1	1.575						
	12-4R	3/4	3/4	6	1.339	0.927	3/4	1.181	POB400	CGH6R2	BHA0616	STP5	KHD0510	HW25L-HW50L
	64-4R	1	3/4	6	1.339	0.927	1	1.575						
	12-5R	3/4	3/4	6	1.339	0.963	3/4	1.969	POB500	CTH 6R3	BHA0616	STP5	KHD0510	HW25L-HW50L
	64-5R	1	3/4	6	1.339	0.963	1	1.969						

Applicable inserts C60

Insert

Application	Picture	Designation	Uncoated ST10	Uncoated ST20	Dimensions (inch) W	Dimensions (inch) I	Dimensions (inch) t	Configuration
Grooving · Parting off		POB 300			0.188	2.165	0.236	
		400			5/32	2.165	0.276	
		500			0.197	2.165	0.315	

●: Korea Stock ●: US Stock

Code system	Configuration
M F G N 4 - 0.5R - 30D ① ② ③ ④ ⑤ ⑥ ⑦ ① Multi ② Forming ③ Grinding ④ Feed Direction ⑤ Clamp part: 4 mm ⑥ Nose Radius: 0.5 ⑦ Degree: 30°	 Ex) MFGN4-0.5R-30D
MFGN4 - 0.5R - L 50 D - R 30D ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Nose Radius: 0.5 ③ Left ④ Degree: 50° ⑤ Right ⑥ Degree > 30°	 Ex) MFGN4-0.5R-L50D-R30D
MFGN4 - 2.0 - R 020 250 - L 105 335 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ① Refer to No. 1 ② Width of cutting edge: 2.0 mm ③ Right ④ Nose Radius: 0.20 ⑤ Degree: 25.0° ⑥ Left ⑦ Nose Radius: 1.05 ⑧ Degree: 35.5°	 Ex) MFGN4-2.0-R020250-L105335
MFGN5 - 4.0R F ① ② ③ ① Refer to No. 1 ② Radius: 4.0 ③ Front (Concave)	 Ex) MFGN5-4.0RF
MFGN5 - 4.0R B ① ② ③ ① Refer to No. 1 ② Radius: 4.0 ③ Back (Concave)	 Ex) MFGN5-4.0RB
MFGN5 - 4.0 - R 005 - L 030 ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Width of cutting edge: 4.0 mm ③ Right ④ Nose Radius: 0.05 ⑤ Left ⑥ Nose Radius: 0.30	 Ex) MFGN5-4.0-R005-L030
MFGN5 - 4.0 - 0.05 R ① ② ③ ① Refer to No. 1 ② Width of cutting edge: 4.0 mm ③ Nose Radius: 0.05	 Ex) MFGN5-4.0-0.05R
MFG R 5 - 4.0 - 5D - R 002 - L 115 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ① Refer to No. 1 ② Right ③ Clamp part: 5 mm ④ Width of cutting edge: 4.0 mm ⑤ Lead angle: 5° ⑥ Right ⑦ Nose Radius: 0.02 ⑧ Left ⑨ Nose Radius: 1.15	 Ex) MFGR5-4.0-5D-R002-L115
MFG L 5 - 4.0 - 15D - 1.5R ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Left ③ Clamp part: 5 mm ④ Width of cutting edge: 4.0 mm ⑤ Lead angle: 15° ⑥ Right Nose Radius: 1.5	 Ex) MFGL5-4.0-15D-1.5R
MFG R 5 - 4.10 - 25D - R012 - L000 ① ② ③ ④ ⑤ ⑥ ⑦ ① Refer to No. 1 ② Right ③ Clamp part: 5 mm ④ Width of cutting edge: 4.1 mm ⑤ Degree: 25° ⑥ Right Nose Radius: 1.2 ⑦ Left Nose Radius: 0.0	 Ex) MFGR5-4.10-25D-R012-L000

M This is metric size. We can also provide in inch type

Special Order Form for V-Pulley Insert

Code system

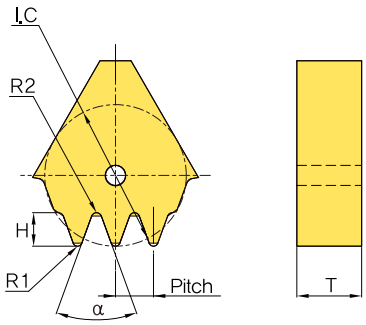
KP	27	064	-	R0.425	N3
KORLOY PULLEY	ØD	W		R1	No. of flutes

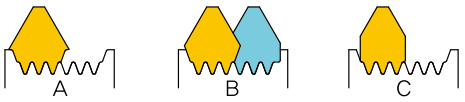
■ Ex)

I.C	T	R	Z
Ø 12.7	6.4	0.425	3

▶ Special types are available for quotation

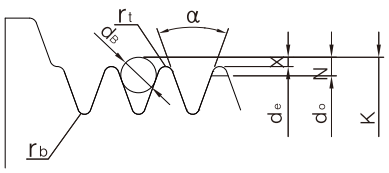
Insert for machining of pulley





▶ For reference: KS specifications and cods for V-pulley for vehicles(PK)

Diameter



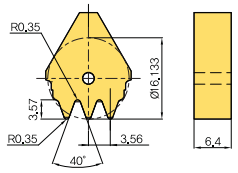
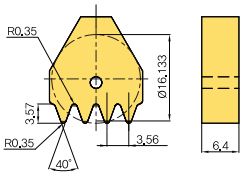
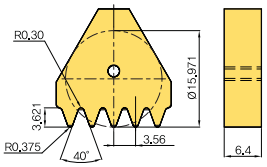
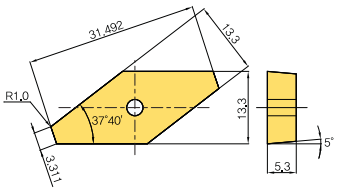
- d_e: Effective diameter
- d_o: Outer diameter
- K: Diameter of ball or rod
- d_a: Diameter of ball for inspection or rod

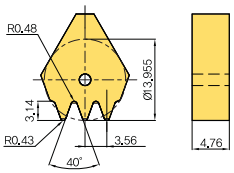
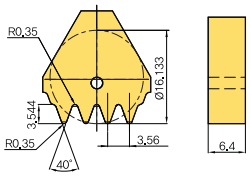
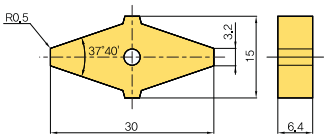
Code system

P	6	PK96.3
Pulley	No. of groove	Cross section of groove / Effective diameter(mm)

Cross section		PH	PJ	PK	PL	PM
Pitch of grrove		1.6±0.03	2.34±0.03	3.56±0.05	4.7±0.05	9.4±0.08
Groove angle	±0.5°	40°	40°	40°	40°	40°
r_t	Min.	0.15	0.2	0.25	0.4	0.75
r_b	Max.	0.3	0.4	0.5	0.4	0.75
d_B	±0.01	1	1.5	2.5	3.3	6.4
Application		electrical, electronics instrument	Machine with light duty, Compressor, Pump	Vehicles	Small agricultural machine	Large agricultural machine

M This is metric size. We can also provide in inch type

Specifications	Standard designation
	KP27064-R0.35-N3 (DF356-3B)
	KP27064-R0.35-N4 (DF356-4B)
	KP27064-R0.375-N5 (DF356-5B)
	VF13M522

Specifications	Standard designation
	KP27064-R0.43-N3 (DF356-3SR)
	KP27064-R0.35-N4-A (DF356-4X)
	UF320

M This is metric size. We can also provide in inch type

D

THREADING

Korloy threading tools are available for machining various shapes of thread at various pitches while ensuring high quality performances



Threading Code System

D02 Threading Holder Code System
D02 Threading Insert Code System

Threading

D03 Technical Information for Threading
D09 Threading Insert with Chip Breaker

Thread Inserts

D10 Partial Profile 60˚
D11 Partial Profile 55˚
D12 ISO Metric
D16 American UN
D18 With Worth
D22 British Standard Pipe Thread
D22 National Pipe Thread
D23 National Pipe Thread-Dry seal
D23 Round DIN 405
D24 Trapez DIN 103
D24 American ACME
D25 Stub ACME
D26 UNJ (Unified Constant Thread)

Thread Inserts

D28 American Buttress (ABUT)
D28 British Buttress (BBUT)
D29 Metric Buttress (SAGE)/API
D30 API Buttress Casing (BUT)
D30 API Round Casing & Tubing (APIRD)
D30 Extreme Line Casing (EL)

Thread Holders

D31 External Holder
D32 Internal Holder
D33 Vertical Type Holder

Thread Milling

D34 Technical Information for Thread Milling
D44 Thread Milling Inserts
D49 Thread Milling Holder

Solid Threading Endmills

D50 Technical Information for Solid Threading Endmills
D51 Solid Threading Endmills



Threading holder code system

E R H 031 (N) - 11 (C)

1 Holder type | 2 Hand of insert | 3 Name | 4 Height of shank | 5 Shim | 6 Insert size (inch) | 7 clamping system

1 Holder type
E R H 031 (N) - 11 (C)

E: For External I: For Internal

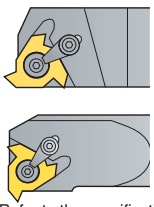
2 Hand of insert
E R H 031 (N) - 11 (C)

R: Right handed L: Left handed

3 Name
E R H 031 (N) - 11 (C)

H: Holder

4 Height of shank
E R H 031 (N) - 11 (C)



*Refer to the specification for shank diameter information

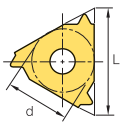
031: 0.31
0375: 0.375
050: 0.50
0625: 0.625
075: 0.75
100: 1.00
125: 1.25
150: 1.50
200: 2.00
250: 2.50

5 Shim
E R H 031 (N) - 11 (C)

No code: Shim required
N: No shim required

6 Insert size (inch)
E R H 031 (N) - 11 (C)

11: d = 1/4
16: d = 3/8
22: d = 1/2
27: d = 5/8



7 Clmaping system
E R H 031 (N) - 11 (C)

No code: Screw on system
C: Clamp on system

Threading insert code system

E R M 16 - 1.5 ISO

1 Insert type | 2 Hand of insert | 3 Chip breaker | 4 Insert size (inch) | 5 Pitch | 6 Type

1 Insert type
E R M 16 - 1.5 ISO

E: External thread I: Internal thread

2 Hand of insert
E R M 16 - 1.5 ISO

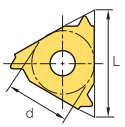
R: Right handed L: Left handed

3 Chip breaker
E R M 16 - 1.5 ISO

M: With Chip Breaker

4 Insert size (inch)
E R M 16 - 1.5 ISO

11: d = 1/4
16: d = 3/8
22: d = 1/2
27: d = 5/8



Insert Shape


< ER/IR >


< ERM/IRM >

5 Pitch
E R M 16 - 1.5 ISO

Full profile	
inch	tpi
0.35~6.0	72~3

Partial profile	
inch	tpi
A 0.5~1.5	48~16
AG 0.5~3.0	48~8
G 1.75~3.0	14~8
N 3.5~5.0	7~5
Q 5.5~6.0	4.5~4

6 Type
E R M 16 - 1.5 ISO

Partial profile 60°
Partial Profile 55°
ISO Metric (Full Profile)
American UN (Full Profile) UN, UNC, UNF, UNEF
Whitworth (Full Profile) BSW, BSF, BSP
British Standard Pipe thread (Full Profile) BSPT
National Pipe Thread (Full Profile) NPT
National Pipe Threads-Dryseal (Full Profile) NPTF
Round DIN 405
Trapez DIN 103
American ACME
Stub ACME
UNJ
American Buttress
British Buttress
Metric Buttress-Sagengewinde
API
API Buttress Casing
API Round Casing & Tubing
EL-Extreme Line

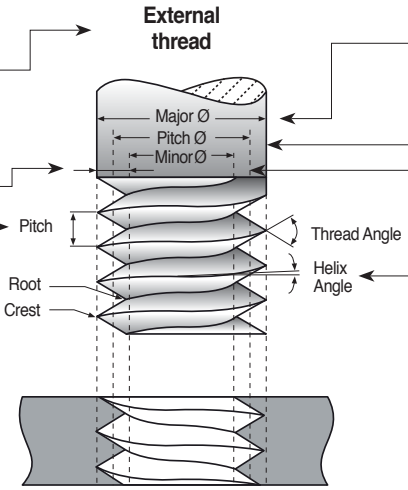
Special features

External thread
A thread on the external surface of a cylinder screw or cone

Depth of thread
The distance between the crest and root measured from normal to theaxis

Pitch
The distance between the corresponding points on adjacent thread forms measured parallel to the axis. This distance can be defined in millimeters or by the tpi (threads per inch), which is the reciprocal of the pitch

Nominal diameter
The diameter of which the diameter limits are derived by the application of deviation allowances and tolerances



Internal thread
A thread on the internal surface of a cylinder or cone

Major diameter
The largest diameter of a screw thread

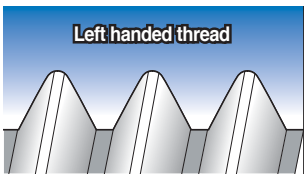
Pitch diameter
On a straight thread, the diameter of an imaginary cylinder, the surface of which cuts the thread forms where the width of the thread and groove are equal

Minor diameter
The smallest diameter of a screw thread

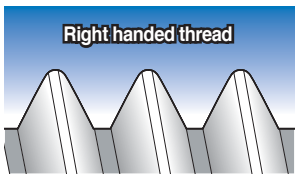
Helix angle
For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

Straight thread
A thread formed on a cylinder

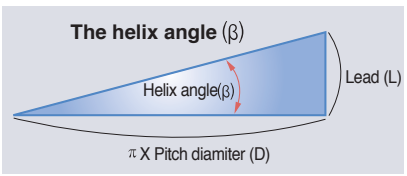
Taper thread
A thread formed on a cone



A thread which, when viewed axially, winds in a counter clockwise and receding direction. All left handed threads are designated LH



A thread which, when viewed axially, winds in a clockwise and receding direction. Threads are always right handed unless they are specified

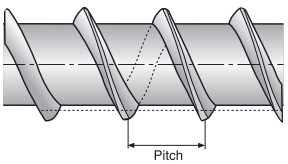


For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

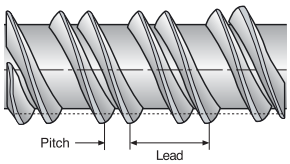
Machining a multi-start thread

- A thread in which the lead is an integral multiple, greater than one, of the pitch. A multi-start thread permits a more rapid advance without a coarser (larger) thread form

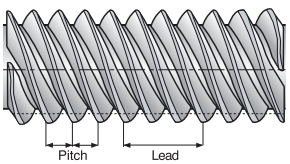
First start machined



Second start machined

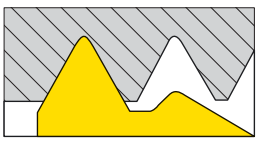


Third start machined (Final, 3 starts thread)



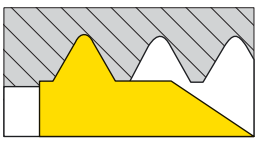
Insert profile style

Partial profile



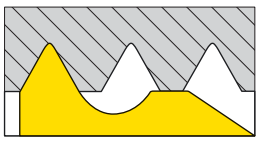
The V partial profile insert cuts without topping the outer diameter of the thread. The same insert can be used for a range of different thread pitches which have a common thread angle

Full profile



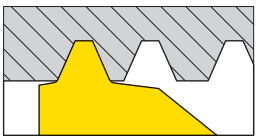
The full profile insert will form a complete thread profile including the crest. For every thread pitch and standard, a separate insert is required

Full Profile for fine pitches



The full profile for Fine Pitches will form a complete thread
The topping of the outer diameter is generated by second tooth

Semi full

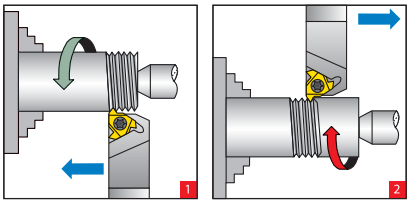


The Semi profile insert will form a complete thread including crest radius but without topping the outer diameter Mainly used for trapezoidal profiles

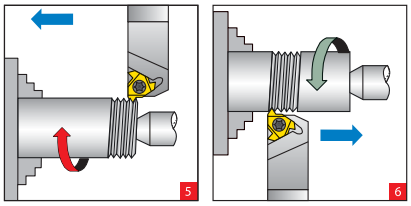
Thread turning method

Thread	Inserts & tool holder	Rotation	Feed direction	Helix method	Drawing no.
Right Hand Externa	EX RH	Counter clockwise	Towards chuck	Regular	1
	EX LH	Clockwise	From chuck	Reversed	2
Right Hand Internal	IN LH	Counter clockwise	Towards chuck	Regular	3
	IN LH	Clockwise	From chuck	Reversed	4
Left Hand External	EX LH	Clockwise	Towards chuck	Regular	5
	EX RH	Counter clockwise	From chuck	Reversed	6
Left Hand Internal	IN LH	Clockwise	Towards chuck	Regular	7
	IN RH	Counter clockwise	From chuck	Reversed	8

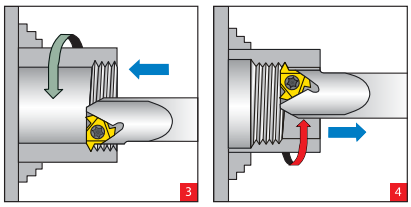
External RH thread



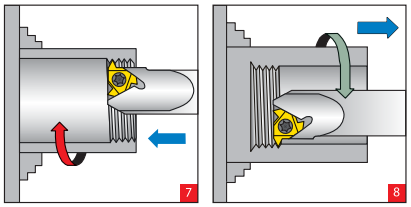
External LH thread



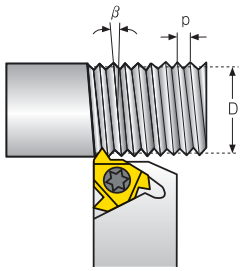
Internal RH thread



Internal LH thread



Calculating the helix angle (β)



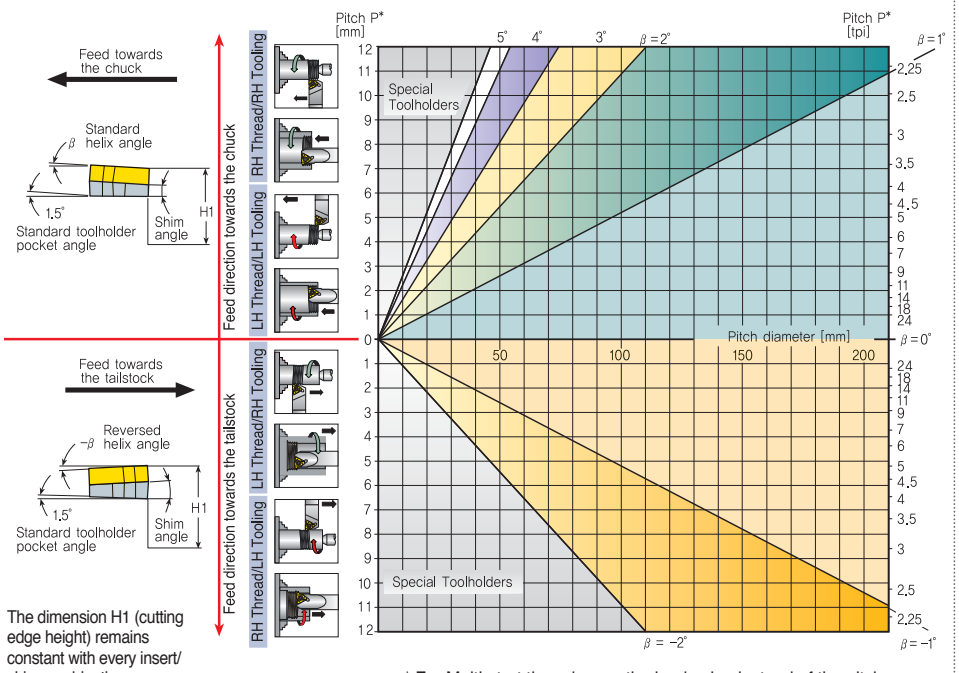
• The helix angle is calculated by the following formula:

$$\beta = \tan^{-1}\frac{P \times N}{\pi \times D}$$

β: Helix angle (°)
P: Pitch (inch)
N: No. of starts
D: Pitch diameter (inch)
Lead = P x N

• The helix angle can also be found from the diagram below

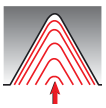
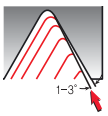
Helix angle diagram



The dimension H1 (cutting edge height) remains constant with every insert/ shim combination

* For Multi-start threads, use the lead value instead of the pitch

Thread infeed method

Infeed		Application		
	**Radial Infeed**	• When the pitch is smaller than 16 tpi • For material with short chips • For work with hardened material	→	Radial infeed is the simplest and quickest method The feed is perpendicular to the turning axis, and both flanks of the insert perform the cutting operation. Radial infeed is recommended in 3 cases
	**Flank Infeed (modified)**	• When the thread pitch is greater than 16 tpi. Using the radial method,the effective cutting edge length is too large, resulting in chatter. for TRAPEZ and ACME. The radial method results in three cutting edges, making chip flow very difficult	→	Flank infeed is recommended in the following cases
	**Alternate Flank Infeed**	• This method divides the load equally on both flanks, resulting in equal wear along the cutting edges. Alternate flank infeed requires more complicated programming, and is not available on all lathes	→	Use of the alternate flank method is recommended especially in large pitches and for materials with long chips

Shim

Standard shim

ATE (External) ATI (Through)



Helix angle 1.5°

Insert size	d	9.525 (3/8)		12.7 (1/2)		15.875 (5/8)	
	L	16		22		27	
Holder		ER(L)H	IR(L)H	ER(L)H	IR(L)H	ER(L)H	IR(L)H
Ordering code		ATE16	ATI16	ATE22	ATI22	ATE27	ATI27

※ Standard shim has lead angle 1.5°

Application grade

Grade	Features		Available insert type
PC5300	Universal grade	• For chip breaker type only • Stable machining on a wide application due to fine-grained carbide substrate with balanced heat resistance and toughness • Excellent wear resistance and oxidation resistance due to AiTN coating film Outstanding performance on high speed machining	ERM/IRM (Insert with Chip breaker)
PC3030T	Specialized grade for threading inserts	• A tough sub-micron substrate with TiAlN coating provides good fracture toughness and excellent wear resistance • Outstanding performance on STS and hard to cut materials	ER/IR (Ground insert)
PC9070	Specialized grade for threading inserts	• Strong wear resistance in stainless machining thanks to multilayer PVD coatings	ER/IR (Ground insert)

Application range

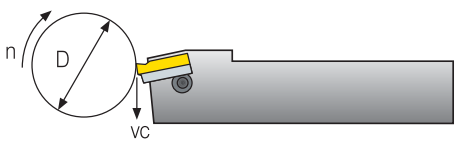
Workpiece		● ◄·····► ✿
P	Carbon steel, Alloy steel, Cast Steel	PC5300 PC3030T
M	Stainless steel, Heat resistant steel, Titanium alloy steel	PC5300 PC3030T PC9070
K	Carbon Iron, Aluminum, Cast Steel, Copper	PC5300 PC3030T

Recommended cutting condition

Workpiece			Hardness brinell (HB)	vc (sfm)		
				PC3030T	PC9070	PC5300
P	Carbon steel	Low carbon (C = 0.1-0.25 %)	125	380~630		360~620
		Medium carbon (C = 0.25-0.55 %)	150	330~580		330~540
		High carbon (C = 0.55-0.85 %)	170	300~510		290~510
	Low alloy steel (alloying elements ≤ 5%)	Non-hardened	180	330~600		330~590
		Hardened	275	250~460		250~460
		Hardened	350	230~450		230~440
	High alloy steel (alloying elements > 5%)	Annealed	200	260~400		260~390
		Hardened	325	170~330		160~330
	Cast steel	Low alloy (alloying elements <5%)	200	230~430		230~430
		High alloy (alloying elements >5%)	225	200~400		200~390
M	Stainless steel ferritic	Non-hardened	200	230~430	230~490	230~430
		Hardened	330	170~310	200~410	160~310
	Stainless steel austenitic	Austenitic	180	260~400	290~520	260~390
		Super austenitic	200	100~330	130~390	100~330
	Stainless steel cast ferritic	Non-hardened	200	300~400	290~490	290~390
		Hardened	330	220~360	210~390	210~360
	Stainless steel cast austenitic	Austenitic	200	280~360	280~390	280~360
		Hardened	330	200~330	190~360	200~330
	High temperature alloy	Annealed (Iron based)	200	150~200		150~190
		Aged (Iron based)	280	100~170		100~160
		Annealed (Nickel or Cobalt based)	250	70~100		65~160
		Aged (Nickel or Cobalt based)	350	50~80		50~80
	Titanium alloy	99.5% pure Titanium	400Rm	460~560		460~560
		Titanium alloy	1050Rm	170~230		160~230
K	Extra hard steel	Hardened & tempered	55HRC	150~200		150~190
	Malleable cast iron	Ferritic (short chips)	130	230~400		190~390
		Pearlitic (long chips)	230	230~400		190~390
	Gray cast iron	Low tensile strength	180	230~430		190~430
		High tensile strength	260	200~330		200~330
	Nodular SG iron	Ferritic	160	410~530		410~520
		Pearlitic	260	300~400		290~390
	Aluminum alloy wrought	Non-aging	60	330~830		330~820
		Aged	100	260~600		260~590
	Aluminum alloy	Cast	75	660~1300		660~1310
		Cast & aged	90	660~920		660~920
		Cast Si 13-22%	130	200~500		200~590
	Copper and copper alloy	Brass	90	260~400		260~690
		Bronze and non-leaded copper	100	260~400		260~690

Calculation of n [RPM]

$$n = \frac{vc \times 12}{\pi \times D} \qquad vc = \frac{\pi \times D \times n}{12}$$



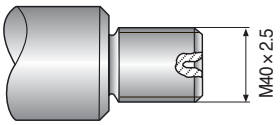
n: Revolution Per Minute [min^{-1}]
vc: Cutting Speed [sfm]
D: Workpiece Diameter [inch]

Number of passes

Pitch	mm	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	8.00
	tpi	48	32	24	20	16	14	12	10	8	7	6	5.5	5	4.5	4	3
No. of passes		4~6	4~7	4~8	5~9	6~10	7~12	7~12	8~14	9~16	10~18	11~18	11~19	12~20	12~20	12~20	15~24

※ One cutting depth is calculated by total cutting depth divided into machining times
ex) ER16-1.5ISO, hmin 0.92: If 10 times machining, one cutting depth is 0.092 (0.92/10)

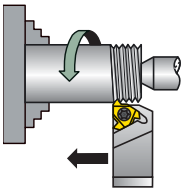
Step by step thread turning



Application

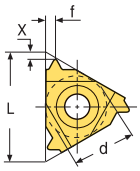
- Thread: External right hand ISO metric M40x2.5
- Material: 4140 (25 HRC)

1 Choose the thread turning method



Feed direction towards the chuck was chosen
Therefore an external right hand insert and an external right hand holder will be used

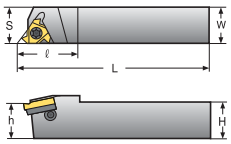
2 Choose the insert size



Chosen insert: ER16-2.5 ISO

Insert size	Pitch	Ordering code	Shim	Tool holder
d	mm	RH (Right Hand)	RH (Right Hand)	
3/8	2.5	ER16-2.5ISO	ATE16	ERH□□-16

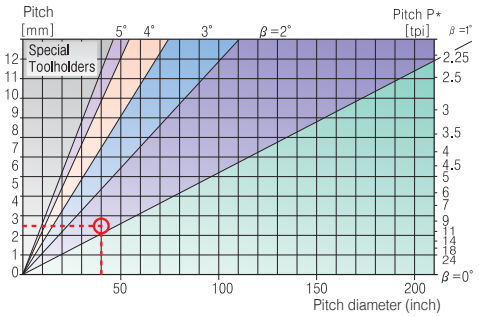
3 Choose the tool holder



Chosen tool holder: ERH 25-16

Insert size	Ordering code	Dimensions (inch)				
d	RH (Right Hand)	H=h	W	S	L	ℓ
3/8	ERH25-16	0.625	0.625	0.625	5.0	1.02

4 Determine the helix angle



From the table, using a pitch of 2.5 mm(10 tpi) and a workpiece diameter of 40mm (1.57"), we find the helix angle to be 1.5°

5 Choose the correct shim

Resultant helix angle		1.5°
Insert size	d	3/8
	L	16
Ordering Code		ATE16

6 Choose the carbide grade and cutting speed

Workpiece			HB	vc (sfm)
				PC3030T
P	Low alloy steel (alloying elements ≤ 5%)	Non-hardened	180	330~600
		Hardened	275	250~460
		Hardened	350	230~450

- Carbide grade chosen: PC3030T
- Cutting speed: 460 sfm

7 Determine the number of passes

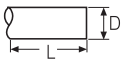
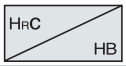
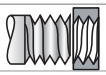
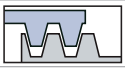
Pitch	mm	1.50	1.75	2.00	2.50	3.00	3.50	4.00
	tpi	16	14	12	10	8	7	6
No.of passes		6~10	7~12	7~12	8~14	9~16	10~18	11~18

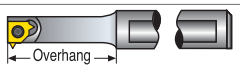
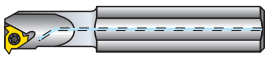
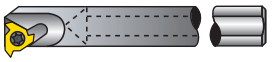
- Carbide grade chosen: PC3030T
- Cutting speed: 460 sfm

8 Summary

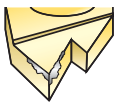
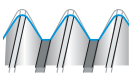
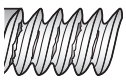
Thread type	ISO M40 x 2.5 External right hand
1. Feed Direction	Towards the chuck
2. Insert and Grade	ER16-2.5ISO, PC3030T
3. Tool holder	ERH25-16
4. Helix Angle	1.5°
5. Shim	ATE16
6. Cutting Speed (sfm)	460
7. Number of Passes	10

Cutting condition depending on

Workpiece	Material type	
	Material dimension	
	Diameter and length chipflow character	
	Material hardness	
Thread application	External or internal	
	Profile shape	
	Surface finish	
Machine	Machine stability	
	Max. RPM	
	Clamping system stability	

Coolant	Coolant type	
Holders	Holder cross section area	
	Holder overhang	
	Through coolant option	
	Shank type: Carbide, Alloy,	
Insert	Carbide implant grade	P M K
	Profile Shape: pitch and depth	
	Nose radius	
	Chipbreaker style	

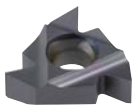
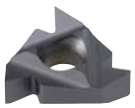
Trouble shooting

Problem	Possible cause	Solution
 **Increased flank wear**	Cutting speed too high	Reduce cutting speed/ use coated insert
	Depth of cut too low/too many passes	Increase the depth of cut per pass
	Unsuitable carbide grade	Use a coated carbide grade
	Insufficient cooling	Increase coolant flow rate
 **Uneven cutting edge wear**	Incorrect helix angle	Choose the correct shim
	Wrong infeed method	Use the Alternating Flank Infeed method
 **Extreme plastic deformation**	Depth of cut too large	Decrease depth of cut/ increase number of passes
	Insufficient cooling	Increase coolant flow rate
	Cutting speed too high	Reduce cutting speed
	Unsuitable carbide grade	Use a tougher carbide
	Nose radius too small	Use an insert with a larger radius, if possible
 **Cutting edge breakage**	Depth of cut too large	Decrease depth of cut/ increase number of passes.
	Extreme plastic deformation	Use a tougher carbide
	Insufficient cooling	Increase flow rate and/ or correct flow direction
	Unsuitable ca rbide grade	Use a tougher carbide
	Instability	Check stability of the system
 **Built-up edge**	Incorrect cutting speed	Change the cutting speed
	Unsuitable carbide grade	Use a coated carbide
 **Thread profile is too shallow**	The tool is not at the workpiece axis height	Change tool height
	Insert is not machining the thread crest	Measure the workpiece diameter
	Worn insert	Change the cutting edge sooner
 **Poor surface quality**	Too low cutting speed	Increase cutting speed
	Wrong shim	Choose correct shim
	Flank infeed method is not appropriate	Use the alternate flank or radial infeed method

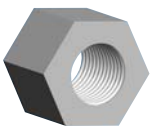
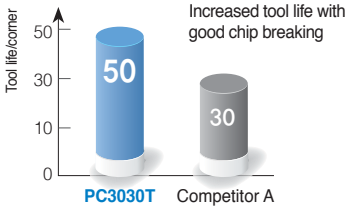
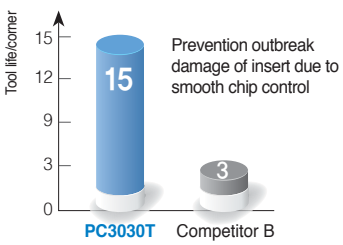
Threading insert with chip breaker

Features

- Economical insert
- Good toughness and high accuracy as ground type inserts
- Exclusive insert design improves chip control
- New grade for general application of various kinds of workpieces

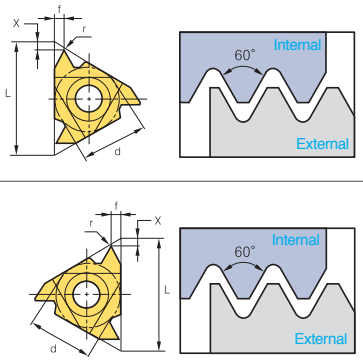
Type	Ground insert		Insert with a chip breaker			
C/B Code	None		None		U	
Designation	ER16-1.5ISO		ERM16-1.5ISO		ERM16-1.5ISO-U	
Machining	External	Internal	External	Internal	External	Internal
Insert shape						
Chip shape						
Class	P, M, K, N, S		P, M, K		P, M, K	
Application	G-Class		M-Class		M-Class	
Features	• Groove-shaped chip breaker with superior chip evacuation lowers cutting load • Enables high precision machining • Applicable for machining of various shapes of threads • Applicable for machining of various workpieces		• Unique 3 dimensional chip breaker improves machinability with good chip control • Excellent cutting edge treatment technology ensures high precision sharp cutting edge		• Groove-shaped chip breaker with superior chip evacuation lowers cutting load • Reduces machining pass by 10~30% • Excellent cutting edge treatment achieves high precision sharp cutting edge	

Application examples

KORLOY		ERM16-1.5ISO [PC3030T]	IRM16-2.0ISO [PC3030T]
Competitor tools		ER16-1.5ISO [K-Maker]	IR16-2.0ISO [S-Maker]
Workpiece	Material	1040	304
	Figure		
Cutting condition	Cutting speed (sfm)	200	400
	Pass	8	9
	Machining	Radial infeed	Radial infeed
	Pitch	1.5	2.0
Coolant		Wet	Wet
Result			

Partial profile 60°

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ER 11-A60	●	●	EL 11-A60			0.5~1.5	48~16	1/4	0.433	0.002	0.03	0.04	
	16-A60	●	●	16-A60	●		0.5~1.5	48~16	3/8	0.630	0.011	0.05	0.07	
	16-G60	●		16-G60	●		1.75~3.0	14~8	3/8	0.630	0.011	0.05	0.07	
	16-AG60	●	●	16-AG60	●		0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N60	●	●	22-N60	●		3.5~5.0	7~5	1/2	0.866	0.021	0.07	0.10	
	27-Q60	●		27-Q60			5.5~6.0	4.5~4	5/8	1.063	0.021	0.07	0.10	
Internal	IR 11-A60	●	●	IL 11-A60	●	●	0.5~1.5	48~16	1/4	0.433	0.002	0.03	0.04	
	16-A60	●	●	16-A60	●		0.5~1.5	48~16	3/8	0.630	0.002	0.03	0.04	
	16-G60	●		16-G60	●		1.75~3.0	14~8	3/8	0.630	0.006	0.05	0.07	
	16-AG60	●	●	16-AG60	●		0.5~3.0	48~8	3/8	0.630	0.002	0.05	0.07	
	22-N60	●	●	22-N60	●		3.5~5.0	7~5	1/2	0.866	0.012	0.08	0.10	
	27-Q60	●	●	27-Q60			5.5~6.0	4.5~4	5/8	1.063	0.012	0.07	0.11	

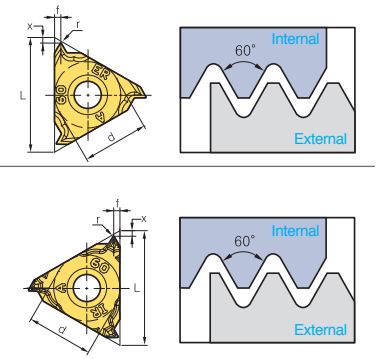


Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

Partial profile 60° (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-A60	●				0.5~1.5	48~16	3/8	0.630	0.003	0.05	0.07	
	16-G60	●				1.75~3.0	14~8	3/8	0.630	0.003	0.05	0.07	
	16-AG60	●				0.5~3.0	48~8	3/8	0.630	0.030	0.05	0.07	
	22-N60	●				3.5~5.0	7~5	1/2	0.866	0.021	0.07	0.10	
Internal	IRM 11-A60	●				0.5~1.5	48~16	1/4	0.433	0.003	0.03	0.04	
	16-A60	●				0.5~1.5	48~16	3/8	0.630	0.003	0.03	0.04	
	16-G60	●				1.75~3.0	14~8	3/8	0.630	0.047	0.05	0.07	
	16-AG60	●				0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N60	●				3.5~5.0	7~5	1/2	0.866	0.012	0.07	0.10	

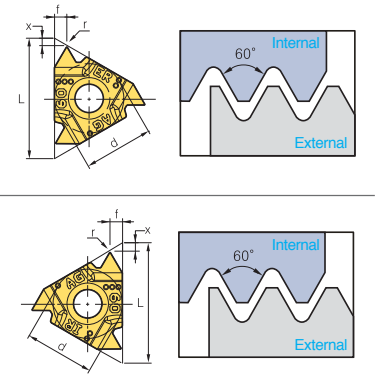


Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

Partial profile 60° (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-AG60-U					0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
Internal	IRM 16-AG60-U					0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	

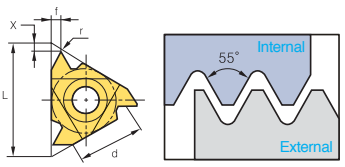


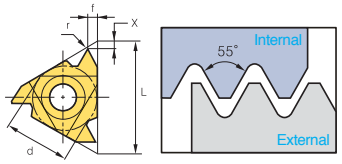
Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

Partial profile 55°

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ER 11-A55			EL 11-A55			0.5~1.5	48~16	1/4	0.433	0.002	0.03	0.04	
	16-A55	●		16-A55			0.5~1.5	48~16	3/8	0.630	0.002	0.03	0.04	
	16-G55	●		16-G55			1.75~3.0	14~8	3/8	0.630	0.008	0.05	0.07	
	16-AG55	●		16-AG55	●		0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N55	●		22-N55			3.5~5.0	7~5	1/2	0.866	0.017	0.07	0.10	
	27-Q55			27-Q55			5.5~6.0	4.5~4	5/8	1.063	0.024	0.08	0.11	
Internal	IR 11-A55	●		IL 11-A55	●		0.5~1.5	48~16	1/4	0.433	0.002	0.03	0.04	
	16-A55	●		16-A55			0.5~1.5	48~16	3/8	0.630	0.020	0.02	0.04	
	16-G55	●		16-G55			1.75~3.0	14~8	3/8	0.630	0.008	0.05	0.07	
	16-AG55	●		16-AG55	●		0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N55	●		22-N55			3.5~5.0	7~5	1/2	0.866	0.017	0.67	0.10	
	27-Q55			27-Q55			5.5~6.0	4.5~4	5/8	1.063	0.024	0.08	0.10	



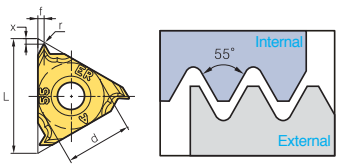


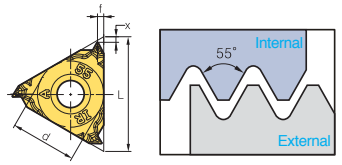
Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

Partial profile 55° (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-A55	●				0.5~1.5	48~16	3/8	0.630	0.003	0.03	0.04	
	16-G55	●				1.75~3.0	14~8	3/8	0.630	0.008	0.05	0.07	
	16-AG55	●				0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N55	●				3.5~5.0	7~5	1/2	0.866	0.017	0.07	0.10	
Internal	IRM 11-A55	●				0.5~1.5	48~16	1/4	0.433	0.003	0.03	0.04	
	16-A55	●				0.5~1.5	48~16	3/8	0.630	0.003	0.03	0.04	
	16-G55					1.75~3.0	14~8	3/8	0.630	0.009	0.05	0.07	
	16-AG55	●				0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
	22-N55	●				3.5~5.0	7~5	1/2	0.866	0.017	0.07	0.10	



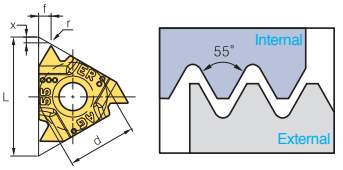


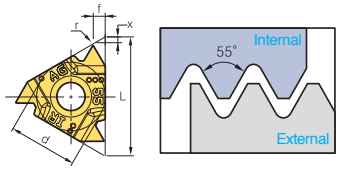
Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

Partial profile 55° (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-AG55-U					0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	
Internal	IRM 16-AG55-U					0.5~3.0	48~8	3/8	0.630	0.003	0.05	0.07	

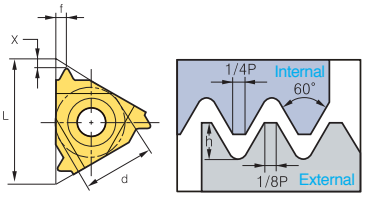




Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

ISO Metric

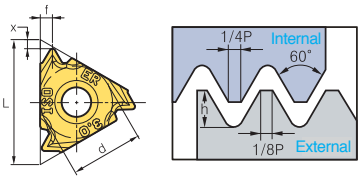
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 11-0.35ISO			EL 11-0.35ISO			0.35	1/4	0.433	0.008	0.03	0.02	
	11-0.4ISO			11-0.4ISO			0.4	1/4	0.433	0.011	0.03	0.02	
	11-0.45ISO			11-0.45ISO			0.45	1/4	0.433	0.011	0.03	0.02	
	11-0.5ISO			11-0.5ISO			0.5	1/4	0.433	0.012	0.02	0.02	
	11-0.6ISO			11-0.6ISO			0.6	1/4	0.433	0.015	0.02	0.02	
	11-0.7ISO			11-0.7ISO			0.7	1/4	0.433	0.017	0.02	0.02	
	11-0.75ISO			11-0.75ISO			0.75	1/4	0.433	0.017	0.02	0.02	
	11-0.8ISO			11-0.8ISO			0.8	1/4	0.433	0.019	0.02	0.02	
	11-1.0ISO			11-1.0ISO			1.0	1/4	0.433	0.024	0.02	0.03	
	11-1.25ISO		●	11-1.25ISO			1.25	1/4	0.433	0.030	0.03	0.04	
	11-1.5ISO	●		11-1.5ISO			1.5	1/4	0.433	0.036	0.03	0.04	
	11-1.75ISO			11-1.75ISO			1.75	1/4	0.433	0.042	0.03	0.04	
	16-0.35ISO			16-0.35ISO			0.35	3/8	0.630	0.008	0.03	0.02	
	16-0.4ISO			16-0.4ISO			0.4	3/8	0.630	0.010	0.03	0.02	
	16-0.45ISO	●		16-0.45ISO			0.45	3/8	0.630	0.011	0.03	0.02	
	16-0.5ISO	●		16-0.5ISO	●		0.5	3/8	0.630	0.012	0.03	0.02	
	16-0.6ISO	●		16-0.6ISO			0.6	3/8	0.630	0.015	0.02	0.02	
	16-0.7ISO	●		16-0.7ISO			0.7	3/8	0.630	0.017	0.02	0.02	
	16-0.75ISO	●		16-0.75ISO			0.75	3/8	0.630	0.018	0.02	0.02	
	16-0.8ISO	●	●	16-0.8ISO			0.8	3/8	0.630	0.019	0.02	0.03	
	16-1.0ISO	●	●	16-1.0ISO	●		1.0	3/8	0.630	0.024	0.02	0.03	
	16-1.25ISO	●	●	16-1.25ISO			1.25	3/8	0.630	0.030	0.03	0.04	
	16-1.5ISO	●	●	16-1.5ISO	●		1.5	3/8	0.630	0.036	0.03	0.04	
	16-1.75ISO	●	●	16-1.75ISO			1.75	3/8	0.630	0.042	0.04	0.05	
	16-2.0ISO	●	●	16-2.0ISO	●		2.0	3/8	0.630	0.048	0.04	0.05	
	16-2.5ISO	●	●	16-2.5ISO			2.5	3/8	0.630	0.060	0.04	0.07	
	16-3.0ISO	●	●	16-3.0ISO			3.0	3/8	0.060	0.067	0.05	0.07	
	22-3.5ISO	●	●	22-3.5ISO			3.5	1/2	0.866	0.085	0.06	0.09	
	22-4.0ISO	●	●	22-4.0ISO	●		4.0	1/2	0.866	0.096	0.06	0.09	
	22-4.5ISO	●	●	22-4.5ISO			4.5	1/2	0.866	0.109	0.06	0.09	
	22-5.0ISO	●	●	22-5.0ISO			5.0	1/2	0.866	0.121	0.06	0.10	
	27-5.5ISO			27-5.5ISO			5.5	5/8	1.063	0.133	0.06	0.11	
	27-6.0ISO		●	27-6.0ISO			6.0	5/8	1.063	0.145	0.08	0.11	

Applicable holders D31

●: Korea Stock ●: US Stock

ISO Metric (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ERM 16-1.0ISO	●				1.0	3/8	0.630	0.024	0.02	0.03	
	16-1.25ISO					1.25	3/8	0.630	0.030	0.03	0.04	
	16-1.5ISO	●				1.5	3/8	0.630	0.036	0.03	0.04	
	16-1.75ISO	●				1.75	3/8	0.630	0.042	0.04	0.05	
	16-2.0ISO	●				2.0	3/8	0.630	0.049	0.04	0.05	
	16-2.5ISO	●				2.5	3/8	0.630	0.060	0.04	0.05	
	16-3.0ISO	●				3.0	3/8	0.630	0.073	0.05	0.06	

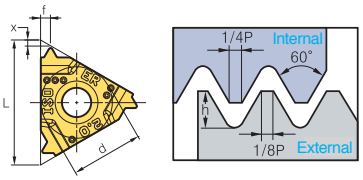


Applicable holders D31

●: Korea Stock ●: US Stock

ISO Metric (U chip breaker) new

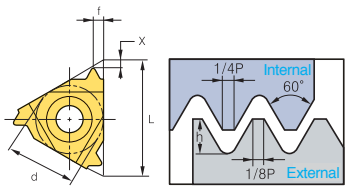
Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ERM 16-1.5ISO-U					1.5	3/8	0.630	0.036	0.03	0.04	
	16-2.0ISO-U					2.0	3/8	0.630	0.049	0.04	0.05	



Applicable holders D31

●: Korea Stock ●: US Stock

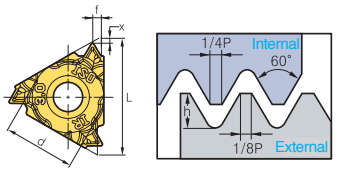
ISO Metric

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (inch) d	L	hmin	X	f	Picture
Internal	IR 11-0.35ISO			IL 11-0.35ISO			0.35	1/4	0.433	0.008	0.03	0.01	
	11-0.4ISO			11-0.4ISO			0.4	1/4	0.433	0.009	0.03	0.02	
	11-0.45ISO			11-0.45ISO			0.45	1/4	0.433	0.010	0.03	0.02	
	11-0.5ISO	●		11-0.5ISO	●		0.5	1/4	0.433	0.001	0.02	0.02	
	11-0.6ISO			11-0.6ISO			0.6	1/4	0.433	0.014	0.02	0.02	
	11-0.7ISO			11-0.7ISO			0.7	1/4	0.433	0.016	0.02	0.02	
	11-0.75ISO	●		11-0.75ISO	●		0.75	1/4	0.433	0.017	0.02	0.02	
	11-0.8ISO			11-0.8ISO			0.8	1/4	0.433	0.018	0.02	0.03	
	11-1.0ISO	●	●	11-1.0ISO	●	●	1.0	1/4	0.433	0.023	0.02	0.03	
	11-1.25ISO	●	●	11-1.25ISO			1.25	1/4	0.433	0.028	0.03	0.04	
	11-1.5ISO	●	●	11-1.5ISO	●		1.5	1/4	0.433	0.034	0.03	0.04	
	11-1.75ISO		●	11-1.75ISO			1.75	1/4	0.433	0.040	0.04	0.04	
	11-2.0ISO	●	●	11-2.0ISO	●		2.0	1/4	0.433	0.045	0.03	0.04	
	11-2.5ISO	●		11-2.5ISO	●		2.5	1/4	0.433	0.057	0.03	0.04	
	16-0.35ISO			16-0.35ISO			0.35	3/8	0.630	0.008	0.03	0.01	
	16-0.4ISO			16-0.4ISO			0.4	3/8	0.630	0.009	0.03	0.02	
	16-0.45ISO			16-0.45ISO			0.45	3/8	0.630	0.010	0.03	0.02	
	16-0.5ISO	●		16-0.5ISO			0.5	3/8	0.630	0.011	0.03	0.02	
	16-0.6ISO			16-0.6ISO			0.6	3/8	0.630	0.014	0.02	0.02	
	16-0.7ISO			16-0.7ISO			0.7	3/8	0.630	0.016	0.02	0.02	
	16-0.75ISO	●		16-0.75ISO			0.75	3/8	0.630	0.017	0.02	0.02	
	16-0.8ISO			16-0.8ISO			0.8	3/8	0.630	0.018	0.02	0.02	
	16-1.0ISO	●	●	16-1.0ISO			1.0	3/8	0.630	0.023	0.02	0.03	
	16-1.25ISO	●	●	16-1.25ISO			1.25	3/8	0.630	0.028	0.03	0.04	
	16-1.5ISO	●	●	16-1.5ISO			1.5	3/8	0.630	0.034	0.03	0.04	
	16-1.75ISO	●	●	16-1.75ISO			1.75	3/8	0.630	0.040	0.04	0.05	
	16-2.0ISO	●	●	16-2.0ISO	●		2.0	3/8	0.630	0.045	0.04	0.05	
	16-2.5ISO	●	●	16-2.5ISO	●		2.5	3/8	0.630	0.057	0.04	0.07	
	16-3.0ISO	●	●	16-3.0ISO	●		3.0	3/8	0.630	0.068	0.04	0.06	
	22-3.5ISO	●	●	22-3.5ISO			3.5	1/2	0.866	0.08	0.06	0.09	
	22-4.0ISO	●	●	22-4.0ISO	●		4.0	1/2	0.866	0.091	0.06	0.09	
	22-4.5ISO	●	●	22-4.5ISO			4.5	1/2	0.866	0.102	0.06	0.09	
	22-5.0ISO	●	●	22-5.0ISO			5.0	1/2	0.866	0.114	0.06	0.09	
	27-5.5ISO			27-5.5ISO			5.5	5/8	1.063	0.125	0.06	0.09	
	27-6.0ISO	●		27-6.0ISO	●		6.0	5/8	1.063	0.136	0.07	0.10	

Applicable holders D32

●: Korea Stock ●: US Stock

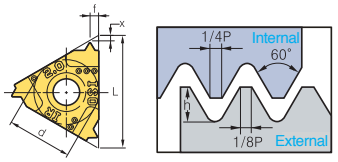
ISO Metric (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (inch) d	L	hmin	X	f	Picture
Internal	IRM 11-1.5ISO	●				1.5	1/4	0.433	0.034	0.03	1.04	
	16-1.0ISO	●				1.0	3/8	0.630	0.023	0.02	0.03	
	16-1.25ISO					1.25	3/8	0.630	0.034	0.03	0.04	
	16-1.5ISO	●				1.5	3/8	0.630	0.028	0.03	1.04	
	16-1.75ISO					1.75	3/8	0.630	0.034	1.04	1.05	
	16-2.0ISO	●				2.0	3/8	0.630	0.045	1.04	1.05	
	16-2.5ISO	●				2.5	3/8	0.630	0.057	1.04	1.06	
	16-3.0ISO	●				3.0	3/8	0.630	0.068	1.04	1.06	

Applicable holders **D32**

●: Korea Stock ●: US Stock

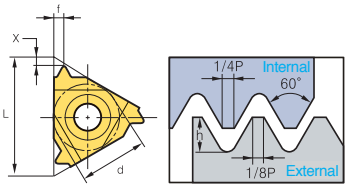
ISO Metric (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (inch) d	L	hmin	X	f	Picture
Internal	IRM 16-1.5ISO-U					1.5	3/8	0.630	0.034	0.03	1.04	
	16-2.0ISO-U					2.0	3/8	0.630	0.045	1.04	1.05	

Applicable holders **D32**

●: Korea Stock ●: US Stock

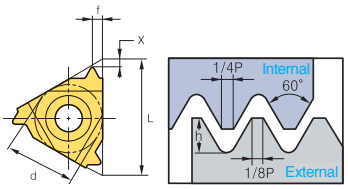
American UN (UN, UNC, UNF, UNEF, UNS)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 11-72UN			EL 11-72UN			72	1/4	0.433	0.009	1/32	0.016	
	11-64UN			11-64UN			64	1/4	0.433	0.009	1/32	0.016	
	11-56UN			11-56UN			56	1/4	0.433	0.011	0.028	0.016	
	11-48UN			11-48UN			48	1/4	0.433	0.013	0.024	0.024	
	11-44UN			11-44UN			44	1/4	0.433	0.014	0.024	0.024	
	11-40UN			11-40UN			40z	1/4	0.433	0.015	0.024	0.024	
	11-36UN			11-36UN			36	1/4	0.433	0.017	0.024	0.024	
	11-32UN			11-32UN			32	1/4	0.433	0.019	0.024	0.024	
	11-28UN			11-28UN			28	1/4	0.433	0.022	0.024	0.028	
	11-27UN			11-27UN			27	1/4	0.433	0.023	0.028	0.031	
	11-24UN			11-24UN			24	1/4	0.433	0.026	0.028	0.031	
	11-20UN			11-20UN			20	1/4	0.433	0.031	1/32	0.035	
	11-18UN			11-18UN			18	1/4	0.433	0.034	1/32	0.039	
	11-16UN			11-16UN			16	1/4	0.433	0.038	0.035	0.043	
	11-14UN			11-14UN			14	1/4	0.433	0.044	0.035	0.043	
	16-72UN			16-72UN			72	3/8	0.630	0.009	1/32	0.016	
	16-64UN			16-64UN			64	3/8	0.630	0.009	1/32	0.016	
	16-56UN			16-56UN			56	3/8	0.630	0.011	0.028	0.016	
	16-48UN			16-48UN			48	3/8	0.630	0.013	0.024	0.024	
	16-44UN			16-44UN			44	3/8	0.630	0.014	0.024	0.024	
	16-40UN			16-40UN			40	3/8	0.630	0.015	0.024	0.024	
	16-36UN			16-36UN			36	3/8	0.630	0.017	0.024	0.024	
	16-32UN	●		16-32UN			32	3/8	0.630	0.008	0.024	0.024	
	16-28UN			16-28UN			28	3/8	0.630	0.022	0.024	0.028	
	16-27UN			16-27UN			27	3/8	0.630	0.023	0.028	0.031	
	16-24UN	●	●	16-24UN			24	3/8	0.630	0.026	0.028	0.031	
	16-20UN	●	●	16-20UN			20	3/8	0.630	0.031	1/32	0.035	
	16-18UN	●	●	16-18UN			18	3/8	0.630	0.034	1/32	0.039	
	16-16UN	●	●	16-16UN			16	3/8	0.630	0.038	0.035	0.043	
	16-14UN	●	●	16-14UN			14	3/8	0.630	0.004	0.039	0.047	
	16-13UN			16-13UN			13	3/8	0.630	0.047	0.039	0.051	
	16-12UN	●	●	16-12UN			12	3/8	0.630	0.051	0.043	0.055	
	16-11.5UN			16-11.5UN			11.5	3/8	0.630	0.053	0.043	0.059	
	16-11UN	●	●	16-11UN			11	3/8	0.630	0.056	0.043	0.059	
	16-10UN	●	●	16-10UN			10	3/8	0.630	0.061	0.043	0.059	
	16-9UN	●		16-9UN			9	3/8	0.630	0.068	0.047	0.067	
	16-8UN	●		16-8UN			8	3/8	0.630	0.077	0.047	0.063	
	22-7UN			22-7UN			7	1/2	0.866	0.087	0.063	0.091	
	22-6UN			22-6UN			6	1/2	0.866	0.102	0.063	0.091	
	22-5UN			22-5UN			5	1/2	0.866	0.123	0.067	0.098	
	27-4.5UN			27-4.5UN			4.5	5/8	1.063	0.136	0.075	0.106	
	27-4UN			27-4UN			4	5/8	1.063	0.153	0.083	0.118	

Applicable holders D31

●: Korea Stock ●: US Stock

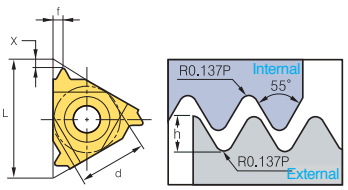
American UN (UN, UNC, UNF, UNEF, UNS)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
Internal	IR 11-72UN			IL 11-72UN			72	1/4	0.433	0.008	1/32	0.012	
	11-64UN			11-64UN			64	1/4	0.433	0.009	1/32	0.016	
	11-56UN			11-56UN			56	1/4	0.433	0.010	0.028	0.016	
	11-48UN			11-48UN			48	1/4	0.433	0.012	0.024	0.024	
	11-44UN			11-44UN			44	1/4	0.433	0.013	0.024	0.024	
	11-40UN			11-40UN			40	1/4	0.433	0.015	0.024	0.024	
	11-36UN			11-36UN			36	1/4	0.433	0.016	0.024	0.024	
	11-32UN			11-32UN			32	1/4	0.433	0.018	0.024	0.024	
	11-28UN			11-28UN			28	1/4	0.433	0.020	0.024	0.028	
	11-27UN			11-27UN			27	1/4	0.433	0.021	0.028	0.031	
	11-24UN			11-24UN			24	1/4	0.433	0.024	0.028	0.031	
	11-20UN		●	11-20UN			20	1/4	0.433	0.029	1/32	0.035	
	11-18UN	●		11-18UN			18	1/4	0.433	0.032	1/32	0.039	
	11-16UN		●	11-16UN			16	1/4	0.433	0.036	0.035	0.043	
	11-14UN			11-14UN			14	1/4	0.433	0.041	0.035	0.043	
	11-12UN		●	11-12UN			12	1/4	0.433	0.048	1/32	0.043	
	11-11UN	●		11-11UN			11	1/4	0.433	0.052	1/32	0.043	
	16-72UN			16-72UN			72	3/8	0.630	0.008	1/32	0.012	
	16-64UN			16-64UN			64	3/8	0.630	0.009	1/32	0.016	
	16-56UN			16-56UN			56	3/8	0.630	0.010	0.028	0.016	
	16-48UN			16-48UN			48	3/8	0.630	0.012	0.024	0.024	
	16-44UN			16-44UN			44	3/8	0.630	0.013	0.024	0.024	
	16-40UN			16-40UN			40	3/8	0.630	0.015	0.024	0.024	
	16-36UN			16-36UN			36	3/8	0.630	0.016	0.024	0.024	
	16-32UN			16-32UN			32	3/8	0.630	0.020	0.024	0.024	
	16-28UN			16-28UN			28	3/8	0.630	0.020	0.024	0.028	
	16-27UN			16-27UN			27	3/8	0.630	0.021	0.028	0.031	
	16-24UN			16-24UN			24	3/8	0.630	0.024	0.028	0.031	
	16-20UN	●		16-20UN			20	3/8	0.630	0.029	1/32	0.035	
	16-18UN		●	16-18UN			18	3/8	0.630	0.032	1/32	0.039	
	16-16UN	●	●	16-16UN			16	3/8	0.630	0.036	0.035	0.043	
	16-14UN	●		16-14UN			14	3/8	0.630	0.041	0.035	0.047	
	16-13UN			16-13UN			13	3/8	0.630	0.044	0.039	0.051	
	16-12UN	●	●	16-12UN			12	3/8	0.630	0.048	0.043	0.055	
	16-11.5UN			16-11.5UN			11.5	3/8	0.630	0.050	0.043	0.059	
	16-11UN	●	●	16-11UN			11	3/8	0.630	0.052	0.043	0.059	
	16-10UN	●		16-10UN	●		10	3/8	0.630	0.058	0.043	0.059	
	16-9UN		●	16-9UN			9	3/8	0.630	0.064	0.047	0.067	
	16-8UN	●	●	16-8UN	●		8	3/8	0.630	0.072	0.043	0.059	
	22-7UN			22-7UN			7	1/2	0.866	0.082	0.063	0.091	
	22-6UN			22-6UN			6	1/2	0.866	0.096	0.063	0.091	
	22-5UN			22-5UN			5	1/2	0.866	0.115	0.063	0.091	
	27-4.5UN			27-4.5UN			4.5	5/8	1.063	0.128	0.067	0.094	
	27-4UN			27-4UN			4	5/8	1.063	0.144	0.071	0.106	

Applicable holders D32

● : Korea Stock ● : US Stock

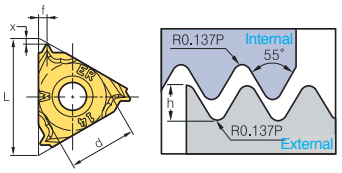
Whitworth (BSW, BSF, BSP, BSB)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (inch)					Picture
							(tpi)	d	L	hmin	X	f	
External	ER 11-72W			EL 11-72W			72	1/4	0.433	0.009	0.028	0.016	
	11-60W			11-60W			60	1/4	0.433	0.011	0.028	0.016	
	11-56W			11-56W			56	1/4	0.433	0.011	0.028	0.016	
	11-48W			11-48W			48	1/4	0.433	0.013	0.024	0.024	
	11-40W			11-40W			40	1/4	0.433	0.016	0.024	0.024	
	11-36W			11-36W			36	1/4	0.433	0.018	0.024	0.024	
	11-32W			11-32W			32	1/4	0.433	0.020	0.024	0.024	
	11-28W			11-28W			28	1/4	0.433	0.023	0.024	0.028	
	11-26W			11-26W			26	1/4	0.433	0.025	0.028	0.031	
	11-24W			11-24W			24	1/4	0.433	0.027	0.028	0.031	
	11-22W			11-22W			22	1/4	0.433	0.029	1/32	0.035	
	11-20W			11-20W			20	1/4	0.433	0.032	1/32	0.035	
	11-19W			11-19W			19	1/4	0.433	0.034	1/32	0.039	
	11-18W			11-18W			18	1/4	0.433	0.035	1/32	0.039	
	11-16W			11-16W			16	1/4	0.433	0.040	0.035	0.043	
	11-14W			11-14W			14	1/4	0.433	0.046	0.039	0.047	
	16-72W			16-72W			72	3/8	0.630	0.009	0.028	0.016	
	16-60W			16-60W			60	3/8	0.630	0.011	0.028	0.016	
	16-56W			16-56W			56	3/8	0.630	0.011	0.028	0.016	
	16-48W			16-48W			48	3/8	0.630	0.013	0.024	0.024	
	16-40W			16-40W			40	3/8	0.630	0.016	0.024	0.024	
	16-36W			16-36W			36	3/8	0.630	0.018	0.024	0.024	
	16-32W			16-32W			32	3/8	0.630	0.020	0.024	0.024	
	16-30W			16-30W			30	3/8	0.630	0.022	0.024	0.028	
	16-28W	●	●	16-28W			28	3/8	0.630	0.023	0.024	0.028	
	16-26W			16-26W			26	3/8	0.630	0.025	0.028	0.031	
	16-24W			16-24W			24	3/8	0.630	0.027	0.028	0.031	
	16-22W			16-22W			22	3/8	0.630	0.029	1/32	0.035	
	16-20W			16-20W			20	3/8	0.630	0.032	1/32	0.035	
	16-19W	●	●	16-19W			19	3/8	0.630	0.034	1/32	0.039	
	16-18W	●		16-18W			18	3/8	0.630	0.035	1/32	0.039	
	16-16W	●		16-16W			16	3/8	0.630	0.040	0.035	0.043	
	16-14W	●	●	16-14W			14	3/8	0.630	0.046	0.039	0.047	
	16-12W	●		16-12W			12	3/8	0.630	0.054	0.043	0.055	
	16-11W	●	●	16-11W			11	3/8	0.630	0.058	0.043	0.059	
	16-10W	●		16-10W			10	3/8	0.630	0.064	0.043	0.059	
	16-9W			16-9W			9	3/8	0.630	0.071	0.047	0.067	
	16-8W	●		16-8W			8	3/8	0.630	0.080	0.047	0.059	
	22-7W			22-7W			7	1/2	0.866	0.131	0.063	0.091	
	22-6W			22-6W			6	1/2	0.866	0.107	0.063	0.091	
	22-5W			22-5W			5	1/2	0.866	0.128	0.067	0.094	
	27-4.5W			27-4.5W			4.5	5/8	1.063	0.142	0.071	0.102	
	27-4W			27-4W			4	5/8	1.063	0.160	0.079	0.114	

Applicable holders D31

●: Korea Stock ●: US Stock

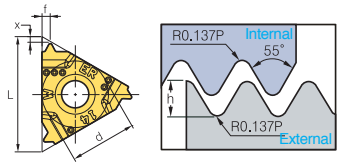
Whitworth (M chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ERM 16-11W	●				11	3/8	0.630	0.046	0.039	0.047	
	16-14W	●				14	3/8	0.630	0.058	0.043	0.059	
	16-19W	●				19	3/8	0.630	0.034	1/32	0.039	

Applicable holders D31

●: Korea Stock ●: US Stock

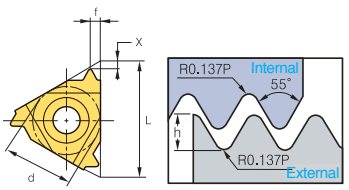
Whitworth (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ERM 16-14W-U					14	3/8	0.630	0.046	0.039	0.047	
	16-11W-U					11	3/8	0.630	0.058	0.043	0.059	

Applicable holders D31

●: Korea Stock ●: US Stock

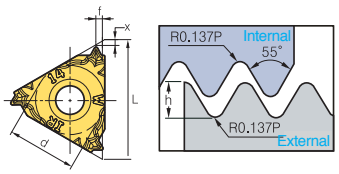
Whitworth (BSW, BSF, BSP, BSB)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (inch)					Picture
							(tpi)	d	L	hmin	X	f	
Internal	IR 11-72W			IL 11-72W			72	1/4	0.433	0.009	0.028	0.016	
	11-60W			11-60W			60	1/4	0.433	0.011	0.028	0.016	
	11-56W			11-56W			56	1/4	0.433	0.011	0.028	0.016	
	11-48W			11-48W			48	1/4	0.433	0.013	0.024	0.024	
	11-40W			11-40W			40	1/4	0.433	0.016	0.024	0.024	
	11-36W			11-36W			36	1/4	0.433	0.018	0.024	0.024	
	11-32W			11-32W			32	1/4	0.433	0.02	0.024	0.024	
	11-28W			11-28W			28	1/4	0.433	0.023	0.024	0.028	
	11-26W			11-26W			26	1/4	0.433	0.025	0.028	0.031	
	11-24W			11-24W			24	1/4	0.433	0.027	0.028	0.031	
	11-22W			11-22W			22	1/4	0.433	0.029	1/32	0.035	
	11-20W			11-20W			20	1/4	0.433	0.032	1/32	0.035	
	11-19W	●	●	11-19W	●		19	1/4	0.433	0.034	1/32	0.039	
	11-18W			11-18W	●		18	1/4	0.433	0.035	1/32	0.039	
	11-16W			11-16W	●		16	1/4	0.433	0.04	0.035	0.043	
	11-14W	●		11-14W	●		14	1/4	0.433	0.046	0.035	0.043	
	11-12W			11-12W	●		12	1/4	0.433	0.052	0.035	0.047	
	16-72W			16-72W			72	3/8	0.63	0.009	0.028	0.016	
	16-60W			16-60W			60	3/8	0.63	0.011	0.028	0.016	
	16-56W			16-56W			56	3/8	0.63	0.011	0.028	0.016	
	16-48W			16-48W			48	3/8	0.63	0.013	0.024	0.024	
	16-40W			16-40W			40	3/8	0.63	0.016	0.024	0.024	
	16-36W			16-36W			36	3/8	0.63	0.018	0.024	0.024	
	16-32W			16-32W			32	3/8	0.63	0.02	0.024	0.024	
	16-30W			16-30W			30	3/8	0.63	0.022	0.024	0.028	
	16-28W			16-28W			28	3/8	0.63	0.023	0.024	0.028	
	16-26W			16-26W			26	3/8	0.63	0.025	0.028	0.031	
	16-24W			16-24W			24	3/8	0.63	0.027	0.028	0.031	
	16-22W			16-22W			22	3/8	0.63	0.029	1/32	0.035	
	16-20W			16-20W			20	3/8	0.63	0.032	1/32	0.035	
	16-19W			16-19W			19	3/8	0.63	0.034	1/32	0.039	
	16-18W			16-18W			18	3/8	0.63	0.035	1/32	0.039	
	16-16W			16-16W			16	3/8	0.63	0.04	0.035	0.043	
	16-14W	●		16-14W			14	3/8	0.63	0.046	0.039	0.047	
	16-12W	●		16-12W			12	3/8	0.63	0.054	0.043	0.055	
	16-11W	●	●	16-11W			11	3/8	0.63	0.058	0.043	0.059	
	16-10W	●		16-10W			10	3/8	0.63	0.064	0.043	0.059	
	16-9W	●		16-9W			9	3/8	0.63	0.071	0.047	0.067	
	16-8W	●		16-8W			8	3/8	0.63	0.08	0.047	0.056	
	22-7W			22-7W			7	1/2	0.866	0.131	0.063	0.097	
	22-6W			22-6W			6	1/2	0.866	0.107	0.063	0.097	
	22-5W			22-5W			5	1/2	0.866	0.128	0.067	0.094	
	27-4.5W			27-4.5W			4.5	5/8	1.063	0.142	0.071	0.102	
	27-4W			27-4W			4	5/8	1.063	0.16	0.079	0.114	

Applicable holders **D32**

●: Korea Stock ●: US Stock

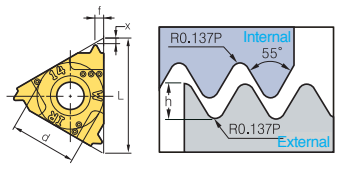
Whitworth (M chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
Internal	IRM 16-14W					14	3/8	0.630	0.046	0.039	0.047	
	16-11W	●				11	3/8	0.630	0.058	0.043	0.059	

Applicable holders **D32**

●: Korea Stock ●: US Stock

Whitworth (U chip breaker) new

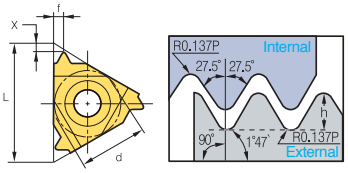
Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
Internal	IRM 16-14W-U					14	3/8	0.630	0.046	0.039	0.047	
	16-11W-U					11	3/8	0.630	0.058	0.043	0.059	

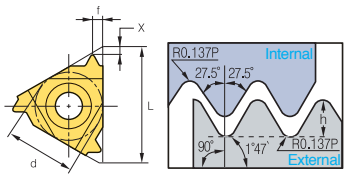
Applicable holders **D32**

●: Korea Stock ●: US Stock

British Standard Pipe Thread (BSPT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 11-28BSPT			EL 11-28BSPT			28	1/4	0.43	0.023	0.02	0.02	
	11-19BSPT			11-19BSPT			19	1/4	0.43	0.034	0.04	0.04	
	11-14BSPT			11-14BSPT			14	1/4	0.43	0.046	0.04	0.04	
	16-28BSPT			16-28BSPT			28	3/8	0.63	0.023	0.02	0.02	
	16-19BSPT		●	16-19BSPT			19	3/8	0.63	0.034	0.04	0.04	
	16-14BSPT		●	16-14BSPT			14	3/8	0.63	0.046	0.05	0.05	
	16-11BSPT	●	●	16-11BSPT			11	3/8	0.63	0.056	0.06	0.06	
Internal	IR 11-28BSPT			IL 11-28BSPT			28	1/4	0.43	0.023	0.02	0.02	
	11-19BSPT		●	11-19BSPT			19	1/4	0.43	0.034	0.03	0.04	
	11-14BSPT		●	11-14BSPT			14	1/4	0.43	0.046	0.04	0.04	
	16-28BSPT			16-28BSPT			28	3/8	0.63	0.023	0.02	0.02	
	16-19BSPT	●	●	16-19BSPT			19	3/8	0.63	0.034	0.03	0.04	
	16-14BSPT	●	●	16-14BSPT			14	3/8	0.63	0.046	0.04	0.05	
	16-11BSPT		●	16-11BSPT			11	3/8	0.63	0.058	0.04	0.06	



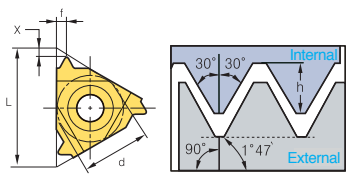


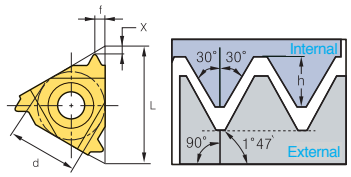
Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

National Pipe Thread (NPT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 11-27NPT			EL 11-27NPT			27	1/4	0.43	0.026	0.03	0.03	
	11-18NPT			11-18NPT			18	1/4	0.43	0.040	0.03	0.04	
	11-14NPT			11-14NPT			14	1/4	0.43	0.052	0.03	0.04	
	16-27NPT			16-27NPT			27	3/8	0.63	0.026	0.03	0.03	
	16-18NPT	●	●	16-18NPT			18	3/8	0.63	0.040	0.03	0.04	
	16-14NPT	●	●	16-14NPT			14	3/8	0.63	0.052	0.04	0.05	
	16-11.5NPT	●		16-11.5NPT			11.5	3/8	0.63	0.065	0.04	0.06	
	16-8NPT	●		16-8NPT			8	3/8	0.63	0.095	0.05	0.07	
Internal	IR 11-27NPT			IL 11-27NPT			27	1/4	0.43	0.026	0.03	0.03	
	11-18NPT	●		11-18NPT			18	1/4	0.43	0.040	0.03	0.04	
	11-14NPT	●	●	11-14NPT	●		14	1/4	0.43	0.052	0.03	0.04	
	16-27NPT			16-27NPT			27	3/8	0.63	0.026	0.03	0.03	
	16-18NPT			16-18NPT			18	3/8	0.63	0.040	0.03	0.04	
	16-14NPT	●	●	16-14NPT			14	3/8	0.63	0.052	0.04	0.05	
	16-11.5NPT	●	●	16-11.5NPT	●		11.5	3/8	0.63	0.065	0.04	0.06	
	16-8NPT	●		16-8NPT	●		8	3/8	0.63	0.095	0.05	0.06	



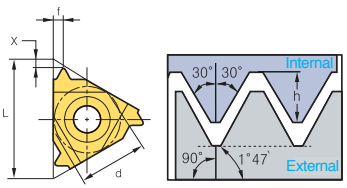


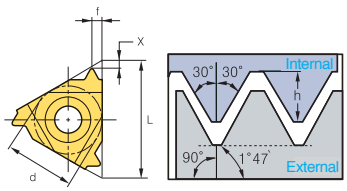
Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

National Pipe Threads-Dryseal (NPTF)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 11-27NPTF			EL 11-27NPTF			27	1/4	0.43	0.025	0.03	0.03	
	11-18NPTF			11-18NPTF			18	1/4	0.43	0.039	0.03	0.04	
	11-14NPTF			11-14NPTF			14	1/4	0.43	0.053	0.03	0.04	
	16-27NPTF			16-27NPTF			27	3/8	0.63	0.025	0.03	0.03	
	16-18NPTF	●		16-18NPTF			18	3/8	0.63	0.039	0.03	0.04	
	16-14NPTF			16-14NPTF			14	3/8	0.63	0.053	0.04	0.05	
	16-11.5NPTF			16-11.5NPTF			11.5	3/8	0.63	0.064	0.04	0.06	
	16-8NPTF			16-8NPTF			8	3/8	0.63	0.094	0.05	0.07	
Internal	IR 11-27NPTF			IL 11-27NPTF			27	1/4	0.43	0.025	0.03	0.03	
	11-18NPTF			11-18NPTF			18	1/4	0.43	0.039	0.03	0.04	
	11-14NPTF			11-14NPTF			14	1/4	0.43	0.053	0.03	0.04	
	16-27NPTF			16-27NPTF			27	3/8	0.63	0.025	0.03	0.03	
	16-18NPTF			16-18NPTF			18	3/8	0.63	0.039	0.03	0.04	
	16-14NPTF			16-14NPTF			14	3/8	0.63	0.053	0.04	0.05	
	16-11.5NPTF			16-11.5NPTF			11.5	3/8	0.63	0.064	0.04	0.06	
	16-8NPTF			16-8NPTF			8	3/8	0.63	0.094	0.05	0.07	



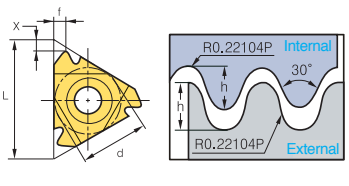


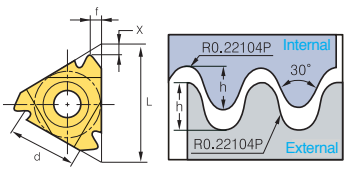
Applicable holders D31, D32

● : Korea Stock ● : US Stock

Round DIN 405

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 16-10RD			EL 16-10RD			10	3/8	0.63	0.050	0.04	0.05	
	16-8RD			16-8RD			8	3/8	0.63	0.063	0.06	0.05	
	16-6RD			16-6RD			6	3/8	0.63	0.083	0.06	0.07	
	22-6RD			22-6RD			6	1/2	0.87	0.083	0.06	0.07	
	22-4RD			22-4RD			4	1/2	0.87	0.125	0.09	0.09	
	27-4RD			27-4RD			4	5/8	1.06	0.125	0.09	0.09	
Internal	IR 16-10RD			IL 16-10RD			10	3/8	0.63	0.050	0.04	0.05	
	16-8RD			16-8RD			8	3/8	0.63	0.063	0.06	0.05	
	16-6RD			16-6RD			6	3/8	0.63	0.083	0.06	0.07	
	22-6RD			22-6RD			6	1/2	0.87	0.083	0.06	0.07	
	22-4RD			22-4RD			4	1/2	0.87	0.125	0.09	0.09	
	27-4RD			27-4RD			4	5/8	1.06	0.125	0.09	0.09	

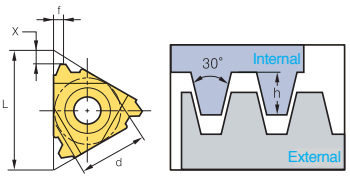
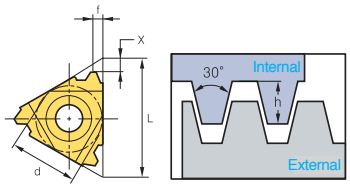




Applicable holders D31, D32

● : Korea Stock ● : US Stock

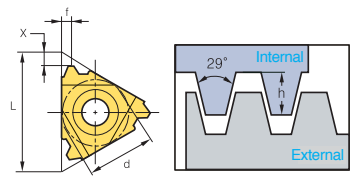
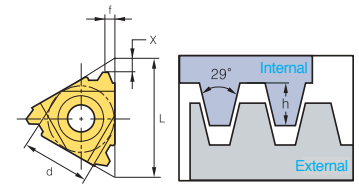
Trapez DIN 103 (TR)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 11-1.5TR			EL 11-1.5TR			1.5	1/4	0.43	0.035	0.03	0.04	
	16-1.5TR			16-1.5TR			1.5	3/8	0.63	0.035	0.04	0.04	
	16-2.0TR	●		16-2.0TR	●		2.0	3/8	0.63	0.049	0.04	0.05	
	16-3.0TR	●	●	16-3.0TR			3.0	3/8	0.63	0.069	0.05	0.06	
	22-4.0TR	●	●	22-4.0TR	●		4.0	1/2	0.87	0.089	0.07	0.07	
	22-5.0TR	●	●	22-5.0TR	●		5.0	1/2	0.87	0.108	0.08	0.10	
	27-6.0TR	●	●	27-6.0TR			6.0	5/8	1.06	0.138	0.09	0.11	
Internal	IR 11-1.5TR			IL 11-1.5TR	●		1.5	1/4	0.43	0.035	0.03	0.04	
	16-1.5TR			16-1.5TR	●		1.5	3/8	0.63	0.035	0.04	0.04	
	16-2.0TR			16-2.0TR	●		2.0	3/8	0.63	0.049	0.04	0.05	
	16-2.5TR			16-2.5TR			2.5	3/8	0.63	0.060	0.05	0.06	
	16-3.0TR	●		16-3.0TR	●		3.0	3/8	0.63	0.069	0.05	0.06	
	22-4.0TR	●	●	22-4.0TR	●		4.0	1/2	0.87	0.089	0.07	0.07	
	22-5.0TR	●	●	22-5.0TR			5.0	1/2	0.87	0.108	0.08	0.10	
	27-6.0TR	●	●	27-6.0TR	●		6.0	5/8	1.06	0.138	0.09	0.11	

Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

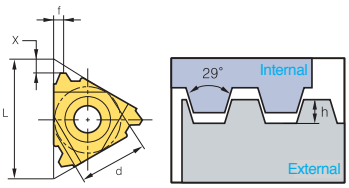
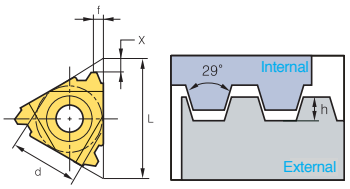
American ACME (ACME)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 11-16ACME			EL 11-16ACME			16	1/4	0.43	0.036	0.04	0.04	
	16-16ACME			16-16ACME			16	3/8	0.63	0.036	0.04	0.04	
	16-14ACME			16-14ACME			14	3/8	0.63	0.041	0.04	0.05	
	16-12ACME			16-12ACME			12	3/8	0.63	0.047	0.04	0.05	
	16-10ACME			16-10ACME			10	3/8	0.63	0.06	0.05	0.06	
	16-8ACME			16-8ACME			8	3/8	0.63	0.072	0.06	0.06	
	16-6ACME			16-6ACME			6	3/8	0.63	0.093	0.07	0.07	
	22-6ACME	●		22-6ACME			6	1/2	0.87	0.093	0.07	0.08	
	22-5ACME			22-5ACME			5	1/2	0.87	0.11	0.08	0.09	
	27-4ACME			27-4ACME			4	5/8	1.06	0.135	0.09	0.11	
Internal	IR 11-16ACME			IL 11-16ACME			16	1/4	0.43	0.036	0.04	0.04	
	16-16ACME			16-16ACME			16	3/8	0.63	0.036	0.04	0.04	
	16-14ACME			16-14ACME			14	3/8	0.63	0.041	0.04	0.05	
	16-12ACME			16-12ACME			12	3/8	0.63	0.047	0.05	0.05	
	16-10ACME			16-10ACME			10	3/8	0.63	0.06	0.05	0.05	
	16-8ACME			16-8ACME			8	3/8	0.63	0.072	0.06	0.06	
	16-6ACME			16-6ACME			6	3/8	0.63	0.093	0.07	0.07	
	22-6ACME			22-6ACME			6	1/2	0.87	0.093	0.07	0.08	
	22-5ACME			22-5ACME			5	1/2	0.87	0.11	0.08	0.09	
	27-4ACME	●		27-4ACME			4	5/8	1.06	0.135	0.09	0.10	

Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

Stub ACME (STACME)

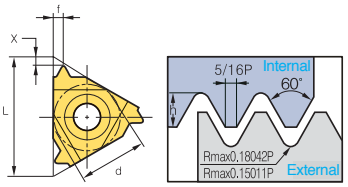
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 11-16STACME			EL 11-16STACME			16	1/4	0.43	0.024	0.04	0.04	
	16-16STACME			16-16STACME			16	3/8	0.63	0.024	0.04	0.04	
	16-14STACME			16-14STACME			14	3/8	0.63	0.026	0.04	0.04	
	16-12STACME			16-12STACME			12	3/8	0.63	0.03	0.05	0.05	
	16-10STACME			16-10STACME			10	3/8	0.63	0.04	0.05	0.05	
	16-8STACME			16-8STACME			8	3/8	0.63	0.048	0.06	0.06	
	16-6STACME			16-6STACME			6	3/8	0.63	0.06	0.07	0.07	
	22-6STACME			22-6STACME			6	1/2	0.78	0.06	0.07	0.07	
	22-5STACME			22-5STACME			5	1/2	0.78	0.07	0.08	0.08	
	27-4STACME			27-4STACME			4	5/8	1.06	0.085	0.09	0.09	
	27-3STACME			27-3STACME			3	5/8	0.43	0.11	0.11	0.11	
Internal	IR 11-16STACME			IL 11-16STACME			16	1/4	0.63	0.024	0.04	0.04	
	16-16STACME			16-16STACME			16	3/8	0.63	0.024	0.04	0.04	
	16-14STACME			16-14STACME			14	3/8	0.63	0.026	0.04	0.04	
	16-12STACME			16-12STACME			12	3/8	0.63	0.03	0.04	0.05	
	16-10STACME			16-10STACME			10	3/8	0.63	0.04	0.05	0.05	
	16-8STACME			16-8STACME			8	3/8	0.63	0.048	0.06	0.06	
	16-6STACME			16-6STACME			6	3/8	0.87	0.06	0.07	0.07	
	22-6STACME			22-6STACME			6	1/2	0.87	0.06	0.07	0.07	
	22-5STACME			22-5STACME			5	1/2	0.87	0.07	0.08	0.09	
	27-4STACME			27-4STACME			4	5/8	1.06	0.085	0.09	0.09	
	27-3STACME			27-3STACME			3	5/8	1.06	0.11	0.11	0.11	

Applicable holders **D31, D32**

● : Korea Stock ● : US Stock

UNJ (Unified constant thread)

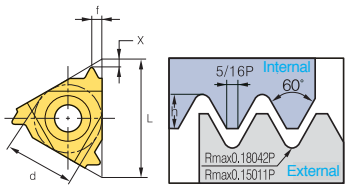
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 11-48UNJ			EL 11-48UNJ			48	1/4	0.43	0.012	0.02	0.02	
	11-44UNJ			11-44UNJ			44	1/4	0.43	0.013	0.02	0.02	
	11-40UNJ			11-40UNJ			40	1/4	0.43	0.015	0.02	0.02	
	11-36UNJ			11-36UNJ			36	1/4	0.43	0.016	0.02	0.02	
	11-32UNJ			11-32UNJ			32	1/4	0.43	0.018	0.02	0.03	
	11-28UNJ			11-28UNJ			28	1/4	0.43	0.02	0.03	0.03	
	11-24UNJ			11-24UNJ			24	1/4	0.43	0.024	0.03	0.03	
	11-20UNJ			11-20UNJ			20	1/4	0.43	0.029	0.03	0.04	
	11-18UNJ			11-18UNJ			18	1/4	0.43	0.032	0.03	0.04	
	11-16UNJ			11-16UNJ			16	1/4	0.43	0.036	0.04	0.04	
	11-14UNJ			11-14UNJ			14	1/4	0.43	0.041	0.04	0.05	
	16-48UNJ			16-48UNJ			48	3/8	0.63	0.012	0.02	0.02	
	16-44UNJ			16-44UNJ			44	3/8	0.63	0.013	0.02	0.02	
	16-40UNJ			16-40UNJ			40	3/8	0.63	0.015	0.02	0.02	
	16-36UNJ			16-36UNJ			36	3/8	0.63	0.016	0.02	0.02	
	16-32UNJ			16-32UNJ			32	3/8	0.63	0.018	0.02	0.03	
	16-28UNJ			16-28UNJ			28	3/8	0.63	0.02	0.03	0.03	
	16-24UNJ			16-24UNJ			24	3/8	0.63	0.024	0.03	0.03	
	16-20UNJ			16-20UNJ			20	3/8	0.63	0.029	0.03	0.04	
	16-18UNJ			16-18UNJ			18	3/8	0.63	0.032	0.03	0.04	
	16-16UNJ			16-16UNJ			16	3/8	0.63	0.036	0.04	0.04	
	16-14UNJ			16-14UNJ			14	3/8	0.63	0.041	0.04	0.05	
	16-13UNJ			16-13UNJ			13	3/8	0.63	0.044	0.04	0.05	
	16-12UNJ			16-12UNJ			12	3/8	0.63	0.048	0.04	0.05	
	16-11UNJ			16-11UNJ			11	3/8	0.63	0.052	0.05	0.06	
	16-10UNJ			16-10UNJ			10	3/8	0.63	0.058	0.05	0.06	
	16-9UNJ			16-9UNJ			9	3/8	0.63	0.064	0.05	0.07	
	16-8UNJ			16-8UNJ			8	3/8	0.63	0.072	0.05	0.06	
	22-7UNJ			22-7UNJ			7	1/2	0.87	0.082	0.07	0.09	
	22-6UNJ			22-6UNJ			6	1/2	0.87	0.096	0.07	0.09	
	22-5UNJ			22-5UNJ			5	1/2	0.87	0.115	0.07	0.10	
	27-4.5UNJ			27-4.5UNJ			4.5	5/8	1.06	0.128	0.08	0.11	
	27-4UNJ			27-4UNJ			4	5/8	1.06	0.144	0.09	0.12	



Applicable holders **D31**

●: Korea Stock ●: US Stock

UNJ (Unified constant thread)

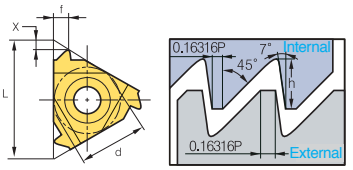
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (inch)					Picture
							(tpi)	d	L	hmin	X	f	
Internal	IR 11-48UNJ			IL 11-48UNJ			48	1/4	0.43	0.012	0.02	0.02	
	11-44UNJ			11-44UNJ			44	1/4	0.43	0.013	0.02	0.02	
	11-40UNJ			11-40UNJ			40	1/4	0.43	0.015	0.02	0.02	
	11-36UNJ			11-36UNJ			36	1/4	0.43	0.016	0.02	0.02	
	11-32UNJ			11-32UNJ			32	1/4	0.43	0.018	0.02	0.03	
	11-28UNJ			11-28UNJ			28	1/4	0.43	0.020	0.03	0.03	
	11-24UNJ			11-24UNJ			24	1/4	0.43	0.024	0.03	0.03	
	11-20UNJ			11-20UNJ			20	1/4	0.43	0.029	0.03	0.04	
	11-18UNJ			11-18UNJ			18	1/4	0.43	0.032	0.03	0.04	
	11-16UNJ			11-16UNJ			16	1/4	0.43	0.036	0.04	0.04	
	11-14UNJ			11-14UNJ			14	1/4	0.43	0.041	0.04	0.05	
	16-48UNJ			16-48UNJ			48	3/8	0.63	0.012	0.02	0.02	
	16-44UNJ			16-44UNJ			44	3/8	0.63	0.013	0.02	0.02	
	16-40UNJ			16-40UNJ			40	3/8	0.63	0.015	0.02	0.02	
	16-36UNJ			16-36UNJ			36	3/8	0.63	0.016	0.02	0.02	
	16-32UNJ			16-32UNJ			32	3/8	0.63	0.018	0.02	0.03	
	16-28UNJ			16-28UNJ			28	3/8	0.63	0.020	0.03	0.03	
	16-24UNJ			16-24UNJ			24	3/8	0.63	0.024	0.03	0.03	
	16-20UNJ			16-20UNJ			20	3/8	0.63	0.029	0.03	0.04	
	16-18UNJ			16-18UNJ			18	3/8	0.63	0.032	0.03	0.04	
	16-16UNJ			16-16UNJ			16	3/8	0.63	0.036	0.04	0.04	
	16-14UNJ			16-14UNJ			14	3/8	0.63	0.041	0.04	0.05	
	16-13UNJ			16-13UNJ			13	3/8	0.63	0.044	0.04	0.05	
	16-12UNJ			16-12UNJ			12	3/8	0.63	0.048	0.04	0.05	
	16-11UNJ			16-11UNJ			11	3/8	0.63	0.052	0.05	0.06	
	16-10UNJ			16-10UNJ			10	3/8	0.63	0.058	0.05	0.06	
	16-9UNJ			16-9UNJ			9	3/8	0.63	0.064	0.05	0.07	
	16-8UNJ			16-8UNJ			8	3/8	0.63	0.072	0.05	0.06	
	22-7UNJ			22-7UNJ			7	1/2	0.87	0.082	0.07	0.09	
	22-6UNJ			22-6UNJ			6	1/2	0.87	0.096	0.07	0.09	
	22-5UNJ			22-5UNJ			5	1/2	0.87	0.115	0.07	0.10	
	27-4.5UNJ			27-4.5UNJ			4.5	5/8	1.06	0.128	0.08	0.11	
	27-4UNJ			27-4UNJ			4	5/8	1.06	0.144	0.09	0.12	

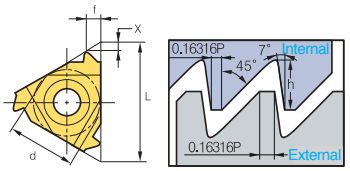
Applicable holders **D32**

●: Korea Stock ●: US Stock

American Buttress (ABUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 11-20ABUT			EL 11-20ABUT			20	1/4	0.43	0.033	0.04	0.06	
	11-16ABUT			11-16ABUT			16	1/4	0.43	0.041	0.05	0.07	
	16-20ABUT			16-20ABUT			20	3/8	0.63	0.033	0.04	0.06	
	16-16ABUT			16-16ABUT			16	3/8	0.63	0.041	0.05	0.07	
	16-12ABUT			16-12ABUT			12	3/8	0.63	0.055	0.06	0.08	
	16-10ABUT			16-10ABUT			10	3/8	0.63	0.066	0.06	0.09	
	22-8ABUT			22-8ABUT			8	1/2	0.87	0.083	0.08	0.13	
	22-6ABUT			22-6ABUT			6	1/2	0.87	0.110	0.09	0.14	
Internal	IR 11-20ABUT			IL 11-20ABUT			20	1/4	0.43	0.033	0.04	0.06	
	11-16ABUT			11-16ABUT			16	1/4	0.43	0.041	0.05	0.07	
	16-20ABUT			16-20ABUT			20	3/8	0.63	0.033	0.04	0.06	
	16-16ABUT			16-16ABUT			16	3/8	0.63	0.041	0.05	0.07	
	16-12ABUT			16-12ABUT			12	3/8	0.63	0.055	0.06	0.08	
	16-10ABUT			16-10ABUT			10	3/8	0.63	0.066	0.06	0.09	
	22-8ABUT			22-8ABUT			8	1/2	0.87	0.083	0.08	0.13	
	22-6ABUT			22-6ABUT			6	1/2	0.87	0.110	0.09	0.14	



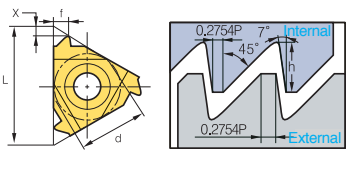


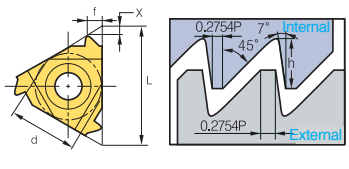
Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

British Buttress (BBUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 16-16BBUT			EL 16-16BBUT			16	3/8	0.63	0.032	0.04	0.06	
	16-12BBUT			16-12BBUT			12	3/8	0.63	0.042	0.06	0.08	
	16-10BBUT			16-10BBUT			10	3/8	0.63	0.050	0.06	0.09	
	16-8BBUT			16-8BBUT			8	3/8	0.63	0.063	0.06	0.10	
	22-8BBUT			22-8BBUT			8	1/2	0.87	0.063	0.06	0.10	
Internal	IR 16-16BBUT			IL 16-16BBUT			16	3/8	0.63	0.032	0.04	0.06	
	16-12BBUT			16-12BBUT			12	3/8	0.63	0.042	0.06	0.08	
	16-10BBUT			16-10BBUT			10	3/8	0.63	0.050	0.06	0.09	
	16-8BBUT			16-8BBUT			8	3/8	0.63	0.063	0.06	0.10	
	22-8BBUT			22-8BBUT			8	1/2	0.87	0.063	0.06	0.10	

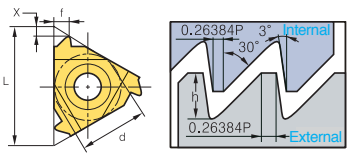
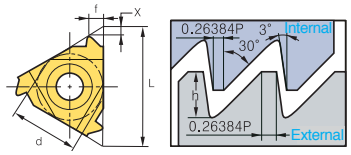




Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

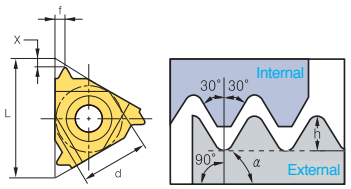
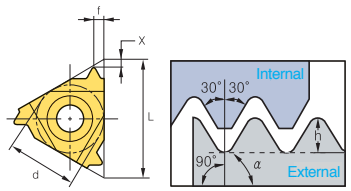
Metric Buttress (SAGE)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 16-2.0SAGE			EL 16-2.0SAGE			2.0	3/8	0.63	0.069	0.06	0.08	
	22-2.0SAGE			22-2.0SAGE			2.0	1/2	0.87	0.069	0.06	0.08	
	22-3.0SAGE	●		22-3.0SAGE			3.0	1/2	0.87	0.102	0.07	0.10	
	27-4.0SAGE			27-4.0SAGE			4.0	5/8	1.06	0.140	0.08	0.13	
Internal	IR 16-2.0SAGE			IL 16-2.0SAGE			2.0	3/8	0.63	0.059	0.06	0.09	
	22-3.0SAGE			22-3.0SAGE			3.0	1/2	0.87	0.089	0.07	0.11	
	27-4.0SAGE			27-4.0SAGE			4.0	5/8	1.06	0.122	0.08	0.13	

Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

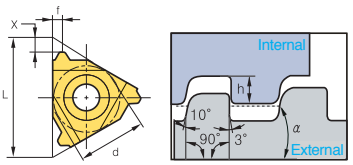
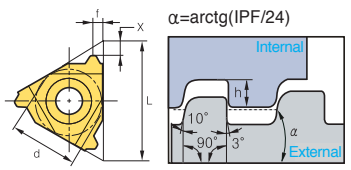
API

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 22-4API382			EL 22-4API382			4	1/2	0.87	0.122	0.08	0.11	
	22-4API383			22-4API383			4	1/2	0.87	0.122	0.08	0.11	
	22-4API502			22-4API502			4	1/2	0.87	0.148	0.08	0.11	
	22-4API503			22-4API503			4	1/2	0.87	0.148	0.08	0.11	
	22-5API403			22-5API403			5	1/2	0.87	0.118	0.07	0.10	
	22-6API551			22-6API551			6	1/2	0.87	0.056	0.10	0.09	
	27-4API382			27-4API382			4	5/8	0.63	0.122	0.08	0.11	
	27-4API383			27-4API383			4	5/8	0.63	0.122	0.08	0.11	
	27-4API502			27-4API502			4	5/8	0.63	0.148	0.08	0.12	
	27-4API503			27-4API503			4	5/8	0.63	0.148	0.08	0.12	
	27-5API403			27-5API403			5	5/8	0.63	0.056	0.07	0.11	
Internal	IR 22-4API382			IL 22-4API382			4	1/2	0.87	0.122	0.08	0.11	
	22-4API383			22-4API383			4	1/2	0.87	0.122	0.08	0.11	
	22-4API502			22-4API502			4	1/2	0.87	0.148	0.08	0.12	
	22-4API503			22-4API503			4	1/2	0.87	0.148	0.08	0.11	
	22-5API403	●		22-5API403			5	1/2	0.87	0.118	0.07	0.10	
	22-6API551			22-6API551			6	1/2	0.87	0.056	0.10	0.09	
	27-4API382			27-4API382			4	5/8	0.63	0.122	0.08	0.11	
	27-4API383			27-4API383			4	5/8	0.63	0.122	0.08	0.11	
	27-4API502			27-4API502			4	5/8	0.63	0.148	0.08	0.12	
	27-4API503			27-4API503			4	5/8	0.63	0.148	0.08	0.12	
	27-5API403			27-5API403			5	5/8	0.63	0.056	0.07	0.11	

Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

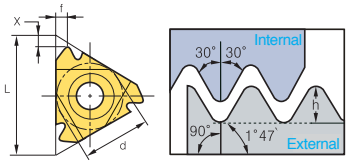
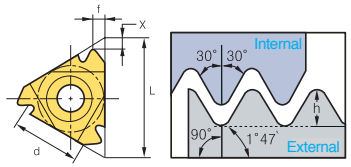
API Buttress Casing (BUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) IPF	d	L	hmin	X	f	Picture
External	ER 22-5BUT75			EL 22-5BUT75			5	0.75	1/2	0.87	0.061	0.12	0.12	
	22-5BUT1			22-5BUT1			5	1	1/2	0.87	0.061	0.12	0.12	
Internal	IR 22-5BUT75			IL 22-5BUT75			5	0.75	1/2	0.87	0.061	0.12	0.12	
	22-5BUT1			22-5BUT1			5	1	1/2	0.87	0.061	0.12	0.12	

Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

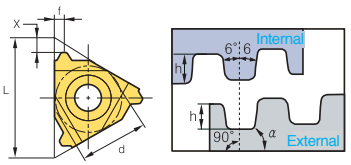
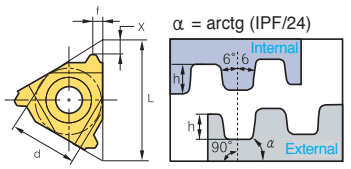
API Round Casing & Tubing (APIRD)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) d	L	hmin	X	f	Picture
External	ER 16-10APIRD	●		EL 16-10APIRD			10	3/8	0.63	0.056	0.05	0.06	
	16-8APIRD	●		16-8APIRD			8	3/8	0.63	0.071	0.05	0.06	
Internal	IR 16-10APIRD	●		IL 16-10APIRD			10	3/8	0.63	0.056	0.05	0.06	
	16-8APIRD	●		16-8APIRD			8	3/8	0.63	0.071	0.05	0.06	

Applicable holders **D31, D32**

●: Korea Stock ●: US Stock

Extreme Line Casing (EL)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (inch) IPF	d	L	hmin	X	f	Picture
External	ER 22-6EL15			EL 22-6EL15			6	1.5	1/2	0.087	0.048	0.07	0.07	
	22-5EL125			22-5EL125			5	1.25	1/2	0.087	0.067	0.09	0.09	
Internal	IR 22-6EL15			IL 22-6EL15			6	1.5	1/2	0.087	0.055	0.07	0.07	
	22-5EL125			22-5EL125			5	1.25	1/2	0.087	0.075	0.09	0.09	

Applicable holders **D31, D32**

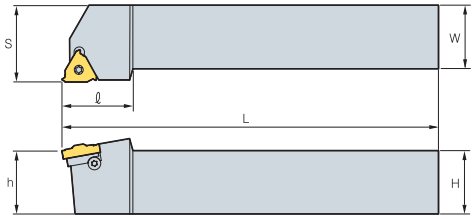
●: Korea Stock ●: US Stock

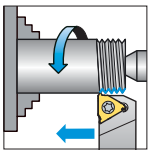
ER(L)H

(Screw on system)









Righthand drawing

(inch)

	Designation	Inscribed circle	H	W	L	S	H	ℓ	Insert Screw	Shim screw	Screw RH	Screw LH	Wrench
ER(L)H	031N-11	1/4	0.31	0.31	5.37	0.425	0.31	0.69	ST11N	-	-	-	TW08P
	039N-11	1/4	0.39	0.39	2.75	0.43	0.39	0.68					
	050N-11	1/4	0.50	0.50	3.14	0.47	0.50	0.68					
	050N-16	3/8	0.50	0.50	3.27	0.625	0.50	0.87	ST16N	-	-	-	TW10P
	3/8-16	3/8	0.375	0.375	2.45	0.625	0.375	0.76	ST16	STA16	ATE16	ATI22	TW10P
	050-16	3/8	0.50	0.50	3.27	0.625	0.50	0.87					
	0625-16	3/8	0.625	0.625	5.00	0.625	0.625	1.02					
	075-16	3/8	0.75	0.75	5.00	0.75	0.75	1.02					
	100-16	3/8	1.00	1.00	6.00	1.00	1.00	1.20					
	125-16	3/8	1.25	1.25	7.00	1.25	1.25	1.18					
	100-22	1/2	1.00	1.00	6.00	1.00	1.00	1.42	ST22	STA22	ATE22	ATI22	TW20P
	125-22	1/2	1.25	1.25	7.00	1.25	1.25	1.42					
	150-22	1/2	1.50	1.50	8.00	1.50	1.50	1.42					
	100-27	5/8	1.00	1.00	6.00	1.25	1.00	1.57	ST27	STA27	ATE27	ATI27	TW25L
	125-27	5/8	1.25	1.25	7.00	1.25	1.25	1.57					
	150-27	5/8	1.50	1.50	8.00	1.50	1.50	1.57					
	200-27	5/8	2.00	2.00	10.00	2.00	2.00	1.57					

Applicable inserts **D10~D13, D16, D18, D19, D22, D23~D26**

• Helix angle is 1.5° for all holders

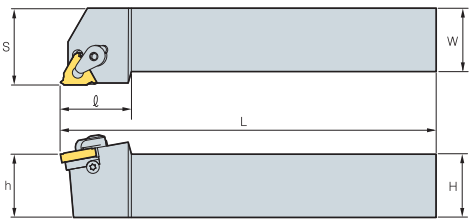
• No shim needed for N type holder

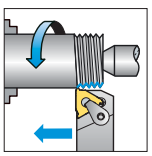
ER(L)H-C

(Clamp on system)









Righthand drawing

(inch)

	Designation	Inscribed circle	H	W	L	S	H	ℓ	Shim screw	Clamp	Screw RH	Screw LH	Wrench
ER(L)H	075-16C	3/8	0.75	0.75	5.00	0.75	0.75	1.02	STA16	CTH16	ATE16	ATI16	TW10P TW15P
	100-16C	3/8	1.00	1.00	6.00	1.00	1.00	1.20					
	125-16C	3/8	1.25	1.25	7.00	1.25	1.25	1.18					
	100-22C	1/2	1.00	1.00	6.00	1.00	1.00	1.42	STA22	CTH22	ATE22	ATI22	TW20P
	125-22C	1/2	1.25	1.25	7.00	1.25	1.25	1.42					
	150-22C	1/2	1.50	1.50	8.00	1.50	1.50	1.42					
	100-27C	5/8	1.00	1.00	6.00	1.00	1.00	1.57	STA27	CTH27	ATE27	ATI27	TW25L
	125-27C	5/8	1.25	1.25	7.00	1.25	1.25	1.57					
	150-27C	5/8	1.50	1.50	8.00	1.50	1.50	1.57					
	200-27C	5/8	2.00	2.00	10.00	2.00	2.00	1.57					

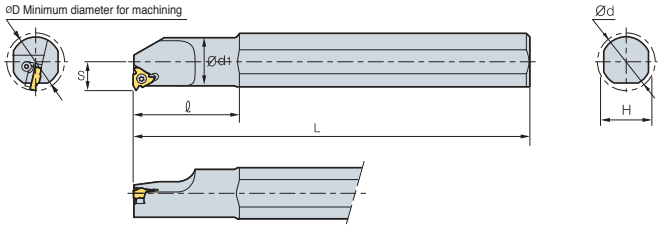
Applicable inserts **D10~D13, D16, D18, D19, D22, D23~D26**

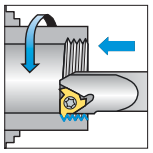
• Helix angle is 1.5° for all holders

IR(L)H

(Screw on system)







Righthand drawing

(inch)

Designation		Inscribed circle	ØD	Ød	Ød1	H	L	S	ℓ	Insert screw	Shim screw	Screw RH	Screw LH	Wrench
IR(L)H	0375DN-11	1/4	0.50	0.40	0.375	0.37	3.9	0.28	-					
	0375N-11	1/4	0.50	0.75	0.375	0.67	7.0	0.28	1.00	ST11N	-	-	-	TW08P
	050N-11	1/4	0.65	0.75	0.50	0.67	7.0	0.37	1.25					
	050N-16	3/8	0.67	0.75	0.50	0.67	7.0	0.40	1.25					
	0625N-16	3/8	0.80	0.75	0.625	0.67	7.0	0.46	1.50	ST16N	-	-	-	TW10P
	0625DN-16	3/8	0.80	0.625	0.625	0.58	6.0	0.46	1.25					
	075-16	3/8	0.90	0.75	0.75	0.67	7.0	0.51	1.50					
	100-16	3/8	0.12	1.25	1.00	1.12	10.0	0.65	2.50					
	100D-16	3/8	1.20	1.00	1.00	0.90	8.0	0.65	1.75	ST16	STA16	ATI16	ATE16	TW10P
	125-16	3/8	1.45	1.25	1.25	1.12	10.0	0.77	2.50					
	150-16	3/8	1.65	1.50	1.50	1.34	12.0	0.90	2.50					
	075N-22	1/2	1.00	0.75	0.75	0.67	7.0	0.59	2.00	ST22N	-	-	-	TW20P
	100-22	1/2	1.25	1.25	1.00	1.12	10.0	0.71	2.50					
	100D-22	1/2	1.25	1.00	1.00	0.88	8.0	0.71	1.75	ST22	STA22	ATI22	ATE22	TW20P
	125-22	1/2	1.50	1.25	1.25	1.12	10.0	0.85	2.50					
	150-22	1/2	1.75	1.50	1.50	1.34	12.0	0.98	2.50					
	125-27	5/8	1.55	1.25	1.25	1.12	10.0	0.88	2.50					
	150-27	5/8	1.80	1.50	1.50	1.34	12.0	1.00	2.50	ST27	STA27	ATI27	ATE27	TW25L
	200-27	5/8	2.30	2.00	2.00	1.80	14.0	1.25	3.00					
	250-27	5/8	2.80	2.50	2.50	2.26	16.0	1.50	3.00					

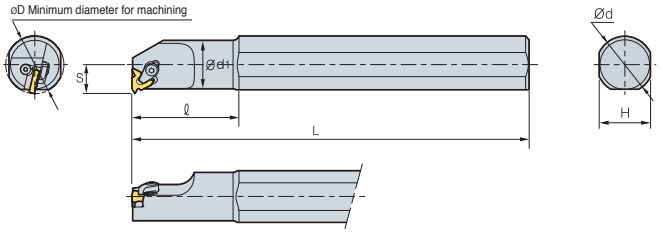
Applicable inserts **D10, D11, D14, D15, D17, D20~D25, D27~D30**

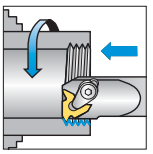
• Helix angle is 1.5° for all holders. • No shim needed for N type holder

IR(L)H-C

(Clamp on system)







Righthand drawing

(inch)

Designation		Inscribed circle	ØD	Ød	Ød1	H	L	S	ℓ	Shim screw	Clamp	Screw RH	Screw LH	Wrench
IR(L)H	075-16C	3/8	0.90	0.75	0.75	0.67	7.0	0.51	1.50					
	100-16C	3/8	1.20	1.25	1.00	1.12	10.0	0.65	2.50					TW10P
	100D-16C	3/8	1.20	1.00	1.00	0.9	8.0	0.65	1.75	STA16	CTH16	ATI16	ATE16	TW15P
	125-16C	3/8	1.45	1.25	1.25	1.12	10.0	0.77	2.50					
	150-16C	3/8	1.65	1.50	1.50	1.34	12.0	0.90	2.50					
	100-22C	1/2	1.25	1.25	1.00	1.12	10.0	0.71	2.50					
	100D-22C	1/2	1.25	1.00	1.00	0.88	8.0	0.71	1.75	STA22	CTH22	ATI22	ATE22	TW20P
	125-22C	1/2	1.50	1.25	1.25	1.12	10.0	0.85	2.50					
	150-22C	1/2	1.75	1.50	1.50	1.34	12.0	0.98	2.50					
	125-27C	5/8	1.55	1.25	1.25	1.12	10.0	0.88	2.50					
	150-27C	5/8	1.80	1.50	1.50	1.34	12.0	1.00	2.50	STA27	CTH27	ATI27	ATE27	TW25L
	200-27C	5/8	2.30	2.00	2.00	1.8	14.0	1.25	3.00					
	250-27C	5/8	2.80	2.50	2.50	2.26	16.0	1.50	3.00					

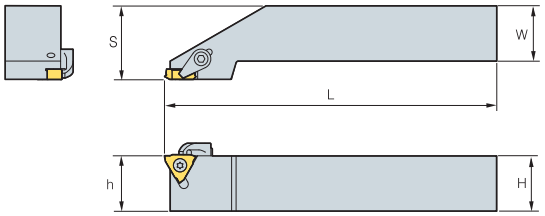
Applicable inserts **D10, D11, D14, D15, D17, D20~D25, D27~D30**

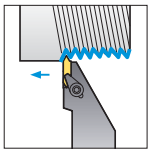
• Helix angle is 1.5° for all holders

VTH



VETR



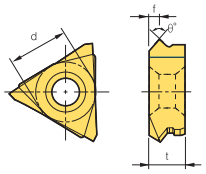


Righthand drawing

(inch)

Designation		H = (h)	W	L	S	Insert	Clamp	Clamp screw	Screw	Wrench
VTH	12R	0.787	0.787	4.921	1.039	VETR	CS6R1	DHA0617	FTKA03510	TW15P, HW30L
	16R	0.984	0.984	5.906	1.315					
	85R	1.260	0.984	6.693	1.315					

Vertical type thread insert

Picture	Designation		Cermet CN20	Uncoated ST10	Dimensions Pitch (mm)	θ	f	Configuration
	VETR	080			0.8	60°	0.055	 d: 0.375 t: 0.1875
		100		●	1.0	60°	0.055	
		125			1.25	60°	0.055	
		150		●	1.5	60°	0.047	
		175			1.75	60°	0.047	
		200		●	2.0	60°	0.047	
		250			2.5	60°	0.055	
		300		●	3.0	60°	0.063	
		150F	●	●	0.8~1.5	60°	0.055	
		300F	●	●	1.5~3.0	60°	0.063	

●: Korea Stock ●: US Stock

Thread milling holders code system

TM S R L 050 - 11

1 Insert style | 2 Holder style | 3 Hand | 4 Shank type | 5 Shank dia. | 6 Cutting edge length

1 Insert style
TM S R L 25 - 11

Thread Milling Holder

2 Holders style
TM S R L 25 - 11

S: Shank Type

3 Hand
TM S R L 25 - 11

R: Right Hand L: Left Hand

4 Shank type
TM S R L 25 - 11

None: Standard
L: Long Type
T: Taper Type

5 Shank dia.
TM S R L 050 - 11

050: 0.50	100: 1.00
0625: 0.625	125: 1.25
075: 0.75	150: 1.50

6 Cutting edge length
TM S R L 25 - 11

10: 0.41	22: 0.87
11: 0.43	27: 1.06
16: 0.63	38: 1.52

Thread milling inserts code system

TM 2 I 16 - 1.5 ISO

1 Insert style | 2 Cutting edge | 3 Type of insert | 4 Cutting edge length | 5 Pitch | 6 Type

1 Insert style
TM 2 I 16 - 1.5 ISO

Thread Milling Holder

2 Cutting edge
TM 2 I 16 - 1.5 ISO

None: 1 cutting edge
2: 2 cutting edge

3 Type of insert
TM 2 I 16 - 1.5 ISO

I: Internal
E: External
EI: External & Internal

4 Cutting edge length
TM 2 I 16 - 1.5 ISO

10: 0.41
11: 0.43
16: 0.63
22: 0.87
27: 1.06
38: 1.52

5 Pitch
TM 2 I 16 - 1.5 ISO

mm: 0.5~6.0 tpi: 48~6

6 Type
TM 2 I 16 - 1.5 ISO

ISO Metric

American UN (UNC, UNF, UNEF)

UNJ

Whit Worth (BSW, BSF, BSP, BSB)

National Pipe Thread (NPT)

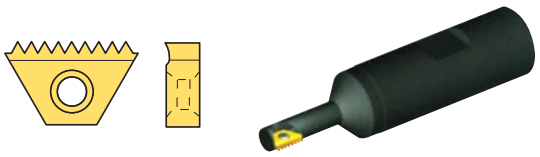
National Pipe Thread (NPTF)

British Standard Pipe Thread (BSPT)

Thread milling

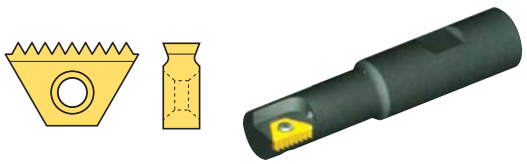
The right tool for the job

Small diameter type



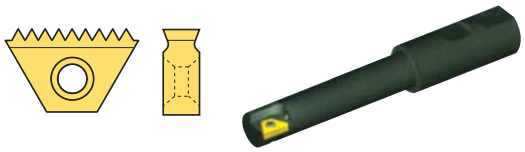
Tool holder: TMSR **Insert**: TM L = 0.41 inch
For small bore diameters down to 0.371 inch

Standard type



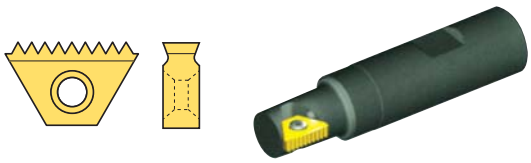
Tool holder: TMSR **Insert**: TM2
For standard length threads

Long type



Tool holder: TMSR **Insert**: TM2
For long or remote threads

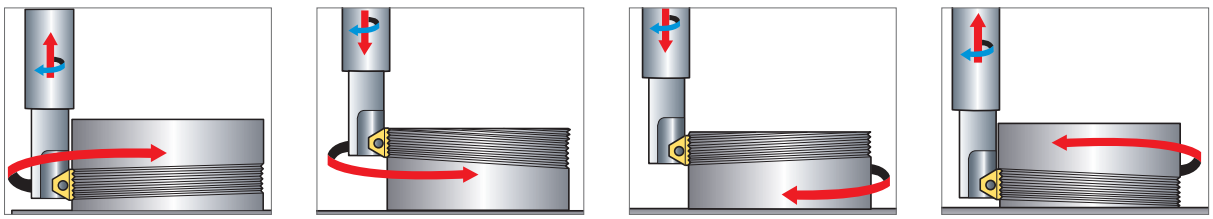
Tapered type



Tool holder: TMSR **Insert**: TM2 (BSPT, NPT, NPTF)
For standard length threads

Thread milling methods

External threading



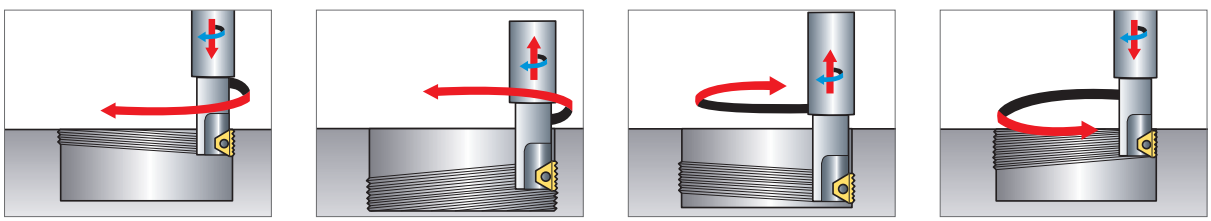
Right handed thread
conventional milling

Left handed thread
down milling

Right handed thread
down milling

Left handed thread
conventional milling

Internal threading



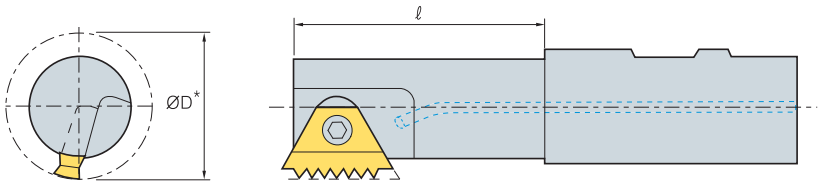
Right handed thread
down milling

Left handed thread
conventional milling

Right handed thread
conventional milling

Left handed thread
down milling

Tooling recommendation for given internal thread specification

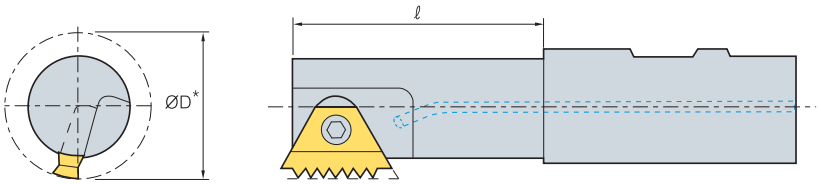


ISO

Pitch (mm)	Nominal dia. (mm)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
0.75	11	TMSR 12-10	TM2I 10-0.75ISO	0.47	0.35	0.017
1.0	12-14	TMSR 12-10	TM2I 10-1.0ISO	0.47	0.35	0.023
	15-18	TMSR 12-11	TM2I 11-1.0ISO	0.47	0.45	
	20	TMSR 16-16	TM2I 16-1.0ISO	0.87	0.67	
	22	TMSR 20-22	TM2I 22-1.0ISO	1.14	0.75	
	24	TMSR 20-16	TM2I 16-1.0ISO	1.69	0.79	
	25-28	TMSRL 25-16	TM2I 16-1.0ISO	0.98	0.87	
1.25	14	TMSR 12-10	TM2I 10-1.25ISO	0.47	0.35	0.028
1.5	14-15	TMSR 12-10	TM2I 10-1.5ISO	0.47	0.35	0.034
	16-20	TMSR 12-11	TM2I 11-1.5ISO	0.47	0.45	
	22	TMSR 16-16	TM2I 16-1.5ISO	0.87	0.67	
	24	TMSR 20-22	TM2I 22-1.5ISO	1.14	0.75	
	25-26	TMSR 20-16	TM2I 16-1.5ISO	1.69	0.79	
	27-30	TMSRL 25-16	TM2I 16-1.5ISO	0.98	0.87	
	35-42	TMSR 25-27	TM2I 27-1.5ISO	2.05	1.18	
	45	TMSR 32-27	TM2I 27-1.5ISO	2.28	1.46	
2.0	22	TMSRT 16-16	TM2I16-2.0ISO	0.87	0.61	0.045
	24	TMSR 16-16	TM2I 16-2.0ISO	0.87	0.67	
	25	TMSR 20-22	TM2I 22-2.0ISO	1.14	0.75	
	27	TMSR 20-16	TM2I 16-2.0ISO	1.69	0.79	
	28-32	TMSRL 25-16	TM2I 16-2.0ISO	0.98	0.87	
	39-42	TMSR 25-27	TM2I 27-2.0ISO	2.05	1.18	
	45-48	TMSR 32-27	TM2I 27-2.0ISO	2.28	1.46	
3.0	42-48	TMSR 25-27	TM2I 27-3.0ISO	2.05	1.18	0.068
	50-52	TMSR 32-27	TM2I 27-3.0ISO	2.28	1.46	
4.0	45-52	TMSR 25-27	TM2I 27-4.0ISO	2.05	1.18	0.091
	55	TMSR 32-38	TM2I 38-4.0ISO	2.17	1.38	
	56-58	TMSR 32-27	TM2I 27-4.0ISO	2.28	1.46	
	60-65	TMSR 40-38	TM2I 38-4.0ISO	2.56	1.81	
5.0	48-52	TMSR 32-38	TM2I 38-5.0ISO	2.05	1.18	0.114
5.5	56	TMSR 32-38	TM2I 38-5.5ISO	2.17	1.38	0.125
	60	TMSR 40-38	TM2I 38-5.5ISO	2.56	1.81	
6.0	64-68	TMSR 40-38	TM2I 38-6.0ISO	2.56	1.81	0.136

• The recommended holder is the largest for the given thread specification
• Holder with smaller or equal cutting diameters (D2) can also be used

Tooling recommendation for given internal thread specification

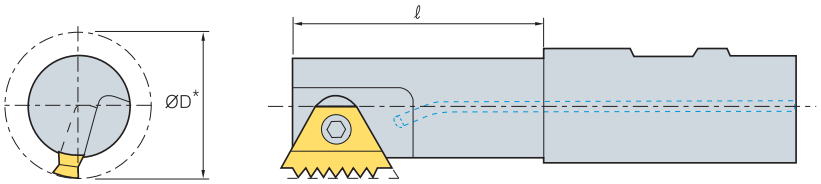


UN

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
32	7/16-1/2	TMSR050-10	TMI 10-32UN	0.47	0.35	0.018
	9/16-11/16	TMSR050-11	TM2I 11-32UN	0.47	0.45	
	3/4-13/16	TMSR0625-16	TM2I 16-32UN	0.87	0.67	
	7/8-15/16	TMSR075-16	TM2I 16-32UN	1.69	0.79	
	1	TMSR100-16	TM2I 16-32UN	0.98	0.87	
28	7/16-1/2	TMSR050-10	TMI 10-28UN	0.47	0.35	0.020
	9/16-3/4	TMSR050-11	TM2I 11-28UN	0.47	0.45	
	13/16-7/8	TMSR0625-16	TM2I 16-28UN	0.87	0.67	
	15/16	TMSR075-16	TM2I 16-28UN	1.69	0.79	
	1-1 1/8	TMSRL100-16	TM2I 16-28UN	0.98	0.87	
24	9/16-11/16	TMSR050-11	TM2I 11-24UN	0.47	0.45	0.024
20	1/2-9/16	TMSR050-10	TMI 10-20UN	0.47	0.35	0.029
	5/8-13/16	TMSR050-11	TM2I 11-20UN	0.47	0.45	
	7/8	TMSR0625-16	TM2I 16-20UN	0.87	0.67	
	15/16-1	TMSR075-16	TM2I 16-20UN	0.69	0.79	
	1 1/16-1 1/8	TMSRL100-167	TM2I 16-20UN	0.98	0.87	
	1 3/8-1 5/8	TMSR100-27	TM2I 27-20UN	2.05	1.18	
	1 11/16-1 13/16	TMSR125-27	TM2I 27-20UN	2.28	1.46	
18	5/8	TMSR050-11	TM2I 11-18UN	0.47	0.45	0.032
	1 1/16-1 3/16	TMSRL100-16	TM2I 16-18UN	0.98	0.87	
	1 7/16-1 5/8	TMSR100-27	TM2I 27-18UN	2.05	1.18	
	1 11/16	TMSR125-27	TM2I 27-18UN	2.28	1.46	
16	11/16-13/16	TMSR050-11	TM2I 11-16UN	0.47	0.45	0.036
	7/8-15/16	TMSR0625-167	TM2I 16-16UN	0.87	0.67	
	1	TMSR075-16	TM2I 16-16UN	1.69	0.79	
	1 1/16-1 3/16	TMSRL100-16	TM2I 16-16UN	0.98	0.87	
	1 7/16-1 5/8	TMSR100-27	TM2I 27-16UN	2.05	1.18	
	1 11/16-1 7/8	TMSR125-27	TM2I 27-16UN	2.28	1.46	
14	7/8	TMSR050-11	TM2I 11-14UN	0.47	0.45	0.041
12	7/8	TMSRT0625-16	TM2I 16-12UN	0.87	0.61	0.048
	15/16	TMSR0625-16	TM2I 16-12UN	0.87	0.67	
	1	TMSR075-225	TM2I 22-12UN	1.14	0.75	
	1 1/16	TMSR075-16	TM2I 16-12UN	1.69	0.79	
	1 1/8-1 1/4	TMSRL100-16	TM2I 16-12UN	0.98	0.87	
	1 1/2-1 11/16	TMSR100-27	TM2I 27-12UN	2.05	1.18	
	1 3/4-1 15/16	TMSR125-27	TM2I 27-12UN	2.28	1.46	
8	1 11/16-1 15/16	TMSR100-27	TM2I 27-8UN	2.05	1.18	0.072
	2-1 1/8	TMSR125-27	TM2I 27-8UN	2.28	1.46	
6	2-2 1/8	TMSR100-27	TM2I 27-6UN	2.05	1.18	0.096
	2 1/4	TMSR125-27	TM2I 27-6UN	2.28	1.46	
	2 3/8-2 1/2	TMSR150-38	TM2I 38-6UN	2.56	1.18	
4.5	2-2 1/4	TMSR125-38	TM2I 38-4.5UN	2.17	1.38	0.128
4	2 1/2	TMSR150-38	TM2I 38-4UN	2.56	1.81	0.144

• The recommended holder is the largest for the given thread specification
• Holder with smaller or equal cutting diameters (D2) can also be used

Tooling recommendation for given internal thread specification



UNJ

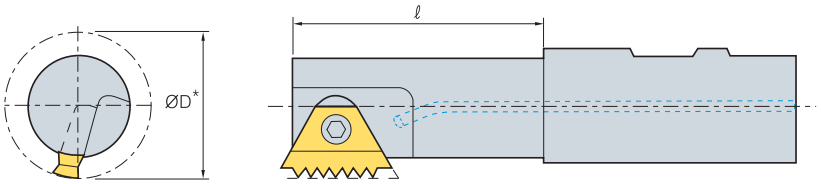
Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
24	9/16-11/16	TMSR050-11	TM2I 11-24UNJ	0.47	0.45	0.024
20	1/2	TMSR050-10	TMI 10-20UNJ	0.47	0.35	0.029
	3/4-13/16	TMSR050-11	TM2I 11-20UNJ	0.47	0.45	
	7/8	TMSR0625-16	TM2I 16-20UNJ	0.87	0.67	
	15/16-1	TMSR075-16	TM2I 16-20UNJ	1.69	0.79	
18	5/8	TMSR050-11	TM2I 11-18UNJ	0.47	0.45	0.032
	1 1/16-1 3/16	TMSRL100-16	TM2I 16-18UNJ	0.98	0.87	
16	11/16-13/16	TMSR050-11	TM2I 11-16UNJ	0.47	0.45	0.036
	7/8-15/16	TMSR0625-16	TM2I 16-16UNJ	0.87	0.67	
	1	TMSR075-16	TM2I 16-16UNJ	1.69	0.79	
	1 1/16-1 3/16	TMSRL100-16	TM2I 16-16UNJ	0.98	0.87	
	1 7/16-1 5/8	TMSR100-27	TM2I 27-16UNJ	2.05	1.18	
	1 11/16-1 7/8	TMSR125-27	TM2I 27-16UNJ	2.28	1.46	
14	7/8	TMSR050-11	TM2I 11-14UNJ	0.47	0.45	0.041
12	7/8	TMSRT0625-16	TM2I 16-12UNJ	0.87	0.61	0.048
	15/16-1	TMSR0625-16	TM2I 16-12UNJ	0.87	0.67	
	1 1/16	TMSR075-16	TM2I 16-12UNJ	1.69	0.79	
	1 1/8-1 1/4	TMSRL100-16	TM2I 16-12UNJ	0.98	0.87	
	1 1/2-1 11/16	TMSR100-27	TM2I 27-12UNJ	2.05	1.18	
	1 3/4-1 15/16	TMSR125-27	TM2I 27-12UNJ	2.28	1.46	

W

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
26	1/2-9/16	TMSR050-10	TMEI 10-26W	0.47	0.35	0.025
	5/8-3/4	TMSR050-11	TM2EI 11-26 W	0.47	0.45	
	13/16-7/8	TMSR0625-16	TM2EI 16-26W	0.87	0.67	
	15/16-1	TMSR075-16	TM2EI 16-26W	1.69	0.79	
	1 1/16-1 1/8	TMSRL100-16	TM2EI 16-26W	0.98	0.87	
20	9/16	TMSR050-10	TM2EI 10-20W	0.47	0.35	0.032
	5/8-13/16	TMSR050-11	TM2EI 11-20W	0.47	0.45	
	7/8-15/16	TMSR0625-16	TM2EI 16-20W	0.87	0.67	
	1	TMSR075-16	TM2EI 16-20W	1.69	0.79	
	1 1/16-1 3/16	TMSRL100-16	TM2EI 16-20W	0.98	0.87	
16	13/16	TMSR0625-16	TM2EI 16-16W	0.87	0.61	0.040
	7/8-15/16	TMSR0625-16	TM2EI 16-16W	0.87	0.67	
	1-1 1/16	TMSR075-16	TM2EI 16-16W	1.69	0.79	
	1 1/8-1 1/4	TMSRL100-16	TM2EI 16-16W	0.98	0.87	
	1.4-1 5/8	TMSR100-27	TM2EI 27-16W	2.05	1.18	
	1 3/4-1.9	TMSR125-27	TM2EI 27-16W	2.28	1.46	
12	1 1/2-1 3/4	TMSR100-27	TM2EI 27-12W	2.05	1.18	0.054
	1 7/8	TMSR125-27	TM2EI 27-12W	2.28	1.46	
8	1 7/8-1.9	TMSR100-27	TM2EI 27-8W	2.05	1.18	0.080
	2.1-2 1/8	TMSR125-276	TM2EI 27-8W	2.28	1.46	
7	2	TMSR100-27	TM2EI 27-7W	2.05	1.18	0.091
6	2.1-2 1/8	TMSR100-27	TM2EI 27-6W	2.05	1.18	0.107
	2 1/4	TMSR125-38	TM2EI 38-6W	2.17	1.38	
	2 3/8-2.6	TMSR125-27	TM2EI 27-6W	2.28	1.46	
	2 5/8-2 3/4	TMSR150-38	TM2EI 38-6W	2.56	1.81	
5	3	TMSR150-38	TM2EI 38-5W	2.56	1.81	0.128
4.5	3 1/2	TMSR150-38	TM2EI 38-4.5W	2.56	1.81	0.142

• The recommended holder is the largest for the given thread specification • Holder with smaller or equal cutting diameters (D2) can also be used

Tooling recommendation for given internal thread specification



BSPT

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
19	3/8	TMSR 21-11	TM2EI 11-19 BSPT	0.79	0.45	0.034
14	1/2-3/4	TMSRT 16-11	TM2EI 16-14 BSPT	0.87	0.61	0.046
11	1-1 1/4	TMSRT 20-16	TM2EI 16-11 BSPT	0.91	0.75	0.058
	1 1/2	TMSR 25-27	TM2EI 27-11 BSPT	2.05	1.18	
	2-6	TMSRT 32-27	TM2EI 27-11 BSPT	2.28	1.46	

NPT

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
14	1/2	TMSRT 16-16	TM2EI 16-14 NPT	0.87	0.61	0.052
	3/4	TMSRT 20-16	TM2EI 16-14 NPT	0.91	0.75	
11.5	1	TMSRT 20-16	TM2EI 16-11.5 NPT	0.91	0.75	0.056
	1 1/4	TMSR 25-27	TM2EI 27-11.5 NPT	2.05	1.18	
	1 1/2-2	TMSRT 32-27	TM2EI 27-11.5 NPT	2.28	1.46	
8	2 1/2	TMSRT 32-27	TM2EI 27-8 NPT	2.28	1.46	0.095
	3-24	TMSR 40-38	TM2EI 38-8 NPT	2.28	1.81	

NPTF

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
14	1/2	TMSRT 16-16	TM2EI 16-14 NPTF	0.87	0.61	0.053
	3/4	TMSRT 20-16	TM2EI 16-14 NPTF	0.91	0.75	
11.5	1	TMSRT 20-16	TM2EI 16-11.5 NPTF	0.91	0.75	0.064
	1 1/2	TMSR 25-27	TM2EI 27-11.5 NPTF	2.05	1.18	
	2	TMSRT 32-27	TM2EI 27-11.5 NPTF	2.28	1.46	
8	2 1/2	TMSRT 32-27	TM2EI 27-8 NPTF	2.28	1.46	0.095
	3	TMSR 40-38	TM2EI 38-8 NPTF	2.28	1.81	

• The recommended holder is the largest for the given thread specification
• Holder with smaller or equal cutting diameters (D2) can also be used

Minimum bore diameters for thread milling

Pitch		0.5	0.6	0.7	0.75 0.80	0.9	1.0	1.25	1.5	1.75	2.0	-	2.5	3.0	3.5	4.0	4.5	5.0	5.5	-	6.0	-
	tpi	48	44	36	32	28	26 24	20 19	18 16	14	13 12	11.5 11	10	9 8	7	6	-	5	-	4.5	-	4
Holder designation	**diameter**	**Minimum diameter for machining**																				
TMSR 12-10	0.35	0.37	0.38	0.39	0.39	0.41	0.42	0.45	0.47													
TMSR 20-10	0.35	0.37	0.38	0.39	0.39	0.41	0.42	0.45	0.47													
TMSR 12-11	0.45	0.47	0.48	0.49	0.49	0.51	0.52	0.55	0.57	0.59												
TMSR 20-11	0.45	0.47	0.48	0.49	0.49	0.51	0.52	0.55	0.57	0.5												
TMSRL 25-11	0.45	0.47	0.48	0.49	0.49	0.51	0.52	0.55	0.57	0.59												
TMSRT 16-16	0.61	0.63	0.64	0.65	0.65	0.67	0.68	0.70	0.73	0.75	0.77	0.79										
TMSR 16-16	0.67	0.69	0.70	0.71	0.72	0.74	0.75	0.77	0.79	0.81	0.83	0.85										
TMSR 16-22	0.67	0.69	0.70	0.71	0.72	0.74	0.75	0.77	0.79	0.81	0.83	0.85										
TMSR 20-22	0.75	0.78	0.79	0.80	0.80	0.82	0.83	0.85	0.87	0.89	0.91	0.93										
TMSRT 20-16	0.75	0.78	0.79	0.80	0.80	0.82	0.83	0.85	0.87	0.89	0.91	0.93										
TMSR 20-16	0.79	0.81	0.83	0.83	0.84	0.86	0.87	0.89	0.91	0.93	0.94	0.96										
TMSRW 25-22	0.87	0.89	0.91	0.91	0.92	0.94	0.94	0.97	0.98	1.00	1.02	1.04										
TMSRL 25-22	0.87	0.89	0.91	0.91	0.92	0.94	0.94	0.97	0.98	1.00	1.02	1.04										
TMSRL 25-16	0.87	0.89	0.91	0.91	0.92	0.94	0.94	0.97	0.98	1.00	1.02	1.04										
TMSR 25-27	1.18	1.21	1.22	1.23	1.24	1.25	1.26	1.29	1.32	1.34	1.36	1.40	1.44	1.54	1.65	1.77	1.89					
TMSRL 25-27	1.18	1.21	1.22	1.23	1.24	1.25	1.26	1.29	1.32	1.34	1.36	1.40	1.44	1.54	1.65	1.77	1.89					
TMSR 32-38	1.38															1.97	2.10	1.67	1.97	1.76	2.26	2.23
TMSR 32-27	1.46	1.50	1.50	1.51	1.52	1.54	1.56	1.59	1.61	1.63	1.65	1.69	1.73	1.83	1.93	2.05	2.19					
TMSRL 32-27	1.46	1.50	1.50	1.51	1.52	1.54	1.56	1.59	1.61	1.63	1.65	1.69	1.73	1.83	1.93	2.05	2.19					
TMSRT 32-27	1.46	1.50	1.50	1.51	1.52	1.54	1.56	1.59	1.61	1.63	1.65	1.69	1.73	1.83	1.93	2.05	2.19					
TMSR 40-38	1.81															2.19	2.17	2.07	2.13	2.15	2.26	2.23
TMSRL 40-38	1.81															2.19	2.17	2.07	2.13	2.15	2.26	2.23

- In order to perform a thread milling operation, a milling machine with three-axis control capability of helical interpolation is required.
- Helical interpolation is a CNC function producing tool movement along a helical path. This helical motion combines circular movement in one plane with a simultaneous linear motion in a plane perpendicular to the first. For example, the path from point A to point B (Fig,A) on the envelope of the cylinder combines a circular movement in the x-y plane with a linear displacement in the z direction
- On most CNC systems this function can be executed in two different ways:

  - GO2: Helical interpolation in a clockwise direction
  - GO3: Helical interpolation in a counter-clockwise direction

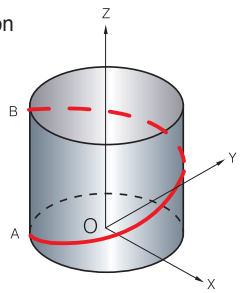


Fig. A

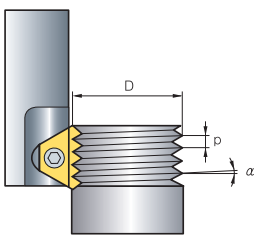


Fig. B

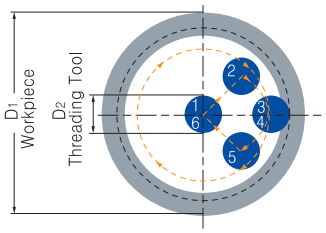
- The thread milling operation (Fig. B) consists of circular rotation of fhe tool around its own axis togerther with an orbiting motion along the bore or workpiece circumference. During one such orbit, the tool will shift vertically one pitch length. These movements combined with the insert geometry create the required thread form. There are three acceptable ways of approaching the workpiece with the tool to initiate production of the thread:

  1. Tangential Arc Approach
  2. Radial Approach
  3. Tangential Line Approach

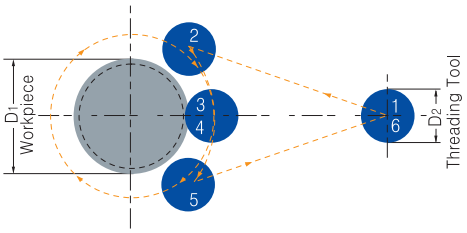
Tangential arc approach

- With this method, the tool enters and exits the workpiece smoothly. No marks are left on the workpiece and there is no vibration, even with harder materials. Although it requires slightly more complex programming than the radial approach (see below), this is the method recommended for machining the highest quality threads

Internal thread



External thread

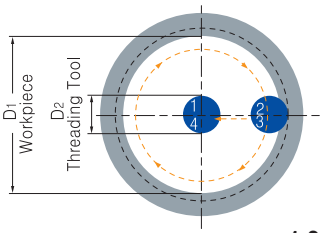


1-2: rapid approach
2-3: tool entry along tangential arc, with simultaneous feed along z-axis
3-4: helical movement during one full orbit (360°)
4-5: tool exit along tangential arc, with continuing feed along z-axis
5-6: rapid return

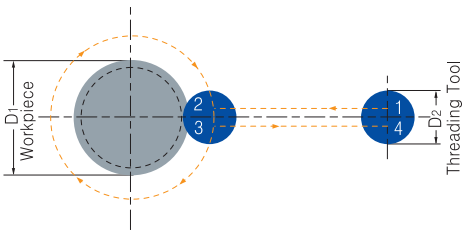
Radial approach

- This is the simplest method. There are two characteristics worth nothing about the radial approach:
  A. a small vertical mark may be lift at the entry (and exit) point. This is of no significance to the thread itself
  B. when using this method with very hard materials, there may be a tendency of the tool to vibrate as it approaches the full cutting depth
- Note: Radial feed during entry to the full profile depth should only be 1/3 of the subsequent circular feed!

Internal thread



External thread

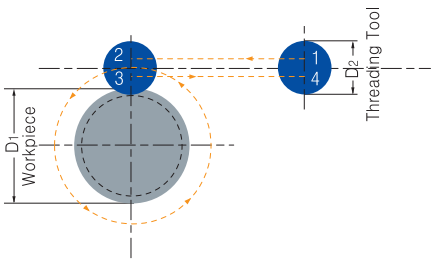


1-2: radial entry
2-3: helical movement during one full orbit (360°)
3-4: radial exit

Tangential line approach

- This method is very simple, and has all of the advantages of the tangential arc method.
  However, it is applicable only with external threads

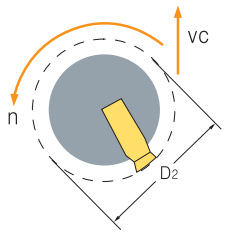
External thread



1-2: radial entry with simultaneous feed along z axis
2-3: helical movement during one full orbit (360°)
3-4: radial exit

Preparing for the thread milling operation

Calculation of rotational velocity and feed at the cutting edge



$$n = \frac{vc \times 12}{\pi \times D2}$$

$$vc = \frac{n \times \pi \times D2}{12}$$

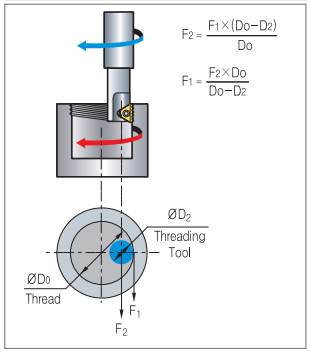
$$F1 = n \times z \times fn$$

n: Rotational Velocity [R.P.M]
vc: Cutting Speed [sfm]
D2: Tool holder Cutting Dia. [inch]
F1: Real Feed rate at the Cutting edges [ipm]
z: No. of Cutting Edges
fn: Feed per Rooth per Rotation [ipr]

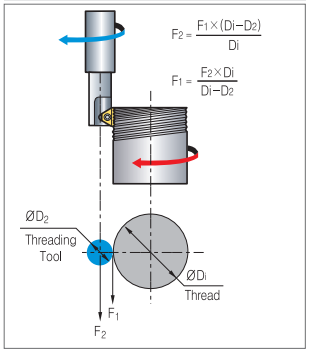
Calculation of feed rates at the tool center line

- On most CNC machines, the feed rate required for programming is that of the center-line of the tool. When dealing with linear tool movement, the feed rate at the cutting edge and the center line are identical, but with circular tool movement this is not the case The equations define the relationship between feed rates at the cutting edge and at the tool center line

Internal thread



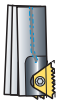
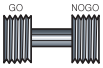
External thread



Grades and applications

- Grade: PC9570T
- Application: First Choice for steel and cast iron,
  A tough sub-micron substrate with TiCN coating
  Provides good fracture toughness and excellent wear resistance

Trouble shooting

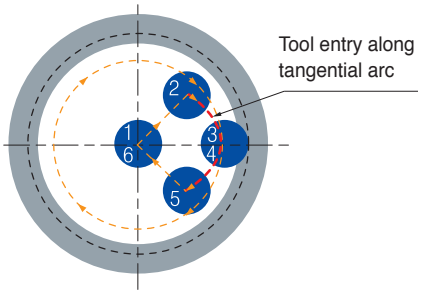
Problem		Possible	Solution
	**Increased insert flank wear**	Cutting speed too high Chip is too thin Insufficient coolant	Reduce cutting speed/use coated insert Increase feed rate Increase coolant flow rate
	**Chipping of cutting edge**	Chip is too thick Vibration	Reduce feed rate/Use the tangential arc method Increase RPM Check stability
	**Material built-up on the cutting edge**	Incorrect cutting speed Unsuitable carbide grade	Change cutting speed Use a coated carbide grade
	**Chatter/ vibration**	Feed rate is too high Profile is too deep Thread length is too long	Reduce the feed. Execute two passes, each with increased cutting depth/ Execute two passes, each cutting only half the thread length Execute two passes, each cutting only half the thread length
	**Insufficient thread accuracy**	Tool deflection	Reduce feed rate/Execute a “zero” cut

Recommended cutting condition

Workpiece			Hardness brinell HB	vc (sfm)		Feed fz (ipt)	
				PC9570T	PC9070M	Indexable insert	Solid endmill
P	Unalloyed steel	Low carbon (C+0.1-0.25%)	125	330~690	260~820	0.002~0.012	0.001~0.006
		Medium carbon (C = 0.25-0.55%)	150	330~590	260~755	0.002~0.010	0.001~0.004
		High carbon (C = 0.55-0.85%)	170	330~560	260~655	0.002~0.008	0.001~0.003
	Low alloy steel (alloying elements≤5%)	Non-hardened	180	290~520	195~590	0.002~0.010	0.001~0.004
		Hardened	275	260~490	195~560	0.002~0.008	0.001~0.003
		Hardened	350	230~460	195~525	0.002~0.006	0.0004~0.001
	High alloy steel	Annealed	200	200~430	130~330	0.002~0.008	0.001~0.002
		Hardened	325	230~360	100~260	0.002~0.004	0.000~0.001
	Cast steel	Low alloy (alloying elements<5%)	200	330~560	260~820	0.002~0.006	0.001~0.004
		High alloy (alloying elements>5%)	225	230~390	195~560	0.002~0.004	0.0004~0.001
M	Stainless steel ferritic	Non-hardened	200	330~560	195~490	0.002~0.006	0.002~0.004
		Hardened	330	330~560	195~395	0.002~0.004	0.0004~0.002
	Stainless steel Austenitic	Austenitic	180	230~460	195~460	0.002~0.006	0.002~0.004
		Super austenitic	200	230~460	195~425	0.002~0.004	0.002~0.004
	Stainless steel cast ferritic	Non-hardened	200	230~460	195~525	0.002~0.006	0.002~0.004
		Hardened	330	230~460	195~360	0.002~0.004	0.001~0.002
	Stainless steel cast austenitic	Austenitic	200	230~390	195~490	0.002~0.006	0.002~0.004
		Hardened	330	230~390	195~330	0.002~0.004	0.001~0.002
	High temperature alloys	Annealed (Iron based)	200	70~150	100~195	0.002~0.004	0.002~0.004
		Aged (Iron based)	280	70~100	65~165	0.001~0.002	0.0004~0.001
		Annealed (Nickel or Cobalt based)	250	50~70	50~115	0.001~0.002	0.0004~0.001
		Aged (Nickel or Cobalt based)	350	30~50	50~100	0.001~0.002	0.0004~0.001
	Titanium alloys	Pure 99.5 Ti	400Rm	230~460	130~260	0.001~0.002	0.001~0.002
		α+β alloys	1050Rm	70~160	65~165	0.001~0.002	0.001~0.002
K	Extra hard steel	Hardened & tempered	55HRC	70~150	50~160	0.0004~0.001	0.0002~0.0004
	Malleable cast iron	Ferritic (short chips)	130	200~430	230~525	0.0008~0.003	0.0004~0.001
		Pearlitic (long chips)	230	200~390	195~490	0.0008~0.002	0.001~0.002
	Grey cast iron	Low tensile strength	180	200~430	230~525	0.002~0.006	0.002~0.004
		High tensile strength	260	200~330	130~395	0.002~0.004	0.001~0.002
	Nodular SG iron	Ferritic	160	200~410	130~360	0.002~0.006	0.002~0.004
		Pearlitic	260	160~290	130~330	0.002~0.004	0.001~0.002
	Aluminum alloys Wrought	Non-aging	60	330~820	655~985	0.004~0.016	0.004~0.010
		Aged	100	330~590	490~820	0.004~0.012	0.004~0.008
	Aluminum alloys	Cast	75	490~1310	330~655	0.004~0.012	0.004~0.008
		Cast & aged	90	490~920	395~720	0.002~0.010	0.004~0.006
		Cast Si 13-22%	130	260~490	655~985	0.004~0.012	0.004~0.008
	Copper and copper alloys	Brass	90	390~670	655~985	0.004~0.012	0.004~0.010
		Bronze and non-leaded copper	100	390~670	490~820	0.002~0.010	0.004~0.008

Example

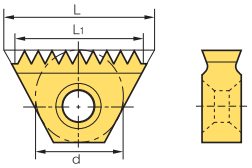
- At tool entry, set the Feed fz [mm/tooth] to 70% lower than the threading Feed
- Threading Feed: 0.012 (ipt)
- Tool entry Feed: 0.004 (ipt)

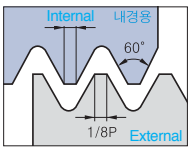


ISO Metric

External/Internal







Defined by: R262 (DIN 13)
Tolerance class: 6g/6H

(inch)

Insert size		Pitch (mm)	Designation						L1	Tooth	Tool holder
d	L		External		PC9570T	Internal		PC9570T			
0.236	0.41	0.5		-		TMI	10-0.5ISO	●	0.39	20	TMSR-10
		0.75		-			10-0.75ISO		0.38	13	
		1.0		-			10-1.0ISO	●	0.35	9	
		1.25		-			10-1.25ISO		0.34	7	
		1.5		-			10-1.5ISO		0.35	6	
1/4	0.43	0.5		-		TM2I	11-0.5ISO		0.39	20	TMSR-11
		0.75	TM2E	11-0.75ISO			11-0.75ISO	●	0.41	14	
		1.0		11-1.0ISO			11-1.0ISO	●	0.39	10	
		1.25		11-1.25ISO			-		0.39	8	
		1.25		-			11-1.25ISO		0.34	7	
		1.5		11-1.5ISO			-		0.35	6	
		1.5		-			11-1.5ISO	●	0.41	7	
3/8	0.63	0.5		-		TM2I	16-0.5ISO		0.59	30	TMSR-16
		0.75	TM2E	16-0.75ISO			16-0.75ISO		0.59	20	
		0.8		-			16-0.8ISO		0.57	18	
		1.0		16-1.0ISO			-		0.55	14	
		1.0		-			16-1.0ISO		0.59	15	
		1.25		16-1.25ISO			16-1.25ISO		0.59	12	
		1.5		16-1.5ISO			16-1.5ISO	●	0.59	10	
		1.75		16-1.75ISO			16-1.75ISO		0.55	8	
		2.0		16-2.0ISO			16-2.0ISO	●	0.55	7	
3/8B	0.87	1.0	TM2E	22-1.0ISO		TM2I	22-1.0ISO		0.87	22	TMSR-22
		1.25		22-1.25ISO			22-1.25ISO		0.84	17	
		1.5		22-1.5ISO			22-1.5ISO	●	0.83	14	
		1.75		22-1.75ISO			22-1.75ISO		0.83	12	
		2.0		22-2.0ISO	●		22-2.0ISO	●	0.87	11	
5/8	1.06	1.0	TM2E	27-1.0ISO		TM2I	27-1.0ISO		1.02	26	TMSR-27
		1.25		27-1.25ISO			27-1.25ISO		0.98	20	
		1.5		27-1.5ISO			27-1.5ISO	●	1.00	17	
		1.75		27-1.75ISO			27-1.75ISO		0.96	14	
		2.0		27-2.0ISO			27-2.0ISO	●	0.94	12	
		2.5		27-2.5ISO			27-2.5ISO		0.98	10	
		3.0		27-3.0ISO			27-3.0ISO	●	0.94	8	
		3.5		27-3.5ISO			27-3.5ISO		0.96	7	
		4.0		27-4.0ISO			27-4.0ISO	●	0.94	6	
		4.5		27-4.5ISO			27-4.5ISO		0.89	5	
3/4B	1.52	1.5	TM2E	38-1.5ISO		TM2I	38-1.5ISO		1.42	24	TMSR-38
		2.0		38-2.0ISO			38-2.0ISO		1.42	18	
		3.0		38-3.0ISO			38-3.0ISO		1.42	12	
		4.0		38-4.0ISO			38-4.0ISO		1.26	8	
		4.5		38-4.5ISO			38-4.5ISO		1.24	7	
		5.0		38-5.0ISO			38-5.0ISO		1.18	6	
		5.5		38-5.5ISO			38-5.5ISO		1.30	6	
		6.0		38-6.0ISO			38-6.0ISO		1.18	5	

Applicable holders D49

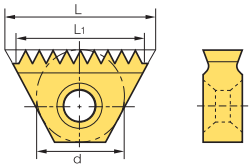
All inserts except TMI10 code have 2 cutting edges

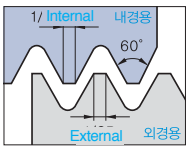
●: Korea Stock ●: US Stock

American UN

External/Internal







Defined by: ANSI B1.1.74
Tolerance class: Class 2A/2B

(inch)

Insert size		Pitch (tpi)	Designation						L1	Tooth	Tool holder
d	L		External		PC9570T	Internal		PC9570T			
0.236	0.41	32		-		TMI	10-32UN		0.38	12	TMSR-10
		28		-			10-28UN		0.36	10	
		24		-			10-24UN		0.38	9	
		20		-			10-20UN		0.35	7	
		18		-			10-18UN		0.33	6	
		16		-			10-16UN		0.31	5	
1/4	0.43	48		-		TM2I	11-48UN		0.39	19	TMSR-11
		40		-			11-40UN		0.40	16	
		32		-			11-32UN		0.41	13	
		28	TM2E	11-28UN			11-28UN		0.39	11	
		27		11-27UN			11-27UN		0.41	11	
		24		11-24UN			11-24UN		0.38	9	
		20		11-20UN			11-20UN		0.40	8	
		18		11-18UN			11-18UN		0.39	7	
		16		11-16UN			11-16UN		0.38	6	
		14		11-14UN			11-14UN		0.36	5	
3/8	0.63	40		-		TM2I	16-40UN		0.58	40	TMSR-16
		32		-			16-32UN		0.59	32	
		28	TM2E	16-28UN			16-28UN		0.57	28	
		27		16-27UN			16-27UN		0.55	27	
		24		16-24UN			16-24UN		0.58	24	
		20		16-20UN			16-20UN		0.55	20	
		18		16-18UN			16-18UN		0.56	18	
		16		16-16UN			16-16UN	●	0.56	16	
		14		16-14UN			16-14UN		0.57	14	
		13		16-13UN			16-13UN		0.54	13	
		12		16-12UN			16-12UN	●	0.58	12	
		11.5		16-11.5UN			16-11.5UN		0.52	11.5	
3/8B	0.87	24	TM2E	22-24UN		TM2I	22-24UN		0.83	20	TMSR-22
		20		22-20UN			22-20UN		0.85	17	
		18		22-18UN			22-18UN		0.83	15	
		16		22-16UN			22-16UN		0.81	13	
		14		22-14UN			22-14UN		0.86	12	
		13		22-13UN			22-13UN		0.85	11	
		12		22-12UN			22-12UN		0.83	10	
5/8	1.06	24	TM2E	27-24UN		TM2I	27-24UN		1.00	24	TMSR-27
		20		27-20UN			27-20UN		1.00	20	
		18		27-18UN			27-18UN		1.00	18	
		16		27-16UN			27-16UN		1.00	16	
		14		27-14UN			27-14UN		1.00	14	
		13		27-13UN			27-13UN		1.00	13	
		12		27-12UN			27-12UN		1.00	12	
		11.5		27-11.5UN			27-11.5UN		0.96	11	
		11		27-11UN			27-11UN		1.00	11	
		10		27-10UN			-		0.90	9	
		10		-			27-10UN		1.00	10	
		9		27-9UN			27-9UN		0.89	8	
		8		27-8UN			27-8UN		0.88	7	
		7		27-7UN			-		0.86	6	
		7		-			27-7UN		1.00	7	
		6		27-6UN			-		0.83	5	
		6		-			27-6UN		1.00	6	
3/4B	1.52	6	TM2E	38-6UN		TM2I	38-6UN		1.33	8	TMSR-38
		5		38-5UN			38-5UN		1.20	6	
		4.5		38-4.5UN			38-4.5UN		1.33	6	
		4		38-4UN			38-4UN		1.25	5	

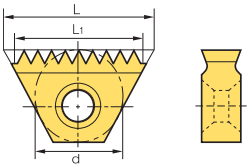
Applicable holders D49

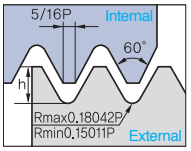
All inserts except TMI10 code have 2 cutting edges

●: Korea Stock ●: US Stock

UNJ (Unified constant thread)







Defined by: MIL-S-8879C
Tolerance class: 3A/3B

External/Internal

(inch)

Insert size		Pitch (tpi)	Designation						L_1	Tooth	Tool holder
d	L		External		PC9570T	Internal		PC9570T			
0.236	0.41	24		-		TMI	10-24UNJ		0.38	9	TMSR-10
		20		-			10-20UNJ		0.35	7	
		18		-			10-18UNJ		0.33	6	
		16		-			10-16UNJ		0.50	8	
1/4	0.43	24	TM2E	11-24UNJ		TM2I	11-24UNJ		0.38	9	TMSR-11
		20		11-20UNJ			11-20UNJ		0.40	8	
		18		-			11-18UNJ		0.39	7	
		16		11-16UNJ			11-16UNJ		0.38	6	
		14		11-14UNJ			11-14UNJ		0.36	5	
3/8	0.63	24	TM2E	16-24UNJ		TM2I	16-24UNJ		0.58	14	TMSR-16
		20		16-20UNJ			16-20UNJ		0.55	11	
		18		16-18UNJ			16-18UNJ		0.56	10	
		16		16-16UNJ			16-16UNJ		0.56	9	
		14		16-14UNJ			16-14UNJ		0.57	8	
		13		16-13UNJ			-		0.54	7	
		12		16-12UNJ			16-12UNJ		0.58	7	
5/8	1.06	16	TM2E	27-16UNJ		TM2I	27-16UNJ		1.00	16	TMSR-27
		12		27-12UNJ			27-12UNJ		1.00	12	
		11		27-11UNJ			27-11UNJ		1.00	11	

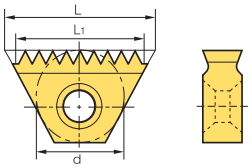
Applicable holders D49

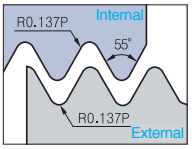
All inserts except TMI10 code have 2 cutting edges

●: Korea Stock ●: US Stock

Whitworth (BSW, BSF, BSP, BSB)







BSW Defined by: B.S.84:1956, DIN 259, ISO228/1: 1982
BSP Defind by: B.S.2779: 1956
Tolerance class: BSW-Medium class A, BSP-Medium class

External/Internal

(inch)

Insert size		Pitch (tpi)	Designation			L_1	Tooth	Tool holder
d	L		External+Internal		PC9570T			
0.236	0.41	28	TMEI	10-28W		0.36	10	TMSR-10
		26		10-26W		0.35	9	
		24		10-24W		0.38	9	
		20		10-20W		0.35	7	
		19		10-19W		0.37	7	
1/4	0.43	28	TM2EI	11-28W		0.39	11	TMSR-11
		26		11-26W		0.38	10	
		24		11-24W		0.38	9	
		20		11-20W		0.40	8	
		19		11-19W		0.37	7	
		14		11-14W		0.36	5	
3/8	0.63	26	TM2EI	16-26W		0.58	15	TMSR-16
		24		16-24W		0.58	14	
		20		16-20W		0.55	11	
		19		16-19W		0.58	11	
		18		16-18W		0.56	10	
		16		16-16W		0.56	9	
		14		16-14W		0.57	8	
		12		16-12W		0.58	7	
		11		16-11W	●	0.55	6	
3/8B	0.87	24	TM2EI	22-24W		0.83	20	TMSR-22
		20		22-20W		0.85	17	
		19		22-19W		0.84	16	
		18		22-18W		0.83	15	
		16		22-16W		0.81	13	
		14		22-14W		0.86	12	
		12		22-12W		0.83	10	
		11		22-11W		0.82	9	
5/8	1.06	16	TM2EI	27-16W		1.00	16	TMSR-27
		14		27-14W		1.00	14	
		12		27-12W		0.92	11	
		11		27-11W		0.91	10	
		10		27-10W		1.00	10	
		9		27-9W		0.89	8	
		8		27-8W		0.88	7	
		7		27-7W		0.66	6	
		6		27-6W		0.83	5	
3/4B	1.52	11	TM2EI	38-11W		1.38	15	TMSR-38
		6		38-6W		1.33	8	
		5		38-5W		1.20	6	
		4.5		38-4.5W		1.33	6	
		-		38-15W		-	-	

Applicable holders D49

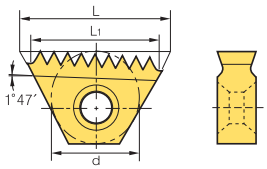
All inserts except TMI10 code have 2 cutting edges

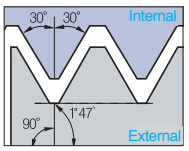
● : Korea Stock ● : US Stock

NPT

External/Internal







Defined by: USAS B2.1: 1968
Tolerance class: Standard NPT

(inch)

Insert size		Pitch (tpi)	Designation			L1	Tooth	Tool holder	
d	L		External+Internal		PC9570T			RH	LH
3/8	0.63	18	TM2E	16-18NPT *		0.56	10	TMSRT-16	TMSLT-16
		14	TM2EI	16-14NPT		0.57	8		
		11.5		16-11.5NPT		0.52	6		
3/8B	0.87	14	TM2EI	22-14NPT		0.86	12	TMSRT-22	TMSLT-22
5/8	1.06	11.5	TM2EI	27-11.5NPT	●	0.96	11	TMSR-27	TMSL-27
		8		27-8NPT	●	0.88	7		
3/4B	1.52	11.5	TM2EI	38-11.5NPT		1.39	16	TMSR-38	TMSL-38
		8		38-8NPT		1.25	10		

Applicable holders D49

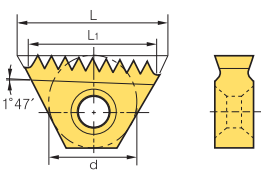
* TM2E16–18NPT is for external threading

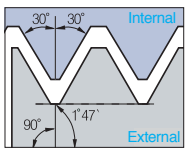
●: Korea Stock ●: US Stock

NPTF

External/Internal







Defined by: ANSI 1.20.3-1976
Tolerance class: Standard NPTF

(inch)

Insert size		Pitch (tpi)	Designation			L1	Tooth	Tool holder	
d	L		External+Internal		PC9570T			RH	LH
3/8	0.63	14	TM2EI	16-14NPTF	●	0.57	8	TMSRT-16	TMSLT-16
		11.5		16-11.5NPTF		0.52	6		
3/8B	0.87	14	TM2EI	22-14NPTF		0.86	12	TMSRT-22	TMSLT-22
		11.5		22-11.5NPTF		0.78	9		
5/8	1.06	11.5	TM2EI	27-11.5NPTF		0.96	11	TMSR-27	TMSL-27
		8		27-8NPTF		0.88	7		
3/4B	1.52	11.5	TM2EI	38-11.5NPTF		1.39	16	TMSR-38	TMSL-38
		8		38-8NPTF		1.25	10		

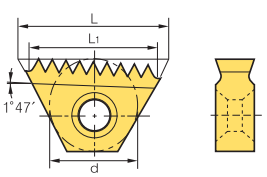
Applicable holders D49

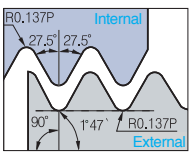
●: Korea Stock ●: US Stock

BSPT

External/Internal







Defined by: B.S 21: 1985
Tolerance class: Standard BSPT

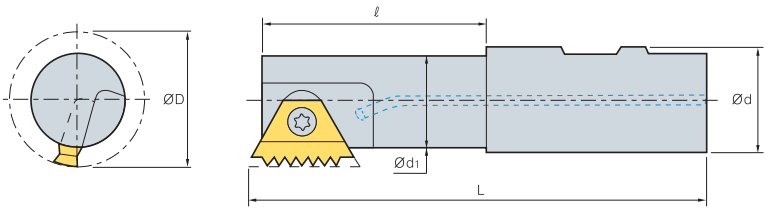
(inch)

Insert size		Pitch (tpi)	Designation			L1	Tooth	Tool holder	
d	L		External+Internal		PC9570T			RH	LH
1/4	0.43	19	TM2EI	11-19BSPT		0.37	7	TMSR-10	TMSL-10
3/8	0.63	14	TM2EI	16-14BSPT		0.57	8	TMSRT-16	TMSLT-16
		11		16-11BSPT		0.56	6		
5/8	1.06	11	TM2EI	27-11BSPT		0.91	10	TMSR-27	TMSL-27

Applicable holders D49

●: Korea Stock ●: US Stock

Standard Type

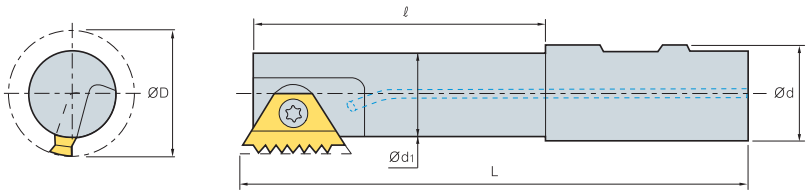


(inch)

Insert size d	Designation		ØD	Ød	Ød1	ℓ	L	Screw	Wrench
0.236	TMSR	050-10	0.35	0.50	0.27	0.47	2.72	STM10	TW07P
		075-10	0.35	0.75	0.27	0.67	3.50		
1/4	TMSR	050-11	0.45	0.50	0.35	0.47	2.75	STM11	TW08P
		075-11	0.45	0.75	0.35	0.79	3.50		
3/8	TMSR	0625-16	0.67	0.625	0.54	0.87	3.56	STM1622	TW10P
		075-16	0.79	0.75	0.65	1.69	3.75		
3/8B	TMSR	0625-22	0.67	0.625	0.53	1.14	3.15	STM1622	TW10P
		075-22	0.75	0.75	0.61	1.14	3.27		
		100-22	0.75	1.00	0.61	1.18	3.68		
	TMSRW	100-22	0.87	1.00	0.73	1.18	3.62		
5/8	TMSR	100-27	1.18	1.00	0.94	2.05	4.38	STM27	TW25L
	TMSL	100-27	1.18	1.00	0.94	2.05	4.38		
	TMSR	125-27	1.46	1.25	1.22	2.28	4.75		
3/4B	TMSR	125-38	1.38	1.25	1.06	2.16	4.45	STM38	TW30L
		150-38	1.81	1.50	1.50	2.56	5.25		

Applicable inserts **D44~48**

Long Type

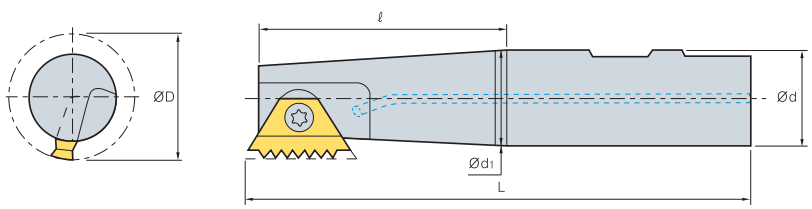


(inch)

Insert size d	Designation		ØD	Ød	Ød1	ℓ	L	Screw	Wrench
3/8	TMSRL	100-16	0.87	1.00	0.73	0.98	5.00	STM11	TW08P
3/8B	TMSRL	100-16	0.87	1.00	0.73	2.50	4.95	STM1622	TW10P
5/8	TMSRL	075-22	0.75	0.75	0.61	1.73	3.86	STM1622	TW10P
		100-22	0.87	1.00	0.73	2.50	4.95		
5/8	TMSRL	100-27	1.18	1.00	0.94	3.62	5.88	STM27	TW25L
		125-27	1.46	1.25	1.22	3.86	6.33		
3/4B	TMSRL	150-38	1.81	1.50	1.50	3.74	6.55	STM38	TW30L

Applicable inserts **D44~48**

Tapered Type



(inch)

Insert size d	Designation		ØD	Ød	Ød1	ℓ	L	Screw	Wrench
3/8	TMSRT	0625-16	0.61	0.625	0.49	0.87	3.56	STM1622	TW10P
		075-16	0.75	0.75	0.59	0.91	3.38	STMT16	
3/8B	TMSRT	0625-22	0.67	0.625	0.53	1.14	3.15	STM1622	TW10P
		075-22	0.75	0.75	0.61	1.14	3.27		
5/8	TMSRT	125-27	1.46	1.25	1.22	2.28	4.75	STM27	TW25L

Applicable inserts **D44~48**

Solid threading endmills code system

STM D 25 189 L03 - I 1.00 ISO

1	2	3	4	5	6	7	8
Type	Flute style	Shank dia.	Cutting dia.	Cutting edge length	Type of tool	Pitch	Type

1 Type

STM D 25 189 L03 - I 1.00 ISO

Solid Threading Endmill

2 Flute style

STM D 25 189 L03 - I 1.00 ISO

HC: Heli Cool

HCR: Heli Radial Cooling

HCC: Heli Cool Chamfering

HCD: Heli Cool C/F & Drilling

D: Deep Threading

3 Shank dia.

STM D 25 189 L03 - I 1.00 ISO

25: 0.25

4 Cutting dia.

STM D 25 189 L03 - I 1.00 ISO

189: 0.189

5 Cutting edge length

STM D 25 189 L03 - I 1.00 ISO

L03: 0.300

6 Type of tool

STM D 25 189 L03 - I 1.00 ISO

I: Internal E: External

7 Pitch

STM D 25 189 L03 - I 1.00 ISO

mm: 0.35~3.0 tpi: 72~12

8 Type

STM D 25 189 L03 - I 1.00 ISO

ISO Metric

American UN

Cutting edge Length UNJ

Whit Worth (BSW, BSF, BSP, BSB)

National Pipe Thread (NPT)

National Pipe Thread (NPTF)

British Standard Pipe Thread (BSPT)

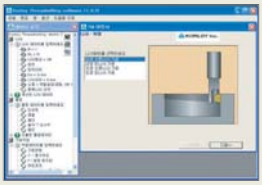
TM-INFO User guide



CNC Program composition
TM-INFO composes CNC program for thread milling process in a short time

- ▶Multilingual
- ▶Window operation

1 Select thread type



2 Select thread standard



3 Select thread type



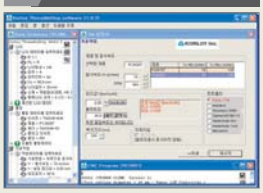
4 Input thread parameter



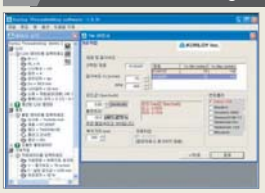
5 Select working way



6 Select tool



7 Confirm the working data & controler



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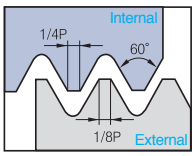
Pls. visit our web-site to download.
http://www.korloy.com

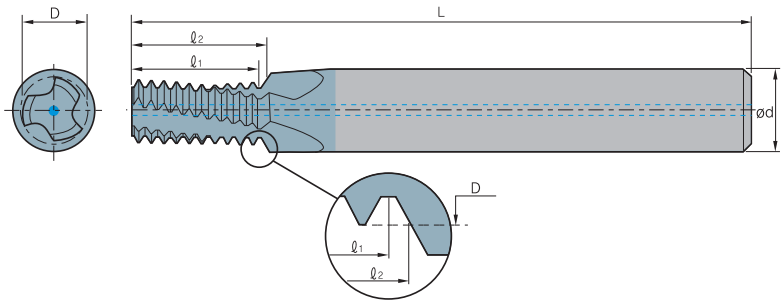
ISO Metric

Helical flutes with thru-hole coolant

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



(ℓ2≤1.5×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (inch)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
M3×0.5	M3.5~M16×0.5	0.5	STMHC	19094L01-I0.50ISO		3/16	0.094	1.772	0.177	0.187	3	9	0.098
M4×0.7		0.7		19124L02-I0.70ISO		3/16	0.124	1.772	0.248	0.262	3	9	0.129
M5×0.8		0.8		19159L02-I0.80ISO		3/16	0.159	2.244	0.283	0.299	3	9	0.165
M6×1.0	M8~M40×1.0	1.0		25189L03-I1.00ISO		1/4	0.189	2.244	0.354	0.374	3	9	0.197
M8×1.25		1.25		31256L05-I1.25ISO		5/16	0.256	2.402	0.492	0.524	3	10	0.268
M10×1.5	M12~M48×1.5	1.5		37323L06-I1.50ISO		3/8	0.323	2.874	0.591	0.62	3	10	0.335
M12×1.75		1.75		37370L07-I1.75ISO		3/8	0.37	2.874	0.689	0.724	4	10	0.405
M14×2.0	M17~M80×2.0	2.0		50457L08-I2.00ISO		1/2	0.457	2.874	0.787	0.827	4	10	0.472
M16×2.0	M17~M80×2.0	2.0		63535L09-I2.00ISO		5/8	0.535	3.622	0.945	0.984	4	12	0.551

●: Korea Stock ●: US Stock

(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (inch)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
M3×0.5	M3.5~M16×0.5	0.5	STMHC	19094L02-I0.50ISO		3/16	0.094	1.772	0.263	0.246	3	12	0.098
	M4×0.5	0.5		19126L03-I0.50ISO		3/16	0.126	1.772	0.315	0.325	3	16	0.138
	M5×0.5	0.5		25165L04-I0.50ISO		1/4	0.165	2.244	0.394	0.404	3	20	0.177
M4×0.7		0.7		19124L03-I0.70ISO		3/16	0.124	1.722	0.331	0.344	3	12	0.129
	M6×0.75	0.75		25197L04-I0.75ISO		1/4	0.197	2.244	0.472	0.487	3	16	0.209
M5×0.8		0.8		19159L04-I0.80ISO		3/16	0.159	2.244	0.409	0.425	3	13	0.165
M6×1.0	M8~M40×1.0	1.0		25189L04-I1.00ISO	●	1/4	0.189	2.244	0.472	0.492	3	12	0.197
	M8×1.0	1.0		31264L06-I1.00ISO		5/16	0.264	2.402	0.630	0.650	3	16	0.276
	M10×1.0	1.0		37343L08-I1.00ISO		3/8	0.343	2.874	0.787	0.807	3	20	0.354
	M12×1.0	1.0		50421L09-I1.00ISO	●	1/2	0.421	2.874	0.945	0.965	4	24	0.433
M8×1.25		1.25		31256L06-I1.25ISO	●	5/16	0.256	2.402	0.640	0.664	3	13	0.268
	M10×1.25	1.25		37335L08-I1.25ISO	●	3/8	0.335	2.874	0.787	0.812	3	16	0.346
M10×1.5	M12~M48×1.5	1.5		37323L07-I1.50ISO	●	3/8	0.323	2.874	0.768	0.797	3	13	0.335
	M12×1.5	1.5		37370L09-I1.50-ISO	●	3/8	0.370	2.874	0.945	0.974	4	16	0.413
	M14×1.5	1.5		50469L11-I1.50ISO		1/2	0.469	3.150	1.122	1.152	4	19	0.492
	M16×1.5	1.5		63547L12-I1.50ISO		5/8	0.547	3.150	1.240	1.270	4	21	0.571
M12×1.75		1.75		37370L09-I1.75ISO		3/8	0.370	2.874	0.965	0.999	4	14	0.405
M14×2.0	M17~M80×2.0	2.0		50457L11-I2.00ISO		1/2	0.457	3.150	1.102	1.142	4	14	0.472
M16×2.0	M17~M80×2.0	2.0		63535L12-I2.00ISO		5/8	0.535	3.622	1.260	1.299	4	16	0.551
M18×2.5		2.5		63583L14-I2.50ISO		5/8	0.583	3.622	1.378	1.427	4	14	0.598
M 20×2.5		2.5		75673L16-I2.50ISO		3/4	0.673	4.016	1.575	1.624	4	16	0.687
M 24×3.0		3.0		75746L19-I3.00ISO		3/4	0.746	4.016	1.980	1.949	4	16	0.827

* Bore Diameter applies to smallest thread Dia

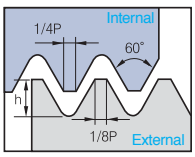
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Korea Stock ●: US Stock

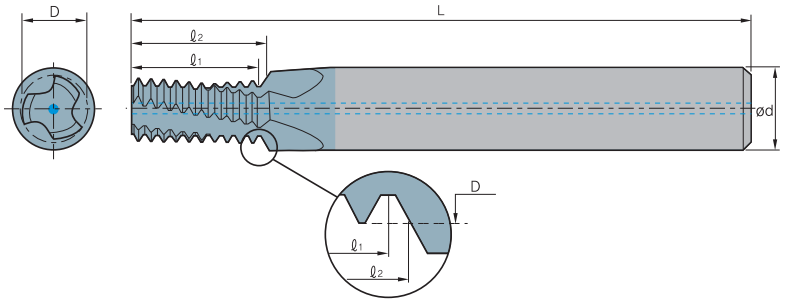
American UN

Helical flutes with thru-hole coolant

Internal



Defined by: ANSI B1.1.74
Tolerance class: 2B



(ℓ2≤1.5×Thread Diameter)

Thread			Pitch (tpi)	Designation			Dimensions (inch)					No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF			Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
No.10~24	5/16″ ,3/8″×24	9/16″~11/16″×24	24	STMHC	19141L03-I24UNC		3/16	0.141	1.722	0.292	0.312	3	7	0.150
No.10~24	5/16″ ,3/8″×24	9/16″~11/16″×24	24		25163L03-I24UNC		1/4	0.163	2.244	0.333	0.354	3	8	0.177
1/4″×20	7/16″ ,1/2″×20	3/4″~1″×20	20		25192L03-I20UNC		1/4	0.162	2.244	0.350	0.375	3	7	0.201
5/16″×18	9/16″ ,5/8″×18	11/16″~1 11/16″×18	18		31242L04-I18UNC		5/16	0.242	2.402	0.444	0.472	3	8	0.260
3/8″×16	3/4″×16		16		31301L05-I16UNC		5/16	0.301	2.402	0.563	0.594	3	9	0.315
7/16″×14	7/8″×14		14		37354L06-I14UNC		3/8	0.354	2.874	0.643	0.678	3	9	0.370
1/2″×13			13		50407L08-I13UNC		1/2	0.407	3.150	0.769	0.808	4	10	0.429
9/16″×12	1″~1 1/2″×12		12		50465L08-I12UNC		1/2	0.465	3.150	0.833	0.875	4	10	0.484

● : Korea Stock ● : US Stock

(ℓ2≤2×Thread Diameter)

Thread			Pitch (tpi)	Designation			Dimensions (inch)					No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF			Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
	No.10~32	No. 12~3/8″×32	32	STMHC	19150L03-I32UNF		3/16	0.150	1.772	0.375	0.391	3	12	0.157
		No. 12~3/8″×32	32		25173L04-I32UNEF		1/4	0.173	2.244	0.438	0.453	3	14	0.185
	No.12, 1/4″×28	7/16″; 1/2″×28	28		25169L04-I28UNF		1/4	0.169	2.244	0.429	0.446	3	12	0.181
	1/4″×28	7/16″; 1/2″×28	28		25203L05-I28UNF		1/4	0.203	2.244	0.500	0.518	3	14	0.216
		7/16″; 1/2″×28	28		37371L08-I28UNEF		3/8	0.371	2.874	0.857	0.875	3	24	0.401
No.10~24	5/16″, 3/8″×24	9/16″~11/16″×24	24		19141L04-I24UNC		3/16	0.141	1.772	0.375	0.396	3	9	0.150
No.12~24	5/16″, 3/8″×24	9/16″~11/16″×24	24		25163L04-I24UNC		1/4	0.163	2.244	0.417	0.437	3	10	0.177
	5/16″, 3/8″×24	9/16″~11/16″×24	24		31263L06-I24UNF		5/16	0.263	2.402	0.625	0.646	3	15	0.272
	3/8″×24	9/16″~11/16″×24	24		37323L07-I24UNF		3/8	0.323	2.874	0.750	0.771	3	18	0.355
		9/16″~11/16″×24	24		50496L11-I24UNEF		1/2	0.496	3.150	1.125	1.145	4	27	0.520
1/4″×20	7/16″, 1/2″×20	3/4″~1″×20	20		25192L05-I20UNC		1/4	0.192	2.244	0.500	0.525	3	10	0.201
	7/16″, 1/2″×20	3/4″~1″×20	20		37362L08-I20UNF		3/8	0.362	2.874	0.850	0.875	3	17	0.390
	1/2″×20	3/4″~1″×20	20		50437L10-I20UNF		1/2	0.437	3.150	1.000	1.025	3	20	0.453
		3/4″~1″×20	20		75685L15-I20UNEF		3/4	0.685	4.016	1.500	1.525	4	30	0.701
5/16″×18	9/16″, 5/8″×18	11/16″~1 11/16″×18	18		31242L16-I18UNC		5/16	0.242	2.402	0.611	0.639	3	11	0.260
	9/16″, 5/8″×18	11/16″~1 11/16″×18	18		50492L11-I18UNF		1/2	0.492	3.150	1.111	1.139	4	20	0.512
	5/8″×18	11/16″~1 11/16″×18	18		63555L12-I18UNF		5/8	0.555	3.622	1.222	1.250	4	22	0.575
3/8″×16	3/4″×16		16		31301L07-I16UNC		5/16	0.301	2.402	0.750	0.781	3	12	0.315
	3/4″×16		16		75669L15-I16UNF		3/4	0.669	4.016	1.500	1.528	4	24	0.689
7/16″×14	7/8″×14		14		37354L08-I14UNC		3/8	0.354	2.874	0.857	0.893	3	12	0.370
	7/8″×14		14		75746L17-I14UNF		3/4	0.746	4.016	1.714	1.750	4	24	0.807
1/2″×13			13		50407L10-I13UNC		1/2	0.407	3.150	1.000	1.039	4	13	0.430
9/16″×12	1″~1 1/2″×12		12		50465L11-I12UNC		1/2	0.462	3.150	1.084	1.125	4	13	0.484
	1″~1 1/2″×12		12		75746L20-I12UNF		3/4	0.746	4.016	2.000	2.042	4	24	0.925
5/8″×11			11		63516L13-I11UNC		5/8	0.516	3.622	1.273	1.318	4	14	0.539
3/4″×10			10		63622L15-I10UNC		5/8	0.622	3.622	1.500	1.550	4	15	0.657
7/8″×9			9		75746L18-I9UNC		3/4	0.746	4.016	1.778	1.833	4	16	0.768
1″×8			8		75746L20-I8UNC		3/4	0.746	4.016	2.000	2.063	4	16	0.866

* Bore Diameter applies to smallest thread Dia

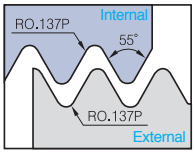
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

● : Korea Stock ● : US Stock

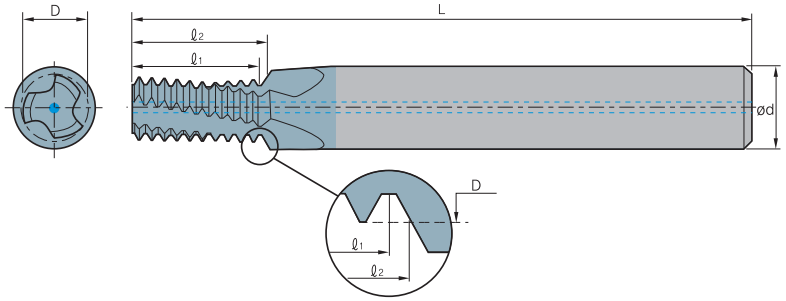
Whitworth

Helical flutes with thru-hole coolant

External/Internal



Defined by: B.S.84: 1956,
DIN 259, ISO228/1: 1982
Tolerance class: Medium class A



(ℓ2≤2×Thread Diameter)

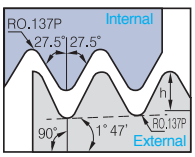
Thread		Pitch (tpi)	Designation			Dimensions (inch)					No.of flute	Tooth	*Bore dia.
BSW	BSF		External/Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
	1/4″×26	26	STMHC	25197L05-EI26BSF		1/4	0.197	2.244	0.500	0.519	3	13	0.209
	5/16″×22	22		31250L06-EI22BSF		5/16	0.250	2.402	0.636	0.659	3	14	0.264
1/4″×20	3/8″×20	20		25175L05-EI20BSW		1/4	0.175	2.244	0.500	0.525	3	10	0.197
	3/8″×20	20		31301L07-EI20BSF		5/16	0.301	2.402	0.750	0.775	3	15	0.323
5/16″×18	7/16″×18	18		25230L06-EI18BSW		1/4	0.230	2.244	0.611	0.639	3	11	0.256
	7/16″×18	18		37362L09-EI18BSF		3/8	0.362	2.874	0.889	0.917	3	16	0.382
3/8″×16	1/2″, 9/16″×16	16		31283L07-EI16BSW		5/16	0.283	2.402	0.750	0.781	3	12	0.311
	1/2″, 9/16″×16	16		50413L10-EI16BSF		1/2	0.413	2.840	1.000	1.031	4	16	0.437
	9/16″×16	16		50478L11-EI16BSF		1/2	0.478	3.150	1.125	1.156	4	18	0.496
7/16″×14	5/8″, 11/16″×14	14		37335L08-EI14BSW		3/8	0.335	2.874	0.857	0.893	3	12	0.362
	5/8″, 11/16″×14	14		63528L12-EI14BSF		5/8	0.528	3.150	1.214	1.250	4	17	0.551
	11/16″×14	14		63591L13-EI14BSF		5/8	0.591	3.622	1.357	1.393	4	19	0.614
1/2″×12	3/4″×12	12		37362L10-EI12BSW		3/8	0.362	2.874	1.000	1.042	3	12	0.413
9/16″×12	3/4″×12	12		50444L11-EI12BSW		1/2	0.444	3.150	1.083	1.125	4	13	0.476
	3/4″×12	12		63622L15-EI12BSF		5/8	0.622	3.622	1.500	1.542	4	18	0.661
5/8″×11	7/8″×11	11		50496L13-EI11BSW		1/2	0.496	3.150	1.273	1.318	4	14	0.528
11/16″×11		11		63559L14-EI11BSW		5/8	0.559	3.622	1.364	1.409	4	15	0.591

●: Korea Stock ●: US Stock

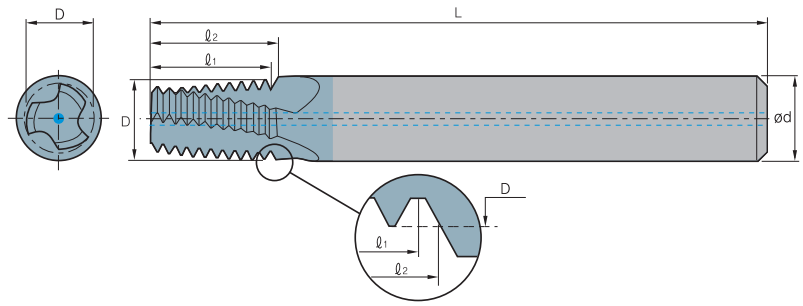
BSPT

Helical flutes with thru-hole coolant

External/Internal



Defined by: B.S.21: 1985
Tolerance class: Standard BSPT



Thread	Pitch (tpi)	Designation			Dimensions (inch)					No.of flute	Tooth	*Bore dia.
Standard		Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
1/16″×28	28	STMHC	25232L03-EI28BSPT		1/4	0.232	2.402	0.393	0.401	3	11	0.264
1/8″×28	28		31301L03-EI28BSPT		5/16	0.301	2.402	0.393	0.401	3	11	0.342
1/4″×19	19		50400L05-EI19BSPT		1/2	0.400	2.874	0.579	0.605	3	11	0.464
3/8″×19	19		50439L05-EI19BSPT		1/2	0.439	2.874	0.579	0.605	4	11	0.598
1/2″, 3/4″×14	14		63561L08-EI14BSPT		5/8	0.561	3.150	0.857	0.893	4	12	0.748
1″, 1 1/2″, 2″, 2 1/2″×11	11		75746L10-EI11BSPT		3/4	0.746	4.016	1.000	1.136	4	12	1.209

* Bore Diameter applies to smallest thread Dia

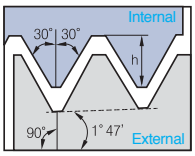
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Korea Stock ●: US Stock

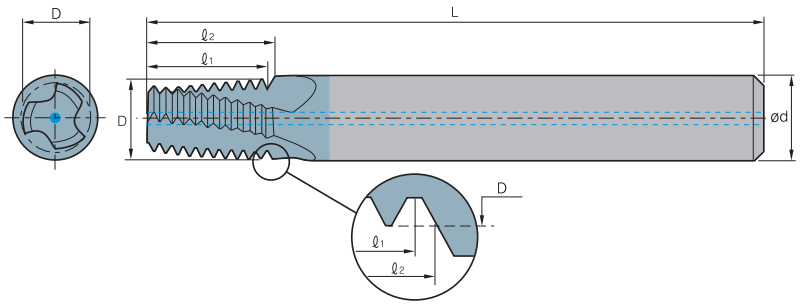
NPT

Helical flutes with thru-hole coolant

External/Internal



Defined by: USAS B2.1: 1968
Tolerance class: Standard NPT



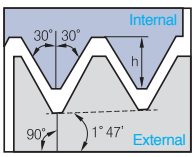
Thread	Pitch (tpi)	Designation			Dimensions (inch)					No.of flute	Tooth	*Bore dia.
Standard		Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
1/16″×27	27	STMHC	25232L03-EI27NPT		1/4	0.232	2.244	0.370	0.389	3	10	0.244
1/8″×27	27		31301L03-EI27NPT		5/16	0.301	2.402	0.370	0.389	3	10	0.330
1/4″×18	18		37370L05-EI18NPT	●	3/8	0.370	2.874	0.556	0.583	3	10	0.437
3/8″×18	18		50439L05-EI18NPT		1/2	0.439	2.874	0.556	0.583	4	10	0.562
1/2″, 3/4″×14	14		63561L07-EI14NPT		5/8	0.561	3.150	0.714	0.750	4	10	0.407, 0.905
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		75746L09-EI11.5NPT		3/4	0.746	4.016	0.870	0.913	4	10	1.411, 1.484, 1.732, 2.204
2 1/2″×8 ; 3″×8	8		75746L13-EI8NPT		3/4	0.746	4.016	1.250	1.313	4	10	2.625, 3.232

●: Korea Stock ●: US Stock

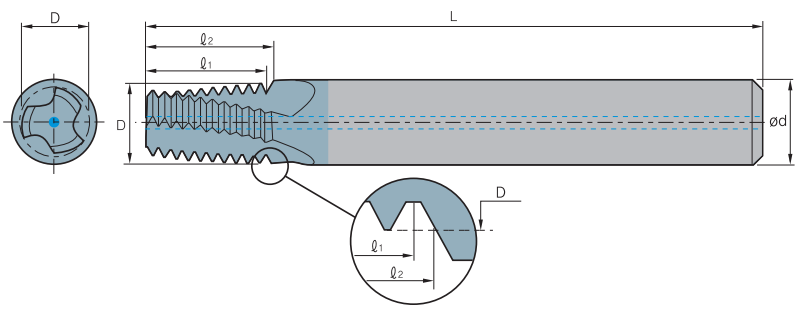
NPTF

Helical flutes with thru-hole coolant

External/Internal



Defined by: ANSI 1.20.3-1976
Tolerance class: Standard NPTF



Thread	Pitch (tpi)	Designation			Dimensions (inch)					No.of flute	Tooth	*Bore dia.
Standard		Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	inch
1/16″×27	27	STMHC	25232L03-EI27NPTF	●	1/4	0.232	2.244	0.370	0.389	3	10	0.240
1/8″×27	27		31301L03-EI27NPTF		5/16	0.301	2.402	0.370	0.389	3	10	0.330
1/4″×18	18		37370L05-EI18NPTF		3/8	0.370	2.874	0.556	0.583	3	10	0.437
3/8″×18	18		50439L05-EI18NPTF		1/2	0.439	2.874	0.556	0.583	4	10	0.562
1/2″, 3/4″×14	14		63561L07-EI14NPTF		5/8	0.561	3.150	0.714	0.750	4	10	0.704, 0.095
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		75746L09-EI11.5NPTF		3/4	0.746	4.016	0.870	0.913	4	10	1.411, 1.484, 1.720, 2.188
2 1/2″×8 ; 3″×8	8		75746L13-EI8NPTF		3/4	0.746	4.016	1.250	1.313	4	10	2.610, 3.232

* Bore Diameter applies to smallest thread Dia

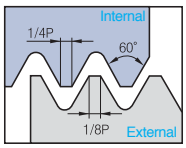
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Korea Stock ●: US Stock

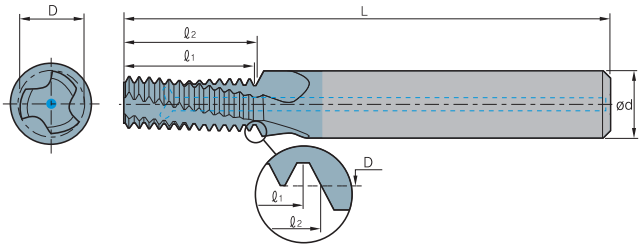
American UN

Helical flutes with radial cooling

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



(ℓ2≤2×Thread Diameter)

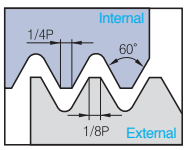
Thread			Designation			Dimensions (inch)					*Bore dia.
UNC	UNF	UNEF		Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	inch
	No.10-32	No.12-3/8×32	STMHCR	19150L03-I32UNF		3/16	0.150	1.772	0.375	0.391	0.157
	1/4×28	7/16,1/2×28		25203L05-I28UNF		1/4	0.203	2.244	0.500	0.518	0.216
No.10-24	5/16, 3/8×24	9/16-11/16×24		19141L04-I24UNC		3/16	0.141	1.772	0.375	0.396	0.150
No.12-24	5/16, 3/8×24	9/16-11/16×24		19163L04-I24UNC		3/16	0.163	1.772	0.417	0.437	0.177
	5/16, 3/8×24	9/16-11/16×24		31263L06-I24UNF		5/16	0.263	2.402	0.625	0.646	0.272
	3/8×24	9/16-11/16×24		37323L07-I24UNF		3/8	0.323	2.874	0.750	0.771	0.335
1/4×20	7/16×1/2×20	3/4-1×20		25192L05-I20UNC		1/4	0.192	2.244	0.500	0.525	0.201
	1/2×20	3/4-1×20		50437L10-I20UNF		1/2	0.437	3.150	1.000	1.025	0.453
5/16×18	9/16, 5/8×18	11/16-1 11/16×18		31242L16-I18UNC		5/16	0.242	2.402	0.611	0.639	0.260
3/8×16	3/4×16			31301L07-I16UNC		5/16	0.301	2.402	0.750	0.781	0.315
7/16×14	7/8×14			37354L08-I14UNC		3/8	0.354	2.874	0.857	0.893	0.370
1/2×13				50407L10-I13UNC		1/2	0.407	3.150	1.000	1.039	0.430
9/16×12	1-1 1/2×12			50465L11-I12UNC		1/2	0.465	3.150	1.084	1.125	0.484

● : Korea Stock ● : US Stock

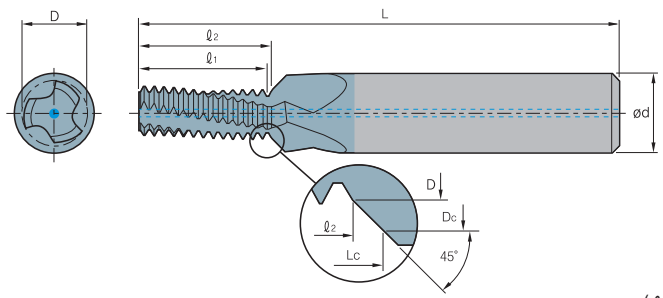
American UN

Helical flutes with thru-hole coolant -Thru & Chamfer

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



(ℓ2≤2×Thread Diameter)

Thread			Designation			Dimensions (inch)							*Bore dia.
UNC	UNF	UNEF		Internal	PC9070M	Ød	D	Dc	L	ℓ1	ℓ2	Lc	inch
	No.10-32	No.12-3/8×32	STMHCC	25150L03-I32UNF		1/4	0.150	0.202	2.244	0.375	0.391	0.417	0.157
	1/4×28	7/16,1/2×28		31203L05-I28UNF		5/16	0.203	0.262	2.402	0.500	0.518	0.549	0.216
No.10-24	5/16, 3/8×24	9/16-11/16×24		25141L04-I24UNC		1/4	0.141	0.202	2.244	0.375	0.396	0.425	0.150
No.12-24	5/16, 3/8×24	9/16-11/16×24		25163L04-I24UNC		1/4	0.163	0.228	2.244	0.417	0.437	0.468	0.177
	5/16, 3/8×24	9/16-11/16×24		37263L06-I24UNF		3/8	0.263	0.324	2.874	0.625	0.646	0.678	0.272
	3/8×24	9/16-11/16×24		50323L07-I24UNF		1/2	0.323	0.387	3.150	0.750	0.771	0.804	0.335
1/4×20	7/16×1/2×20	3/4-1×20		31192L05-I20UNC		5/16	0.192	0.262	2.402	0.500	0.525	0.558	0.201
	1/2×20	3/4-1×20		63437L10-I20UNF		5/8	0.437	0.512	3.622	1.000	1.025	1.065	0.453
5/16×18	9/16, 5/8×18	11/16-1 11/16×18		37242L16-I18UNC		3/8	0.242	0.324	2.874	0.611	0.639	0.676	0.260
3/8×16	3/4×16			50301L07-I16UNC		1/2	0.301	0.387	3.150	0.750	0.781	0.814	0.315
7/16×14	7/8×14			50354L08-I14UNC		1/2	0.354	0.449	3.150	0.857	0.893	0.937	0.370
1/2×13				63407L10-I13UNC		5/8	0.407	0.512	3.622	1.000	1.039	1.087	0.430
9/16×12	1-1 1/2×12			63465L11-I12UNC		5/8	0.465	0.574	3.622	1.084	1.125	1.178	0.484

* Bore Diameter applies to smallest thread Dia

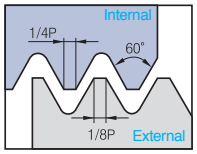
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

● : Korea Stock ● : US Stock

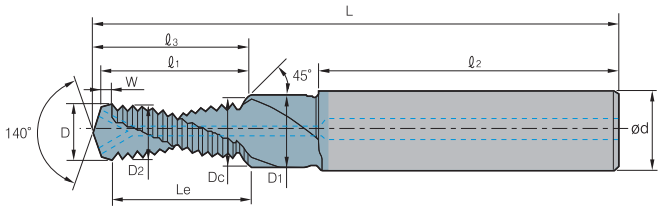
ISO Metric

Drill, Chamfer & Thread with thru-hole coolant

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



Thread	Pitch	Designation			Dimensions (inch)											No.of flute	Tooth
ISO 2D M Coarse	(mm)		Internal	PC9070M	L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	z	zt
M6×1.0	1.0	STMHCD-	IM6×1.0ISO-2D		2.441	0.571	0.539	1.417	0.039	0.500	0.197	0.315	0.260	0.248	0.191	2	11
M8×1.25	1.25		IM8×1.25ISO-2D		2.913	0.717	0.673	1.575	0.051	0.622	0.268	0.394	0.354	0.327	0.254	2	11
M10×1.5	1.5		IM10×1.5ISO-2D		3.11	0.921	0.87	1.772	0.059	0.811	0.335	0.472	0.433	0.406	0.318	2	12
M12×1.75	1.75		IM12×1.75ISO-2D		3.504	1.067	1.004	1.772	0.059	0.945	0.406	0.551	0.531	0.484	0.383	2	12

Thread	Pitch	Designation			Dimensions (inch)											No.of flute	Tooth
ISO 2.5D M Coarse	(mm)		Internal	PC9070M	L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	z	zt
M6×1.0	1.0	STMHCD-	IM6×1.0ISO-2.5D		2.441	0.650	0.618	1.417	0.039	0.579	0.197	0.315	0.260	0.248	0.191	2	13
M8×1.25	1.25		IM8×1.25ISO-2.5D		2.973	0.913	0.870	1.575	0.051	0.819	0.268	0.394	0.354	0.327	0.254	2	15
M10×1.5	1.5		IM10×1.5ISO-2.5D		3.110	1.098	1.047	1.772	0.059	0.988	0.335	0.472	0.433	0.406	0.318	2	15

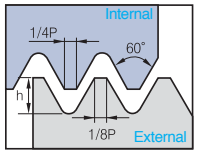
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

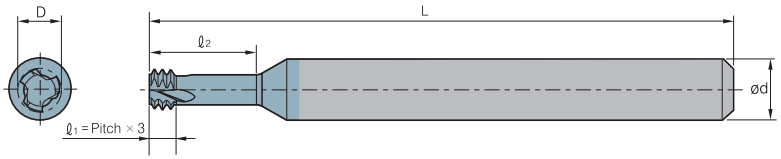
● : Korea Stock ● : US Stock

ISO Metric

Deep threading

Internal





Defined by: R262 (DIN 13)
Tolerance class: 6H

(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (inch)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	inch
M1.6×0.35		0.35	STMD3T	12047L134-I0.35ISO		1/8	0.047	1.181	0.134	3	3	0.049
M2×0.4		0.4		25061L165-I0.4ISO		1/4	0.061	2.244	0.165	3	3	0.063
M2.2×0.45		0.45		25065L181-I0.45ISO		1/4	0.065	2.244	0.181	3	3	0.069
M2.5×0.45		0.45		25077L205-I0.45ISO		1/4	0.077	2.244	0.205	3	3	0.081
M3×0.5	M3.5~M16×0.5	0.5		25094L244-I0.5ISO		1/4	0.094	2.244	0.244	3	3	0.098
M3.5×0.6		0.6		25108L287-I0.6ISO		1/4	0.108	2.244	0.287	3	3	0.114
M4×0.7		0.7		25124L327-I0.7ISO		1/4	0.124	2.244	0.327	3	3	0.130
M5×0.8		0.8		25159L409-I0.8ISO		1/4	0.159	2.244	0.409	3	3	0.165
M6×1.0	M8~M40×1.0	1.0		25189L492-I1.0ISO		1/4	0.189	2.244	0.492	3	3	0.197
M8×1.25		1.25		31256L654-I1.25ISO		5/16	0.256	2.480	0.654	3	3	0.268
M10×1.5	M12~M48×1.50	1.5		37323L819-I1.50ISO		3/8	0.323	2.874	0.819	3	3	0.335
M12×1.75		1.75		37371L984-I1.75ISO		3/8	0.371	2.874	0.984	3	3	0.406

3d (ℓ2≤3×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (inch)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	inch
M1.6×0.35		0.35	STMD3T	12047L197-I0.35ISO		1/8	0.047	1.187	0.197	3	3	0.079
M2×0.4		0.4		25061L244-I0.4ISO		1/4	0.061	2.244	0.244	3	3	0.063
M2.5×0.45		0.45		25077L276-I0.45ISO		1/4	0.077	2.244	0.276	3	3	0.081
M3×0.5	M3.5~M16×0.5	0.5		25094L362-I0.5ISO		1/4	0.094	2.244	0.362	3	3	0.098
M4×0.7		0.7		25124L484-I0.7ISO		1/4	0.124	2.244	0.484	3	3	0.130
M5×0.8		0.8		25159L606-I0.8ISO		1/4	0.159	2.244	0.606	3	3	0.165
M6×1.0	M8~M40×1.0	1.0		25189L728-I1.0ISO		1/4	0.189	2.244	0.728	3	3	0.197
M8×1.25		1.25		31256L969-I1.25ISO		5/16	0.256	2.48	0.969	3	3	0.268

* Bore Diameter applies to smallest thread Dia

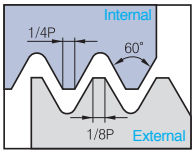
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

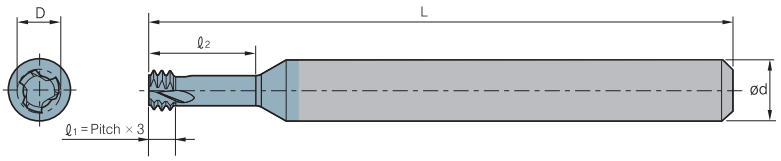
● : Korea Stock ● : US Stock

American UN

Deep threading

Internal





Defined by: ANSI B1.1.74
Tolerance class: 2B

(ℓ2≤ 2×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (inch)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	inch
	No.1~72	72	STMD3T	25057L154-I72UN		1/4	0.057	2.244	0.154	3	3	0.059
No.1~64	No.2~64	64		25055L165-I64UN		1/4	0.055	2.244	0.165	3	3	0.059
No.2~56	No.3~56	56		25065L197-I56UN		1/4	0.065	2.244	0.197	3	3	0.071
No.3~48	No.4~48	48		25075L236-I48UN		1/4	0.075	2.244	0.263	3	3	0.079
No.4, No.5~40	No.6~40	40		25083L236-I40UN		1/4	0.083	2.244	0.236	3	3	0.090
No.5~40	No.6~40	40		25096L283-I40UN		1/4	0.096	2.244	0.283	3	3	0.102
	No.8~36	36		25130L343-I36UN		1/4	0.130	2.244	0.343	3	3	0.138
No.6, No.8~32	No.10~32	32		25100L292-I32UN		1/4	0.100	2.244	0.292	3	3	0.110
No.8~32	No.10~32	32		25126L394-I32UN		1/4	0.126	2.244	0.394	3	3	0.134
	1/4″×28	28		25207L520-I28UN		1/4	0.207	2.244	0.520	3	3	0.216
No.10~24	5/16″×24	24		25141L402-I24UN		1/4	0.141	2.244	0.402	3	3	0.150
	5/16″×24	24		31263L650-I24UN		5/16	0.263	2.480	0.650	3	3	0.272
1/4″×20	7/16″×20	20		25192L528-I20UN		1/4	0.192	2.244	0.528	3	3	0.201
	7/16″×20	20		37375L906-I20UN		3/8	0.375	2.874	0.906	3	3	0.390
3/8″×16		16		31264L752-I16UN		5/16	0.264	2.480	0.752	3	3	0.315
7/16″×14		14		7354L917-I14UN		3/8	0.354	2.874	0.917	3	3	0.370

(ℓ2≤ 3×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (inch)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	inch
	No.1~72	72	STMD3T	25057L226-I72UN		1/4	0.057	2.244	0.226	3	3	0.059
No.4, No.5~40	No.6~40	40		25083L354-I40UN		1/4	0.083	2.244	0.354	3	3	0.091
No.5~40	No.6~40	40		25096L394-I40UN		1/4	0.096	2.244	0.394	3	3	0.102
No.6, No.8~32	No.10~32	32		25100L433-I32UN		1/4	0.100	2.244	0.433	3	3	0.110
No.8~32	No.10~32	32		25126L512-I32UN		1/4	0.126	2.244	0.512	3	3	0.134
	1/4″ 28	28		25207L772-I28UN		1/4	0.207	2.244	0.772	3	3	0.216
	5/16″×24	24		31263L965-I24UN		5/16	0.263	2.480	0.965	3	3	0.272
1/4″×20	7/16″×20	20		25192L780-I20UN		1/4	0.192	2.244	0.780	3	3	0.201

* Bore Diameter applies to smallest thread Dia

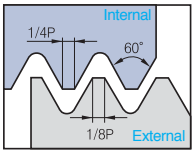
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

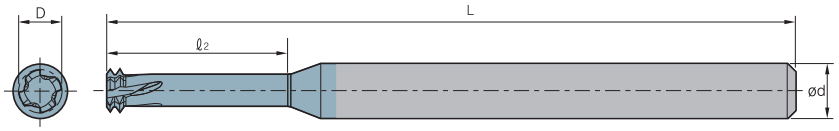
● : Korea Stock ● : US Stock

ISO Metric

Deep threading for hard materials (~HRC62)

Internal





Defined by: R262 (DIN 13)
Tolerance class: 6H

(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (inch)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	inch
M2×0.4		0.4	STMD2L	25061L165-I0.4ISO		1/4	0.061	2.99	0.18	4	2	0.063
M2.2×0.45		0.45		25065L181-I0.45ISO		1/4	0.065	2.99	0.20	4	2	0.070
M2.5×0.45		0.45		25077L204-I0.45ISO		1/4	0.077	2.99	0.22	4	2	0.081
M3×0.5	M3.5~M16×0.5	0.5		25094L244 -I0.5ISO		1/4	0.094	2.99	0.27	4	2	0.101
M3.5×0.6		0.6		25108L287-I0.6ISO		1/4	0.108	2.99	0.31	4	2	0.116
M4×0.7		0.7		25124L326-I0.7ISO		1/4	0.124	2.99	0.36	4	2	0.128
M5×0.8		0.8		25159L409-I0.8ISO		1/4	0.159	2.99	0.44	4	2	0.169
M6×1.0	M8~M40×1.0	1.0		25189L492-I1.0ISO		1/4	0.189	2.99	0.53	4	2	0.201
M8×1.25		1.25		31256L653-I1.25ISO		5/16	0.256	3.15	0.70	4	2	0.268
M10×1.5	M12~M48×1.50	1.5		31308L818-I1.5ISO		5/16	0.308	3.15	0.88	4	2	0.339
M12×1.75		1.75		37371L984-I1.75ISO		3/8	0.371	3.98	1.05	4	2	0.406

(ℓ2≤3×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (inch)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	inch
M2×0.4		0.4	STMD2L	25061L244-I0.4ISO		1/4	0.061	2.99	0.26	4	2	0.063
M2.2×0.45		0.45		25077L303-I0.45ISO		1/4	0.077	2.99	0.32	4	2	0.081
M3×0.5	M3.5~M16×0.5	0.5		25094L362-I0.5ISO		1/4	0.094	2.99	0.38	4	2	0.101
M4×0.7		0.7		25124L484-I0.7ISO		1/4	0.124	2.99	0.51	4	2	0.128
M5×0.8		0.8		25159L606-I0.8ISO		1/4	0.159	2.99	0.64	4	2	0.169
M6×1.0	M8~M40×1.0	1.0		25189L728-I1.0ISO		1/4	0.189	2.99	0.77	4	2	0.201
M8×1.25		1.25		31256L968-I1.25ISO		5/16	0.256	3.15	1.02	4	2	0.268

* Bore Diameter applies to smallest thread Dia

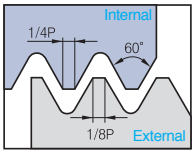
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

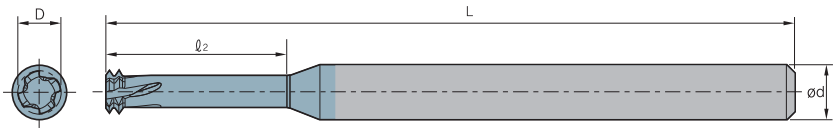
● : Korea Stock ● : US Stock

American UN

Deep threading for hard materials (~HRC62)

Internal





Defined by: ANSI B1.1.74
Tolerance class: 2B

(ℓ2≤ 2×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (inch)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	inch
No.2~56	No.3~56	56	STMD2L	25065L197-I56UN		1/4	0.065	3.00	0.21	4	2	0.070
No.3~48	No.4~48	48		25075L236-I48UN		1/4	0.075	3.00	0.26	4	2	0.093
No.4~40 ; No.5-40	No.6~40	40		25083L236-I40UN		1/4	0.083	3.00	0.26	4	2	0.093
No.5~40	No.6~40	40		25096L283-I40UN		1/4	0.096	3.00	0.31	4	2	0.116
	No.8~36	36		25130L343-I36UN		1/4	0.130	3.00	0.37	4	2	0.140
No.6~32 ; No.8~32	No.10~32	32		25100L292-I32UN		1/4	0.100	3.00	0.32	4	2	0.161
No.8~32	No.10~32	32		25126L394-I32UN		1/4	0.126	3.00	0.42	4	2	0.136
	1/4″×28	28		25207L520-I28UN		1/4	0.207	3.00	0.56	4	2	0.219
No.10~24	5/16″×24	24		25141L402-I24UN		1/4	0.141	3.00	0.44	4	2	0.154
	5/16″×24	24		31263L650-I24UN		5/16	0.263	3.15	0.69	4	2	0.277
1/4″×20	7/16″×20	20		25192L528-I20UN		1/4	0.192	3.00	0.58	4	2	0.204
	7/16″×20	20		37376L906-I20UN		3/8	0.376	4.00	0.96	4	2	0.390
3/8″×16		16		31301L776-I16UN		5/16	0.301	3.15	0.84	4	2	0.316
7/16″×14		14		37354L917-I14UN		3/8	0.354	4.00	0.99	4	2	0.375
1/2″×13		13		37390L101 -I13UN		3/8	0.390	4.00	1.08	4	2	0.422

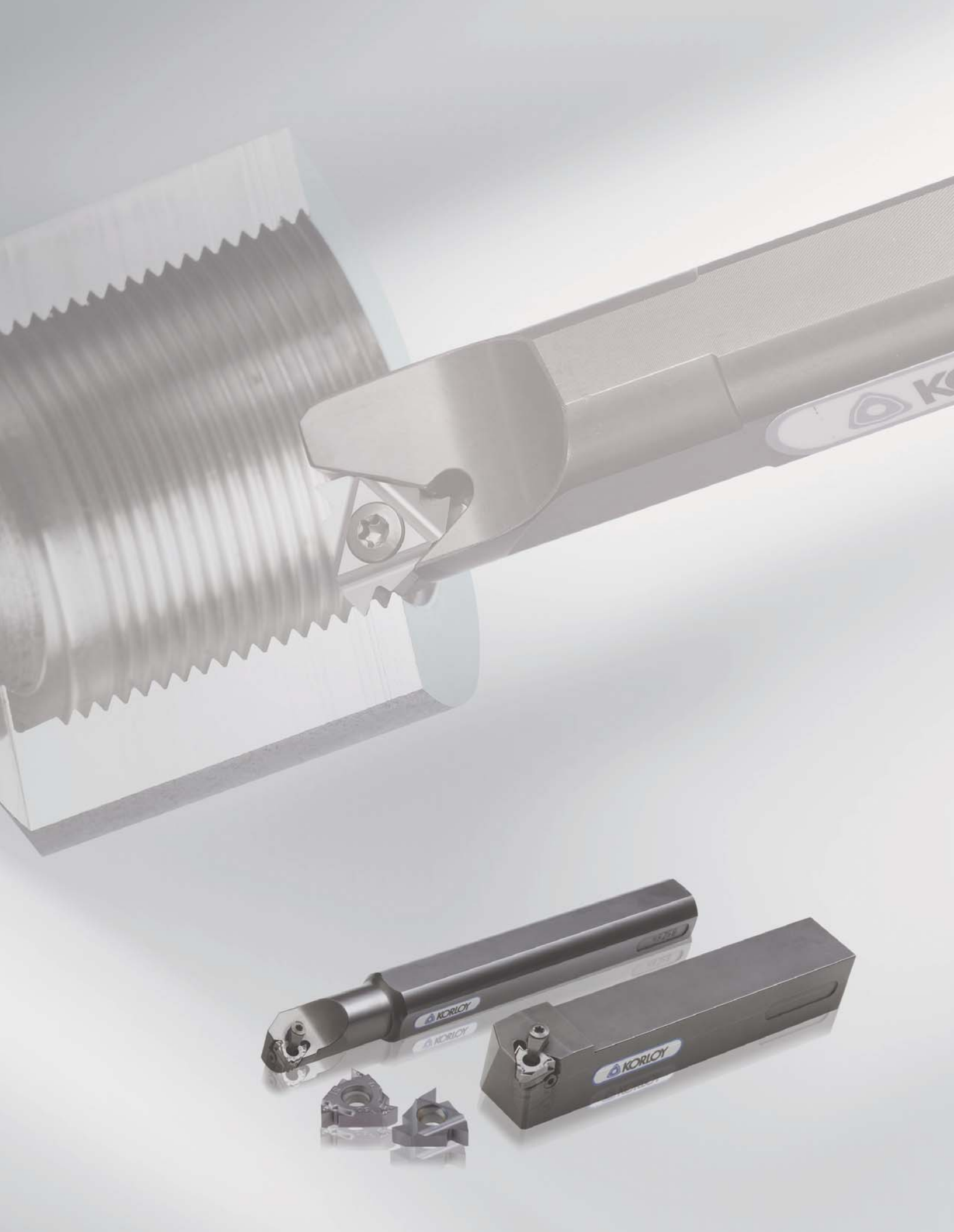
(ℓ2≤ 3×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (inch)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	inch
No.4~40, No.5~40	No.6~40	40	STMD2L	25083L354-I40UN		1/4	0.083	3	0.38	4	2	0.093
No.5~40	No.6~40	40		25096L394-I40UN		1/4	0.096	3	0.41	4	2	0.104
No.6~32, No.8~32	No.10~32	32		25100L433-I32UN		1/4	0.1	3	0.46	4	2	0.111
No.8~32	No.10~32	32		25126L512-I32UN		1/4	0.126	3	0.54	4	2	0.136
	1/4″×28	28		25207L772-I28UN		1/4	0.207	3	0.81	4	2	0.219
	5/16″×24	24		31263L965-I24UN		5/16	0.263	3.15	1.01	4	2	0.272
1/4″~20	7/16″×20	20		25192L780-I20UN		1/4	0.192	3	0.83	4	2	0.204
7/16″×14		14		37354L131-I14UN		3/8	0.354	4	1.39	4	2	0.375

* Bore Diameter applies to smallest thread Dia

Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Korea Stock ●: US Stock


KORLOY
KORLOY
KORLOY

Milling Insert

E02 Milling Insert Code System (ISO)
E04 Milling Inserts
E32 KORLOY Cutters
E38 KORLOY Shanks
E41 KORLOY Modular Adaptors

Face Milling Cutters

E42 Mill-max/Mill-max Plus (E43, E49)
E52 Turbo Mill
E55 Double Mill
E57 Technical Information for Power Buster
E61 Power Buster
E64 Technical Information for Rich Mill
E85 Rich Mill
E128 Technical Information for Aero Mill/ Aero Mill Plus/Aero Mill Mini
E132 Aero Mill
E133 Aero Mill Plus
E135 Aero Mill Mini
E137 PCD Face Cutter

Cutters for Molds

E138 Technical Information for Alpha Mill
E143 Alpha Mill
E172 Technical Information for Future Mill/FMR P-Positive
E187 Future Mill
E213 FMR P-Positive
E225 Technical Information for HFM
E230 HFM
E233 Technical Information for HRMDouble
E238 HRMDouble
E249 HRM
E256 Technical Information for TP2P
E259 TP2P
E261 Technical Information for Laser Mill/GBE/BRE
E270 Laser Mill



Cutters for Molds

E275 BFEA
E276 GBEA
E279 BREA
E281 Tank Mill
E282 Chamfer Tool (Multi-functional, Solid)
E287 T-Cutter (TFE)

Milling Cutters for Aluminum

E288 Technical Information for Pro-A Mill / Pro-X Mill / Pro-L Mill / Pro-XL Mill
E295 Pro-A Mill
E298 Pro-X Mill
E303 Pro-L Mill
E307 Pro-XL Mill
E308 Modular Adaptor (MAT)

Side Milling Cutters

E310 Technical Information for Side Milling Cutters
E312 Side Milling Cutter
E316 Side Cutter
E319 Wind Mill

Milling Cutters for Cast iron at high feed

E323 Technical Information for High feed Cutter
E325 Technical Information for Cube Mill
E326 Technical Information for Couple Mill
E328 Technical Information for Storm Mill
E329 Technical Information for Shave Mill
E331 Technical Information for Shave Mill-Ultra
E332 High feed Cutter
E334 Shave Mill
E335 Shave Mill-Ultra

Gear Tools

E337 Technical Information for Gear Cutter Tools
E338 Gear Cutter Table
E339 Gear Cutter
E347 Gear Cutter Order Form
E348 Indexable HOB Cutter
E349 Indexable HOB Cutter Order Form

MILLING

Milling tools that provide the best quality and improve productivity for every customer needs.

E

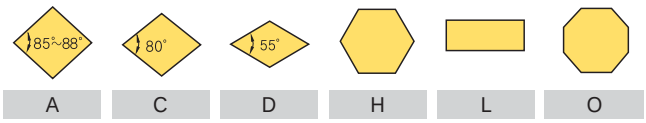


S P K R 4

1	2	3	4	5
Insert Shape	Relief Angle	Tolerance	Cross Section Type	Cutting Edge Length, Diameter of Inscribed circle

1 Insert Shape

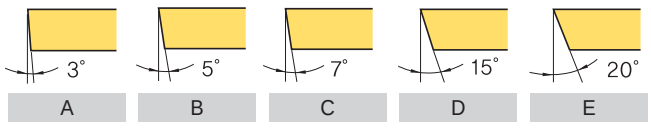
S P K R 4 3 ED2 S R - MX



A	C	D	H	L	O
R	S	T	V	W	

2 Relief Angle

S P K R 4 3 ED2 S R - MX

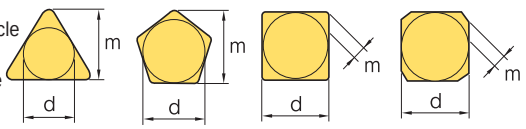


A	B	C	D	E
F	G	N	P	

3 Tolerance

S P K R 4 3 ED2 S R - MX

d : Inscribed Circle
t : Thickness
m : refer to figure



(inch)

Class	d	m	t
A	±0.0010	±0.0002	±0.0010
C	±0.0010	±0.0005	±0.0010
H	±0.0005	±0.0005	±0.0010
E	±0.0010	±0.0010	±0.0010
G	±0.0010	±0.0010	±0.0051
J	±0.0020~±0.0059	±0.0002	±0.0010
K	±0.0020~±0.0059	±0.0005	±0.0010
L	±0.0020~±0.0059	±0.0010	±0.0010
M	±0.0020~±0.0059	±0.0032~±0.0079	±0.0051
U	±0.0032~±0.01	±0.0051~±0.0150	±0.0051

■ Tolerance on C,E,H,M,O,P,R,S,T,W Insert Shape (exceptional case)

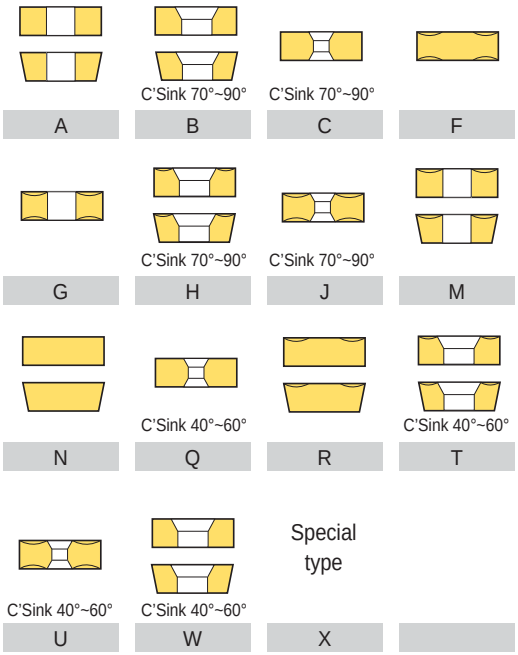
d	Tolerance on d		Tolerance on m	
	J,K,L,M,N	U	M,N	U
1/4	±0.0020	±0.0032	±0.0032	±0.0051
3/8	±0.0020	±0.0032	±0.0032	±0.0051
1/2	±0.0032	±0.0051	±0.0051	±0.0079
5/8	±0.0040	±0.0070	±0.0059	±0.0106
3/4	±0.0040	±0.0070	±0.0059	±0.0106
1	±0.0051	±0.01	±0.0070	±0.0150

Tolerance on D Insert Shape (exceptional case)

d	Tolerance on d	Tolerance on m
1/4	±0.0020	±0.0043
3/8	±0.0020	±0.0043
1/2	±0.0032	±0.0059
5/8	±0.0040	±0.0070
3/4	±0.0040	±0.0070

4 Cross Section Type

S P K R 4 3 ED2 S R - MX

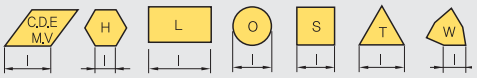


A	B	C	F
G	H	J	M
N	Q	R	T
U	W	X	

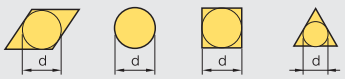
5 Cutting Edge Length, Diameter of Inscribed circle

S P K R 4 3 ED2 S R - MX

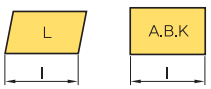
■ Metric system ※ Decimal integer constant



■ Inch system



· Use 1/32″ unit for a insert having smaller I.C under 1/4″
· Use 1/8″ unit for a insert having larger I.C over 1/4″



※ In case of rectangular and rhombic insert indicate cutting edge length instead of inscribed circle.

■ Cross over chart for "Metric" and "Inch" system

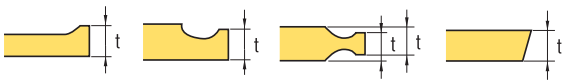
△	06	09	11	16	22	27	33	44
○ □	03	05	06	09	12	15	19	25
55°	04	06	07	11	15	19	23	31
80°	03	05	06	09	12	16	19	25
Inscribed circle	5/32″	7/32″	1/4″	3/8″	1/2″	5/8″	3/4″	1″
Inch system	5	7	2(8)	3	4	5	6	8

3 ED 2 S R - MX

6	7	8	9	10
Height of Cutting Edge	Nose Radius (Nose R)	Edge Preparation	Hand	Chip Breaker for Milling

6 Height of Cutting Edge

S P K R 4 **3** ED 2 S R - MX

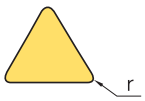


Symbol		Height of cutting edge(t)	
Metric	Inch	mm	Inch
01	1(2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5(3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8(16)	12.70	1/2

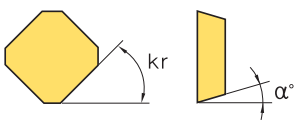
( ) Symbol for small size insert

7 Nose Radius (Nose R)

S P K R 4 3 **ED 2** S R - MX



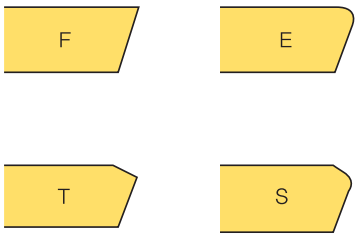
Symbol		r		Symbol		r	
mm	Inch	mm	Inch	mm	Inch	mm	Inch
00	0	0.0		12	3	1.2	3/64
02		0.2		15		1.5	
04	1	0.4	1/64	16	4	1.6	4/64
05		0.5		24	6	2.4	6/64
08	2	0.8	2/64	32	8	3.2	8/64
10		1.0		40		4.0	



Parallel Land	Relief Angle	
kr	α°	
A - 45°	A - 3°	F - 25°
D - 60°	B - 5°	G - 30°
E - 75°	C - 7°	N - 0°
F - 85°	D - 15°	P - 11°
P - 90°	E - 20°	
Z - Special		

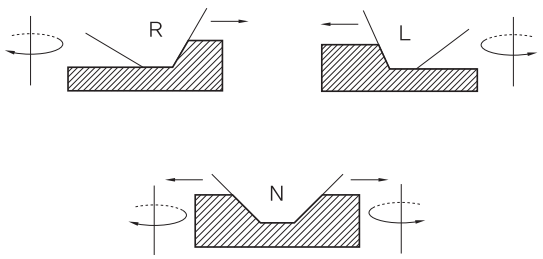
8 Edge Preparation

S P K R 4 3 ED 2 **S** R - MX



9 Hand

S P K R 12 3 ED 2 S **R** - MX



10 Chip Breaker for Milling

S P K R 4 3 ED 2 S R - **MX**



MA MF MM MX

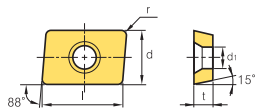
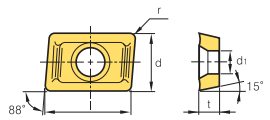
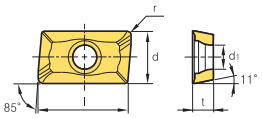
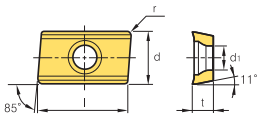
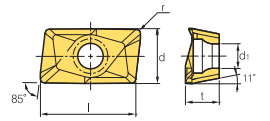
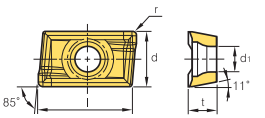
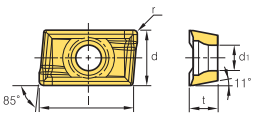
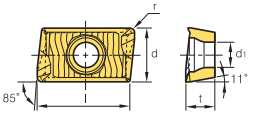
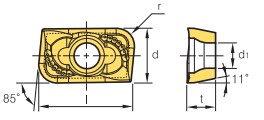


MF MM MR MA



MA MF MM ML

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬢ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

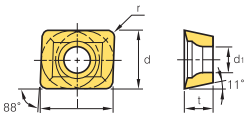
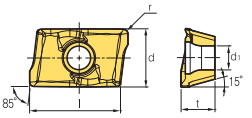
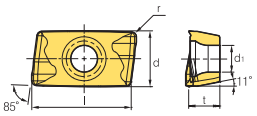
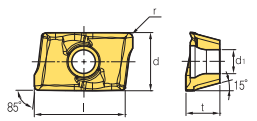
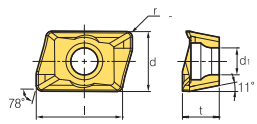
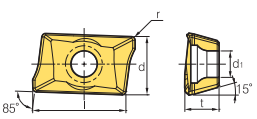
Inserts	Designation	Cermet		Coated										Uncoated		Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	G10	H01	l	d	t	r	d_1		
ADKA	150308R																	0.591	0.375	0.125	0.031	0.177		-
	150308SR																	0.591	0.375	0.125	0.031	0.177		
	150308TR		●															0.591	0.375	0.125	0.031	0.177		
ADLT	150308R			●									●					0.591	0.375	0.125	0.031	0.177		E281
	150308SR								●									0.591	0.375	0.125	0.031	0.177		
	150308TR																	0.591	0.375	0.125	0.031	0.177		
APKT	1604PDSR			●					●			●						0.646	0.375	0.187	0.031	0.173		E147 E159
APKT-MA	1604PDFR-MA														●		●	0.646	0.375	0.187	1/128	0.173		E147 E159
	160416FR-MA																●	0.646	0.375	0.187	0.063	0.173		
APKT-MA2	1604PDFR-MA2																●	0.650	0.375	0.227	0.031	0.177		E147 E159
	160416FR-MA2																	0.650	0.375	0.227	0.063	0.177		
	160432FR-MA2																	0.650	0.375	0.227	0.126	0.177		
APKT-MA3	1604PDFR-MA3															●	●	0.646	0.375	0.197	0.031	0.173		E147 E159
	160420FR-MA3																	0.646	0.375	0.197	0.079	0.173		
APKT-MF	1604PDSR-MF			●									●					0.646	0.375	0.197	0.031	0.173		E147 E159 E168
APKT-MM	1604PDSR-MM			●	●				●		●	●	●					0.646	0.375	0.205	0.031	0.173		E147 E159 E168
APKT-MM1	160432R-MM1																	0.634	0.375	0.187	0.126	0.173		E147 E159

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01
	Steel	P	●	◓	◓	●	✱	✱	●	◓	◓	◓			✱	✱		
	Stainless steel	M			◓								✱		✱	✱		
	Cast iron	K				◓			◓	◓				●	✱	✱	◓	●
	Non-ferrous metal	N																◓
	Heat resistant alloy, Titanium alloy	S													✱	✱		
	Hardened steel	H							●	◓					◓	✱		

Machining types

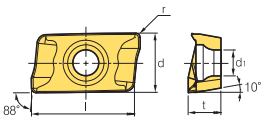
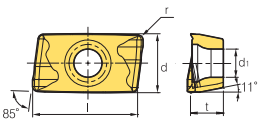
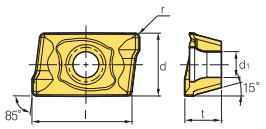
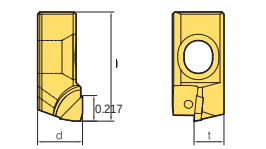
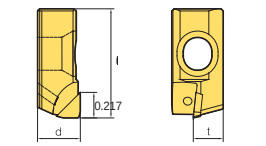
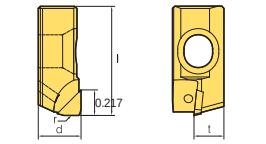
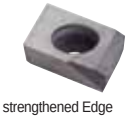
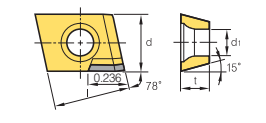
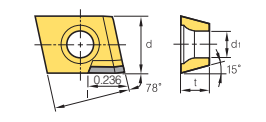
● Continuous cutting
◓ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated												Uncoated		Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	l	d	t	r	d_1		
APLT 	070304R													●				0.295	0.250	0.125	0.016	0.110		E281
APMT-MA 	0602PDFR-MA																●	0.236	0.167	0.102	0.016	0.079		E143~E146
	060208PDFR-MA																	0.236	0.167	0.102	0.031	0.079		E148
	0903PDFR-MA																●	0.370	0.244	0.142	0.016	0.110		E151~E158
	090308PDFR-MA																	0.370	0.244	0.142	0.031	0.110		E160~E161
	11T3PDFR-MA																●	0.441	0.255	0.142	0.020	0.114		E164~E171
	11T308PDFR-MA																	0.441	0.255	0.142	0.031	0.114		
	160404PDFR-MA																	0.646	0.370	0.227	0.016	0.177		
	1604PDFR-MA																●	0.646	0.370	0.227	0.031	0.177		
	180604PDFR-MA																●	0.685	0.432	0.250	0.016	0.177		
	1806PDFR-MA																●	0.685	0.432	0.250	0.031	0.177		
	180612PDFR-MA																●	0.685	0.432	0.250	0.047	0.177		
	180616PDFR-MA																●	0.685	0.432	0.250	0.063	0.177		
	180620PDFR-MA																●	0.685	0.432	0.250	0.079	0.177		
	180624PDFR-MA																●	0.685	0.432	0.250	0.095	0.177		
	180630R-MA																●	0.685	0.432	0.250	0.118	0.177		
APMT-MF 	11T3PDSR-MF				●					●	●			●	●	●		0.441	0.255	0.142	0.020	0.112		E145~E146
	1604PDSR-MF				●					●	●			●	●	●		0.646	0.370	0.227	0.031	0.177		E148~E153
	1806PDSR-MF				●						●			●	●	●		0.685	0.432	0.250	0.031	0.177		E157~E158
	180612PDSR-MF																	0.685	0.432	0.250	0.047	0.177		E160~E163
																								E165~E166
																								E168
																								E171
APMT-ML 	0903PDER-ML													●	●			0.370	0.244	0.142	0.016	0.110		E144~E146
	090308PDER-ML													●	●			0.370	0.244	0.142	0.031	0.110		E148
	11T3PDER-ML													●	●			0.441	0.255	0.142	0.020	0.114		E151~E153
	11T308PDER-ML													●	●			0.441	0.255	0.142	0.031	0.114		E155~E158
	160404PDER-ML													●	●			0.646	0.370	0.227	0.016	0.177		E160~E161
	1604PDER-ML									●				●	●			0.646	0.370	0.227	0.031	0.177		E164~E168
	180604PDER-ML													●	●			0.685	0.432	0.250	0.016	0.177		E170~E171
	1806PDER-ML													●	●			0.685	0.432	0.250	0.031	0.177		
	180612PDER-ML													●	●			0.685	0.432	0.250	0.047	0.177		
	180616PDER-ML													●	●			0.685	0.432	0.250	0.063	0.177		
	180620PDER-ML													●	●			0.685	0.432	0.250	0.079	0.177		
	180624PDER-ML													●	●			0.685	0.432	0.250	0.095	0.177		
	180630R-ML													●	●			0.685	0.432	0.250	0.118	0.177		
APMT-MM 	060202PDSR-MM				●					●				●	●			0.236	0.167	0.102	0.008	0.079		E143~E146
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			0.236	0.167	0.102	0.016	0.079		E148~E158
	060208PDSR-MM				●					●	●			●	●			0.236	0.167	0.102	0.031	0.079		E160~E171
	060212R-MM *				●						●			●	●			0.236	0.167	0.102	0.047	0.079		
	060216R-MM										●			●	●			0.236	0.167	0.102	0.063	0.079		
	0903PDSR-MM				●			●	●	●	●		●	●	●			0.370	0.244	0.142	0.016	0.110		
	090308PDSR-MM				●					●	●			●	●			0.370	0.244	0.142	0.031	0.110		
	090312R-MM										●			●	●			0.370	0.244	0.142	0.047	0.110		
	090316R-MM				●					●	●			●	●			0.370	0.244	0.142	0.063	0.110		
	090320R-MM									●	●			●	●			0.362	0.244	0.142	0.079	0.110		
	090331R-MM *																	0.362	0.244	0.142	0.122	0.110		
	090332R-MM *										●			●	●			0.362	0.244	0.142	0.126	0.110		

●: Korea Stock ●: US Stock

Inserts marked with an asterisk (*) require a custom-made order for special holders.

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated											PCD		Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	DP150	DP200	l	d	t	r	d_1	
APMT-MM 	**11T3PDSR-MM**			●	●			●	●	●	●	●	●	●	●			0.441	0.255	0.142	0.020	0.112		E143~E171
	11T308PDSR-MM				●					●	●	●		●	●			0.441	0.255	0.142	0.031	0.112		
	11T312PDSR-MM				●					●	●	●		●	●			0.441	0.255	0.142	0.047	0.112		
	11T316R-MM				●					●	●			●	●			0.433	0.255	0.142	0.063	0.112		
	11T318R-MM																	0.433	0.255	0.142	0.071	0.112		
	11T324R-MM				●					●	●			●	●			0.433	0.255	0.142	0.094	0.112		
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			0.646	0.370	0.227	0.031	0.177		
	160410PDSR-MM										●			●	●			0.646	0.370	0.227	0.039	0.177		
	160416PDSR-MM				●					●	●	●		●	●			0.646	0.370	0.227	0.063	0.177		
	160424R-MM				●					●	●			●	●			0.630	0.370	0.227	0.094	0.177		
	160430R-MM										●			●	●			0.630	0.370	0.227	0.118	0.177		
	160432R-MM				●					●	●	●		●	●			0.630	0.370	0.227	0.126	0.177		
	160450R-MM ✳										●			●	●			0.630	0.370	0.227	0.197	0.177		
	160464R-MM ✳										●			●	●			0.630	0.370	0.227	0.252	0.177		
	1806PDSR-MM				●			●	●	●	●	●	●	●	●			0.685	0.432	0.250	0.031	0.177		
	180612PDSR-MM				●					●	●			●	●			0.685	0.432	0.250	0.047	0.177		
	180616PDSR-MM				●						●			●	●			0.685	0.432	0.250	0.063	0.177		
	180620PDSR-MM																	0.685	0.432	0.250	0.079	0.177		
	180624PDSR-MM				●						●			●	●			0.685	0.432	0.250	0.094	0.177		
	180630R-MM										●			●	●			0.657	0.432	0.250	0.118	0.177		
	180632R-MM ✳				●						●			●	●			0.657	0.432	0.250	0.126	0.177		
	180640R-MM ✳										●			●	●			0.657	0.432	0.250	0.157	0.177		
	180648R-MM ✳										●			●	●			0.657	0.432	0.250	0.189	0.177		
	180650R-MM ✳										●			●	●			0.657	0.432	0.250	0.197	0.177		
	180660R-MM ✳																	0.657	0.432	0.250	0.236	0.177		
	180664R-MM										●			●	●			0.657	0.432	0.250	0.252	0.177		
BAMPR-XAF 	**BAMPR-XAF**															●		1.004	0.413	0.276	-	-		E133~E134
BAMPR-XAW 	**BAMPR-XAW**															●		1.004	0.394	0.276	-	-		E133~E134
BAMPR-XAWR 	**BAMPR-XAWR**															●		1.004	0.394	0.276	-	-		E133~E134
CDEW-NAF  strengthened Edge	**1204R-NAF**																●	1/2	3/8	0.187	-	0.173		E132
	1204L-NAF																●	1/2	3/8	0.187	-	0.173		
CDEW-NAW  strengthened Edge Wiper Insert	**1204R-NAW**																●	1/2	3/8	0.187	-	0.173		E132
	1204L-NAW																●	1/2	3/8	0.187	-	0.173		

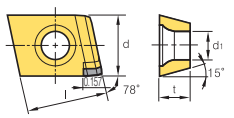
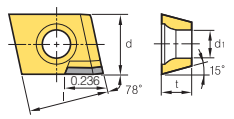
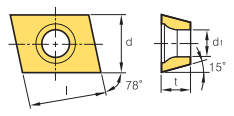
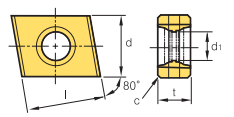
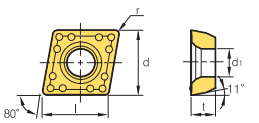
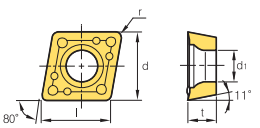
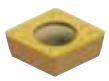
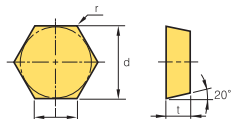
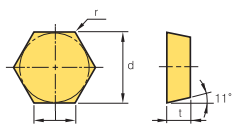
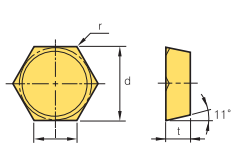
Inserts marked with an asterisk (*) require a custom-made order for special holders.

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01	DP150	DP200
	Steel	P	●	⬬	●	✱	✱	●	⬬	⬬	⬬			✱	✱			
	Stainless steel	M										✱		✱	✱			
	Cast iron	K			⬬			⬬	⬬				●	✱	✱	●		
	Non-ferrous metal	N														⬬	●	●
	Heat resistant alloy, Titanium alloy	S												✱	✱			
	Hardened steel	H						●	⬬					⬬	✱			

Machining types

● Continuous cutting
⬬ General cutting
✱ Interrupted cutting

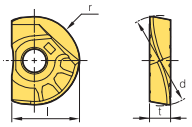
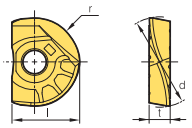
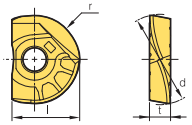
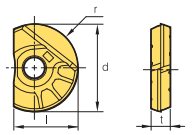
Inserts	Designation	Cermet		Coated										Uncoated	PCD		Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01	DP150	DP200	l	d	t	r	d_1		
CDEW-XAW	1204R-XAW																●	1/2	3/8	0.187	-	0.173		E132
	1204L-XAW																	1/2	3/8	0.187	-	0.173		
Sharp Edge Wiper Insert																								
CDEW-XAF	1204R-XAF																●	1/2	3/8	0.187	-	0.173		E132
	1204L-XAF																	1/2	3/8	0.187	-	0.173		
Sharp Edge																								
CDEW-XCF	1204R-XCF														●			1/2	3/8	0.187	-	0.173		E132
	1204L-XCF																	1/2	3/8	0.187	-	0.173		
Sharp Edge																								
CNHQ	1005-C0.5																	25/64	25/64	7/32	-	0.185		E312
	1305-C0.5																	1/2	25/64	7/32	-	0.185		E313
	1606-C0.5																	5/8	15/32	1/4	-	0.232		
CPMH	432-MM								●									0.508	1/2	0.187	1/32	0.217		E287
																								
CPMT	21.51-MM								●									0.254	1/4	0.094	1/64	0.108		E287
	2.522-MM								●									0.317	5/16	0.134	1/32	0.125		
	32.52-MM								●									0.381	3/8	0.156	1/32	0.173		
HECN	532FN																	23/64	5/8	3/16	1/32	-		E324
	532SN																	23/64	5/8	3/16	1/32	-		
	532TN																	23/64	5/8	3/16	1/32	-		
	633FN																	7/16	3/4	3/16	3/64	-		
	633TN																	7/16	3/4	3/16	3/64	-		
HPEN	532FN																	23/64	5/8	3/16	1/32	-		E324
	532SN																	23/64	5/8	3/16	1/32	-		
	532EN																	23/64	5/8	3/16	1/32	-		
	633FN																	7/16	3/4	3/16	3/64	-		
HPEN-WC	532-WC																	23/64	5/8	3/16	1/32	-		E324
	633-WC																	7/16	3/4	3/16	3/64	-		

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	PC2005	PC2010	PC2015	PC210F	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01
	Steel	P	●	⧓	●	⧓	✱	✱	●	⧓	⧓	⧓			✱	✱		
	Stainless steel	M				●	⧓	⧓					✱		✱	✱		
	Cast iron	K			●	⧓	✱	✱	⧓	⧓				●	✱	✱	⧓	●
	Non-ferrous metal	N					●	●										⧓
	Heat resistant alloy, Titanium alloy	S					●	●							✱	✱		
	Hardened steel	H			●	⧓	✱	✱	●	⧓					⧓	✱		

Machining types

● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

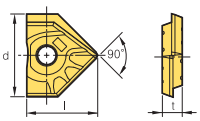
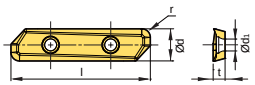
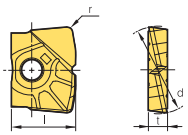
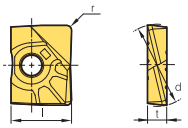
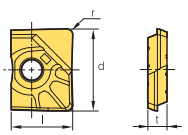
Inserts	Designation	Cermet		Coated													Uncoated		Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	PC2005	PC2010	PC2015	PC210F	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	l	d	t	r	d_1		
LBH 	**0312**																	9/32	5/16	3/32	5/32	-		E271~ E274
	0375																	21/64	3/8	7/64	3/16	-		
	0500																	13/32	1/2	1/8	1/4	-		
	0625																	15/32	5/8	5/32	5/16	-		
	0750																	37/64	3/4	13/64	3/8	-		
	1000																	47/64	1	15/64	1/2	-		
	1250																	59/64	1 1/4	9/32	5/8	-		
LBH-KF 	**0312-KF**																	9/32	5/16	3/32	5/32	-		E270 E271
	0375-KF																	21/64	3/8	7/64	3/16	-		
	0500-KF																	13/32	1/2	1/8	1/4	-		
	0625-KF																	15/32	5/8	5/32	5/16	-		
	0750-KF																	37/64	3/4	13/64	3/8	-		
	1000-KF																	47/64	1	15/64	1/2	-		
	1250-KF																	59/64	1 1/4	9/32	5/8	-		
LBH-KH 	**0312-KH**																	9/32	5/16	3/32	5/32	-		E270 E271
	0375-KH																	21/64	3/8	7/64	3/16	-		
	0500-KH																	13/32	1/2	1/8	1/4	-		
	0625-KH																	15/32	5/8	5/32	5/16	-		
	0750-KH																	37/64	3/4	13/64	3/8	-		
	1000-KH																	47/64	1	15/64	1/2	-		
	1250-KH																	59/64	1 1/4	9/32	5/8	-		
LBS 	**0312**																	9/32	5/16	3/32	5/32	-		E271~ E274
	0375																	21/64	3/8	7/64	3/16	-		
	0500																	13/32	1/2	1/8	1/4	-		
	0625																	15/32	5/8	5/32	5/16	-		
	0750																	37/64	3/4	13/64	3/8	-		
	1000																	47/64	1	15/64	1/2	-		
	1250																	59/64	1 1/4	9/32	5/8	-		

●: Korea Stock ●: US Stock

Workpiece			Cermet		Coated												Uncoated	
			CN2000	CN30	PC2005	PC2010	PC2015	PC210F	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01
Steel	P		●	◓	●	◓	✱	✱	●	◓	◓	◓			✱	✱		
Stainless steel	M					●	◓	◓					✱		✱	✱		
Cast iron	K				●	◓	✱	✱	◓	◓				●	✱	✱	◓	●
Non-ferrous metal	N						●	●										◓
Heat resistant alloy, Titanium alloy	S						●	●							✱	✱		
Hardened steel	H				●	◓	✱	✱	●	◓					◓	✱		

Machining types

● Continuous cutting
◓ General cutting
✱ Interrupted cutting

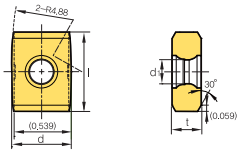
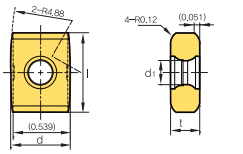
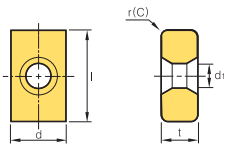
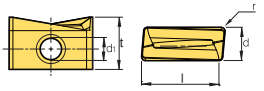
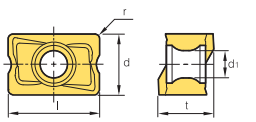
Inserts	Designation	l	d	t	r	d_1	Geometries	Available tools
LCF 	**0625-D90**	35/64	5/8	5/32	-	-		E271~ E274
	0750-D90	43/64	3/4	13/64	-	-		
	1000-D90	27/32	1	15/64	-	-		
LDET 	**650540PPFR-MA**	2.559	0.591	0.221	0.157	0.219		E307
	650550PPFR-MA	2.559	0.591	0.221	0.197	0.219		
LFH 	**0375**	21/64	3/8	7/64	3/64	-		E271~ E274
	0500	13/32	1/2	1/8	3/64	-		
	0625	15/32	5/8	5/32	1/16	-		
	0750	37/64	3/4	13/64	1/16	-		
	1000	47/64	1	15/64	5/64	-		
	1250	59/64	1 1/4	9/32	5/64	-		
LRH 	**0375-R015**	21/64	3/8	7/64	1/64	-	 LRH type	E271~ E274
	0375-R031	21/64	3/8	7/64	1/32	-		
	0375-R062	21/64	3/8	7/64	1/16	-		
	0500-R015	13/32	1/2	1/8	1/64	-		
	0500-R031	13/32	1/2	1/8	1/32	-		
	0500-R062	13/32	1/2	1/8	1/16	-		
	0625-R015	15/32	5/8	5/32	1/64	-		
	0625-R031	15/32	5/8	5/32	1/32	-		
	0625-R062	15/32	5/8	5/32	1/16	-		
	0625-R125	15/32	5/8	5/32	1/8	-		
	0750-R015	37/64	3/4	1/4	1/64	-		
	0750-R031	37/64	3/4	1/4	1/32	-		
	0750-R062	37/64	3/4	1/4	1/16	-		
	0750-R125	37/64	3/4	1/4	1/8	-		
	1000-R015	47/64	1	15/64	1/64	-		
	1000-R031	47/64	1	15/64	1/32	-		
	1000-R062	47/64	1	15/64	1/16	-		
LR  (Special type)	**1000-R125**	47/64	1	15/64	1/8	-	 LR type	
	1250-R031	59/64	1 1/4	9/32	1/32	-		
	1250-R062	59/64	1 1/4	9/32	1/16	-		
	1250-R125	59/64	1 1/4	9/32	1/8	-		

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
	Steel	P	●	⧓	●	✱	✱	●	⧓	⧓	⧓			✱	✱	⧓		
	Stainless steel	M										✱		✱	✱			
	Cast iron	K			⧓			⧓	⧓				●	✱	✱		⧓	●
	Non-ferrous metal	N																⧓
	Heat resistant alloy, Titanium alloy	S												✱	✱			
	Hardened steel	H						●	⧓					⧓	✱			

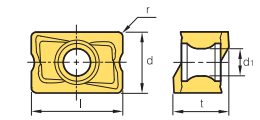
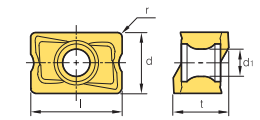
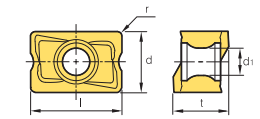
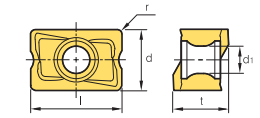
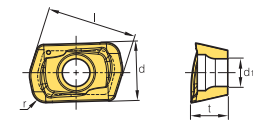
Machining types

● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated												Uncoated			Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400		ST30A	G10	H01	l	d	t	r	d_1		
LNCS	1907-C1.5-WC																		3/4	0.563	0.276	-	0.228		E335 E336
LNCS	1907-R3.0-WC																		3/4	0.563	0.276	-	0.228		E335 E336
LNE	324-R0.8																		5/8	3/8	1/4	1/32	0.173		E339~ E343
	324-C1.0																		5/8	3/8	1/4	3/64	0.173		
LNKT	170708PNR-MM												●	●					0.650	0.276	0.433	0.031	0.177		E259 E260
	170708PNR-ML											●	●	●					0.650	0.276	0.433	0.031	0.177		
KEL-MF	150608-MF																		5/8	0.402	1/4	0.031	-		E342
	150608-ML																		5/8	0.402	1/4	0.031	-		
KEL-QNN	1506QNN-MF																		5/8	0.402	1/4	0.031	-		E328
	1506QNN-ML																		5/8	0.402	1/4	0.031	-		
KEL-ANN	1506ANN-MF																		5/8	0.402	1/4	0.031	-		E328
	1506ANN-ML																		5/8	0.402	1/4	0.031	-		
LNM(E)X-MF	LNMX 100605PNR-MF										●	●	●	●					25/64	33/128	33/128	3/128	0.318		E91
	100608PNR-MF										●	●	●	●					25/64	33/128	33/128	1/32	0.318		E92
	LNEX 100605PNR-MF											●	●	●					25/64	33/128	33/128	3/128	0.318		E95
	100608PNR-MF									●		●	●	●					25/64	33/128	33/128	1/32	0.318		E96 E99~ E103

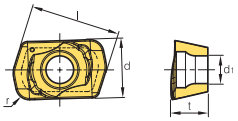
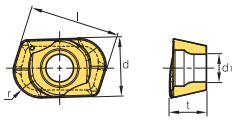
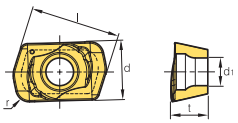
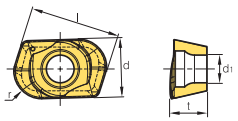
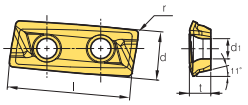
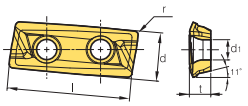
●: Korea Stock ●: US Stock

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	◓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Cermet		Coated										Uncoated			Dimensions (inch)					Geometries	Available tools
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1		
LNM(E)X-MF	LNMX	151004PNR-MF									●		●	●	●				19/32	25/64	25/64	1/64	0.177		E91
		151008PNR-MF								●	●		●	●	●				19/32	25/64	25/64	1/32	0.177		E92
		151016PNR-MF									●		●	●	●				19/32	25/64	25/64	1/16	0.177		E95
	LNEX	151004PNR-MF											●	●	●				19/32	25/64	25/64	1/64	0.177		E96
		151008PNR-MF											●	●	●				19/32	25/64	25/64	1/32	0.177		E99~
		151016PNR-MF											●	●	●				19/32	25/64	25/64	1/16	0.177		E103
LNM(E)X-MM	LNMX	100605PNR-MM								●	●	●	●	●	●				25/64	33/128	33/128	3/128	0.318		E91~
		100608PNR-MM								●	●			●	●				25/64	33/128	33/128	1/32	0.318		E105
		100605PNL-MM								●	●		●	●	●				25/64	33/128	33/128	3/128	0.318		
	LNEX	100605PNR-MM								●			●	●	●				25/64	33/128	33/128	3/128	0.318		
		100608PNR-MM											●	●	●				25/64	33/128	33/128	1/32	0.318		
		100605PNL-MM											●	●	●				25/64	33/128	33/128	3/128	0.318		
LNM(E)X-MM	LNMX	151004PNR-MM									●		●		●				19/32	25/64	25/64	1/64	0.177		E91~
		151008PNR-MM								●	●	●	●	●	●				19/32	25/64	25/64	1/32	0.177		E105
		151016PNR-MM								●	●		●	●	●				19/32	25/64	25/64	1/16	0.177		
		151008PNL-MM									●			●	●				19/32	25/64	25/64	1/32	0.177		
	LNEX	151004PNR-MM											●	●	●				19/32	25/64	25/64	1/64	0.177		
		151008PNR-MM								●			●	●	●				19/32	25/64	25/64	1/32	0.177		
		151016PNR-MM											●	●	●				19/32	25/64	25/64	1/16	0.177		
		151008PNL-MM											●	●	●				19/32	25/64	25/64	1/32	0.177		
LNEX-MA	LNEX	100605PNR-MA																●	25/64	33/128	33/128	3/128	0.318		E91~E95
		151004PNR-MA																●	19/32	25/64	25/64	1/64	0.177		E95~E96
		151008PNR-MA																●	19/32	26/64	26/64	1/32	0.177		E99~
LPMT-MF	LPMT	040210R-MF							●					●	●				0.252	0.165	0.102	0.039	0.079		E230~
																									E232
	LPMT	040220R-MF							●					●	●				0.252	0.165	0.102	0.079	0.079		E230~
																									E232

●: Korea Stock ●: US Stock

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

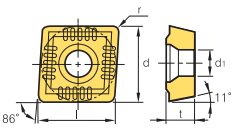
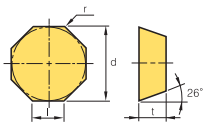
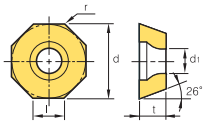
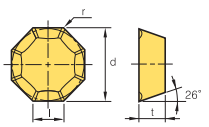
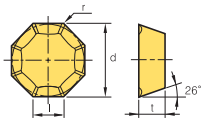
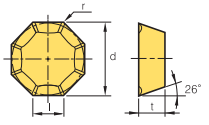
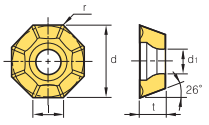
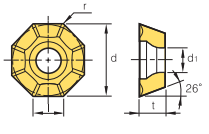
Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1		
LPMW	LPMW 040210R						●	●					●					0.252	0.165	0.102	0.039	0.079		E230~ E232
LPMW	LPMW 040220R						●	●					●					0.252	0.165	0.102	0.079	0.079		E230~ E232
LPEW	LPEW 040210R						●	●					●					0.252	0.165	0.102	0.039	0.079		E230~ E232
LPEW	LPEW 040220R						●	●					●					0.252	0.165	0.102	0.079	0.079		E230~ E232
LXET-MA	250404PEFR-125-MA																	0.984	0.424	0.187	1/64	0.177		E303~ E306
	2504PEFR-125-MA																●	0.984	0.424	0.187	2/64	0.177		
	250412PEFR-125-MA																	0.984	0.424	0.187	3/64	0.177		
	250416PEFR-125-MA																	0.984	0.424	0.187	4/64	0.177		
	250404PEFR-150-MA																	0.984	0.418	0.187	1/64	0.177		
	2504PEFR-150-MA																	0.984	0.418	0.187	2/64	0.177		
	250412PEFR-150-MA																	0.984	0.418	0.187	3/64	0.177		
	250416PEFR-150-MA																	0.984	0.418	0.187	4/64	0.177		
	340504PEFR-200-MA																	1.339	0.542	0.219	1/64	0.219		
	3405PEFR-200-MA																●	1.339	0.542	0.219	2/64	0.219		
	340512PEFR-200-MA																	1.339	0.542	0.219	3/64	0.219		
	340516PEFR-200-MA																	1.339	0.542	0.219	4/64	0.219		
	340504PEFR-250-MA																●	1.339	0.543	0.219	1/64	0.219		
	3405PEFR-250-MA																●	1.339	0.543	0.219	2/64	0.219		
	340512PEFR-250-MA																	1.339	0.543	0.219	3/64	0.219		
	340516PEFR-250-MA																	1.339	0.543	0.219	4/64	0.219		
LXET-ML	250404PEER-125-ML																	0.984	0.424	0.187	1/64	0.177		E303~ E306
	2504PEER-125-ML																	0.984	0.424	0.187	2/64	0.177		
	250412PEER-125-ML																	0.984	0.424	0.187	3/64	0.177		
	250416PEER-125-ML																	0.984	0.424	0.187	4/64	0.177		
	250404PEER-150-ML																	0.984	0.418	0.187	1/64	0.177		
	2504PEER-150-ML																	0.984	0.418	0.187	2/64	0.177		
	250412PEER-150-ML																	0.984	0.418	0.187	3/64	0.177		
	250416PEER-150-ML																	0.984	0.418	0.187	4/64	0.177		
	340504PEER-200-ML																	1.339	0.542	0.219	1/64	0.219		
	3405PEER-200-ML																	1.339	0.542	0.219	2/64	0.219		
	340512PEER-200-ML																	1.339	0.542	0.219	3/64	0.219		
	340516PEER-200-ML																	1.339	0.542	0.219	4/64	0.219		
	340504PEER-250-ML																	1.339	0.543	0.219	1/64	0.219		
	340508PEER-250-ML																	1.339	0.543	0.219	2/64	0.219		
	340512PEER-250-ML																	1.339	0.543	0.219	3/64	0.219		
	340516PEER-250-ML																	1.339	0.543	0.219	4/64	0.219		

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5400	ST30A	H01
	Steel	P	●	◒	◒	✱	●	✱	✱	●	◒	◒	◒	◒		✱	◒	
	Stainless steel	M			◒	✱								✱		✱		
	Cast iron	K					◒			◒	◒				●	✱		●
	Non-ferrous metal	N																◒
	Heat resistant alloy, Titanium alloy	S														✱		
	Hardened steel	H								●	◒					✱		

Machining types

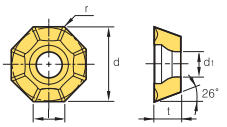
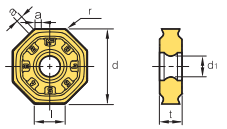
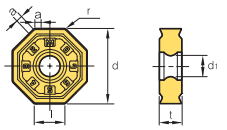
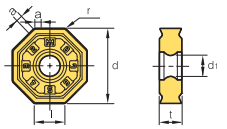
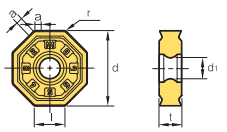
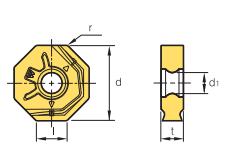
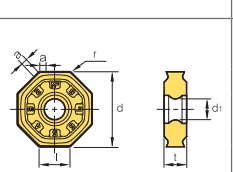
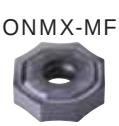
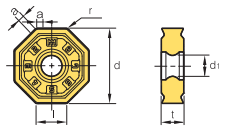
● Continuous cutting
◒ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated												Uncoated		Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5400	ST30A	H01	l	d	t	r	d_1		
MPMT	322																	5/16	0.313	0.125	1/32	0.138		-
	432										●							19/64	3/8	0.156	1/32	0.177		
OFCN	0704SN													●				19/64	45/64	0.187	3/128	-		E56
	0704FN																	19/64	45/64	0.187	3/128	-		
	070408SN																	19/64	45/64	0.187	1/32	-		
	070408FN																	19/64	45/64	0.187	1/32	-		
	070408TN																	19/64	45/64	0.187	1/32	-		
OFCW	05T3SN																	13/64	1/2	0.156	3/128	0.173		E55
	05T3FN																	13/64	1/2	0.156	3/128	0.173		
	05T308FN																	13/64	1/2	0.156	1/32	0.173		
OFKR-MA	0704FN-MA																●	19/64	45/64	3/16	3/128	-		E56
	0704EN-MA																	19/64	45/64	3/16	3/128	-		
OFKR-MF	0704SN-MF			●	●													19/64	45/64	3/16	3/128	-		E56
	070408SN-MF																	19/64	45/64	3/16	1/32	-		
OFKR-MM	0704SN-MM			●	●						●		●	●				19/64	45/64	3/16	3/128	-		E56
	070408SN-MM			●														19/64	45/64	3/16	1/32	-		
OFKT-MA	05T3FN-MA																●	13/64	1/2	5/32	3/128	0.173		E55
	05T3EN-MA																	13/64	1/2	5/32	3/128	0.173		E56
	0704FN-MA																●	19/64	45/64	3/16	3/128	0.217		
	0704EN-MA																	19/64	45/64	3/16	3/128	0.217		
OFKT-MF	05T3SN-MF													●				13/64	1/2	5/32	3/128	0.173		E55
	05T308SN-MF																	13/64	1/2	5/32	1/32	0.217		

●: Korea Stock ●: US Stock

Workpiece			Machining types
Steel	P	● ⧓ ⧓ ● ✱ ✱ ● ⧓ ⧓ ⧓ ✱ ✱ ⧓	● Continuous cutting
Stainless steel	M	⧓ ⧓ ✱ ✱ ✱ ✱
Cast iron	K	⧓ ⧓ ⧓ ⧓ ● ✱ ✱ ●
Non-ferrous metal	N	⧓
Heat resistant alloy, Titanium alloy	S	✱ ✱
Hardened steel	H	● ⧓ ⧓ ✱ ✱

⧓ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated											Uncoated		Dimensions (inch)								Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	l	d	t	r	d_1	a	W	g		
OFKT-MM	05T3SN-MM			●						●		●						13/64	1/2	5/32	3/128	0.173	-	-	-		E55
	05T308SN-MM																	13/64	1/2	5/32	1/32	0.173	-	-	-		E56
	0704SN-MM																	19/64	45/64	3/16	3/128	0.217	-	-	-		
ONHX-MF	060608-MF												●	●	●			17/64	5/8	15/64	1/32	0.220	-	-	-		E126
	080608-MF												●	●	●			21/64	51/64	15/64	1/32	0.220	-	-	-		E127
	0606ANN-MF												●	●	●			17/64	5/8	15/64	1/32	0.220	0.041	-	-		
	0806ANN-MF												●	●	●			21/64	51/64	15/64	1/32	0.220	0.060	-	-		
ONHX-ML	060608-ML													●	●			17/64	5/8	15/64	1/32	0.220	-	-	-		E126
	080608-ML													●	●			21/64	51/64	15/64	1/32	0.220	-	-	-		E127
ONHX-MM	060608-MM												●	●	●			17/64	5/8	15/64	1/32	0.220	-	-	-		E126
	080608-MM												●	●	●			21/64	51/64	15/64	1/32	0.220	-	-	-		E127
	0606ANN-MM												●	●	●			17/64	5/8	15/64	1/32	0.220	0.041	-	-		
	0806ANN-MM												●	●	●			21/64	51/64	15/64	1/32	0.220	0.060	-	-		
ONHX-MA	060608-MA																●	17/64	5/8	15/64	1/32	0.220	-	-	-		E126
	080608-MA																●	21/64	51/64	15/64	1/32	0.220	-	-	-		E127
ONHX-W	060608-W												●	●	●			17/64	5/8	15/64	1/32	0.220	-	-	-		E126
	080608-W												●	●				21/64	51/64	15/64	1/32	0.220	-	-	-		E127
ONMX-MF	060608-MF											●		●	●			17/64	5/8	15/64	1/32	0.220	-	-	-		E126
	080608-MF											●		●	●			21/64	51/64	15/64	1/32	0.220	-	-	-		E127
	0606ANN-MF											●	●	●	●			17/64	5/8	15/64	1/32	0.220	0.041	-	-		
	0806ANN-MF											●		●	●			21/64	51/64	15/64	1/32	0.220	0.060	-	-		
ONMX-MM	060608-MM									●	●			●	●			17/64	5/8	15/64	1/32	0.220	-	-	-		E126
	080608-MM									●	●	●		●	●			21/64	51/64	15/64	1/32	0.220	-	-	-		E127
	0606ANN-MM									●	●			●	●			17/64	5/8	15/64	1/32	0.220	0.041	-	-		
	0806ANN-MM									●	●	●		●	●			21/64	51/64	15/64	1/32	0.220	0.060	-	-		

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NC5330	NC5340	NC5350	PC210F	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01
	Steel	P	●	⧓	●	✱	✱	✱	●	⧓	⧓	⧓			✱	✱	⧓	
	Stainless steel	M						⧓					✱		✱	✱		
	Cast iron	K			⧓			✱	⧓	⧓				●	✱	✱		●
	Non-ferrous metal	N						●										⧓
	Heat resistant alloy, Titanium alloy	S						●							✱	✱		
	Hardened steel	H						✱	●	⧓					⧓	✱		

Machining types

● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated											Uncoated		Dimensions (inch)						Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC210F	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	l	d	t	r	d_1	Cutter width		
PNEJ	1223N									●								-	1/2	0.091	-	0.197	5/32		E316
	1225N																	-	1/2	0.098	-	0.197	23/128		E317
	1230N																	-	1/2	0.118	-	0.197	13/64		
	1235N									●				●				-	1/2	0.138	-	0.197	15/64		
	1240N									●				●				-	1/2	0.157	-	0.197	9/32		
	1245N									●				●				-	1/2	0.177	-	0.197	5/16		
	1250N																	-	1/2	0.197	-	0.197	23/64		
	1255N									●								-	1/2	0.217	-	0.197	25/64		
	1260N																	-	1/2	0.236	-	0.197	7/16		
	1265N													●				-	1/2	0.256	-	0.197	15/32		
	1270N																	-	1/2	0.276	-	0.197	33/64		
	1275N													●				-	1/2	0.295	-	0.197	35/64		
	1285N																	-	1/2	0.335	-	0.197	19/32		
PNEJ-C	1223N-C03																	-	1/2	0.091	-	0.197	5/32	※ C03: Chamfer 0.021 inch C05: Chamfer 0.021 inch	E316
	1230N-C03																	-	1/2	0.118	-	0.197	13/64		E317
	1235N-C03																	-	1/2	0.138	-	0.197	15/64		
	1240N-C05																	-	1/2	0.157	-	0.197	9/32		
	1245N-C05																	-	1/2	0.177	-	0.197	5/16		
	1250N-C05																	-	1/2	0.197	-	0.197	23/64		
	1255N-C05																	-	1/2	0.217	-	0.197	25/64		
	1260N-C05																	-	1/2	0.236	-	0.197	7/16		
	1265N-C05																	-	1/2	0.256	-	0.197	15/32		
	1270N-C05																	-	1/2	0.276	-	0.197	33/64		
	1275N-C05																	-	1/2	0.295	-	0.197	35/64		
RC	062						●											0.620	5/8	0.138	5/16	-	-		E275
	075						●											0.682	3/4	0.157	3/8	-	-		
	100						●											0.874	1	0.197	1/2	-	-		
	125																	1.090	1 1/4	0.236	5/8	-	-		
RDCT-MA	10T3M0-MA															●		-	25/64	0.156	-	0.157	-		E199
	1204M0-MA															●		-	15/32	0.187	-	0.177	-		E200 E205 E206 E211
RDHW	0501M0F																	-	13/64	0.063	-	0.091	-		E203
	0501M0E											●						-	13/64	0.063	-	0.091	-		E204
	0501M0S																	-	13/64	0.063	-	0.091	-		E209
	06T1M0F																	-	15/64	0.078	-	0.098	-		E210
	06T1M0E											●						-	15/64	0.078	-	0.098	-		
	06T1M0S																	-	15/64	0.078	-	0.098	-		
	0702M0F																	-	9/32	0.094	-	0.110	-		
	0702M0E											●						-	9/32	0.094	-	0.110	-		
	0702M0S																	-	9/32	0.094	-	0.110	-		
	0803M0F																	-	5/16	0.125	-	0.134	-		
	0803M0E											●						-	5/16	0.125	-	0.134	-		
	0803M0S																	-	5/16	0.125	-	0.134	-		
RDHW	1605M0F																	-	5/8	0.219	-	0.217	-		E201
	1605M0E																	-	5/8	0.219	-	0.217	-		E202
	1605M0S																	-	5/8	0.219	-	0.217	-		E207
	2006M0F																	-	25/32	1/4	-	0.217	-		E208
	2006M0E																	-	25/32	1/4	-	0.217	-		E211
	2006M0S																	-	25/32	1/4	-	0.217	-		
RDKT-MF	10T3M0-MF											●		●				-	25/64	0.156	-	0.152	-		E199
	1204M0-MF											●		●				-	15/32	0.187	-	0.177	-		E200
	1605M0-MF																	-	5/8	0.219	-	0.217	-		E205 E206 E211

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01
	Steel	P	●	⬢	⬢	●	✱	✱	●	⬢	⬢	⬢			✱	✱	⬢	
	Stainless steel	M			⬢								✱		✱	✱		
	Cast iron	K				⬢			⬢	⬢				●	✱	✱		●
	Non-ferrous metal	N																⬢
	Heat resistant alloy, Titanium alloy	S													✱	✱		
	Hardened steel	H							●	⬢					⬢	✱		

Machining types

● Continuous cutting
⬢ General cutting
✱ Interrupted cutting

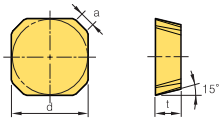
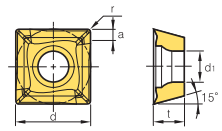
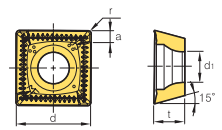
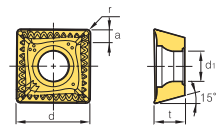
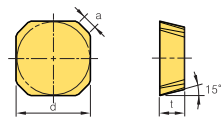
Inserts	Designation	Cermet		Coated												Uncoated		Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	l	d	t	r	d_1		
RDKT-ML	1605M0-ML																	-	5/8	0.219	-	0.217		E201 E207 E211
RDKT-MM	10T3M0-MM			●						●		●	●	●				-	25/64	0.156	-	0.152		E199~ E202 E205~ E211
	1204M0-MM			●						●		●	●	●				-	15/32	0.187	-	0.177		
	1605M0-MM									●								-	5/8	0.219	-	0.217		
	2006M0-MM									●								-	25/32	0.250	-	0.217		
RDKW	0501M0E																	-	13/64	1/16	-	0.091		E203 E204 E209 E210
	06T1M0E																	-	15/64	0.078	-	0.098		
	0702M0E																	-	9/32	3/32	-	0.110		
	0803M0E																	-	5/16	1/8	-	0.134		
REKR-MM	170400-MM																	-	45/64	3/16	-	-		E56
RPCT-MA new	10T3M0-MA																●	-	0.394	0.156	-	0.157		E237~ E248
	1204M0-MA																●	-	0.472	0.187	-	0.177		
	1606M0-MA																●	-	0.630	0.250	-	0.217		
	2007M0-MA																●	-	0.787	0.276	-	0.276		
RPET-ML new	0803M0E-ML													●	●			-	0.315	0.125	-	0.134		E212~ E224
	103TM0E-ML													●	●			-	0.394	0.156	-	0.157		
	1204M0E-ML													●	●			-	0.472	0.187	-	0.177		
	1606M0E-ML													●	●			-	0.630	0.250	-	0.217		
	2007M0E-ML													●	●			-	0.787	0.276	-	0.276		
RPMT-MF new	0803M0E-MF										●			●	●			-	0.315	0.125	-	0.134		E212~ E224
	10T3M0E-MF										●			●	●			-	0.394	0.156	-	0.157		
	1204M0E-MF										●			●	●			-	0.472	0.187	-	0.177		
	1606M0E-MF										●			●	●			-	0.630	0.250	-	0.217		
	2007M0E-MF										●			●	●			-	0.787	0.276	-	0.276		
RPMT-MM new	0803M0S-MM							●	●		●			●	●			-	0.315	0.125	-	0.134		E212~ E224
	10T3M0S-MM							●	●		●			●	●			-	0.394	0.156	-	0.157		
	1204M0S-MM							●	●		●			●	●			-	0.472	0.187	-	0.177		
	1606M0S-MM							●	●		●			●	●			-	0.630	0.250	-	0.217		
	2007M0S-MM							●	●		●			●	●			-	0.787	0.276	-	0.276		
RPMW new	0803M0E1							●	●		●			●	●			-	0.315	0.125	-	0.134		E212~ E224
	10T3M0E1							●	●		●			●	●			-	0.394	0.156	-	0.157		
	1204M0S1							●	●		●			●	●			-	0.472	0.187	-	0.177		
	1204M0S2													●	●			-	0.472	0.187	-	0.177		
	1606M0S1							●	●		●			●	●			-	0.630	0.250	-	0.217		
	2007M0S1							●	●		●			●	●			-	0.787	0.276	-	0.276		

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PD2000	ST30A	G10	H01
	Steel	P	●	⬌	⬌	✖	●	✖	✖	⬌	⬌			✖		⬌		
	Stainless steel	M			⬌	✖						✖		✖				
	Cast iron	K					⬌						●	✖			⬌	●
	Non-ferrous metal	N													●			⬌
	Heat resistant alloy, Titanium alloy	S												✖				
	Hardened steel	H												⬌				

Machining types

● Continuous cutting
⬌ General cutting
✖ Interrupted cutting

Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (inch)						Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PD2000	ST30A	G10	H01	l	d	t	r	d_1	a		
SDCN	42M															●		-	1/2	1/8	-	-	0.059		E42
	42M-G																●	-	1/2	1/8	-	-	0.059		E46
	42MT	●	●		●										●			-	1/2	1/8	-	-	0.059		E52
	42MT-RH																	-	1/2	1/8	-	-	0.059		E53
	42MT-S20										●							-	1/2	1/8	-	-	0.059		
	53M															●		-	5/8	3/16	-	-	0.059		
	53M-G																●	-	5/8	3/16	-	-	0.059		
	53MT		●	●											●			-	5/8	3/16	-	-	0.059		
	53MT-RH								●									-	5/8	3/16	-	-	0.059		
	53MT-S20										●							-	5/8	3/16	-	-	0.059		
	42AEEN																	-	1/2	1/8	-	-	0.059		
	42AEEN-RH																	-	1/2	1/8	-	-	0.056		
	42AESN																	-	1/2	1/8	-	-	0.059		
	42AESN-RH																	-	1/2	1/8	-	-	0.056		
	53AEEN																	-	5/8	3/16	-	-	0.059		
	53AEEN-RH											●	●					-	5/8	3/16	-	-	0.056		
	53AESN																	-	5/8	3/16	-	-	0.059		
	53AESN-RH										●	●						-	5/8	3/16	-	-	0.056		
SDET-MA	09M402R-MA													●			●	-	3/8	0.143	1/128	0.157	0.047		E193~ E198
	09M404R-MA																	-	3/8	0.143	1/64	0.157	0.047		
	09M405R-MA																	-	3/8	0.143	3/128	0.157	0.047		
	130504R-MA																●	-	0.531	0.219	1/64	0.219	0.087		
SDET-MF	09M405R-MF																	-	3/8	5/32	3/124	0.157	0.047		E193~ E198
	130508R-MF																	-	0.531	7/32	1/32	0.219	0.087		
SDET-MM	09M405R-MM																	-	3/8	5/32	3/124	0.157	0.047		E193~ E198
	130508R-MM																	-	0.531	7/32	1/32	0.219	0.087		
SDKN-CM	42MT-CM		●															-	1/2	1/8	-	-	0.059		E42 E52

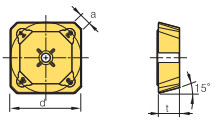
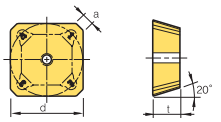
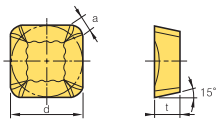
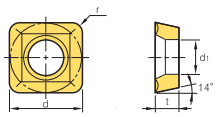
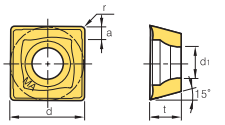
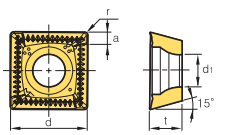
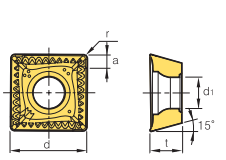
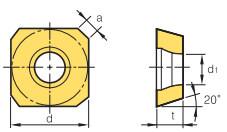
- **Cutting-edge geometry**
  - G: Light Side, Sharpe Edge
  - S20: STS
  - RH: Strengthened Edge
- **Sub-cutting-edge geometry**
  - M: AEFN
  - MT: AETN

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
	Steel	P	●	⬌	⬌	✱	●	✱	✱	⬌	⬌			✱	✱	⬌		
	Stainless steel	M			⬌	✱						✱		✱	✱			
	Cast iron	K					⬌						●	✱	✱		⬌	●
	Non-ferrous metal	N																⬌
	Heat resistant alloy, Titanium alloy	S												✱	✱			
	Hardened steel	H												⬌	✱			

Machining types

● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated											Uncoated			Dimensions (inch)						Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	a		
SDKN-MU	42AESN-MU									●								-	1/2	1/8	-	-	0.086		E42 E46 E52 E53
	53AESN-MU									●								-	5/8	3/16	-	-	0.083		
SDKN-SU	42AESN-SU									●			●	●				-	1/2	1/8	-	-	0.086		E42 E46 E52 E53
	53AESN-SU									●			●	●				-	5/8	3/16	-	-	0.083		
SDKR-MX	42AESN-MX																	-	1/2	1/8	-	-	0.057		E42 E46 E52 E53
	42AETN-MX																	-	1/2	1/8	-	-	0.057		
	42AEN-MX			●														-	1/2	1/8	-	-	0.057		
	53AESN-MX				●													-	5/8	3/16	-	-	0.057		
	53AETN-MX																	-	5/8	3/16	-	-	0.057		
	53AEN-MX			●														-	5/8	3/16	-	-	0.057		
SDMT-MM	322-MM								●				●					-	3/8	1/8	0.031	0.173	-		E278 E281
SDXT-MA	09M405R-MA															●		-	3/8	0.157	3/128	0.157	0.047		E193~ E198
	130508R-MA															●		-	0.531	7/32	1/32	0.219	0.087		
SDXT-MF	09M403R-MF																	-	3/8	0.157	1/64	0.157	0.047		E193~ E198
	09M403L-MF																	-	3/8	0.157	1/64	0.157	0.047		
	09M404R-MF																	-	3/8	0.157	1/64	0.157	0.047		
	09M404L-MF																	-	3/8	0.157	1/64	0.157	0.047		
	09M405R-MF			●						●	●	●	●	●				-	3/8	0.157	3/128	0.157	0.047		
	09M405L-MF									●	●	●	●	●				-	3/8	0.157	3/128	0.157	0.047		
	130508R-MF			●						●	●	●	●	●				-	0.531	7/32	1/32	0.219	0.087		
SDXT-MM	09M405R-MM			●	●				●	●	●	●	●	●				-	3/8	0.157	3/128	0.157	0.047		E193~ E198
	09M405L-MM									●		●						-	3/8	0.157	3/128	0.157	0.047		
	130508R-MM			●	●				●	●	●	●	●	●				-	0.531	7/32	1/32	0.219	0.087		
	130508L-MM																	-	0.531	7/32	1/32	0.219	0.087		
	130538-MM																	-	0.531	7/32	5/32	0.219	0.087		
SECA	43AFSN			●														-	1/2	3/16	-	0.219	0.105		-
	43AFTN																	-	1/2	3/16	-	0.219	0.105		
	43AFFN																	-	1/2	3/16	-	0.219	0.105		
	43AFEN		●						●		●							-	1/2	3/16	-	0.219	0.105		
	53AFSN																	-	5/8	3/16	-	0.217	0.110		
	53AFTN																	-	5/8	3/16	-	0.217	0.110		
	53AFFN																	-	5/8	3/16	-	0.217	0.110		

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01
	Steel	P	●	●	●	●	●	●	●	●			●	●		●		
	Stainless steel	M			●	●					●		●	●				
	Cast iron	K					●					●	●	●			●	●
	Non-ferrous metal	N													●			●
	Heat resistant alloy, Titanium alloy	S											●	●				
	Hardened steel	H											●	●				

Machining types

● Continuous cutting
● General cutting
✱ Interrupted cutting

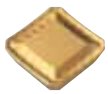
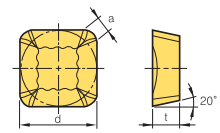
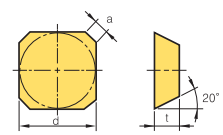
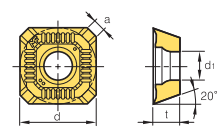
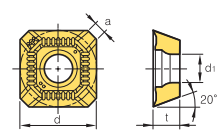
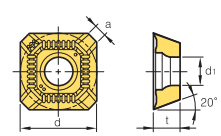
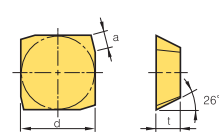
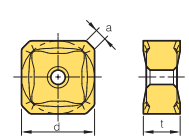
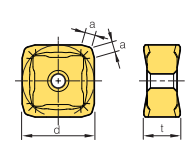
Inserts	Designation	Cermet		Coated											Uncoated			Dimensions (inch)						Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	l	d	t	r	d_1	a		
SECN	42AFFN															●	●	-	1/2	0.125	-	-	0.091	● Shape of Edge - S20: STS - RH: Strengthened Edge, STS	E44 E45
	42AFTN	●	●												●			-	1/2	0.125	-	-	0.091		
	42AFEN																	-	1/2	0.125	-	-	0.091		
	42AFSN			●	●													-	1/2	0.125	-	-	0.091		
	42AFEN-RH										●	●						-	1/2	0.125	-	-	0.091		
	42AFTN-RH																	-	1/2	0.125	-	-	0.091		
	42AFTN-S20									●								-	1/2	0.125	-	-	0.091		
	53AFFN															●		-	5/8	0.187	-	-	0.094		
	53AFTN		●															-	5/8	0.187	-	-	0.094		
	53AFEN																	-	5/8	0.187	-	-	0.094		
	53AFSN																	-	5/8	0.187	-	-	0.094		
	53AFEN-RH																	-	5/8	0.187	-	-	0.094		
	53AFSN-RH										●							-	5/8	0.187	-	-	0.094		
	53AFTN-S20																	-	5/8	0.187	-	-	0.094		
SEET-MA	32AGFN-MA													●			●	-	3/8	0.125	-	0.134	0.083		E187~ E192
	14M4AGFN-MA																●	-	0.551	0.157	-	0.173	0.096		
SEET-MF	32AGSN-MF									●	●	●	●					-	3/8	0.125	-	0.134	0.083		E187~ E192
	14M4AGSN-MF									●	●	●	●					-	0.551	0.157	-	0.173	0.096		
SEET-MM	32AGSN-MM										●	●	●					-	3/8	0.125	-	0.134	0.083		E187~ E192
	14M4AGSN-MM								●	●	●	●	●					-	0.551	0.157	-	0.173	0.096		
SEEW	32AGTN																	-	3/8	0.125	-	0.134	0.083		E187~ E192
	14M4AGTN		●															-	0.551	0.157	-	0.173	0.096		
SEEW-W	14M4AGFN-W																	-	0.551	0.717	-	0.157	0.173		E188
	14M4AGSN-W											●						-	0.551	0.717	-	0.157	0.173		E190
	14M4AGTN-W								●		●							-	0.551	0.717	-	0.157	0.173		E192
SEKN-SU	42AFSN-SU								●									-	1/2	1/8	-	0.097	-		E44 E45
	53AFSN-SU								●									-	5/8	3/16	-	0.097	-		
SEKR-MF1	42AFSN-MF1																	-	1/2	0.125	-	0.090	-		E44 E45

●: Korea Stock ●: US Stock

Workpiece																		
Steel	P	●	⬍	⬍	✱	●	✱	✱	⬍	⬍			✱	✱	⬍		
Stainless steel	M			⬍	✱						✱		✱	✱			
Cast iron	K					⬍						●	✱	✱		⬍	●
Non-ferrous metal	N																⬍
Heat resistant alloy, Titanium alloy	S												✱	✱			
Hardened steel	H												⬍	✱			

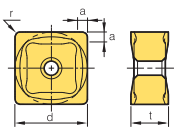
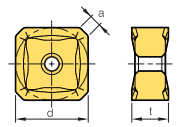
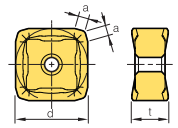
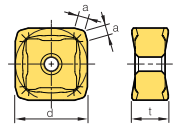
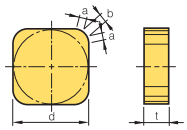
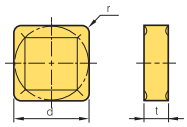
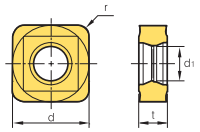
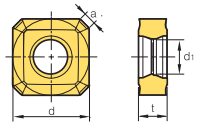
Machining types

● Continuous cutting
⬍ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet CN2000	Cermet CN30	Coated NCM325	Coated NCM335	Coated NC5330	Coated NC5340	Coated NC5350	Coated PC3500	Coated PC3600	Coated PC9530	Coated PC6510	Coated PC5300	Coated PC5400	Uncoated ST30A	Uncoated G10	Uncoated H01	Dimensions (inch) l	d	t	d1	a	Geometries	Available tools
SEKR-MX 	42AFSN-MX			●	●						●							-	1/2	0.125	-	0.090		E44
	43AFSN-MX			●					●		●							-	1/2	0.187	-	0.090		E45
	53AFSN-MX			●							●							-	5/8	0.187	-	0.094		
SEMN 	43AZ																	-	1/2	3/16	-	0.087		-
SEXT-MF 	32AGSN-MF									●		●	●	●				-	3/8	1/8	0.134	0.083		E187~
	14M4AGSN-MF									●		●	●	●				-	0.551	0.157	0.173	0.104		E192
SEXT-MM 	32AGSN-MM								●	●		●	●	●				-	3/8	1/8	0.134	0.083		E187~
	14M4AGSN-MM			●	●				●	●	●	●	●	●				-	0.551	0.157	0.173	0.104		E192
SEXT-MR 	32AGSN-MR																	-	3/8	1/8	0.134	0.083		E187~
	14M4AGSN-MR								●		●		●					-	0.551	0.157	0.173	0.104		E192
SFCN 	42EFR																●	-	1/2	1/8	-	0.098		E46
SNC(M)F-MF 	SNCF 1206ANN-MF																	-	1/2	17/64	-	0.079		E121
	1507ANN-MF											●						-	5/8	0.289	-	0.083		E122
	SNMF 1206ANN-MF																	-	1/2	17/64	-	0.079		
	1507ANN-MF																	-	5/8	0.289	-	0.083		
	SNCF 1206ENN-MF											●						-	1/2	17/64	-	0.079		E123
	1507ENN-MF											●						-	5/8	0.289	-	0.083		E124
	SNMF 1206ENN-MF								●									-	1/2	17/64	-	0.079		
	1507ENN-MF																	-	5/8	0.289	-	0.083		

●: Korea Stock ●: US Stock

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	◖◗ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

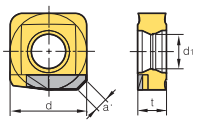
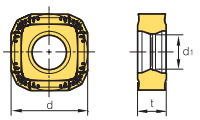
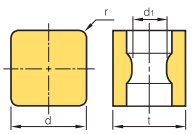
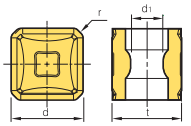
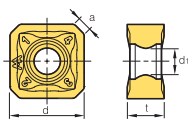
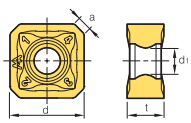
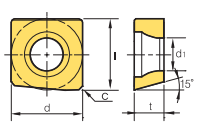
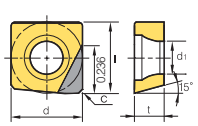
Inserts	Designation	Cermet		Coated										Uncoated		Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	l	d	t	r	d_1	a	b		
SNC(M)F-MF	SNCF 1206QNN-MF												●					-	1/2	33/128	0.039	-	0.039	-		E125
	SNMF 1206QNN-MF																	-	1/2	33/128	0.039	-	0.039	-		
SNC(M)F-MM	SNCF 1206ANN-MM																	-	1/2	33/128	-	-	0.07	-		E121 E122
	1507ANN-MM																	-	5/8	0.289	-	-	0.071	-		
	SNMF 1206ANN-MM																	-	1/2	33/128	-	-	0.07	-		
	1507ANN-MM																	-	5/8	0.289	-	-	0.071	-		
SNC(M)F-MM	SNCF 1206ENN-MM																	-	1/2	33/128	-	-	0.07	-		E123 E124
	1507ENN-MM																	-	5/8	0.289	-	-	0.07	-		
	SNMF 1206ENN-MM										●							-	1/2	33/128	-	-	0.07	-		
	1507ENN-MM																	-	5/8	0.289	-	-	0.07	-		
SNC(M)F-MM	SNCF 1206QNN-MM												●					-	1/2	33/128	0.031	-	0.039	-		E125
	SNMF 1206QNN-MM										●							-	1/2	33/128	0.031	-	0.039	-		
SNCN	43ENN			●												●		-	1/2	0.187	-	-	0.055	0.039		E47
	53ENN																	-	5/8	0.187	-	-	0.055	0.039		
SNEF	435												●					-	1/2	0.187	0.075	-	-	-		E332
	535																	-	5/8	0.187	0.075	-	-	-		
SNEU-MF	120420-MF												●					-	1/2	3/16	5/69	0.224	(0.091)	-		E334
SNEU-MF	1204ANN-MF																	-	1/2	3/16	-	0.224	(0.079)	-		E334

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01	DP150	DP200
	Steel	P	●	⬬	●	✖	✖	●	⬬	⬬	⬬			✖	✖			
	Stainless steel	M										✖		✖	✖			
	Cast iron	K			⬬			⬬	⬬				●	✖	✖	●		
	Non-ferrous metal	N														⬬	●	●
	Heat resistant alloy, Titanium alloy	S												✖	✖			
	Hardened steel	H						●	⬬					⬬	✖			

Machining types

● Continuous cutting
⬬ General cutting
✖ Interrupted cutting

Inserts	Designation	Cermet		Coated											Uncoated	PCD		Dimensions (inch)						Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01	DP150	DP200	l	d	t	r	d_1	a		
SNEU-TBW 	**1204-TBW**																	-	1/2	3/16	-	0.224	(0.083)		E334
SNEU-WMF 	**1204R-WMF**																	-	1/2	3/16	-	0.224	-		E334
SNEX 	**101010**											●						-	25/64	25/64	5/128	23/128	-		-
	1010ZNN											●						-	25/64	25/64	(5/128)	23/128	-		
SNEX-CU1 	**101010-CU1**											●						-	25/64	25/64	5/128	23/128	-		-
	1010ZNN-CU1											●						-	25/64	25/64	5/128	23/128	-		
	121212-CU1																	-	1/2	1/2	3/64	23/128	-		
	1212ZNN-CU1																	-	1/2	1/2	3/64	23/128	-		
SNEX-MA 	**1206ANN-MA**														●			-	1/2	1/4	-	0.177	0.093		E111~ E120
	1206ENN-MA											●			●			-	1/2	1/4	-	0.205	0.072		
	1206QNN-MA														●			-	1/2	1/4	-	0.205	0.055		
	120612-MA														●			-	1/2	1/4	0.047	0.205	-		
SNEX-ML 	**1206ANN-ML**												●	●				-	1/2	1/4	-	0.205	0.093		E111~ E120
	1206ENN-ML												●	●				-	1/2	1/4	-	0.205	0.717		
	1206QNN-ML												●	●				-	1/2	1/4	1/32	0.205	0.055		
	120612-ML												●	●				-	1/2	1/4	0.047	0.205	-		
	1507ANN-ML												●	●				-	5/8	1/4	-	0.220	0.124		
	1507ENN-ML												●	●				-	5/8	1/4	-	0.220	0.105		
SNEW 	**09T3ADFR**														●			3/8	3/8	5/32	-	0.173	-		E135 E136
SNEW-NAF 	**09T3ADTR-NAF**																●	3/8	3/8	5/32	-	0.173	-		E135 E136
	09T3ADTR-NAW																●	3/8	3/8	5/32	-	0.173	-		
	NAW: Wiper insert																								

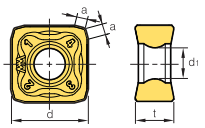
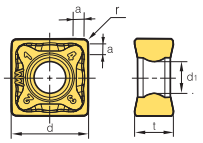
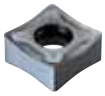
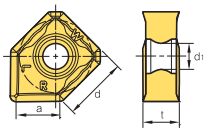
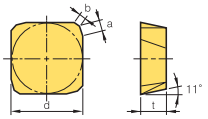
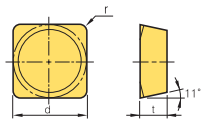
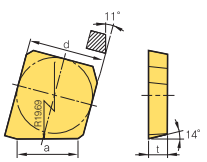
●: Korea Stock ●: US Stock

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	◖◗ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated										Uncoated	PCD		Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01	DP150	DP200	l	d	t	r	d_1	a	b		
SNEW-XAF	09T3ADTR-XAF																●	3/8	3/8	5/32	-	0.173	-	-		E135
	09T3ADTR-XAW																●	3/8	3/8	5/32	-	0.173	-	-		E136
	XAW: Wiper insert																									
SNHT-WX	1102308R/L-WX												●					-	0.433	0.090	-	0.157	-	-		E321
	110308R/L-WX												●					-	0.433	0.120	-	0.157	-	-		E322
	120308R/L-WX																	-	1/2	0.130	-	0.197	-	-		
	1203508R/L-WX												●					-	1/2	0.140	-	0.197	-	-		
	120408R/L-WX																	-	1/2	0.160	-	0.197	-	-		
	1204508R/L-WX												●					-	1/2	0.180	-	0.197	-	-		
	120508R/L-WX												●					-	1/2	0.196	-	0.197	-	-		
	1205408R/L-WX												●					-	1/2	0.215	-	0.197	-	-		
	120608R/L-WX																	-	1/2	0.236	-	0.197	-	-		
	1206508R/L-WX																	-	1/2	0.256	-	0.197	-	-		
	120708R/L-WX																	-	1/2	0.276	-	0.197	-	-		
	1207508R/L-WX																	-	1/2	0.295	-	0.197	-	-		
SNKN	1204ENN											●						-	1/2	3/16	-	-	0.055	0.039		E47
	1504ENN																	-	5/8	3/16	-	-	0.055	0.039		
SNM(E)X-MF	SNMX 1206ANN-MF								●	●		●	●	●				-	1/2	1/4	-	0.177	0.093	-		E111
	1507ANN-MF									●		●	●	●				-	5/8	5/16	-	0.220	0.124	-		E112
	SNEX 1206ANN-MF								●	●		●	●	●				-	1/2	1/4	-	0.177	0.093	-		E116
	1507ANN-MF											●	●	●				-	5/8	5/16	-	0.220	0.124	-		
SNM(E)X-MF	SNMX 1206ENN-MF								●	●		●	●	●				-	1/2	1/4	-	0.205	0.072	-		E111~
	1507ENN-MF									●		●	●	●				-	5/8	5/16	-	0.220	0.105	-		E114
	SNEX 1206ENN-MF											●	●	●				-	1/2	1/4	-	0.205	0.072	-		
	1507ENN-MF											●	●	●				-	5/8	5/16	-	0.220	0.105	-		
SNM(E)X-MF	SNMX 1206QNN-MF								●	●		●	●	●				-	1/2	1/4	1/32	0.177	0.093	-		E119
	120612-MF									●		●	●	●				-	1/2	1/4	0.047	0.177	-	-		E120
	SNEX 1206QNN-MF								●			●	●	●				-	1/2	1/4	1/32	0.177	0.093	-		
	120612-MF											●	●	●				-	1/2	1/4	0.047	0.177	-	-		
SNM(E)X-MM	SNMX 1206ANN-MM			●					●	●	●	●	●	●				-	1/2	1/4	-	0.177	0.093	-		E111~
	1507ANN-MM								●	●		●	●	●				-	5/8	5/16	-	0.220	0.124	-		E114
	SNEX 1206ANN-MM								●	●	●	●	●	●				-	1/2	1/4	-	0.177	0.093	-		
	1507ANN-MM											●	●	●				-	5/8	5/16	-	0.220	0.124	-		

●: Korea Stock ●: US Stock

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

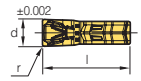
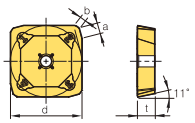
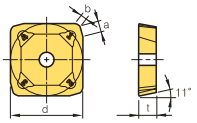
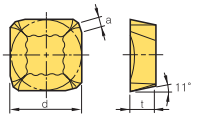
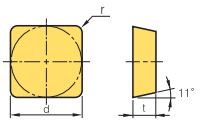
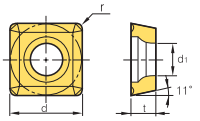
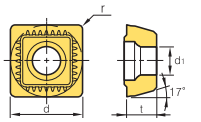
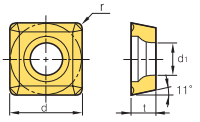
Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	a	b		
SNM(E)X-MM	SNMX 1206ENN-MM								●	●		●	●	●				-	1/2	1/4	-	0.205	0.072	-		E115~ E118
	1507ENN-MM									●		●	●	●				-	5/8	5/16	-	0.220	0.105	-		
	SNEX 1206ENN-MM									●		●	●	●				-	1/2	1/4	-	0.205	0.072	-		
	1507ENN-MM											●	●	●				-	5/8	5/16	-	0.220	0.105	-		
SNM(E)X-MM	SNMX 1206QNN-MM								●	●		●	●	●				-	1/2	1/4	1/32	0.177	0.093	-		E119 E120
	120612-MM								●	●		●	●	●				-	1/2	1/4	0.047	0.177	-	-		
	SNEX 1206QNN-MM											●	●	●				-	1/2	1/4	1/32	0.177	0.093	-		
	120612-MM											●						-	1/2	1/4	0.047	0.177	-	-		
SNEX-W	1206ANN-W								●			●	●					0.674	1/2	1/4	-	0.177	0.299	-		E111 E112
																										
SPCN	42EDR		●	●	●										●	●	●	-	1/2	1/8	-	-	0.055	0.039		E48 E49
	42EDR-RH																	-	1/2	1/8	-	-	0.055	0.039		
	42EDL														●			-	1/2	1/8	-	-	0.055	0.039		
	42EDR-G																●	-	1/2	1/8	-	-	0.055	0.039		
	42EDR-RN																	-	1/2	1/8			0.055	0.039		
	42EDER-RH											●	●					-	1/2	1/8	-	-	0.064	0.031		
	42EDSR-RH											●						-	1/2	1/8	-	-	0.064	0.031		
	42EDTR-RH								●									-	1/2	1/8	-	-	0.064	0.031		
	42EDR-S20										●							-	1/2	1/8	-	-	0.055	1.0		
	43EDR																	-	1/2	3/16	-	-	0.055	1.0		
	5312T																	-	5/8	3/16	0.047	-	-	-		
	53EDR		●	●											●	●		-	5/8	3/16	-	-	0.055	0.039		
	53EDR-RH																		5/8	3/16	-	-	0.055	0.039		
	53EDSR																	-	5/8	3/16	-	-	0.055	0.039		
	53EDL											●						-	5/8	3/16	-	-	0.055	0.039		
	53EDR-G																●	-	5/8	3/16	-	-	0.055	0.039		
	53EDR-RN	●																-	5/8	3/16	-	-	0.055	0.039		
	53EDER-RH											●	●					-	5/8	3/16	-	-	0.064	0.031		
	53EDSR-RH											●						-	5/8	3/16	-	-	0.064	0.031		
	53EDTR-RH								●									-	5/8	3/16	-	-	0.064	0.031		
	53EDR-S20										●							-	5/8	3/16	-	-	0.055	0.039		
																									SPCN5312T	
SPEN-WC	434-WC																	-	1/2	3/16	1/16	-	-	-		E333
	533-WC																	-	5/8	3/16	3/64	-	-	-		
	534-WC																	-	5/8	3/16	1/16	-	-	-		
	535-WC																	-	5/8	3/16	5/64	-	-	-		
	636-WC																	-	3/4	3/16	3/32	-	-	-		
SPEX	42EDR-1																	-	1/2	1/8	-	-	0.402	-		E48 E49
	42EDL-1																	-	1/2	1/8	-	-	0.402	-		
	53EDR-1																	-	5/8	3/16	-	-	0.402	-		
	53EDL-1																	-	5/8	3/16	-	-	0.402	-		
	63EDR-1																	-	3/4	3/16	-	-	0.402	-		
	63EDL-1																	-	3/4	3/16	-	-	0.402	-		

●: Korea Stock ●: US Stock

Workpiece		
Steel	P	
Stainless steel	M	
Cast iron	K	
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

Machining types

● Continuous cutting
◓ General cutting
✱ Interrupted cutting

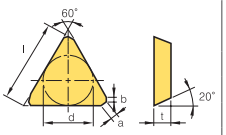
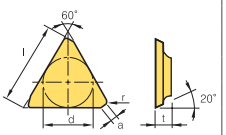
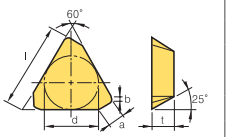
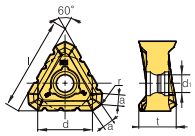
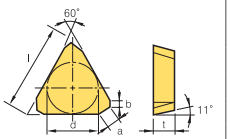
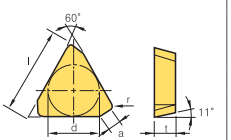
Inserts	Designation	Cermet		Coated											Uncoated		Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	ST30A	G10	l	d	t	r	d_1	a	b		
SPFN	200-N																	0.346	0.087	-	1/128	-	-	-		E318
	300-N																	0.386	0.118	-	1/128	-	-	-		
	400-N																	0.386	0.157	-	0.010	-	-	-		
SPKN-MU	42EDSR-MU											●						-	1/2	1/8	-	-	0.034	0.074		E48
	53EDSR-MU											●						-	5/8	3/4	-	-	0.033	0.076		E49
SPKN-SU	42EDSR-SU											●		●	●			1/2	1/2	1/8	-	-	0.065	0.036		E48
	42EDSL-SU											●						1/2	1/2	1/8	-	-	0.065	0.036		E49
	53EDSR-SU											●		●	●			5/8	5/8	3/16	-	-	0.064	0.037		
	53EDSL-SU											●						5/8	5/8	3/16	-	-	0.064	0.037		
SPKR-MX	42EDSR-MX			●	●						●							-	1/2	1/8	-	-	0.055	-		E48
	42EDSL-MX																	-	1/2	1/8	-	-	0.055	-		E49
	53EDR-MX			●														-	5/8	3/16	-	-	0.057	-		
	53EDSR-MX										●							-	5/8	3/16	-	-	0.057	-		
SPMN	422															●		-	1/2	0.125	1/32	-	-	-		E284
SPMT	221			●														-	1/4	0.125	1/64	0.110	-	-		E281 E278 E279
SPMT-KC	110408-KC										●					●	●	-	0.453	3/16	1/32	0.177	-	-		E284
SPMT-MM	432-MM										●			●				-	1/2	0.187	1/32	0.220	-	-		E281
	442-MMN																	-	1/2	7/32	1/32	0.220	-	-		E278 E279

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
	Steel	P	●	⧓	⧓	✱	●	✱	✱	⧓	⧓		✱	✱	✱	⧓		
	Stainless steel	M			⧓	✱						✱		✱	✱			
	Cast iron	K					⧓						●	✱	✱		⧓	●
	Non-ferrous metal	N																⧓
	Heat resistant alloy, Titanium alloy	S												✱	✱			
	Hardened steel	H												⧓	✱			

Machining types

● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (inch)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	a	b		
TEC(E)N 	TECN 22R																	55/128	1/4	0.125	-	-	0.039	0.020		E54
	22TR		●												●			55/128	1/4	0.125	1/32	-	0.020	-		
	32R															●		0.650	3/8	0.125	-	-	0.039	0.020		
	32R-G																	0.650	3/8	0.125	-	-	0.039	0.020		
	32TR		●		●										●			0.650	3/8	0.125	1/32	-	0.020	-		
	32TR-S20										●							0.650	3/8	0.125	1/32	-	0.020	-		
	43R-G																	55/64	1/2	0.187	-	-	0.075	0.020		
	43TR-Z																	55/64	1/2	0.187	1/32	-	0.059	-		
	43TR																	55/64	1/2	0.187	1/32	-	0.059	-		
TEEN 	32TR																	0.650	3/8	0.125	1/32	-	0.020	-	 ● Shape of Edge - G: Light side, Sharp edge - S20: STS - ZH: Hole added	
	43R-Z														●			55/64	1/2	0.187	-	-	0.075	0.020		
	43TR-Z									●	●							55/64	1/2	0.187	1/32	-	0.059	-		
	43TR-ZH															●		55/64	1/2	0.187	1/32	-	0.059	-		
	43R																●	55/64	1/2	0.187	-	-	0.075	0.020		
	43R-G	●	●	●	●							●			●			55/64	1/2	0.187	-	-	0.075	0.020		
	43TR										●							55/64	1/2	0.187	1/32	-	0.059	-		
	43TR-S20																	55/64	1/2	0.187	1/32	-	0.059	-		
TFCN 	42PFR															●		1/2	55/64	0.125	-	-	0.095	0.028		E50
	42PFL																	1/2	55/64	0.125	-	-	0.095	0.028		
TNMX 	2710AZNR-NM					●			●		●		●					1.063	5/8	0.394	1/32	0.220	0.104	-		E61~ E63
	2710AZNL-NM																	1.063	5/8	0.394	1/32	0.220	0.104	-		
	3012PNR-NM																	1.181	0.687	0.471	0.031	0.220	0.138	-		
TPCN 	22PPN		●												●	●		0.433	1/4	1/8	-	-	0.028	0.028	 	E51
	22PPTN																	0.433	1/4	1/8	-	-	0.028	0.028		
	32PDR			●														0.650	3/8	1/8	-	-	0.047	0.028		
	32PPN		●	●								●				●		0.650	3/8	1/8	-	-	0.047	0.047		
	32PPR		●	●											●	●	●	0.650	3/8	1/8	-	-	0.047	0.039		
	32PPR-RH																	0.650	3/8	1/8	-	-	0.047	0.039		
	32PPR-G																●	0.650	3/8	1/8	-	-	0.047	0.039		
	32PPSR																●	0.650	3/8	1/8	-	-	0.047	0.039		
	32PPTN																	0.650	3/8	1/8	-	-	0.047	0.047		
	32PPTR																	0.650	3/8	1/8	-	-	0.047	0.039		
	32PPTR-RH																	0.650	3/8	1/8	-	-	0.047	0.039		
	32PPR-RH																	0.650	3/8	1/8	-	-	0.047	0.039		
	32PDER-RH											●	●					0.650	3/8	1/8	1/32	-	0.059	-		
	32PDSR-RH											●						0.650	3/8	1/8	1/32	-	0.059	-		
	32PDR-S20										●							0.650	3/8	1/8	-	-	0.047	0.028		
	32PDR-RN																	0.650	3/8	1/8	-	-	0.059	0.039		
	43PDR		●	●											●	●		0.866	1/2	3/16	-	-	0.055	0.028		
	43PDR-RH																	0.866	1/2	3/16	-	-	0.055	0.028		
	43PDR-RN																	0.866	1/2	3/16	-	-	0.056	0.020		
	43PDR-G																●	0.866	1/2	3/16	-	-	0.055	0.028		
	43PDL														●			0.866	1/2	3/16	-	-	0.055	0.028		
	43PDSR				●													0.866	1/2	3/16	-	-	0.055	0.028		
	43PDTR																	0.866	1/2	3/16	-	-	0.055	0.028		
	43PPN																	0.866	1/2	3/16	-	-	0.047	0.047		
	43PPTN																	0.866	1/2	3/16	-	-	0.047	0.047		
	43PDER-RH																	0.866	1/2	3/16	1/32	-	0.071	-		
	43PDSR-RH											●	●					0.866	1/2	3/16	1/32	-	0.071	-		
	43PDR-S20											●						0.866	1/2	3/16	-	-	0.055	0.028		

●: Korea Stock ●: US Stock

Workpiece		
Steel	P	
Stainless steel	M	
Cast iron	K	
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

Machining types

- ● Continuous cutting
- ◓ General cutting
- ✱ Interrupted cutting

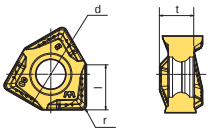
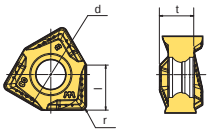
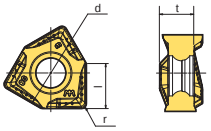
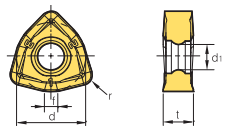
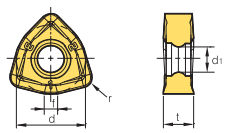
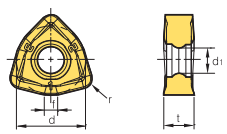
Inserts	Designation	Cermet		Coated												Uncoated	Dimensions (inch)								Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01	l	d	t	r	d_1	a	b	f		
TPKN-MU	43PDSR-MU											●						0.866	1/2	3/16	1/32	-	0.077	-			E51
TPKN-SU	32PDSL-SU																	0.650	3/8	1/8	0.039	-	0.067	-			E51
	32PDSR-SU											●						0.650	3/8	1/8	0.039	-	0.067	-			
	43PDSL-SU											●						0.866	1/2	3/16	0.039	-	0.075	-			
	43PDSR-SU											●			●	●		0.866	1/2	3/16	0.039	-	0.075	-			
TPKR-MX	32PDSN-MX																	0.650	3/8	1/8	-	-	0.047	0.047			E51
	32PDSR-MX												●					0.650	3/8	1/8	-	-	0.047	0.028			
	32PPR-MX			●														0.650	3/8	1/8	-	-	0.047	0.039			
	32PPSN-MX																	0.650	3/8	1/8	-	-	0.047	0.047			
	32PPSR-MX				●													0.650	3/8	1/8	-	-	0.047	0.039			
	43PDR-MX			●														0.866	1/2	3/16	0.039	-	0.055	-			
	43PDSR-MX			●	●													0.866	1/2	3/16	0.039	-	0.055	-			
	43PPR-MX																	0.866	1/2	3/16	0.039	-	0.055	-			
TWX-KC	16R-KC										●							0.650	3/8	5/32	1/32	0.175	-	-	-		E286
	22R-KC										●							0.866	1/2	3/16	1/32	0.175	-	-	-		
VCKT-MA	220530N-MA																●	0.614	1/2	0.219	0.118	0.220	-	-	-		E295 E296
VDKT-MA	11T210N-MA																●	0.438	1/4	0.113	0.047	0.110	-	-	-		E295
	11T220N-MA																	0.264	1/4	0.113	0.079	0.110	-	-	-		E296
WDKT-MH	080316ZDSR-MH								●	●	●	●	●	●	●	●		-	5/16	0.125	1/16	0.130	-	-	0.071		E249~ E255
	10T320ZDSR-MH								●	●	●	●	●	●	●	●		-	25/64	0.156	5/64	0.169	-	-	0.091		
	130520ZDSR-MH								●	●	●	●	●	●	●	●		-	17/32	0.219	5/64	0.219	-	-	0.122		
	150625ZDSR-MH										●	●	●	●	●	●		-	19/32	0.250	13/128	0.219	-	-	0.138		

●: Korea Stock ●: US Stock

Workpiece		
Steel	P	● ⬢ ● ✱ ✱ ● ⬢ ⬢ ⬢ ✱ ✱ ⬢
Stainless steel	M	✱ ✱ ✱ ⬢
Cast iron	K	⬢ ⬢ ⬢ ● ✱ ✱ ⬢ ●
Non-ferrous metal	N	● ⬢
Heat resistant alloy, Titanium alloy	S	✱ ✱
Hardened steel	H	⬢ ⬢ ✱ ✱

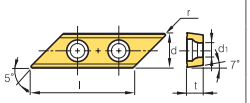
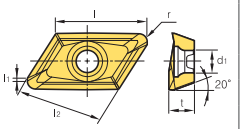
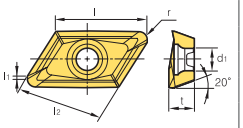
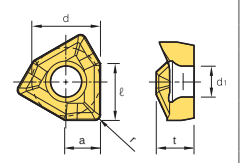
Machining types

● Continuous cutting
⬢ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated											Uncoated		Dimensions (inch)						Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	H01	l	d	t	r	d_1	f		
WNGX-MA	040304PNFR-MA																	0.169	0.276	0.136	0.016	-	-		E106~ E108
	040308PNFR-MA																	0.169	0.276	0.136	0.031	-	-		
	040312PNFR-MA																	0.169	0.276	0.136	0.047	-	-		
	040316PNFR-MA																	0.169	0.276	0.136	0.063	-	-		
	080604PNFR-MA																	0.323	0.512	0.252	0.016	-	-		
	080608PNFR-MA																●	0.323	0.512	0.252	0.031	-	-		
	080612PNFR-MA																	0.323	0.512	0.252	0.047	-	-		
	080616PNFR-MA																	0.323	0.512	0.252	0.063	-	-		
	080620PNFR-MA																	0.323	0.512	0.252	0.079	-	-		
WNGX-ML	040304PNER-ML																	0.169	0.276	0.136	0.016	-	-		E106~ E108
	040308PNER-ML																	0.169	0.276	0.136	0.031	-	-		
	040312PNER-ML																	0.169	0.276	0.136	0.047	-	-		
	040316PNER-ML																	0.169	0.276	0.136	0.063	-	-		
	080604PNER-ML									●			●	●				0.323	0.512	0.252	0.016	-	-		
	080608PNER-ML									●			●	●				0.323	0.512	0.252	0.031	-	-		
	080612PNER-ML																	0.323	0.512	0.252	0.047	-	-		
	080616PNER-ML																	0.323	0.512	0.252	0.063	-	-		
	080620PNER-ML																	0.323	0.512	0.252	0.079	-	-		
WNGX-MM	040304PNSR-MM																	0.169	0.276	0.136	0.016	-	-		E106~ E108
	040308PNSR-MM																	0.169	0.276	0.136	0.031	-	-		
	040312PNSR-MM																	0.169	0.276	0.136	0.047	-	-		
	040316PNSR-MM																	0.169	0.276	0.136	0.063	-	-		
	080604PNSR-MM																	0.323	0.512	0.252	0.016	-	-		
	080608PNSR-MM									●			●	●				0.323	0.512	0.252	0.031	-	-		
	080612PNSR-MM																	0.323	0.512	0.252	0.047	-	-		
	080616PNSR-MM																	0.323	0.512	0.252	0.063	-	-		
	080620PNSR-MM																	0.323	0.512	0.252	0.079	-	-		
WNMX-MF	060312ZNN-MF									●			●	●				-	0.250	0.125	0.047	0.113	0.047		E238~ E248
	09T316ZNN-MF									●			●	●				-	0.375	0.156	0.063	0.142	0.067		
	130520ZNN-MF									●			●	●				-	0.500	0.219	0.079	0.185	0.098		
	160720ZNN-MF									●			●	●				-	0.630	0.276	0.079	0.228	0.118		
WNMX-ML	060312ZNN-ML												●	●				-	0.250	0.125	0.047	0.113	0.047		E238~ E248
	09T316ZNN-ML												●	●				-	0.375	0.156	0.063	0.142	0.067		
	130520ZNN-ML												●	●				-	0.500	0.219	0.079	0.185	0.098		
	160720ZNN-ML												●					-	0.630	0.276	0.079	0.228	0.118		
WNMX-MM	060312ZNN-MM						●	●		●			●	●				-	0.250	0.125	0.047	0.113	0.047		E238~ E248
	09T316ZNN-MM						●	●	●	●	●		●	●				-	0.375	0.156	0.063	0.142	0.067		
	130520ZNN-MM						●	●	●	●	●		●	●				-	0.500	0.219	0.079	0.185	0.098		
	160720ZNN-MM									●			●	●				-	0.630	0.276	0.079	0.228	0.118		

●: Korea Stock ●: US Stock

Workpiece			Machining types
Steel	P	● ⧓ ● ✱ ✱ ● ⧓ ⧓ ⧓ ✱ ✱ ⧓	● Continuous cutting
Stainless steel	M	✱ ✱ ✱	⧓ General cutting
Cast iron	K	⧓ ⧓ ⧓ ⧓ ✱ ✱ ⧓ ●	✱ Interrupted cutting
Non-ferrous metal	N	● ⧓
Heat resistant alloy, Titanium alloy	S	✱ ✱
Hardened steel	H	● ⧓ ✱ ✱

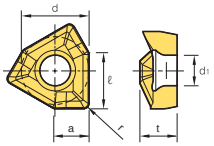
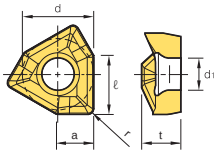
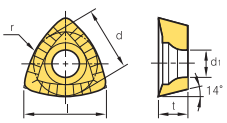
Inserts	Designation	Cermet		Coated											Uncoated			Dimensions (inch)								Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	l	l2	l1	d	t	r	d1	a		
XCET-KC	310404ER-KC								●						●	●		1.217	-	-	3/8	0.177	1/64	0.173	-		E285
XEKT-MA	19M504FR-MA													●		●		0.709	0.646	0.055	-	0.197	0.016	0.173	-		E298~ E302
	19M508FR-MA													●		●		0.709	0.646	0.039	-	0.197	0.031	0.173	-		
	19M512FR-MA													●		●		0.709	0.646	0.024	-	0.197	0.047	0.173	-		
	19M516FR-MA															●		0.689	0.646	0.020	-	0.197	0.063	0.173	-		
	19M518FR-MA																	0.689	0.646	0.020	-	0.197	0.071	0.173	-		
	19M520FR-MA													●		●		0.689	0.646	0.020	-	0.197	0.079	0.173	-		
	19M530FR-MA															●		0.669	0.646	0.028	-	0.197	0.118	0.173	-		
	19M532FR-MA													●		●		0.669	0.646	0.020	-	0.197	0.126	0.173	-		
	19M540FR-MA													●		●		0.650	0.646	0.020	-	0.197	0.157	0.173	-		
	19M550FR-MA													●		●		0.630	0.646	0.016	-	0.197	0.197	0.173	-		
	250604FR-MA															●		0.965	0.862	0.059	-	0.250	0.016	0.236	-		
	250608FR-MA															●		0.965	0.862	0.047	-	0.250	0.031	0.236	-		
	250612FR-MA															●		0.965	0.862	0.031	-	0.250	0.047	0.236	-		
	250616FR-MA																	0.965	0.862	0.016	-	0.250	0.063	0.236	-		
	250620FR-MA															●		0.945	0.862	0.020	-	0.250	0.079	0.236	-		
	250630FR-MA																	0.933	0.862	0.024	-	0.250	0.118	0.236	-		
	250632FR-MA															●		0.933	0.862	0.016	-	0.250	0.126	0.236	-		
	250640FR-MA																	0.898	0.862	0.047	-	0.250	0.157	0.236	-		
	250650FR-MA															●		0.894	0.862	0.016	-	0.250	0.197	0.236	-		
XEKT-ML	19M504ER-ML																	0.709	0.646	0.055	-	0.197	0.016	0.173	-		E298~ E302
	19M508ER-ML																	0.709	0.646	0.039	-	0.197	0.031	0.173	-		
	19M512ER-ML																	0.709	0.646	0.024	-	0.197	0.047	0.173	-		
	19M516ER-ML																	0.689	0.646	0.020	-	0.197	0.063	0.173	-		
	19M518ER-ML																	0.689	0.646	0.020	-	0.197	0.071	0.173	-		
	19M520ER-ML																	0.689	0.646	0.020	-	0.197	0.079	0.173	-		
	19M530ER-ML																	0.669	0.646	0.028	-	0.197	0.118	0.173	-		
	19M532ER-ML																	0.669	0.646	0.020	-	0.197	0.126	0.173	-		
	19M540ER-ML																	0.650	0.646	0.020	-	0.197	0.157	0.173	-		
	19M550ER-ML																	0.630	0.646	0.016	-	0.197	0.197	0.173	-		
	250604ER-ML																	0.965	0.862	0.059	-	0.250	0.016	0.236	-		
	250608ER-ML																	0.965	0.862	0.047	-	0.250	0.031	0.236	-		
	250612ER-ML																	0.965	0.862	0.031	-	0.250	0.047	0.236	-		
	250616ER-ML																	0.965	0.862	0.016	-	0.250	0.063	0.236	-		
	250620ER-ML																	0.945	0.862	0.020	-	0.250	0.079	0.236	-		
	250630ER-ML																	0.933	0.862	0.024	-	0.250	0.118	0.236	-		
	250632ER-ML																	0.933	0.862	0.016	-	0.250	0.126	0.236	-		
	250640ER-ML																	0.898	0.862	0.047	-	0.250	0.157	0.236	-		
	250650ER-ML																	0.894	0.862	0.016	-	0.250	0.197	0.236	-		
XNCT-MA	080504PNFR-MA															●		0.323	-	-	0.394	0.217	0.016	0.177	0.114		E86~ E89
	080508PNFR-MA															●		0.323	-	-	0.394	0.217	0.031	0.177	0.114		
	080512PNFR-MA															●		0.323	-	-	0.394	0.217	0.047	0.177	0.114		
	080520PNFR-MA															●		0.323	-	-	0.394	0.217	0.079	0.177	0.114		
	120608PNFR-MA															●		0.472	-	-	0.512	0.256	0.031	0.217	0.138		

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
	Steel	P	●	⧓	●	✱	✱	●	⧓	⧓	⧓		✱	✱		⧓		
	Stainless steel	M										✱	✱	✱				
	Cast iron	K			⧓			⧓	⧓			●	✱	✱		⧓	●	●
	Non-ferrous metal	N																⧓
	Heat resistant alloy, Titanium alloy	S											✱	✱				
	Hardened steel	H						●	⧓				⧓	✱	✱			

Machining types

● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

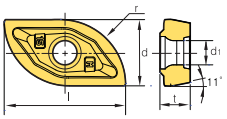
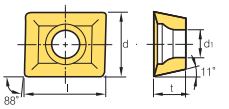
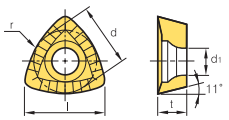
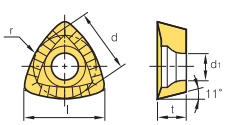
Inserts	Designation	Cermet		Coated												Uncoated			Dimensions (inch)						Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	a		
XNKT-ML 	060405PNER-ML							●		●		●	●	●				0.224	0.256	0.157	0.020	0.134	0.071		E85~ E89
	060408PNER-ML									●		●	●	●				0.224	0.256	0.157	0.031	0.134	0.071		
	080504PNER-ML									●			●	●				0.323	0.394	0.217	0.016	0.177	0.114		
	080508PNER-ML							●		●		●	●	●				0.323	0.394	0.217	0.031	0.177	0.114		
	080512PNER-ML									●		●	●	●				0.323	0.394	0.217	0.047	0.177	0.114		
	080516PNER-ML									●		●	●	●				0.323	0.394	0.217	0.063	0.177	0.114		
	080520PNER-ML												●	●				0.323	0.394	0.217	0.079	0.177	0.114		
	120608PNER-ML									●		●	●	●				0.472	0.512	0.256	0.031	0.217	0.138		
	120612PNER-ML												●	●				0.472	0.512	0.256	0.047	0.217	0.138		
	120616PNER-ML												●	●				0.472	0.512	0.256	0.063	0.217	0.138		
	120620PNER-ML												●	●				0.472	0.512	0.256	0.079	0.217	0.138		
XNKT-MM 	060405PNSR-MM						●	●		●		●	●	●				0.224	0.256	0.157	0.020	0.134	0.071		E85~ E89
	060408PNSR-MM						●	●		●		●	●	●				0.224	0.256	0.157	0.031	0.134	0.071		
	080504PNSR-MM									●			●	●				0.323	0.394	0.217	0.016	0.177	0.114		
	080508PNSR-MM						●	●		●		●	●	●				0.323	0.394	0.217	0.031	0.177	0.114		
	080512PNSR-MM						●	●		●		●	●	●				0.323	0.394	0.217	0.047	0.177	0.114		
	080516PNSR-MM						●	●		●			●	●				0.323	0.394	0.217	0.063	0.177	0.114		
	080520PNSR-MM						●	●		●		●	●	●				0.323	0.394	0.217	0.079	0.177	0.114		
	120604PNSR-MM												●	●				0.472	0.512	0.256	0.016	0.217	0.138		
	120608PNSR-MM						●	●		●		●	●	●				0.472	0.512	0.256	0.031	0.217	0.138		
	120612PNSR-MM						●	●		●		●	●	●				0.472	0.512	0.256	0.047	0.217	0.138		
	120616PNSR-MM						●	●					●	●				0.472	0.512	0.256	0.063	0.217	0.138		
	120620PNSR-MM						●	●					●	●				0.472	0.512	0.256	0.079	0.217	0.138		
ZDMT-R-MM 	080310R-MM								●				●					21/64	0.265	0.126	0.394	0.110	-		E304
	110312.5R-MM								●				●					27/64	0.334	0.144	0.492	0.110	-		
	130416R-MM								●				●					33/64	0.413	0.187	0.630	0.173	-		

●: Korea Stock ●: US Stock

Workpiece			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
	Steel	P	●	◓	●	✱	✱	●	◓	◓	◓			✱	✱	◓		
	Stainless steel	M										✱		✱	✱			
	Cast iron	K			◓			◓	◓				●	✱	✱		◓	●
	Non-ferrous metal	N																◓
	Heat resistant alloy, Titanium alloy	S												✱	✱			
	Hardened steel	H						●	◓					◓	✱			

Machining types

● Continuous cutting
◓ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (inch)					Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1		
ZPET-MM Internal	080M-MM																	0.630	0.315	0.138	0.315	0.114		E277
	090M-MM																	0.697	0.284	0.169	0.354	0.134		E278
	100M-MM							●	●				●					0.748	0.409	0.177	0.394	0.134		
	110M-MM																	0.874	0.433	0.189	0.433	0.177		
	125M-MM							●	●				●					0.945	0.508	0.209	0.492	0.177		
	130M-MM																	1.012	0.512	0.209	0.512	0.177		
	140M-MM																	1.071	0.551	0.248	0.551	0.221		
	150M-MM												●					1.102	0.606	0.276	0.591	0.220		
	160M-MM							●	●				●					1.122	0.646	0.276	0.630	0.220		
	200M-MM								●									1.496	0.815	0.315	0.787	0.260		
	250M-MM																	1.890	1.020	0.374	0.984	0.339		
ZPET-MM External	080S-MM																	0.591	0.260	0.315	0.315	0.114		
	090S-MM																	0.610	0.291	0.146	0.354	0.134		
	100S-MM							●	●				●					0.610	0.331	0.394	0.394	0.134		
	110S-MM																	0.713	0.354	0.173	0.433	0.177		
	125S-MM							●	●				●					0.807	0.421	0.492	0.492	0.177		
	130S-MM																	0.874	0.433	0.173	0.519	0.177		
	140S-MM																	0.949	0.433	0.224	0.551	0.221		
	150S-MM								●				●					0.984	0.488	0.591	0.591	0.220		
	160S-MM							●	●				●					1.024	0.528	0.630	0.630	0.220		
	200S-MM								●									1.260	0.657	0.787	0.787	0.260		
	250S-MM																	1.575	0.815	0.984	0.984	0.339		
ZPMT-MM	1504PPSR-MM								●				●					5/8	1/2	0.187	-	0.220		E281
	1505PPSR-MMN																	5/8	1/2	0.227	-	0.220		
ZPMT-R-MM	160520R-MM								●				●					81/128	1/2	0.219	0.787	0.220		E279
	160525R-MM								●				●					81/128	1/2	0.219	0.984	0.220		
	160531.5R-MM												●					11/16	1/2	0.219	1.240	0.220		
ZPMT-R-MR	160525R-MR																	11/16	1/2	0.219	0.984	0.220		E279

●: Korea Stock ●: US Stock

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Mill-max	ADNA 4000/5000+		45°	Ø3~Ø12	Excellent cutting-edge strength and chip flow	●					E42 E43
		AEA 4000/5000		45°	Ø3~Ø12	Low cutting load and good machinability	●					E44 E45
		EFA 4000	Al 	15°	Ø3~Ø12	High rake angle to prevents welding	●					E46
		ENA 4000		15°	Ø3~Ø12	Economical because double sided inserts applied	●					E47
		EPNA 4000/5000+		15°	Ø3~Ø12	Double posi rake angle and low cutting force	●					E48 E49
		PFA 4000	Al 	0°	Ø3~Ø12	High rake angle and good machinability	●	●	●			E50
		PPNA 4000		0°	Ø3~Ø12	Double posi rake angle and low cutting force	●	●	●			E51
	Turbo Mill	ADSA 4000/5000		45°	Ø0.75~Ø2.5	Anti-vibration	●					E52 E53
		PESA 2000/3000/ 4000		0°	Ø2~Ø2.5	High rake angle, Cutting efficiency	●	●	●			E54
	Double Mill	AFOA4000		45°	Ø3~Ø5	High rake angle low cutting force Economical (8 corners available)	●					E55 E56
		AFOA5000			Ø3~Ø12							
	Power Buster	PBACA5000		45°	Ø3~Ø12	Double-sided Insert High depth High Feed Roughing	●					E61
		PBZCA5000		10°	Ø3~Ø12		●					E62
		PBPCMA6000 new		0°	Ø3~Ø12		●	●				E63

Al Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Aero Mill	APDA A type, B type	Al 	0°	Ø3~Ø12	Aluminum cutter body suitable for high speed machining, Both cemented carbides and PCD inserts are available, G2.5 balance possible	●					E132
	Aero Mill Plus	APDA-PB	Al 	0°	Ø3~Ø12	Prevent overload to the spindle bearings through weight reduction of the Al alloy body and enable high-speed processing	●					E133 E134
	Aero Mill Mini	MAPDSA	Al 	0°	Ø1.25~Ø1.5	Available with small Machining center-Carbide, PCD insert Application-Balancing class G2.5	●					E135
		MAPDA	Al 	0°	Ø1.5~Ø2.5		●					E136
	Rich Mill	RM8ACA4000 RMH8ACA4000		45°	Ø2~Ø15	8 corners available Double-sided insert for steel, cast iron, stainless steel, aluminum	●					E111 E112 E113 E114
		RM8ACA5000 RMH8ACA5000			Ø3~Ø15		●					
		RM8ECA4000 RMH8ECA4000		15°	Ø2~Ø15	8 corners available Double-sided insert for steel, cast iron	●					E115 E116 E117 E118
		RM8ECA5000 RM8HECA5000			Ø3~Ø15		●					
		RM8QCA4000 RMH8QCA4000		2°	Ø2.5~Ø8	8 corners available Reduced cutting interruption at cast Iron	●					E119 E120
		RMT8AA 4000/5000		45°	Ø3~Ø12	Easy insert change and good machinability due to latch clamping system 8 corners available Excellent surface finish	●					E121 E122
		RMT8EA 4000/5000		15°	Ø3~Ø12		●					E123 E124
		RMT8QA		2°	Ø3~Ø12		●					E125
		RM16ACA 6000/8000		45°	Ø2.5~Ø15	16 corners available. Wiper inserts can be applied for good surface finish Strong insert and powerful clamping	●					E126 E127
Cutters for molds	Rich Mill	RM3PCA3000 new		0°	Ø1.5~Ø3	Perfect perpendicularity Strong clamping	●	●	●		●	E85 E86 E87
		RM3PCA4000 new			Ø1.5~Ø5							
		RM3PCA5000 new			Ø3~Ø5							

Al Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Rich Mill	RM4PCA3000		0°	Ø1.5~Ø4	4corners available. High rake angle insert reduces cutting force. Excellent insert rigidity	●	●	●		●	E91 E92
		RM4PCA4000			Ø2~Ø6							
		RM4ZCA3000		0°	Ø1.5~Ø2	In vertical machining, the maximum cutting depth for RM4Z3000: 9.00 mm, RM4Z4000: 14.0 mm	●	●	●		●	E104
		RM4ZCA4000			Ø2.5~Ø4							
		RM6PCA new		0°	Ø1.5~Ø5	Improved productivity and high-quality shouldering through high speed and high feed machining	●	●	●		●	E106 ~E108
	Alpha Mill	AMCA 1000S/1500S/ 2000S		0°	Ø1.5~Ø4	3-dimensional shape and high rake angle lowers cutting load and ensures better chip evacuation Inner coolant system for better chip control increases tool life Wide size range of inserts enlarges application range. Various types of Alpha Mills available for high depth of cut and high feed machining	●	●	●	●	●	E143 ~E145
		AMCA 3000S/3000S-K/ 4000S		0°	Ø1.5~Ø5		●	●	●	●	●	E146 ~E148
		AMCA 1000SE 2000SE 3000SE		15°	Ø1.5~Ø4		●					E149 E150
		AMCA 2000M 3000M 4000M		0°	Ø2~Ø5		●	●	●	●	●	E151 E152 E153
	Future Mill	FMACA3000		45°	Ø2~Ø5	Accurate inserts and cutter, Excellent chip flow	●					E187 E188
		FMACA4000			Ø2~Ø8							
		FMACA3000A		45°	Ø2.5~Ø5	Excellent in high speed cutting and tapping center, low power machine due to light aluminum body	●					E189 E190
		FMACA4000A			Ø2.5~Ø12							
		FMPCA3000		0°	Ø2~Ø4	4 corners available various inserts can be applied to machine for different types of workpiece	●	●	●			E193 E194
		FMPCA4000			Ø2.5~Ø5							
		FMPCA3000A		0°	Ø2.5~Ø4	Excellent in high speed cutting and tapping center, low power machine due to light aluminum body	●	●	●			E195 E196
		FMPCA4000A			Ø2.5~Ø12							
		FMRCA3000		-	Ø1.5~Ø4	4~8 corners available Double contact faces between insert & seat part of cutter for stable clamping Excellent rotating-free machining	●				●	E199 E200
		FMRCA4000			Ø2~Ø5							
		FMRCA5000		-	Ø2~Ø5		●				●	E201 E202
		FMRCA6000			Ø2.5~Ø6							

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Future Mill P-positive	FMRCA 3000 4000 5000 6000 (new)		-	Ø1.5~Ø8	Stable clamping system enables stable machining and productivity Varied product line-up ensures wide application range Optimal shape and grade with high hardness for hard-to-cut material machining.	●				●	E213 ~E216
	HRM	HRMCA13		75°	Ø2~Ø3	Powerful clamping by double clamping system 3 corners available high feed cutting with low cutting load	●	●	●	●	●	E249 E250
		HRMCA15			Ø2.5~Ø6							
	HRMD	HRMDCA09		76°	Ø1.5~Ø4	Double side insert with 6 corner High feed cutting with strong simple screw-on clamp	●	●	●	●	●	E238 ~E240
		HRMDCA13			Ø2~Ø5							
		HRMDCA16 (new)			Ø3~Ø12							
	Tangen-Pro	TP2PCA (new)		0°	Ø1.5~Ø5	High-quality results available even under harsh cutting conditions, thanks to the stable clamping force	●	●	●			E259
Cutters for aluminum	Pro-A Mill	PACA 2000/4000	Al 	0°	Ø1.5~Ø4	Buffed insert controls chip flow without built-up edge	●	●	●	●	●	E295
	Pro-X Mill	PAXCA5000	Al 	0°	Ø1.5~Ø5	Powerful clamping Excellent body rigidity for rectangular and curve machining	●	●	●	●	●	E298 E299
		PAXCA6000			Ø2~Ø5							
	Pro-L Mill	PALCA	Al 	0°	Ø2.5	High helix and high depth of cut High perpendicularity Low cutting load	●	●	●	●	●	E303

Al Cutter for Aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
High feed cutter for cast iron	High feed cutter	PNHA 4000/5000		0°	Ø5~Ø18	Wiper insert available Double negative rake angle Excellent surface finish	●					E332
		PPHA 4000		0°	Ø5~Ø18	Square insert and wiper insert available Excellent surface finish	●					E333
	Shave Mill	SVMA4000		0°	Ø3~Ø12	Exclusive adjusting device of cutting-edge adjusts run-out easily.	●					E334
	Shave Mill Ultra	SVUA6000		0°	Ø3~Ø12	Good rigidity and economical due to Screw on Simple type	●					E335
		SVUA6000-B		0°	Ø3~Ø12	Easy to handle the run-out due to Korloy exclusive high toughness cutting-edge special parts	●					E336
Indexable side cutter	Tangential type / Full-side cutter	TAFCPA		-	Ø4~Ø12	Various cutting depth can be possible because of adjustable length control. Medium to Roughing based on strengthened edge		●	●			E312
		TAFCBA		-	Ø4~Ø12		●	●	●			E312
	Tangential type / Half-side cutter	TAHCPA		-	Ø4~Ø12			●	●			E313
		TAHCBA		-	Ø4~Ø12		●	●	●			E313

Type	Cutter		Designation	Shape	A.A	Diameter range	Features	Application					Page
								Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Indexable side cutter	Radial type	Full-side cutter	RAFCPA		-	Ø4~Ø12	Wide range of machining width with only one side cutter due to adjustable cutting-edge height Suitable for medium and finishing in narrow width side cutting due to good chip evacuation by 3-dimensional chip breaker		●	●			E314
			RAFCBA		-	Ø4~Ø12		●	●	●			E314
		Half-side cutter	RAHCPA		-	Ø4~Ø12			●	●			E315
			RAHCBA		-	Ø4~Ø12		●	●	●			E315
Side cutter	-		SPPA		-	Ø3~Ø8	Economical by using pentagonal insert Suitable for narrow & deep grooving			●			E316
			SPBA		-	Ø3~Ø8	Economical by using pentagonal insert Suitable for narrow & deep grooving			●			E317
			SPSA		-	Ø2~Ø8	For narrow and deep width grooving			●			E318
	Full-side cutter		RM4PFCBA		-	Ø3~Ø6	4 corner usage with double-sided insert can be economical			●			E93 E94
			RM4PFCPA		-	Ø3~Ø6				●			E97 E98
	Half-side cutter		RM4PHCBA		-	Ø3~Ø6	4 corner usage with double-sided insert can be economical			●			E95 E96
			RM4PHCPA		-	Ø3~Ø6				●			E99 E100
	Wind Mill		WFSBA		-	Ø3~Ø8	The nose R shape of insert ensures long tool life. Wide applications with various widths and corner R sizes.	●	●	●			E321
			WFSPA		-	Ø3~Ø8			●	●			E322

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Turbo Mill	ADSA 4000/5000		45°	Ø2~Ø2.5	Uneven insert spacing prevents chattering	●					E52 E53
		PESA 2000/3000/4000		0°	Ø0.75~Ø2.5	Good machinability due to the high rake angle	●	●	●			E54
Cutters for molds	Rich Mill	RM3PSA3000 new		0°	Ø0.75~Ø1.5	Perfect perpendicularity Strong clamping	●	●	●		●	E88 E89
		RM3PSA4000 new			Ø1.25~Ø2.5							
		RM4PSA3000		0°	Ø0.562~Ø2	4 corners available High rake angle insert reduces cutting force Excellent insert rigidity	●	●	●		●	E101
		RM4PSA4000			Ø1.25~Ø2.5		●	●	●		●	E102
		RM4ZSA3000		0°	Ø1~Ø1.5	In vertical machining, the maximum cutting width: 9.0 mm	●	●	●		●	E105
		RM6PSA new		0°	Ø0.75~Ø2	Improved productivity and high-quality shouldering through high speed and high feed machining	●	●	●		●	E108 E109
	Alpha Mill	AMSA 1000S/1500S 2000S/3000S 3000S-K/4000S		0°	Ø0.438~Ø2.5	The combination of a 3-dimensional curve design & high rake angle helps chip-evacuation effectively with a low cutting forcel Inner coolant system The various range of inserts can provide the widened choice High depth and high feed can be available during operation	●	●	●	●	●	E154 ~E161
		AMSA 1000SE/2000SE 3000SE		15°	Ø1~Ø2.5		●					E162 E163
		AMSA 1000M/1500M 2000M/4000M		0°	Ø0.625~Ø2		●	●	●	●	●	E164 ~E166
		AMSA 1000MH/1500MH 2000MH/3000MH		0°	Ø0.562~Ø1.5		●	●	●	●	●	E167 E168
	Future Mill	FMASA3000		45°	Ø1~Ø2.5	For precision machining Excellent chip evacuation	●					E191 E192
		FMASA4000			Ø2~Ø2.5							
		FMPSA3000		0°	Ø1~Ø2.5	4 corners available Strong cutting-edge with low cutting load	●					E197 E198
		FMPSA4000			Ø1.5~Ø2.5							
		FMRSA 1000/1500/2000 2500/3000/4000 5000/6000		-	Ø0.312~Ø2.5	2 touch clamping system, convenient insert change	●	●	●	●	●	E203 ~208

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Future Mill P-positive	FMRSA 2500/3000 4000/5000 6000 new		-	Ø0.688~Ø2	P-positive relief angle ensures high rigidity and high machinability in die steel and high-resistant alloy machining Flat clearance face of insert prevents interference and revolution while machining	●	●	●	●	●	E217 ~E220
	HFM	HFMSA 1000 new		-	Ø0.313~Ø0.813	Apply helix cutting-edge on insert, low cutting load and reinforce toughness on corner Increased rigidity with double relief angle (11, 13), prevent interference with high feed To apply the negative axial rake angle when set up the holder, increased chipping resistance	●	●	●	●	●	E230 ~E231
	HRM	HRMSA 08/10/13/15		75°	Ø0.75~Ø2.5	Powerful clamping by double clamping system 3 corners available High feed cutting with low cutting load	●	●	●	●	●	E251 ~E253
	HRMD	HRMDSA 06 new 09/13		76°	Ø0.68~Ø2.5	6 corners available, High feed, multi-function, Only one screw application	●	●	●	●	●	E241 ~E244
	Tangen-Pro	TP2PSA new		0°	Ø1.5~Ø2	High-quality results available even under harsh cutting conditions, thanks to the stable clamping force	●	●	●			E260
	Tank Mill	THEA		0°	Ø0.984~Ø1.968	Right-hand helix angle employed for good chip evacuation. Special surface treatment prevents body breaking and improves rigidity. Strong cutting-edge	●	●				E281
	Laser Mill	LBEA□□ LREA□□		-	Ø0.312~Ø1.5	Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available	●	●	●	●		E270 ~E274
		LBEA□□-C LREA□□-C		-	Ø0.312~Ø1.5	Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available Carbide shank	●	●	●			E270 ~E274
	Mach Mill	BFEA		-	Ø0.625~Ø1.25	Upgraded cutting performance with S type curve design V clamping application	●	●	●	●		E275
		GBEA GBEA-M		-	Ø0.63~Ø1.969	Helical design of edge can reduce the force during operation. Safe application to prevent rotation guarantee the increased tool life	●	●	●	●		E276
		BREA		-	Ø0.787~Ø2.48	Flute type chip-pocket can make chip-evacuation Customized edge design can prevent the breakage of holder's body	●	●	●	●		E279

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Chamfer Tool	CEA		15°	Ø1~Ø1.217	For Back & Front high quality chamfering and various Chamfering angle machining	●					E284
				30°	Ø1~Ø1.413							
				45°	Ø0.281~Ø1.587							
				60°	Ø1~Ø1.72							
				60°	Ø0.203~Ø1.384	Various chamfer Degrees available Effective long chamfer cutting available	●	●	●			E285
				45°	Ø0.203~Ø1.896							
				30°	Ø0.203~Ø2.278							
				45°	Ø0.87~Ø1.14	Center Ring, Grooving, Chamfer Ring	●	●	●		●	E286
	T-Cutter	TFEA		0°	Ø0.83~Ø1.97	For slotting	●	●	●	●	●	E287
Cutters for aluminum	Pro-A Mill	PASA 2000/4000		0°	Ø0.5~Ø1.5 Ø1.25~Ø1.5	Polished face increases chip flow and reduces built-up edge	●	●	●	●	●	E296
	Pro-X Mill	PAXSA 5000/6000		0°	Ø0.75~Ø1.5 Ø1.25~Ø1.5	Square shoulder and corner machining	●	●	●	●	●	E300 E301
	Pro-L Mill	PALSA-HR (Single-edge)		0°	Ø1.25~Ø2.5	High helix and high depth of cut High perpendicularity Low cutting load	●	●	●	●	●	E304 E305
		PALSA-HM (Multi-edge)			Ø2.5		●	●	●	●	●	E306
	Pro-XL Mill	PXLSA		0°	Ø1.5~Ø3	Improved surface finish and perpendicularity achieved by a single pass with the deep cutting-edges	●	●				E307
Thread milling	-	TM		-	Ø1.5~Ø2	For internal and external threading	●					D49

Al Cutter for Aluminum

FMRMA type
E209~212
E221~224



LBEA-MHD type
E274



PAMA type
E297



PAXMA type
E302



AMMA type
E169~171



RM3PMA type
E90



RM4PMA type
E103



RM4ZMA type
E105



RM6PMA type
E110



HFMMA type
E232



HRMMA type
E254, 255



HRMDMA type
E246~248



GBEMA type
E278





Steel Shank type
E308



Carbide Shank type
E309

ADNA4000



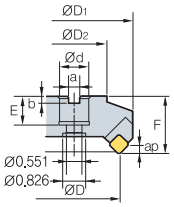


Fig. 1

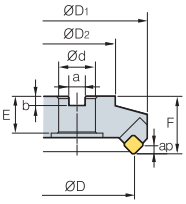


Fig. 2

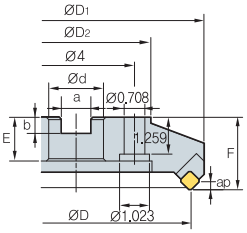


Fig. 3

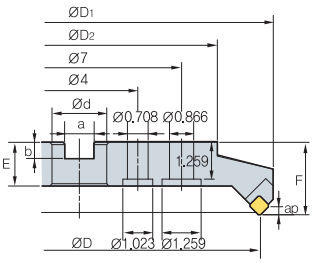


Fig. 4



AA
45°

- AR: 15°
- RR: -4°

(inch)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
ADNA	4300R/L	4	3	3.98	2.205	1	0.375	0.248	0.866	2.0	0.24	4.2	1
	4400R/L	5	4	4.98	2.874	1 1/4	0.500	0.319	0.866	2.0	0.24	5.5	2
	4500R/L	6	5	5.94	3.389	1 1/2	0.625	0.394	1.181	2.5	0.24	9.5	2
	4600R/L	8	6	6.91	4.882	2	0.750	0.433	1.181	2.5	0.24	14.1	2
	4800R/L	10	8	8.91	5.118	2 1/2	1.000	0.551	1.496	2.5	0.24	19.1	3
	41000R/L	12	10	10.91	7.087	2 1/2	1.000	0.551	1.496	2.5	0.24	30.8	3
	41200R/L	14	12	12.91	9.449	2 1/2	1.000	0.551	1.496	2.5	0.24	46.2	4

Available Inserts

SDCN SDKN-MU SDKN-SU SDKR-MX

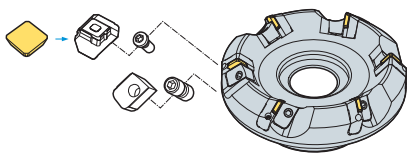


Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	42M															●		E17
	42M-G																●	
	42MT	●	●		●										●			
	42MT-RH																	
	42MT-S20										●							
	42AEEN																	
	42AEEN-RH																	
	42AESN																	
	42AESN-RH																	
SDKN	42AESN-MU									●								E18
	42AESN-SU									●			●	●				
SDKR	42AESN-MX																	E18
	42AETN-MX																	
	42AEN-MX			●														

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LADN4R/L	WEPN4R/L	DHA0821F	LTX0514	HW40

Available Inserts **E17, E18**

ADNA5000+



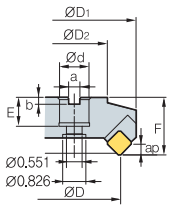


Fig. 1

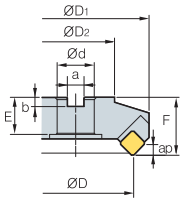


Fig. 2

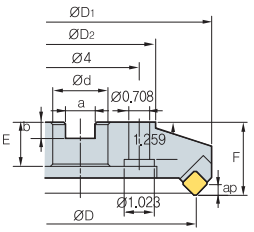


Fig. 3

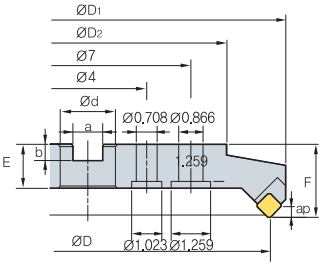


Fig. 4



AA
45°

- AR: 15°
- RR: -4°

(inch)

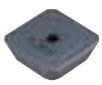
Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
ADNA	5300R/L+	4	3	4.07	2.205	1	0.374	0.248	0.866	2.0	0.32	4.4	1
	5400R/L+	5	4	5.02	2.874	1 1/4	0.500	0.319	0.866	2.0	0.32	5.9	2
	5500R/L+	6	5	5.98	3.389	1 1/2	0.625	0.394	1.181	2.5	0.32	9.5	2
	5600R/L+	8	6	6.98	4.882	2	0.750	0.433	1.181	2.5	0.32	14.3	2
	5800R/L+	10	8	8.98	5.118	2 1/2	1.000	0.551	1.496	2.5	0.32	20.0	3
	51000R/L+	12	10	10.98	7.087	2 1/2	1.000	0.551	1.496	2.5	0.32	31.9	3
	51200R/L+	14	12	12.98	9.449	2 1/2	1.000	0.551	1.496	2.5	0.32	46.2	4

Available Inserts

SDCN



SDKN-MU



SDKN-SU



SDKR-MX

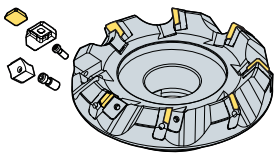


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	53M														●			E17
	53M-G																●	
	53MT		●	●											●			
	53MT-RH								●									
	53MT-S20										●							
	53AEEN																	
	53AEEN-RH											●	●					
	53AESN																	
	53AESN-RH										●	●						
SDKN	53AESN-MU									●								E18
	53AESN-SU									●			●	●				
SDKR	53AESN-MX				●													E18
	53AETN-MX																	
	53AEN-MX			●														

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LADN5R/L	WHPS5R/L	WHX0817 WHX0813*	LTX0514	HW40

Available Inserts **E17, E18**

*: Ø80

AEA4000



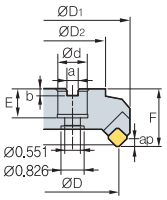


Fig. 1

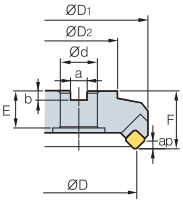


Fig. 2

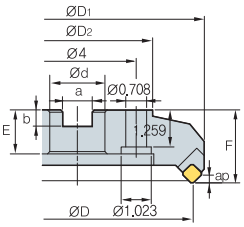


Fig. 3

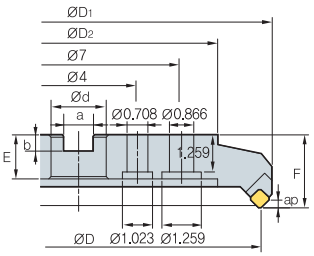


Fig. 4



AA
45°

- AR: 20°
- RR: -3°

(inch)

Designation		⊙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
AEA	4300R/L	4	3	3.91	2.205	1	0.375	0.248	0.866	2.0	0.22	3.70	1
	4400R/L	5	4	4.87	2.874	1 1/4	0.5	0.319	0.866	2.0	0.22	6.40	2
	4500R/L	6	5	5.83	3.389	1 1/2	0.625	0.394	1.181	2.5	0.22	9.70	2
	4600R/L	8	6	6.83	4.882	2	0.75	0.433	1.181	5.5	0.22	13.40	2
	4800R/L	10	8	8.79	5.118	2 1/2	1.000	0.551	1.496	2.5	0.22	19.60	3
	41000R/L	12	10	10.79	7.087	2 1/2	1.000	0.551	1.496	2.5	0.22	34.50	3
	41200R/L	15	12	12.79	9.449	2 1/2	1.000	0.551	1.496	2.5	0.22	55.20	4

Available Inserts

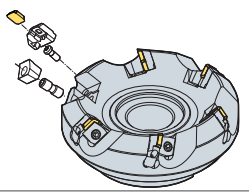
	SECN	SEKN-SU	SEKR-MF1	SEKR-MX
				

Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SECN	42AFFN															●	●	E19
	42AFTN	●	●												●			
	42AFEN																	
	42AFSN			●	●													
	42AFEN-RH											●	●					
	42AFTN-RH																	
	42AFTN-S20										●							
SEKN	42AFSN-SU									●								E19
SEKR	42AFSN-MF1																	E19
	42AFSN-MX			●	●						●							E20

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LAE4R/L	WAE4R/L	DHA0821F	LTX0512	HW40

Available Inserts **E19, E20**

AEA5000



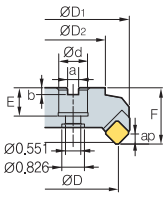


Fig. 1

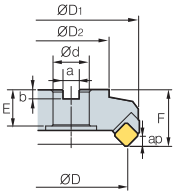


Fig. 2

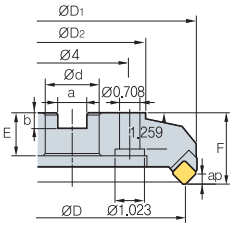


Fig. 3

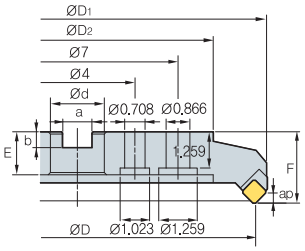


Fig. 4



AA
45°

- AR: 20°
- RR: -3°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
AEA	5300R/L	4	3	3.91	2.205	1	0.375	0.248	0.866	2.0	0.30	3.7	1
	5400R/L	5	4	4.87	2.874	1 1/4	0.500	0.319	0.866	2.0	0.30	6.4	2
	5500R/L	6	5	5.83	3.389	1 1/2	0.625	0.394	1.181	2.5	0.30	9.7	2
	5600R/L	8	6	6.83	4.882	2	0.750	0.433	1.181	2.5	0.30	13.4	2
	5800R/L	10	8	8.79	5.118	2 1/2	1.000	0.551	1.496	2.5	0.30	19.6	3
	51000R/L	12	10	10.79	7.087	2 1/2	1.000	0.551	1.496	2.5	0.30	34.5	3
	51200R/L	15	12	12.79	9.449	2 1/2	1.000	0.551	1.496	2.5	0.30	55.2	4

Available Inserts


SECN


SEKR-MX

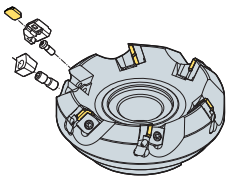

SEKN-SU

Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SECN	53AFFN														●			E19
	53AFTN		●															
	53AFEN																	
	53AFSN																	
	53AFEN-RH																	
	53AFSN-RH											●						
	53AFTN-S20																	
SEKN	53AFSN-SU									●								E19
	53AFSN-MX			●							●							

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LAE5R/L	WAE5R/L	DHA0821F	LTX0512	HW40

Available Inserts E19

EFA4000



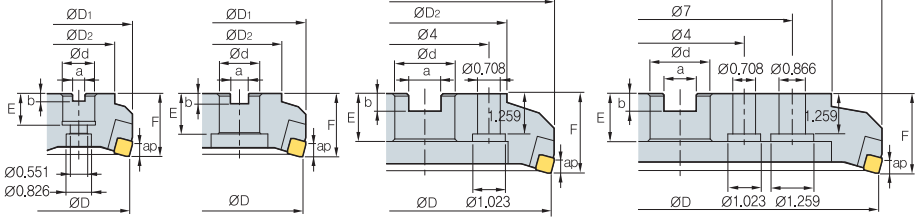


Fig. 1 Fig. 2 Fig. 3 Fig. 4

AA
15°

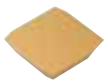
- AR: 18°
- RR: 11°

(inch)

Designation		⊙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
EFA	4300R/L	4	3	3.35	2.205	1	0.375	0.248	0.866	2.0	0.32	3.3	1
	4400R/L	5	4	4.31	2.874	1 1/4	0.500	0.319	0.866	2.0	0.32	4.6	2
	4500R/L	6	5	5.31	3.389	1 1/2	0.625	0.394	1.181	2.5	0.32	8.4	2
	4600R/L	8	6	6.31	4.882	2	0.750	0.433	1.181	2.5	0.32	12.1	2
	4800R/L	10	8	8.31	5.118	2 1/2	1.000	0.551	1.496	2.5	0.32	18.0	3
	41000R/L	12	10	10.28	7.087	2 1/2	1.000	0.551	1.496	2.5	0.32	29.5	3
	41200R/L	16	12	12.28	9.449	2 1/2	1.000	0.551	1.496	2.5	0.32	46.6	4

Available Inserts

SFCN

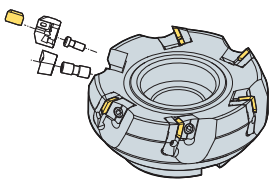


Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SFCN	42EFR																●	E20

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
K	250~400	0.008~0.002	H01

Assembling



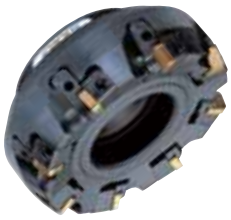
Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LEF4R/L LEF4R1*/L1*	WEFR/L	DHA0821F	LTX0512	HW40

*: Ø3~Ø12

Available Inserts E20

ENA4000



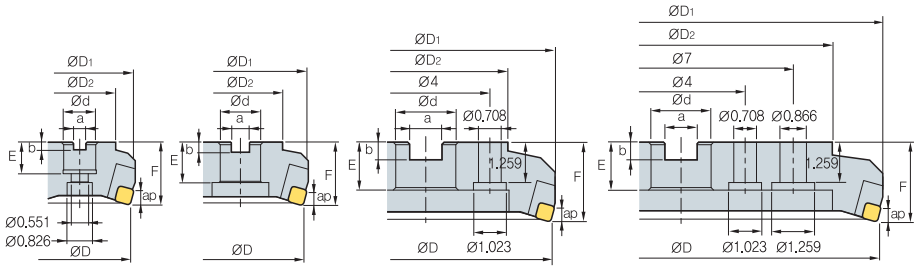


Fig. 1 Fig. 2 Fig. 3 Fig. 4



AA
15°

- AR: -6°
- RR: -5°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
ENA	4300R/L	5	3	3.28	2.205	1	0.375	0.248	0.866	2.0	0.33	3.1	1
	4400R/L	6	4	4.28	2.874	1 1/4	0.500	0.319	0.866	2.0	0.33	4.6	2
	4500R/L	8	5	5.28	3.389	1 1/2	0.625	0.394	1.181	2.5	0.33	8.4	2
	4600R/L	10	6	6.28	4.882	2	0.750	0.433	1.181	2.5	0.33	12.5	2
	4800R/L	12	8	8.28	5.118	2 1/2	1.000	0.551	1.496	2.5	0.33	18.5	3
	41000R/L	16	10	10.28	7.087	2 1/2	1.000	0.551	1.496	2.5	0.33	30.4	3
	41200R/L	20	12	12.28	9.449	2 1/2	1.000	0.551	1.496	2.5	0.33	47.5	4

Available Inserts

SNCN SNKN

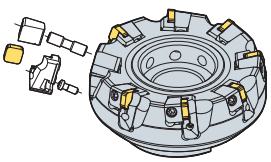


Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCN	43ENN			●											●			E21
SNKN	1204ENN											●						E23

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



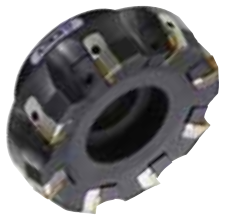
Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LEN4R/L	WENR/L WENR1*/L1*	DHA0830 DHA0825*	LTX0512	HW40

Available Inserts **E21, E23**

*: Ø3~Ø4

EPNA4000



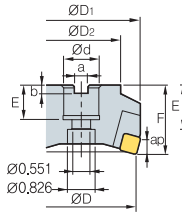


Fig. 1

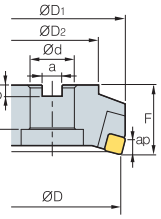


Fig. 2

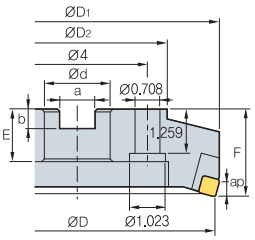


Fig. 3

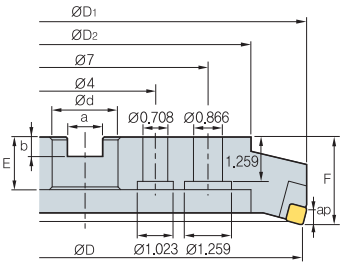


Fig. 4



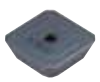
AA
15°

- AR: 7°
- RR: 0°

(inch)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
EPNA	4300R/L	5	3	3.31	2.205	1	0.375	0.248	0.866	2.0	0.35	3.1	1
	4400R/L	6	4	4.28	2.874	1 1/4	0.500	0.319	0.866	2.0	0.35	4.6	2
	4500R/L	8	5	5.28	3.389	1 1/2	0.625	0.394	1.181	2.5	0.35	8.4	2
	4600R/L	10	6	6.24	4.882	2	0.750	0.433	1.181	2.5	0.35	12.5	2
	4800R/L	12	8	8.24	5.118	2 1/2	1.000	0.551	1.496	2.5	0.35	18	3
	41000R/L	16	10	10.24	7.087	2 1/2	1.000	0.551	1.496	2.5	0.35	29.7	3
	41200R/L	20	12	12.24	9.449	2 1/2	1.000	0.551	1.496	2.5	0.35	46.4	4

Available Inserts

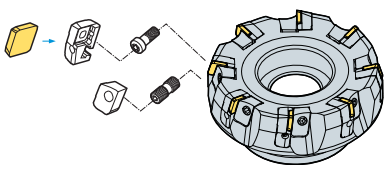
SPCN	SPKN-SU	SPKN-MU	SPKR-MX	SPEX
				

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPCN	42EDR		●	●	●										●	●	●	E24
	42EDL														●			
	42EDR-G																●	
	42EDER-RH											●	●					
	42EDSR-RH											●						
	42EDTR-RH								●									
	42EDR-S20										●							
SPKN	42EDSR-MU									●								E25
	42EDSR-SU									●			●	●				
	42EDSL-SU									●								
SPKR	42EDSR-MX			●	●				●									E25
	42EDSL-MX																	
SPEX	42EDR/L-1																	E24

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LEPN4R/L LEPN4R1*/L1*	WEPN4R/L	DHA0821F DHA0817F*	LTX0514	HW40

*: Ø3~Ø4

Available Inserts E24, E25

EPNA5000+



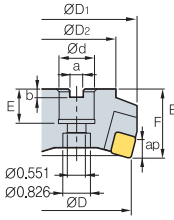


Fig. 1

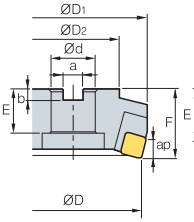


Fig. 2

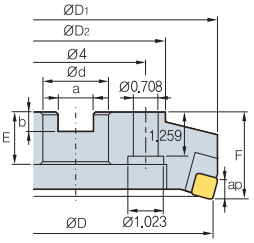


Fig. 3

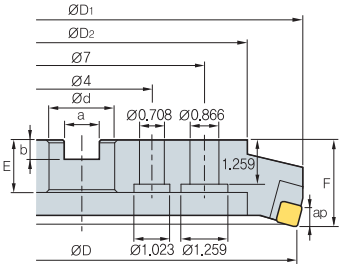


Fig. 4



AA
15°

- AR: 7°
- RR: 0°

(inch)

Designation		⊚	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
EPNA	5300R/L+	5	3	3.42	2.205	1	0.374	0.248	0.866	2.0	0.47	3.8	1
	5400R/L+	6	4	4.35	2.874	1 1/4	0.500	0.319	0.866	2.0	0.47	5.5	2
	5500R/L+	8	5	5.38	3.389	1 1/2	0.625	0.394	1.181	2.5	0.47	8.4	2
	5600R/L+	10	6	6.36	4.882	2	0.750	0.433	1.181	2.5	0.47	12.1	2
	5800R/L+	12	8	8.36	5.118	2 1/2	1.000	0.551	1.496	2.5	0.47	17.6	3
	51000R/L+	16	10	10.36	7.087	2 1/2	1.000	0.551	1.496	2.5	0.47	32.6	3
	51200R/L+	20	12	12.35	9.449	2 1/2	1.000	0.551	1.496	2.5	0.47	49.4	4

Available Inserts

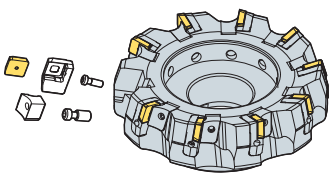
SPCN	SPKN-SU	SPKN-MU	SPKR-MX	SPEX
				

Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPCN	5312T																	E24
	53EDR		●	●											●	●		
	53EDSR																	
	53EDL											●						
	53EDR-G																●	
	53EDER-RH											●	●					
	53EDSR-RH											●						
	53EDTR-RH								●									
	53EDR-S20										●							
SPKN	53EDSR-MU									●								E25
	53EDSR-SU									●			●	●				
	53EDSL-SU									●								
SPKR	53EDR-MX			●														E25
	53EDSR-MX								●									
SPEX	53EDR/L-1																	E24

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~12	LEPN5R/L LEPN5R1*/L1*	WHPS5R/L	WHX0817 WHX0813*	LTX0514	HW40

Available Inserts **E24, E25**

*: Ø80

PFA4000



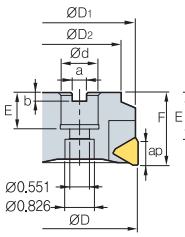


Fig. 1

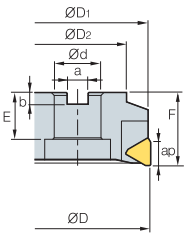


Fig. 2

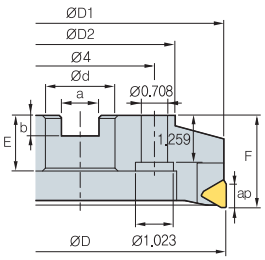


Fig. 3

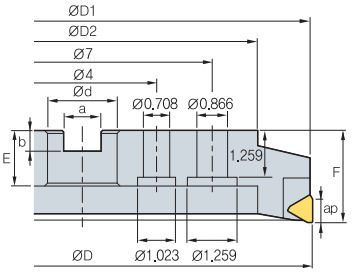


Fig. 4




AA
0°

- AR: 15°
- RR: 14°

(inch)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
PFA	4300R/L	4	3	2.96	2.205	1	0.375	0.248	0.866	2.0	0.63	2.6	1
	4400R/L	4	4	3.88	2.874	1 1/4	0.500	0.319	0.866	2.0	0.63	4.0	2
	4500R/L	7	5	4.88	3.389	1 1/4	0.625	0.394	1.181	2.5	0.63	6.8	2
	4600R/L	9	6	5.92	4.882	2	0.750	0.433	1.181	2.5	0.63	12.3	2
	4800R/L	11	8	7.88	5.118	2 1/2	1.000	0.551	1.496	2.5	0.63	19.4	3
	41000R/L	15	10	9.88	7.087	2 1/2	1.000	0.551	1.496	2.5	0.63	35.2	3
	41200R/L	19	12	11.84	9.449	2 1/2	1.000	0.551	1.496	2.5	0.63	48.4	4

Available Inserts

TFCN

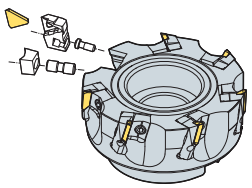


Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TFCN	42PFR																●	E26
	42PFL																	

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



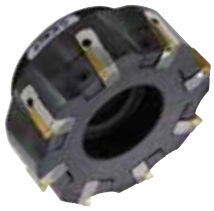
Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LPF4R/L LPF4R1**/L1**	WPFR/L	DHA0821F DHA0817F*	LTX0512	HW40

*: Ø3~Ø4/ **: Ø80~Ø125

Available Inserts E26

PPNA4000



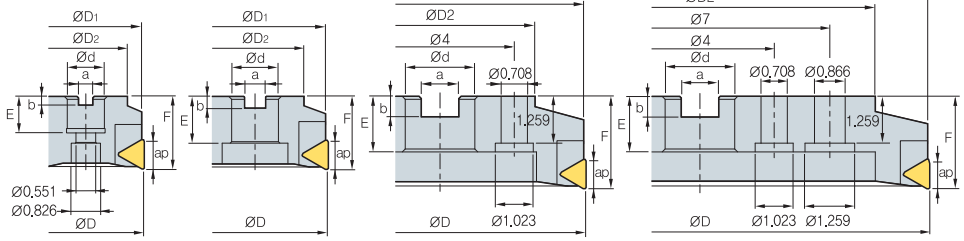


Fig. 1 Fig. 2 Fig. 3 Fig. 4

AA 0°
- AR: 7°
- RR: 0°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
PPNA	4300R/L	5	3	2.96	2.205	1	0.375	0.248	0.866	2.0	0.70	2.9	1
	4400R/L	6	4	3.96	2.874	1 1/4	0.500	0.319	0.866	2.0	0.70	4.2	2
	4500R/L	8	5	4.96	3.389	1 1/4	0.625	0.394	1.181	2.5	0.70	7.7	2
	4600R/L	10	6	5.92	4.882	2	0.750	0.433	1.181	2.5	0.70	12.3	2
	4800R/L	12	8	7.92	5.118	2 1/2	1.000	0.551	1.496	2.5	0.70	17.8	3
	41000R/L	16	10	9.92	7.087	2 1/2	1.000	0.551	1.496	2.5	0.70	29.3	3
	41200R/L	20	12	11.92	9.449	2 1/2	1.000	0.551	1.496	2.5	0.70	47.1	4

Available Inserts

TPCN TPKN-SU TPKN-MU TPKR-MX

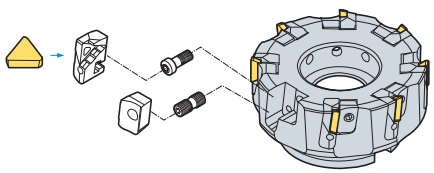


Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TPCN	43PDR		●	●											●	●		E26
	43PDR-G																●	
	43PDL														●			
	43PDSR				●													
	43PDTR																	
	43PDR-RH																	
	43PDER-RH											●	●					
	43PDSR-RH											●						
	43PDR-S20										●							
TPKN	43PDSR-MU									●								E27
	43PDSR-SU									●			●	●				
	43PDSL-SU									●								
TPKR	43PDR-MX			●														E27
	43PDSR-MX			●	●													
	43PPR-MX																	

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



Parts

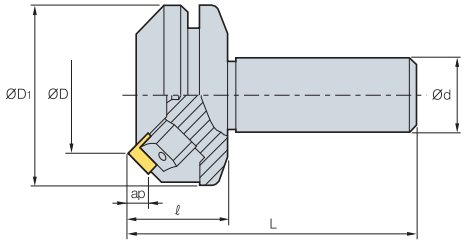
Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~Ø12	LPPN4R/L LPPN4R1*/L1*	WPPN4R/L	DHA0821F DHA0817F*	LTX0514	HW40

Available Inserts **E26, E27**

*: Ø3~Ø4

ADSA4000







AA
45°

- AR: 15°
- RR: -3°

(inch)

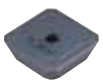
Designation			ØD	ØD1	Ød	ℓ	L	ap	lbs
ADSA	4200R	3	2	2.984	1 1/4	1.575	4.724	0.26	4.0
	4200R-S150	3	2	2.984	1 1/2	1.575	4.724	0.26	4.8
	4250R	4	2 1/2	3.445	1 1/4	1.575	4.724	0.26	5.1
	4250R-S150	4	2 1/2	3.445	1 1/2	1.575	4.724	0.26	5.9

Available Inserts

SDCN



SDKN-MU



SDKN-SU



SDKR-MX

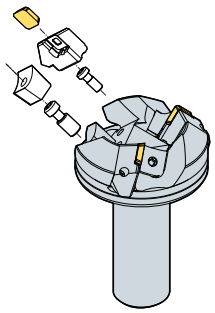


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	42M														●			E17
	42M-G																●	
	42MT	●	●		●										●			
	42MT-RH																	
	42MT-S20										●							
	42AEEN																	
	42AEEN-RH																	
	42AESN																	
	42AESN-RH																	
SDKN	42AESN-MU									●								E18
	42AESN-SU									●			●	●				
SDKR	42AESN-MX																	E18
	42AETN-MX																	
	42AEN-MX			●														

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



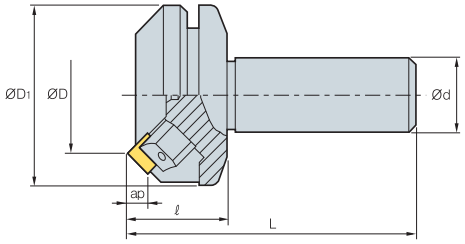
Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø2~Ø2 1/2	LASS4R/L	WASR/L	WTX0817	LTX0512	TW25

Available Inserts E17, E18

ADSA5000





AA
45°

- AR: 15°
- RR: -3°

(inch)

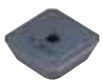
Designation			ØD	ØD1	Ød	ℓ	L	ap	lbs
ADSA	5200R	3	2	2.984	1 1/4	1.575	4.724	0.33	4.2
	5200R-S150	3	2	2.984	1 1/2	1.575	4.724	0.33	5.1
	5250R	4	2 1/2	3.445	1 1/4	1.575	4.724	0.33	5.3
	5250R-S150	4	2 1/2	3.445	1 1/2	1.575	4.724	0.33	6.2

Available Inserts

SDCN



SDKN-MU



SDKN-SU



SDKR-MX

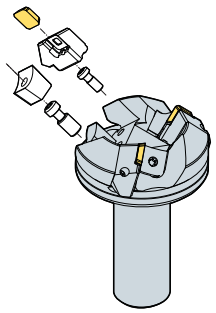


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	53M														●			E17
	53M-G																●	
	53MT		●	●											●			
	53MT-RH								●									
	53MT-S20										●							
	53AEEN																	
	53AEEN-RH											●	●					
	53AESN																	
	53AESN-RH										●	●						
SDKN	53AESN-MU									●								E18
	53AESN-SU									●			●	●				
SDKR	53AESN-MX				●													E18
	53AETN-MX																	
	53AEN-MX			●														

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3600 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø2~Ø2 1/2	LASS5R/L	WASR/L	WTX0817	LTX0512	TW25

Available Inserts **E17, E18**

PESA2000/3000/4000



2000/3000 type 4000 type

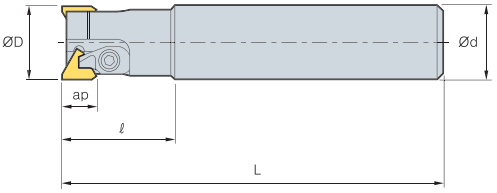


Fig. 1

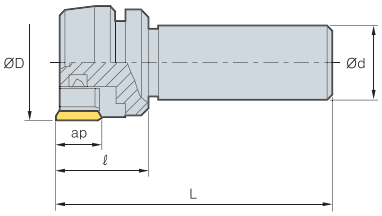
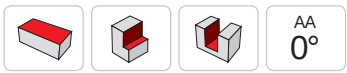


Fig. 2



AA 0°

- AR: 10°~15°
- RR: 2°~ -3°

(inch)

Designation		⦾	ØD	Ød	ℓ	L	ap	lbs	Fig.
PESA	2075R	2	3/4	3/4	1.181	4.331	0.32	0.7	1
	2100R	2	1	1	1.378	4.724	0.32	1.1	1
	3125R	2	1 1/4	1 1/4	1.772	6.299	0.51	2.2	1
	3150R	2	1 1/2	1 1/4	1.772	6.299	0.51	2.9	1
	4200R	3	2	1 1/4	1.575	4.724	0.65	2.6	2
	4200R-S150	3	2	1 1/2	1.575	4.724	0.65	3.3	2
	4250R	4	1 1/2	1 1/4	1.575	4.724	0.65	3.3	2
	4250R-S150	4	1 1/2	1 1/2	1.575	4.724	0.65	4.0	2

Available Inserts

TECN TEEN

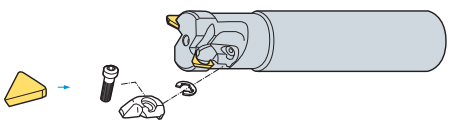


Designation			Cermet		Coated										Uncoated			page
			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
2000 type	TECN	22R																	E26
		22TR		●												●			
3000 type	TECN	32R															●		E26
		32TR		●		●										●			
		32TR-S20										●							
4000 type	TEEN	43R															●		E26
		43R-G																●	
		43TR	●	●	●	●							●			●			
		43TR-S20										●							
		43TR-Z														●			
		43TR-ZH								●		●							

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	**NCM325** **PC3500** **ST30A**
M	150~600 150~400	0.008~0.002 0.008~0.002	**PC9530**
K	500~900 300~600	0.012~0.002 0.012~0.002	**PC6510** **G10**

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench	Wrench	Clamp	Ring
Ø3/4~Ø1 (2000 type)	-	-	-	CHX0407	HW25L	-	CH4R1	ER03
Ø1 1/4~1 1/2 (3000 type)	-	-	-	CHX0510	HW30L	-	CH5R1	ER04
Ø2~Ø2 1/2 (4000 type)	LPTS4R/L	WPTSR	DHA0815	LTX0512	-	HW40	-	-

Available Inserts E26

AFOA4000



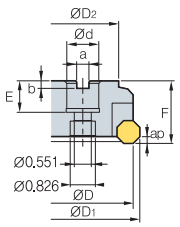


Fig. 1

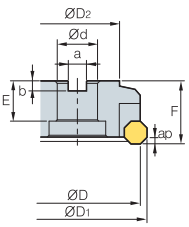


Fig. 2

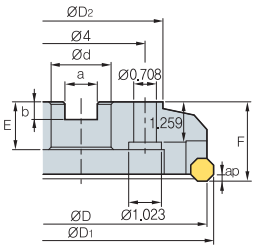


Fig. 3

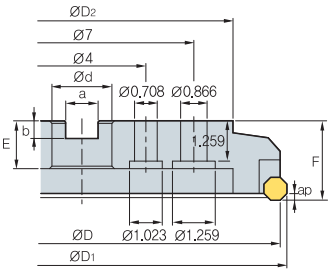


Fig. 4



AA
45°

- AR: 15°
- RR: 5°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
AFOA	4300R/L	5	3	3.31	2.205	1	0.375	0.248	0.866	2.0	0.26	3.1	1
	4400R/L	6	4	4.31	2.874	1 1/4	0.500	0.319	0.866	2.0	0.26	4.4	1
	4500R/L	8	5	5.31	3.389	1 1/2	0.625	0.394	1.181	2.5	0.26	6.8	1

Available Inserts

OFCW



OFKT-MF



OFKT-MM



OFKT-MA

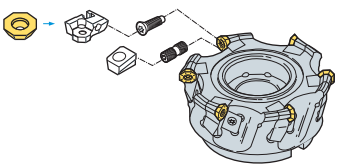


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
OFCW	05T3SN																	E13
	05T3FN																	
	05T308FN																	
OFKT	05T3SN-MF											●						E13
	05T308SN-MF																	
	05T3SN-MM			●					●		●							
	05T308SN-MM																	E14
	05T3FN-MA																●	
	05T3EN-MA																	

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3500 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling

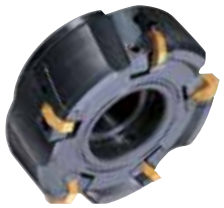


Parts

Specification	Locator	Wedge	Wedge Screw	Screw	Wrench
Ø3~Ø5	LAF04R/L	WAFO4R/L	DHA0815	FTKA0408	TW15S

Available Inserts **E13, E14**

AFOA5000



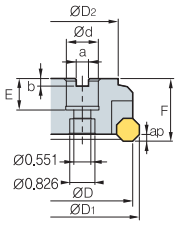


Fig. 1

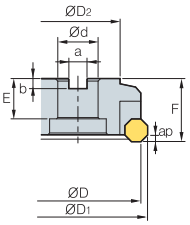


Fig. 2

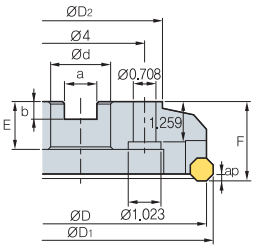


Fig. 3

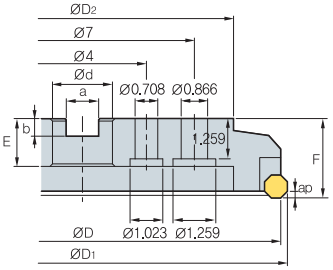


Fig. 4



AA
45°

- AR: 15°
- RR: 5°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
AFOA	5300R/L	5	3	3.43	2.205	1	0.375	0.248	0.866	2.0	0.37	3.1	1
	5400R/L	6	4	4.43	2.874	1 1/4	0.500	0.319	0.866	2.0	0.37	4.4	2
	5500R/L	8	5	5.43	3.389	1 1/2	0.625	0.394	1.181	2.5	0.37	6.8	2
	5600R/L	10	6	6.43	4.882	2	0.750	0.433	1.181	2.5	0.37	11.4	2
	5800R/L	12	8	8.43	5.118	2 1/2	1.000	0.551	1.496	2.5	0.37	16.5	3
	51000R/L	16	10	10.43	7.087	2 1/2	1.000	0.551	1.496	2.5	0.37	35.4	3
	51200R/L	20	12	12.43	9.449	2 1/2	1.000	0.551	1.496	2.5	0.37	50.2	4

Available Inserts

OFKT-MM OFKT-MA OFCN OFKR-MF



OFKR-MM OFKR-MA REKR-MM

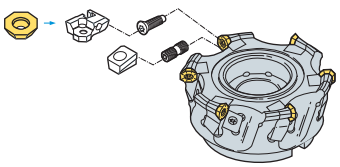


Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
OFCN	0704SN											●						E13
	0704FN																	
	070408SN																	
	070408FN																	
OFKR	0704SN-MF			●	●													E13
	070408SN-MF																	
	0704SN-MM			●	●				●		●	●						
	070408SN-MM			●														
	0704FN-MA																●	
	0704EN-MA																	
OFKT	0704SN-MM																	E13
	0704FN-MA																●	
	0704EN-MA																	
REKR	170400-MM																	E16

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	500~1,000 400~800 300~600	0.006~0.002 0.008~0.002 0.008~0.002	NCM325 PC3500 ST30A
M	150~600 150~400	0.008~0.002 0.008~0.002	PC9530
K	500~900 300~600	0.012~0.002 0.012~0.002	PC6510 G10

Assembling



Parts

Specification	Locator	Wedge	Wedge Screw	Locator Screw	Wrench
Ø3~ Ø12	LAF05R/L LAF05R*/L-1*	WEFR/L	DHA0821F	LTX0512	HW40

*: Ø3~Ø4

Available Inserts **E13, E16**

New serrated edge design increases productivity by reducing insert cutting load

Power Buster

- New tooling utilizing a specially designed serrated edge to increase productivity by reducing the cutting load.
- Double-sided 6 corner insert geometry ensures high rigidity, long tool life and cost efficiency
- The serrated edge divides the chips into smaller pieces. This feature provides excellent chip control, reduces interference of the cutter and ensures good durability of the cutter body.
- Two types of inserts are available-TNMX27 for PBA (AA: 45°) and PBZ (AA: 10°), and TNMX30 for PBP (AA: 0°)
- Application: High depth of cut and feed rate (Steel, Cast iron)

Code system

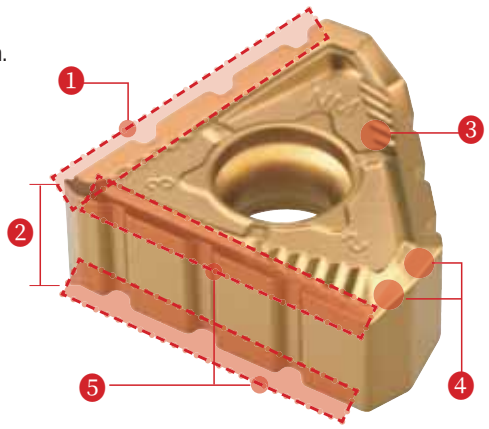
PB A C A 5 400 R/L – M

Power Buster	AA	Cutter type	Arbor type	Inscribed circle of insert	Tool Dia.	Hand	No of tooth
Power buster	A: 45° Z: 10° P: 0°	C: Cutter	M: Metric A: Inch	5: 5/8 6: 0.687	ØD: 4inch	R: Right L: Left	No code: Coarse pitch M: Close pitch 8: 8 teeth

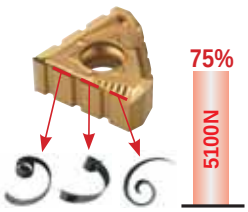
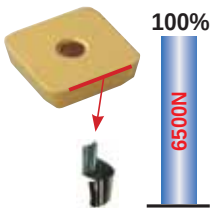
Features of insert

1 Major cutting-edge (Serrated edge)

- Low cutting forces
- Ideal for chip control, divides chips into small pieces for proper chip evacuation. Double-sided 6 corner insert
- Ideal edge design for Steel and Cast iron rough milling



- **Comparison of chip control and cutting force**

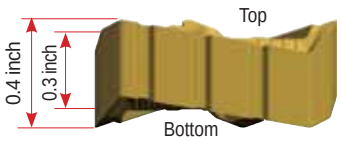
Power Buster	ISO milling insert
	

■**Workpiece** 4140

■**Cutting condition** vc = 656 sfm, ap = 0.32 inch, ae = 3.54 inch, fz = 0.012 ipt

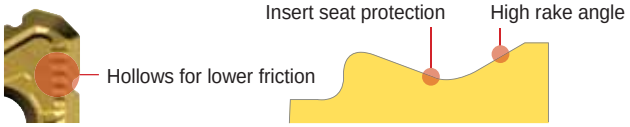
2 Thicker insert

- Thick insert guarantees high rigidity
- Balanced insert design for stable mounting



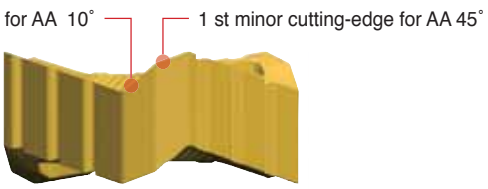
3 NM Chip breaker

- High rake angle for low cutting force
- Good chip flow at various feed and depth of cut
- Inserts are protected with seats for a precise mounting
- Low friction and good heat evacuation at high depth cut



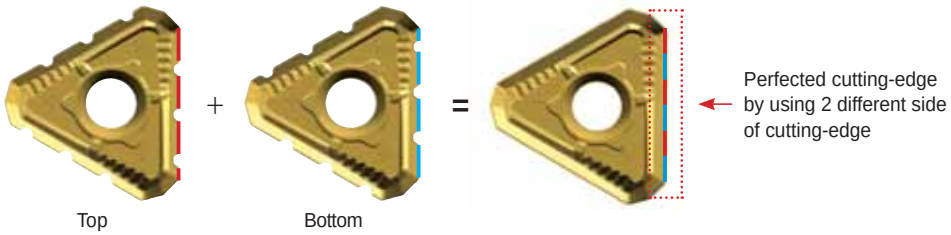
❹ Insert shape applied to PBA/Z cutters (AA: 45°/10°)

- High rake angle to avoid interference with chip
- Calculated minor cutting-edge angel for both AA 45° & 10° cutter



❺ Mirror system

- Cutting-edge on the both side of insert covers all overlapped cutting area



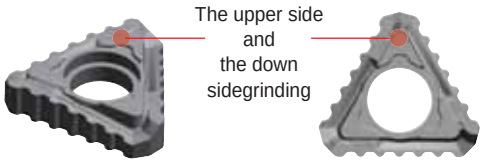
Features of cutter

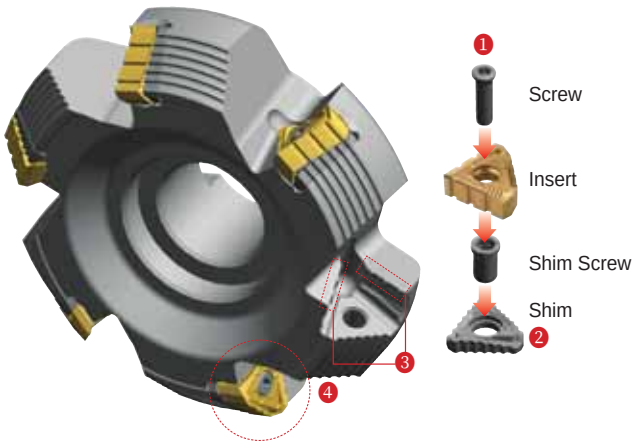
❶ Screw-on clamping system

- Simple and strong screw on clamping system

❷ Better rigidity & Stable Assembly system

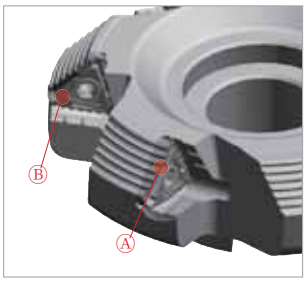
- The shim protects the cutter from insert damage
- High accuracy shim ensures tighter clamping

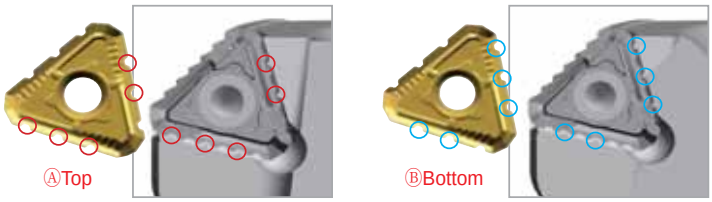




❸ Foolproof System

- Insert serrations match pocket design to prevent improper seating and alignment

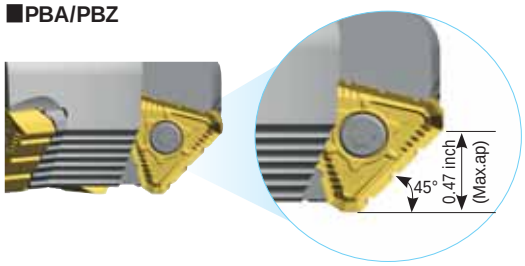




❹ Multi-application system

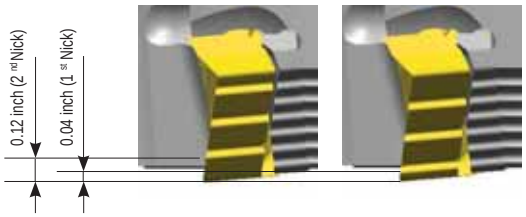
• Same insert for multi-use (45˚and 10˚)

■PBA/PBZ

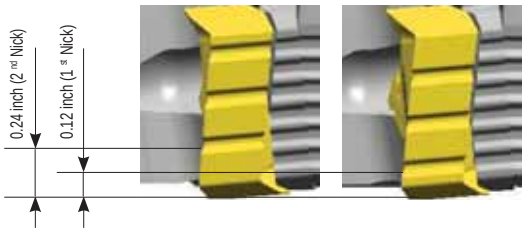




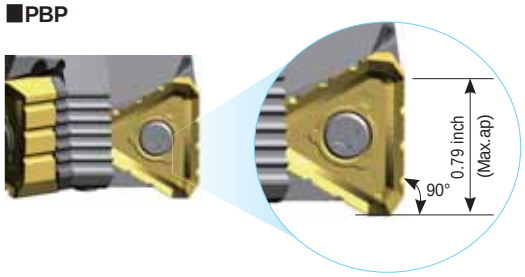
The serrations are effective with a depth of cut larger than 0.04 inch



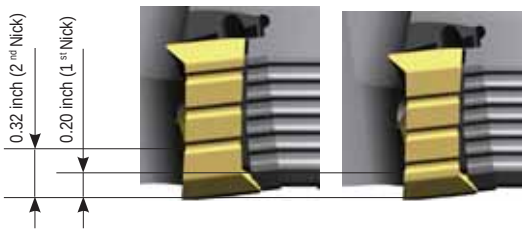
The serrations are effective with a depth of cut larger than 0.12 inch



■PBP

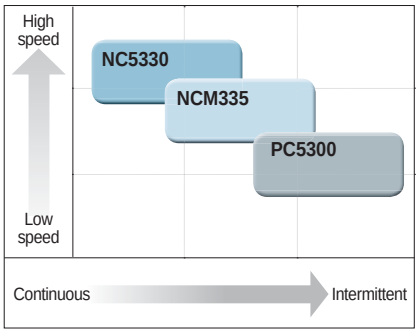


For the AA 90° cutter, nicks function properly at depth of cuts over 0.20 inch



Recommended cutting condition

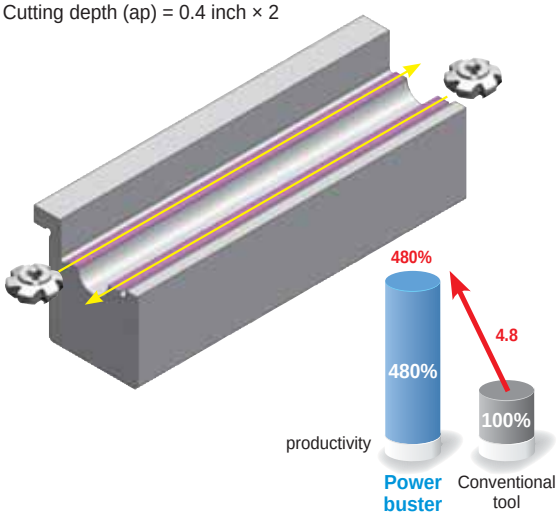
ISO	Workpiece	NC5330	NCM335	PC5300
		fz(ipt)		
		0.004-0.008-0.012	0.004-0.008-0.012	0.004-0.008-0.012
		vc(sfm)		
P	Carbon steel	984-820-656	919-755-591	820-656-525
P	Alloy steel	820-394-591	755-591-492	591-492-394
P	Die steel	591-492-427	525-427-361	459-394-328
K	Gray cast iron	919-722-591	820-656-525	722-591-492
K	Malleable cast iron	820-656-525	755-591-492	591-492-427
K	Nodular cast iron	755-591-492	689-525-427	525-394-328



Power Buster Test

■Cylinder block for ship engine (Cast iron)

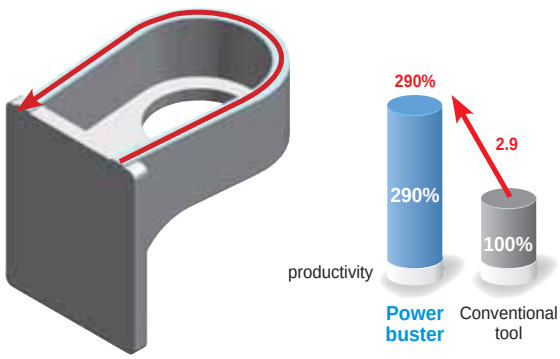
Cutting width (ae) = 6.3 inch × 2
Cutting depth (ap) = 0.4 inch × 2



Item	Power Buster	Conventional tool
Diameter (ØD)	8 inch	8 inch
⊙	12 tooth	12 tooth
Grades	NC5330	PVD coating for Cast iron
vc	558 sfm	427 sfm
fz	0.009 ipt	0.006 ipt
ap	0.4 inch x 2 passes	0.16 inch x 5 passes
min	28.2 min/ea	137.5 min/ea
4.8 times productivity increased		• One-sided 4 corner insert (Without nick) • AA 45° cutter

■Heavy machinery part (Alloy steel)

Cutting width (ae) = 6.3 inch × 2
Cutting depth (ap) = 0.4 inch × 2



Item	Power Buster	Conventional tool
Diameter (ØD)	5 inch	5 inch
⊙	8 tooth	8 tooth
Grades	NCM335	PVD coating for Cast iron
vc	591 sfm	492 sfm
fz	0.006 ipt	0.004 ipt
ap	0.2 inch x 2 passes	0.1 inch x 4 passes
min	5 min/ea	14.7 min/ea
2.9 times productivity increased		• Double-sided 8 corner insert (Without nick) • AA 45° cutter

PBACA5000



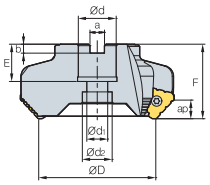


Fig. 1

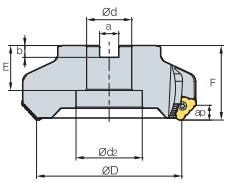


Fig. 2

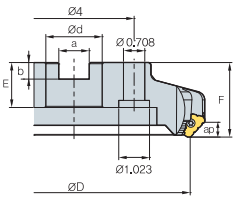


Fig. 3

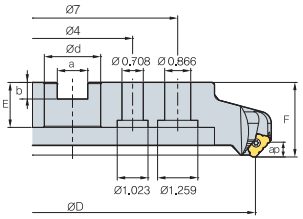


Fig. 4



AA
45°

- AR: -5°
- RR: -11°

(inch)

Designation			⌀	ØD	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
Coarse pitch	PBACA	5300R/L	4	3	1.000	0.551	0.827	0.374	0.248	0.866	2.000	0.472	2.9	1
		5400R/L	4	4	1.250	-	1.772	0.500	0.319	0.866	2.000	0.472	4.6	2
		5500R/L	6	5	1.500	-	2.205	0.626	0.394	1.181	2.500	0.472	9.3	2
		5600R/L	8	6	2.000	-	3.937	0.748	0.433	1.181	2.500	0.472	11.7	2
		5800R/L	10	8	2.500	-	-	1.000	0.551	1.496	2.500	0.472	18.3	2
		51000R/L	12	10	2.500	-	-	1.000	0.551	1.496	2.500	0.472	30.0	3
		51200R/L	14	12	2.500	-	-	1.000	0.551	1.496	2.500	0.472	43.9	4
Close pitch	PBACA	5300R/L-M	6	3	1.000	0.551	0.827	0.374	0.248	0.866	2.000	0.472	2.8	1
		5400R/L-M	6	4	1.250	-	1.772	0.500	0.319	0.866	2.000	0.472	4.6	2
		5500R/L-M	8	5	1.500	-	2.205	0.626	0.394	1.181	2.500	0.472	9.1	2
		5600R/L-M	10	6	2.000	-	3.937	0.748	0.433	1.181	2.500	0.472	11.6	2
		5800R/L-M	12	8	2.500	-	-	1.000	0.551	1.496	2.500	0.472	17.9	2
		51000R/L-M	14	10	2.500	-	-	1.000	0.551	1.496	2.500	0.472	29.7	3
		51200R/L-M	16	12	2.500	-	-	1.000	0.551	1.496	2.500	0.472	43.4	4

Available Inserts

TNMX-NM



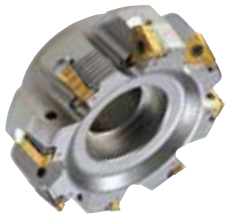
Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TNMX	2710AZNR-NM					●			●		●		●					E26
	2710AZNL-NM																	

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3~Ø12	FTGA0518	ST53AZR	SHXN0712F	TW20-100

Available Inserts **E26**

PBZCA5000



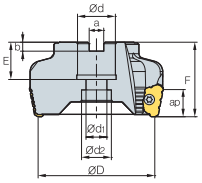


Fig. 1

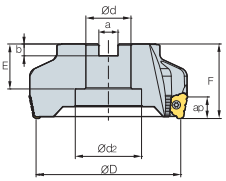


Fig. 2

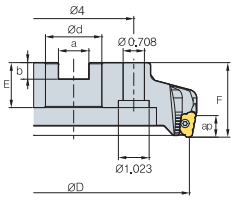


Fig. 3

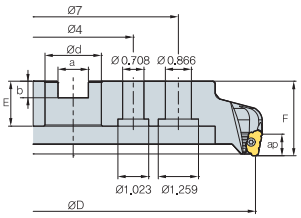


Fig. 4



AA
10°

- AR: -5°
- RR: -12°

(inch)

Designation			⌀	ØD	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
Coarse pitch	PBZCA	5300R/L	4	3	1.000	0.551	0.827	0.374	0.248	0.866	2.000	0.709	2.2	1
		5400R/L	4	4	1.250	-	1.772	0.500	0.319	0.866	2.500	0.709	3.5	2
		5500R/L	6	5	1.500	-	2.205	0.626	0.394	1.181	2.500	0.709	7.5	2
		5600R/L	8	6	2.000	-	3.937	0.748	0.433	1.181	2.500	0.709	9.7	2
		5800R/L	10	8	2.500	-	-	1.000	0.551	1.496	2.500	0.709	15.7	2
		51000R/L	12	10	2.500	-	-	1.000	0.551	1.496	2.500	0.709	27.6	3
		51200R/L	14	12	2.500	-	-	1.000	0.551	1.496	2.500	0.709	41.3	4
Close pitch	PBZCA	5300R/L-M	6	3	1.000	0.551	0.827	0.374	0.248	0.866	2.000	0.709	2.2	1
		5400R/L-M	6	4	1.250	-	1.772	0.500	0.319	0.866	2.500	0.709	3.5	2
		5500R/L-M	8	5	1.500	-	2.205	0.626	0.394	1.181	2.500	0.709	7.9	2
		5600R/L-M	10	6	2.000	-	3.937	0.748	0.433	1.181	2.500	0.709	9.7	2
		5800R/L-M	12	8	2.500	-	-	1.000	0.551	1.496	2.500	0.709	15.7	2
		51000R/L-M	14	10	2.500	-	-	1.000	0.551	1.496	2.500	0.709	27.3	3
		51200R/L-M	16	12	2.500	-	-	1.000	0.551	1.496	2.500	0.709	40.8	4

Available Inserts

TNMX-NM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TNMX	2710AZNR-NM					●			●		●		●					E26
	2710AZNL-NM																	

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3~Ø12	FTGA0518	ST53AZR	SHXN0712F	TW20-100

Available Inserts E26

PBPCA6000 new



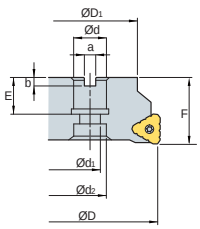


Fig. 1

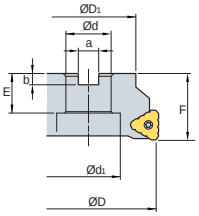


Fig. 2

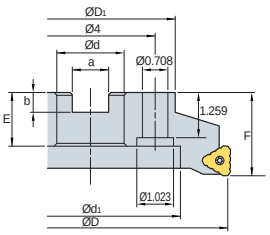


Fig. 3

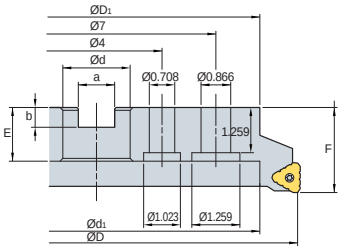


Fig. 4



AA
0°

- AR: -5°
- RR: -12°

(inch)

Designation		⌀	ØD	ØD1	Ød	Ød2	Ød2	a	b	E	F	ap	lbs	Fig.
PBPCA	6300R-4	4	3	2.205	1		1.496	0.374	0.248	0.866	2	0.787	1.706	1
	6400R-6	6	4	2.874	1.25	-	1.772	0.500	0.319	0.866	2	0.787	2.754	2
	6500R-6	6	5	3.937	1.5	-	2.205	0.626	0.394	1.181	2.5	0.787	6.250	2
	6600R-8	8	6	4.331	2	-	3.543	0.752	0.433	1.181	2.5	0.787	9.560	3
	6800R-10	10	8	5.118	2.5	-	5.197	1.000	0.551	1.496	2.5	0.787	12.000	3
	61000R-12	12	10	7.087	2.5	-	7.087	1.000	0.551	1.496	2.5	0.787	22.120	3
	91200R-14	14	12	9.449	2.5	-	9.370	1.000	0.551	1.496	2.5	0.787	34.590	4

Available Inserts

TNMX-NM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TNMX	3012PNR-NM																	E26

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3~Ø12	FTGA0518	ST53PNR	SHXN0712F	TW20-100

Available Inserts E26

Rich Mill series is one of innovations that provides more available cutting-edges by double-sided insert and longer tool life for our customers

Rich Mill Series

- Rich Mill series is one of the innovations that provides more available cutting-edges with double-sided inserts and longer tool life for our customers
- The unique geometry and special cutting-edge guarantees low cutting loads and long tool life
- Rich Mill series has a wide application range from steel and stainless steel to cast iron and aluminum
- Applying negative inserts makes it even stronger and provides longer tool life
- Rich Mill series has both screw-on clamping system and latch clamping system

Code system

RM16	A	C	A	4	400	H	R – M

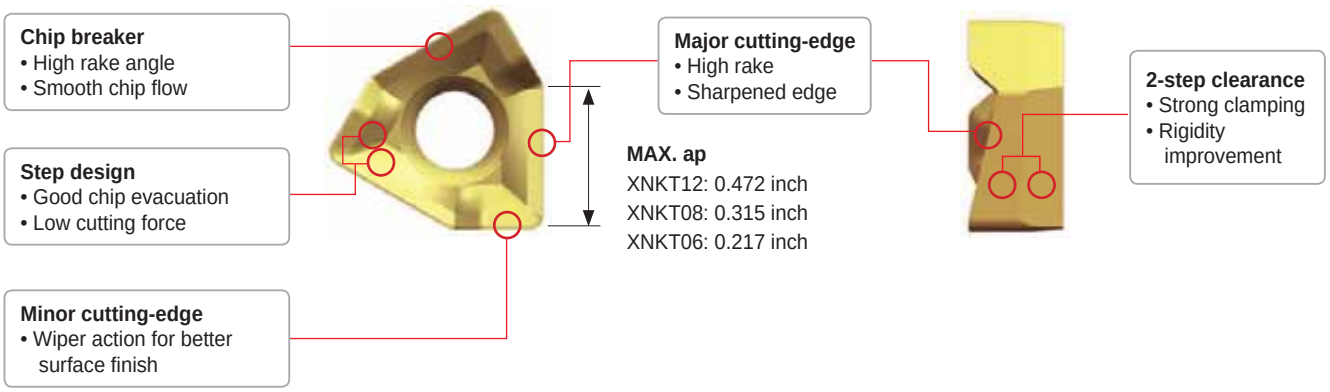
Number of edges	Approach angle	Tool type	Arbors type	Inscreibed circle of insert	Tool Dia.	Coolant type	Hand	Pitch type
RM3: Number of edges-3 RM4: Number of edges-4 RM8: Number of edges-8 RMH8: Number of edges-8 (Shim) RMT8: Number of edges-8 (Latch Clamp) RM16: Number of edges-16	A: 45˚ D: 30˚ E: 15˚ F: 5˚ P: 0˚ Q: 2˚ Z: Plunging	C: Cutter S: Shank	M: Metric A: Inch	3 : 3/8 4 : 4/8 5 : 5/8	400 : Ø4	H: Thru-Hole No code: None	R: Right L: Left	M: Close H: Extra Close

Rich Mill RM3

Features

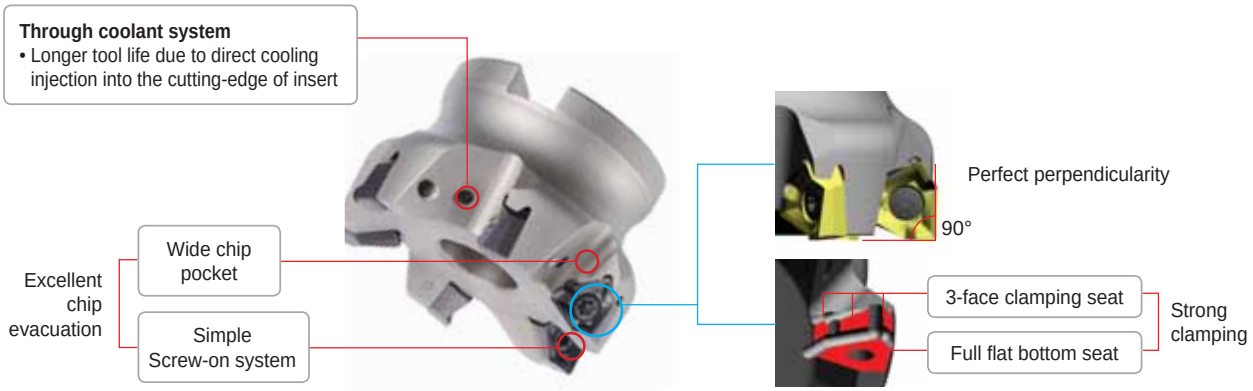
- High Quality - True 90° shouldering operation
- High Productivity - Strong thick insert and 3-face clamping ensure stable operation even tough condition.
- High Economics - Long tool life due to optimized manufacturing process

Features of insert



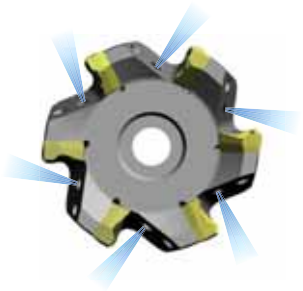
Rich Mill RM3

Features of cutter



Through coolant system

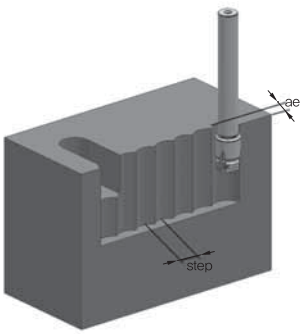
- Exclusive through coolant bolt required
- Effective coolant distribution directly to cutting-edge
- Coolant supporting arbor required



Features of chip breakers

Insert		Cutting-edge	Features
Aluminum **MA**			• Superior cutting quality for aluminum due to sharp cutting-edge and buffed surface
Light **ML**			• Superior cutting quality for light and light cutting, difficult-to-cut material machining through the low cutting load of chip breaker
General **MM**			• Suitable for various cutting due to special shape design for general cutting

Max Step in plunging



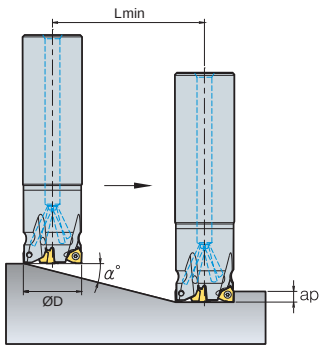
Type	max. ae
3000 type	0.098
4000 type	0.118
5000 type	0.138

ae	Cutter diameter (Ø)								
	Ø0.75	Ø1	Ø1.25	Ø1.5	Ø2	Ø2.5	Ø3	Ø4	Ø5
	Max step (inch)								
0.039	0.335	0.389	0.437	0.480	0.556	0.622	0.683	0.790	0.884
0.079	0.460	0.539	0.607	0.669	0.778	0.873	0.959	1.111	1.245
0.118	0.546	0.645	0.731	0.808	0.943	1.061	1.167	1.354	1.519
0.138	-	-	-	-	-	-	1.258	1.459	1.637

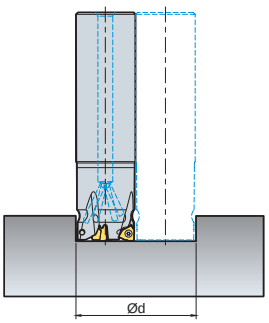
Rich Mill RM3

Ramping and Helical cutting

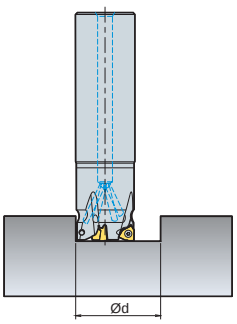
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole



(inch)

Type	Tool Dia. ØD	1. Ramping		2. Helical cutting for blind hole				3.Helical cutting for through hole	
		α °	Lmin	Minimum Hole Diameter Ød	Maximum Pitch	Maximum Hole Diameter Ød	Maximum Pitch	Minimum Hole Diameter Ød	Maximum Pitch
3000 type	0.75	17.5	0.708	1.400	0.217	1.440	0.217	1.212	0.220
	1.00	9.5	1.294	1.900	0.217	1.940	0.217	1.712	0.220
	1.25	6.5	1.901	2.400	0.217	2.440	0.217	2.212	0.220
	1.50	5.0	2.475	2.900	0.217	2.940	0.217	2.712	0.220
	2.00	3.5	3.540	3.900	0.217	3.940	0.217	3.712	0.220
	2.50	2.5	4.959	4.900	0.217	4.940	0.217	4.712	0.207
	3.00	2.0	6.201	5.900	0.217	5.940	0.217	5.712	0.201
4000 type	1.00	23.0	0.742	1.800	0.315	1.920	0.315	1.529	0.310
	1.25	13.0	1.312	2.300	0.315	2.300	0.315	2.029	0.310
	1.50	9.0	1.989	2.800	0.315	2.920	0.315	2.529	0.310
	2.00	5.5	3.271	3.800	0.315	3.920	0.315	3.529	0.310
	2.50	4.0	4.504	4.800	0.315	4.920	0.315	4.529	0.310
	3.00	3.0	6.010	5.800	0.315	5.920	0.315	5.529	0.310
	4.00	2.0	9.019	7.800	0.315	7.920	0.315	7.529	0.297
	5.00	1.5	12.028	9.800	0.303	9.920	0.307	9.529	0.288
5000 type	3.00	5.5	4.906	5.744	0.472	5.906	0.472	5.439	0.470
	4.00	3.5	7.724	7.744	0.472	7.913	0.472	7.439	0.470
	5.00	3.0	9.015	9.752	0.472	9.921	0.472	9.439	0.470

* Please be sure to use cutting oil or air for ramping and helical machining
Lmin = ap/tan (α°)

3000 type: Available ap = 0.217 inch
4000 type: Available ap = 0.315 inch
5000 type: Available ap = 0.472 inch

Rich Mill RM3

Application guideline for grade

Workpiece		P		M	K	N
		Carbon steel	Alloy steel	Stainless steel	Cast iron	Aluminum
Chip breaker	First choice	MM	MM	ML	ML	MA
	Second choice	ML	ML	-	MM	-
Grades	High speed machining	PC3600	PC3600	PC5300	PC6510	H01
	General machining	PC5400	PC5300	PC5400	PC5300	
	Interrupted machining	PC5400	PC5400	PC5400	PC5400	

Recommended cutting condition

• RM3 3000 type

Workpiece		Grades	Cutting conditions				Cutting conditions			
			vc (sfm)	fz (ipt)	max ap (inch)	Available inserts	vc (sfm)	fz (ipt)	max ap (inch)	Available inserts
P	steel	PC3600	524~885	0.010~0.002	0.217	XNKT0604□□ PN□R-MM	524~885	0.008~0.002	0.217	XNKT0604□□ PN□R-ML
		PC5300	492~787	0.010~0.002	0.217		492~787	0.012~0.002	0.217	
		PC5400	426~688	0.010~0.002	0.217		426~688	0.012~0.002	0.217	
M	Stainless steel	PC5300	295~492	0.008~0.002	0.217		295~492	0.006~0.002	0.217	
		PC5400	229~393	0.008~0.002	0.217		229~393	0.006~0.002	0.217	
K	Cast iron	PC6510	459~754	0.012~0.003	0.217		459~754	0.010~0.003	0.217	
		PC5300	393~656	0.012~0.003	0.217		393~656	0.010~0.003	0.217	

※ Maximum cutting conditions: vc (sfm) = 1148, fz (ipt) = 0.020 according to the cutting environment

• RM3 4000 type

Workpiece		Grades	Cutting conditions				Cutting conditions			
			vc (sfm)	fz (ipt)	max ap (inch)	Available inserts	vc (sfm)	fz (ipt)	max ap (inch)	Available inserts
P	steel	PC3600	524~885	0.012~0.002	0.315	XNKT0805□□ PN□R-MM	524~885	0.010~0.002	0.315	XNKT0805□□ PN□R-ML
		PC5300	492~787	0.012~0.002	0.315		492~787	0.010~0.002	0.315	
		PC5400	426~688	0.012~0.002	0.315		426~688	0.010~0.002	0.315	
M	Stainless steel	PC5300	295~492	0.010~0.002	0.315		295~492	0.008~0.002	0.315	
		PC5400	229~393	0.010~0.002	0.315		229~393	0.008~0.002	0.315	
K	Cast iron	PC6510	459~754	0.014~0.003	0.315		459~754	0.012~0.003	0.315	
		PC5300	393~656	0.014~0.003	0.315		393~656	0.012~0.003	0.315	
N	Aluminum	H01	1312~3937	0.016~0.004	0.315	XNKT0805□□PN□R-MA	-	-	-	-

※ Maximum cutting conditions: vc (sfm) = 1148, fz (ipt) = 0.028 according to the cutting environment

• RM3 5000 type

Workpiece		Grades	Cutting conditions				Cutting conditions			
			vc (sfm)	fz (ipt)	max ap (inch)	Available inserts	vc (sfm)	fz (ipt)	max ap (inch)	Available inserts
P	steel	PC3600	524~885	0.012~0.002	0.472	XNKT1206□□ PN□R-MM	524~885	0.010~0.002	0.472	XNKT1206□□ PN□R-ML
		PC5300	492~787	0.012~0.002			492~787	0.010~0.002		
		PC5400	426~688	0.012~0.002			426~688	0.010~0.002		
M	Stainless steel	PC5300	295~492	0.010~0.002			295~492	0.008~0.002		
		PC5400	229~393	0.010~0.002			229~393	0.008~0.002		
K	Cast iron	PC6510	459~754	0.014~0.003			459~754	0.012~0.003		
		PC5300	393~656	0.014~0.003			393~656	0.012~0.003		
N	Aluminum	H01	1312~3937	0.016~0.004		XNCT1206□□PN□R-MA				

※ Maximum cutting conditions: vc (sfm) = 1148, fz (ipt) = 0.028 according to the cutting environment

Rich Mill RM4

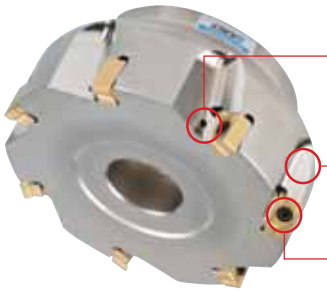


Features

- Economical 4 cutting-edges by using double-sided insert
- RM4, as a multi-functional milling tool, offers economical 4 cutting-edges by using an innovative double-sided insert
- Special designed chip breaker consists of high rake angle and strong cutting-edge to decrease the cutting load
- RM4 is multi-functional tool that can cover facing, side cutting, shouldering, slotting, ramping & helical cutting
- Optimal matching of the special cutting-edge geometry with variety of new grades provides consistence & long tool life of insert

Features of cutter

- 4 cutting-edges can be used by using double-sided insert
- High rake angle chip breaker and cutting-edge can make smooth cutting with low cutting load
- Strong negative insert
- High efficiency, economical, multi-functional tool



Through coolant system Longer tool life due to direct cooling injection into the cutting-edge of insert

Wide chip pocket for better chip evacuation

Simple screw on system

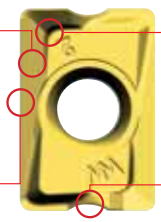
Improving chip control

Features of insert

- Double-sided insert using 4 cutting-edges
- High rake angle chip breaker, cutting-edge
- Flexibility of product
- High efficiency, economical, multi-functional tool
- Negative insert has strong cutting-edge

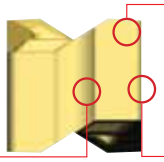
Chip breaker
- High rake angle chip breaker
- Improving chip control

Major cutting-edge
- High rake angle chip breaker
- Better surface roughness



Step design
- Improving chip control
- Reducing cutting load

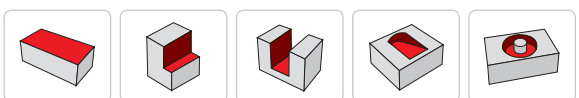
Concave design
- 4 cutting-edges
- Minimize interference



Minor cutting-edge
- Special design of cutting-edge to improve surface roughness

Clearance face
- Strong negative face
- Strong cutting-edge

Uses



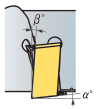
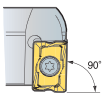
Facing | Shouldering | Slotting | Ramping | Helical cutting

Rich Mill RM4

Features of chip breakers

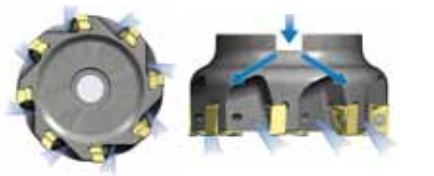
Insert		Cutting-edge	Features
Aluminum, Light machining **MA**			• With sharp edge application the better productivity has been accomplished, especially for Aluminum or low force cut
Light cutting **MF**			• Due to low cutting load, it is good for light cutting and difficult-to-cut material
General cutting **MM**			• It is suitable design for general milling

Setting Configuration

Shape	Setting angle of insert	Features
		High rake chip breaker & positive setting angle for low cutting load → Improving machinability
		Multi applications for facing, shouldering, slotting, ramping, helical cutting, etc

Through Coolant System

- By using on exclusive coolant bolt (hexagonal socket bolt) powerful cooling & better chip evacuation can be acquired
- To get optimal chip control, the direction of coolant injection has been designed to reach to each cutting-edge directly (through coolant arbor is required)

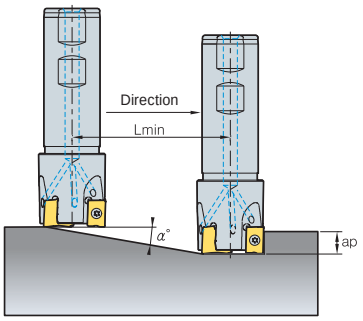


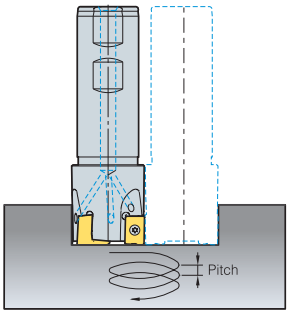
Through coolant system for decreasing cutting heat and good chip evacuation

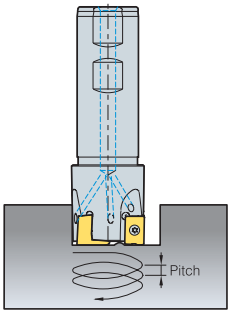
Rich Mill RM4

Ramping and Helical cutting

1. Ramping	2. Helical cutting for blind hole	3. Helical cutting for through hole







(inch)

Designation	1. Ramping			2. Helical cutting for blind hole				3.Helical cutting for through hole	
	D	α °	Lmin	Maximum Hole Diameter	Maximum Pitch	Minimum Hole Diameter	Maximum Pitch	Minimum Hole Diameter	Maximum Pitch
3056HR	0.562	5.6	3.92	1.069	0.15	0.990	0.13	0.785	0.06
3062HR	0.625	4.2	5.14	1.195	0.13	1.116	0.11	0.911	0.06
3068HR	0.688	3.5	6.27	1.321	0.12	1.242	0.11	1.037	0.06
3075HR	0.750	2.9	7.42	1.445	0.11	1.366	0.10	1.161	0.06
3100HR	1.000	1.8	12.40	1.945	0.09	1.866	0.08	1.661	0.06
3125HR	1.250	1.2	17.64	2.445	0.08	2.366	0.07	2.161	0.06
3150HR	1.500	0.9	23.04	2.945	0.07	2.866	0.07	2.661	0.06
3200HR	2.000	0.6	33.70	3.945	0.07	3.866	0.06	3.661	0.05
3150HR	1.500	0.9	23.04	2.945	0.07	2.866	0.07	2.661	0.06
3200HR	2.000	0.6	33.70	3.945	0.07	3.866	0.06	3.661	0.05
3250HR	2.500	0.5	44.27	4.945	0.06	4.866	0.06	4.661	0.05
3300HR	3.000	0.3	56.44	5.945	0.06	5.866	0.06	5.661	0.05
3400HR	4.000	0.2	77.85	7.945	0.06	7.866	0.05	7.661	0.05
4125HR	1.250	2.5	9.024	2.445	0.16	2.366	0.15	2.161	0.12
4150HR	1.500	2.0	11.283	2.945	0.15	2.866	0.14	2.661	0.12
4200HR	2.000	2.0	11.283	3.945	0.20	3.866	0.19	3.661	0.18
4250HR	2.500	2.0	11.283	4.945	0.25	4.866	0.24	4.661	0.23
4200HR	2.000	2.0	11.283	3.945	0.20	3.866	0.19	3.661	0.18
4250HR	2.500	2.0	11.283	4.945	0.25	4.866	0.24	4.661	0.23
4300HR	3.000	1.5	15.046	5.945	0.23	5.866	0.22	5.661	0.21
4400HR	4.000	1.0	22.572	7.945	0.20	7.866	0.19	7.661	0.20
4500HR	5.000	1.0	22.572	9.945	0.26	9.866	0.25	9.661	0.25
4600R	6.000	0.5	45.148	11.945	0.15	11.866	0.15	11.661	0.15

* Please be sure to use cutting oil or air for ramping and helical machining
  Lmin = ap/tan (α°)

  3000 type: Available ap = 0.217 inch
  4000 type: Available ap = 0.315 inch

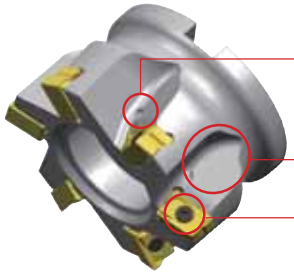
Recommended cutting condition

ISO	Grades	LNM(E)X100605PNR-MF		LNM(E)X100605PNR-MM		LNEX100605PNR-MA		Max-ap	LNM(E)X151008PNR-MF		LNM(E)X151008PNR-MM		LNEX151008PNR-MA		Max-ap
		vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)		vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	
P	NCM325	-	-	-	-	-	-	0.354 inch	490~985	0.01~0.002	390~985	0.012~0.002	490~985	0.008~0.001	0.551 inch
P	PC3500	490~985	0.010~0.002	390~985	0.012~0.002	490~985	0.008~0.001		490~985	0.01~0.002	390~985	0.012~0.002	490~985	0.008~0.001	
M	PC5300	390~590	0.010~0.002	330~590	0.012~0.002	390~655	0.008~0.001		390~590	0.01~0.002	330~590	0.012~0.002	390~665	0.008~0.001	
K	PC6510	490~985	0.012~0.003	390~985	0.014~0.003	-	-		490~985	0.012~0.003	390~985	0.014~0.003	-	-	

Rich Mill RM4Z

Features

- Rich mill series RM4Z is a plunge mill for high efficiency vertical machining such as slotting and pocketing in roughing applications
- Rich mill series RM4Z is a highly efficient milling tool for plunging, shouldering and facing. It makes operations more economical with the use of its double-sided 4-corner insert
- Plunge machining reduces lead time for high productivity and precision machining.
- In plunging the max depth of RM4Z 3000 type is 0.354 inch and that of RM4Z 4000 type is 0.551 inch

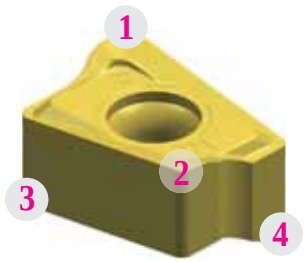


Through coolant system
- Improving chip control
  Cooling inserts increases tool life

Wide chip pocket

Screw on system

Improving chip evacuation

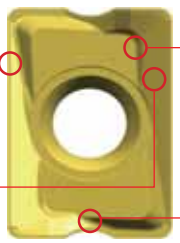


- Double-sided insert ···› 4 corner available
- High rake angle chip breaker and cutting-edge
- Various available machining types
- High efficiency and economical insert
- Negative type insert - Strong cutting-edge

Features of insert

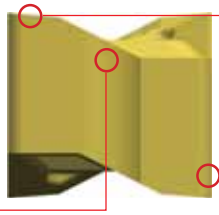
Major cutting-edge
- High rake cutting-edge
- Sharp cutting-edge

Chip breaker
- High rake angle
- Control chip flow



Step design
- Improving chip control
- Reducing cutting load

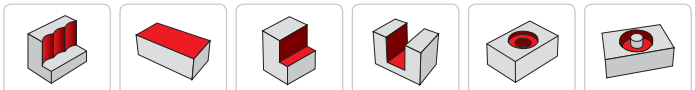
Concave design
- 4 corner available
- Avoiding interference of cutting-edges



Minor cutting-edge
- Special design for plunge machining

Sides
- Negative type
- Strong cutting-edge

Uses

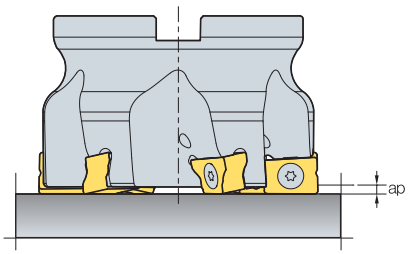


Plunging | Facing | Shouldering | Slotting | Counter Boring | Helical cutting

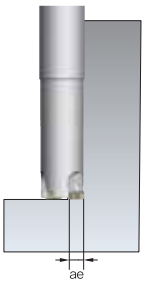
Rich Mill RM4Z

The depth of cut by machining type

• In horizontal machining, Depth of cut = ap (inch)

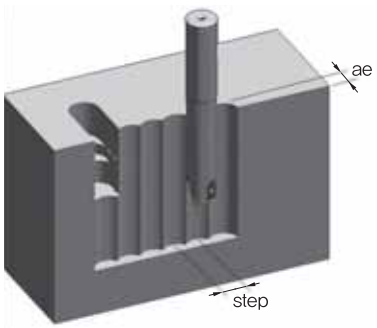


• In plunging, Depth of cut = ae (inch)



RM4Z	Horizontality	Verticality	
	max ap (inch)	max ae (inch)	step
RM4Z 3000	0.059	0.354	< 0.7D
RM4Z 4000	0.098	0.551	< 0.7D

Max Step in plunging

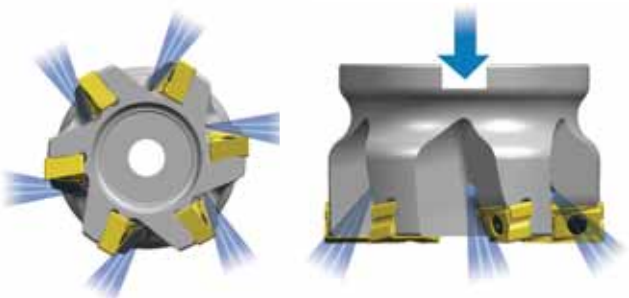


ae	Cutter Diameter (inch)						
	1.00	1.25	1.50	2.00	2.50	3.00	4.00
	max step (inch)						
0.039	0.386	0.433	0.476	0.555	0.622	0.681	0.787
0.079	0.535	0.606	0.783	0.776	0.870	0.957	1.110
0.118	0.642	0.728	0.807	0.941	1.059	1.165	1.350
0.157	0.724	0.827	0.917	1.075	1.215	1.335	1.555
0.197	0.791	0.909	1.012	1.189	1.346	1.484	1.728
0.236	0.846	0.976	1.091	1.287	1.461	1.614	1.882
0.276	0.890	1.035	1.161	1.378	1.563	1.732	2.024
0.315	0.925	1.083	1.220	1.457	1.657	1.839	2.154
0.354	0.953	1.126	1.272	1.524	1.740	1.933	2.272
0.394	-	-	-	-	1.819	2.024	2.382
0.433	-	-	-	-	1.890	2.106	2.484
0.472	-	-	-	-	0.776	2.185	2.579
0.512	-	-	-	-	2.016	2.256	2.669
0.551	-	-	-	-	2.071	2.323	2.756

Through coolant system

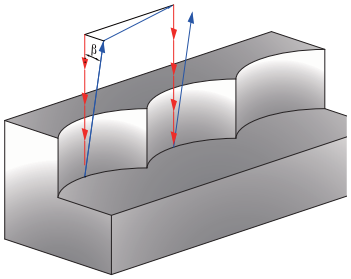
- Exclusive hexagonal coolant socket bolt provides excellent cooling and chip evacuation
- Direct coolant injection to cutting-edge improves cooling effectiveness
- Coolant type arbor should be used

* Coolant bolt is not included, it is for sale



Rich Mill RM4Z

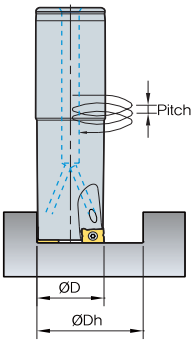
Programming tip

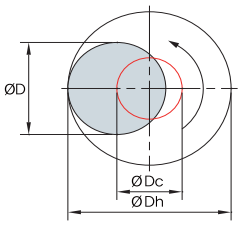


Plunging feed direction
Tool escape
β Escape angle (β ≥ 1°)

• When your tool steps back after plunging, please get over 1° more escape angle

Helical machining





ØDc = ØDh-ØD

ØDc = Tool center path
ØDh = Desired hole diameter
ØD = Tool Dia.

Designation		Diameter ØD (inch)	Helical data			
			ØDh max (inch)	Max. Pitch (inch)	ØDh min (inch)	Max. Pitch (inch)
RM4ZSA	3100HR-L100	1.00	1.921	0.075	1.213	0.017
	3125HR-L125	1.25	2.421	0.038	1.674	0.013
	3150HR-L125	1.50	2.921	0.023	2.174	0.011
RM4ZCA	3150HR	1.50	2.921	0.023	2.174	0.011
	3200HR	2.00	3.921	0.021	3.174	0.012
RM4ZMA	3100HR-M12	1.00	1.921	0.075	1.213	0.017
	3125HR-M16	1.25	2.421	0.038	1.674	0.013
	3150HR-M16	1.50	2.921	0.023	2.174	0.011
RM4ZCA	4250HR	2.50	4.921	0.039	3.780	0.021
	4300HR	3.00	5.921	0.032	4.780	0.019
	4400HR	4.00	7.921	0.021	6.780	0.015

Recommended cutting condition

(inch)

ISO	Grades	LNM(E)X100605PNL-MM				LNM(E)X151008PNL-MM			
		vc (sfm)	fz (ipt)	* max ae (inch)	** max ap (inch)	vc (sfm)	fz (ipt)	* max ae (inch)	** max ap (inch)
P	PC3500	350~820	0.010~0.002	0.354	0.059	400~820	0.010~0.002	0.551	0.098
M	PC5300	270~600	0.008~0.002			330~600	0.008~0.002		
K	PC6510	350~820	0.012~0.003			400~820	0.012~0.003		

* max ae (inch): (Plunging) max. radial depth of cut

** max ap (inch): (Shouldering/Facing) max depth of cut

Rich Mill RM6

Features

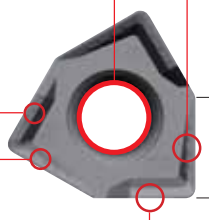
- Stable clamping- 3 clamping surfaces on the side and strong clamping screws
  → Improves cutting stability
- High quality results- High precision, excellent perpendicularity, outstanding surface finish on the flank, accurate tolerance
- High productivity- High rake angle and sharp cutting-edges for lower cutting resistance
  → Ideal for high speed and high feed machining

Features of insert

Higher clamping stability
- Wide clamping areas and strong clamping screws for rigid clamping

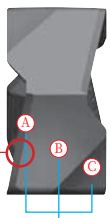
High rake angle chip breaker
- Maintains stable clamping
- Induces smooth chip flow
  → Increases insert life

Wide minor cutting-edges
- Improved surface finish
- Enable multi-purpose machining incl. plunging



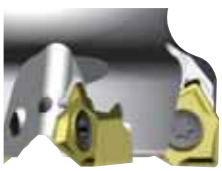
MAX. ap
WNGX08: 0.323 inch
WNGX04: 0.157 inch

High rake cutting-edges
- Improved machinability and reduces cutting resistance

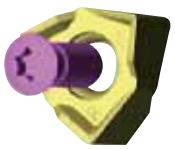


3-level flank relief surface
- Enhances rigidity and enables stable clamping
  → Improves cutting stability

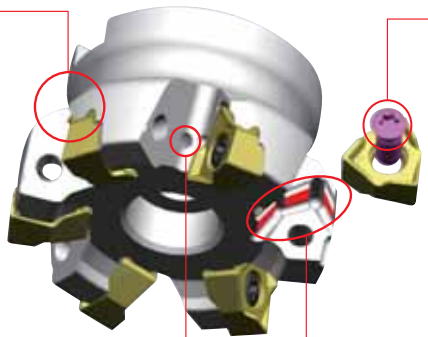
Features of cutter

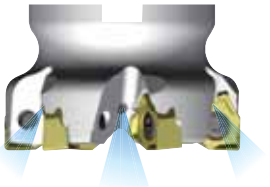


Streamlined holder design
- Improved chip evacuation in deep shouldering and slotting



Strong clamping screws
- Strong clamping screws enable rigid clamping





Through coolant system
- Improved chip flow and tool life thanks to insert cooling



3-side supporting system
- Stable tool life

Rich Mill RM6

Features of chip breakers

Insert		Cutting-edge	Features
For aluminum **MA**			• Sharp cutting-edges for excellent cutting performance in aluminum machining • Buffed surface for excellent chip flow and welding resistance
For light cutting **ML**			• Chip breaker design of low cutting resistance, ideal for light cutting and machining hard-to-cut materials • Excellent tool life and quality results
For general cutting **MM**			• Chip breaker design ideal for general shoulder milling and most applications

Application guideline for grade

Workpiece		P		M	K	N
		Carbon steel	Alloy steel	Stainless steel	Cast iron	Non ferrous metal
Shape	1st recommended	MM	MM	ML	ML	MA
	2nd recommended	ML	ML	-	MM	-
Grades	High speed milling	PC3600	PC3600	PC5300	PC6510	H01
	General milling	PC5400	PC5300	PC5400	PC5300	H01
	Interrupted milling	PC5400	PC5400	PC5400	PC5400	H01

Recommended cutting condition

• WNGX04

Workpiece		Grades	WNGX040304PNSR-MM			WNGX040304PNER-ML			WNGX040304PNFR-MA		
			vc (sfm)	fz (ipt)	max. ap(inch)	vc (sfm)	fz (ipt)	max. ap (inch)	vc (sfm)	fz (ipt)	max. ap (inch)
P	Steel	PC3600	525~886	0.010~0.002	0.169	525~886	0.008~0.002	0.169	-	-	0.169
		PC5300	492~787	0.010~0.002	0.169	492~787	0.010~0.002	0.169	-	-	0.169
		PC5400	427~689	0.010~0.002	0.169	427~689	0.010~0.002	0.169	-	-	0.169
M	Stainless steel	PC5300	295~492	0.008~0.002	0.169	295~492	0.004~0.002	0.169	-	-	0.169
		PC5400	230~394	0.008~0.002	0.169	230~394	0.004~0.002	0.169	-	-	0.169
K	Cast iron	PC6510	459~755	0.012~0.008	0.169	459~755	0.010~0.008	0.169	-	-	0.169
		PC5300	394~656	0.012~0.008	0.169	394~656	0.010~0.008	0.169	-	-	0.169
N	Nonferrous metal	H01	-	-	0.169	-	-	0.169	1640~3281	0.008~0.002	0.169

※ The above data refer to general cutting conditions and can be adjustable up to 984 sfm and 0.016 ipt depending on user environment.

• WNGX08

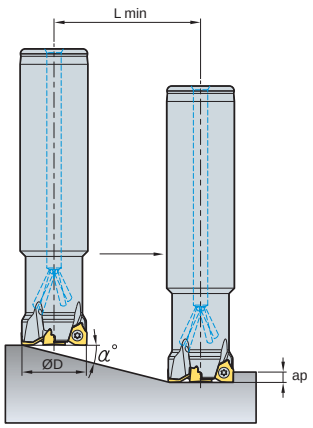
Workpiece		Grades	WNGX080608PNSR-MM			WNGX080608PNER-ML			WNGX080608PNFR-MA		
			vc (sfm)	fz (ipt)	max. ap (inch)	vc (sfm)	fz (ipt)	max. ap (inch)	vc (sfm)	fz (ipt)	max. ap (inch)
P	Steel	PC3600	525~886	0.010~0.002	0.323	525~886	0.008~0.002	0.323	-	-	0.323
		PC5300	492~787	0.010~0.002	0.323	492~787	0.010~0.002	0.323	-	-	0.323
		PC5400	427~689	0.010~0.002	0.323	427~689	0.010~0.002	0.323	-	-	0.323
M	Stainless steel	PC5300	295~492	0.008~0.002	0.323	295~492	0.004~0.002	0.323	-	-	0.323
		PC5400	230~394	0.008~0.002	0.323	230~394	0.004~0.002	0.323	-	-	0.323
K	Cast iron	PC6510	459~755	0.012~0.008	0.323	459~755	0.010~0.008	0.323	-	-	0.323
		PC5300	394~656	0.012~0.008	0.323	394~656	0.010~0.008	0.323	-	-	0.323
N	Nonferrous metal	H01	-	-	0.323	-	-	0.323	1640~3281	0.002~0.008	0.323

※ The above data refer to general cutting conditions and can be adjustable up to 984sfm and 0.016ipt depending on user environment.

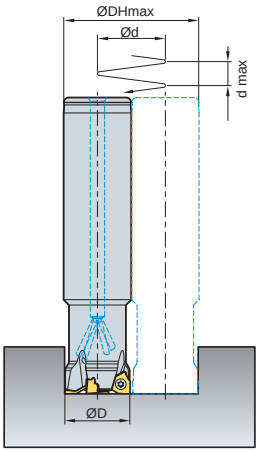
Rich Mill RM6

Ramping

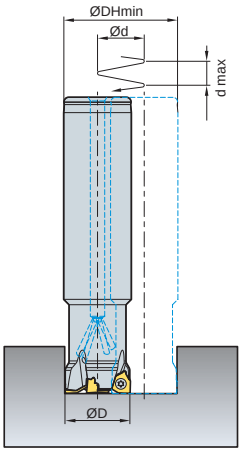
1. Ramping



2. Helical cutting for blind holes



3. Helical cutting for through holes



(inch)

Designation		Tool Dia. ØD	Depth of cut ap	1. Ramping		2. Helical cutting for blind holes				3. Helical cutting for through holes	
				Max. rake angle α°	Lmin	Min. machining Dia. Ø DHmin	Max. pitch dmax	Max. machining Dia. Ø DHmax	Max. pitch dmax	Min. machining Dia. Ø DHmin	Max. pitch dmax
RM6PS	125R-2W125-500-WN08	Ø1.25	0.315	0.8	22.6	2.1	0.03	2.43	0.05	1.476	0.02
	150R-3W125-500-WN08	Ø1.50	0.315	0.5	36.1	2.6	0.03	2.93	0.03	1.976	0.01
	200R-4W125-500-WN08	Ø2.00	0.315	0.3	60.2	3.6	0.02	3.93	0.03	2.976	0.01
RM6PCM	250R-100-6-WN08	Ø2.50	0.315	0.2	90.3	4.6	0.02	4.93	0.02	3.976	0.01
	300R-100-7-WN08	Ø3.00	0.315	0.2	90.3	5.6	0.03	5.93	0.03	4.976	0.01
	400R-150-8-WN08	Ø4.00	0.315	0.1	180.5	7.6	0.02	7.93	0.02	6.976	0.01
	500R-150-11-WN08	Ø5.00	0.315	0.1	180.5	9.6	0.02	9.93	0.02	8.976	0.01

Lmin = ap/tan (α°)

Lmin: Cutting length at min. rake angle
ap: Axial depth of cut
α°: Available rake angle for ramping

Rich Mill RM8

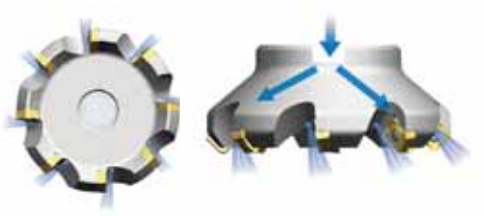
Features

- Double-sided insert to use 8 cutting-edges
- Innovative double-sided insert makes it possible to use 8 cutting-edges
  It is more economical than conventional single sided insert
- The unique geometry and high rake angle of cutting-edge guarantees excellent surface finish
  Applicable for various workpieces like steel, stainless steel, cast iron, aluminum
- Combined with the innovative geometry and various grades
  provided the tool offers durability and excellent tool life
- Various pitches and chip breakers can be applicable for diverse machining
- Light Rich mill cutter can be useful for high speed machining and low power machine



Through coolant system

- Exclusive coolant bolt is adapted to get better chip evacuation and more powerful cooling. To get optimal chip evacuation, the direction of coolant injection has been designed to reach to each cutting-edge directly. Through coolant arbor is required

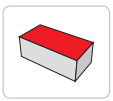


Through coolant system for decreasing cutting heat and good chip evacuation

Features of chip breaker

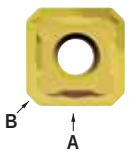
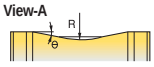
Insert		Cutting-edge	Features
For aluminum **MA**			• Due to sharp cutting-edge and buffed surface, it has good chip flow and welding resistance
For hard-to-cut material **ML**			• Chip breaker with low cutting load is optimal for machining hard-to-cut materials
For light cutting **MF**			• Due to low cutting load, it is good for light cutting and difficult-to-cut material
For general cutting **MM**			• It is suitable design for general milling
For wiper **W**			• Specialized edge design can be suitable for excellent surface roughness operation

Uses



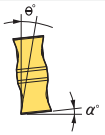
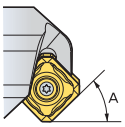
Facing

Features of insert

Insert	Cutting-edge	Features
	View-A 	High rake chip breaker & positive setting angle for low cutting load
	View-B 	Designed wiper technology in minor cutting-edge for improved surface roughness
	Chip breaker 	Low cutting load due to the positive setting and high rake angle chip breaker

Rich Mill RM8

Setting Configuration

Shape	Setting angle of insert	Features
		High rake angle makes positive setting angle for low cutting load
		Suitable for facing and chamfering • RM8A A = 45° • RM8E A = 15° • RM8Q A = 2°

Recommended cutting condition

(inch)

ISO	Grades	SNM(E)X1206A(E)NN-MF		SNM(E)X1206A(E)NN-MM		SNEX1206A(E)NN-MA		Max-ap	SNM(E)X1507A(E)NN-MF		SNM(E)X1507A(E)NN-MM		Max-ap
		vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)		vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	
P	NC5330	-	-	490~985	0.014~0.004	-	-	RM8A 0.236 RM8E 0.354 RM8Q 0.453	-	-	490~985	0.014~0.004	RM8A 0.295 RM8E 0.433
P	NCM325	655~985	0.012~0.002	490~985	0.014~0.004	655~1150	0.010~0.001		655~985	0.012~0.002	490~985	0.014~0.004	
P	PC3500	655~985	0.012~0.002	490~985	0.014~0.004	655~1150	0.010~0.001		655~985	0.012~0.002	490~985	0.014~0.004	
M	PC6510	490~985	0.014~0.003	490~985	0.016~0.004	-	-		490~985	0.014~0.003	490~985	0.016~0.004	
M	PC5300	490~985	0.014~0.003	490~985	0.016~0.004	-	-		490~985	0.014~0.003	490~985	0.016~0.004	
K	PC9530	330~590	0.002	390~590	0.014~0.004	390~955	0.008~0.001		-	-	-	-	
K	PC5300	-	-	-	-	-	-		330~590	0.002	390~590	0.014~0.004	

Rich Mill RMH8

Screw on clamping system

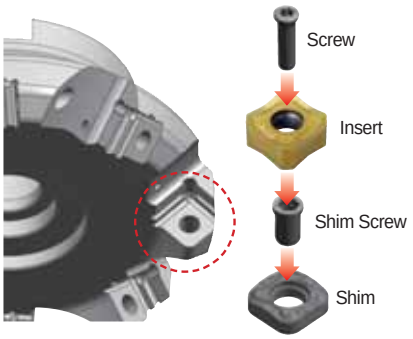
• Adaptable and Stable clamping system

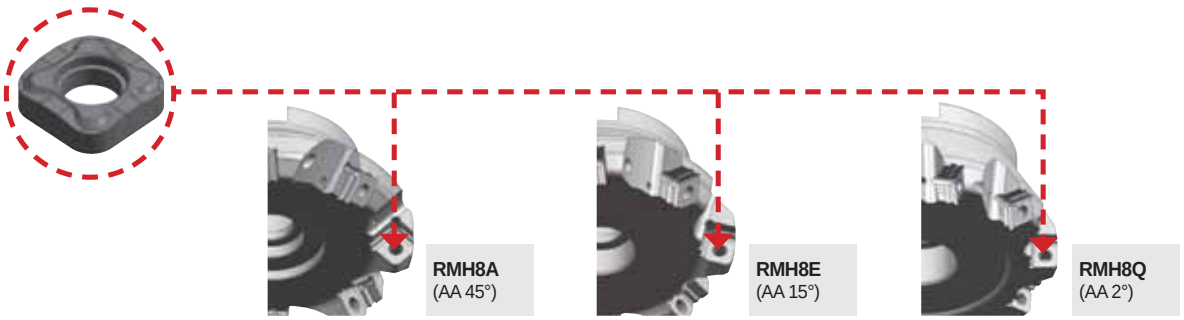
Reinforced rigidity and enhanced clamping power

• Appling shim system, prevent cutter damage when insert breaks

Adapting/exchangeable shim

• Using various kinds of cutter (Approach angle 45°, 15°, 2°)
• Stable clamping power with insert



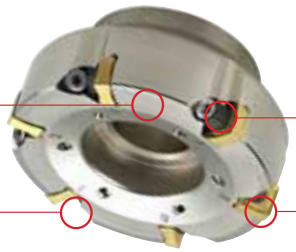


Rich Mill RMT8

Features

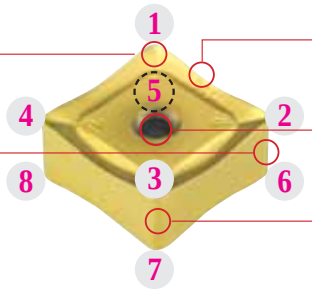
- New latch clamping system provides a powerful cutting force and an easy insert change
- New grades with chipping resistance provides good surface roughness and better tool life
- Due to the specially designed chip breaker, all operations are possible
- RMT with various pitches can replace conventional ISO milling tool

Features of cutter



- High rigid cutter body to improve durability
- The 3-dimensional chip pocket design for smooth chip control
- New latch clamping system ensures the powerful cutting force and easy to insert change
- Economical 8 corners with a double-sided insert

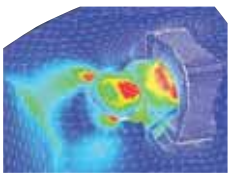
Features of insert (using R/L)



- Economical 8 corners
- Coated grades with improved chipping resistance
- Low cutting load due to high rake angle chip breaker
- The chamber shape for stable clamping
- Optimal design of minor cutting-edge to use in R/L cutting type good surface roughness

Clamping force analysis





Features of chip breakers

Insert		Cutting-edge	Features
For fine finishing **MF**			• Our specialized insert design creates low cutting forces suitable for light cutting, HRSA
For strengthen **MM**			• Suitable geometry design for general milling has wider ranges of machining

Recommended grades and chip breakers

ISO	Grades	MM	MF
P	NCM325	◎	○
	PC5300	◎	○
M	PC9530	○	◎
K	PC6510	○	◎

◎: Optimum ○: Proper

Recommended cutting condition

ISO	Grades	MM		MF	
		vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)
P	NC5330	620~1010	0.014~0.004	620~1010	0.012~0.002
	NCM325	520~880	0.014~0.004	520~880	0.012~0.002
	PC3500	420~680	0.014~0.004	420~680	0.012~0.002
M	PC9530	290~490	0.012~0.002	290~490	0.012~0.002
K	PC6510	450~750	0.016~0.004	450~750	0.014~0.003

Rich Mill RM16

Features

- Economical 16 cutting-edges
- Reduces cost in medium cutting
- Wiper insert can be used for good surface roughness
- Optimal matching of the special cutting-edge geometry with variety of new grades provides consistence & long tool
- When it is used 16 corners, maximum cutting depth is 0.22 inch, but it is used 8 corners, maximum cutting depth is 0.51 inch
- Wiper insert is placed 0.002 inch lower than facing insert in cutter
- When feed is bigger than wiper cutting-edge length (0.28 inch), 2 wiper inserts are placed in symmetrical position

Features of chip breakers

Insert		Cutting-edge	Features
For aluminum cutting light **MA**			• With sharp edge application, the better productivity has been accomplished, especially for Aluminum cutting
For hard-to-cut material **ML**			• Chip breaker with low cutting load is optimal for machining hard-to-cut materials
For light cutting **MF**			• Due to low cutting load, it is good for light cutting and difficult-to-cut material
For general cutting **MM**			• It is suitable design for general milling
For wiper **W**			• It has better surface roughness than MM and MF chip breakers

Instruction for wiper insert

Hand	Correct setting	Incorrect setting			
Right hand					
Decision	○	×	×	×	×
Left hand					
Decision	○	×	×	×	×

Through coolant system

- Well designed chip pocket for better chip flow
- Through coolant system reduces cutting heat and improves chip evacuation



Recommended cutting condition

(inch)

ISO	Grades	ONM(H)X060608-MM		ONM(H)X060608-MF		ONHX060608-W		ONM(H)X080608-MM		ONM(H)X080608-MF		ONHX080608-W	
		vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)
P	NCM325	500~990	0.014~0.004	660~990	0.012~0.002	660~990	0.008~0.002	500~990	0.016~0.004	660~990	0.014~0.002	660~990	0.010~0.002
P	PC3500	500~990	0.014~0.004	660~990	0.012~0.002	660~990	0.008~0.002	500~990	0.016~0.004	660~990	0.014~0.002	660~990	0.010~0.002
M	PC9530	400~590	0.014~0.004	330~590	0.012~0.002	330~590	0.008~0.002	400~590	0.016~0.004	330~590	0.014~0.002	330~590	0.010~0.002
K	PC6510	500~990	0.016~0.004	500~990	0.014~0.003	500~990	0.010~0.002	500~990	0.018~0.004	500~990	0.016~0.003	500~990	0.012~0.002

Cutters

Type	A.A	Designation	Shape	Cutter Diameter	Application			Features	Page
RM3	0°	RM3PCA3000 new		Ø1.5~Ø3	XNKT060405PNER-ML	XNKT060405PNSR-MM		• Economical 3 corners. • Perfect perpendicularity • Longer tool life due to direct injection into the cutting-edge of insert	E85
		RM3PCA4000 new		Ø1.5~Ø5	XNCT080508PNFR-MA XNKT080508PNER-ML XNKT080508PNSR-MM	XNKT080512PNSR-MM XNKT080516PNSR-MM XNKT080520PNSR-MM			E86
		RM3PCA5000 new		Ø3~Ø5	XNCT120608PNER-MA XNKT120608PNER-ML XNKT120612PNER-ML XNKT120616PNER-ML XNKT120620PNER-ML	XNKT120608PNSR-MM XNKT120612PNSR-MM XNKT120616PNSR-MM XNKT120620PNSR-MM			E87
RM4	0°	RM4PCA3000		Ø1.5~Ø4	LNEX100605PNR-MF LNMX100605aPNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM		• Economical 4 corners. • Screw on type for slotting, facing.	E91
		RM4PCA4000		Ø2~Ø6	LNEX151004PNR-MF LNMX151004PNR-MF LNEX151004PNR-MM LNMX151004PNR-MM LNEX151008PNR-MF LNMX151008PNR-MF LNEX151008PNR-MM LNMX151008PNR-MM	LNEX151016PNR-MF LNMX151016PNR-MF LNEX151016PNR-MM LNMX151016PNR-MM LNEX151004PNR-MA LNEX151008PNR-MA LNEX151008PNL-MM LNMX151008PNL-MM			E92
		RM4ZCA3000		Ø1.5~Ø2	LNEX100605PNL-MM	LNMX100605PNL-MM		• Economical 4 corners. • Optimal insert application for vertical machining	E104
		RM4ZCA4000		Ø2.5~Ø4	LNEX151008PNL-MM	LNMX151008PNL-MM			
RM6	0°	RM6PCM-WN04 new		Ø1.5~Ø2.5	WNGX040304PNFR-MA WNGX040308PNFR-MA WNGX040312PNFR-MA WNGX040316PNFR-MA WNGX040304PNER-ML WNGX040308PNER-ML	WNGX040312PNER-ML WNGX040316PNER-ML WNGX040304PNSR-MM WNGX040308PNSR-MM WNGX040312PNSR-MM WNGX040316PNSR-MM		• Improved productivity and high-quality shouldering through high speed and high feed machining	E106
		RM6PCA-WN08 new		Ø2.0~Ø5.0	WNGX080604PNFR-MA WNGX080608PNFR-MA WNGX080612PNFR-MA WNGX080616PNFR-MA WNGX080620PNFR-MA WNGX080604PNER-ML WNGX080608PNER-ML WNGX080612PNER-ML	WNGX080616PNER-ML WNGX080620PNER-ML WNGX080604PNSR-MM WNGX080608PNSR-MM WNGX080612PNSR-MM WNGX080616PNSR-MM WNGX080620PNSR-MM			E107
RM8	45°	RM8ACA4000		Ø2~Ø10	SNEX1206ANN-MA SNEX1206ANN-MF SNMX1206ANN-MF SNEX1206ANN-ML	SNEX1206ANN-MM SNMX1206ANN-MM SNEX1206ANN-W		• Economical 8 corners. • Low cutting load and excellent smooth cutting.	E111
		RM8ACA5000		Ø3~Ø12	SNEX1507ANN-MF SNMX1507ANN-MF SNEX1507ANN-ML	SNEX1507ANN-MM SNMX1507ANN-MM			E113

Cutters

Type	A.A	Designation	Shape	Cutter Diameter	Application			Features	Page
RM8	15°	**RM8ECA4000**		Ø2~Ø8	SNEX1206ENN-MA SNEX1206ENN-MF SNMX1206ENN-MF	SNEX1206ENN-ML SNEX1206ENN-MM SNMX1206ENN-MM		• Economical 8 corners. • Low cutting load and excellent smooth cutting.	E115
		RM8ECA5000		Ø3~Ø12	SNEX1507ENN-MF SNMX1507ENN-MF SNEX1507ENN-ML	SNEX1507ENN-MM SNMX1507ENN-MM			E117
	2°	**RM8QCA4000**		Ø2.5~Ø8	SNEX1206QNN-MA SNEX1206QNN-MF SNMX1206QNN-MF SNEX1206QNN-ML SNEX1206QNN-MM SNMX1206QNN-MM	SNEX120612-MA SNEX120612-MF SNMX120612-MF SNEX120612-ML SNEX120612-MM SNMX120612-MM			E119
	45°	**RMH8ACA4000**		Ø3~Ø15	SNEX1206ANN-MA SNEX1206ANN-MF SNMX1206ANN-MF	SNEX1206ANN-ML SNEX1206ANN-MM SNMX1206ANN-MM SNEX1206ANN-W			E112
		RMH8ACA5000		Ø3~Ø15	SNEX1507ANN-MF SNMX1507ANN-MF SNEX1507ANN-ML	SNEX1507ANN-MM SNMX1507ANN-MM			E114
	15°	**RMH8ECA4000**		Ø3~Ø15	SNEX1206ENN-MA SNEX1206ENN-MF SNMX1206ENN-MF	SNEX1206ENN-ML SNEX1206ENN-MM SNMX1206ENN-MM			E116
		RMH8ECA5000		Ø3~Ø15	SNEX1507ENN-MF SNMX1507ENN-MF SNEX1507ENN-ML	SNEX1507ENN-MM SNMX1507ENN-MM			E118
	2°	**RMH8QCA4000**		Ø3~Ø8	SNEX1206QNN-MA SNEX1206QNN-MF SNMX1206QNN-MF SNEX1206QNN-ML SNEX1206QNN-MM SNMX1206QNN-MM	SNEX120612-MA SNEX120612-MF SNMX120612-MF SNEX120612-ML SNEX120612-MM SNMX120612-MM			E120
	45°	**RMT8AA 4000/5000**		Ø3~Ø12	SNCF1206ANN-MF SNCF1507ANN-MF SNMF1206ANN-MF SNMF1507ANN-MF	SNCF1206ANN-MM SNCF1507ANN-MM SNMF1206ANN-MM SNMF1507ANN-MM		• Economical 8 corners. • Excellent tool life and surface toughness due to low cutting resistance and high rake edge geometry. • Good performance with increased chipping resistance and grade	E121 E122
	15°	**RMT8EA 4000/5000**		Ø3~Ø12	SNCF1206ENN-MF SNCF1507ENN-MF SNMF1206ENN-MF SNMF1507ENN-MF	SNCF1206ENN-MM SNCF1507ENN-MM SNMF1206ENN-MM SNMF1507ENN-MM			E123 E124
	2°	**RMT8QA4000**		Ø3~Ø12	SNCF1206QNN-MF	SNMF1206QNN-MF			E125

Shanks / Modulars

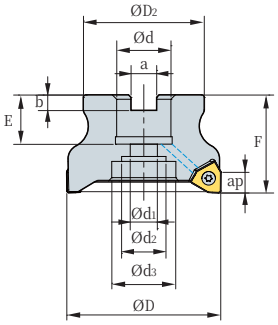
Type	A.A	Designation	Shape	Cutter Diameter	Application			Features	Page
RM16	45°	**RM16ACA 6000/8000**		Ø2.5~Ø8	ONHX060608-MF ONMX060608-MF ONHX0606ANN-MF ONMX0606ANN-MF ONHX080608-MF ONMX080608-MF ONHX0806ANN-MF ONMX0806ANN-MF ONHX060608-ML ONHX080608-ML ONHX060608-MM	ONMX060608-MM ONHX0606ANN-MM ONMX0606ANN-MM ONHX080608-MM ONMX080608-MM ONHX0806ANN-MM ONMX0806ANN-MM ONHX060608-MA ONHX060608-W ONHX080608-MA ONHX080608-W		• Economical 16 corners. • Wiper insert for surface roughness.	E126 E127
RM3	0°	**RM3PSA3000** new		Ø0.75~Ø1.5	XNKT060405PNER-ML	XNKT060405PNSR-MM		• Economical 3 corners. • Perfect perpendicular shouldering operation multi milling tool	E88
		RM3PSA4000 new		Ø1.25~Ø2.5	XNKT080508PNER-ML XNKT080508PNSR-MM XNKT080512PNSR-MM	XNKT080516PNSR-MM XNKT080520PNSR-MM			E89
		RM3PMA 3000/4000 new		Ø0.75~Ø2	XNKT060405PNER-ML XNKT060405PNSR-MM XNKT060408PNER-ML XNKT060408PNSR-MM XNCT080504PNFR-MA XNCT080508PNFR-MA XNCT080512PNFR-MA XNCT080520PNFR-MA	XNKT080508PNER-ML XNKT080508PNSR-MM XNKT080512PNER-ML XNKT080512PNSR-MM XNKT080516PNER-ML XNKT080516PNSR-MM XNKT080520PNER-ML XNKT080520PNSR-MM			E90
RM4	0°	**RM4PSA3000**		Ø0.562~Ø2	LNEX100605PNR-MF LNMX100605PNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM		• Economical 4 corners. • Screw on type for slotting, facing.	E101
		RM4PSA4000		Ø1.25~Ø2.5	LNEX151004PNR-MF LNMX151004PNR-MF LNEX151004PNR-MM LNMX151004PNR-MM LNEX151008PNR-MF LNMX151008PNR-MF LNEX151008PNR-MM LNMX151008PNR-MM	LNEX151016PNR-MF LNMX151016PNR-MF LNEX151016PNR-MM LNMX151016PNR-MM LNEX151004PNR-MA LNEX151008PNR-MA LNEX151008PNL-MM LNMX151008PNL-MM			E102
		RM4ZSA3000		Ø1~Ø1.5	LNEX100605PNL-MM	LNMX100605PNL-MM		• Economical 4 corners. • Optimal insert application for vertical machining	E105

Shanks / Modulars

Type	A.A	Designation	Shape	Cutter Diameter	Application		Features	Page
RM4	0°	**RM4PMA3000**		Ø0.562~Ø2	LNEX100605PNR-MF LNMX100605PNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM	• Economical 4 corners. • Screw on type for slotting, facing.	E103
	0°	**RM4ZMA3000**		Ø1~Ø1.5	LNEX100605PNL-MM	LNMX100605PNL-MM	• Economical 4 corners. • Optimal insert application for vertical machining	E105
RM6	0°	**RM6PSA-WN04** new		Ø0.75~Ø1.25	WNGX040304PNFR-MA WNGX040308PNFR-MA WNGX040312PNFR-MA WNGX040316PNFR-MA WNGX040304PNER-ML WNGX040308PNER-ML	WNGX040312PNER-ML WNGX040316PNER-ML WNGX040304PNSR-MM WNGX040308PNSR-MM WNGX040312PNSR-MM WNGX040316PNSR-MM	• Improved productivity and high-quality shouldering through high speed and high feed machining	E108
	0°	**RM6PSA-WN08** new		Ø1.25~Ø2	WNGX080604PNFR-MA WNGX080608PNFR-MA WNGX080612PNFR-MA WNGX080616PNFR-MA WNGX080620PNFR-MA WNGX080604PNER-ML WNGX080608PNER-ML WNGX080612PNER-ML	WNGX080616PNER-ML WNGX080620PNER-ML WNGX080604PNSR-MM WNGX080608PNSR-MM WNGX080612PNSR-MM WNGX080616PNSR-MM WNGX080620PNSR-MM		E109
	0°	**RM6PMA-WN04** new		Ø0.75~Ø1.25	WNGX040304PNFR-MA WNGX040308PNFR-MA WNGX040312PNFR-MA WNGX040316PNFR-MA WNGX040304PNER-ML WNGX040308PNER-ML	WNGX040312PNER-ML WNGX040316PNER-ML WNGX040304PNSR-MM WNGX040308PNSR-MM WNGX040312PNSR-MM WNGX040316PNSR-MM	• Economical 4 corners. • Optimal insert application for vertical machining	E110
	0°	**RM6PMA-WN08** new		Ø1.25~Ø1.5	WNGX080604PNFR-MA WNGX080608PNFR-MA WNGX080612PNFR-MA WNGX080616PNFR-MA WNGX080620PNFR-MA WNGX080604PNER-ML WNGX080608PNER-ML WNGX080612PNER-ML	WNGX080616PNER-ML WNGX080620PNER-ML WNGX080604PNSR-MM WNGX080608PNSR-MM WNGX080612PNSR-MM WNGX080616PNSR-MM WNGX080620PNSR-MM		

RM3PCA3000 new





AA 0°

- AR: -5°
- RR: -9°~ -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
RM3PCA	3150HR	5	1.50	1.417	0.50	0.287	0.430	-	0.252	0.170	0.630	1.50	0.315	0.441
	3150HR-M	6	1.50	1.417	0.50	0.287	0.430	-	0.252	0.170	0.630	1.50	0.315	0.441
	3200HR	6	2.00	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.315	0.661
	3200HR-M	7	2.00	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.315	0.661
	3250HR	7	2.50	2.205	1.00	0.551	0.827	-	0.374	0.248	0.787	1.75	0.315	1.080
	3250HR-M	8	2.50	2.205	1.00	0.551	0.827	-	0.374	0.248	0.787	1.75	0.315	1.080
	3300HR	8	3.00	2.205	1.00	0.551	0.866	-	0.374	0.248	0.787	2.00	0.315	1.918
	3300HR-M	10	3.00	2.205	1.00	0.551	0.866	-	0.374	0.248	0.787	2.00	0.315	1.940

Available Inserts

XNKT-ML



XNKT-MM



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNKT	060405PNER-ML							●		●		●	●	●				E30
	060405PNSR-MM						●	●		●		●	●	●				
	060408PNER-ML									●		●	●	●				
	060408PNSR-MM						●	●		●		●	●	●				

Parts

Specification	Screw	Wrench
Ø1.50~Ø3.00	FTNA0306	TW09S

Available Inserts E30

RM3PCA4000 new



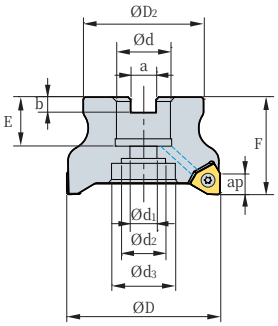


Fig. 1

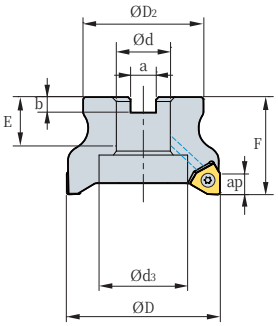


Fig. 2



AA 0°

- AR: -5°
- RR: -8°~ -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Fig.
RM3PCA	4150HR	3	1.5	1.417	0.5	0.287	0.43	-	0.252	0.17	0.63	1.5	0.315	0.45	1
	4150HR-M	4	1.5	1.417	0.5	0.287	0.43	-	0.252	0.17	0.63	1.5	0.315	0.45	1
	4200HR	4	2	1.772	0.75	0.413	0.63	-	0.315	0.22	0.787	1.75	0.315	0.72	1
	4200HR-M	5	2	1.772	0.75	0.413	0.63	-	0.315	0.22	0.787	1.75	0.315	0.72	1
	4250HR	5	2.5	2.205	1	0.551	0.827	-	0.374	0.248	0.787	1.75	0.315	1.15	1
	4250HR-M	6	2.5	2.205	1	0.551	0.827	-	0.374	0.248	0.787	1.75	0.315	1.15	1
	4300HR	5	3	2.205	1	0.551	0.866	-	0.374	0.248	0.787	2	0.315	1.81	1
	4300HR-M	7	3	2.205	1	0.551	0.866	-	0.374	0.248	0.787	2	0.315	1.81	1
	4400HR	7	4	2.874	1.25	0.689	1.024	1.614	0.5	0.319	0.787	2	0.315	3.37	1
	4400HR-M	8	4	2.874	1.25	0.689	1.024	1.614	0.5	0.319	0.787	2	0.315	3.37	1
	4400HR-1.5	7	4	3.386	1.5	-	-	1.969	0.625	0.394	1.181	2	0.315	3.44	2
	4400HR-M-1.5	8	4	3.386	1.5	-	-	1.969	0.625	0.394	1.181	2	0.315	3.44	2
	4500HR	8	5	3.937	1.5	0.827	1.22	1.969	0.626	0.394	1.063	2.5	0.315	7.24	1
	4500HR-M	10	5	3.937	1.5	0.827	1.22	1.969	0.626	0.394	1.063	2.5	0.315	7.30	1

Available Inserts

XNCT-MA



XNKT-ML



XNKT-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNCT	080504PNFR-MA																●	E29 E30
	080508PNFR-MA																●	
	080512PNFR-MA																●	
	080520PNFR-MA																●	
XNKT	080508PNER-ML							●		●		●	●	●				
	080508PNSR-MM						●	●		●		●	●	●				
	080512PNER-ML									●		●	●	●				
	080512PNSR-MM						●	●		●		●	●	●				
	080516PNER-ML									●		●	●	●				
	080516PNSR-MM						●	●		●			●	●				
	080520PNER-ML												●	●				
	080520PNSR-MM						●	●		●		●	●	●				

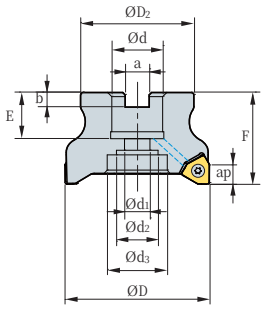
Parts

Specification	Screw	Wrench
Ø1.50~Ø5.00	FTNA0408	TW15S

Available Inserts **E29, E30**

RM3PCA5000 new





AA
0°

- AR: -5°
- RR: -7°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
RM3PCA	5300HR	5	3.00	2.205	1.00	0.551	0.866	1.300	0.374	0.248	0.787	2.0	0.5	1.73
	5300HR-M	7	3.00	2.205	1.00	0.551	0.866	1.300	0.374	0.248	0.787	2.0	0.5	1.76
	5400HR	7	4.00	2.874	1.25	0.689	1.024	1.614	0.500	0.319	0.787	2.0	0.5	3.30
	5400HR-M	8	4.00	2.874	1.25	0.689	1.024	1.614	0.500	0.319	0.787	2.0	0.5	3.33
	5400HR-1.5	7	4.00	2.874	1.50	-	1.500	1.969	0.626	0.394	1.102	2.0	0.5	2.87
	5400HR-M-1.5	8	4.00	2.874	1.50	-	1.500	1.969	0.626	0.394	1.102	2.0	0.5	2.89
	5500HR	8	5.00	3.937	1.50	0.827	1.220	1.969	0.626	0.394	1.063	2.5	0.5	7.01
	5500HR-M	10	5.00	3.937	1.50	0.827	1.220	1.969	0.626	0.394	1.063	2.5	0.5	7.01

Available Inserts

XNCT-MA new | XNKT-ML new | XNKT-MM new

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNCT	120608PNFR-MA																	E29 E30
XNKT	120608PNER-ML									●		●	●	●				
	120608PNSR-MM						●	●		●		●	●	●				
	120612PNER-ML												●	●				
	120612PNSR-MM						●	●		●		●	●	●				
	120616PNER-ML												●	●				
	120616PNSR-MM						●	●					●	●				
	120620PNER-ML												●	●				
	120620PNSR-MM						●	●					●	●				

Parts

Specification	Screw	Wrench
Ø3.00~Ø5.00	FTNA0511	TW20-100

Available Inserts **E29, E30**

RM3PSA3000 new



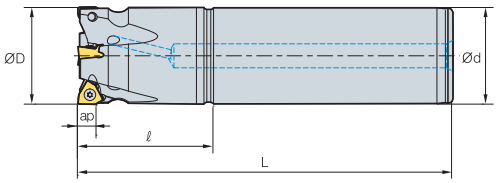


Fig. 1

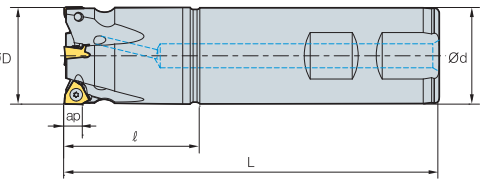
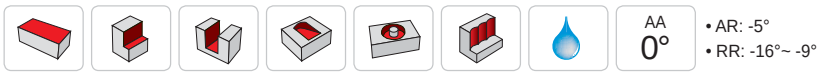


Fig. 2



AA 0°

- AR: -5°
- RR: -16°~ -9°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
RM3PSA	3075HR-2S075	2	0.75	0.75	1.378	3.346	0.22	0.34	1
	3075HR-2M075	2	0.75	0.75	1.378	5.906	0.22	0.62	1
	3075HR-2L075	2	0.75	0.75	1.378	7.874	0.22	0.86	2
	3100HR-2S100	2	1.00	1.00	1.575	3.937	0.22	0.73	1
	3100HR-2M100	2	1.00	1.00	1.575	5.906	0.22	1.12	1
	3100HR-2L100	2	1.00	1.00	1.575	7.874	0.22	1.51	2
	3100HR-3S100	3	1.00	1.00	1.575	3.937	0.22	0.72	1
	3100HR-3M100	3	1.00	1.00	1.575	5.906	0.22	1.11	1
	3100HR-3L100	3	1.00	1.00	1.575	7.874	0.22	1.5	2
	3125HR-4S125	4	1.25	1.25	1.654	3.937	0.22	1.16	1
	3125HR-4L125	4	1.25	1.25	1.654	7.874	0.22	2.47	2
	3150HR-4S125	4	1.50	1.25	1.654	4.331	0.22	1.5	1
	3150HR-4L125	4	1.50	1.25	1.654	7.874	0.22	2.65	2
	3150HR-4L150	4	1.50	1.50	1.654	7.874	0.22	3.57	2
	3150HR-5S125	5	1.50	1.25	1.654	4.331	0.22	1.49	1
	3150HR-5L125	5	1.50	1.25	1.654	7.874	0.22	2.64	2
	3150HR-5L150	5	1.50	1.50	1.654	7.874	0.22	3.57	2

Available Inserts

XNKT-ML



XNKT-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNKT	060405PNER-ML							●		●		●	●	●				E30
	060405PNSR-MM						●	●		●		●	●	●				
	060408PNER-ML									●		●	●	●				
	060408PNSR-MM						●	●		●		●	●	●				

Parts

Specification	Screw	Wrench
Ø0.75~Ø1.50	FTNA0306	TW09S

Available Inserts E30

RM3PSA4000 new



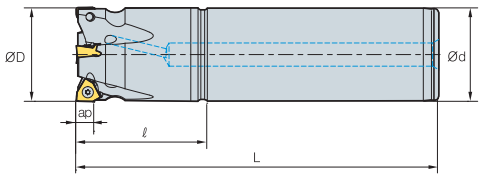


Fig. 1

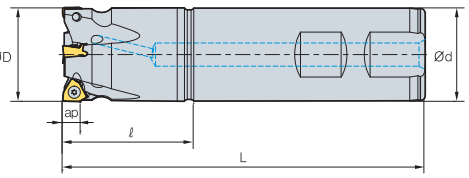


Fig. 2



AA 0°

- AR: -5°
- RR: -11°~ -7°

(inch)

Designation		⊙	ØD	Ød	ℓ	L	ap	lbs	Fig.
RM3PSA	4100HR-2L100	2	1.00	1.00	1.575	7.874	0.315	1.322	1
	4100HR-2S100	2	1.00	1.00	1.575	4.528	0.315	0.816	2
	4100HR-3L100	3	1.00	1.00	1.575	7.874	0.315	1.322	1
	4100HR-3S100	3	1.00	1.00	1.575	4.528	0.315	0.837	2
	4125HR-4L125	4	1.25	1.25	1.654	7.874	0.315	2.491	1
	4125HR-4S125	4	1.25	1.25	1.654	4.922	0.315	1.499	2
	4150HR-4L125	4	1.50	1.25	1.654	7.874	0.315	2.689	1
	4150HR-4S125	4	1.50	1.25	1.654	5.315	0.315	1.786	2
	4200HR-4L125	4	2.00	1.25	1.654	7.874	0.315	3.042	1
	4200HR-4S125	4	2.00	1.25	1.654	5.315	0.315	2.182	2
	4200HR-5L125	5	2.00	1.25	1.654	7.874	0.315	3.086	1
	4200HR-5S125	5	2.00	1.25	1.654	4.331	0.315	2.205	2

Available Inserts

XNCT-MA new | XNKT-ML new | XNKT-MM new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNCT	080504PNFR-MA																●	
	080508PNFR-MA																●	
	080512PNFR-MA																●	
	080520PNFR-MA																●	
XNKT	080508PNER-ML							●		●		●	●	●				
	080508PNSR-MM						●	●		●		●	●	●				E29
	080512PNER-ML									●		●	●	●				E30
	080512PNSR-MM						●	●		●		●	●	●				
	080516PNER-ML									●		●	●	●				
	080516PNSR-MM						●	●		●			●	●				
	080520PNER-ML												●	●				
	080520PNSR-MM						●	●		●		●	●	●				

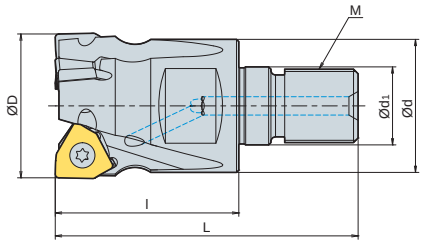
Parts

Specification	Screw	Wrench
Ø1.00~Ø2.00	FTNA0408	TW15S

Available Inserts **E29, E30**

RM3PMA3000/4000 new





AA 0°

- AR: -5°
- RR: -16°~ -7°

(inch)

Designation		⌀	ØD	Ød	Ød1	l	L	M	ap	lbs
RM3PMA	3075HR-2-M10	2	0.75	0.689	0.413	1.181	1.969	M10	0.217	0.13
	3100HR-3-M12	3	1.00	0.906	0.492	1.378	2.283	M12	0.217	0.22
	3125HR-4-M16	4	1.25	1.142	0.669	1.575	2.598	M16	0.217	0.47
	3150HR-5-M16	5	1.50	1.142	0.669	1.575	2.598	M16	0.217	0.58
RM3PMA	4125HR-3-M16	3	1.25	1.142	0.669	1.575	2.598	M16	0.315	0.47
	4150HR-4-M16	4	1.50	1.142	0.669	1.969	2.992	M16	0.315	0.73
	4200HR-5-M16	5	2.00	1.142	0.669	2.165	3.189	M16	0.315	1.09

Available Inserts

XNCT-MA new | XNKT-ML new | XNKT-MM new



Designation			Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
3000 type	XNKT	060405PNER-ML							●		●		●	●	●				E30
		060405PNSR-MM						●	●		●		●	●	●				
		060408PNER-ML									●		●	●	●				
		060408PNSR-MM						●	●		●		●	●	●				
4000 type	XNCT	080504PNFR-MA																●	E29 E30
		080508PNFR-MA																●	
		080512PNFR-MA																●	
		080520PNFR-MA																●	
	XNKT	080508PNER-ML							●		●		●	●	●				
		080508PNSR-MM						●	●		●		●	●	●				
		080512PNER-ML									●		●	●	●				
		080512PNSR-MM						●	●		●		●	●	●				
		080516PNER-ML									●		●	●	●				
		080516PNSR-MM						●	●		●			●	●				
		080520PNER-ML												●	●				
		080520PNSR-MM						●	●		●		●	●	●				

Available adaptor

Designation		Available adaptor
RM3PMA	3075HR-2-M10	MATA-M10
	3100HR-3-M12	MATA-M12
	3125HR-4-M16	MATA-M16
	3150HR-5-M16	MATA-M16
RM3PMA	4125HR-3-M16	MATA-M16
	4150HR-4-M16	MATA-M16
	4200HR-5-M16	MATA-M16

Designation: RM3PMA4125HR-3-M16
Modular head threading measure size (M16)

II

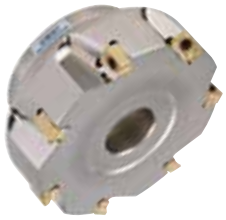
Adaptor spec.: MATA-M16-137-S125S
Adaptor threading measure (M16)

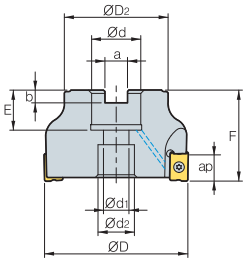
Parts

Specification	Screw	Wrench
Ø0.75~Ø1.50 (3000 type)	FTNA0306	TW09S
Ø1.25~Ø2.00 (4000 type)	FTNA0408	TW15S

Available Inserts E29, E30 Available Adaptor E308~E309

RM4PCA3000





AA
0°

- AR: -6°
- RR: -19°~ -13°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Bolt
RM4PCA	3150HR	4	1.50	1.417	0.50	0.287	0.433	0.250	0.169	0.630	1.50	0.354	0.5	SB0825
	3150HR-M	5	1.50	1.417	0.50	0.287	0.433	0.250	0.169	0.630	1.50	0.354	0.5	SB0825
	3200HR	5	2.00	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.354	0.8	SB1025
	3200HR-M	7	2.00	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.354	0.8	SB1025
	3250HR	7	2.50	2.205	1.00	0.551	0.827	0.375	0.248	0.866	1.75	0.354	1.3	SB1025
	3250HR-M	9	2.50	2.205	1.00	0.551	0.827	0.375	0.248	0.866	1.75	0.354	1.3	SB1025
	3300HR	8	3.00	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.354	2.7	SB1230
	3300HR-M	10	3.00	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.354	2.7	SB1230
	3400HR	9	4.00	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.354	4.3	SB1630
	3400HR-M	12	4.00	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.354	4.2	SB1630

Available Inserts

LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM



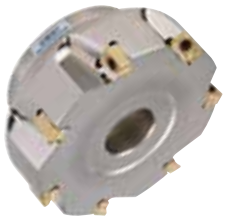
Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF											●	●	●				E10 E11
	100605PNR-MM								●			●	●	●				
	100605PNR-MA																●	
	100605PNL-MM											●	●	●				
	100608PNR-MF								●			●	●	●				
	100608PNR-MM											●	●	●				
LNMX	100605PNR-MF									●		●	●	●				
	100605PNR-MM								●	●	●	●	●	●				
	100608PNR-MF									●		●	●	●				
	100608PNR-MM								●	●			●	●				
	100605PNL-MM								●	●	●	●	●	●				

Parts

Specification	Screw	Wrench
Ø1.50~Ø4.00	FTKA0307	TW09S

Available Inserts **E10, E11**

RM4PCA4000



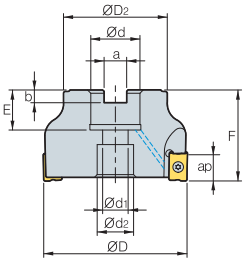


Fig. 1

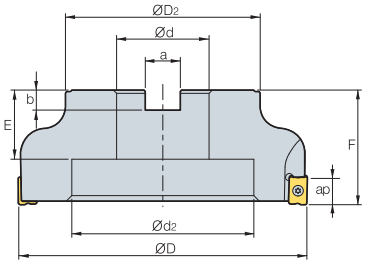


Fig. 2

AA
0°

- AR: -6°
- RR: -19°~ -13°

(inch)

Designation		⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Bolt	Fig.
RM4PCA	4200HR	3	2.00	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.551	0.8	SB1025	1
	4200HR-M	4	2.00	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.551	0.8	SB1025	1
	4250HR	4	2.50	2.205	1.00	0.551	0.827	0.375	0.248	0.866	1.75	0.551	1.2	SB1025	1
	4250HR-M	6	2.50	2.205	1.00	0.551	0.827	0.375	0.248	0.866	1.75	0.551	1.3	SB1025	1
	4300HR	5	3.00	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.551	2.6	SB1230	1
	4300HR-M	7	3.00	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.551	2.5	SB1230	1
	4400HR	5	4.00	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.551	4.0	SB1630	1
	4400HR-M	8	4.00	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.551	4.0	SB1630	1
	4500HR	7	5.00	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.551	8.3	SB2040	1
	4500HR-M	10	5.00	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.551	8.1	SB2040	1
	4600R	8	6.00	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.551	10.5	MBA	2
	4600R-M	11	6.00	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.551	10.4	MBA	2

Available Inserts

LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151004PNR-MF											●	●	●				E10 E11
	151004PNR-MM											●	●	●				
	151004PNR-MA																●	
	151008PNR-MF											●	●	●				
	151008PNR-MM								●			●	●	●				
	151008PNR-MA																●	
	151008PNL-MM											●	●	●				
	151016PNR-MF											●	●	●				
	151016PNR-MM											●	●	●				

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNMX	151004PNR-MF									●		●	●	●				E10 E11
	151004PNR-MM											●	●	●				
	151008PNR-MF								●	●		●	●	●				
	151008PNR-MM								●	●	●	●	●	●				
	151008PNL-MM									●			●	●				
	151016PNR-MF									●	●		●	●				
	151016PNR-MM								●	●		●	●	●				

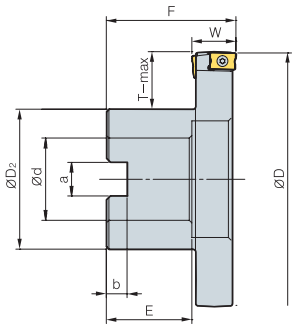
Parts

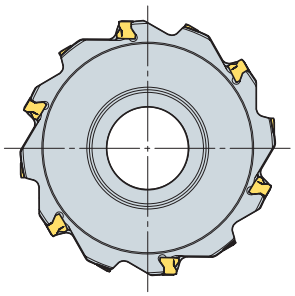
Specification	Screw	Wrench
Ø2.00~Ø6.00	FTKA0412B	TW15S

Available Inserts **E10, E11**

RM4PFCBA3000







(inch)

Designation		⌀	ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PFCBA	3300043R	10	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.433	0.673
	3300051R	10	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.512	0.673
	3300059R	10	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.591	0.673
	3300066R	10	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.669	0.673
	3400043R	12	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.433	0.898
	3400051R	12	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.512	0.898
	3400059R	12	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.591	0.898
	3400066R	12	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.669	0.898
	3500043R	14	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.433	1.083
	3500051R	14	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.512	1.083
	3500059R	14	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.591	1.083
	3500066R	14	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.669	1.083
	3600043R	16	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.433	1.583
	3600051R	16	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.512	1.583
	3600059R	16	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.591	1.583
	3600066R	16	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.669	1.583

Available Inserts

LNEX-MM



LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC3530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MM								●			●	●	●				E11
	100605PNL-MM											●	●	●				
LNMX	100605PNR-MM								●	●	●	●	●	●				
	100605PNL-MM								●	●		●	●	●				

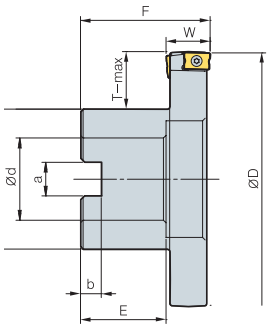
Parts

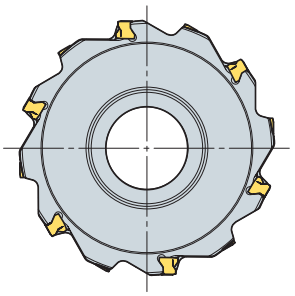
Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0307	TW09S

Available Inserts E11

RM4PFCBA4000







(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PFCBA	4300086R	6	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.866	0.673
	4300094R	6	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.945	0.673
	4300102R	6	3.0	1.575	1.00	0.375	0.248	0.866	2.0	1.024	0.673
	4300110R	6	3.0	1.575	1.00	0.375	0.248	0.866	2.0	1.102	0.673
	4400086R	8	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.866	0.898
	4400094R	8	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.945	0.898
	4400102R	8	4.0	2.126	1.25	0.5	0.319	0.866	2.0	1.024	0.898
	4400110R	8	4.0	2.126	1.25	0.5	0.319	0.866	2.0	1.102	0.898
	4500086R	10	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.866	1.083
	4500094R	10	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.945	1.083
	4500102R	10	5.0	2.756	1.50	0.625	0.394	1.181	2.5	1.024	1.083
	4500110R	10	5.0	2.756	1.50	0.625	0.394	1.181	2.5	1.102	1.083
	4600086R	12	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.866	1.583
	4600094R	12	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.945	1.583
	4600102R	12	6.0	2.756	1.50	0.625	0.394	1.181	2.5	1.024	1.583
	4600110R	12	6.0	2.756	1.50	0.625	0.394	1.181	2.5	1.102	1.583

Available Inserts

LNEX-MM



LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151008PNR-MM								●			●	●	●				E11
	151008PNL-MM											●	●	●				
LNMX	151008PNR-MM								●	●	●	●	●	●				
	151008PNL-MM									●			●	●				

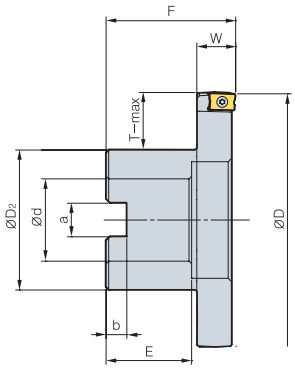
Parts

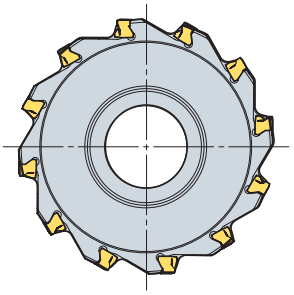
Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0412B	TW15S

Available Inserts E11

RM4PHCBA3000







(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PHCBA	3300059R	10	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.591	0.673
	3400059R	12	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.591	0.898
	3500059R	14	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.591	1.083
	3600059R	16	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.591	1.583

Available Inserts

LNEX-MF



LNEX-MM



LNEX-MA



LNMX-MF



LNMX-MM



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF											●	●	●				E10 E11
	100605PNR-MM								●			●	●	●				
	100605PNR-MA																●	
	100608PNR-MF								●			●	●	●				
	100608PNR-MM											●	●	●				
LNMX	100605PNR-MF									●		●	●	●				
	100605PNR-MM								●	●	●	●	●	●				
	100608PNR-MF									●		●	●	●				
	100608PNR-MM								●	●	●	●	●	●				

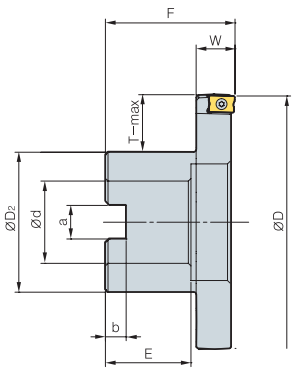
Parts

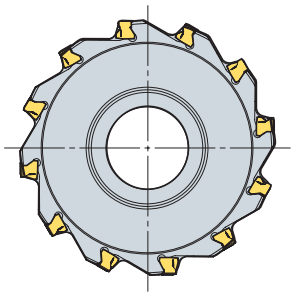
Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0307	TW09S

Available Inserts **E10, E11**

RM4PHCBA4000







(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PHCBA	4300078R	6	3.0	1.575	1.00	0.375	0.248	0.866	2.0	0.787	0.673
	4400078R	8	4.0	2.126	1.25	0.5	0.319	0.866	2.0	0.787	0.898
	4500078R	10	5.0	2.756	1.50	0.625	0.394	1.181	2.5	0.787	1.083
	4600078R	12	6.0	2.756	1.50	0.625	0.394	1.181	2.5	0.787	1.583

Available Inserts

LNEX-MF



LNEX-MM



LNEX-MA



LNMX-MF



LNMX-MM



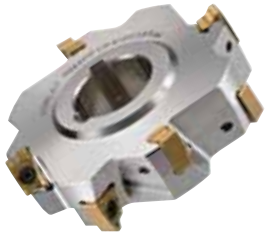
Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151004PNR-MF											●	●	●				
	151004PNR-MM											●	●	●				
	151004PNR-MA																●	
	151008PNR-MF											●	●	●				
	151008PNR-MM								●			●	●	●				
	151008PNR-MA																●	
	151016PNR-MF											●	●	●				E10
	151016PNR-MM											●	●	●				E11
LNMX	151004PNR-MF									●		●	●	●				
	151004PNR-MM											●	●	●				
	151008PNR-MF								●	●		●	●	●				
	151008PNR-MM								●	●	●	●	●	●				
	151016PNR-MF									●	●		●	●				
	151016PNR-MM								●	●		●	●	●				

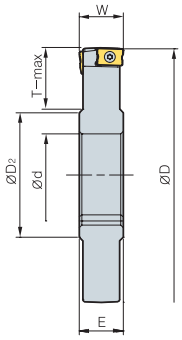
Parts

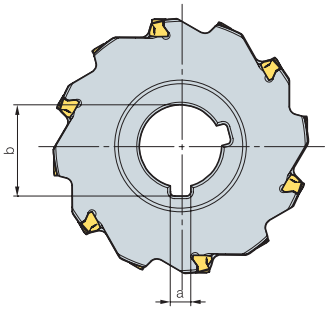
Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0412B	TW15S

Available Inserts **E10, E11**

RM4PFCPA3000







(inch)

Designation			ØD	ØD2	Ød	a	b	E	W	T-max
RM4PFCPA	3300043R	10	3.0	1.634	1.00	0.25	1.104	0.433	0.433	0.604
	3300051R	10	3.0	1.634	1.00	0.25	1.104	0.512	0.512	0.604
	3300059R	10	3.0	1.634	1.00	0.25	1.104	0.591	0.591	0.604
	3300066R	10	3.0	1.634	1.00	0.25	1.104	0.669	0.669	0.604
	3400043R	12	4.0	1.890	1.25	0.313	1.385	0.433	0.433	0.945
	3400051R	12	4.0	1.890	1.25	0.313	1.385	0.512	0.512	0.945
	3400059R	12	4.0	1.890	1.25	0.313	1.385	0.591	0.591	0.945
	3400066R	12	4.0	1.890	1.25	0.313	1.385	0.669	0.669	0.945
	3500043R	14	5.0	2.283	1.50	0.375	1.666	0.433	0.433	1.280
	3500051R	14	5.0	2.283	1.50	0.375	1.666	0.512	0.512	1.280
	3500059R	14	5.0	2.283	1.50	0.375	1.666	0.591	0.591	1.280
	3500066R	14	5.0	2.283	1.50	0.375	1.666	0.669	0.669	1.280
	3600043R	16	6.0	2.283	1.50	0.375	1.666	0.433	0.433	1.780
	3600051R	16	6.0	2.283	1.50	0.375	1.666	0.512	0.512	1.780
	3600059R	16	6.0	2.283	1.50	0.375	1.666	0.591	0.591	1.780
	3600066R	16	6.0	2.283	1.50	0.375	1.666	0.669	0.669	1.780

Available Inserts

LNEX-MM



LNMX-MM



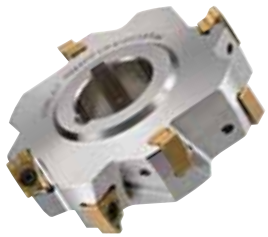
Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MM								●			●	●	●				E11
	100605PNL-MM											●	●	●				
LNMX	100605PNR-MM								●	●	●	●	●	●				
	100605PNL-MM								●	●		●	●	●				

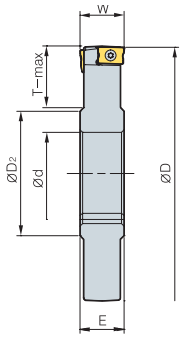
Parts

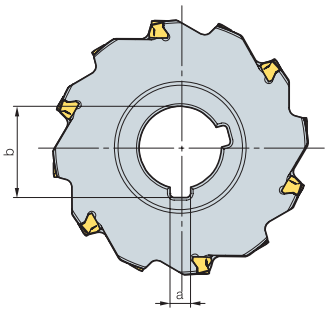
Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0307	TW09S

Available Inserts E11

RM4PFCPA4000







(inch)

Designation		⚙	ØD	ØD2	Ød	a	b	E	W	T-max
RM4PFCPA	4300086R	6	3.0	1.634	1.00	0.25	1.104	0.866	0.866	0.604
	4300094R	6	3.0	1.634	1.00	0.25	1.104	0.945	0.945	0.604
	4300102R	6	3.0	1.634	1.00	0.25	1.104	1.024	1.024	0.604
	4300110R	6	3.0	1.634	1.00	0.25	1.104	1.102	1.102	0.604
	4400086R	8	4.0	1.890	1.25	0.313	1.385	0.866	0.866	0.945
	4400094R	8	4.0	1.890	1.25	0.313	1.385	0.945	0.945	0.945
	4400102R	8	4.0	1.890	1.25	0.313	1.385	1.024	1.024	0.945
	4400110R	8	4.0	1.890	1.25	0.313	1.385	1.102	1.102	0.945
	4500086R	10	5.0	2.283	1.50	0.375	1.666	0.866	0.866	1.280
	4500094R	10	5.0	2.283	1.50	0.375	1.666	0.945	0.945	1.280
	4500102R	10	5.0	2.283	1.50	0.375	1.666	1.024	1.024	1.280
	4500110R	10	5.0	2.283	1.50	0.375	1.666	1.102	1.102	1.280
	4600086R	12	6.0	2.283	1.50	0.375	1.666	0.866	0.866	1.780
	4600094R	12	6.0	2.283	1.50	0.375	1.666	0.945	0.945	1.780
	4600102R	12	6.0	2.283	1.50	0.375	1.666	1.024	1.024	1.780
	4600110R	12	6.0	2.283	1.50	0.375	1.666	1.102	1.102	1.780

Available Inserts

LNEX-MM



LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151008PNR-MM								●			●	●	●				E11
	151008PNL-MM											●	●	●				
LNMX	151008PNR-MM								●	●	●	●	●	●				
	151008PNL-MM									●			●	●				

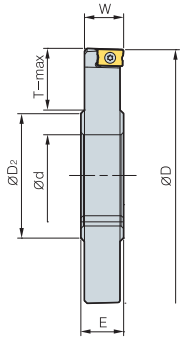
Parts

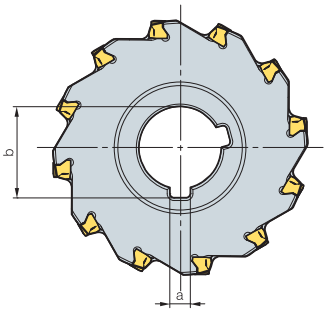
Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0412B	TW15S

Available Inserts E11

RM4PHCPA3000







(inch)

Designation			ØD	ØD2	Ød	a	b	E	W	T-max
RM4PHCPA	3300059R	10	3.0	1.634	1.00	0.25	1.104	0.650	0.594	0.604
	3400059R	12	4.0	1.890	1.25	0.313	1.385	0.650	0.594	0.945
	3500059R	14	5.0	2.283	1.50	0.375	1.666	0.650	0.594	1.280
	3600059R	16	6.0	2.283	1.50	0.375	1.666	0.650	0.594	1.780

Available Inserts


LNEX-MF


LNEX-MM


LNEX-MA


LNMX-MF


LNMX-MM

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF											●	●	●				E10 E11
	100605PNR-MM								●			●	●	●				
	100605PNR-MA																●	
	100608PNR-MF								●			●	●	●				
	100608PNR-MM											●	●	●				
LNMX	100605PNR-MF									●		●	●	●				
	100605PNR-MM								●	●	●	●	●	●				
	100608PNR-MF									●		●	●	●				
	100608PNR-MM								●	●			●	●				

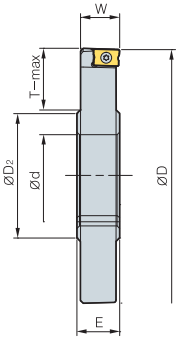
Parts

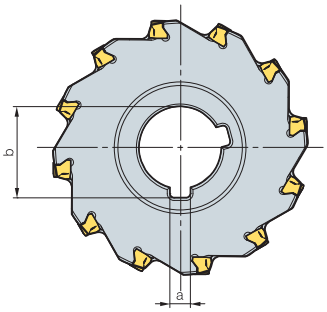
Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0307	TW09S

Available Inserts **E10, E11**

RM4PHCPA4000







(inch)

Designation			ØD	ØD2	Ød	a	b	E	W	T-max
RM4PHCPA	4300078R	6	3.0	1.634	1.00	0.25	1.104	0.866	0.780	0.604
	4400078R	8	4.0	1.890	1.25	0.313	1.385	0.866	0.780	0.945
	4500078R	10	5.0	1.890	1.50	0.375	1.666	0.866	0.780	1.280
	4600078R	12	6.0	1.890	1.50	0.375	1.666	0.866	0.780	1.780

Available Inserts


LNEX-MF


LNEX-MM


LNEX-MA


LNMX-MF


LNMX-MM

Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151004PNR-MF											●	●	●				
	151004PNR-MM											●	●	●				
	151004PNR-MA																	
	151008PNR-MF											●	●	●				
	151008PNR-MM								●			●	●	●				
	151008PNR-MA																	
	151016PNR-MF											●	●	●				E10
	151016PNR-MM											●	●	●				E11
LNMX	151004PNR-MF									●		●	●	●				
	151004PNR-MM											●	●	●				
	151008PNR-MF								●	●		●	●	●				
	151008PNR-MM								●	●	●	●	●	●				
	151016PNR-MF									●	●		●	●				
	151016PNR-MM								●	●		●	●	●				

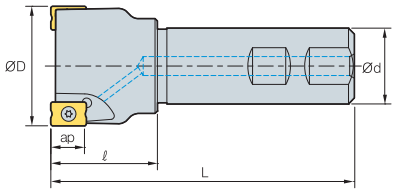
Parts

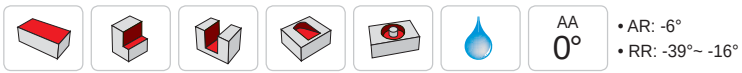
Specification	Screw	Wrench
Ø3.0~Ø6.0	FTKA0412B	TW15S

Available Inserts **E10, E11**

RM4PSA3000







AA 0°

- AR: -6°
- RR: -39°~ -16°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
RM4PSA	3056HR-S062	1	0.562	0.625	0.906	3.543	0.354	0.2
	3062HR-S062	1	0.625	0.625	0.984	3.543	0.354	0.2
	3068HR-S062	2	0.688	0.625	0.906	3.543	0.354	0.3
	3075HR-S075	2	0.750	0.750	1.181	3.937	0.354	0.5
	3075HR-S075M	3	0.750	0.750	1.181	3.937	0.354	0.5
	3100HR-S100	2	1.000	1.000	1.378	4.528	0.354	0.8
	3100HR-S100M	3	1.000	1.000	1.378	4.528	0.354	0.8
	3125HR-S125	3	1.250	1.250	1.575	4.921	0.354	1.5
	3125HR-S125M	4	1.250	1.250	1.575	4.921	0.354	1.5
	3150HR-S125	4	1.500	1.250	1.654	5.118	0.354	1.9
	3150HR-S125M	5	1.500	1.250	1.654	5.118	0.354	1.9
	3150HR-S150	4	1.500	1.500	1.654	5.118	0.354	2.6
	3150HR-S150M	5	1.500	1.500	1.654	5.118	0.354	2.6
	3150HR-S165	4	1.500	1.654	1.654	5.118	0.354	2.8
	3150HR-S165M	5	1.500	1.654	1.654	5.118	0.354	2.8
	3200HR-S125	5	2.000	1.250	1.772	5.315	0.354	2.3
	3200HR-S125M	7	2.000	1.250	1.772	5.315	0.354	2.3
	3200HR-S150	5	2.000	1.500	1.772	5.315	0.354	3.0
	3200HR-S150M	7	2.000	1.500	1.772	5.315	0.354	3.0
	3200HR-S165	5	2.000	1.654	1.772	5.315	0.354	3.3
	3200HR-S165M	7	2.000	1.654	1.772	5.315	0.354	3.3

Available Inserts

LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF											●	●	●				E10 E11
	100605PNR-MM								●			●	●	●				
	100605PNR-MA																●	
	100605PNL-MM											●	●	●				
	100608PNR-MF								●			●	●	●				
	100608PNR-MM											●	●	●				
LNMX	100605PNR-MF									●		●	●	●				
	100605PNR-MM								●	●	●	●	●	●				
	100605PNL-MM								●	●		●	●	●				
	100608PNR-MF									●		●	●	●				
	100608PNR-MM								●	●			●	●				

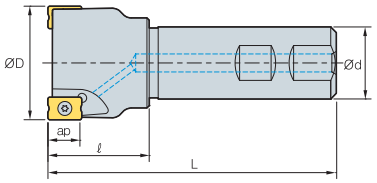
Parts

Specification	Screw	Wrench
Ø0.562~Ø2.000	FTKA0307	TW09S

Available Inserts **E10, E11**

RM4PSA4000







AA 0°

• AR: -6°
• RR: -24°~ -14°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
RM4PSA	4125HR-S125	2	1.250	1.250	1.575	4.921	0.551	1.5
	4032HR-S32M	3	1.250	1.250	1.575	4.921	0.551	1.5
	4040HR-S32M	3	1.500	1.250	1.654	4.921	0.551	1.8
	4150HR-S125	3	1.500	1.250	1.654	4.921	0.551	1.8
	4150HR-S150	3	1.500	1.500	1.654	4.921	0.551	2.5
	4150HR-S165	3	1.500	1.654	1.654	4.921	0.551	2.7
	4200HR-S125	3	2.000	1.250	1.772	4.921	0.551	2.2
	4200HR-S125M	4	2.000	1.250	1.772	4.921	0.551	2.2
	4200HR-S150	3	2.000	1.500	1.772	4.921	0.551	3.0
	4200HR-S150M	4	2.000	1.500	1.772	4.921	0.551	2.9
	4200HR-S165	3	2.000	1.654	1.772	4.921	0.551	3.2
	4200HR-S165M	4	2.000	1.654	1.772	4.921	0.551	3.2
	4250HR-S125	4	2.500	1.250	1.772	4.921	0.551	2.8
	4250HR-S125M	6	2.500	1.250	1.772	4.921	0.551	2.7
	4250HR-S150	4	2.500	1.500	1.772	4.921	0.551	3.6
	4250HR-S150M	6	2.500	1.500	1.772	4.921	0.551	3.5
	4250HR-S165	4	2.500	1.654	1.772	4.921	0.551	3.8
	4250HR-S165M	6	2.500	1.654	1.772	4.921	0.551	3.7

Available Inserts

LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151004PNR-MF											●	●	●				
	151004PNR-MM											●	●	●				
	151004PNR-MA																●	
	151008PNR-MF											●	●	●				
	151008PNR-MM								●			●	●	●				
	151008PNR-MA																●	
	151016PNR-MF											●	●	●				E10
	151016PNR-MM											●	●	●				E11
LNMX	151004PNR-MF									●		●	●	●				
	151004PNR-MM											●	●	●				
	151008PNR-MF								●	●		●	●	●				
	151008PNR-MM								●	●	●	●	●	●				
	151016PNR-MF									●	●		●	●				
	151016PNR-MM								●	●		●	●	●				

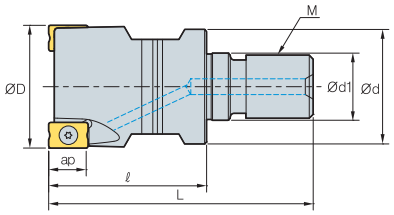
Parts

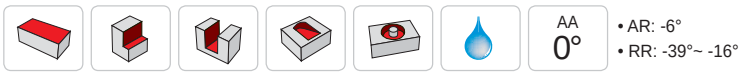
Specification	Screw	Wrench
Ø1.250~Ø2.500	FTKA0412B	TW15S

Available Inserts **E10, E11**

RM4PMA3000







AA 0°

- AR: -6°
- RR: -39°~ -16°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
RM4PMA	3056HR-M06	1	0.563	0.433	0.256	1.575	0.984	M06	0.354	0.04
	3063HR-M08	1	0.625	0.571	0.335	0.654	0.984	M08	0.354	0.04
	3068HR-M08	2	0.688	0.571	0.335	0.654	0.984	M08	0.354	0.07
	3075HR-M10	2	0.750	0.689	0.413	2.008	1.181	M10	0.354	0.13
	3100HR-M12	2	1.000	0.906	0.492	2.323	1.378	M12	0.354	0.24
	3125HR-M16	3	1.250	1.142	0.669	2.638	1.575	M16	0.354	0.46
	3150HR-M16	4	1.500	1.142	0.669	2.638	1.575	M16	0.354	0.57
	3200HR-M16	5	2.000	1.142	0.669	2.835	1.772	M16	0.354	0.90

Available Inserts

LNEX-MF



LNEX-MM



LNEX-MA



LNMX-MF



LNMX-MM



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF											●	●	●				E10 E11
	100605PNR-MM								●			●	●	●			●	
	100605PNR-MA																	
	100605PNL-MM											●	●	●				
	100608PNR-MF								●			●	●	●				
	100608PNR-MM											●	●	●				
LNMX	100605PNR-MF									●		●	●	●				
	100605PNR-MM								●	●	●	●	●	●				
	100605PNL-MM								●	●		●	●	●				
	100608PNR-MF									●		●	●	●				
	100608PNR-MM								●	●			●	●				

Available adaptor

Designation		Available adaptor
RM4PMA	3056HR-M06	MATA-M06
	3063HR-M08	MATA-M08
	3068HR-M08	
	3075HR-M10	MATA-M10
	3100HR-M12	MATA-M12
	3125HR-M16	MATA-M16
	3150HR-M16	
	3200HR-M16	

Designation: RM4PMA3125HR-M16
Modular Head Threading Measure size (M16)

=

Adaptor spec.: MATA-M16-137-S125S
Adaptor Threading Measure (M16)

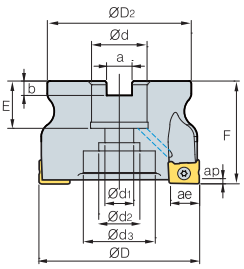
Parts

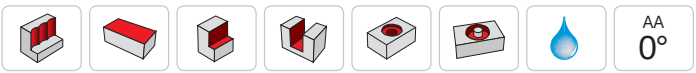
Specification	Screw	Wrench
Ø0.563~Ø2.000	FTKA0307	TW09S

Available Inserts E10, E11 Available Adaptor E308~E309

RM4ZCA3000/4000







AA
0°

- AR: -11°
- RR: -12°~ -10°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	ae	lbs
RM4ZCA	3150HR	4	1.50	1.417	0.50	0.287	0.433	-	0.250	0.169	0.630	1.50	0.059	0.354	0.4
	3200HR	5	2.00	1.850	0.75	0.433	0.630	-	0.313	0.220	0.787	1.75	0.059	0.354	0.7
RM4ZCA	4250HR	5	2.50	2.283	1.00	0.551	0.827	-	0.375	0.248	0.866	1.75	0.098	0.551	1.2
	4300HR	6	3.00	2.677	1.00	0.551	0.827	-	0.375	0.248	0.866	1.75	0.098	0.551	2.4
	4400HR	7	4.00	3.150	1.25	0.709	1.024	1.575	0.500	0.319	0.866	2.00	0.098	0.551	3.7

Available Inserts

LNEX-MM



LNMX-MM



Designation			Cermet		Coated											Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
3000 type	LNEX	100605PNL-MM											●	●	●				E11
	LNMX	100605PNL-MM								●	●		●	●	●				
4000 type	LNEX	151008PNL-MM											●	●	●				
	LNMX	151008PNL-MM									●			●	●				

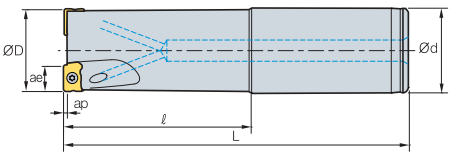
Parts

Specification	Screw	Wrench
Ø1.50~Ø2.00	FTKA0307	TW09S
Ø2.50~Ø4.00	FTKA0412B	TW15S

Available Inserts E11

RM4ZSA3000





AA 0°

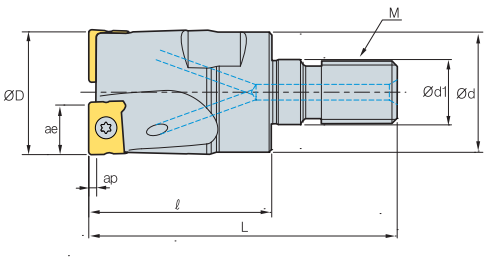
- AR: -11°
- RR: -17°~ -14°

(inch)

Designation			ØD	Ød	ℓ	L	ap	ae	lbs
RM4ZSA	3100HR-L100	2	1.000	1.000	5.000	8.000	0.059	0.354	1.3
	3125HR-L125	3	1.250	1.250	5.000	8.500	0.059	0.354	2.4
	3150HR-L125	4	1.500	1.500	1.654	10.000	0.059	0.354	3.3

RM4ZMA3000





AA 0°

- AR: -11°
- RR: -17°~ -14°

Designation		Stock		ØD	Ød	Ød1	l	L	M	ap	ae	lbs
RM4ZMA	3100HR-M12		2	1.000	0.906	0.492	1.378	2.323	M12	0.059	0.354	0.2
	3125HR-M16	●	3	1.250	1.142	0.669	1.575	2.638	M16	0.059	0.354	0.4
	3150HR-M16		4	1.500	1.142	0.669	1.575	2.638	M16	0.059	0.354	0.6

●Stock item

Available Inserts

LNEX-MM



LNMX-MM



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNL-MM											●	●	●				E11
LNMX	100605PNL-MM								●	●		●	●	●				

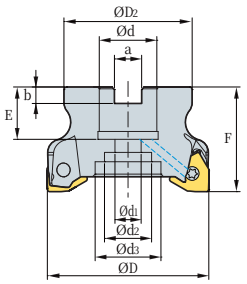
Parts

Specification	Screw	Wrench
Ø1.000~Ø1.500	FTKA0307	TW09S

Available Inserts E11

RM6PCA-WN04 new





AA 0°

- AR: -6°
- RR: -14°~ -11°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
RM6PCA	150R-050-6-WN04	6	1.5	1.417	0.50	0.287	0.433	-	0.252	0.170	0.630	1.50	0.169	0.421
	150R-050-7-WN04	7	1.5	1.417	0.50	0.287	0.433	-	0.252	0.170	0.630	1.50	0.169	0.422
	200R-075-8-WN04	8	2.0	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.169	0.772
	200R-075-9-WN04	9	2.0	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.169	0.772
	250R-100-10-WN04	10	2.5	2.205	1.00	0.551	0.827	-	0.374	0.248	0.787	1.75	0.169	1.194
	250R-100-11-WN04	11	2.5	2.205	1.00	0.551	0.827	-	0.374	0.248	0.787	1.75	0.169	1.196

Available Inserts

WNGX-MA new | WNGX-ML new | WNGX-MM new





Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	040304PNFR-MA																	E28
	040308PNFR-MA																	
	040312PNFR-MA																	
	040316PNFR-MA																	
WNGX	040304PNER-ML																	
	040308PNER-ML																	
	040312PNER-ML																	
	040316PNER-ML																	
WNGX	040304PNSR-MM																	
	040308PNSR-MM																	
	040312PNSR-MM																	
	040316PNSR-MM																	

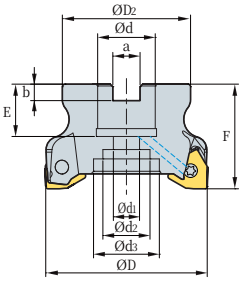
Parts

Specification	Screw	Wrench	Wrench
Ø1.5~Ø2.5	ETNA02506	TW07S	-

Available Inserts E28

RM6PCA-WN08 new





AA 0°

- AR: -6°
- RR: -14°~ -11°

(inch)

	Designation		ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
RM6PCA	200R-075-4-WN08	4	2.0	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.323	0.662
	200R-075-5-WN08	5	2.0	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.323	0.687
	250R-100-5-WN08	5	2.5	2.205	1.00	0.551	0.827	-	0.374	0.248	0.787	1.75	0.323	1.091
	250R-100-6-WN08	6	2.5	2.205	1.00	0.551	0.827	-	0.374	0.248	0.787	1.75	0.323	1.076
	300R-100-7-WN08	7	3.0	2.205	1.00	0.551	0.866	1.299	0.374	0.248	0.787	2.00	0.323	1.735
	300R-100-9-WN08	9	3.0	2.205	1.00	0.551	0.866	1.299	0.374	0.248	0.787	2.00	0.323	1.715
	400R-150-8-WN08	8	4.0	3.385	1.50	-	-	1.969	0.626	0.394	1.102	2.00	0.323	3.397
	400R-150-11-WN08	11	4.0	3.385	1.50	-	-	1.969	0.626	0.394	1.102	2.00	0.323	3.440
	500R-150-11-WN08	11	5.0	3.937	1.50	0.827	1.220	1.969	0.626	0.394	1.063	2.50	0.323	7.528
	500R-150-14-WN08	14	5.0	3.937	1.50	0.827	1.220	1.969	0.626	0.394	1.063	2.50	0.323	7.409

Available Inserts

WNGX-MA new | WNGX-ML new | WNGX-MM new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	080604PNFR-MA																	E28
	080608PNFR-MA																●	
	080612PNFR-MA																	
	080616PNFR-MA																	
	080620PNFR-MA																	
WNGX	080604PNER-ML									●			●	●				
	080608PNER-ML									●			●	●				
	080612PNER-ML																	

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	080616PNER-ML																	E28
	080620PNER-ML																	
WNGX	080604PNSR-MM									●			●					
	080608PNSR-MM									●			●					
	080612PNSR-MM																	
	080616PNSR-MM																	
	080620PNSR-MM																	

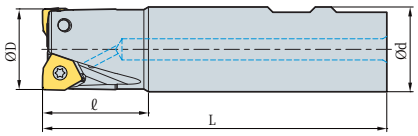
Parts

Specification	Screw	Wrench	Wrench
Ø2.0~Ø5.0	FTNA0512	-	TW20-100

Available Inserts E28

RM6PSA-WN04 new





AA 0°

- AR: -6°
- RR: -32°~ -21°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
RM6PSA	075R-2W075-450-WN04	2	0.75	0.75	1.378	4.5	0.169	0.447
	075R-3W075-450-WN04	3	0.75	0.75	1.378	4.5	0.169	0.447
	100R-3W100-450-WN04	3	1.00	1.00	1.378	4.5	0.169	0.850
	100R-4W100-450-WN04	4	1.00	1.00	1.378	4.5	0.169	0.845
	125R-5W125-450-WN04	5	1.25	1.25	1.378	4.5	0.169	1.356
	125R-6W125-450-WN04	6	1.25	1.25	1.378	4.5	0.169	1.359

Available Inserts

WNGX-MA new | WNGX-ML new | WNGX-MM new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	040304PNFR-MA																	E28
	040308PNFR-MA																	
	040312PNFR-MA																	
	040316PNFR-MA																	
WNGX	040304PNER-ML																	
	040308PNER-ML																	
	040312PNER-ML																	
	040316PNER-ML																	
WNGX	040304PNSR-MM																	
	040308PNSR-MM																	
	040312PNSR-MM																	
	040316PNSR-MM																	

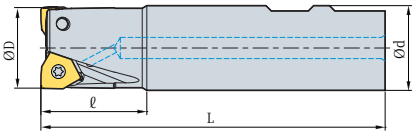
Parts

Specification	Screw	Wrench	Wrench
Ø0.75~Ø1.25	ETNA02506	TW07S	-

Available Inserts E28

RM6PSA-WN08 new





AA 0°

- AR: -6°
- RR: -32°~ -21°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
RM6PSA	125R-2W125-500-WN08	3	1.25	1.25	1.575	5.0	0.323	1.463
	150R-3W125-500-WN08	3	1.50	1.25	1.575	5.0	0.323	1.492
	150R-4W125-500-WN08	4	1.50	1.25	1.575	5.0	0.323	1.482
	200R-4W125-500-WN08	4	2.00	1.25	1.575	5.0	0.323	1.631
	200R-5W125-500-WN08	5	2.00	1.25	1.575	5.0	0.323	1.656

Available Inserts

WNGX-MA WNGX-ML WNGX-MM



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	080604PNFR-MA																	E28
	080608PNFR-MA																●	
	080612PNFR-MA																	
	080616PNFR-MA																	
	080620PNFR-MA																	
WNGX	080604PNER-ML									●			●	●				
	080608PNER-ML									●			●	●				
	080612PNER-ML																	
	080616PNER-ML																	
	080620PNER-ML																	
WNGX	080604PNSR-MM									●			●					
	080608PNSR-MM									●			●					
	080612PNSR-MM																	
	080616PNSR-MM																	
	080620PNSR-MM																	

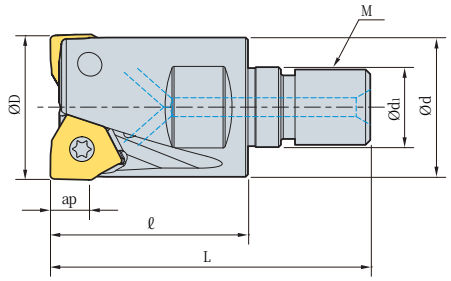
Parts

Specification	Screw	Wrench	Wrench
Ø1.25~Ø2.00	FTNA0512	-	TW20-100

Available Inserts E28

RM6PMA





AA 0°

- AR: -6°
- RR: -9°~ -6°

(inch)

Designation		⌀	ØD	Ød	Ød1	ℓ	L	M	ap	lbs
RM6PMA	075R-2-M10-WN04	2	0.75	0.689	0.413	1.181	1.969	M10	0.120	0.120
	075R-3-M10-WN04	3	0.75	0.689	0.413	1.181	1.969	M10	0.119	0.119
	100R-4-M12-WN04	4	1.00	0.906	0.492	1.181	2.087	M12	0.212	0.212
	100R-5-M12-WN04	5	1.00	0.906	0.492	1.181	2.087	M12	0.209	0.209
	125R-5-M16-WN04	5	1.25	1.142	0.669	1.575	2.598	M16	0.461	0.461
	125R-6-M16-WN04	6	1.25	1.142	0.669	1.575	2.598	M16	0.466	0.466
RM6PMA	125R-2-M16-WN08	2	1.25	1.142	0.669	1.693	2.717	M16	0.439	0.439
	150R-3-M16-WN08	3	1.50	1.142	0.669	1.693	2.717	M16	0.505	0.505
	150R-4-M16-WN08	4	1.50	1.142	0.669	1.693	2.717	M16	0.505	0.505

Available Inserts

WNGX-MA



WNGX-ML



WNGX-MM



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	040304PNFR-MA																	E28
	040308PNFR-MA																	
	040312PNFR-MA																	
	040316PNFR-MA																	
	040304PNER-ML																	
WNGX	040308PNER-ML																	
	040312PNER-ML																	
	040316PNER-ML																	
WNGX	040304PNSR-MM																	
	040308PNSR-MM																	
	040312PNSR-MM																	
	040316PNSR-MM																	

Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	080604PNFR-MA																	E28
	080608PNFR-MA																●	
	080612PNFR-MA																	
	080616PNFR-MA																	
	080620PNFR-MA																	
WNGX	080604PNER-ML									●			●●					
	080608PNER-ML									●			●●					
	080612PNER-ML																	
	080616PNER-ML																	
	080620PNER-ML																	
WNGX	080604PNSR-MM									●			●					
	080608PNSR-MM									●			●					
	080612PNSR-MM																	
	080616PNSR-MM																	
	080620PNSR-MM																	

Available adaptor

Designation		Available adaptor
RM6PMA	075R-2-M10-WN04	MATA-M10
	075R-3-M10-WN04	MATA-M10
	100R-4-M12-WN04	MATA-M12
	100R-5-M12-WN04	MATA-M12
	125R-5-M16-WN04	MATA-M16

Designation		Available adaptor
RM6PMA	125R-6-M16-WN04	MATA-M16
	125R-2-M16-WN08	MATA-M16
	150R-3-M16-WN08	MATA-M16
	150R-4-M16-WN08	MATA-M16

Designation: RM6PMA125R-2-M16-WN08
Modular Head Threading Measure size (M16)

||

Adaptor spec.: MATA-M16-354-S125S-C
Adaptor Threading Measure (M16)

Parts

Specification	Screw	Wrench	Wrench
Ø0.75~Ø1.25	ETNA02506	TW07S	-
Ø1.25~Ø1.50	FTNA0512	-	TW20-100

Available Inserts E28

RM8ACA4000



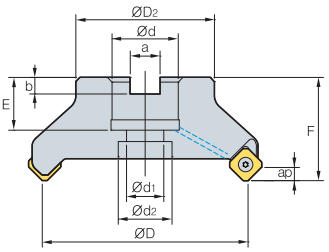


Fig. 1

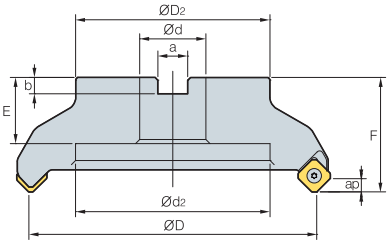


Fig. 2

AA
45°

- AR: -6°
- RR: -9°~ -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM8ACA	4200HR-M	4	2.0	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.236	1.1	1
	4200HR-H	6	2.0	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.236	1.1	1
	4250HR-M	6	2.5	2.205	1.00	0.551	0.827	0.375	0.248	0.787	1.75	0.236	1.5	1
	4250HR-H	8	2.5	2.205	1.00	0.551	0.827	0.375	0.248	0.787	1.75	0.236	1.5	1
	4300HR	5	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.236	2.6	1
	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.236	2.6	1
	4300HR-H	10	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.236	2.9	1
RM8ACA	4400HR	6	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.236	3.7	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.236	3.7	1
	4400HR-H	12	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.236	3.7	1
	4500HR	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.236	7.9	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.236	7.9	1
	4500HR-H	16	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.236	8.1	1
	4600R	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.236	10.6	2
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.236	11.7	2
	4600R-H	18	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.236	11.9	2
	4800R-M	14	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.236	15.6	2
	4800R-H	24	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.236	15.6	2
	41000R-M	16	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.50	0.236	26.2	2
	41000R-H	30	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.50	0.236	26.4	2

Available Inserts

	SNEX-MF	SNEX-ML	SNEX-MM	SNEX-MA	SNEX-W	SNMX-MF	SNMX-MM
							

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206ANN-MF								●	●		●	●	●				E22 E23
	1206ANN-ML												●	●				
	1206ANN-MM			●					●	●	●	●	●	●				
	1206ANN-MA																●	
	1206ANN-W								●			●	●					
SNMX	1206ANN-MF								●	●		●	●	●				
	1206ANN-MM			●					●	●	●	●	●	●				

Parts

Specification	Screw	Wrench
Ø2.0~Ø10.0	FTKA0410	TW15S

Available Inserts **E22, E23**

RMH8ACA4000

Shim type



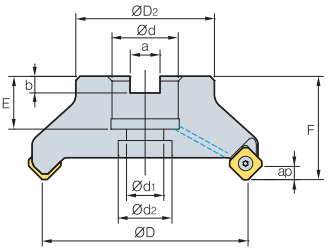


Fig. 1

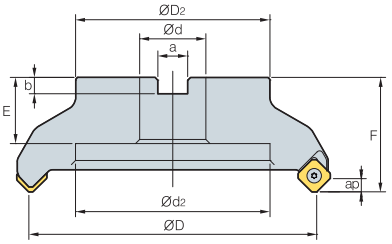


Fig. 2

AA 45°

- AR: -6°
- RR: -9°~ -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RMH8ACA	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.0	0.236	2.6	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.0	0.236	3.7	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.5	0.236	7.9	1
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.5	0.236	10.6	2
	4800R-M	14	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.5	0.236	15.6	2
	41000R-M	16	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.5	0.236	26.2	2
	41200R-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.5	0.236	40.8	2
	41500R-M	26	15.0	9.843	2.50	-	9.370	1.000	0.551	1.496	3.0	0.236	81.8	2

Available Inserts

SNEX-MF | SNEX-ML | SNEX-MM | SNEX-MA | SNEX-W | SNMX-MF | SNMX-MM










Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206ANN-MF								●	●		●	●	●				E22 E23
	1206ANN-ML												●	●				
	1206ANN-MM			●					●	●	●	●	●	●				
	1206ANN-MA																●	
	1206ANN-W								●			●	●					
SNMX	1206ANN-MF								●	●		●	●	●				
	1206ANN-MM			●					●	●	●	●	●	●				

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3.0~Ø15.0	FTKA0412B	SS42RM8	SHXN0609F	TW15S

Available Inserts **E22, E23**

RM8ACA5000



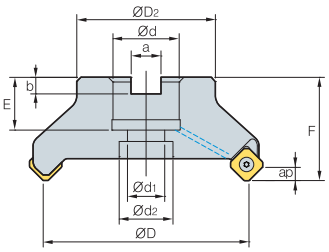


Fig. 1

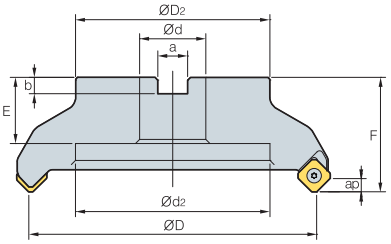


Fig. 2

AA
45°

- AR: -6°
- RR: -9°~ -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM8ACA	5300HR-M	6	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.295	2.6	1
	5400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.295	3.7	1
	5500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.295	7.9	1
	5600H-M	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.295	10.6	2
	5800H-M	12	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.295	15.6	2
	51000H-M	15	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.50	0.295	26.2	2
	51200H-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.50	0.295	47.5	2

Available Inserts


SNEX-MF


SNEX-ML


SNEX-MM


SNMX-MF


SNMX-MM

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1507ANN-MF											●	●	●				E22 E23
	1507ANN-ML												●	●				
	1507ANN-MM											●	●	●				
SNMX	1507ANN-MF									●		●	●	●				
	1507ANN-MM								●	●		●	●	●				

Parts

Specification	Screw	Wrench
Ø3.0~Ø12.0	FTGA0513	TW20-100

Available Inserts **E22, E23**

RMH8ACA5000

Shim type



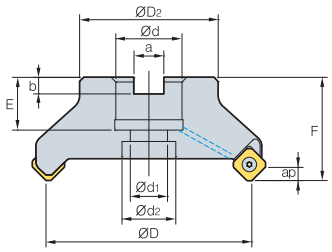


Fig. 1

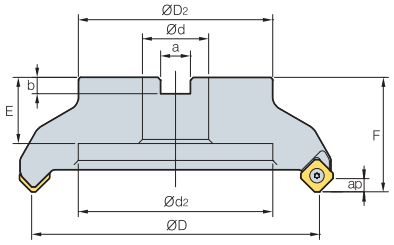


Fig. 2

AA 45°

- AR: -6°
- RR: -9°~ -6°

(inch)

Designation		⬡	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RMH8ACA	5300HR-M	6	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.0	0.295	2.6	1
	5400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.0	0.295	5.4	1
	5500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.5	0.295	7.8	1
	5600R-M	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.5	0.295	10.8	2
	5800R-M	12	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.5	0.295	15.4	2
	51000R-M	15	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.5	0.295	25.8	2
	51200R-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.5	0.295	41.4	2
	51500R-M	22	15.0	9.843	2.50	-	9.370	1.000	0.551	1.496	3.0	0.295	81.8	2

Available Inserts

	SNEX-MF	SNEX-ML	SNEX-MM	SNMX-MF	SNMX-MM
					

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1507ANN-MF											●	●	●				E22 E23
	1507ANN-ML												●	●				
	1507ANN-MM											●	●	●				
SNMX	1507ANN-MF									●		●	●	●				
	1507ANN-MM								●	●		●	●	●				

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3.0~Ø15.0	FTGA0513	SS53RM8	SHXN0712F	TW20-100

Available Inserts **E22, E23**

RM8ECA4000



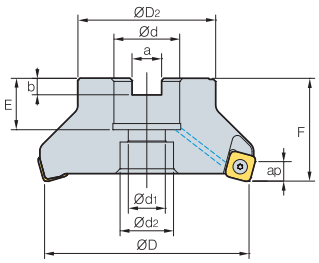


Fig. 1

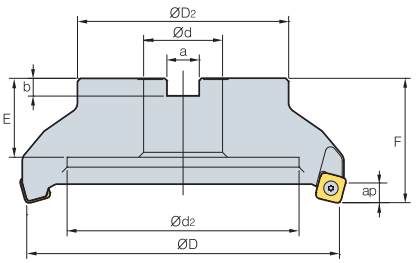


Fig. 2

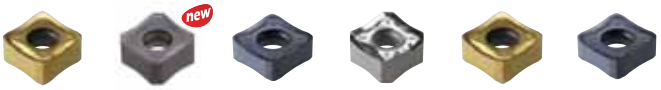
AA 15°

- AR: -6°
- RR: -8°~ -6°

(inch)

Designation		⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM8ECA	4200HR-M	4	2.0	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.354	1.1	1
	4250HR-M	6	2.5	1.772	0.75	0.413	0.630	0.313	0.220	0.787	1.75	0.354	1.3	1
	4300HR	5	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.354	2.6	1
	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.354	2.4	1
	4400HR	6	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.354	3.7	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.354	5.5	1
	4500HR	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.354	6.6	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.354	6.8	1
	4600R	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.354	9.9	2
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.354	8.8	2
	4800R-M	16	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.354	13.0	2

Available Inserts



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206ENN-MF								●	●		●	●	●				
	1206ENN-ML												◆	●				
	1206ENN-MM								●	●		●	●	●				E22
	1206ENN-MA											●					●	E23
SNMX	1206ENN-MF								●	●		●	●	●				
	1206ENN-MM								●	●		◆	●	●				

Parts

Specification	Screw	Wrench
Ø2.0~Ø8.0	PTKA0411-R3	TW15S

Available Inserts **E22, E23**

RMH8ECA4000

Shim type



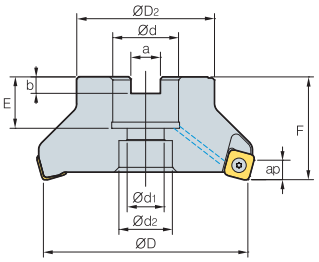


Fig. 1

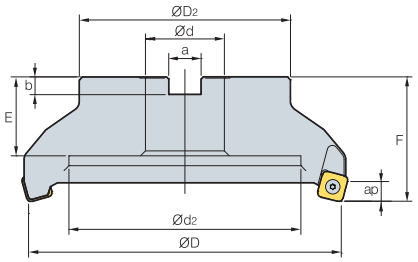


Fig. 2

AA 15°

- AR: -6°
- RR: -8°~ -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RMH8ECA	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.0	0.354	2.3	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.0	0.354	5.4	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.5	0.354	6.5	1
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.5	0.354	8.6	2
	4800R-M	16	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.5	0.354	12.8	2
	41000R-M	16	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.5	0.354	23.6	2
	41200R-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.5	0.354	39.2	2
	41500R-M	24	15.0	9.843	2.50	-	9.370	1.000	0.551	1.496	3.0	0.354	69.0	2

Available Inserts

SNEX-MF | SNEX-ML | SNEX-MM | SNEX-MA | SNMX-MF | SNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206ENN-MF								●	●		●	●	●				
	1206ENN-ML												●	●				
	1206ENN-MM								●	●		●	●	●				E22
	1206ENN-MA											●					●	E23
SNMX	1206ENN-MF								●	●		●	●	●				
	1206ENN-MM								●	●		●	●	●				

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3.0~Ø15.0	PTKA0411-R3	SS42RM8	SHXN0609F	TW15S

Available Inserts **E22, E23**

RM8ECA5000



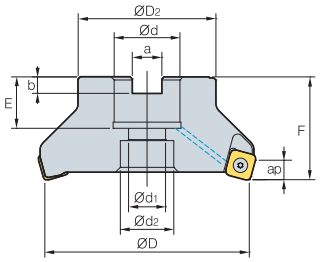


Fig. 1

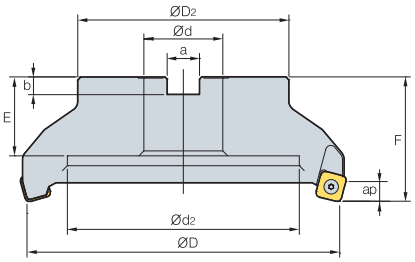


Fig. 2

AA
15°

- AR: -6°
- RR: -8°~ -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM8ECA	5300HR-M	6	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.433	2.6	1
	5400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.433	3.7	1
	5500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.433	7.9	1
	5600R-M	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.433	10.6	2
	5800R-M	12	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.433	15.6	2
	51000R-M	15	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.50	0.433	26.2	2
	51200R-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.50	0.433	47.5	2

Available Inserts


SNEX-MF



SNEX-ML


SNEX-MM


SNMX-MF


SNMX-MM

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1507ENN-MF											●	●	●				E22 E23
	1507ENN-ML												●	●				
	1507ENN-MM											●	●	●				
SNMX	1507ENN-MF									●		●	●	●				
	1507ENN-MM									●		●	●	●				

Parts

Specification	Screw	Wrench
Ø3~Ø12	FTGA0513	TW20-100

Available Inserts **E22, E23**

RMH8ECA5000

Shim type



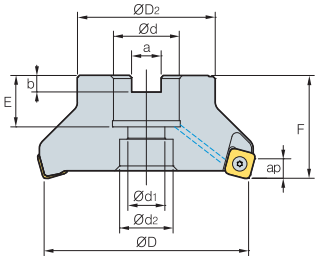


Fig. 1

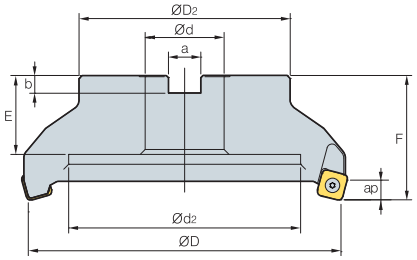


Fig. 2

AA 15°

- AR: -6°
- RR: -8°~ -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RMH8ECA	5300HR-M	6	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.0	0.433	2.3	1
	5400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.0	0.433	4.5	1
	5500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.5	0.433	7.3	1
	5600R-M	10	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.5	0.433	9.5	2
	5800R-M	12	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.5	0.433	13.8	2
	51000R-M	15	10.0	7.087	2.50	-	7.087	1.000	0.551	1.496	2.5	0.433	23.8	2
	51200R-M	20	12.0	9.449	2.50	-	9.370	1.000	0.551	1.496	2.5	0.433	39.0	2
	51500R-M	22	15.0	9.843	2.50	-	9.370	1.000	0.551	1.496	3.0	0.433	77.4	2

Available Inserts



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1507ENN-MF											●	●	●				E22 E23
	1507ENN-ML												●	●				
	1507ENN-MM											●	●	●				
SNMX	1507ENN-MF									●		●	●	●				
	1507ENN-MM									●		●	●	●				

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3.0~Ø15.0	FTGA0513	SS53RM8	SHXN0712F	TW20-100

Available Inserts **E22, E23**

RM8QCA4000



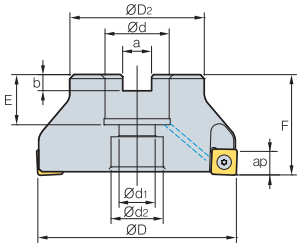


Fig. 1

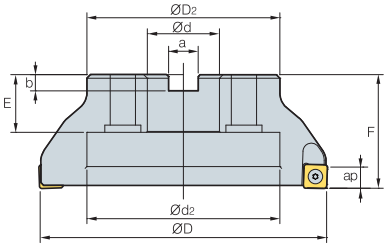


Fig. 2

AA 2°

- AR: -6°
- RR: -8°~ -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM8QCA	4250HR-M	6	2.5	2.205	1.00	0.551	0.827	0.375	0.248	0.787	1.75	0.453	1.2	1
	4250HR-H	8	2.5	2.205	1.00	0.551	0.827	0.375	0.248	0.787	1.75	0.453	1.2	1
	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.453	2.3	1
	4300HR-H	10	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.00	0.453	2.1	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.453	3.6	1
	4400HR-H	12	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.00	0.453	3.4	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.453	7.1	1
	4500HR-H	14	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.50	0.453	7.1	1
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.453	8.5	2
	4600R-H	18	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.50	0.453	8.5	2
	4800R-M	14	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.453	14.0	2
	4800R-H	22	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.50	0.453	14.0	2

Available Inserts

SNEX-MF | SNEX-ML | SNEX-MM | SNEX-MA | SNMX-MF | SNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206QNN-MF								●			●	●	●				
	1206QNN-ML												●	●				
	1206QNN-MM											●	●	●				
	1206QNN-MA																●	
	120612-MF											●	●	●				
	120612-ML												●	●				E22
	120612-MM											●						E23
	120612-MA																●	
SNMX	1206QNN-MF								●	●		●	●	●				
	1206QNN-MM								●	●		●	●	●				
	120612-MF									●		●	●	●				
	120612-MM								●	●		●	●	●				

Parts

Specification	Screw	Shim
Ø2.5~Ø8.0	PTKA0411-R3	TW15S

Available Inserts **E22, E23**

RMH8QCA4000

Shim type



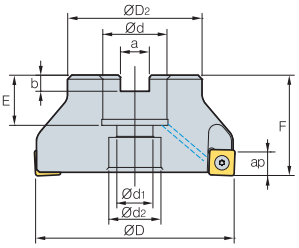


Fig. 1

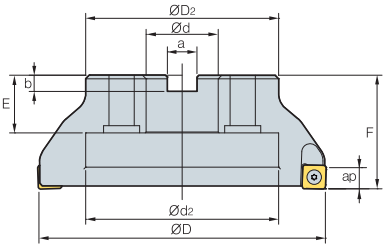


Fig. 2

AA
2°

- AR: -6°
- RR: -8°~ -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RMH8QCA	4300HR-M	7	3.0	2.205	1.00	0.551	0.827	0.375	0.248	0.866	2.0	0.453	2.3	1
	4400HR-M	8	4.0	2.874	1.25	0.709	1.024	0.500	0.319	0.866	2.0	0.453	5.4	1
	4500HR-M	10	5.0	3.386	1.50	0.827	1.220	0.625	0.394	1.181	2.5	0.453	6.5	1
	4600R-M	12	6.0	4.882	2.00	-	4.213	0.750	0.433	1.181	2.5	0.453	8.6	2
	4800R-M	16	8.0	5.118	2.50	-	5.315	1.000	0.551	1.496	2.5	0.453	10.8	2

Available Inserts

SNEX-MF	SNEX-ML	SNEX-MM	SNEX-MA	SNMX-MF	SNMX-MM
					

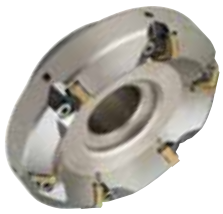
Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC3530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206QNN-MF								●			●	●	●				
	1206QNN-ML												●	●				
	1206QNN-MM											●	●	●				
	1206QNN-MA																●	
	120612-MF											●	●	●				
	120612-ML												●	●				E22
	120612-MM											●						E23
	120612-MA																●	
SNMX	1206QNN-MF								●	●		●	●	●				
	1206QNN-MM								●	●		●	●	●				
	120612-MF									●		●	●	●				
	120612-MM								●	●		●	●	●				

Parts

Specification	Screw	Shim	Shim Screw	Wrench
Ø3.0~Ø8.0	PTKA0411-R3	SS42RM8	SHXN0609F	TW15S

Available Inserts **E22, E23**

RMT8AA4000



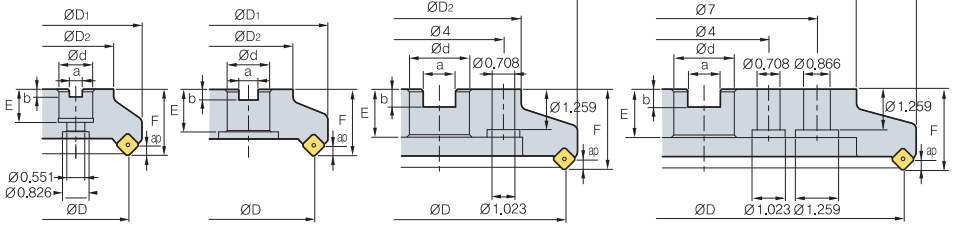


Fig. 1 Fig. 2 Fig. 3 Fig. 4



AA
45°

- AR: -6°
- RR: -6°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
RMT8AA	4300R/L	5	3.0	3,780	2.205	1.0	0.374	0.248	0.866	2.0	0.157	3.52	1
	4300R/L-M	6	3.0	2,953	2.205	1.0	0.374	0.248	0.866	2.0	0.157	3.52	1
	4400R/L	6	4.0	4,803	2.874	1.3	1.500	0.319	1.181	2.0	0.157	5.06	2
	4400R/L-M	8	4.0	3.996	2.874	1.3	1.500	0.319	1.181	2.0	0.157	5.06	2
	4500R/L	8	5.0	5.748	3.386	1.5	1.626	0.394	1.496	2.5	0.157	9.46	2
	4500R/L-M	10	5.0	4.961	3.386	1.5	1.626	0.394	1.496	2.5	0.157	9.46	2
	4600R/L	10	6.0	6.732	4.882	2.0	0.748	0.433	1.496	2.5	0.157	14.30	2
	4600R/L-M	14	6.0	5.965	4.882	2.0	0.748	0.433	1.496	2.5	0.157	14.30	2
	4800R/L	12	8.0	8.740	5.118	2.5	1.000	0.551	1.496	2.5	0.157	19.36	3
	4800R/L-M	18	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.157	19.36	3
	41000R/L	16	10.0	10.748	7.087	2.5	1.000	0.551	1.496	2.5	0.157	31.02	3
	41000R/L-M	22	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.157	31.02	3
	41200R/L	20	12.0	8.819	9.449	2.5	1.000	0.551	1.496	2.5	0.157	49.06	4
	41200R/L-M	28	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.157	49.06	4

Available Inserts

SNCAF-MF SNC(M)F-MM



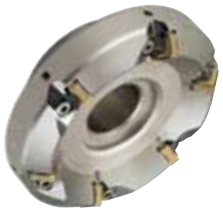
Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	1206ANN-MF																	E20 E21
	1206ANN-MM																	
SNMF	1206ANN-MF																	
	1206ANN-MM																	

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø3.0~Ø12.0	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100

Available Inserts **E20, E21**

RMT8AA5000



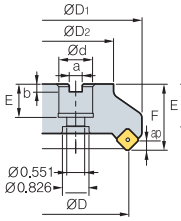


Fig. 1

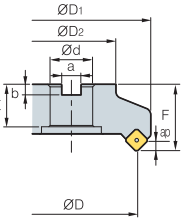


Fig. 2

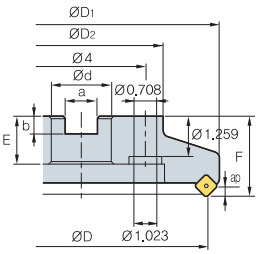


Fig. 3

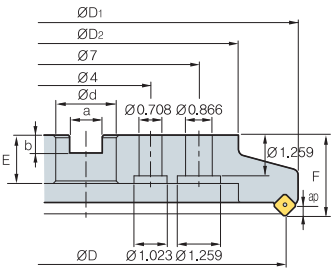


Fig. 4

AA
45°

- AR: -6°
- RR: -6°

(inch)

Designation		⭘	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
RMT8AA	5300R/L	5	3.0	3.937	2.205	1.0	0.374	0.248	0.866	2.0	0.236	3.96	1
	5300R/L-M	6	3.0	2.953	2.205	1.0	0.374	0.319	0.866	2.0	0.236	3.96	1
	5400R/L	6	4.0	4.961	2.874	1.3	1.500	0.319	0.866	2.0	0.236	5.72	2
	5400R/L-M	8	4.0	3.996	2.874	1.3	1.500	0.394	0.866	2.0	0.236	5.72	2
	5500R/L	8	5.0	5.945	3.386	1.5	1.626	0.394	1.181	2.5	0.236	9.46	2
	5500R/L-M	10	5.0	4.961	3.386	1.5	1.626	0.433	1.181	2.5	0.236	9.46	2
	5600R/L	10	6.0	6.929	4.882	2.0	0.748	0.433	1.181	2.5	0.236	14.30	2
	5600R/L-M	14	6.0	5.965	4.882	2.0	0.748	0.551	1.181	2.5	0.236	14.30	2
	5800R/L	12	8.0	8.937	5.118	2.5	1.000	0.551	1.496	2.5	0.236	19.80	3
	5800R/L-M	18	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.236	19.80	3
	51000R/L	16	10.0	10.945	7.087	2.5	1.000	0.551	1.496	2.5	0.236	31.68	3
	51000R/L-M	22	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.236	31.68	3
	51200R/L	20	12.0	12.953	9.449	2.5	1.000	0.551	1.496	2.5	0.236	48.84	4
	51200R/L-M	28	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.236	48.84	4

Available Inserts

SNCAF-MF



SNC(M)F-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	1507ANN-MF											●						E20 E21
	1507ANN-MM																	
SNMF	1507ANN-MF																	
	1507ANN-MM																	

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø3.0~Ø12.0	ETKA0625	KHB0417	SPR0415	LTC06SR-RM5	TW20-100

Available Inserts **E20, E21**

RMT8EA4000



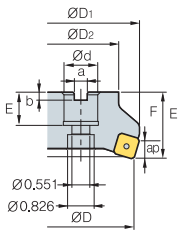


Fig. 1

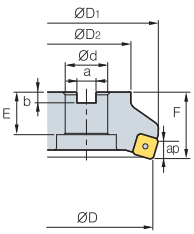


Fig. 2

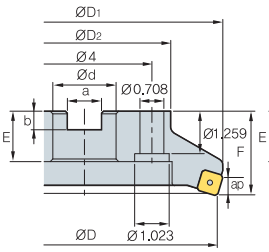


Fig. 3

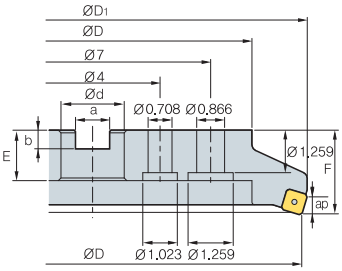


Fig. 4

AA
15°

- AR: -6°
- RR: -8°~ -6°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
RMT8EA	4300R/L	5	3.0	3.268	2.205	1.0	0.374	0.248	0.866	2.0	0.197	3.30	1
	4300R/L-M	6	3.0	2.953	2.205	1.0	0.374	0.248	0.866	2.0	0.197	3.30	1
	4400R/L	6	4.0	4.291	2.874	1.3	0.500	0.319	0.866	2.0	0.197	4.40	2
	4400R/L-M	8	4.0	3.996	2.874	1.3	0.500	0.319	0.866	2.0	0.197	4.40	2
	4500R/L	8	5.0	5.276	3.386	0.5	0.626	0.394	1.181	2.5	0.197	8.36	2
	4500R/L-M	10	5.0	4.496	3.386	0.5	0.626	0.394	1.181	2.5	0.197	8.36	2
	4600R/L	10	6.0	6.299	4.882	2.0	0.748	0.433	1.181	2.5	0.197	12.76	2
	4600R/L-M	14	6.0	5.965	4.882	2.0	0.748	0.433	1.181	2.5	0.197	12.76	2
	4800R/L	12	8.0	8.268	5.118	2.5	1.000	0.551	1.496	2.5	0.197	17.38	3
	4800R/L-M	18	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.197	17.38	3
	41000R/L	16	10.0	10.276	7.087	2.5	1.000	0.551	1.496	2.5	0.197	28.60	3
	41000R/L-M	22	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.197	28.60	3
	41200R/L	20	12.0	12.283	9.449	2.5	1.000	0.551	1.496	2.5	0.197	45.10	4
	41200R/L-M	28	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.197	45.10	4

Available Inserts

SNCAF-MF



SNC(M)F-MM



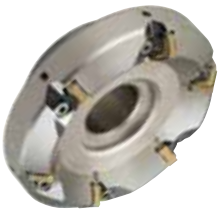
Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	1206ENN-MF											●						E20 E21
	1206ENN-MM																	
SNMF	1206ENN-MF								●									
	1206ENN-MM								●									

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø3.0~Ø12.0	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100

Available Inserts **E20, E21**

RMT8EA5000



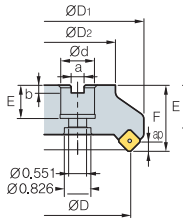


Fig. 1

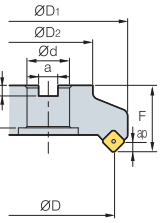


Fig. 2

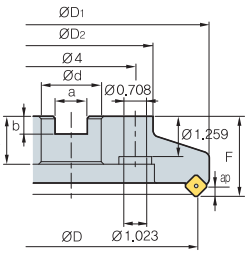


Fig. 3

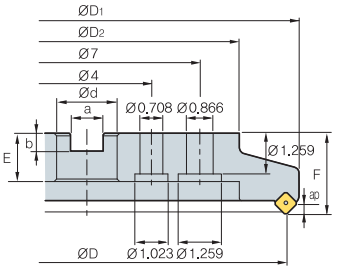


Fig. 4

AA
15°

- AR: -6°
- RR: -8°~ -6°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
RMT8EA	5300R/L	5	3.0	3.307	2.205	1.0	0.374	0.248	0.866	2.0	0.315	3.08	1
	5300R/L-M	6	3.0	2.953	2.205	1.0	0.374	0.248	0.866	2.0	0.315	4.18	1
	5400R/L	6	4.0	4.331	2.874	1.3	0.500	0.319	0.866	2.0	0.315	4.18	2
	5400R/L-M	8	4.0	3.996	2.874	1.3	0.500	0.319	0.866	2.0	0.315	4.18	2
	5500R/L	8	5.0	5.315	3.386	0.5	0.626	0.394	1.181	2.5	0.315	8.14	2
	5500R/L-M	10	5.0	4.961	3.386	0.5	0.626	0.394	1.181	2.5	0.315	8.14	2
	5600R/L	10	6.0	6.339	4.882	2.0	0.748	0.433	1.181	2.5	0.315	12.54	2
	5600R/L-M	14	6.0	5.965	4.882	2.0	0.748	0.433	1.181	2.5	0.315	12.54	2
	5800R/L	12	8.0	8.307	5.118	2.5	1.000	0.551	1.496	2.5	0.315	16.50	3
	5800R/L-M	18	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.315	16.50	3
	51000R/L	16	10.0	10.315	7.087	2.5	1.000	0.551	1.496	2.5	0.315	27.28	3
	51000R/L-M	22	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.315	27.28	3
	51200R/L	20	12.0	12.323	9.449	2.5	1.000	0.551	1.496	2.5	0.315	43.78	4
	51200R/L-M	28	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.315	43.78	4

Available Inserts

SNCAF-MF SNC(M)F-MM



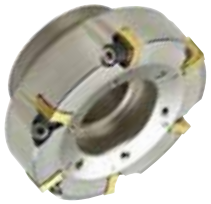
Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	1507ENN-MF											●						E20
	1507ENN-MM																	E21
SNMF	1507ENN-MF																	
	1507ENN-MM																	

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø3.0~Ø12.0	ETKA0625	KHB0417	SPR0415	LTC06SR-RM5	TW20-100

Available Inserts **E20, E21**

RMT8QA4000



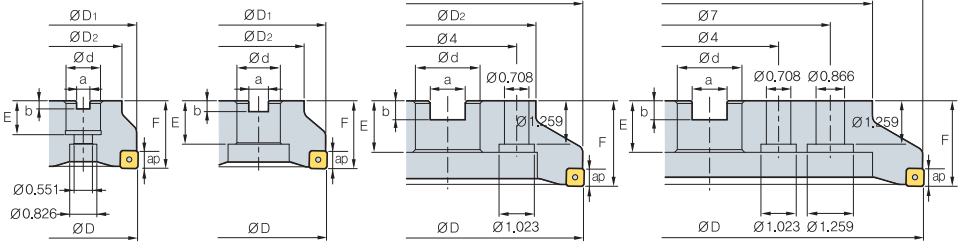


Fig. 1 Fig. 2 Fig. 3 Fig. 4



AA 2°

- AR: -6°
- RR: -11°~ -6°

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
RMT8QA	4300R/L	5	3.0	2.953	2.205	1.0	0.374	0.248	0.866	2.0	0.197	3.08	1
	4300R/L-M	6	3.0	2.953	2.205	1.0	0.374	0.248	0.866	2.0	0.197	3.08	1
	4400R/L	6	4.0	3.996	2.874	1.3	0.500	0.319	0.866	2.0	0.197	3.86	2
	4400R/L-M	8	4.0	3.996	2.874	1.3	0.500	0.319	0.866	2.0	0.197	3.86	2
	4500R/L	8	5.0	4.961	3.386	1.5	0.626	0.394	1.181	2.5	0.197	7.92	2
	4500R/L-M	10	5.0	4.961	3.386	1.5	0.626	0.394	1.181	2.5	0.197	7.92	2
	4600R/L	10	6.0	5.965	4.882	2.0	0.748	0.433	1.181	2.5	0.197	12.54	2
	4600R/L-M	14	6.0	5.965	4.882	2.0	0.748	0.433	1.181	2.5	0.197	12.54	2
	4800R/L	12	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.197	16.50	3
	4800R/L-M	18	8.0	7.953	5.118	2.5	1.000	0.551	1.496	2.5	0.197	16.50	3
	41000R/L	16	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.197	27.50	3
	41000R/L-M	22	10.0	9.961	7.087	2.5	1.000	0.551	1.496	2.5	0.197	27.50	3
	41200R/L	20	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.197	43.78	4
	41200R/L-M	28	12.0	11.969	9.449	2.5	1.000	0.551	1.496	2.5	0.197	43.78	4

Available Inserts

SNMF-MF SNMF-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNMF	1206QNN-MF																	E20
	1206QNN-MM								●									

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø3.0~Ø12.0	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100

Available Inserts E20

RM16ACA6000



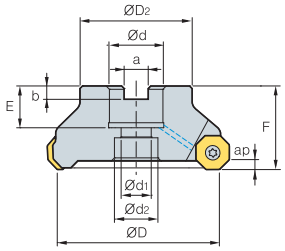


Fig. 1

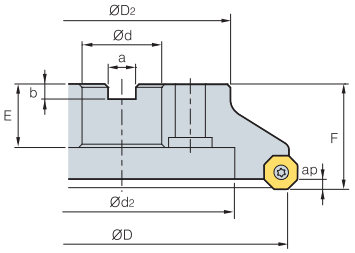


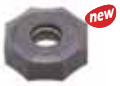
Fig. 2

AA 45°
• AR: -6°
• RR: -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM16ACA	6250HR-M	5	2.5	2.205	1.00	0.551	0.827	0.374	0.236	0.787	1.75	0.157	1.5	1
	6250HR-H	7	2.5	2.205	1.00	0.551	0.827	0.374	0.236	0.787	1.75	0.157	1.5	1
	6300HR-M	6	3.0	2.205	1.00	0.551	0.827	0.374	0.236	0.866	2.00	0.157	2.6	1
	6300HR-H	8	3.0	2.205	1.00	0.551	0.827	0.374	0.236	0.866	2.00	0.157	2.6	1
	6400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.315	0.866	2.00	0.157	4.2	1
	6400HR-H	10	4.0	2.874	1.25	0.709	1.024	0.500	0.315	0.866	2.00	0.157	4.2	1
	6500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	0.157	7.7	1
	6500HR-H	14	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	0.157	7.7	1
	6600R-M	10	6.0	4.882	2.00	-	4.213	0.748	0.433	1.181	2.50	0.157	9.0	2
	6600R-H	16	6.0	4.882	2.00	-	4.213	0.748	0.433	1.181	2.50	0.157	9.0	2
	6800R-M	12	8.0	5.118	2.50	-	5.315	1.012	0.551	1.496	2.50	0.157	13.4	2
	6800R-H	20	8.0	5.118	2.50	-	5.315	1.012	0.551	1.496	2.50	0.157	13.4	2

Available Inserts

ONHX-MF	ONHX-ML	ONHX-MM	ONHX-W	ONHX-MA	ONMX-MF	ONMX-MM
						

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
ONHX	060608-MM											●	●	●				E14
	060608-MF											●	●	●				
	060608-ML												●	●				
	060608-MA																●	
	060608-W										●	●	●					
	0606ANN-MM											●	●	●				
	0606ANN-MF											●	●	●				
ONMX	060608-MM								●	●		●	●	●				
	060608-MF									●		●	●	●				
	0606ANN-MM								●	●		●	●	●				
	0606ANN-MF									●	●	●	●	●				

Parts

Specification	Screw	Wrench
Ø2.5~Ø8.0	FTGA0513	TW20-100

Available Inserts E14

RM16ACA8000



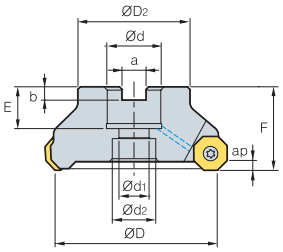


Fig. 1

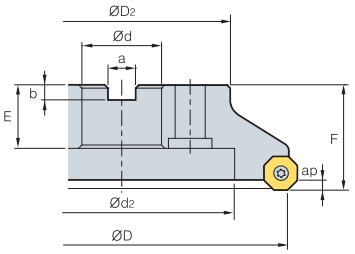


Fig. 2

AA 45°
- AR: -6°
- RR: -6°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Fig.
RM16ACA	8250HR-M	5	2.5	2.205	1.00	0.551	0.827	0.374	0.236	0.787	1.75	0.216	1.5	1
	8250HR-H	6	2.5	2.205	1.00	0.551	0.827	0.374	0.236	0.787	1.75	0.216	1.5	1
	8300HR-M	6	3.0	2.205	1.00	0.551	0.827	0.374	0.236	0.866	2.00	0.216	2.6	1
	8300HR-H	7	3.0	2.205	1.00	0.551	0.827	0.374	0.236	0.866	2.00	0.216	2.6	1
	8400HR-M	7	4.0	2.874	1.25	0.709	1.024	0.500	0.315	0.866	2.00	0.216	4.0	1
	8400HR-H	9	4.0	2.874	1.25	0.709	1.024	0.500	0.315	0.866	2.00	0.216	4.0	1
	8500HR-M	8	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	0.216	7.7	1
	8500HR-H	10	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	0.216	7.7	1
	8600R-M	10	6.0	4.882	2.00	-	4.213	0.748	0.433	1.181	2.50	0.216	9.9	2
	8600R-H	14	6.0	4.882	2.00	-	4.213	0.748	0.433	1.181	2.50	0.216	9.9	2
	8800R-M	12	8.0	5.118	2.50	-	5.315	1.012	0.551	1.496	2.50	0.216	12.8	2
	8800R-H	16	8.0	5.118	2.50	-	5.315	1.012	0.551	1.496	2.50	0.216	12.8	2

Available Inserts

ONHX-MF	ONHX-ML	ONHX-MM	ONHX-W	ONHX-MA	ONMX-MF	ONMX-MM
						

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
ONHX	080608-MM																	
	080608-MF																	
	080608-ML																	
	080608-W																	
	080608-MA																	
	0806ANN-MM																	E14
	0806ANN-MF																	
ONMX	080608-MM								●		●		●					
	080608-MF																	
	0806ANN-MM												●					
	0806ANN-MF																	

Parts

Specification	Screw	Wrench
Ø2.5~Ø8.0	FTGA0513	TW20-100

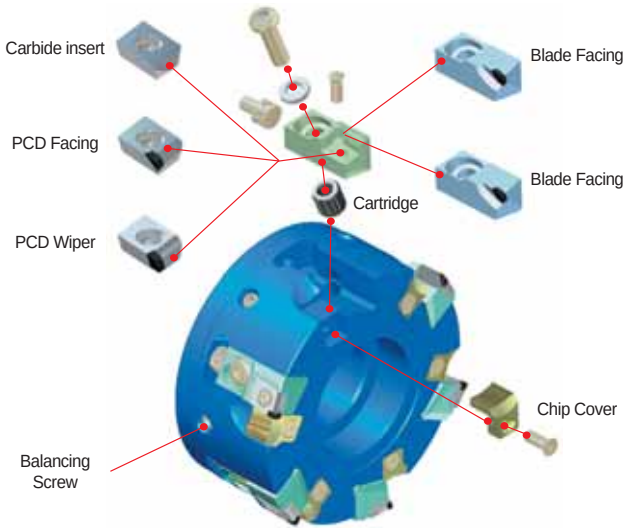
Available Inserts **E14**

Lighter tool ensures excellent performance in high speed machining.

Aero Mill

- Excellent machining performance can be acquired especially at the high speeds due to the light aluminum cutter body that is 50% of the weight of a conventional steel cutter body
- High speed milling cutter for precise machining
- Special Aluminum material and high rake angle of insert provide rigid & stable machining
- High tolerance surface finishs can be acquired due to the low cutting load provided from the high rake angle
- Balanceable up to G2.5 level

Assembly structure of cutter

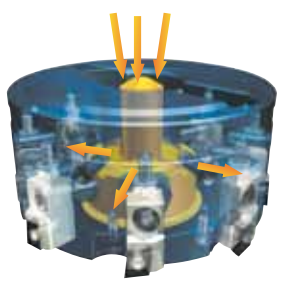
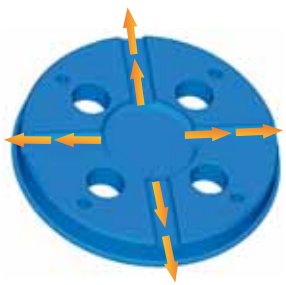


Features of cutter

- Increased stability based on cartridge type application
- Both insert and blade can be available in the same cutter
- Finishing to roughing can be possible because of wide chip pocket space
- Roughing and finishing available with carbide, PCD insert application
- Cutter breakage can be solved by making use of the chip cover

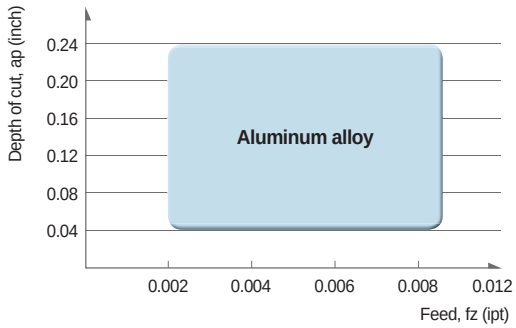
Coolant through system

- Specially designed coolant through system provides coolant from the center of the cutter to the insert enhances the cooling rate and chip evacuation.
- Direction of coolant has designed to focus directly to the insert cutting-edge to maximize chip evacuation and improve tool life
- Coolant bolt is applicable up to Ø6, coolant cover is applicable from Ø8 and over. Coolant devices are sold separately for through coolant system, through coolant arbor has to be used

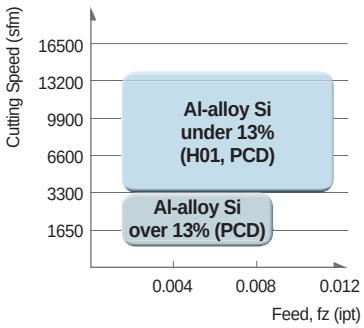
Coolant Bolt	Coolant Cover
	
For Ø3~Ø6	For Ø8 and over

Aero Mill

Application range



Recommended cutting condition

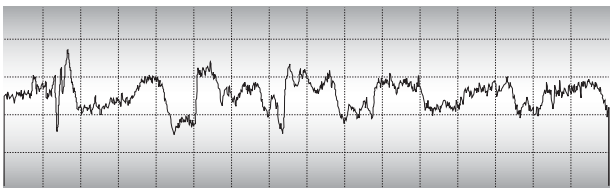


Surface finish

■**Workpiece** A6061

■**Cutting condition**
vc = 5200 sfm vf = 20 ipm
N = 5000 min^{-1} fz = 0.004 ipt
ap = 0.02 inch Machine = PCV620

■**Designation**
Cutter APD100R-A6Z (6 Flutes)
Insert CDEW1204R-XCF (H01)



- Rmax: 2.1㎛
- Rz: 1.6㎛
- Ra: 0.3㎛

Max. revolution

Diameter (inch)	Max. revolution (rpm)
Ø3	16,000
Ø4	15,000
Ø5	12,500
Ø6	10,000
Ø8	8,000
Ø10	6,500
Ø12	5,000

Coolant parts

Diameter (inch)	Type	Designation		Shape	Note
Ø3	Coolant Bolt	CBP080-IN/MM			Extra charge
Ø4	Coolant Bolt	CBP100-IN	CBP100-MM-1		
Ø5	Coolant Bolt	CBP125-IN	CBP125-MM-1		
Ø6	Coolant Bolt	CBP160-IN	CBP160-MM		
Ø8	Coolant Cover	CCP200			
Ø10	Coolant Cover	CCP250			
Ø12	Coolant Cover	CCP315			

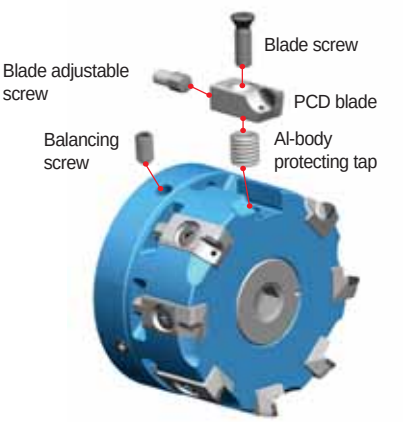
• Choice: CBP100-IN:APD type, General for unmarked item

Cone Shaped Head Indexable Drill

Aero Mill-Plus

- Improve tool life up to 20% with a coolant system that enables direct spray cooling to cutting blades
- Enable high feed milling by increasing the number of cutting blades by 20% through a simply structured coupling method for clamps
- Reduces set up time up to 40% by applying a spanner adjustment method
- Introduce an aluminum cutter body to provide a superior cutting performance during high speed milling

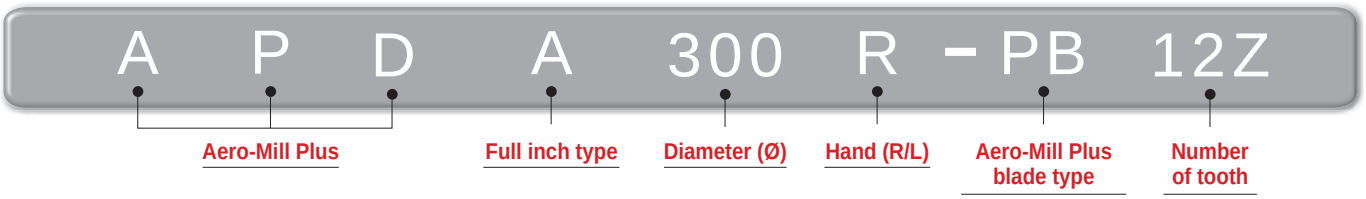
Assembly structure of cutter



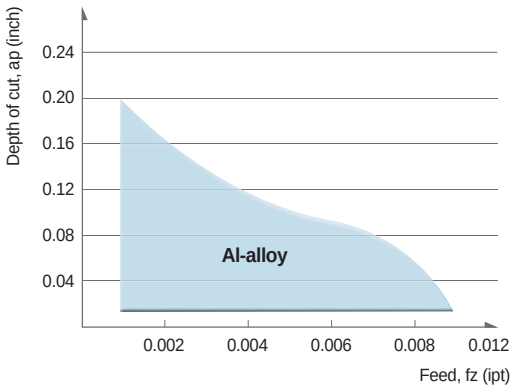
Features of cutter

- Prevent overload to the spindle bearings through weight reduction of the Al alloy body and enable high-speed processing
- Provide PCD Blade-dedicated cutter design to offer stable tool life and increase of applied blades
- Improve the blade life by applying a coolant system that enables direct spray cooling to cutting blades
- Adopt a clamping method with simple structure without set screw
- Reduce weight and apply a coolant bolt that is exclusively used for Aero-Mill Plus that applies coolant to remove internal chip

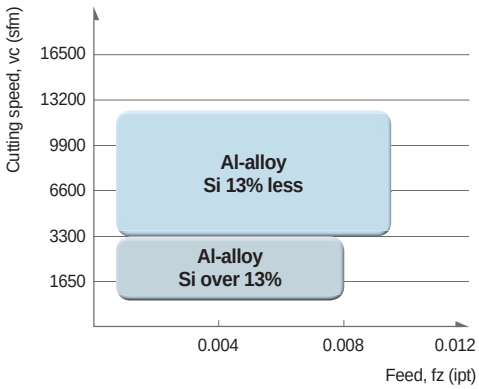
Code system



Application range



Recommended cutting speed



Max. RPM

Diameter (inch)	Max. revolution (rpm)
Ø3	20,000
Ø4	18,000
Ø5	16,000
Ø6	13,000
Ø8	10,000
Ø10	8,000
Ø12	7,000

Coolant parts

Diameter (inch)	Type	Designation	Shape	Material	Note
Ø3	Coolant bolt	CB-AMP300-IN		Steel	Included
Ø4		CB-AMP400-IN			
Ø5		CB-AMP500-IN			
Ø6		CB-AMP600-IN			
Ø8	Coolant cover	CCV-AMP800-IN		Aluminum	Extra charge
Ø10		CCV-AMP1000-IN			
Ø12		CCV-AMP1200-IN			

Good performance in small-medium size of operations

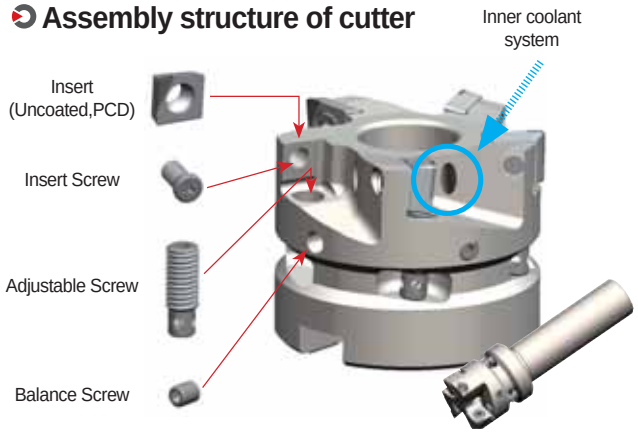
Aero Mill-Mini

- Good performance in small-medium size of operations
- Good duration of the steel body
- Choice of Uncoated carbide / PCD grades can be applied to various kind of work material
- Balance level: G25

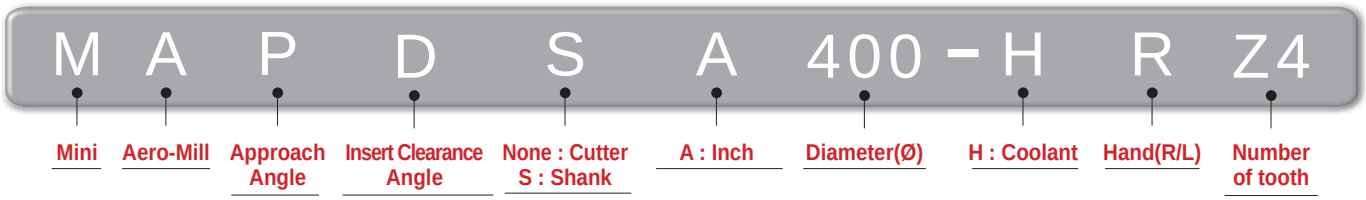
Features of cutter

- Simple and strong design of Screw-on clamping.
- Adjustable range: ± 0.004 inch Max
- Adjustable step: Min. 2 micro meter
- Wide chip pocket area for Roughing and Aluminum machining.
- Inner coolant system

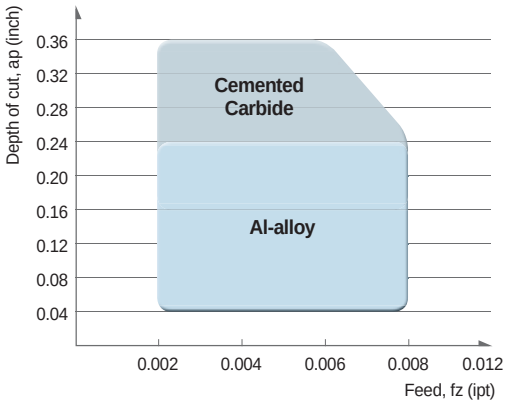
Assembly structure of cutter



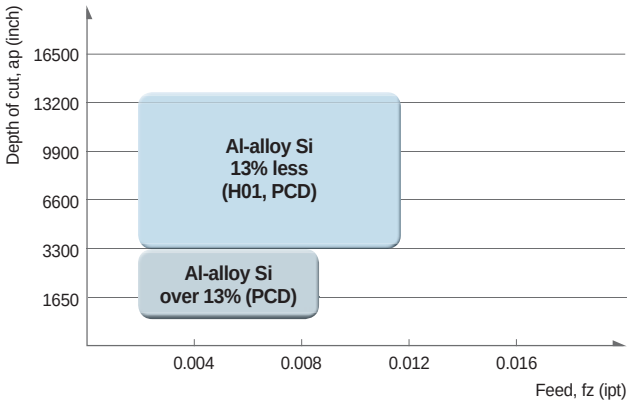
Code system



Application range



Recommended cutting condition

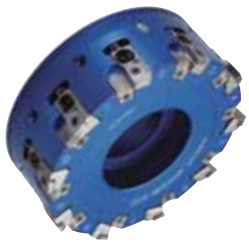


Max. RPM

Diameter	Max. RPM (min^{-1})
Ø1.25	26,000
Ø1.50	24,500
Ø2.00	22,000
Ø2.50	20,000

APDA-A

Cartridge + Insert



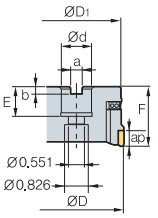


Fig. 1

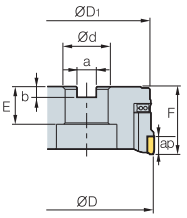


Fig. 2

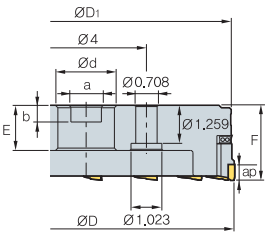


Fig. 3

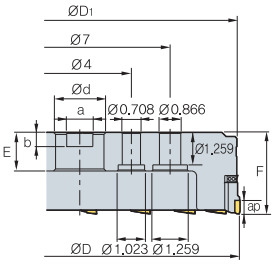


Fig. 4

AA
0°

- AR: 6°
- RR: 5°~9°

(inch)

Designation			ØD	ØD1	Ød	a	b	E	F	ap	Max rpm	lbs	Fig.
APDA	300R/L-A6Z	6	3.0	2.843	1.000	0.375	0.248	0.866	2.000	0.24	16000	1.7	1
	400R/L-A6Z	6	4.0	3.803	1.250	0.500	0.319	0.866	2.000	0.24	15000	2.1	2
	500R/L-A8Z	8	5.0	4.804	1.500	0.625	0.394	1.181	2.500	0.24	12500	4.0	2
	600R/L-A10Z	10	6.0	5.803	2.000	0.750	0.433	1.181	2.500	0.24	10000	6.4	2
	800R/L-A12Z	12	8.0	7.803	2.500	1.000	0.551	1.496	2.500	0.24	8000	8.8	3
	1000R/L-A16Z	16	10.0	9.803	2.500	1.000	0.551	1.496	2.500	0.24	6500	13.9	3
	1200R/L-A18Z	18	12.0	11.803	2.500	1.000	0.551	1.496	3.125	0.24	5000	24.9	4

Available Inserts

CDEW-XCF CDEW-XAF, NAF CDEW-XAW, NAW



Designation		Uncoated			PCD	page
		H01	G10	ST30A	DP200	
CDEW	1204R-XCF	●				E06 E07
	1204L-XCF					
	1204R-XAF				●	
	1204L-XAF					
	1204R-NAF				●	
	1204R-XAW				●	
	1204L-XAW					
	1204R-NAW				●	

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
Aluminum	3,300~13,200 1,650~8,250	0.002~0.012 0.002~0.008	DP200 H01

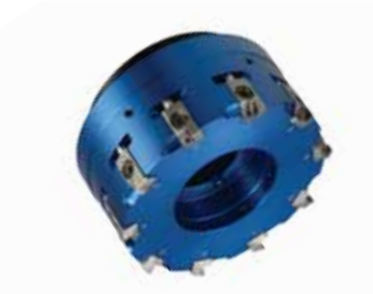
Parts

Specification	Cartridge	Chip cover	Chip cover Screw	Insert Screw	Adjust Screw	Cartridge Screw	Wrench for Insert	Wrench for Cartridge
Ø3.0~Ø12.0	LAPDR/L-AJ	CAPDR/L-AJ	PTMA0411	FTNA0411	AZ0514	BHA0619-NYLOK	TW15S	HW50

Available Inserts E06, E07

APDA-PB

Blade



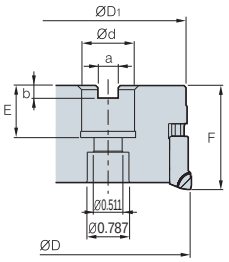


Fig. 1

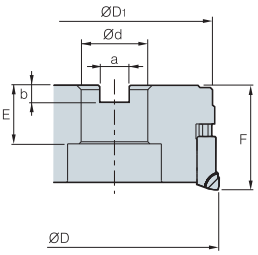


Fig. 2

AA 0°

- AR: 6°
- RR: -4°~1°

(inch)

Designation			Max	ØD	ØD1	Ød	a	b	E	F	ap	lbs	Fig.
APDA	300R-PB6Z	6	10	3.0	2.882	1	0.375	0.248	0.787	2	0.196	1.1	1
	300R-PB8Z	8	10	3.0	2.882	1	0.375	0.248	0.787	2	0.196	1.2	1
	400R-PB6Z	6	12	4.0	3.882	1.25	0.5	0.319	0.984	2	0.196	2.1	2
	400R-PB8Z	8	12	4.0	3.882	1.25	0.5	0.319	0.984	2	0.196	2.1	2
	500R-PB8Z	8	14	5.0	4.882	1.5	0.625	0.394	1.26	2.5	0.196	4.3	2
	500R-PB10Z	10	14	5.0	4.882	1.5	0.625	0.394	1.26	2.5	0.196	4.2	2
	600R-PB10Z	10	20	6.0	5.882	2	0.750	0.433	1.26	2.5	0.196	6.6	2
	600R-PB12Z	12	20	6.0	5.882	2	0.750	0.433	1.26	2.5	0.196	6.8	2

Available Blades

	BAMPR-XAF	BAMPR-XAW	BAMPR-XAWR
			

Designation	PCD	page
	DP150	
BAMPR-XAF	●	E06
BAMPR-XAW	●	
BAMPR-XAWR		

Parts

Specification	Blade screw	Blade adjustable screw	Al-body protecting tap	Balancing screw	Wrench for insert	Wrench for Cartridge
Ø3.0~Ø6.0	ETKA0620	AZ0514-SPN6	UZD1010	KHE0610	SPN-6	TW25-100

Available Inserts **E06**

APDA-PB

Blade



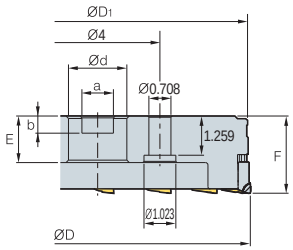


Fig. 1

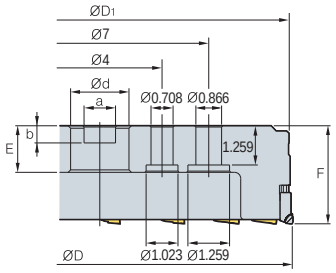


Fig. 2

AA
0°

- AR: -6°
- RR: -39°~ -16°

(inch)

Designation			Max	ØD	ØD1	Ød	a	b	E	F	ap	lbs	Fig.
APDA	800R-PB12Z	12	26	8.0	7.882	2.50	1	0.551	1.575	2.5	0.196	9.9	1
	1000R-PB16Z	16	32	10.0	9.882	2.50	1	0.551	1.575	2.5	0.196	15.2	1
	1200R-PB18Z	18	42	12.0	11.88	2.50	1	0.551	1.575	2.5	0.196	22.1	2

Available Blades

Designation	BAMPR-XAF	BAMPR-XAW	BAMPR-XAWR	page
	PCD			
	DP150			
BAMPR-XAF	●			E06
BAMPR-XAW	●			
BAMPR-XAWR				

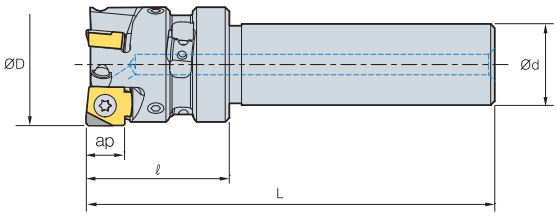
Parts

Specification	Blade screw	Blade adjustable screw	Al-body protecting tap	Balancing screw	Wrench for insert	Wrench for Cartridge
Ø8.0~Ø12.0	ETKA0620	AZ0514-SPN6	UZD1010	KHE0610	SPN-6	TW25-100

Available Inserts E06

MAPDSA000HR/L-Z0





※ PCD ap: 0.236inch

AA 0°

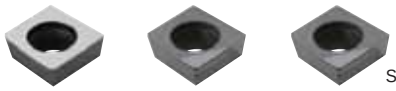
- AR: 6°
- RR: -4°~1°

(inch)

Designation			ØD	Ød	ℓ	L	ap	Max rpm	lbs
MAPDSA	125HR/L-Z3	3	1.25	0.75	1.5	4	0.354	26,000	0.35
	150HR/L-Z4	4	1.5	0.75	1.5	4	0.354	24,500	0.42

Available Inserts

SNEW SNEW-XAF SNEW-NAF



Strengthened Edge

Designation		Uncoated			PCD	page
		H01	G10	ST30A	DP200	
SNEW	09T3ADFR	●				E22 E23
	09T3ADTR-XAF				●	
	09T3ADTR-XAW				●	
	09T3ADTR-NAF				●	
	09T3ADTR-NAW				●	

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
Aluminum	3,300~13,200 1,650~8,250	0.002~0.012 0.002~0.008	DP200 H01

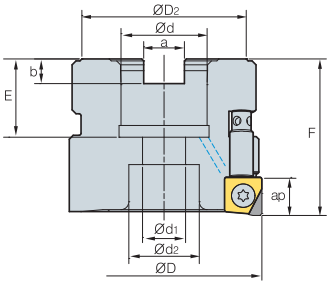
Parts

Specification	Insert Screw	Adjust Screw	Balance Screw	Wrench for Insert	Adjust Wrench
Ø1.25~Ø1.5	FTKA0408	AHX0617F-NYLOK	KHD0405	TW15S	HW20L

Available Inserts E22, E23

MAPDA000HR/L-Z0





※ PCD ap : 0.236inch
※ Uncoated carbide ap : 0.354inch

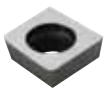
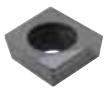
AA 0°
• AR: 6°
• RR: -1°~12°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	Max rpm	lbs
MAPD	150HR/L-Z4	4	1.5	1.417	0.50	0.252	0.169	0.630	1.50	0.287	0.433	0.354	24,000	0.24
	200HR/L-Z5	5	2.0	1.772	0.75	0.321	0.220	0.787	1.75	0.433	0.630	0.354	22,000	0.35
	250HR/L-Z6	6	2.5	1.772	0.75	0.321	0.220	0.787	1.75	0.551	0.826	0.354	20,000	0.65

Available Inserts

SNEW SNEW-XAF SNEW-NAF


Strengthened Edge

Designation		Cermet			Uncoated				PCD	page
		CN2000	CN20	CN30	H01	G10	ST30A	ST20	DP200	
SNEW	09T3ADFR				●					E22 E23
	09T3ADTR-XAF								●	
	09T3ADTR-XAW								●	
	09T3ADTR-NAF								●	
	09T3ADTR-NAW								●	

Recommended cutting condition

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
Aluminum	3,300~13,200 1,650~8,250	0.002~0.012 0.002~0.008	DP200 H01

Coolant Bolt (Not included)

Designation	Applicable cutter	Available Cutters
CB0525	MAPDA150HR/L-Z4	Ø1.5
CB1025	MAPDA200HR/L-Z5 MAPDA250HR/L-Z6	Ø2.0 Ø2.5

Parts

Specification	Insert Screw	Adjust Screw	Balance Screw	Wrench for Insert	Adjust Wrench
Ø1.5~Ø2.5	FTKA0408	AHX0617F-NYLOK	KHD0405	TW15S	HW20L

Available Inserts E22, E23

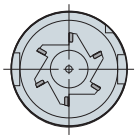
Code system

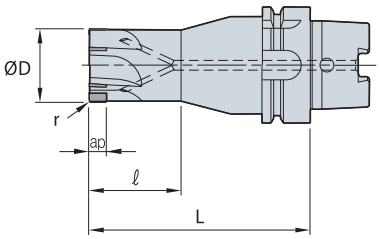
PDFA 6 2500 – HSK63A

- PDFA — PCD FACE CUTTER
- 6 — Tooth
- 2500 — Diameter
- HSK63A — Shank

PCD FACE CUTTER









AA 0°

- AR: 6°
- RR: 5°~9°

(inch)

Designation		Stock	⦾	ØD	r	ap	ℓ	L
PDFA	41250-HSK50A		4	1.250	0.02	0.3	2.0	5.0
	41575-HSK50A		4	1.575	0.02	0.3	2.0	5.0
	41250-HSK63A		4	1.250	0.02	0.3	2.0	5.0
	41575-HSK63A		4	1.575	0.02	0.3	2.0	5.0
	42000-HSK63A		4	2.000	0.02	0.3	2.0	5.0
	62500-HSK63A		6	2.500	0.02	0.5	-	4.0
	62500-HSK100A		6	2.500	0.02	0.5	-	4.0

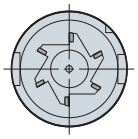
●Stock item

Recommended cutting condition

Workpiece	vc (sfm)	fz (ipt)	ap (inch)
Al, Brass, Alloy	655~6,550	0.001~0.004	0.002~0.157

Special PCD order sheet





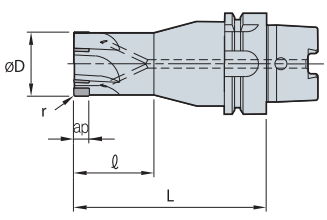


Fig. 1

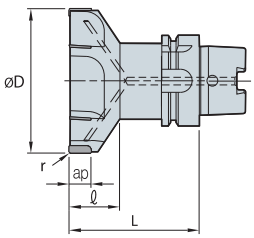


Fig. 2

Designation	Fig.	tooth	Dimensions (inch)					
			ØD	r	ap	ℓ	L	Shank spec.
PDFA								

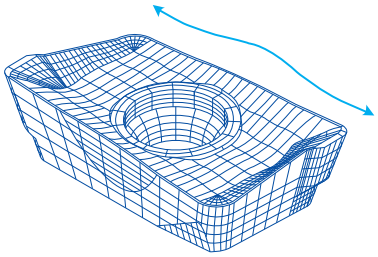
Various applications are available with multi-functional cutters

Alpha Mill

- Innovative curve cutting-edge and chip-breaker design ensures ideal 90-degree cutting, lower cutting resistance, and improved insert life.
- Various applications are available with multi-functional cutters. (Facing, Slotting, Square shoulder milling, etc.)
- Excellent performance ensured at large depth of cut operations due to strong cutting-edge and low cutting resistance.

Features of insert

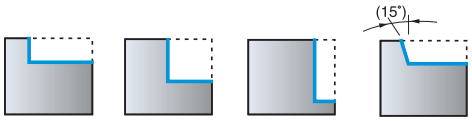
- Long tool life at high speed, high feed and deeper cutting by low cutting resistance and strong cutting-edge
- Distinguished features of Alpha-Curve reduce cutting resistance and improve cutting-edge strength and wear resistance



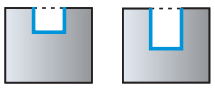
- Low cutting resistance is realized by KORLOY unique design-the alpha curve cutting-edge and optimal convex and concave design
- Highly efficient machining is available by the ideal application of the grade to material

Application example

Shouldering



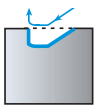
Slotting



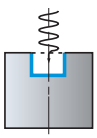
Drilling



Ramping



Helical cutting





Features of chip breakers

Type	Chip breaker	Cutting-edge	Features
Al	MA		• Optimal cutting-edge and buffed surface for aluminum workpieces ensure high performance in machining
Hard-to-cut material	ML		• Chip breaker with low cutting load is optimal for machining hard-to-cut materials
Light cutting	MF		• Chip breaker with low cutting load and harder cutting-edge than ML's are optimal for light cutting
General cutting	MM		• Optimal for milling in general ranges

Product constitution

Item description	Type	Nose R	MA	ML
APMT	1000 type	0.016	APMT0602PDFR-MA	-
		0.031	APMT060208PDFR-MA	-
	1500 type	0.016	APMT0903PDFR-MA	APMT0903PDER-ML
		0.031	APMT090308PDFR-MA	APMT090308PDER-ML
	2000 type	0.020	APMT11T3PDFR-MA	APMT11T3PDER-ML
		0.031	APMT11T308PDFR-MA	APMT11T308PDER-ML
	3000 type	0.016	APMT160404PDFR-MA	APMT160404PDER-ML
		0.031	APMT1604PDFR-MA	APMT1604PDER-ML
	4000 type	0.016	APMT180604PDFR-MA	APMT180604PDER-ML
		0.031	APMT1806PDFR-MA	APMT1806PDER-ML
		0.047	APMT180612PDFR-MA	APMT180612PDER-ML
		0.063	APMT180616PDFR-MA	APMT180616PDER-ML
		0.079	APMT180620PDFR-MA	APMT180620PDER-ML
		0.094	APMT180624PDFR-MA	APMT180624PDER-ML
		0.118	APMT180630R-MA	APMT180630R-ML

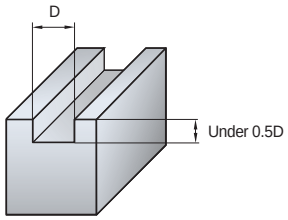
- The inserts can switch to the APMT type holders.

Recommended grades and chip breakers by workpiece

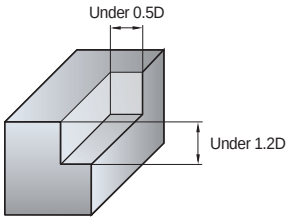
Chip breaker	Cutter edge	Recommended C/B and grade as per workpiece (●: 1st)													
		P				M		K		N		S		H	
		Low carbon steel/Mild steel		High carbon steel/Mild steel		Stainless steel		Cast iron		Aluminum alloy		Ti/Inconel		High hardness steel	
		C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades
MA		-	-	-	-	-	-	-	-	●	●H01	-	-	-	-
ML		-	-	-	-	●	●PC5300 ○PC5400 ○PC9530	-	-	-	-		●PC5300 ○PC5400	-	
MF		●	●PC3500 ○PC5300 ○PC5400 ○NCM325 ○NC5340	-	○PC3500 ○NCM325 ○NC5340	-	●PC5300 ○PC5400 ○PC9530	●	●PC6510 ○PC5300 ○PC5400	-	-	-	●PC5300 ○PC5400	-	
MM		-	●PC3500 ○PC5300 ○PC5400 ○NCM325 ○NC5340	●	●PC3500 ○PC5300 ○PC5400 ○NCM325 ○NC5340	-	●PC5300 ○PC5400 ○PC9530	-	●PC6510 ○PC5300 ○PC5400	-	-	-	●PC5300 ○PC5400	●	○PC2505 ●PC2510

Recommended depth of cut

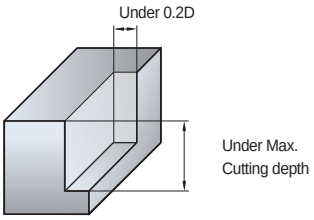
1. Slotting



2. Shouldering



3. Shouldering



Recommended cutting condition (for Multi-edge type)

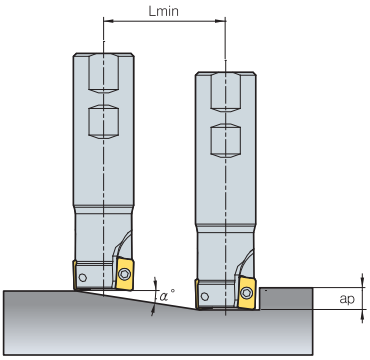
Workpiece	Grades	Fig.	Tool dia. Ø0.43, Ø0.625		Ø0.75, 1.0		Ø1.25, 1.5		Ø2.0, 2.5		Ø3.0, 4.0	
			vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)
Mild steel, Low carbon steel	NC5340 NCM325 PC5400 PC5300 PC3500 PC3600	①	160~260	0.003~0.002	260~330	0.003~0.002	330~390	0.003~0.002	330~390	0.003~0.002	330~390	0.003~0.002
		②	210~295	0.004~0.003	330~390	0.004~0.003	390~460	0.004~0.003	390~460	0.004~0.003	390~460	0.004~0.003
		③	210~310	0.006~0.004	330~390	0.006~0.004	390~460	0.006~0.004	390~460	0.006~0.004	430~490	0.006~0.004
High carbon steel, Alloy steel	NC5340 NCM325 PC5300 PC3500 PC3600	①	150~200	0.002	200~260	0.002	260~330	0.002	260~330	0.002	260~330	0.002
		②	160~260	0.003~0.002	260~330	0.003~0.002	330~390	0.004~0.003	330~390	0.004~0.003	330~390	0.004~0.003
		③	160~260	0.006~0.004	260~330	0.006~0.004	360~430	0.006~0.004	330~430	0.006~0.004	360~430	0.006~0.004
Alloy tool steel	PC5300 PC3500 PC3600 PC2510 PC2505	①	130~180	0.002	160~230	0.002	230~300	0.002	230~300	0.002	230~300	0.002
		②	150~200	0.003~0.002	200~260	0.003~0.002	300~390	0.003~0.002	330~390	0.003~0.002	330~390	0.003~0.002
		③	160~250	0.007~0.005	300~360	0.007~0.005	330~430	0.006~0.004	330~390	0.006~0.004	360~430	0.006~0.004
Stainless steel	PC5300 PC9530	①	115~165	0.002	160~230	0.002	230~300	0.002	230~300	0.002	230~300	0.002
		②	150~200	0.003~0.002	200~260	0.003~0.002	300~390	0.003~0.002	330~390	0.003~0.002	330~390	0.003~0.002
		③	160~250	0.006~0.004	300~360	0.006~0.004	330~430	0.006~0.004	360~430	0.006~0.004	360~430	0.006~0.004
Cast iron	PC6510 PC5300	①	160~230	0.005~0.004	230~300	0.005~0.004	230~300	0.005~0.004	300~390	0.005~0.004	300~390	0.005~0.004
		②	160~260	0.005	260~330	0.005	300~390	0.005	330~460	0.005	330~460	0.005
		③	160~260	0.008~0.006	260~330	0.008~0.006	330~430	0.008~0.006	390~490	0.008~0.006	390~490	0.008~0.006
Aluminum alloy	H01	①	520~1970	0.008~0.004	660~2,620	0.008~0.004	980~2,950	0.008~0.004	1,310~3,280	0.008~0.004	1,310~3,280	0.008~0.004
		②	650~2,130	0.012~0.006	820~2,950	0.012~0.006	980~3,120	0.012~0.006	1,310~3,280	0.016~0.004	1,310~3,280	0.016~0.004
		③	650~2,130	0.012~0.006	820~2,950	0.012~0.006	980~3,120	0.012~0.006	1,310~3,280	0.016~0.004	1,310~3,280	0.016~0.004
Hardened steel	PC5300 PC2510 PC2505	①	115~160	0.001	160~230	0.001	200~300	0.001	200~300	0.001	200~300	0.001
		②	150~200	0.003~0.002	200~260	0.003~0.002	260~330	0.003~0.002	260~330	0.003~0.002	260~330	0.003~0.002
		③	160~260	0.003~0.002	260~330	0.003~0.002	260~330	0.003~0.002	260~330	0.003~0.002	260~330	0.003~0.002

Recommended cutting condition (for Single-edge type)

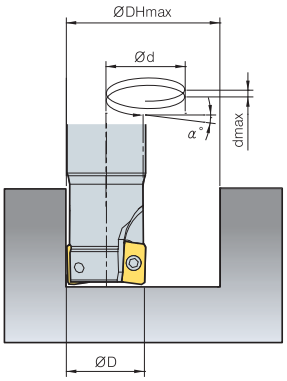
Workpiece	Grades	Fig.	Tool dia. Ø0.43, Ø0.625		Ø0.75, 1.0		Ø1.25, 1.5		Ø2.0, 2.5		Ø3.0, 4.0	
			vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)
Mild steel, low carbon steel	NC5340 NCM325 PC5400 PC5300 PC3500 PC3600	①	150~200	0.003~0.002	200~260	0.003~0.002	260~390	0.003~0.002	390~660	0.003~0.002	490~660	0.003~0.002
		②	200~295	0.004~0.003	260~390	0.004~0.003	390~590	0.004~0.003	590~820	0.004~0.003	660~820	0.004~0.003
		③	200~295	0.006~0.004	260~390	0.006~0.004	390~590	0.006~0.004	590~820	0.006~0.004	660~820	0.006~0.004
High carbon steel, alloy steel	NC5340 NCM325 PC5300 PC3500 PC3600	①	130~200	0.002	160~260	0.002	260~360	0.002	330~490	0.002	330~490	0.002
		②	160~260	0.003~0.002	260~330	0.003~0.002	360~490	0.004~0.002	490~660	0.004~0.002	490~660	0.004~0.002
		③	160~260	0.006~0.004	260~330	0.006~0.004	390~490	0.006~0.004	590~660	0.006~0.004	590~660	0.006~0.004
Alloy tool steel	PC5300 PC3500 PC3600 PC2510 PC2505	①	115~160	0.002	160~230	0.002	260~330	0.002	330~430	0.002	330~430	0.002
		②	150~230	0.003~0.002	230~330	0.003~0.002	330~430	0.004~0.002	430~590	0.004~0.002	430~590	0.004~0.002
		③	150~230	0.006~0.004	230~330	0.006~0.004	330~490	0.006~0.004	430~590	0.006~0.004	430~590	0.006~0.004
Stainless steel	PC5300 PC9530	①	115~160	0.002	160~230	0.002	260~330	0.002	330~430	0.002	330~430	0.002
		②	150~230	0.003~0.002	230~330	0.003~0.002	330~430	0.004~0.002	430~590	0.004~0.002	430~590	0.004~0.002
		③	150~230	0.006~0.004	230~330	0.006~0.004	330~490	0.006~0.004	430~590	0.006~0.004	430~590	0.006~0.004
Cast iron	PC6510 PC5300	①	160~260	0.005~0.003	260~330	0.005~0.003	260~330	0.006	390~490	0.006	390~490	0.006
		②	210~295	0.006~0.005	330~390	0.006~0.005	330~430	0.007~0.006	490~660	0.007~0.006	490~660	0.007~0.006
		③	210~295	0.008~0.006	330~390	0.008~0.006	330~430	0.008~0.006	490~660	0.008~0.006	490~660	0.008~0.006
Aluminum alloy	H01	①	650~1970	0.008~0.006	820~2,620	0.008~0.006	980~2,950	0.008~0.006	1,310~3,280	0.008~0.004	1,310~3,280	0.008~0.004
		②	650~2130	0.010~0.008	820~2,950	0.010~0.008	1,150~3,120	0.010~0.008	1,310~3,280	0.012~0.008	1,310~3,280	0.012~0.008
		③	650~2130	0.012~0.010	820~2,950	0.012~0.010	1,150~3,120	0.012~0.010	1,310~3,280	0.016~0.012	1,310~3,280	0.016~0.012
Hardened steel	PC5300 PC2510 PC2505	①	115~160	0.003	160~230	0.001	200~300	0.001	200~300	0.001	200~300	0.001
		②	150~210	0.003~0.002	200~260	0.003~0.002	260~330	0.003~0.002	260~330	0.003~0.002	260~330	0.003~0.002
		③	160~260	0.003~0.002	260~330	0.003~0.002	260~330	0.003~0.002	260~330	0.003~0.002	260~330	0.003~0.002

Cutting condition for ramping and helical operation

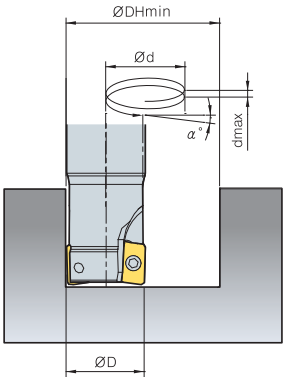
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole

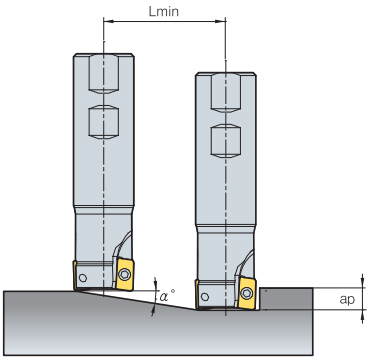


Designation		Tool Dia. ØD(min)	Ramping			Helical cutting for blind hole				Helical cutting for through hole	
			ap	Maximum angle α(°)	Lmin (inch)	Max. desirable hole Dia. ØDHmax (inch)	Max. pitch dmax (inch)	Min. desirable hole Dia. ØDHmin (inch)	Max. pitch dmax(inch)	Min. desirable hole Dia. ØDHmin (inch)	Max. pitch dmax (inch)
AMSA	1043HS	0.438	0.220	5.50	2.045	0.828	0.080	0.781	0.075	0.599	0.058
	1050HS	0.500	0.220	4.52	2.492	0.953	0.075	0.906	0.072	0.724	0.057
	1056HS	0.563	0.220	3.83	2.938	1.078	0.072	1.031	0.069	0.849	0.057
	1062HS	0.625	0.220	3.33	3.384	1.203	0.070	1.156	0.067	0.974	0.057
	1068HS	0.688	0.220	2.94	3.831	1.328	0.068	1.281	0.066	1.099	0.056
	1075HS	0.750	0.220	2.64	4.277	1.453	0.067	1.406	0.065	1.224	0.056
	1081HS	0.813	0.220	2.39	4.724	1.578	0.066	1.531	0.064	1.349	0.056
	1087HS	0.875	0.220	2.18	5.170	1.703	0.065	1.656	0.063	1.474	0.056
	1100HS	1.000	0.220	1.86	6.063	1.953	0.063	1.906	0.062	1.724	0.056
	1106HS	1.063	0.220	1.73	6.509	2.078	0.063	2.031	0.061	1.849	0.056
	1125HS	1.250	0.220	1.44	7.849	2.453	0.062	2.406	0.060	2.224	0.056
	1131HS	1.313	0.220	1.36	8.295	2.578	0.061	2.531	0.060	2.349	0.056
AMCA	1150HS	1.500	0.220	1.17	9.634	2.953	0.060	2.906	0.059	2.724	0.056
	1200HS	2.000	0.220	0.85	13.206	3.953	0.059	3.906	0.058	3.724	0.056
	1250HS	2.500	0.220	0.67	16.777	4.953	0.058	4.906	0.058	4.724	0.055
AMSA	15050HS	0.500	0.354	5.93	3.410	0.953	0.099	0.898	0.093	0.646	0.067
	15056HS	0.563	0.354	6.05	3.342	1.078	0.114	1.023	0.108	0.771	0.082
	15062HS	0.625	0.354	5.10	3.967	1.203	0.107	1.148	0.103	0.896	0.080
	15068HS	0.688	0.354	4.41	4.592	1.328	0.102	1.273	0.098	1.021	0.079
	15075HS	0.750	0.354	3.89	5.217	1.453	0.099	1.398	0.095	1.146	0.078
	15081HS	0.813	0.354	3.47	5.842	1.578	0.096	1.523	0.092	1.271	0.077
	15087HS	0.875	0.354	3.14	6.467	1.703	0.093	1.648	0.090	1.396	0.076
	15093HS	0.938	0.354	2.86	7.092	1.828	0.091	1.773	0.089	1.521	0.076
	15100HS	1.000	0.354	2.63	7.717	1.953	0.090	1.898	0.087	1.646	0.076
	15112HS	1.125	0.354	2.26	8.967	2.203	0.087	2.148	0.085	1.896	0.075
	15118HS	1.188	0.354	2.12	9.592	2.328	0.086	2.273	0.084	2.021	0.075
	15125HS	1.250	0.354	1.99	10.217	2.453	0.085	2.398	0.083	2.146	0.074
	15137HS	1.375	0.354	1.77	11.467	2.703	0.084	2.648	0.082	2.396	0.074
AMCA	15150HS	1.500	0.354	1.60	12.717	2.953	0.082	2.898	0.081	2.646	0.074
	15200HS	2.000	0.354	1.15	17.717	3.953	0.079	3.898	0.078	3.646	0.073
	15250HS	2.500	0.354	0.89	22.717	4.953	0.077	4.898	0.076	4.646	0.072
	15300HS	3.000	0.354	0.73	27.717	5.953	0.076	5.898	0.075	5.646	0.072
	15400HS	4.000	0.354	0.54	37.717	7.953	0.075	7.898	0.074	7.646	0.072

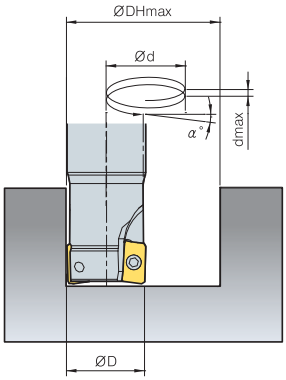
$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (inch)}$$

Cutting condition for ramping and helical operation

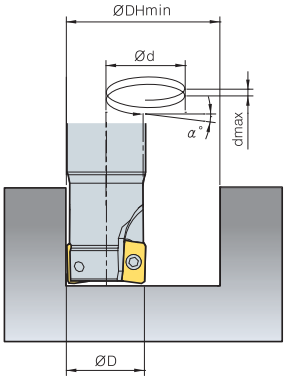
1. Ramping



2. Helical cutting for blind hole



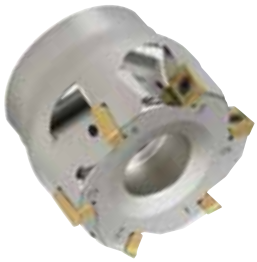
3. Helical cutting for through hole

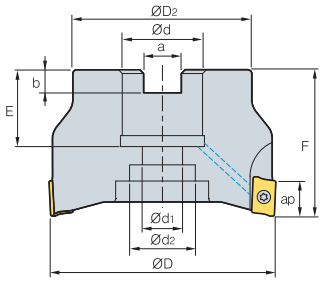


Designation		Tool Dia. ØD(min)	Ramping			Helical cutting for blind hole				Helical cutting for through hole	
			ap	Maximum angle α(°)	Lmin(sfm)	Max. desirable hole Dia. ØDHmax (inch)	Max. pitch dmax (inch)	Min. desirable hole Dia. ØDHmin (inch)	Max. pitch dmax (inch)	Min. desirable hole Dia. ØDHmin (inch)	Max. pitch dmax (inch)
AMSA	2050HS	0.500	0.433	11.69	1.903	0.921	0.191	0.858	0.178	0.646	0.134
	2056HS	0.563	0.433	7.55	2.969	1.046	0.139	0.983	0.130	0.771	0.102
	2063HS	0.625	0.433	10.30	2.165	1.171	0.213	1.093	0.199	0.896	0.163
	2069HS	0.688	0.433	8.23	2.723	1.296	0.187	1.218	0.176	1.021	0.148
	2075HS	0.750	0.433	5.60	4.016	1.421	0.139	1.343	0.132	1.146	0.112
	2088HS	0.875	0.433	5.15	4.366	1.671	0.151	1.593	0.144	1.396	0.126
	2100HS	1.000	0.433	3.92	5.748	1.921	0.132	1.843	0.126	1.646	0.113
	2125HS	1.250	0.433	2.70	8.346	2.421	0.114	2.343	0.110	2.146	0.101
	2150HS	1.500	0.433	1.98	11.378	2.921	0.101	2.843	0.098	2.646	0.092
	2200HS	2.000	0.433	1.48	15.197	3.921	0.102	3.843	0.100	3.646	0.094
	2250HS	2.500	0.433	1.11	20.236	4.921	0.096	4.843	0.094	4.646	0.090
AMCA	2150HS	1.500	0.433	0.36	62.047	2.921	0.019	2.843	0.018	2.646	0.017
	2200HS	2.000	0.433	0.36	62.047	3.921	0.025	3.843	0.024	3.646	0.023
	2250HS	2.500	0.433	0.27	82.835	4.921	0.023	4.843	0.023	4.646	0.022
	2300HS	3.000	0.433	0.21	109.606	5.921	0.021	5.843	0.021	5.646	0.020
	2400HS	4.000	0.433	0.16	141.102	7.921	0.022	7.843	0.022	7.646	0.021
AMSA	3100HS	1.000	0.63	4.72	4.764	1.921	0.159	1.843	0.152	1.449	0.120
	3125HS	1.250	0.63	3.00	7.520	2.421	0.127	2.343	0.123	1.949	0.102
	3150HS	1.500	0.63	2.29	9.843	2.921	0.117	2.843	0.114	2.449	0.098
	3200HS	2.000	0.63	1.64	13.780	3.921	0.112	3.843	0.110	3.449	0.099
	3250HS	2.500	0.63	1.22	18.504	4.921	0.105	4.843	0.103	4.449	0.095
AMCA	3150HS	1.500	0.63	1.99	11.319	2.921	0.102	2.843	0.099	2.449	0.085
	3200HS	2.000	0.63	1.67	13.504	3.921	0.114	3.843	0.112	3.449	0.101
	3250HS	2.500	0.63	1.22	18.504	4.921	0.105	4.843	0.103	4.449	0.095
	3300HS	3.000	0.63	0.90	25.039	5.921	0.093	5.843	0.092	5.449	0.086
	3400HS	4.000	0.63	0.69	32.677	7.921	0.095	7.843	0.094	7.449	0.090
AMSA	2100MH	1.000	0.433	1.50	30.070	1.921	0.050	1.843	0.048	-	-
	2125MH	1.250	0.433	1.50	45.104	2.421	0.063	2.343	0.061	-	-
AMSA	3150MH	1.500	0.63	1.50	60.139	2.921	0.076	2.843	0.074	-	-
AMSA	4125HS	1.250	0.709	3.42	10.737	2.453	0.147	2.398	0.143	2.146	0.128
	4150HS	1.500	0.709	2.65	13.871	2.953	0.137	2.898	0.134	2.646	0.122
	4200HS	2.000	0.709	1.82	20.141	3.953	0.126	3.898	0.124	3.646	0.116
	4250HS	2.500	0.709	1.39	26.410	4.953	0.120	4.898	0.119	4.646	0.113
AMCA	4200HS	2.000	0.709	1.82	20.141	3.953	0.126	3.898	0.124	3.646	0.116
	4250HS	2.500	0.709	1.39	26.410	4.953	0.120	4.898	0.119	4.646	0.113
	4300HS	3.000	0.709	1.12	32.679	5.953	0.117	5.898	0.116	5.646	0.111
	4400HS	4.000	0.709	0.81	45.217	7.953	0.113	7.898	0.112	7.646	0.109
	4500HS	5.000	0.709	0.64	57.756	9.953	0.111	9.898	0.110	9.646	0.107

$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

AMCA1000S





AA 0°

- AR: 9°~13°
- RR: -14°~5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
AMCA	1150HS	10	1.500	1.417	0.500	0.287	0.433	0.252	0.169	0.630	1.500	0.220	0.53
	1200HS	12	2.000	1.772	0.750	0.433	0.630	0.321	0.220	0.787	1.750	0.220	0.79
	1250HS	14	2.500	1.772	0.750	0.433	0.630	0.321	0.220	0.787	1.750	0.220	1.34

Available inserts

APMT-MA APMT-MM





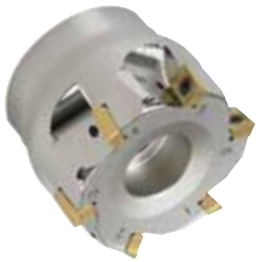
Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0602PDFR-MA																●	E05
	060208PDFR-MA																	
	060202PDSR-MM				●					●				●	●			
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			
	060208PDSR-MM				●					●	●			●	●			
	060212R-MM				●						●			●	●			

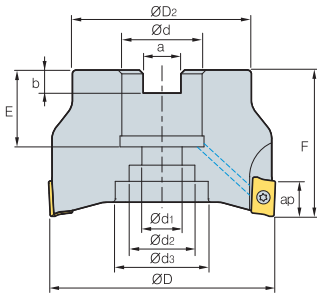
Parts

Specification	Screw	Wrench
Ø1.500~Ø2.500	FTKA01842	TW06S-A

Available inserts **E05**

AMCA1500S





AA
0°

- AR: 9°~13°
- RR: -14°~5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
AMCA	15150HS	5	1.500	1.417	0.500	0.287	0.433	-	0.252	0.169	0.630	1.500	0.354	0.48
	15200HS	6	2.000	1.772	0.750	0.433	0.630	-	0.321	0.220	0.787	1.750	0.354	0.75
	15250HS	8	2.500	1.772	0.750	0.433	0.630	-	0.321	0.200	0.787	1.750	0.354	1.25
	15300HS	10	3.000	2.205	1.000	0.551	1.260	-	0.384	0.248	0.866	2.000	0.354	2.42
	15400HS	12	4.000	2.874	1.250	0.709	1.024	1.575	0.510	0.319	0.866	2.000	0.354	4.62

Available inserts



APMT-MA



APMT-ML


APMT-MM

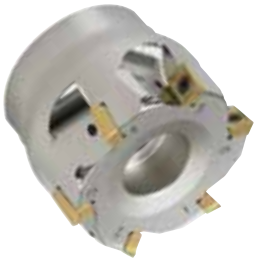
Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	E05
	090308PDFR-MA																	
	0903PDER-ML													●	◐			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	◐	●			
	090308PDSR-MM				●					●	●			◐	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

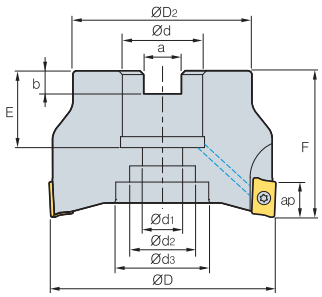
Parts

Specification	Screw	Wrench
Ø1.500~Ø4.000	FTKA02565S	TW08S

Available inserts E05

AMCA2000S





AA 0°

- AR: 9°~13°
- RR: -14°~5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
AMCA	2150HS	5	1.500	1.417	0.500	0.287	0.433	-	0.252	0.169	0.630	1.500	0.433	0.44
	2200HS	6	2.000	1.772	0.750	0.433	0.630	-	0.321	0.220	0.787	1.750	0.433	0.70
	2250HS	8	2.500	1.772	1.000	0.551	0.827	-	0.321	0.220	0.787	1.750	0.433	1.32
	2300HS	8	3.000	2.205	1.000	0.551	0.827	-	0.384	0.248	0.866	2.000	0.433	2.64
	2400HS	10	4.000	2.874	1.250	0.709	1.024	1.575	0.510	0.319	0.866	2.000	0.433	4.62

Available inserts



APMT-MA



APMT-ML


APMT-MM


APMT-MF

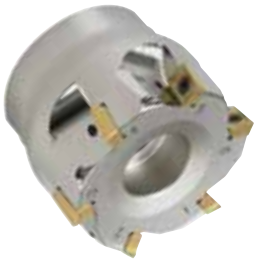
Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC3530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			E05
	11T3PDSR-MF				●					●	●		●	●	●			
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

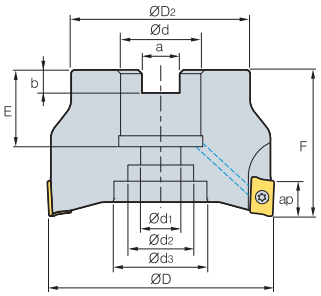
Parts

Specification	Screw	Wrench
Ø1.5~Ø4.000	FTKA02565S	TW08S

Available inserts E05

AMCA3000S





AA
0°

• AR: 14°
• RR: -12°~8°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
AMCA	3150HS	4	1.500	1.417	0.500	0.287	0.433	-	0.250	0.169	0.630	1.500	0.630	0.44
	3200HS	5	2.000	1.772	0.750	0.433	0.630	-	0.313	0.220	0.787	1.750	0.630	0.86
	3250HS	6	2.500	1.772	1.000	0.551	0.827	-	0.375	0.248	0.787	1.750	0.630	1.10
	3300HS	7	3.000	2.205	1.000	0.551	0.827	-	0.375	0.248	0.866	2.000	0.630	2.64
	3400HS	8	4.000	2.874	1.250	0.709	1.024	-	0.500	0.319	0.866	2.000	0.630	5.50

• It is recommended to use an exclusive holder with the "New" sticker for APMT inserts.

Available inserts

	APMT-MA	APMT-ML	APMT-MM	APMT-MF
				

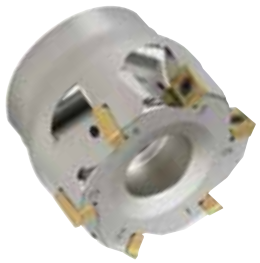
Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDFR-MA																●	E05
	160404PDFR-MA																	
	1604PDER-ML													●	●			
	160404PDER-ML													●	●			
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●	●		●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●	●		●	●			

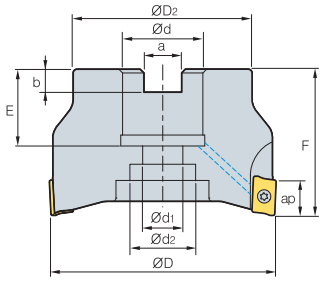
Parts

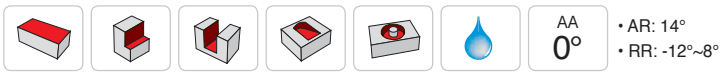
Specification	Screw	Wrench
Ø1.500~Ø4.000	FTKA0410	TW15S

Available inserts E05

AMCA3000S-K







AA 0°

- AR: 14°
- RR: -12°~8°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
AMCA	3150HS-K	4	1.500	1.417	0.500	0.287	0.433	0.250	0.169	0.630	1.500	0.630	0.44
	3200HS-K	5	2.000	1.772	0.750	0.416	0.630	0.313	0.200	0.787	1.750	0.630	0.66
	3250HS-K	6	2.500	1.772	1.000	0.551	0.827	0.375	0.248	0.787	1.750	0.630	1.10
	3300HS-K	7	3.000	2.205	1.000	0.551	0.827	0.375	0.248	0.866	2.000	0.630	2.64
	3400HS-K	8	4.000	2.874	1.250	-	1.772	0.500	0.319	0.866	2.000	0.630	5.50

• It is recommended to use an exclusive holder with the "New" sticker for APMT inserts.

Available inserts

	APKT	APKT-MF	APKT-MM	APKT-MM1	APKT-MA	APKT-MA2	APKT-MA3
							

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APKT	1604PDSR			●						●		●						E04
	1604PDSR-MF			●									●					
	1604PDSR-MM			●	●					●	●	●	●	●	●			
	160432R-MM1																	
	1604PDFR-MA														●		●	
	1604PDFR-MA2																●	
	160416FR-MA2																	
	160432FR-MA2																	
	1604PDFR-MA3															●	●	

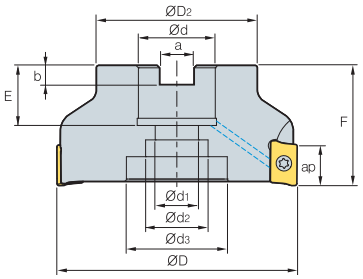
Parts

Specification	Screw	Wrench
Ø1.500~Ø4.000	FTKA0410	TW15S

Available inserts **E04**

AMCA4000S





AA
0°

- AR: 13°~15°
- RR: -12°~7°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
AMCA	4200HS	5	2.000	1.772	0.750	0.433	0.630	-	0.321	0.220	0.827	1.750	0.669	0.62
	4250HS	6	2.500	1.772	0.750	0.433	0.630	-	0.321	0.220	0.827	1.750	0.669	1.10
	4300HS	7	3.000	2.205	1.000	0.551	0.827	-	0.384	0.248	0.866	2.000	0.669	2.20
	4400HS	8	4.000	2.874	1.250	0.709	1.024	1.575	0.510	0.319	0.866	2.000	0.669	3.74
	4500HS	9	5.000	3.386	1.500	0.827	1.141	1.969	0.636	0.394	1.181	2.500	0.669	7.26

• It is recommended to use an exclusive holder with the "New" sticker for APMT inserts.

Available inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF



Designation		Cermet		Coated													Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA																●	E05
	180604PDFR-MA																●	
	180612PDFR-MA																●	
	180616PDFR-MA																●	
	180620PDFR-MA																●	
	180624PDFR-MA																●	
	180630R-MA																●	
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			

Designation		Cermet		Coated													Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	180620PDER-ML													●	●			E05
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM			●				●	●	●	●	●	●	◐	◐			
	1806PDSR-MF			●							●		●	●	●			
	180612PDSR-MM			●						●	●			●	●			
	180616PDSR-MM			●							●			◐	●			
	180620PDSR-MM																	
	180624PDSR-MM			●							●			●	●			
	180630R-MM										●			●	●			
	180632R-MM			●							●			◐	●			

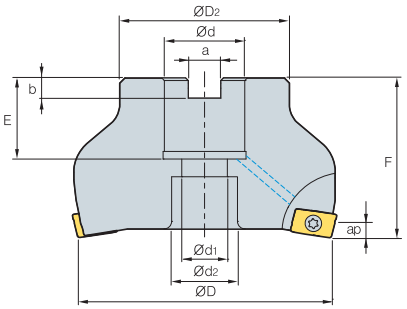
Parts

Specification	Screw	Wrench
Ø2.000~Ø5.000	FTKA0410	TW15S

Available inserts E05

AMCA1000SE/2000SE





AA 15°
- AR: 45°
- RR: 0°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
AMCA	1150HSE	4	1.500	1.417	0.500	0.287	0.433	0.252	0.169	0.630	1.500	0.098	0.57
	1200HSE	5	2.000	1.772	0.750	0.433	0.630	0.315	0.220	0.787	1.750	0.098	0.86
	2300HSE	5	3.000	2.205	1.000	0.551	0.827	0.374	0.236	0.866	2.000	0.157	2.65
	2400HSE	6	4.000	2.874	1.250	0.709	1.024	0.500	0.315	0.866	2.000	0.157	5.14

Available inserts


APMT-MM


APMT-MF

Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
1000 type	APMT	060202PDSR-MM				●					●				●	●			E05
		0602PDSR-MM				●			●	●	●	●	●	●	◐	◐			
		060208PDSR-MM				●					●	●			●	●			
		060212R-MM				●						●			●	●			
2000 type	APMT	11T3PDSR-MM			●	●			●	●	◐	●	◐	●	◐	◐			
		11T3PDSR-MF				●					●	●		●	●	◐			
		11T308PDSR-MM				●					●	●	●		◐	●			
		11T312PDSR-MM				●					●	●	●		●	●			
		11T316R-MM				●					●	●			◐	●			
		11T318R-MM																	
		11T324R-MM				●					●	●			●	●			

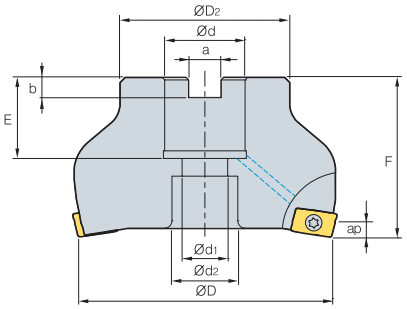
Parts

Specification	Screw	Wrench	Wrench
Ø1.500~Ø2.000 (1000 type)	FTKA01842	-	TW06S-A
Ø3.000~Ø4.000 (2000 type)	FTKA02565S	TW08S	-

Available inserts **E05**

AMCA3000SE





AA 15°
• AR: 45°
• RR: 0°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
AMCA	3300HSE	4	3.000	2.205	1.000	0.551	0.827	0.374	0.236	0.866	2.000	0.236	2.87
	3400HSE	5	4.000	2.874	1.250	0.709	1.024	0.500	0.315	0.866	2.000	0.236	5.07

Available inserts


APMT-MM


APMT-MF

Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			E05
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●	●		●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●	●		●	●			

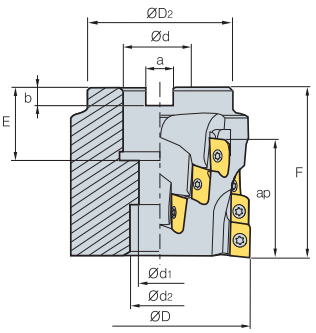
Parts

Specification	Screw	Wrench
Ø3.000~Ø4.000	FTKA0410	TW08S

Available inserts E05

AMCA2000M









AA 0°

- AR: 9°
- RR: -9°~ -5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	No. of flute	ap	lbs
AMCA	2200M	16	2.0	1.772	0.75	0.433	0.630	0.315	0.220	0.866	2.283	4	1.535	1.54
	2250M	16	2.5	2.205	1.00	0.551	0.827	0.374	0.248	0.944	2.283	4	1.535	1.76
	2300M	20	3.0	2.756	1.25	0.708	1.023	0.500	0.319	0.944	2.480	5	1.535	2.12
	2400M	24	4.0	3.386	1.50	1.260	1.969	0.626	0.394	1.181	2.480	6	1.535	2.65

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF

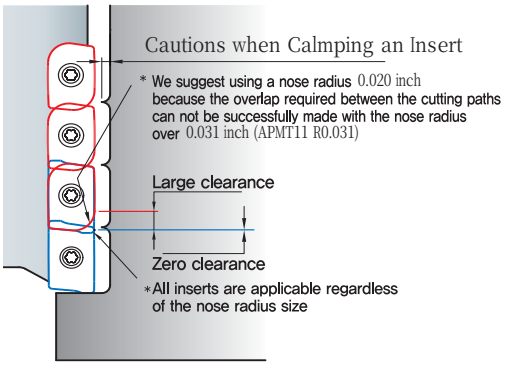







Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	E05
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Caution when clamping the inserts



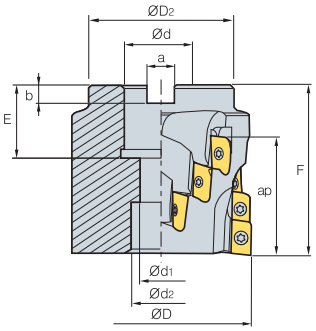
Parts

Specification	Screw	Wrench
Ø2.0~Ø4.0	FTKA02565S	TW08S

Available inserts E05

AMCA3000M









AA 0°

- AR: 9°
- RR: -9°~ -5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	No. of flute	ap	lbs
AMCA	3250M	16	2.5	2.205	1.00	0.551	0.827	0.374	0.236	0.945	3.346	4	2.244	2.43
	3300M	20	3.0	2.205	1.25	0.709	1.024	0.500	0.315	1.690	3.937	4	2.795	4.92
	3400M	30	4.0	3.386	1.50	0.866	1.260	0.626	0.394	1.181	3.937	6	2.795	7.92

Available inserts

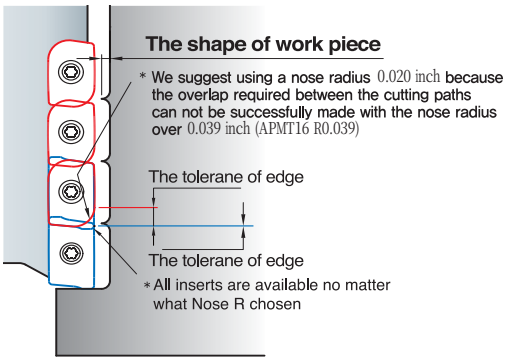
APMT-MA (new) APMT-ML (new) APMT-MM APMT-MF






Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDFR-MA																●	
	160404PDFR-MA																	
	1604PDER-ML													●	●			
	160404PDER-ML													●	●			
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	1604PDSR-MF				●					●	●		●	●	●			E05
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●	●		●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●	●		●	●			

Caution when clamping the inserts



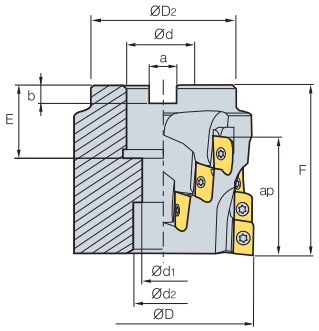
Parts

Specification	Screw	Wrench
Ø2.5~Ø4.0	FTKA0410	TW15S

Available inserts E05

AMCA4000M









AA 0°

- AR: 9°
- RR: -9°~ -5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	No. of flute	ap	lbs
AMCA	4250M	16	2.5	2.205	1.00	0.551	0.827	0.374	0.248	0.944	3.346	4	2.406	2.43
	4300M	20	3.0	2.756	1.25	0.709	1.024	0.500	0.315	0.944	3.937	4	2.996	4.92
	4400M	30	4.0	3.386	1.50	0.866	1.260	0.626	0.394	1.181	3.937	6	2.996	7.92
	4500M	18	5.0	3.386	1.50	0.866	1.260	0.626	0.394	1.181	2.677	6	1.815	8.82

Available inserts

APMT-MA (new) APMT-ML (new) APMT-MM APMT-MF

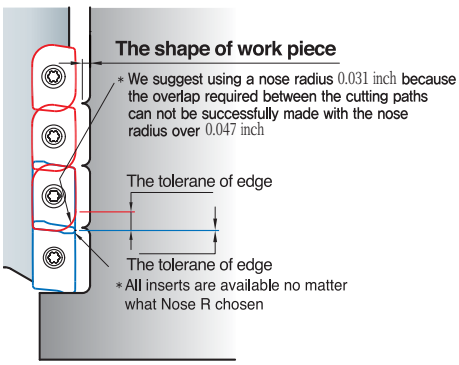





Designation		Cermet CN2000	Cermet CN30	Coated NCM325	Coated NC5330	Coated NC5340	Coated NC5350	Coated PC2505	Coated PC2510	Coated PC3500	Coated PC3600	Coated PC9530	Coated PC6510	Coated PC5300	Coated PC5400	Uncoated G10	Uncoated H01	page
APMT	1806PDFR-MA														●			
	180604PDFR-MA														●			
	180612PDFR-MA														●			
	180616PDFR-MA														●			
	180620PDFR-MA														●			
	180624PDFR-MA														●			E05
	180630R-MA														●			
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			

Designation		Cermet CN2000	Cermet CN30	Coated NCM325	Coated NC5330	Coated NC5340	Coated NC5350	Coated PC2505	Coated PC2510	Coated PC3500	Coated PC3600	Coated PC9530	Coated PC6510	Coated PC5300	Coated PC5400	Uncoated G10	Uncoated H01	page
APMT	180620PDER-ML													●	●			
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM			●				●	●	●	●	●	●	●	●			
	1806PDSR-MF			●							●		●	●	●			
	180612PDSR-MM			●						●	●			●	●			E05
	180616PDSR-MM			●							●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM			●							●			●	●			
	180630R-MM										●			●	●			
	180632R-MM			●							●			●	●			

Caution when clamping the inserts



Parts

Specification	Screw	Wrench
Ø2.5~Ø5.0	FTKA0410	TW15S

Available inserts **E05**

AMSA1000S



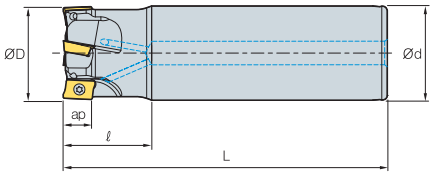


Fig. 1

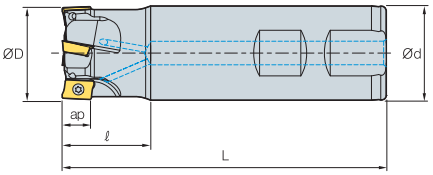


Fig. 2








AA 0°

- AR: 7.5°~13°
- RR: -17°~ -6°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	1043HS	2	0.438	0.375	0.787	3.150	0.22	0.09	2
	1050HS-2	2	0.500	0.500	0.984	3.150	0.22	0.12	2
	1050HS-2L050	2	0.500	0.500	0.984	4.724	0.22	0.20	1
	1050HS-3	3	0.500	0.500	0.984	3.150	0.22	0.12	2
	1056HS-2	2	0.563	0.625	0.984	3.543	0.22	0.24	2
	1056HS-2L062	2	0.563	0.625	0.984	5.512	0.22	0.40	1
	1056HS-3	3	0.563	0.625	0.984	3.543	0.22	0.24	2
	1062HS-3	3	0.625	0.625	0.984	3.543	0.22	0.26	2
	1062HS-3L062	3	0.625	0.625	0.984	6.299	0.22	0.49	1
	1062HS-4	4	0.625	0.625	0.984	3.543	0.22	0.26	2
	1068HS	4	0.688	0.625	0.984	3.543	0.22	0.26	2
	1068HS-3L062	3	0.688	0.625	0.984	6.299	0.22	0.49	1
	1075HS-4	4	0.750	0.750	1.181	4.331	0.22	0.51	2
	1075HS-4L075	4	0.750	0.750	1.181	7.874	0.22	0.95	1
	1075HS-5	5	0.750	0.750	1.181	4.331	0.22	0.51	2
	1081HS	5	0.813	0.750	1.181	4.331	0.22	0.53	2
	1081HS-4L075	4	0.813	0.750	1.181	7.874	0.22	0.95	1
	1087HS	5	0.875	0.750	1.181	4.331	0.22	0.60	2
	1100HS	7	1.000	1.000	1.181	4.724	0.22	0.86	2
	1106HS	7	1.063	1.000	1.181	4.724	0.22	0.86	2
	1125HS	8	1.250	1.250	1.378	4.724	0.22	1.43	2
	1131HS	8	1.313	1.250	1.378	4.724	0.22	1.43	2

Available inserts

APMT-MA



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0602PDFR-MA																●	E05
	060208PDFR-MA																	
	060202PDSR-MM				●					●				●	●			
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			
	060208PDSR-MM				●					●	●			●	●			
	060212R-MM				●						●			●	●			
	060216R-MM										●			●	●			

Parts

Specification	Screw	Wrench
Ø0.438~Ø1.313	FTKA01842	TW06S-A

Available inserts E05

AMSA1500S



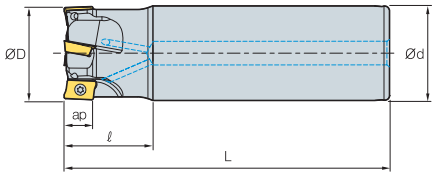


Fig. 1

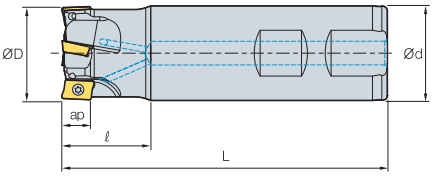


Fig. 2



AA 0°

- AR: 7.5°~12.5°
- RR: -28°~ -14°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	15050HS	1	0.500	0.625	0.984	3.150	0.354	0.21	2
	15050HS-1L062	1	0.500	0.625	1.181	6.299	0.354	0.46	1
	15056HS	1	0.563	0.625	0.984	3.150	0.354	0.22	2
	15056HS-1L062	1	0.563	0.625	1.181	6.299	0.354	0.46	1
	15062HS	2	0.625	0.625	1.181	3.543	0.354	0.24	2
	15062HS-2L062	2	0.625	0.625	1.181	6.299	0.354	0.46	1
	15068HS	2	0.688	0.625	1.181	3.543	0.354	0.27	2
	15068HS-2L062	2	0.688	0.625	1.181	6.299	0.354	0.46	1
	15075HS	2	0.750	0.750	1.181	3.543	0.354	0.40	2
	15075HS-2L075	2	0.750	0.750	1.181	6.299	0.354	0.75	1
	15075HS-3	3	0.750	0.750	1.181	3.543	0.354	0.40	2
	15081HS	2	0.813	0.750	1.181	3.543	0.354	0.44	2
	15081HS-2L075	2	0.813	0.750	1.181	6.299	0.354	0.75	1
	15081HS-3	3	0.813	0.750	1.181	3.543	0.354	0.44	2
	15087HS	3	0.875	0.750	1.181	4.331	0.354	0.51	2
	15087HS-3L075	3	0.875	0.750	1.181	7.087	0.354	0.84	1
	15093HS	3	0.938	0.750	1.181	4.331	0.354	0.66	2
	15093HS-4	4	0.938	0.750	1.181	4.331	0.354	0.66	2
	15100HS-3S075	3	1.000	0.750	1.181	4.331	0.354	0.77	2
	15100HS	3	1.000	1.000	1.181	4.331	0.354	0.77	2
	15100HS-3L100	3	1.000	1.000	1.181	7.087	0.354	1.30	2
	15100HS-4S075	4	1.000	0.750	1.181	4.331	0.354	0.55	1
	15100HS-4S100	4	1.000	1.000	1.181	4.331	0.354	0.55	2

Available inserts

APMT-MA



APMT-ML



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			E05
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

Parts

Specification	Screw	Wrench
Ø0.500~Ø1.000	FTKA02555S FTKA02565S	TW08S

Available inserts **E05**

AMSA1500S



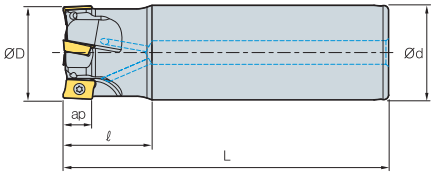


Fig. 1

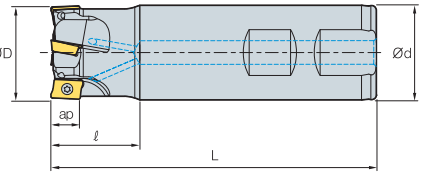
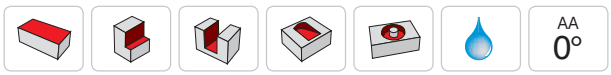


Fig. 2



AA 0°

- AR: 7.5°~12.5°
- RR: -28°~ -14°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	15100HS-3L100	3	1.000	1.000	1.181	7.087	0.354	1.30	1
	15100HS-4S075	4	1.000	0.750	1.181	4.331	0.354	0.55	2
	15100HS-4S100	4	1.000	1.000	1.181	4.331	0.354	0.55	2
	15112HS	4	1.125	1.000	1.181	4.331	0.354	0.79	2
	15112HS-4L100	4	1.125	1.000	1.181	7.087	0.354	1.35	1
	15112HS-5	5	1.125	1.000	1.181	4.331	0.354	0.79	2
	15118HS	4	1.188	1.000	1.181	4.331	0.354	0.84	2
	15118HS-4L100	4	1.188	1.000	1.181	7.087	0.354	1.37	1
	15118HS-5	5	1.188	1.000	1.181	4.331	0.354	0.84	2
	15125HS	4	1.250	1.250	1.181	4.331	0.354	1.32	2
	15125HS-4L125	4	1.250	1.250	1.181	7.087	0.354	2.21	1
	15125HS-5	5	1.250	1.250	1.181	4.331	0.354	1.32	2
	15137HS	5	1.375	1.250	1.181	4.331	0.354	1.54	2
	15137HS-6	6	1.375	1.250	1.181	4.331	0.354	1.54	2
	15150HS-S125	5	1.500	1.250	1.378	5.118	0.354	1.76	2
	15150HS-5L125	5	1.500	1.250	1.378	7.874	0.354	2.65	1
	15150HS-6S125	6	1.500	1.250	1.378	5.118	0.354	1.76	2
	15150HS-S150	5	1.500	1.500	1.378	5.118	0.354	2.49	2
	15150HS-6S150	6	1.500	1.500	1.378	5.118	0.354	2.49	2

Available inserts

APMT-MA



APMT-ML



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	E05
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

Parts

Specification	Screw	Wrench
Ø1.000~Ø1.500	FTKA02565S	TW08S

Available inserts E05

AMSA2000S



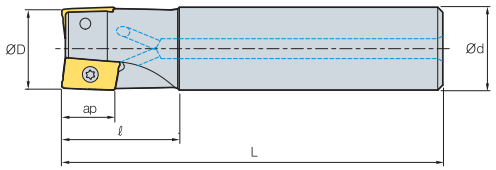


Fig. 1

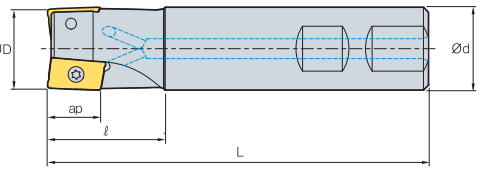
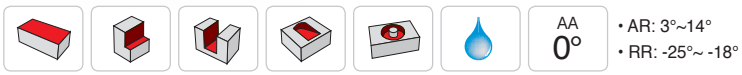


Fig. 2



AA 0°

- AR: 3°~14°
- RR: -25°~ -18°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	2050HS	1	0.500	0.625	0.984	3.346	0.433	0.22	2
	2050HS-1L062	1	0.500	0.625	1.181	6.299	0.433	0.46	1
	2056HS	1	0.563	0.625	0.984	3.543	0.433	0.26	2
	2056HS-1L062	1	0.563	0.625	1.181	6.299	0.433	0.46	1
	2062HS	2	0.625	0.625	0.984	3.543	0.433	0.26	2
	2062HS-2L062	2	0.625	0.625	1.181	7.087	0.433	0.46	1
	2068HS	2	0.688	0.625	0.984	3.543	0.433	0.26	2
	2068HS-2L062	2	0.688	0.625	1.181	7.087	0.433	0.46	1
	2075HS	2	0.750	0.750	1.181	3.937	0.433	0.46	2
	2075HS-2L075	2	0.750	0.750	1.181	8.268	0.433	0.75	1
	2087HS	3	0.875	0.750	1.378	4.528	0.433	0.55	2
	2087HS-3L075	3	0.875	0.750	1.378	7.087	0.433	0.84	1
	2100HS	3	1.000	1.000	1.378	4.528	0.433	0.88	2
	2100HS-3L100	3	1.000	1.000	1.575	7.087	0.433	1.30	1
	2125HS	4	1.250	1.250	1.575	4.921	0.433	1.54	2
	2125HS-4L125	4	1.250	1.250	1.969	7.087	0.433	2.21	1
	2150HS	5	1.500	1.250	1.654	5.118	0.433	1.85	2
	2150HS-5L125	5	1.500	1.250	1.969	7.874	0.433	2.65	1
	2150HS-S150	5	1.500	1.500	1.654	5.118	0.433	2.54	2
	2200HS	6	2.000	1.250	1.772	5.315	0.433	2.34	2
	2200HS-S150	6	2.000	1.500	1.772	5.315	0.433	3.04	2
	2250HS	8	2.500	1.250	1.772	5.315	0.433	2.89	2
	2250HS-S150	8	2.500	1.500	1.772	5.315	0.433	3.57	2

Available inserts


APMT-MA


APMT-ML


APMT-MM


APMT-MF

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			E05
	11T3PDSR-MF				●					●	●		●	●	●			
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Parts

Specification	Screw	Wrench
Ø0.500~Ø2.500	FTKA02555S FTKA02565S	TW08S

Available inserts **E05**

AMSA3000S



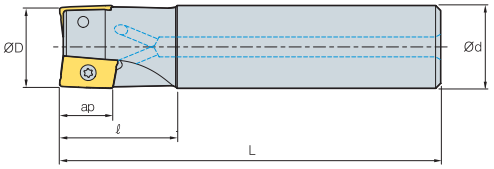


Fig. 1

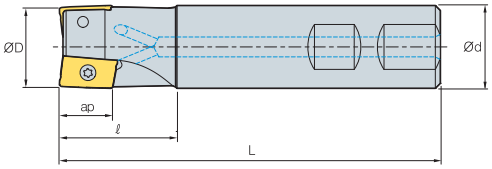


Fig. 2

AA 0°

- AR: 3°~14°
- RR: -18°~ -10°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	3100HS	2	1.000	1.000	1.378	4.528	0.630	0.88	2
	3100HS-2M100	2	1.000	1.000	1.378	7.087	0.630	1.43	1
	3100HS-2L100	2	1.000	1.000	2.362	8.661	0.630	1.65	1
	3125HS	3	1.250	1.250	1.575	4.921	0.630	1.52	2
	3125HS-2M125	2	1.250	1.250	1.575	7.874	0.630	2.49	1
	3125HS-2L125	2	1.250	1.250	2.559	10.236	0.630	3.35	1
	3125HS-3M125	3	1.250	1.250	1.575	7.874	0.630	2.47	1
	3125HS-3L125	3	1.250	1.250	2.559	10.236	0.630	3.26	1
	3150HS	4	1.500	1.250	1.654	5.118	0.630	1.76	2
	3150HS-3M125	3	1.500	1.250	1.654	7.874	0.630	2.73	1
	3150HS-3L125	3	1.500	1.250	1.654	10.236	0.630	3.55	1
	3150HS-4M125	4	1.500	1.250	1.654	7.874	0.630	2.67	1
	3150HS-4L125	4	1.500	1.250	1.654	10.236	0.630	3.48	1
	3150HS-S150	4	1.500	1.500	1.654	5.118	0.630	2.43	2
	3200HS	5	2.000	1.250	1.772	5.315	0.630	2.21	2
	3200HS-S150	5	2.000	1.500	1.772	5.315	0.630	2.87	2
	3250HS	6	2.500	1.250	1.772	5.315	0.630	2.76	2
	3250HS-S150	6	2.500	1.500	1.772	5.315	0.630	3.31	2

• It is recommended to use made to order holders in case of nose radius over R0.126

Available inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDFR-MA																●	
	160404PDFR-MA																	
	1604PDER-ML													●	●			
	160404PDER-ML													●	●			
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			E05
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●			●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●	●		●	●			

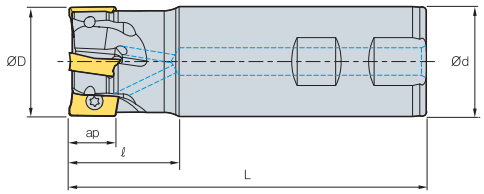
Parts

Specification	Screw	Wrench
Ø1.000~Ø2.500	FTKA0408 FTKA0410	TW15S

Available inserts E05

AMSA3000S-K





AA 0°

- AR: 14°
- RR: -18°~ -10°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
AMSA	3100HS-K	2	1.000	1.000	1.378	4.528	0.630	0.88
	3125HS-K	3	1.250	1.250	1.575	4.921	0.630	1.52
	3150HS-K	4	1.500	1.250	1.654	5.118	0.630	1.76
	3150HS-K-150	4	1.500	1.500	1.654	5.118	0.630	2.43
	3200HS-K	5	2.000	1.250	1.772	5.315	0.630	2.21
	3200HS-K-150	5	2.000	1.500	1.772	5.315	0.630	2.87
	3250HS-K	6	2.500	1.250	1.772	5.315	0.630	2.76
	3250HS-K-150	6	2.500	1.500	1.772	5.315	0.630	3.31

Available inserts



Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APKT	1604PDSR			●						●			●					
	1604PDSR-MF			●										●				
	1604PDSR-MM			●	●					●		●	●	●	●			
	160432R-MM1																	
	1604PDFR-MA														●		●	E04
	1604PDFR-MA2																●	
	160416FR-MA2																	
	160432FR-MA2																	
	1604PDFR-MA3															●	●	

Parts

Specification	Screw	Wrench
Ø1.000~Ø2.500	FTKA0408 FTKA0410	TW15S

Available inserts E04

AMSA4000S



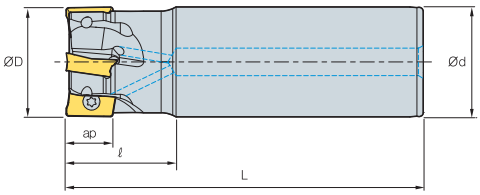


Fig. 1

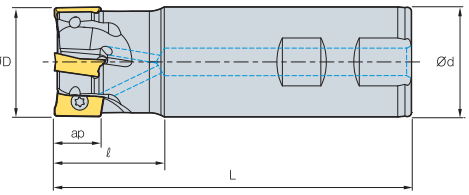


Fig. 2



AA
0°

- AR: 7°~13°
- RR: -20°~ -6°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	4100HS	2	1.000	1.000	1.575	4.331	0.669	0.77	2
	4100HS-2M100	2	1.000	1.000	1.575	7.087	0.669	1.28	1
	4100HS-2L100	2	1.000	1.000	1.575	9.055	0.669	1.59	1
	4106HS	2	1.063	1.000	1.575	4.331	0.669	0.82	2
	4106HS-2M100	2	1.063	1.000	1.575	7.087	0.669	1.32	1
	4106HS-2L100	2	1.063	1.000	1.575	9.055	0.669	1.63	1
	4125HS	3	1.250	1.250	1.575	4.921	0.669	1.43	2
	4125HS-2M125	2	1.250	1.250	1.969	7.874	0.669	2.58	1
	4125HS-2L125	2	1.250	1.250	1.969	10.236	0.669	3.35	1
	4125HS-3M125	3	1.250	1.250	1.969	7.874	0.669	2.43	1
	4125HS-3L125	3	1.250	1.250	1.969	10.236	0.669	3.26	1
	4131HS	3	1.313	1.250	1.575	4.921	0.669	1.50	2
	4131HS-2M125	2	1.313	1.250	1.969	7.874	0.669	2.47	1
	4131HS-2L125	2	1.313	1.250	1.969	10.236	0.669	3.31	1
	4131HS-3M125	3	1.313	1.250	1.969	7.874	0.669	2.47	1
	4131HS-3L125	3	1.313	1.250	1.969	10.236	0.669	3.31	1

• It is recommended to use made to order holders in case of nose radius over R0.126

Available inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA														●			
	180604PDFR-MA														●			
	180612PDFR-MA														●			
	180616PDFR-MA														●			
	180620PDFR-MA														●			
	180624PDFR-MA														●			E05
	180630R-MA														●			
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	180620PDER-ML													●	●			
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM			●				●	●	●	●	●	●	●	●			
	1806PDSR-MF			●							●		●	●	●			
	180612PDSR-MM			●						●	●			●	●			E05
	180616PDSR-MM			●							●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM			●							●			●	●			
	180630R-MM										●			●	●			
	180632R-MM			●							●			●	●			

Parts

Specification	Screw	Wrench
Ø1.000~Ø1.313	FTKA0408 FTKA0410	TW15S

Available inserts E05

AMSA4000S



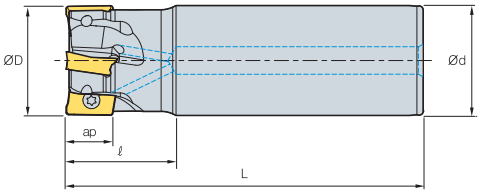


Fig. 1

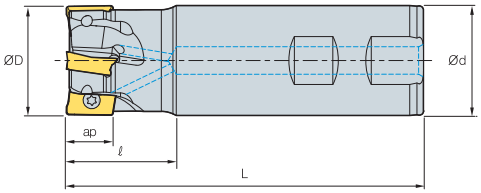


Fig. 2








AA 0°

- AR: 7°~13°
- RR: -20°~ -6°

(inch)

Designation		○	ØD	Ød	ℓ	L	ap	lbs	Fig.
AMSA	4150HS-3M125	3	1.500	1.250	1.969	7.874	0.669	2.65	1
	4150HS-3L125	3	1.500	1.250	1.969	10.236	0.669	3.53	1
	4150HS-4M125	4	1.500	1.250	1.969	7.874	0.669	2.65	1
	4150HS-4L125	4	1.500	1.250	1.969	10.236	0.669	3.53	1
	4150HS-S125	4	1.500	1.250	1.575	5.118	0.669	1.68	2
	4150HS-S150	4	1.500	1.500	1.575	5.118	0.669	2.43	2
	4200HS-S125	5	2.000	1.250	1.575	5.315	0.669	2.09	2
	4200HS-S150	5	2.000	1.500	1.575	5.315	0.669	2.87	2
	4250HS-S125	6	2.500	1.250	1.575	5.315	0.669	2.76	2
	4250HS-S150	6	2.500	1.500	1.575	5.315	0.669	3.53	2

• It is recommended to use made to order holders in case of nose radius over R0.126

Available inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF



Designation		Cermet		Coated													Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA																●	
	180604PDFR-MA																●	
	180612PDFR-MA																●	
	180616PDFR-MA																●	
	180620PDFR-MA																●	
	180624PDFR-MA																●	E05
	180630R-MA																●	
	1806PDER-ML														●	●		
	180604PDER-ML														●	●		
	180612PDER-ML														●	●		
	180616PDER-ML														●	●		

Designation		Cermet		Coated													Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	180620PDER-ML													●	●			
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM				●			●	●	●	●	●	●	◐	◐			
	1806PDSR-MF				●						●		●	●	●			
	180612PDSR-MM				●					●	●			●	●			
	180616PDSR-MM				●						●			◐	●			
	180620PDSR-MM																	
	180624PDSR-MM				●						●			●	●			
	180630R-MM										●			●	●			
	180632R-MM				●						●			◐	●			

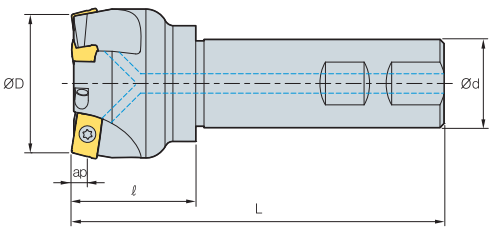
Parts

Specification	Screw	Wrench
Ø1.500~Ø2.500	FTKA0410	TW15S

Available inserts **E05**

AMSA1000SE/2000SE





AA 15°
- AR: -4.5°~ -1°
- RR: -3°~0°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
AMSA	1100HSE	3	1.000	1.000	1.181	4.528	0.098	0.90
	2100HSE	2	1.000	1.000	1.181	4.528	0.157	0.88
	2125HSE	3	1.250	1.250	1.575	4.921	0.157	1.59
	2150HSE	3	1.500	1.250	1.575	5.118	0.157	1.90
	2150HSE-S150	3	1.500	1.500	1.575	5.118	0.157	2.65
	2200HSE	4	2.000	1.250	1.575	5.315	0.157	2.16
	2200HSE-S150	4	2.000	1.500	1.575	5.315	0.157	2.87
	2250HSE	5	2.500	1.250	1.575	5.315	0.157	2.73
	2250HSE-S150	5	2.500	1.500	1.575	5.315	0.157	3.46

Available inserts

APMT-MF APMT-MM




Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
1000 type	APMT	060202PDSR-MM				●					●				●	●			E05
		0602PDSR-MM				●			●	●	●	●	●	●	◐	◐			
		060208PDSR-MM				●					●	●			●	●			
		060212R-MM				●						●			●	●			
		060216R-MM										●			●	●			
2000 type	APMT	11T3PDSR-MM			●	●			●	●	◐	●	◐	●	◐	◐			
		11T3PDSR-MF				●					●	●		●	●	◐			
		11T308PDSR-MM				●					●	●	●		◐	●			
		11T312PDSR-MM				●					●	●	●		●	●			
		11T316R-MM				●					●	●			◐	●			
		11T318R-MM																	
		11T324R-MM				●					●	●			●	●			

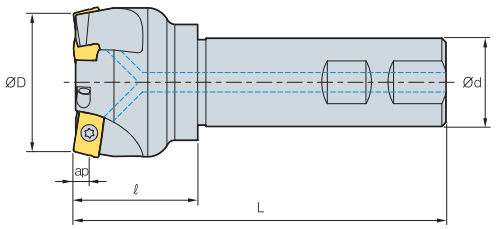
Parts

Specification	Screw	Wrench	Wrench
Ø1.000 (1000 type)	FTKA01842	-	TW06S-A
Ø1.000~Ø2.500 (2000 type)	FTKA02565S	TW08S	-

Available inserts E05

AMSA3000SE





AA 15°

- AR: -4.5°~ -1°
- RR: -3°~0°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
AMSA	3200HSE	3	2.000	1.250	1.772	5.315	0.236	2.21
	3200HSE-S150	3	2.000	1.500	1.772	5.315	0.236	2.87
	3250HSE	4	2.500	1.250	1.772	5.315	0.236	2.87
	3250HSE-S150	4	2.500	1.500	1.772	5.315	0.236	3.53

Available inserts

APMT-MF



APMT-MM



Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			E05
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●	●		●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●	●		●	●			

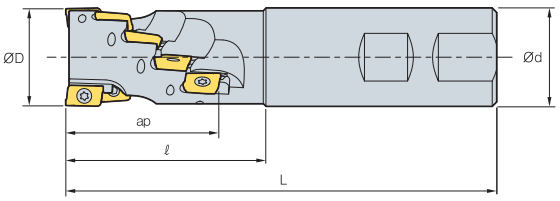
Parts

Specification	Screw	Wrench
Ø2.000~Ø2.500	FTKA0410	TW15S

Available inserts **E05**

AMSA1000M/1500M









AA
0°

- AR: 7°~9°
- RR: -13°~ -10°

(inch)

Designation			ØD	Ød	ℓ	L	No. of flute	ap	lbs
AMSA	1062M	6	0.625	0.625	1.181	3.150	2	0.610	0.66
	1075M	12	0.750	0.750	1.260	3.346	3	0.807	0.66
	1100M	20	1.000	1.000	1.535	3.740	4	1.004	0.66
	15075M	3	0.750	0.750	1.654	4.134	1	1.043	0.66
	15100M	8	1.000	1.000	1.969	4.331	2	1.378	0.66
	15125M	10	1.250	1.250	2.362	4.724	2	1.732	0.66

Available inserts

APMT-MA　APMT-ML　APMT-MM

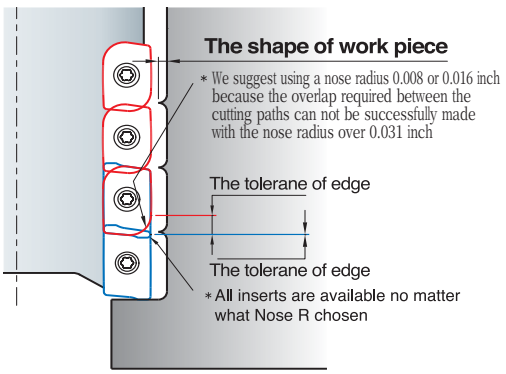






Type	Designation		Cermet		Coated											Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
1000 type	APMT	0602PDFR-MA																●	E05
		060208PDFR-MA																	
		060202PDSR-MM				●					●				●	●			
		0602PDSR-MM				●			●	●	●	●	●	●	●	●			
		060208PDSR-MM				●					●	●			●	●			
		060212R-MM				●						●			●	●			
		060216R-MM									●	●			●	●			
1500 type	APMT	0903PDFR-MA																●	
		090308PDFR-MA																	
		0903PDER-ML													●	●			
		090308PDER-ML													●	●			
		0903PDSR-MM				●			●	●	●	●		●	●	●			
		090308PDSR-MM				●					●	●			●	●			
		090312R-MM										●			●	●			
		090316R-MM				●					●	●			●	●			
		090320R-MM									●	●			●	●			

Caution when clamping the inserts



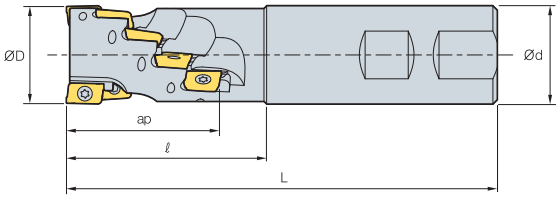
Parts

Specification	Screw	Wrench	Wrench
Ø0.625~Ø1.000 (1000 type)	FTKA01842	-	TW06S-A
Ø0.750~Ø1.250 (2000 type)	FTKA02565S	TW08S	-

Available inserts E05

AMSA2000M











AA 0°

- AR: 7°~9°
- RR: -13°~ -10°

(inch)

Designation			ØD	Ød	ℓ	L	No. of flute	ap	lbs
AMSA	2075M	3	0.750	0.750	1.772	4.724	1	1.157	0.71
	2100M	8	1.000	1.000	2.165	5.118	2	1.531	0.88
	2125M	10	1.250	1.250	2.559	5.512	2	1.909	1.43
	2150M	14	1.500	1.654	2.953	5.906	2	2.283	1.65

Available inserts

APMT-MA | APMT-ML | APMT-MM | APMT-MF







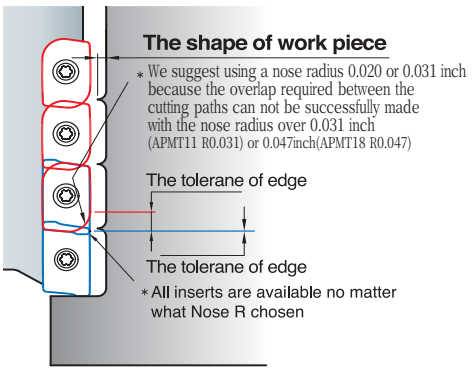

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			E05
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Parts

Specification	Screw	Wrench
Ø0.750~Ø1.500	FTKA02565S	TW08S

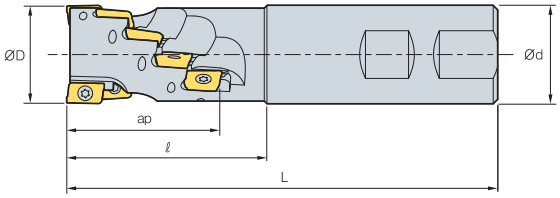
Available inserts **E05**

Caution when clamping the inserts



AMSA4000M







AA 0°

- AR: 7°~9°
- RR: -13°~ -10°

(inch)

Designation			ØD	Ød	ℓ	L	No. of flute	ap	lbs
AMSA	4125M	4	1.250	1.250	2.362	5.118	2	1.244	1.43
	4150M	6	1.500	1.500	2.756	5.512	2	1.811	2.45
	4200M-S150	6	2.000	1.500	2.165	4.921	2	1.811	2.69
	4200M	8	2.000	1.500	2.756	5.512	2	2.402	3.02

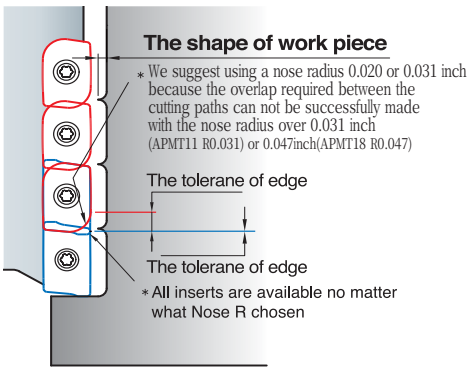
Available inserts



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA																●	
	180604PDFR-MA																●	
	180612PDFR-MA																●	
	180616PDFR-MA																●	
	180620PDFR-MA																●	
	180624PDFR-MA																●	
	180630R-MA																●	
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			
	180620PDER-ML													●	●			
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM				●			●	●	●	●	●	●	●	●			
	1806PDSR-MF				●						●		●	●	●			
	180612PDSR-MM				●					●	●			●	●			
	180616PDSR-MM				●						●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM				●						●			●	●			
	180630R-MM										●			●	●			
	180632R-MM				●						●			●	●			

E05

Caution when clamping the inserts



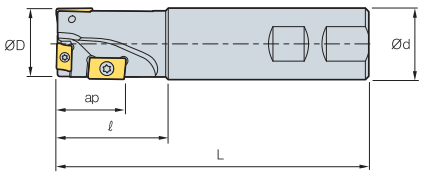
Parts

Specification	Screw	Wrench
Ø1.250~Ø2.000	FTKA0410	TW15S

Available inserts E05

AMSA1000MH/1500MH







AA 0°

- AR: 9°~12°
- RR: -12°~ -10°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs	APMT 0602	APMT 0903	APM(X)T 11T3 -	APMT 1604	APKT 1604 -
AMSA	1056MH	3	0.5625	0.500	1.181	4.724	0.433	0.35	3	-	-	-	-
	1062MH	3	0.6250	0.625	1.181	5.512	0.433	0.44	3	-	-	-	-
	1068MH	3	0.6875	0.625	1.181	5.512	0.433	0.46	3	-	-	-	-
	15075MH	3	0.7500	0.750	1.378	5.512	0.669	0.68	1	2	-	-	-

Available inserts

APMT-MA APMT-ML APMT-MM



Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
1000 type	APMT	0602PDFR-MA																●	E05
		060208PDFR-MA																	
		060202PDSR-MM				●					●				●	●			
		0602PDSR-MM				●			●	●	●	●	●	●	●	●			
		060208PDSR-MM				●					●	●			●	●			
2000 type	APMT	0903PDFR-MA																●	
		090308PDFR-MA																	
		0903PDER-ML													●	●			
		090308PDER-ML													●	●			
		0903PDSR-MM				●			●	●	●	●		●	●	●			
		090308PDSR-MM				●					●	●			●	●			

Parts

Specification	Screw	Wrench	Wrench
Ø0.5625~Ø0.6875 (1000 type)	FTKA01842	-	TW06S-A
Ø0.7500 (1500 type)	FTKA02565S	TW08S	-

Available inserts E05

Recommended cutting condition

	Drilling	Shouldering	Slotting
vc(sfm)	260~650	260~650	260~650
fz(ipt)	0.002~0.001	0.010~0.002	0.008~0.002

- Please keep the drill depth under 0.25D when you're drilling
- Please keep the step depth from 0.008 to 0.012inch

AMSA2000MH/3000MH



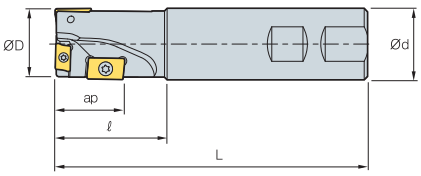


Fig. 1

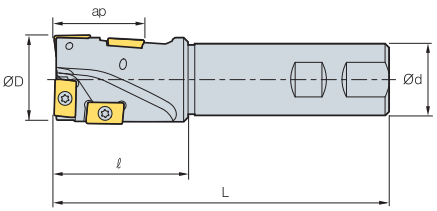


Fig. 2



AA 0°

- AR: 9°~12°
- RR: -12°~ -10°

(inch)

Designation		⚙	ØD	Ød	ℓ	L	ap	lbs	APMT 0602	APMT 0903	APM(X)T 11T3 -	APMT 1604	APKT 1604 -	Fig.
AMSA	2100MH	3	1.0000	1.000	1.575	5.118	0.787	0.99	-	-	3	-	-	1
	2125MH	3	1.2500	1.250	1.969	5.512	1.181	1.65	-	-	1	2		1
	3150MH	4	1.5000	1.250	2.362	5.906	1.575	1.98	-	-	-	-	4	2

Available inserts



Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NCM335	NC5330	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	G10	H01	
2000 type	APMT	11T3PDFR-MA																●	E04 E05
		11T308PDFR-MA																	
		11T3PDER-ML												●	●				
		11T308PDER-ML												●	●				
		11T3PDSR-MM			●		●	●	●	●	●	●	●	●	●				
		11T3PDSR-MF					●			●	●		●	●	●				
		11T308PDSR-MM					●			●	●	●		●	●				
		11T312PDSR-MM					●			●	●	●		●	●				
		11T316R-MM					●			●	●			●	●				
		11T318R-MM					●												
		11T324R-MM					●			●	●			●	●				
3000 type	APMT	1604PDSR-MM			●		●	●	●	●	●	●	●	●	●				
		1604PDSR-MF					●			●	●		●	●	●				
3000-K type	APKT	1604PDSR-MM			●	●				●		●	●	●					
		1604PDSR-MF			●									●					

Parts

Specification	Screw	Wrench	Wrench
Ø1.000~Ø1.2500 (2000 type)	FTKA02565S	TW08S	-
Ø1.5000 (3000 type)	FTKA0410	TW15S	-

Recommended cutting condition

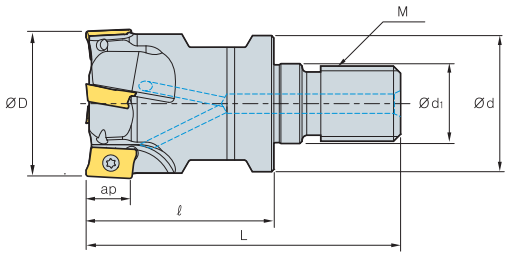
	Drilling	Shouldering	Slotting
vc(sfm)	260~650	260~650	260~650
fz(ipt)	0.002~0.001	0.010~0.002	0.008~0.002

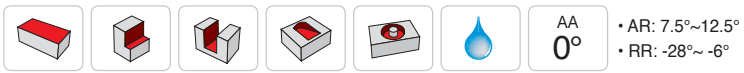
- Please keep the drill depth under 0.25D when you're drilling
- Please keep the step depth from 0.008 to 0.012inch

Available inserts **E04, E05**

AMMA1000







AA 0°

- AR: 7.5°~12.5°
- RR: -28°~ -6°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
AMMA	1050HR-M06	3	0.500	0.433	0.256	0.984	1.575	M06	0.22	0.04
	1062HR-M08	4	0.625	0.571	0.335	0.984	1.654	M08	0.22	0.07
	1075HR-M10	5	0.750	0.689	0.413	1.181	2.008	M10	0.22	0.15
	1100HR-M12	7	1.000	0.906	0.492	1.378	2.323	M12	0.22	0.26
	1125HR-M16	8	1.250	1.142	0.669	1.575	2.638	M16	0.22	0.51

Available inserts

APMT-MA



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0602PDFR-MA																●	E05
	060208PDFR-MA																	
	060202PDSR-MM				●					●				●	●			
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			
	060208PDSR-MM				●					●	●			●	●			
	060212R-MM				●						●			●	●			
	060216R-MM										●			●	●			

Available adaptor

Designation		Available adaptor
AMMA	1050HR-M06	MATA - M06
	1062HR-M08	MATA - M08
	1075HR-M10	MATA - M10
	1100HR-M12	MATA - M12
	1125HR-M16	MATA - M16

Designation: AMMA1125HR-M16
Modular head threading measure size (M16)

II

Adaptor spec.: MATA-M16-354-S125S-C
Adaptor threading measure (M16)

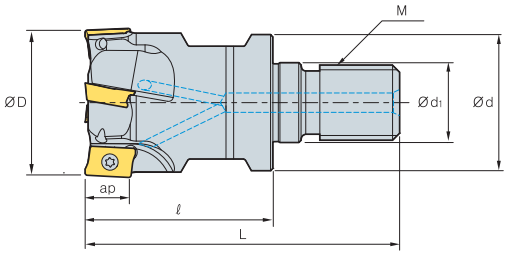
Parts

Specification	Screw	Wrench
Ø0.500~Ø1.2500	FTKA01842	TW06S-A

Available inserts **E05** Available Adaptor **E308~E309**

AMMA1500







AA 0°

- AR: 7.5°~12.5°
- RR: -28°~ -6°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
AMMA	15050HR-M06	1	0.500	0.433	0.256	0.984	1.575	M06	0.35	0.14
	15062HR-M08	2	0.625	0.571	0.335	0.984	1.654	M08	0.35	0.17
	15075HR-M10	2	0.750	0.689	0.413	1.181	2.008	M10	0.35	0.13
	15100HR-M12	3	1.000	0.906	0.492	1.378	2.323	M12	0.35	0.26
	15125HR-M16	4	1.250	1.142	0.669	1.575	2.638	M16	0.35	0.48

Available inserts



APMT-MA



APMT-ML



APMT-MM

Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	E05
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

Available adaptor

Designation		Available adaptor
AMMA	15050HR-M06	MATA - M06
	15062HR-M08	MATA - M08
	15075HR-M10	MATA - M10
	15100HR-M12	MATA - M12
	15125HR-M16	MATA - M16
	15032HR-M16	MATA - M16

Designation: AMMA15125HR-M16
Modular head threading measure size (M16)

II

Adaptor spec.: MATA-M16-354-S125S-C
Adaptor threading measure (M16)

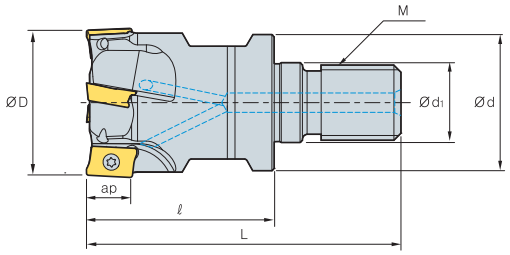
Parts

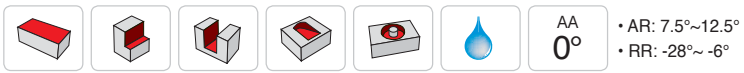
Specification	Screw	Wrench
Ø0.500~Ø1.250	FTKA02555S FTKA02565S	TW08S

Available inserts E05 Available Adaptor E308~E309

AMMA2000







AA 0°

- AR: 7.5°~12.5°
- RR: -28°~ -6°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
AMMA	2062HR-M08	2	0.625	0.571	0.335	0.984	1.654	M08	0.43	0.09
	2075HR-M10	2	0.750	0.689	0.413	1.181	2.008	M10	0.43	0.15
	2100HR-M12	3	1.000	0.906	0.492	1.378	2.323	M12	0.43	0.24
	2125HR-M16	4	1.250	1.142	0.669	1.575	2.638	M16	0.43	0.51
	2150HR-M16	5	1.500	1.142	0.669	1.575	2.638	M16	0.43	0.55

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	E05
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Available adaptor

Designation		Available adaptor
AMMA	2062HR-M08	MATA - M08
	2075HR-M10	MATA - M10
	2100HR-M12	MATA - M12
	2125HR-M16	MATA - M16
	2150HR-M16	

Designation: AMMA2125HR-M16
Modular head threading measure size (M16)

||

Adaptor spec.: MATA-M16-354-S125S-C
Adaptor threading measure (M16)

Parts

Specification	Screw	Wrench
Ø0.625~Ø1.500	FTKA02565S	TW08S

Available inserts E05 Available Adaptor E308~E309

Rigid body employs high tensile aluminum

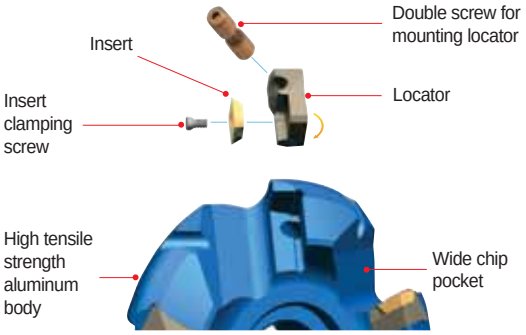
Future Mill

- Light-weight aluminum body (50% of steel body) can be used for high speed cutting, tapping center, and on low power machines
- Easy handling
- It can be used for aluminum alloys, medium cutting of steel, and cast iron
- Rigid body employs high tensile aluminum
- Locators for excellent durability
- A variety of chip breaker are available
- The high rake angle provides low cutting loads and good surface roughness

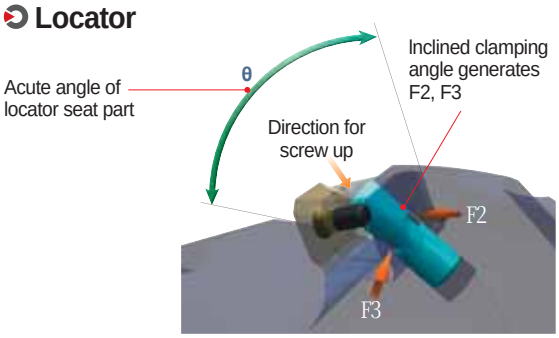
Features of cutter

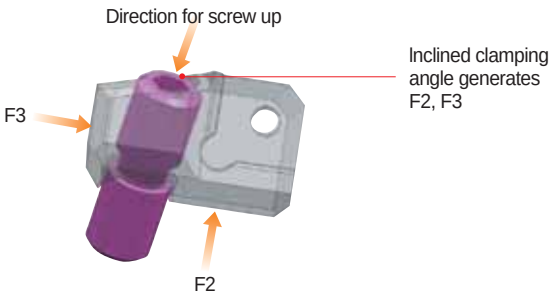
- Strong clamping between aluminum body and locator with double screw provides high efficiency
- Acute angle of locator seat provides strong clamping
- Wide chip pocket area provides good chip evacuation
- High tensile strength aluminum body

Assembly structure of cutter



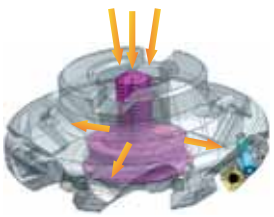
Locator



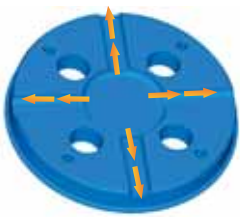


Through coolant system

- Exclusively designed coolant bolt and cover provide excellent coolant action and chip evacuation for improved tool life
- Exact coolant direction to cutting area
- Exclusive coolant bolt and cover are sold separately. Through coolant arbor is required

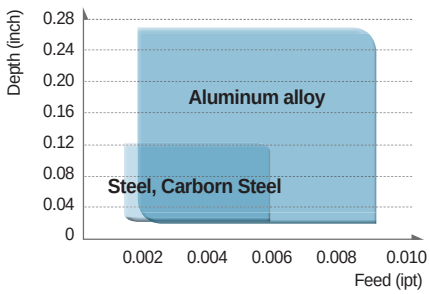


• Bolt: Ø2.5~Ø6.0

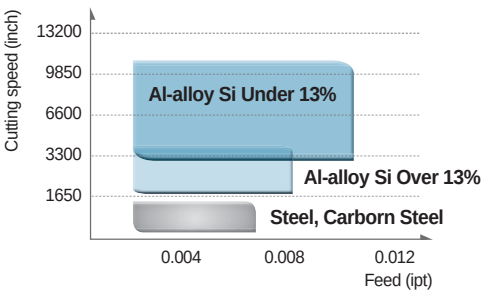


• Cover: Over Ø8.0

Application range as per workpiece



Cutting speed



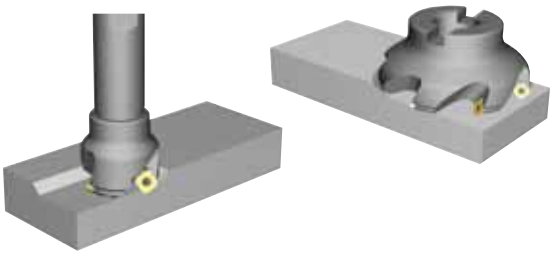
Max. available revolution

Cutter diameter	Max. revolution
Ø2.5	20,000
Ø3.0	16,000
Ø4.0	13,000
Ø5.0	10,000
Ø6.0	8,000
Ø8.0	6,500
Ø10.0	5,000
Ø12.0	4,000

Future Mill (FMA)

Features

- General milling cutter for high productivity
- Adjustable pitch of cutter and various chip breaker offer wide application range.
- Light cutter body allows high speed cutting and can be used in low horse power machine
- Smooth cutting with low cutting load is accomplished with High-rake angle



Features of chip breaker

Type	Chip breaker	Cutting-edge	Features
Light cutting	No C/B		• Superior surface roughness at finishing due to ground type cermet insert
	MF 		• Superior cutting quality for light and difficult-to-cut material machining through the low cutting load of chip breaker
General cutting	MM 		• Suitable for various cutting due to special shape design for general cutting
Roughing	MR 		• Tough cutting-edge provides stable cutting performance in severe interruption
For aluminum	MA 		• Superior cutting quality for aluminum due to sharp cutting-edge and buffed surface - S□ET-MA: Sharp cutting-edge due to high accurate grinding - S□XT-MA: Suitable cutting-edge for roughing

Recommended cutting condition

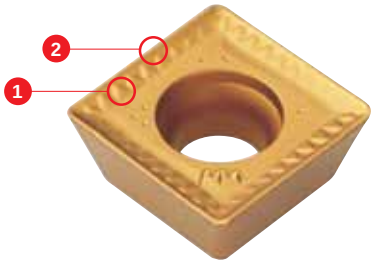
(inch)

ISO	Grades	vc (sfm)	MF	MM	MR	MA
			fz (ipt)	fz (ipt)	fz (ipt)	fz (ipt)
P	NC5330	690~1150	0.008~0.002	0.012~0.004	0.012~0.004	-
	NCM325	620~1020	0.008~0.002	0.012~0.004	0.012~0.004	-
	PC3500	525~885	0.008~0.002	0.012~0.004	0.012~0.004	-
M	PC9530	295~490	0.006~0.002	0.012~0.004	-	-
	NCM335	230~390	0.006~0.002	0.012~0.004	-	-
K	PC5300	360~590	0.008~0.002	0.012~0.004	-	-
Aluminum	H01	850~1440	-	-	-	0.014~0.004

Future Mill (FMP)

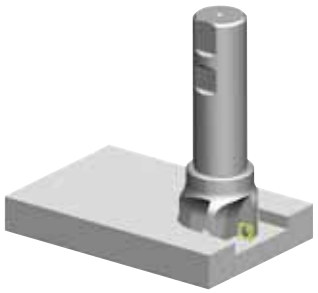
Features

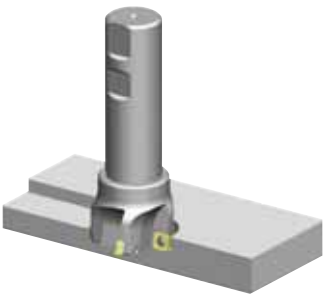
- The strong cutting-edge ensures excellent tool life in high feed and high speed, deep depth of cut, with low cutting loads
- Optimal grades for most workpieces make high efficiency cutting possible
- Unique chip breaker makes good chip evacuation and lower cutting loads (1)
- Innovative curve cutting-edge lowers cutting load and provides a stronger cutting-edge (2)



Machining examples







Features of chip breaker

- Innovative special cutting-edge and chip breaker design ensures ideal 90˚cutting and low cutting load
- Various applications are available with multi functional cutters (Facing, Slotting, Shouldering)
- Improved tool life due to special coated grades
- Superior cutting quality at deep cutting depth through the low cutting load and strong cutting-edge

Recommended C/B and grade as per workpiece

Chip breaker		Cutter edge	Recommended C/B and grade as per workpiece (●: 1st)									
			Low carbon steel / Mild steel		High carbon steel / Mild steel		Stainless steel		Cast iron		Aluminum alloy	
			C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades
Low cutting load type	MF		●	○NCM325 ○NC5330 ●NCM335		●NCM325 ○NC5330 ○NCM335	●	○NCM325 ○NC5330 ●NCM335	●	●PC6510 ○PC215K	-	-
Reinforced cutting edge type	MM			○NCM325 ○NC5330 ●NCM335		●NCM325 ○NC5330 ○NCM335		○NCM325 ○NC5330 ●NCM335		●PC6510 ○PC215K	-	-
Sharp cutting edge type	MA		-	-	-	-	-	-	-	-	●	●H01 ○G10

Recommended cutting condition

(inch)

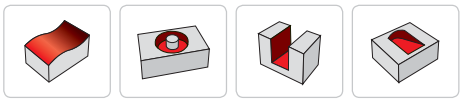
ISO	Cutting Speed vc (sfm)					
	CVD Coated		PVD Coated			Carbide
	NCM325	NCM335	PC6510	PC5300	PC9530	H01
P	620~1020	590~950	-	420~590	-	-
M	360~590	330~530	-	360~590	300~490	-
K	-	-	590~760	-	-	-
N	-	-	-	-	-	850~1440

Future Mill (FMR)

Features

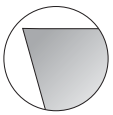
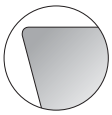
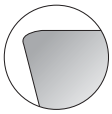
- Wide coverage for medium to roughing, general steel to high hardness mold materials
- 2 step shape of insert provides strong clamping and can minimize components to replace the shim
- 4-8 cutting-edge available per insert (Inscribed circle 05, 06, 07, 08, 10, 12, 16, 20)
- Uneven flute spacing prevents vibration on high speed applications and provides more stable machining
- Precise design of the insert seat prevents insert from chattering
- Special design of the insert bottom prevents movement and chatter of insert
- Easy to change cutting-edge due to the rotation prevention design of the insert

Machining examples



Copying | Helical | Slotting & Side cutting | Ramping

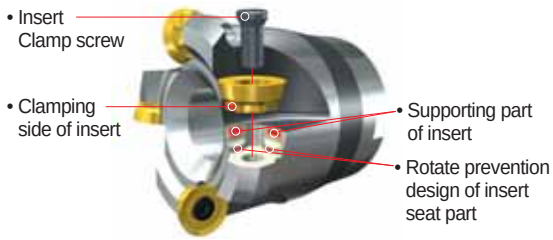
FMR Insert cutting-edge shape

Designation	RDHW□□□□M0F	RDHW□□□□M0E	RDHW□□□□M0S
Cutting edge shape (G calss)			

Features of chip breakers

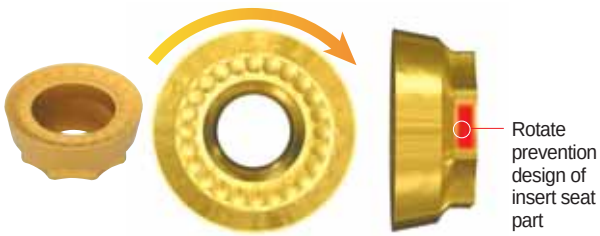
Chip breakers		Cutter edge	Features
Finishing **MF**			• Low cutting resistance chip breaker design guarantees long tool life good performance at finishing and difficult-to-cut material machining
Medium **MM**			• Suitable for general milling at wide application range
Aluminum **MA**			• Sharp cutting-edge and buffed top face for aluminum machining prevent welding and control chip flow

Clamping system



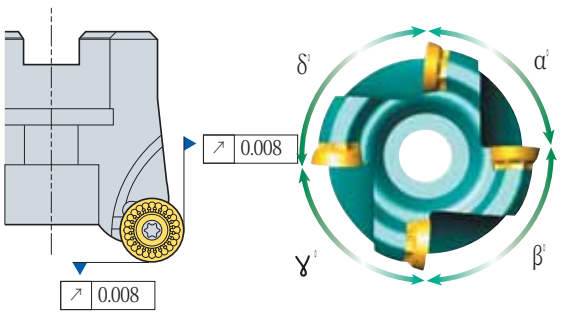
FMR鞿3000 type
FMR鞿4000 type

FMR鞿5000 type
FMR鞿6000 type



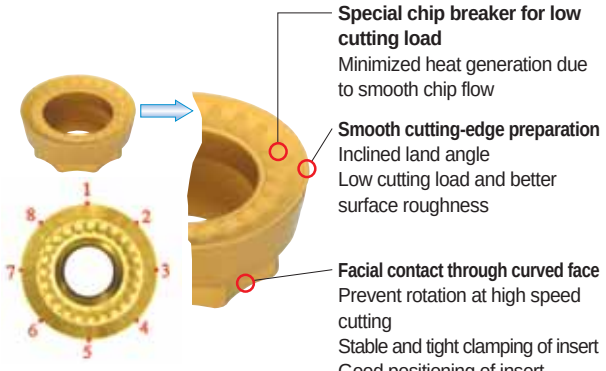
RDKT10T3M0-鞿鞿
RDKT1204M0-鞿鞿

RDKT1605M0-MM
RDKT2006M0-MM



Good surface finish due to the precise design of insert seat part of cutter

Uneven flute spacing prevents vibration at high speed application and provides stable machining



4-8 cutting-edge available per insert

Special chip breaker for low cutting load
Minimized heat generation due to smooth chip flow

Smooth cutting-edge preparation
Inclined land angle
Low cutting load and better surface roughness

Facial contact through curved face
Prevent rotation at high speed cutting
Stable and tight clamping of insert
Good positioning of insert repeatedly

Future Mill (FMR)

Chip removal rate (inch³/min)

	Workpiece	Grades	Ø0.31	Ø0.37	Ø0.50	Ø0.62	Ø0.63	Ø0.75	Ø0.87	Ø1.00	Ø1.10	Ø1.25	Ø1.30	Ø1.50	Ø2.00	Ø2.48	Ø2.50	Ø4.00	Ø5.00	Ø6.00
P	General structure steel(under 200HB)	PC3500 PC3545 PC5300	4.97	9.94	9.94	14.92	31.83	31.83	47.74	47.74	47.74	71.61	38.19	95.49	119.36	143.23	167.11	190.98	133.69	509.29
			vc=820, fz=0.010, ap=0.020, ae=0.5D				vc(sfm)=984, fz(ipt)=0.016 ap(inch)=0.040, ae=0.5D		vc(sfm)=820, fz(ipt)=0.016, ap(inch)=0.060, ae=0.5D											vc(sfm)=656, fz(ipt)=0.020 ap(inch)=0.157, ae=0.5D
	General carbon steel (under 30 HRC)		3.97	7.95	7.95	11.93	25.46	25.46	38.19	38.19	38.19	57.29	38.19	76.39	95.49	114.59	133.69	152.78	133.69	458.36
			vc=656, fz=0.010, ap=0.020, ae=0.5D				vc(sfm)=820, fz(ipt)=0.016 ap(inch)=0.040, ae=0.5D		vc(sfm)=656, fz(ipt)=0.016, ap(inch)=0.060, ae=0.5D											vc(sfm)=590, fz(ipt)=0.020 ap(inch)=0.157, ae=0.5D
	High carbon steel, Alloy steel (30~40 HRC)		2.86	5.72	5.72	8.59	22.91	22.91	34.37	34.37	34.37	51.56	34.37	68.75	85.94	103.13	120.32	137.5	120.32	407.43
			vc=590, fz=0.008, ap=0.020, ae=0.5D				vc(sfm)=656, fz(ipt)=0.016 ap(inch)=0.040, ae=0.5D		vc(sfm)=590, fz(ipt)=0.016, ap(inch)=0.060, ae=0.5D											vc(sfm)=525, fz(ipt)=0.020 ap(inch)=0.157, ae=0.5D
	High carbon steel, Alloy steel (40~50 HRC)		1.24	2.48	2.48	3.72	11.45	11.45	14.32	17.18	14.32	21.48	14.32	28.64	35.8	42.97	50.13	57.29	50.13	249.55
			Vc=426, fz=0.006, ap=0.016, ae=0.5D				vc(sfm)=558, fz(ipt)=0.012 ap(inch)=0.035, ae=0.5D		vc(sfm)=492, fz(ipt)=0.012, ap(inch)=0.040, ae=0.5D											vc(sfm)=459, fz(ipt)=0.016 ap(inch)=0.138, ae=0.5D
	Alloy steel (over 50 HRC)		0.95	1.9	1.9	2.86	7.63	7.63	9.54	11.45	9.54	14.32	9.54	19.09	23.87	28.64	33.42	38.19	33.42	152.78
			vc=328, fz=0.006, ap=0.016, ae=0.5D				vc(sfm)=426, fz(ipt)=0.012 ap(inch)=0.035, ae=0.5D		vc(sfm)=328, fz(ipt)=0.012, ap(inch)=0.040, ae=0.5D											vc(sfm)=328, fz(ipt)=0.016 ap(inch)=0.012, ae=0.5D
M	Stainless steel	PC5300	2.06	4.13	4.13	6.2	16.55	16.55	12.41	24.82	12.41	18.62	12.41	24.82	31.03	37.24	43.44	49.65	43.44	331.04
			vc=426, fz=0.010, ap=0.020, ae=0.5D				vc(sfm)=656, fz(ipt)=0.008 ap(inch)=0.040, ae=0.5D		vc(sfm)=426, fz(ipt)=0.008, ap(inch)=0.060, ae=0.5D											vc(sfm)=426, fz(ipt)=0.020 ap(inch)=0.016, ae=0.5D
K	Cast iron	PC5300	2.86	5.72	5.72	8.59	14.32	14.32	21.48	21.48	21.48	32.22	21.48	42.97	53.71	64.45	75.2	85.94	75.2	366.69
			vc=590, fz=0.010, ap=0.020, ae=0.5D				vc(sfm)=590, fz(ipt)=0.008 ap(inch)=0.040, ae=0.5D		vc(sfm)=590, fz(ipt)=0.008, ap(inch)=0.060, ae=0.5D											vc(sfm)=590, fz(ipt)=0.016 ap(inch)=0.016, ae=0.5D

Required machine power (P_{KW} = 0.75 x P_{HP})

•RDKT10□□

(inch)

	Workpiece	Grades	7/8	1	1	1 1/4	1 5/8	2	2 1/2	3 1/4	4	Cutting condition			
												vc	fz	ap	ae
P	General structure steel(under 200HB)	PC3500 PC3545 PC5300	2.2	2.2	2.2	3.3	4.4	5.5	6.6	7.7	8.8	830	0.016	0.06	0.5D
P	General carbon steel (under 30 HRC)		2.1	2.1	2.1	3.1	4.1	5.2	6.2	7.3	8.3	660	0.016	0.06	0.5D
P	High carbon steel, Alloy steel (30~40 HRC)		2.2	2.2	2.2	3.3	4.5	5.6	6.7	7.9	9	600	0.016	0.06	0.5D
P	High carbon steel, Alloy steel (40~50 HRC)		1.1	1.1	1.1	1.6	2.1	2.6	3.2	3.7	4.2	500	0.012	0.04	0.5D
P	Alloy steel(over 50 HRC)		0.7	0.7	0.7	1.1	1.4	1.7	2.1	2.4	2.8	330	0.012	0.04	0.5D
M	Stainless steel	PC5300	0.6	0.6	0.6	0.8	1.2	1.5	1.7	2	2.3	430	0.008	0.06	0.5D
K	Cast iron	PC5300	0.6	0.6	0.6	0.9	1.2	1.5	1.8	2.1	2.4	600	0.008	0.06	0.5D

• The figures in the above chart means Php value.

•RDKT12□□

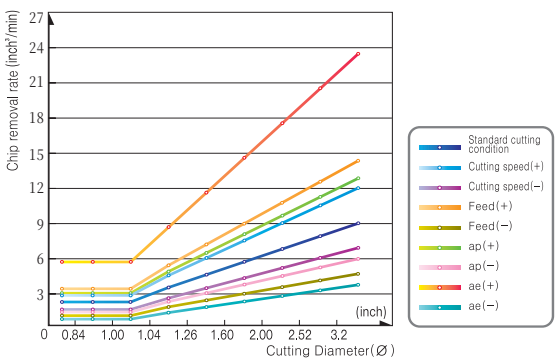
(inch)

	Workpiece	Grades	1 1/4	15/16	1 5/8	2	2 1/2	3 1/4	4	5	Cutting condition			
											vc	fz	ap	ae
P	General structure steel(under 200HB)	PC3500 PC3545 PC5300	1.7	1.7	2.6	3.5	3.5	4.4	5.3	6.1	660	0.016	0.06	0.5D
P	General carbon steel (under 30 HRC)		2	2	3.1	4.1	2.6	5.2	6.2	7.2	600	0.016	0.06	0.5D
P	High carbon steel, Alloy steel (30~40 HRC)		2.2	2.2	3.3	4.4	2.8	5.6	6.7	7.8	530	0.016	0.06	0.5D
P	High carbon steel, Alloy steel (40~50 HRC)		1	1	1.5	1.6	2.1	2.6	3.1	3.6	460	0.012	0.04	0.5D
P	Alloy steel(over 50 HRC)		0.7	0.7	1	1.4	0.8	1.7	2.1	2.4	330	0.012	0.04	0.5D
M	Stainless steel	PC5300	0.5	0.5	0.8	1.1	0.7	1.4	1.7	2	430	0.008	0.06	0.5D
K	Cast iron	PC5300	0.6	0.6	0.9	1.2	0.7	1.5	1.8	2.1	600	0.008	0.06	0.5D

• The figures in the above chart means Php value.

Chip removal rate by cutting condition

• Used insert: RDKT10□□



• Variation of cutting condition

Standard	ISO
	vc = 656 fz = 0.016 ap = 0.06 ae = 0.5D
Speed (+)	830
Speed (-)	500
Feed (+)	0.024
Feed (-)	0.008
ap (+)	0.080
ap (-)	0.040
ae (+)	D
ae (-)	0.008D

Recommended cutting condition

• Side milling, slotting, ramping, copying

Workpiece		Hardness	Grades	Cutting speed (sfm)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)
P	Cabon steel	200HB ≤	PC5300	919	0.039	0.016	0.047	0.016	0.059	0.016	0.067	0.016	0.079	0.02	0.094	0.024	0.118	0.028	0.157	0.031
			PC5400	804																
		30HRC ≤	PC5300	820	0.028	0.016	0.047	0.016	0.059	0.016	0.067	0.016	0.079	0.02	0.094	0.024	0.118	0.028	0.157	0.031
			PC5400	689																
	Alloy steel	30~40HRC	PC5300	640	0.028	0.008	0.035	0.008	0.047	0.008	0.059	0.008	0.067	0.012	0.079	0.016	0.106	0.02	0.146	0.024
			PC5400	558																
	High alloy steel (alloy constituent > 5%)	40~50HRC	PC5300	492	0.028	0.008	0.035	0.008	0.047	0.008	0.059	0.008	0.067	0.012	0.079	0.016	0.106	0.02	0.146	0.024
			PC5400	427																
		Tensile strength 350MPa ≤	PC5300	394	0.028	0.008	0.035	0.008	0.047	0.008	0.059	0.008	0.067	0.012	0.079	0.016	0.106	0.02	0.146	0.024
			PC5400	344																
M	Stainless steel	270HB≤	PC5300	427	0.028	0.008	0.035	0.008	0.047	0.008	0.059	0.008	0.067	0.012	0.079	0.016	0.106	0.02	0.146	0.024
			PC5400	361																
K	Cast iron, Ductile cast iron	Low tensile	PC5300	476	0.028	0.016	0.047	0.016	0.059	0.016	0.067	0.016	0.079	0.02	0.094	0.024	0.118	0.028	0.157	0.031
			PC5400	361																

• Plunging

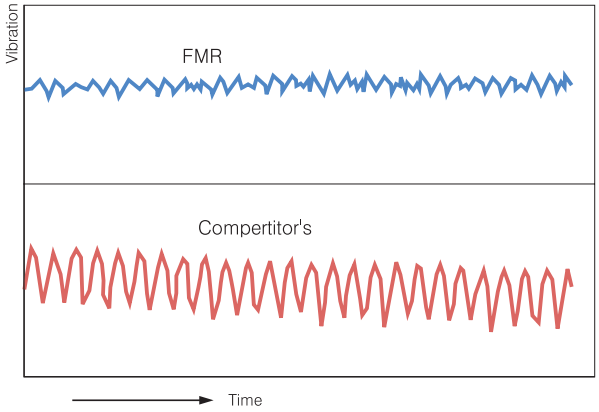
Workpiece		Hardness	Grades	Cutting speed (sfm)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)
P	Cabon steel	200HB ≤	PC5300	919	0.098	0.008	0.118	0.008	0.138	0.008	0.157	0.008	0.197	0.012	0.236	0.016	0.315	0.02	0.394	0.024
			PC5400	804																
		30HRC ≤	PC5300	820	0.098	0.008	0.118	0.008	0.138	0.008	0.157	0.008	0.197	0.012	0.236	0.016	0.315	0.02	0.394	0.024
			PC5400	689																
	Alloy steel	30~40HRC	PC5300	640	0.098	0.004	0.118	0.004	0.138	0.004	0.157	0.004	0.197	0.008	0.236	0.012	0.315	0.016	0.394	0.02
			PC5400	558																
	High alloy steel (alloy constituent > 5%)	40~50HRC	PC5300	492	0.098	0.004	0.118	0.004	0.138	0.004	0.157	0.004	0.197	0.008	0.236	0.012	0.315	0.016	0.394	0.02
			PC5400	427																
		Tensile strength 350MPa ≤	PC5300	394	0.098	0.004	0.118	0.004	0.138	0.004	0.157	0.004	0.197	0.008	0.236	0.012	0.315	0.016	0.394	0.02
			PC5400	344																
M	Stainless steel	270HB≤	PC5300	427	0.098	0.004	0.118	0.004	0.138	0.004	0.157	0.004	0.197	0.008	0.236	0.012	0.315	0.016	0.394	0.02
			PC5400	361																
K	Cast iron, Ductile cast iron	Low tensile	PC5300	476	0.098	0.008	0.118	0.008	0.138	0.008	0.157	0.008	0.197	0.012	0.236	0.016	0.315	0.02	0.394	0.024
			PC5400	361																

• Helical cutting

Workpiece		Hardness	Grades	Cutting speed (sfm)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)	ap(inch)	fz(ipt)
P	Cabon steel	200HB ≤	PC5300	919	0.039	0.008	0.039	0.008	0.039	0.008	0.039	0.008	0.079	0.012	0.079	0.016	0.157	0.02	0.157	0.024
			PC5400	804																
		30HRC ≤	PC5300	820	0.028	0.008	0.028	0.008	0.028	0.008	0.028	0.008	0.079	0.012	0.079	0.016	0.146	0.02	0.146	0.024
			PC5400	689																
	Alloy steel	30~40HRC	PC5300	640	0.028	0.004	0.028	0.004	0.028	0.004	0.028	0.004	0.067	0.008	0.067	0.012	0.146	0.016	0.146	0.02
			PC5400	558																
	High alloy steel (alloy constituent > 5%)	40~50HRC	PC5300	492	0.028	0.004	0.028	0.004	0.028	0.004	0.028	0.004	0.067	0.008	0.067	0.012	0.146	0.016	0.146	0.02
			PC5400	427																
		Tensile strength 350MPa ≤	PC5300	394	0.028	0.004	0.028	0.004	0.028	0.004	0.028	0.004	0.067	0.008	0.067	0.012	0.146	0.016	0.146	0.02
			PC5400	344																
M	Stainless steel	270HB≤	PC5300	427	0.028	0.004	0.028	0.004	0.028	0.004	0.028	0.004	0.067	0.008	0.067	0.012	0.157	0.016	0.157	0.02
			PC5400	361																
K	Cast iron, Ductile cast iron	Low tensile	PC5300	476	0.039	0.008	0.039	0.008	0.039	0.008	0.039	0.008	0.079	0.012	0.079	0.016	0.394	0.02	0.394	0.024
			PC5400	361																

Future Mill (FMR)

FMR Vibration test



Machining example



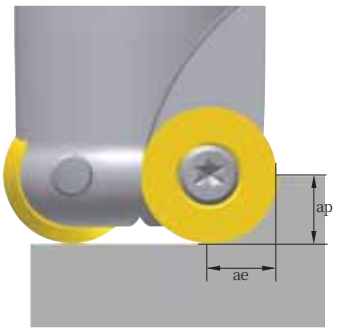
- **Workpiece** STD11
- **Cutting condition** vc = 650sfm
  fz = 0.015ipt
  ap = 0.08inch
  ae = 0.16inch
- **Designation** FMRS3032RD-S
  RDKT10T3M0-MM
  (PC3535)

Cutting condition formulas for milling

Cutting speed	RPM
$vc = \frac{\pi \times D \times n}{12}$ (sfm)	$n = \frac{vc \times 12}{\pi \times D}$ (min^{-1})

Feed (per tooth)	Feed (per minute)
$fz = \frac{vf}{Z \times n}$ (ipt)	$vf = fz \times n \times z$ (ipm)

Chip removal rate	Required machine power
$Q = ap \times ae \times vf$ ($inch^3$/min)	$Pkw = \frac{Q \times kc}{60 \times 102 \times \eta}$ (kW) $Php = \frac{Pkw}{0.75}$ (hp)



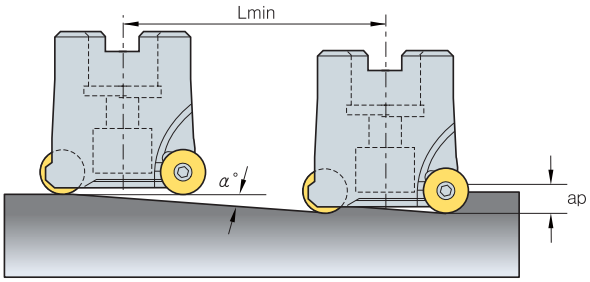
vc = Cutting speed (sfm)	**Pkw** = Required machine power (kW)
n = Revolution per a minute (min^{-1})	**Php** = Horsepower requirement (hp)
D = Cutting diameter (inch)	**Q** = Chip removal amount ($inch^3$/min)
De = Efficient cutting diameter (inch)	**ap** = Depth of cut (inch)
vf = Feed per a minute (ipm)	**ae** = Width of cut (inch)
fz = Feed per tooth (ipt)	**Kc** = Specific cutting resistance (MPa)
z = Number of tooth	η = Mechanical efficiency (%)
Pc = Power requirement (kW)	

Feed as per cutting depth

Designation	Chip breaker	Depth of cut (inch)								
		0.008~0.020	0.020~0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315
RDHW0501M0	**-**	0.010	0.006	-	-	-	-	-	-	-
RDHW06T1M0	**-**	0.012	0.008	0.004	-	-	-	-	-	-
RDHW0702M0	**-**	0.014	0.010	0.004	0.003	-	-	-	-	-
RDHW0803M0	**-**	0.016	0.012	0.006	0.0004	-	-	-	-	-
RDKT10T3M0 -	**MF/MM**	-	0.016	0.014	0.012	0.008	-	-	-	-
RDKT1204M0 -	**MF/MM**	-	0.020	0.018	0.012	0.010	0.009	-	-	-
RDHW1605M0	**-**	-	0.024	0.020	0.018	0.014	0.012	0.008	0.004	-
RDHW2006M0	**-**	-	-	0.024	0.020	0.016	0.012	0.010	0.006	0.004
RDKT1605M0 -	**MM**	-	0.024	0.020	0.018	0.014	0.012	0.008	0.004	-
RDKT2006M0 -	**MM**	-	-	0.024	0.020	0.016	0.012	0.010	0.006	0.004

Future Mill (FMR)

Ramping technical data



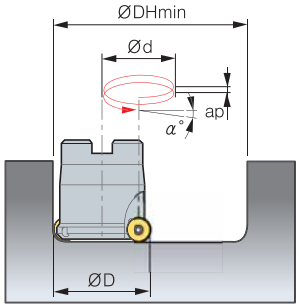
$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

※ Lmin: Min. inclination cutting length
α°: Max. ramping angle
ap: Depth of cut

Section	Tool Dia.	Ramping angle α° (Max)	Cutting length L(inch) by ramping angle									
			ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
FMR1000	0.312	18.14	0.12	0.24	0.30	-	-	-	-	-	-	-
	0.375	11.7	0.19	0.38	0.48	-	-	-	-	-	-	-
	0.500	8.43	0.26	0.53	0.66	-	-	-	-	-	-	-
	0.625	5.93	0.38	0.76	0.95	-	-	-	-	-	-	-
FMR1500	0.375	20.67	0.81	0.21	0.26	0.31	-	-	-	-	-	-
	0.500	10.05	0.40	0.44	0.56	0.67	-	-	-	-	-	-
	0.625	6.12	0.24	0.73	0.92	1.1	-	-	-	-	-	-
	0.750	4.36	0.17	1.03	1.29	1.55	-	-	-	-	-	-
FMR2000	0.625	9.42	0.24	0.47	0.59	0.71	0.83	-	-	-	-	-
	0.750	5.85	0.38	0.77	0.96	1.15	1.34	-	-	-	-	-
FMR2500	0.625	13.7	0.16	0.32	0.40	0.48	0.57	0.65	-	-	-	-
	0.750	9.29	0.24	0.48	0.60	0.72	0.84	0.96	-	-	-	-
	1.000	6.56	0.34	0.68	0.86	1.03	1.20	1.37	-	-	-	-
FMR3000	1.500	9.09	0.25	0.49	0.62	0.74	0.86	0.98	1.23	-	-	-
	2.000	6.52	0.34	0.69	0.86	1.03	1.21	1.38	1.72	-	-	-
	2.500	4.76	0.47	0.95	1.18	1.42	1.65	1.89	2.36	-	-	-
	3.000	3.52	0.64	1.28	1.60	1.92	2.24	2.56	3.20	-	-	-
	4.000	2.69	0.84	1.68	2.09	2.51	2.93	3.35	4.19	-	-	-
FMR4000	2.000	7.13	0.31	0.63	0.79	0.94	1.10	1.26	1.57	1.89	-	-
	2.500	5.08	0.44	0.89	1.11	1.33	1.55	1.77	2.21	2.66	-	-
	3.000	3.69	0.61	1.22	1.53	1.83	2.14	2.44	3.05	3.66	-	-
	4.000	2.79	0.81	1.62	2.02	2.42	2.83	3.23	4.04	4.85	-	-
	5.000	2.14	1.05	2.11	2.63	3.16	3.69	4.21	5.27	6.32	-	-
FMR5000	2.000	5.22	0.43	0.86	1.08	1.29	1.51	1.72	2.15	2.59	3.45	-
	2.500	3.79	0.59	1.19	1.49	1.78	2.08	2.38	2.97	3.57	4.75	-
	3.000	2.97	0.76	1.52	1.90	2.28	2.66	3.04	3.79	4.55	6.07	-
	4.000	2.09	1.08	2.16	2.70	3.24	3.78	4.32	5.39	6.47	8.63	-
	5.000	1.63	1.38	2.77	3.46	4.15	4.84	5.53	6.92	8.30	11.07	-
FMR6000	2.500	3.69	0.61	1.22	1.53	1.83	2.14	2.44	3.05	3.66	4.88	2.44
	3.000	2.72	0.83	1.66	2.07	2.49	2.9	3.31	4.14	4.97	6.63	3.31
	4.000	2.12	1.06	2.13	2.66	3.19	3.72	4.25	5.32	6.38	8.51	4.25
	5.000	1.57	1.44	2.87	3.59	4.31	5.03	5.75	7.18	8.62	11.49	5.74

Future Mill (FMR)

Helical cutting technical data - ØDH Min



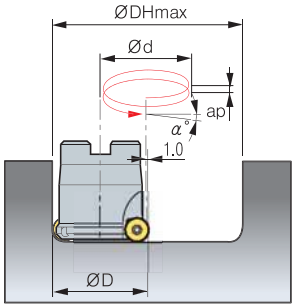
- ØD = Tool dia. (inch), ØDH Min, Max = Min, Max diameter (inch)
- Ød = Tool path (inch)
- ØDH Min (Min diameter) = ØD × 2 - Insert size, ØDH Max (Max diameter) = ØD × 2 - 2
- Ød (Tool path) = ØDH Min, Max - ØD

(inch)

Section	Insert Size	Tool Dia. (ØD)	ØDH Min	Ød	Ramping angle (α°)									
					ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
FMR1000	0.312	0.31	0.43	0.12	6.11	12.35	15.57	-	-	-	-	-	-	-
	0.375	0.39	0.59	0.20	3.65	7.34	7.34	-	-	-	-	-	-	-
	0.500	0.47	0.75	0.28	2.61	5.23	5.23	-	-	-	-	-	-	-
	0.625	0.59	0.98	0.39	1.83	3.65	3.65	-	-	-	-	-	-	-
FMR1500	0.375	0.39	0.55	0.16	4.57	9.20	9.20	13.95	-	-	-	-	-	-
	0.500	0.47	0.71	0.24	3.04	6.11	6.11	9.20	-	-	-	-	-	-
	0.625	0.63	1.02	0.39	1.83	3.65	3.65	5.49	-	-	-	-	-	-
	0.750	0.79	1.34	0.55	1.30	2.61	2.61	3.92	-	-	-	-	-	-
FMR2000	0.625	0.59	0.91	0.31	2.28	4.57	4.57	6.88	8.04	-	-	-	-	-
	0.750	0.79	1.3	0.51	1.40	2.81	2.81	4.22	4.92	-	-	-	-	-
FMR2500	0.625	0.63	0.94	0.31	2.28	4.57	4.57	6.88	8.04	9.20	-	-	-	-
	0.750	0.79	1.26	0.47	1.52	3.04	3.04	4.57	5.34	6.11	-	-	-	-
	1.000	0.98	1.65	0.67	1.07	2.15	2.15	3.22	3.76	4.30	-	-	-	-
FMR3000	1.500	1.57	2.76	1.18	0.61	1.22	1.22	1.83	2.13	2.43	3.04	-	-	-
	2.000	1.97	3.54	1.57	0.46	0.91	0.91	1.37	1.60	1.83	2.28	-	-	-
	2.500	2.48	4.57	2.09	0.34	0.69	0.69	1.03	1.21	1.38	1.72	-	-	-
	3.000	3.15	5.91	2.76	0.26	0.52	0.52	0.78	0.91	1.04	1.30	-	-	-
	4.000	3.94	7.48	3.54	0.20	0.41	0.41	0.61	0.71	0.81	1.01	-	-	-
FMR4000	2.000	1.97	3.46	1.5	0.48	0.96	0.96	1.44	1.68	1.92	2.4	2.88	-	-
	2.500	2.48	4.49	2.01	0.36	0.72	0.72	1.07	1.25	1.43	1.79	2.15	-	-
	3.000	3.15	5.83	2.68	0.27	0.54	0.54	0.81	0.94	1.07	1.34	1.61	-	-
	4.000	3.94	7.40	3.46	0.21	0.41	0.41	0.62	0.73	0.83	1.04	1.24	-	-
	5.000	4.92	9.37	4.45	0.16	0.32	0.32	0.48	0.57	0.65	0.81	0.97	-	-
FMR5000	2.000	1.97	3.31	1.34	0.54	1.07	1.07	1.61	1.88	2.15	2.69	3.22	4.30	-
	2.500	2.48	4.33	1.85	0.39	0.78	0.78	1.16	1.36	1.55	1.94	2.33	3.11	-
	3.000	3.15	5.67	2.52	0.29	0.57	0.57	0.86	1.00	1.14	1.43	1.71	2.28	-
	4.000	3.94	7.24	3.31	0.22	0.43	0.43	0.65	0.76	0.87	1.09	1.30	1.74	-
	5.000	4.92	9.21	4.29	0.17	0.33	0.33	0.50	0.59	0.67	0.84	1.00	1.34	-
FMR6000	2.500	3.15	5.51	2.36	0.30	0.61	0.61	0.91	1.06	1.22	1.52	1.83	2.43	3.04
	3.000	3.94	7.09	3.15	0.23	0.46	0.46	0.68	0.8	0.91	1.14	1.37	1.83	2.28
	4.000	4.92	9.06	4.13	0.17	0.35	0.35	0.52	0.61	0.70	0.87	1.04	1.39	1.74
	5.000	6.30	11.81	5.51	0.13	0.26	0.26	0.39	0.46	0.52	0.65	0.78	1.04	1.30

Future Mill (FMR)

Helical cutting technical data - ØDH Max



- ØD = Tool dia. (inch), ØDH Min, Max = Min, Max diameter (inch)
- Ød = Tool path (inch)
- ØDH Min (Min diameter) = ØD × 2 - Insert size, ØDH Max (Max diameter) = ØD × 2 - 2
- Ød (Tool path) = ØDH Min, Max - ØD

(inch)

Section	Insert Size	Tool Dia. (ØD)	ØDH Min	Ød	Ramping angle (α°)									
					ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
FMR1000	0.312	0.31	0.55	0.24	3.04	6.11	7.65	-	-	-	-	-	-	-
	0.375	0.39	0.71	0.31	2.28	4.57	5.72	-	-	-	-	-	-	-
	0.500	0.47	0.87	0.39	1.83	3.65	4.57	-	-	-	-	-	-	-
	0.625	0.59	1.10	0.51	1.40	2.81	3.51	-	-	-	-	-	-	-
FMR1500	0.375	0.39	0.71	0.31	2.28	4.57	5.72	6.88	-	-	-	-	-	-
	0.500	0.47	0.87	0.39	1.83	3.65	4.57	5.49	-	-	-	-	-	-
	0.625	0.63	1.18	0.55	1.30	2.61	3.26	3.92	-	-	-	-	-	-
	0.750	0.79	1.50	0.71	1.01	2.03	2.54	3.04	-	-	-	-	-	-
FMR2000	0.625	0.59	1.10	0.51	1.40	2.81	3.51	4.22	4.92	-	-	-	-	-
	0.750	0.79	1.50	0.71	1.01	2.03	2.54	3.04	3.55	-	-	-	-	-
FMR2500	0.625	0.63	1.18	0.55	1.30	2.61	3.26	3.92	4.57	5.23	-	-	-	-
	0.750	0.79	1.50	0.71	1.01	2.03	2.54	3.04	3.55	4.06	-	-	-	-
	1.000	0.98	1.89	0.91	0.79	1.59	1.98	2.38	2.78	3.18	-	-	-	-
FMR3000	1.500	1.57	3.07	1.50	0.48	0.96	1.20	1.44	1.68	1.92	2.40	-	-	-
	2.000	1.97	3.86	1.89	0.38	0.76	0.95	1.14	1.33	1.52	1.90	-	-	-
	2.500	2.48	4.88	2.40	0.30	0.60	0.75	0.90	1.05	1.20	1.50	-	-	-
	3.000	3.15	6.22	3.07	0.23	0.47	0.58	0.70	0.82	0.94	1.17	-	-	-
	4.000	3.94	7.80	3.86	0.19	0.37	0.47	0.56	0.65	0.74	0.93	-	-	-
FMR4000	2.000	1.97	3.86	1.89	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	-	-
	2.500	2.48	4.88	2.40	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	-	-
	3.000	3.15	6.22	3.07	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	-	-
	4.000	3.94	7.80	3.86	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	-	-
	5.000	4.92	9.76	4.84	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	-	-
FMR5000	2.000	1.97	3.86	1.89	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	3.04	-
	2.500	2.48	4.88	2.40	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	2.39	-
	3.000	3.15	6.22	3.07	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	1.87	-
	4.000	3.94	7.80	3.86	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	1.49	-
	5.000	4.92	9.76	4.84	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	1.19	-
FMR6000	2.500	3.15	6.22	3.07	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	1.87	2.34
	3.000	3.94	7.80	3.86	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	1.49	1.86
	4.000	4.92	9.76	4.84	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	1.19	1.48
	5.000	6.30	12.52	6.22	0.12	0.23	0.29	0.35	0.40	0.46	0.58	0.69	0.92	1.16

Future Mill series for mold making

FMR P-positive

- Stable clamping system enables stable machining and productivity
- Varied product line-up ensures wide application range
- Optimal shape and grade with high hardness for hard-to-cut material machining

Features

- P-positive relief angle (11˚) ensures high rigidity and high machinability in die steel and high-resistant alloy machining
- Flat clearance face of insert prevents interference and revolution while machining
- Optimal grades and chip breakers for various workpieces
- Chip breaker
  - Concave shape ensures wide chip pocket and lowers cutting temperature
- Clearance face for preventing rotation
  - Prevents rotation in machining
  - Divides corners
  - Prevents interference in high-feed machining
  - Ensures stable clamping
- Through-coolant system
  - Superb chip evacuation
  - Low cutting heat ensures long tool life

Features of chip breakers

Chip breaker	Cutting-edge	Applications	Features
MA		Aluminum machining	• Optimal cutting-edge for aluminum machining and buffed surface ensure high machinability
ML		Titanium & Inconel machining	• Excellent results in titanium machining thanks to a high hardness cutting-edge and the chip breaker reducing the cutting load
MF		Fine finishing	• Chip breaker for low cutting resistance enables fine finishing.
MM		General machining	• Optimal for general machining
None C/B		Super hard material machining	• Optimal for high hardness die steel and heat resistant alloy

Recommended cutting condition

* Recommended chip breaker: ● First ◦ Second

Workpiece			Hardness	Grades	Cutting conditions				Chip breaker					
					vc (sfm)	fz (ipt)	ap (inch)	ae (inch)	MA	ML	MF	MM	None C/B 1	None C/B 2
P	Low carbon steel		HB80~180	PC5400	328~820	0.028~0.005	0.012~0.236	0.7D~0.1D	-	-	●	○	-	-
	High carbon steel		HB180~280	PC5400	328~722	0.028~0.005	0.012~0.236	0.7D~0.1D	-	-	●	○	-	-
	Low alloy steel		Under HRC27	PC3600	590~951	0.024~0.008	0.012~0.236	0.7D~0.1D	-	-	-	●	○	-
				PC5400 / PC5300	328~656	0.024~0.008	0.012~0.236	0.7D~0.1D	-	-	-	●	○	-
	Low pre-hardened steel		HRC20~50	PC3600	426~820	0.020~0.012	~0.020	0.7D~0.1D	-	-	-	-	●	○
				PC5300	164~492	0.020~0.012	~0.020	0.7D~0.1D	-	-	-	-	●	○
	High alloy steel		Under HRC27	PC3600	426~820	0.020~0.012	~0.020	0.7D~0.1D	-	-	-	●	○	-
				PC5300	164~492	0.020~0.012	~0.020	0.7D~0.1D	-	-	-	●	○	-
	High pre-hardened steel		HRC20~48	PC5300	164~492	0.020~0.012	~0.020	0.7D~0.1D	-	-	-	-	●	○
M	Stainless steel		Under HB270	PC5300 / PC5400	328~492	0.024~0.008	0.012~0.236	0.7D~0.1D	-	-	○	●	-	-
K	Gray cast iron, Ductile cast iron		Under 350MPa	PC5300	394~689	0.024~0.008	0.012~0.236	0.7D~0.1D	-	-	○	●	-	-
N	Aluminum		-	H01	984~2,625	0.024~0.012	0.012~0.236	0.7D~0.1D	●	-	-	-	-	-
S	Heat resistant alloy	Fe	HRC30~40	PC5300 / PC5400	115~197	0.020~0.012	~0.020	0.7D~0.1D	-	●	○	-	-	-
		Ni or Co	HRC40~45	PC5300 / PC5400	98~164	0.020~0.012	~0.020	0.7D~0.1D	-	●	○	-	-	-
	Titanium		HRC35~45	PC5300 / PC5400	131~230	0.020~0.012	~0.059	0.7D~0.1D	-	●	○	-	-	-
H	High hardened materials		Over HRC50	PC5300 / PC5400	98~164	0.020~0.012	~0.020	0.7D~0.1D	-	-	-	-	●	○

Feed per tooth according to ap (fz, ipt)

(inch)

Insert	Insert size (d)	Feed per tooth according to ap							
		ap=0.039	ap=0.079	ap=0.118	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
RPMT08	0.135	0.012	0.009	0.007	0.006	-	-	-	-
RPMT10	0.394	0.016	0.011	0.01	0.008	0.005	-	-	-
RPMT12	0.472	0.024	0.018	0.014	0.012	0.01	0.008	-	-
RPMT16	0.630	0.026	0.018	0.016	0.013	0.012	0.011	0.009	-
RPMT20	0.787	0.028	0.02	0.017	0.014	0.013	0.011	0.01	0.009

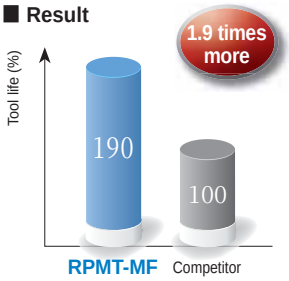
Performance evaluation

P Alloy steel (SM490A Heat treatment, HRC 38~40)

■ **Cutting conditions**
vc (sfm) = 820
fz (ipt) = 0.024
ap (inch) = 0.039
wet

■ **Tools**
Insert RPMT1204M0E-MF(PC5300)
Holder FMRSA4125HRP-3L100

■ **Result**



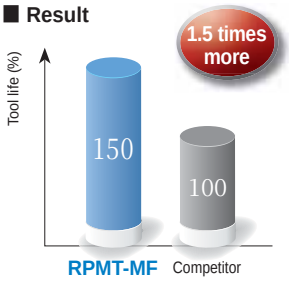


P Low pre-hardened steel (KP4M Heat treatment, HRC 30~45)

■ **Cutting conditions**
vc (sfm) = 584
fz (ipt) = 0.028
ap (inch) = 0.059
dry

■ **Tools**
Insert RPMT1606M0S-MM(PC5300)
Holder FMRCA5250HRP-4

■ **Result**



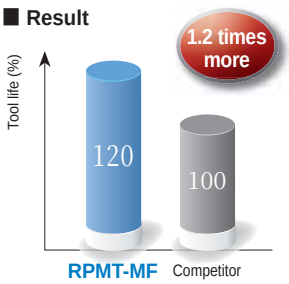


P Low pre-hardened steel (KP1, HRC 28~33)

■ **Cutting conditions**
vc (sfm) = 584
fz (ipt) = 0.029
ap (inch) = 0.031
dry

■ **Tools**
Insert RPMT1204M0E-MF(PC5300)
Holder FMRCA4250HRP-6

■ **Result**



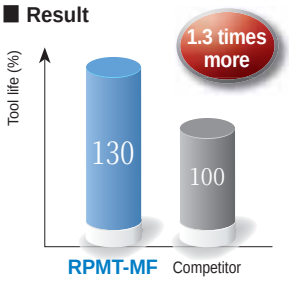


P High pre-hardened steel (STD61, HRC 50~52)

■ **Cutting conditions**
vc (sfm) = 164
fz (ipt) = 0.006
ap (inch) = 0.157
dry

■ **Tools**
Insert RPMW1204M0S1(PC5300)
Holder FMRSA4125HRP-3L100

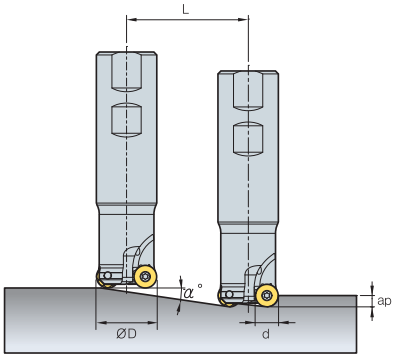
■ **Result**





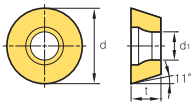
FMR P-positive

Maximum angle table for ramping machining



$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (inch)}$$

※ L (inch): Cutting length
α°: Max. ramping angle
ap: Depth of cut



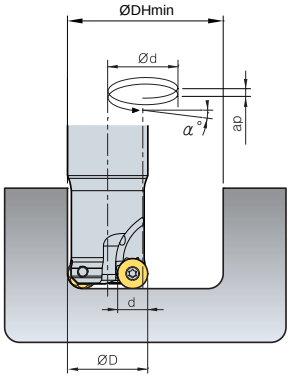
(inch)

Section	Insert size(d)	Tool Dia. (ØD)	Ramping angle α°(max)	Cutting length L by ap									
				ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
FMR2500	0.315	0.688	4.44	0.507	1.013	1.266	1.52	1.773	2.026	-	-	-	-
	0.315	0.75	17.3	0.126	0.253	0.316	0.379	0.442	0.506	-	-	-	-
	0.315	0.813	14.4	0.153	0.307	0.383	0.46	0.537	0.613	-	-	-	-
	0.315	1	9.54	0.234	0.468	0.585	0.703	0.82	0.937	-	-	-	-
	0.315	1.063	8.57	0.261	0.522	0.653	0.783	0.914	1.044	-	-	-	-
FMR3000	0.394	1	13.3	0.167	0.333	0.416	0.5	0.583	0.666	0.833	-	-	-
	0.394	1.063	11.67	0.191	0.381	0.477	0.572	0.667	0.762	0.953	-	-	-
	0.394	1.25	8.52	0.263	0.525	0.657	0.788	0.92	1.051	1.314	-	-	-
	0.394	1.313	7.82	0.287	0.574	0.717	0.86	1.004	1.147	1.434	-	-	-
	0.394	1.5	6.26	0.359	0.718	0.897	1.077	1.256	1.435	1.794	-	-	-
	0.394	2	4.09	0.551	1.102	1.378	1.654	1.929	2.205	2.756	-	-	-
	0.394	2.5	3.03	0.743	1.487	1.859	2.23	2.602	2.974	3.717	-	-	-
FMR4000	0.472	1	4.34	0.519	1.038	1.297	1.557	1.816	2.076	2.594	3.113	-	-
	0.472	1.063	3.76	0.599	1.198	1.498	1.797	2.097	2.396	2.995	3.594	-	-
	0.472	1.25	14.94	0.148	0.295	0.369	0.443	0.517	0.59	0.738	0.886	-	-
	0.472	1.313	13.49	0.164	0.328	0.41	0.492	0.574	0.656	0.821	0.985	-	-
	0.472	1.5	10.44	0.214	0.427	0.534	0.641	0.748	0.855	1.069	1.282	-	-
	0.472	2	6.49	0.346	0.692	0.865	1.038	1.211	1.384	1.73	2.076	-	-
	0.472	2.5	4.71	0.478	0.957	1.196	1.435	1.674	1.913	2.391	2.87	-	-
	0.472	3	3.69	0.611	1.221	1.526	1.832	2.137	2.442	3.053	3.663	-	-
	0.472	4	2.58	0.875	1.75	2.188	2.625	3.063	3.5	4.375	5.251	-	-
FMR5000	0.63	1.5	20.01	0.108	0.216	0.27	0.324	0.378	0.432	0.541	0.649	0.865	-
	0.63	2	10.99	0.203	0.406	0.507	0.608	0.71	0.811	1.014	1.217	1.623	-
	0.63	2.5	7.54	0.298	0.595	0.744	0.893	1.041	1.19	1.488	1.785	2.38	-
	0.63	3	5.73	0.392	0.784	0.981	1.177	1.373	1.569	1.961	2.353	3.138	-
	0.63	4	3.87	0.582	1.163	1.454	1.745	2.036	2.326	2.908	3.49	4.653	-
	0.63	5	2.92	0.771	1.542	1.927	2.313	2.698	3.084	3.855	4.626	6.168	-
	0.63	6	2.35	0.96	1.921	2.401	2.881	3.361	3.842	4.802	5.762	7.683	-
FMR6000	0.787	2	17.22	0.127	0.254	0.318	0.381	0.445	0.508	0.635	0.762	1.016	1.271
	0.787	2.5	10.99	0.203	0.406	0.507	0.608	0.71	0.811	1.014	1.217	1.623	2.028
	0.787	3	8.04	0.279	0.557	0.696	0.836	0.975	1.114	1.393	1.671	2.229	2.786
	0.787	4	5.23	0.43	0.86	1.075	1.29	1.505	1.72	2.15	2.581	3.441	4.301
	0.787	5	3.87	0.582	1.163	1.454	1.745	2.036	2.326	2.908	3.49	4.653	5.816
	0.787	6	3.07	0.733	1.466	1.833	2.199	2.566	2.932	3.666	4.399	5.865	7.331
	0.787	8	2.18	1.036	2.072	2.59	3.108	3.627	4.145	5.181	6.217	8.289	10.361
	0.787	10	1.68	1.339	2.678	3.348	4.018	4.687	5.357	6.696	8.035	10.713	13.392

* Insert size (d): Please refer page E19, E20 applicable insert drawing.

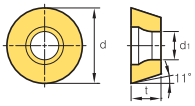
FMR P-positive

Minimum hole diameter table for helical machining (ØDH Min)



- ØD = Tool dia. (inch)
- Ød (Tool path, inch) = ØDH Min, Max - ØD
- ØDH Min (Minimum hole diameter) = ØD × 2 - Insert size (d)
- ØDH Max (Maximum hole diameter) = ØD × 2 - 2
- Ramping angle by ap (α°) = $\tan^{-1}\left(\frac{ap}{\pi \times Ød}\right)$

  Helical angle adjusted by ap cannot exceed maximum angle
- ap = Depth of cut



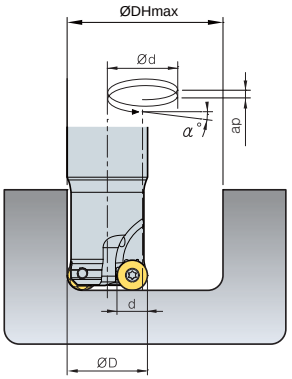
(inch)

Section	Insert size(d)	Tool Dia. (ØD)	Ramping angle α°(max)	ØDH min	Ød	Ramping angle by ap									
						ap=1	ap=2	ap=2.5	ap=3	ap=3.5	ap=4	ap=5	ap=6	ap=8	ap=10
FMR2500	0.315	0.688	4.44	1.06	0.37	0.076	0.152	-	-	-	-	-	-	-	-
	0.315	0.75	17.3	1.19	0.44	0.065	0.13	0.163	0.196	0.228	0.261	-	-	-	-
	0.315	0.813	14.4	1.31	0.5	0.057	0.114	0.142	0.171	0.199	0.228	-	-	-	-
	0.315	1	9.54	1.69	0.69	0.041	0.083	0.103	0.124	0.145	0.165	-	-	-	-
	0.315	1.063	8.57	1.81	0.75	0.038	0.076	0.095	0.114	0.133	0.152	-	-	-	-
FMR3000	0.394	1	13.3	1.61	0.61	0.047	0.093	0.117	0.14	0.164	0.187	-	-	-	-
	0.394	1.063	11.67	1.73	0.67	0.042	0.085	0.106	0.127	0.148	0.169	-	-	-	-
	0.394	1.25	8.52	2.11	0.86	0.033	0.066	0.083	0.099	0.116	0.132	-	-	-	-
	0.394	1.313	7.82	2.23	0.92	0.031	0.062	0.077	0.092	0.108	0.123	-	-	-	-
	0.394	1.5	6.26	2.61	1.11	0.026	0.051	0.064	0.077	0.09	0.102	-	-	-	-
	0.394	2	4.09	3.61	1.61	0.018	0.035	0.044	0.053	0.062	0.07	-	-	-	-
	0.394	2.5	3.03	4.61	2.11	0.013	0.027	0.034	0.04	0.047	0.054	-	-	-	-
FMR4000	0.472	1	4.34	1.53	0.53	0.054	0.107	0.134	-	-	-	-	-	-	-
	0.472	1.063	3.76	1.65	0.59	0.048	0.096	0.12	-	-	-	-	-	-	-
	0.472	1.25	14.94	2.03	0.78	0.036	0.073	0.091	0.109	0.127	0.146	0.182	0.219	-	-
	0.472	1.313	13.49	2.15	0.84	0.034	0.067	0.084	0.101	0.118	0.135	0.169	0.203	-	-
	0.472	1.5	10.44	2.53	1.03	0.028	0.055	0.069	0.083	0.096	0.11	0.138	0.165	-	-
	0.472	2	6.49	3.53	1.53	0.019	0.037	0.046	0.056	0.065	0.074	0.093	0.111	-	-
	0.472	2.5	4.71	4.53	2.03	0.014	0.028	0.035	0.042	0.049	0.056	0.07	0.084	-	-
	0.472	3	3.69	5.53	2.53	0.011	0.022	0.028	0.034	0.039	0.045	0.056	0.067	-	-
	0.472	4	2.58	7.53	3.53	0.008	0.016	0.02	0.024	0.028	0.032	0.04	0.048	-	-
FMR5000	0.63	1.5	20.01	2.37	0.87	0.033	0.065	0.081	0.098	0.114	0.13	0.163	0.196	0.261	-
	0.63	2	10.99	3.37	1.37	0.021	0.041	0.052	0.062	0.072	0.083	0.103	0.124	0.165	-
	0.63	2.5	7.54	4.37	1.87	0.015	0.03	0.038	0.045	0.053	0.061	0.076	0.091	0.121	-
	0.63	3	5.73	5.37	2.37	0.012	0.024	0.03	0.036	0.042	0.048	0.06	0.072	0.096	-
	0.63	4	3.87	7.37	3.37	0.008	0.017	0.021	0.025	0.029	0.034	0.042	0.05	0.067	-
	0.63	5	2.92	9.37	4.37	0.006	0.013	0.016	0.019	0.023	0.026	0.032	0.039	0.052	-
	0.63	6	2.35	11.37	5.37	0.005	0.011	0.013	0.016	0.018	0.021	0.026	0.032	0.042	-
FMR6000	0.787	2	17.22	3.21	1.21	0.023	0.047	0.058	0.07	0.082	0.093	0.117	0.14	0.187	0.234
	0.787	2.5	10.99	4.21	1.71	0.017	0.033	0.041	0.05	0.058	0.066	0.083	0.099	0.132	0.165
	0.787	3	8.04	5.21	2.21	0.013	0.026	0.032	0.038	0.045	0.051	0.064	0.077	0.102	0.128
	0.787	4	5.23	7.21	3.21	0.009	0.018	0.022	0.026	0.031	0.035	0.044	0.053	0.07	0.088
	0.787	5	3.87	9.21	4.21	0.007	0.013	0.017	0.02	0.023	0.027	0.034	0.04	0.054	0.067
	0.787	6	3.07	11.21	5.21	0.005	0.011	0.014	0.016	0.019	0.022	0.027	0.033	0.043	0.054
	0.787	8	2.18	15.21	7.21	0.004	0.008	0.01	0.012	0.014	0.016	0.02	0.024	0.031	0.039
	0.787	10	1.68	19.21	9.21	0.003	0.006	0.008	0.009	0.011	0.012	0.015	0.018	0.025	0.031

* Insert size (d): Please refer page E19, E20 applicable insert drawing.

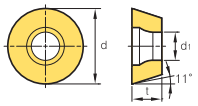
FMR P-positive

Maximum hole diameter table for helical machining (ØDH Max)



- ØD = Tool dia. (inch)
- Ød (Tool path, inch) = ØDH Min, Max - ØD
- ØDH Min (Minimum hole diameter) = ØD × 2 - Insert size (d)
- ØDH Max (Maximum hole diameter) = ØD × 2 - 2
- Ramping angle by ap (α°) = $\tan^{-1}\left(\frac{ap}{\pi \times Ød}\right)$

  Helical angle adjusted by ap cannot exceed maximum angle
- ap = Depth of cut



(inch)

Section	Insert size(d)	Tool Dia. (ØD)	Ramping angle α°(max)	ØDH max	Ød	Ramping angle by ap									
						ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=0.197	ap=0.236	ap=0.315	ap=0.394
FMR2500	0.315	0.688	4.44	1.3	0.61	0.046	0.093	0.116	0.14	-	-	-	-	-	-
	0.315	0.75	17.3	1.42	0.67	0.042	0.084	0.105	0.127	0.148	0.169	-	-	-	-
	0.315	0.813	14.4	1.55	0.73	0.039	0.077	0.096	0.116	0.135	0.154	-	-	-	-
	0.315	1	9.54	1.92	0.92	0.031	0.061	0.077	0.092	0.108	0.123	-	-	-	-
	0.315	1.063	8.57	2.05	0.98	0.029	0.058	0.072	0.086	0.101	0.115	-	-	-	-
FMR3000	0.394	1	13.3	1.92	0.92	0.031	0.061	0.077	0.092	0.108	0.123	-	-	-	-
	0.394	1.063	11.67	2.05	0.98	0.029	0.058	0.072	0.086	0.101	0.115	-	-	-	-
	0.394	1.25	8.52	2.42	1.17	0.024	0.048	0.06	0.072	0.085	0.097	-	-	-	-
	0.394	1.313	7.82	2.55	1.23	0.023	0.046	0.057	0.069	0.08	0.092	-	-	-	-
	0.394	1.5	6.26	2.92	1.42	0.02	0.04	0.05	0.06	0.07	0.08	-	-	-	-
	0.394	2	4.09	3.92	1.92	0.015	0.029	0.037	0.044	0.052	0.059	-	-	-	-
	0.394	2.5	3.03	4.92	2.42	0.012	0.023	0.029	0.035	0.041	0.047	-	-	-	-
FMR4000	0.472	1	4.34	1.92	0.92	0.031	0.061	0.077	0.092	0.108	0.123	-	-	-	-
	0.472	1.063	3.76	2.05	0.98	0.029	0.058	0.072	0.086	0.101	0.115	-	-	-	-
	0.472	1.25	14.94	2.42	1.17	0.024	0.048	0.06	0.072	0.085	0.097	0.121	0.145	-	-
	0.472	1.313	13.49	2.55	1.23	0.023	0.046	0.057	0.069	0.08	0.092	0.115	0.138	-	-
	0.472	1.5	10.44	2.92	1.42	0.02	0.04	0.05	0.06	0.07	0.08	0.1	0.12	-	-
	0.472	2	6.49	3.92	1.92	0.015	0.029	0.037	0.044	0.052	0.059	0.074	0.088	-	-
	0.472	2.5	4.71	4.92	2.42	0.012	0.023	0.029	0.035	0.041	0.047	0.058	0.07	-	-
	0.472	3	3.69	5.92	2.92	0.01	0.019	0.024	0.029	0.034	0.039	0.048	0.058	-	-
	0.472	4	2.58	7.92	3.92	0.007	0.014	0.018	0.022	0.025	0.029	0.036	0.043	-	-
FMR5000	0.63	1.5	20.01	2.92	1.42	0.02	0.04	0.05	0.06	0.07	0.08	0.1	0.12	0.159	-
	0.63	2	10.99	3.92	1.92	0.015	0.029	0.037	0.044	0.052	0.059	0.074	0.088	0.118	-
	0.63	2.5	7.54	4.92	2.42	0.012	0.023	0.029	0.035	0.041	0.047	0.058	0.07	0.094	-
	0.63	3	5.73	5.92	2.92	0.01	0.019	0.024	0.029	0.034	0.039	0.048	0.058	0.077	-
	0.63	4	3.87	7.92	3.92	0.007	0.014	0.018	0.022	0.025	0.029	0.036	0.043	0.058	-
	0.63	5	2.92	9.92	4.92	0.006	0.011	0.014	0.017	0.02	0.023	0.029	0.034	0.046	-
	0.63	6	2.35	11.92	5.92	0.005	0.01	0.012	0.014	0.017	0.019	0.024	0.029	0.038	-
FMR6000	0.787	2	17.22	3.92	1.92	0.015	0.029	0.037	0.044	0.052	0.059	0.074	0.088	0.118	0.147
	0.787	2.5	10.99	4.92	2.42	0.012	0.023	0.029	0.035	0.041	0.047	0.058	0.07	0.094	0.117
	0.787	3	8.04	5.92	2.92	0.01	0.019	0.024	0.029	0.034	0.039	0.048	0.058	0.077	0.097
	0.787	4	5.23	7.92	3.92	0.007	0.014	0.018	0.022	0.025	0.029	0.036	0.043	0.058	0.072
	0.787	5	3.87	9.92	4.92	0.006	0.011	0.014	0.017	0.02	0.023	0.029	0.034	0.046	0.057
	0.787	6	3.07	11.92	5.92	0.005	0.01	0.012	0.014	0.017	0.019	0.024	0.029	0.038	0.048
	0.787	8	2.18	15.92	7.92	0.004	0.007	0.009	0.011	0.012	0.014	0.018	0.021	0.029	0.036
	0.787	10	1.68	19.92	9.92	0.003	0.006	0.007	0.009	0.01	0.011	0.014	0.017	0.023	0.029

* Insert size (d): Please refer page E19, E20 applicable insert drawing.

FMACA3000



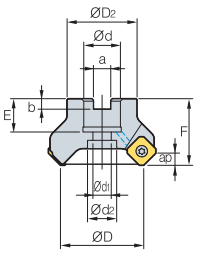


Fig. 1

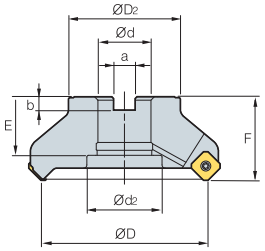


Fig. 2

AA 45°

- AR: 21°
- RR: -17°~ -12°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMACA	3200HR	4	2.0	1.772	0.75	0.313	0.22	0.787	1.75	0.413	0.63	1.157	0.9	1
	3200HR-H	6	2.0	1.772	0.75	0.313	0.22	0.787	1.75	0.413	0.63	1.157	0.9	1
	3250HR	5	2.5	2.205	1.00	0.375	0.248	0.787	1.75	0.551	0.827	1.157	1.1	1
	3250HR-H	8	2.5	2.205	1.00	0.375	0.248	0.787	1.75	0.551	0.827	1.157	1.3	1
	3300HR	6	3.0	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	1.157	2.4	1
	3300HR-H	10	3.0	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	1.157	2.6	1
	3400HR	7	4.0	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	1.157	3.9	1
	3400HR-H	12	4.0	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	1.157	3.7	1
	3500HR	8	5.0	3.386	1.50	0.625	0.394	1.063	2.50	0.823	1.22	1.157	7.7	2
	3500HR	14	5.0	3.386	1.50	0.625	0.394	1.063	2.50	0.823	1.22	1.157	7.7	2

Available inserts

SEET-MF	SEET-MM	SEET-MA	SEXT-MF	SEXT-MM	SEXT-MR	SEEW



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	32AGFN-MA													●			●	E19 E20
	32AGSN-MF									●	●	●	●					
	32AGSN-MM										●	●	●					
SEXT	32AGSN-MF								●		●	●	●					
	32AGSN-MM							●	●		●	●	●					
	32AGSN-MR																	
SEEW	32AGTN																	

Parts

Specification	Screw	Insert wrench
Ø2.0~Ø5.0	FTKA0307	TW09S

Available inserts **E19, E20**

FMACA4000



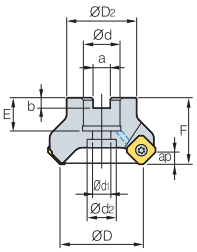


Fig. 1

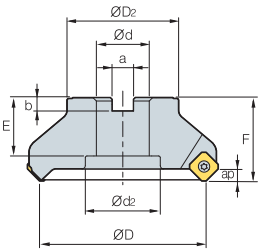


Fig. 2

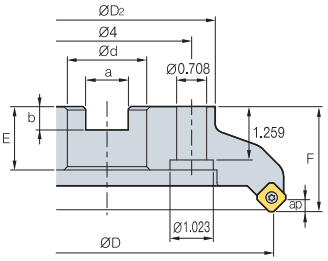


Fig. 3

AA
45°

- AR: 21°
- RR: -17°~ -12°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMACA	4200HR	3	2.0	1.772	0.75	0.313	0.22	0.787	1.75	0.413	0.63	0.256	0.9	1
	4250HR	4	2.5	2.205	1.00	0.375	0.248	0.787	1.75	0.551	0.827	0.256	1.3	1
	4250HR-M	5	2.5	2.205	1.00	0.375	0.248	0.787	1.75	0.551	0.827	0.256	1.3	1
	4250HR-H	6	2.5	2.205	1.00	0.375	0.248	0.787	1.75	0.551	0.827	0.256	1.3	1
	4300HR	5	3.0	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.256	2.4	1
	4300HR-M	6	3.0	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.256	2.4	1
	4300HR-H	8	3.0	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.256	2.4	1
	4400HR	5	4.0	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.256	3.5	1
	4400HR-M	7	4.0	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.256	3.5	1
	4400HR-H	10	4.0	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.256	3.5	1
	4500HR	6	5.0	3.386	1.50	0.625	0.394	1.063	2.50	0.823	1.220	0.256	6.8	1
	4500HR-M	8	5.0	3.386	1.50	0.625	0.394	1.063	2.50	0.823	1.220	0.256	6.8	1
	4500HR-H	12	5.0	3.386	1.50	0.625	0.394	1.063	2.50	0.823	1.220	0.256	6.8	1
	4600R	7	6.0	4.882	2.00	0.750	0.433	1.181	2.50	-	-	0.256	10.6	2
	4600R-M	10	6.0	4.882	2.00	0.750	0.433	1.181	2.50	-	-	0.256	10.6	2
	4600R-H	16	6.0	4.882	2.00	0.750	0.433	1.181	2.50	-	-	0.256	10.6	2
	4800R	8	8.0	5.118	2.50	1.000	0.551	1.496	2.50	-	-	0.256	13.4	3
	4800R-M	12	8.0	5.118	2.50	1.000	0.551	1.496	2.50	-	-	0.256	13.4	3
	4800R-H	18	8.0	5.118	2.50	1.000	0.551	1.496	2.50	-	-	0.256	13.4	3

Available inserts

SEET-MF | SEET-MM | SEET-MA | SEXT-MF | SEXT-MM | SEXT-MR | SEEW | SEEW-W



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	14M4AGFN-MA																●	E19 E20
	14M4AGSN-MF									●	●	●	●					
	14M4AGSN-MM								●	●	●	●	●					
SEXT	14M4AGSN-MF								●		●	●	●					
	14M4AGSN-MM			●	●			●	●	●	●	●	●					

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEXT	14M4AGSN-MR									●		●						E19 E20
SEEW	14M4AGTN	●																
	14M4AGFN-W																	
	14M4AGSN-W											●						
	14M4AGTN-W								●		●							

Parts

Specification	Screw	Shim	Shim screw	Insert wrench	Shim screw
Ø2.0~Ø8.0	FTGA03512	SS42SAF	SHXN0509F	TW15S	HW35L

Available inserts **E19, E20**

FMACA3000-A

Aluminum body



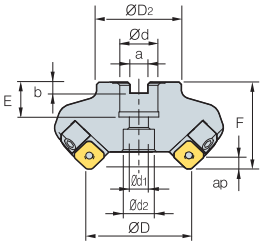


Fig. 1

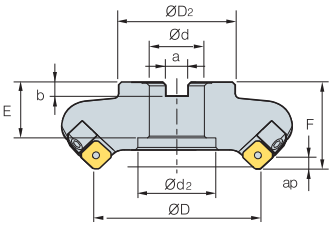


Fig. 2



AA
45°

- AR: 21°
- RR: -16°~ -12°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMACA	3250R-A	3	2.50	2.205	1.00	0.38	0.248	0.866	1.75	0.551	0.827	0.157	1.0	1
	3300R-A	4	3.00	2.205	1.00	0.38	0.248	0.866	2.00	0.551	0.827	0.157	1.5	1
	3400R-A	5	4.00	2.874	1.25	0.50	0.319	1.181	2.00	-	1.772	0.157	1.9	2
	3500R-A	6	5.00	3.386	1.50	0.63	0.394	1.181	2.50	-	2.205	0.157	3.4	2

Available inserts

SEET-MF SEET-MM SEET-MA SEXT-MF SEXT-MM SEXT-MR SEEW



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	32AGFN-MA													●			●	E19 E20
	32AGSN-MF									●	●	●	●					
	32AGSN-MM										●	●	●					
SEXT	32AGSN-MF								●		●	●	●					
	32AGSN-MM							●	●		●	●	●					
	32AGSN-MR																	
SEEW	32AGTN																	

Parts

Specification	Screw	Insert wrench	Locator wrench	Locator	Locator screw
Ø2.50~Ø5.00	FTKA0307	TW09S	HW30L	LFMA3R-A	DHA620

Available inserts **E19, E20**

FMACA4000-A

Aluminum body



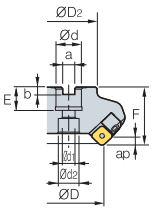


Fig. 1

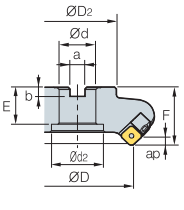


Fig. 2

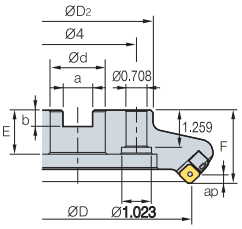


Fig. 3

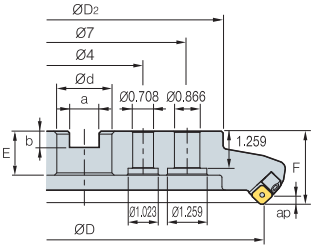


Fig. 4



AA
45°

- AR: 21°
- RR: -16°~ -12°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMACA	4250R-A	3	2.50	2.205	1.00	0.75	0.433	1.181	2.0	-	0.827	0.256	1.2	1
	4300R-A	4	3.00	2.205	1.00	0.38	0.248	0.866	2.0	-	0.827	0.256	1.6	1
	4400R-A	5	4.00	2.874	1.25	0.5	0.319	1.181	2.0	0.551	1.772	0.256	2.2	2
	4500R-A	6	5.00	3.386	1.50	0.63	0.394	1.181	2.5	0.551	2.205	0.256	3.3	2
	4600R-A	7	6.00	4.882	2.00	0.75	0.433	1.181	2.5	-	2.953	0.256	4.6	2
	4800R-A	8	8.00	5.118	2.50	1.00	0.551	1.496	2.5	-	-	0.256	6.4	3
	41000R-A	10	10.00	7.087	2.50	1.00	0.551	1.496	2.5	-	-	0.256	9.0	3
	41200R-A	12	12.00	9.449	2.50	1.00	0.551	1.496	2.5	-	-	0.256	14.5	4

Note) Through coolant type between Ø2.0~Ø5.0

Available inserts

SEET-MF	SEET-MM	SEET-MA	SEXT-MF	SEXT-MM	SEXT-MR	SEEW	SEEW-W
							

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	14M4AGFN-MA																●	
	14M4AGSN-MF									●	●	●	●					
	14M4AGSN-MM								●	●	●	●	●					E19
SEXT	14M4AGSN-MF								●		●	●	●					E20
	14M4AGSN-MM			●	●			●	●	●	●	●	●					
	14M4AGSN-MR									●		●						
SEEW	14M4AGTN		●															
	14M4AGFN-W																	E19
	14M4AGSN-W											●						E20
	14M4AGTN-W								●		●							

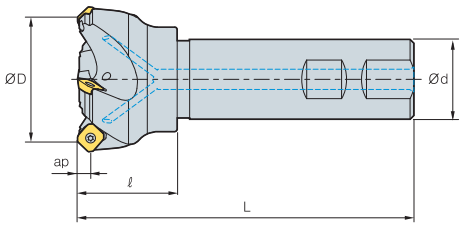
Parts

Specification	Screw	Insert wrench	Locator wrench	Locator	Locator screw
Ø2.50~Ø12.00	FTGA03512	TW15S	HW40L	LFMA4R-A	DHA0830

Available inserts **E19, E20**

FMASA3000





AA 45°

- AR: 23°
- RR: -17°~ -13°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
FMASA	3100HR	2	1.00	1.00	1.378	4.528	0.157	0.9
	3125HR	3	1.25	1.00	1.575	4.921	0.157	1.1
	3125HR-S125	3	1.25	1.25	1.575	4.921	0.157	1.8
	3150HR	3	1.50	1.25	1.575	5.118	0.157	2.0
	3200HR	4	2.00	1.25	1.575	5.315	0.157	2.2
	3200HR-S150	4	2.00	1.50	1.575	5.512	0.157	2.9
	3250HR	5	2.50	1.25	1.772	5.315	0.157	3.5
	3250HR-S150	5	2.50	1.50	1.772	5.512	0.157	3.7

Available inserts

	SEET-MF	SEET-MM	SEET-MA	SEXT-MF	SEXT-MM	SEXT-MR	SEEW
							

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	32AGFN-MA													●			●	E19 E20
	32AGSN-MF									●	●	●	●					
	32AGSN-MM										●	●	●					
SEXT	32AGSN-MF								●		●	●	●					
	32AGSN-MM							●	●		●	●	●					
	32AGSN-MR																	
SEEW	32AGTN																	

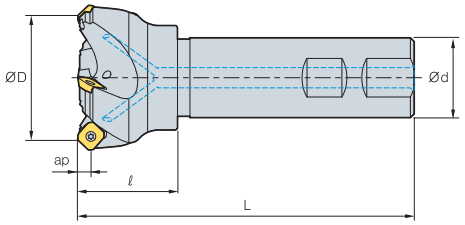
Parts

Specification	Screw	Insert wrench
Ø1.00~Ø2.50	FTKA0307	TW09S

Available inserts **E19, E20**

FMASA4000





AA 45°

- AR: 23°
- RR: -17°~ -13°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
FMASA	4200HR	3	2.0	1.25	1.772	5.315	0.256	3.3
	4200HR-S150	3	2.0	1.50	1.772	5.315	0.256	4.6
	4250HR	4	2.5	1.25	1.772	5.315	0.256	4.4
	4250HR-S150	4	2.5	1.50	1.772	5.315	0.256	5.7

Available inserts

SEET-MF	SEET-MM	SEET-MA	SEXT-MF	SEXT-MM	SEXT-MR	SEEW	SEEW-W
							

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	14M4AGFN-MA																●	
	14M4AGSN-MF									●	●	●	●					
	14M4AGSN-MM								●	●	●	●	●					
SEXT	14M4AGSN-MF								●		●	●	●					
	14M4AGSN-MM			●	●			●	●	●	●	●	●					E19
	14M4AGSN-MR									●		●						E20
SEEW	14M4AGTN		●															
	14M4AGFN-W																	
	14M4AGSN-W											●						
	14M4AGTN-W								●		●							

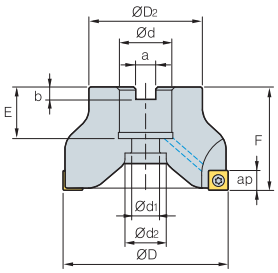
Parts

Specification	Screw	Shim	Shim screw	Insert wrench	Shim screw
Ø2.0~Ø2.5	FTGA03512	SS42SAF	SHXN0509F	TW15S	HW35L

Available inserts **E19, E20**

FMPCA3000





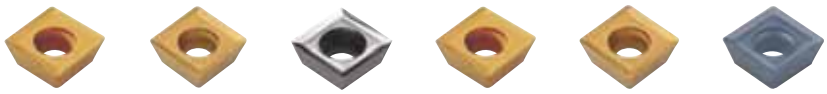
AA 0°

- AR: 10°
- RR: -9°~ -8°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs
FMPCA	3200HS	5	2.0	1.772	0.75	0.787	1.75	0.413	0.63	0.313	0.220	0.275	0.7
	3250HS	6	2.5	2.205	1.00	0.787	1.75	0.551	0.827	0.375	0.248	0.275	1.1
	3300HS	7	3.0	2.205	1.00	0.866	2.00	0.551	0.827	0.375	0.248	0.275	2.2
	3400HS	8	4.0	2.874	1.25	0.866	2.00	0.709	1.024	0.500	0.319	0.275	3.3

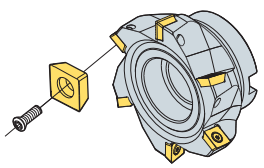
Available inserts



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	09M402R-MA													●			●	
	09M405R-MF																	
	09M405R-MM																	
SDXT	09M405R-MF			●					●	●	●	●	●					E17
	09M405L-MF																	E18
	09M405R-MM			●	●			●	●	●	●	●	●					
	09M405L-MM								●		●							
	09M405R-MA																●	

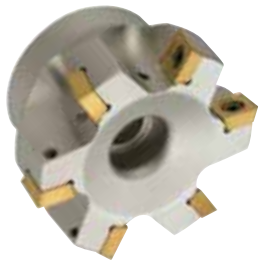
Parts

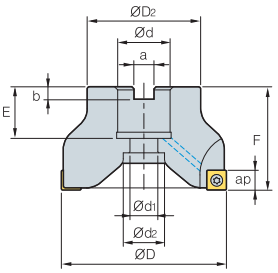
Specification	Screw	Wrench
Ø2.0~Ø4.0	FTGA03508	TW15S

Assembling	
	

Available inserts E17, E18

FMPCA4000





AA 0°

- AR: 10°
- RR: -9°~ -8°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs
FMPCA	4250HS	5	2.5	2.205	1.00	0.787	1.75	0.551	0.827	0.375	0.248	0.433	0.9
	4300HS	6	3.0	2.205	1.00	0.787	2.00	0.551	0.827	0.375	0.248	0.433	2.0
	4400HS	7	4.0	2.874	1.25	0.827	2.00	0.709	1.024	0.500	0.319	0.433	3.3
	4500HS	8	5.0	3.386	1.50	1.063	2.50	0.823	1.220	0.625	0.394	0.433	6.8

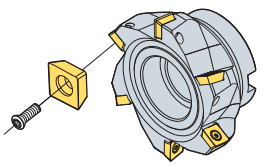
Available inserts



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	130504R-MA																●	E17 E18
	130508R-MF																	
	130508R-MM																	
SDXT	130508R-MF			●					●	●	●	●	●					
	130508R-MM			●	●			●	●	●	●	●	●					
	130538-MM																	
	130508R-MA																●	

Parts

Specification	Screw	Wrench
Ø2.5~Ø5.0	FTNC04511	TW20S

Assembling	
	

Available inserts E17,E18

FMPCA3000-A

Aluminum body



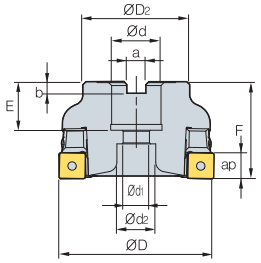


Fig. 1

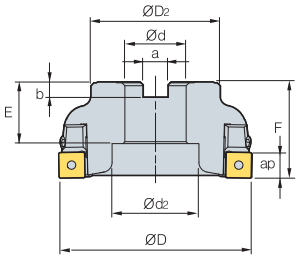


Fig. 2




AA
0°

- AR: 10°
- RR: -9°~ -7.3°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMPCA	3250S-A	3	2.50	-	1.00	0.375	0.248	0.866	1.75	-	0.827	0.157	0.5	1
	3300S-A	4	3.00	-	1.00	0.375	0.248	0.866	2.00	-	0.827	0.157	1.0	1
	3400S-A	5	4.00	-	1.25	0.500	0.319	1.181	2.00	-	1.772	0.157	1.5	2

Available inserts

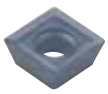

SDET-MF


SDET-MM


SDET-MA


SDXT-MF


SDXT-MM


SDXT-MA

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	09M402R-MA													●			●	
	09M405R-MF																	
	09M405R-MM																	
SDXT	09M405R-MF			●					●	●	●	●	●					E17
	09M405L-MF																	E18
	09M405R-MM			●	●			●	●	●	●	●	●					
	09M405L-MM								●		●							
	09M405R-MA																●	

Parts

Specification	Screw	Insert wrench	Locator wrench	Locator	Locator screw	Chip cover	Chip cover screw
Ø2.50	FTGA03508	TW15S	HW30L	LFMP3R-A	DHA0624	CFMP3R14R1-A	PXMA0306
Ø3.00~Ø4.00	FTGA03508	TW15S	HW30L	LFMP3R-A	DHA0624	CFMP3R-A	PXMA0306

Available inserts **E17, E18**

FMPCA4000-A

Aluminum body



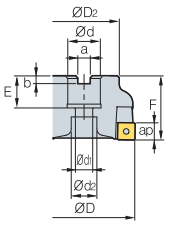


Fig. 1

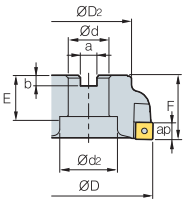


Fig. 2

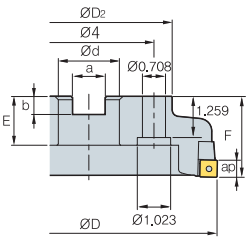


Fig. 3

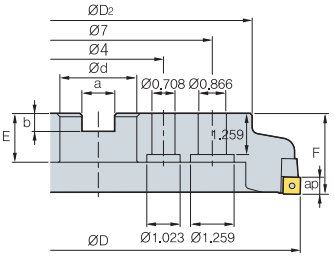


Fig. 4




AA
0°

- AR: 10°
- RR: -9°~ -7.3°

(inch)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMPCA	4250S-A	3	2.50	-	1.00	0.750	0.433	1.181	1.75	-	0.827	0.256	0.5	1
	4300S-A	4	3.00	-	1.00	0.375	0.248	0.866	2.00	-	0.827	0.256	1.0	1
	4400S-A	5	4.00	-	1.25	0.500	0.319	1.181	2.00	-	1.772	0.256	1.5	2
	4500S-A	6	5.00	-	1.50	0.625	0.394	1.181	2.50	-	2.205	0.256	2.9	2
	4600S-A	8	6.00	-	2.00	0.750	0.433	1.181	2.50	-	2.756	0.256	4.4	2
	4800S-A	10	8.00	-	2.50	1.000	0.551	1.496	2.50	-	-	0.256	7.3	3
	41000S-A	12	10.00	-	2.50	1.000	0.551	1.496	2.50	-	-	0.256	11.6	3
	41200S-A	14	12.00	-	2.50	1.000	0.551	1.496	2.50	-	-	0.256	18.4	4

Available inserts

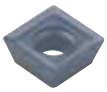

SDET-MF


SDET-MM


SDET-MA


SDXT-MF


SDXT-MM


SDXT-MA

Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC3530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	130504R-MA																●	E17 E18
	130508R-MF																	
	130508R-MM																	
SDXT	130508R-MF			●					●	●	●	●	●					
	130508R-MM			●	●			●	●	●	●	●	●					
	130538-MM																	
	130508R-MA																●	

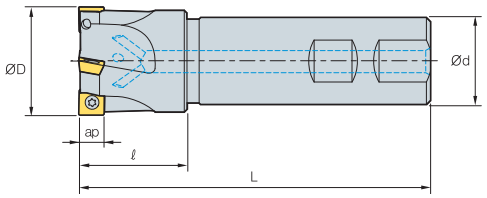
Parts

Specification	Screw	Insert wrench	Locator wrench	Locator	Locator screw	Chip cover	Chip cover screw
Ø2.50~Ø3.00	FTNC04509	TW20S	HW40L	LFMP4R1-A	DHA0825	CFMP3R14R1-A	PXMA0306
Ø4.00~Ø12.00	FTNC04509	TW20S	HW40L	LFMP4R-A	DHA0830	CFMP4R-A	PXMA0306

Available inserts **E17, E18**

FMPSA3000









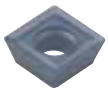

AA 0°

- AR: 10°
- RR: -9°~ -8°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
FMPSA	3100HS	2	1.00	1.00	1.378	4.528	0.275	0.9
	3125HS	3	1.25	1.00	1.575	4.921	0.275	1.1
	3125HS-S125	3	1.25	1.25	1.575	5.118	0.275	1.3
	3150HS	4	1.50	1.25	1.575	5.118	0.275	1.8
	3200HS	5	2.00	1.25	1.575	5.315	0.275	2.2
	3200HS-S150	5	2.00	1.50	1.575	5.512	0.275	2.9
	3250HS	6	2.50	1.25	1.772	5.709	0.275	2.6
	3250HS-S150	6	2.50	1.50	1.772	5.709	0.275	3.5

Available inserts

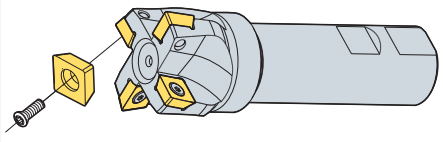
	SDET-MF	SDET-MM	SDET-MA	SDXT-MF	SDXT-MM	SDXT-MA
						

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	09M402R-MA													●			●	
	09M405R-MF																	
	09M405R-MM																	
SDXT	09M405R-MF			●					●	●	●	●	●					E17
	09M405L-MF																	E18
	09M405R-MM			●	●			●	●	●	●	●	●					
	09M405L-MM								●		●							
	09M405R-MA																●	

Parts

Specification	Screw	Wrench
Ø1.00~Ø2.50	FTGA03508	TW15S

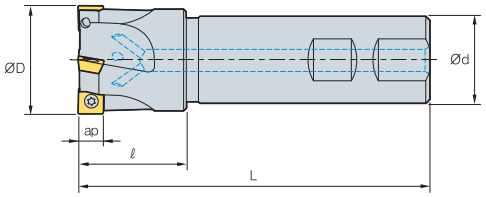
Assembling



Available inserts E17, E18

FMPSA4000





AA 0°
- AR: 10°
- RR: -9°~ -8°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
FMPSA	4150HS	3	1.5	1.25	1.575	5.180	0.433	2.2
	4200HS	4	2.0	1.25	1.772	5.315	0.433	3.3
	4200HS-S150	4	2.0	1.50	1.772	5.709	0.433	3.7
	4250HS	5	2.5	1.25	1.772	5.315	0.433	4.6
	4250HS-S150	5	2.5	1.50	1.772	5.709	0.433	5.3

Available inserts

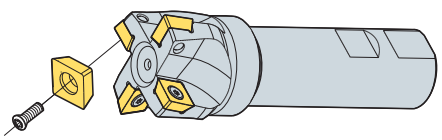


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	130504R-MA																●	E17 E18
	130508R-MF																	
	130508R-MM																	
SDXT	130508R-MF			●					●	●	●	●	●					
	130508R-MM			●	●			●	●	●	●	●	●					
	130538-MM																	
	130508R-MA																●	

Parts

Specification	Screw	Wrench
Ø1.5~Ø2.5	FTNC04511	TW20S

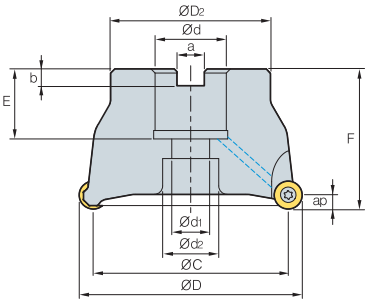
Assembling



Available inserts **E17, E18**

FMRCA3000







• AR: 5°
• RR: -5°

(inch)

Designation			ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs
FMRCA	3150HRD	3	1.5	1.11	1.417	0.50	0.250	0.169	0.630	1.50	0.287	0.433	0.196	0.4
	3150HRD-H	4	1.5	1.11	1.417	0.50	0.250	0.169	0.630	1.50	0.287	0.433	0.196	0.4
	3200HRD	4	2.0	1.61	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.196	0.7
	3200HRD-H	5	2.0	1.61	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.196	0.7
	3250HRD	5	2.5	2.11	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.196	1.4
	3250HRD-H	6	2.5	2.11	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.196	1.4
	3300HRD	6	3.0	2.61	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.196	2.4
	3300HRD-H	7	3.0	2.61	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.196	2.4
	3400HRD	7	4.0	3.61	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.196	4.6
	3400HRD-H	8	4.0	3.61	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.196	4.6

Available inserts

RDKT-MF



RDKT-MM



RDCT-MA



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDCT	10T3M0-MA																●	E15 E16
RDKT	10T3M0-MF											●		●				
	10T3M0-MM			●						●		●	●	●				

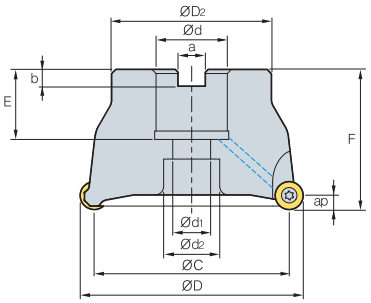
Parts

Specification	Screw	Wrench
Ø1.5~Ø4.0	FTGA03508	TW15S

Available inserts **E15, E16**

FMRCA4000







• AR: 5°
• RR: -5°

(inch)

Designation			ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs
FMRCA	4200HRD	4	2.0	1.53	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.236	0.9
	4250HRD	4	2.5	2.03	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.236	1.3
	4250HRD-M	5	2.5	2.03	1.772	0.75	0.313	0.220	0.787	1.75	0.433	0.630	0.236	1.3
	4300HRD	5	3.0	2.53	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.236	2.2
	4300HRD-M	6	3.0	2.53	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.236	2.2
	4400HRD	6	4.0	3.53	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.236	4.2
	4400HRD-M	7	4.0	3.53	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.236	4.2
	4500HRD	7	5.0	4.53	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.236	6.6
	4500HRD-M	8	5.0	4.53	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.236	6.6

Available inserts

RDKT-MF | RDKT-MM | RDCT-MA





Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDCT	1204M0-MA																●	E15 E16
RDKT	1204M0-MF											●		●				
	1204M0-MM			●						●		●	●	●				

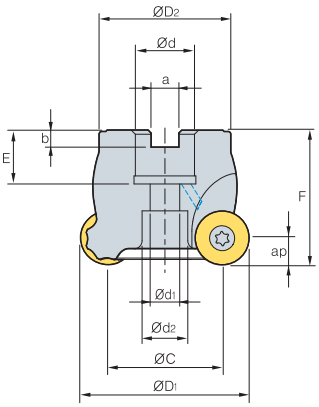
Parts

Specification	Screw	Wrench
Ø2.0~Ø5.0	FTKA0410	TW15S

Available inserts **E15, E16**

FMRCA5000







• AR: 5°
• RR: -5°

(inch)

Designation			ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs
FMRCA	5200HRD	3	2.0	1.37	1.772	0.75	0.313	0.220	0.827	2.00	0.433	0.630	0.314	0.9
	5250HRD	4	2.5	1.87	1.772	0.75	0.313	0.220	0.827	2.00	0.433	0.630	0.314	1.3
	5250HRD-H	5	2.5	1.87	1.772	0.75	0.313	0.220	0.827	2.00	0.433	0.630	0.314	1.3
	5300HRD	5	3.0	2.37	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.314	2.0
	5300HRD-H	6	3.0	2.37	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.314	2.0
	5400HRD	6	4.0	3.37	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.314	4.2
	5400HRD-H	7	4.0	3.37	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.314	4.2
	5500HRD	7	5.0	4.37	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.314	6.6
	5500HRD-H	8	5.0	4.37	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.314	6.6

Available inserts

RDHW-E,F,S | RDKT-MF | RDKT-ML | RDKT-MM



Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDHW	1605M0E																	
	1605M0F																	
	1605M0S																	E15
RDKT	1605M0-MM									●								E16
	1605M0-MF																	
	1605M0-ML																	

Parts

Specification	Screw	Wrench
Ø2.0~Ø5.0	FTGA0513-P	TW20-100

Available inserts **E15, E16**

FMRCA6000



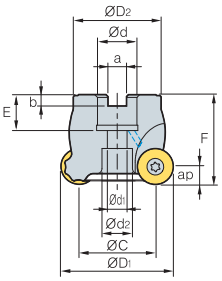


Fig. 1

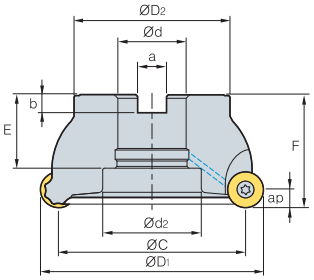


Fig. 2

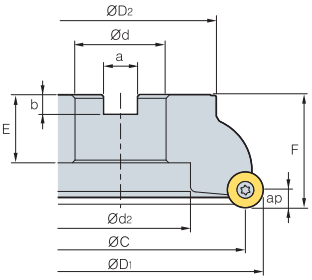


Fig. 3



• AR: 5°
• RR: -5°

(inch)

Designation			ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	lbs	Fig.
FMRCA	6250HRD	3	2.5	1.72	1.772	0.75	0.313	0.220	0.787	2.00	0.433	0.630	0.393	1.1	1
	6250HRD-M	4	2.5	1.72	1.772	0.75	0.313	0.220	0.787	2.00	0.433	0.630	0.393	1.1	1
	6300HRD	4	3.0	2.22	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.393	1.8	1
	6300HRD-M	5	3.0	2.22	2.205	1.00	0.375	0.248	0.866	2.00	0.551	0.827	0.393	1.8	1
	6400HRD	5	4.0	3.22	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.393	3.5	1
	6400HRD-M	6	4.0	3.22	2.874	1.25	0.500	0.319	0.827	2.00	0.709	1.024	0.393	3.5	1
	6500HRD	6	5.0	4.22	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.393	6.0	2
	6500HRD-M	7	5.0	4.22	3.386	1.50	0.626	0.394	1.063	2.50	0.827	1.220	0.393	6.0	2
	6600HRD	7	6.0	5.22	3.937	1.50	0.626	0.394	1.181	2.50	-	3.150	0.393	9.7	3
	6600HRD-M	8	6.0	5.22	3.937	1.50	0.626	0.394	1.181	2.50	-	3.150	0.393	9.7	3

Available inserts

RDHW-E,F,S



RDKT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDHW	2006M0E																	E15
	2006M0F																	E16
	2006M0S																	
RDKT	2006M0-MM									●								

Parts

Specification	Screw	Wrench
Ø2.5~Ø6.0	FTGA0515-P	TW20-100

Available inserts **E15, E16**

FMRSA1000/1500



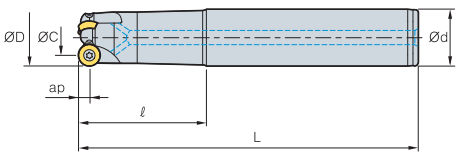


Fig. 1

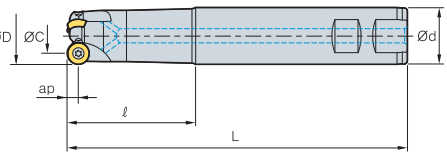


Fig. 2



• AR: 5°
• RR: -5°~ -1°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	10031HRD-M	1	0.312	0.118	0.375	1.181	3.150	0.098	0.4	1
	10031HRD-L	1	0.312	0.118	0.375	1.969	3.937	0.098	0.4	1
	10037HRD-M	2	0.375	0.177	0.500	1.732	3.937	0.098	0.4	1
	10037HRD-L	2	0.375	0.177	0.500	2.520	4.724	0.098	0.4	1
	10050HRD-M	2	0.500	0.303	0.500	1.732	3.937	0.098	0.7	1
	10050HRD-L	2	0.500	0.303	0.625	3.150	6.299	0.098	0.7	1
	10062HRD-M	3	0.625	0.425	0.625	3.150	6.299	0.098	0.7	1
	10062HRD-L	3	0.625	0.425	0.625	3.937	7.874	0.098	0.9	1
	15037HRD-M	1	0.375	0.138	0.500	1.732	3.937	0.118	0.4	1
	15037HRD-L	1	0.375	0.138	0.500	2.520	4.724	0.118	0.4	1
	15050HRD-M	2	0.500	0.264	0.500	2.126	4.331	0.118	0.7	1
	15050HRD-L	2	0.500	0.264	0.625	3.150	6.299	0.118	0.7	1
	15062HRD-M	3	0.625	0.386	0.625	2.362	5.118	0.118	0.7	1
	15062HRD-L	3	0.625	0.386	0.750	3.543	7.087	0.118	0.9	1
	15075HRD-M	3	0.750	0.512	0.750	3.150	5.906	0.118	0.9	1
	15075HRD-L	3	0.750	0.512	0.750	3.543	7.874	0.118	1.1	1

Available inserts

RDHW-E,F,S



RDKW



Type	Designation		Cermet		Coated											Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
1000 type	RDHW	0501M0E											●						
		0501M0F																	
		0501M0S																	
	RDKW	0501M0E																	E15
1500 type	RDHW	06T1M0E											●						E16
		06T1M0F																	
		06T1M0S																	
	RDKW	06T1M0E																	

Parts

Specification	Screw	Wrench
Ø0.312~Ø0.625 (1000 type)	FTNA0203	TW06P
Ø0.375~Ø0.750 (1500 type)	FTNA02205	TW06P

Available inserts **E15, E16**

FMRSA2000/2500



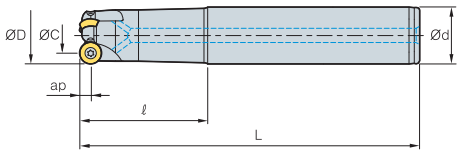


Fig. 1

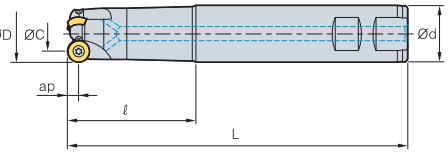


Fig. 2



• AR: 5°
• RR: -5°~ -1°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	20062HRD-S	2	0.625	0.346	0.625	2.165	4.528	0.138	0.7	2
	20062HRD-M	2	0.625	0.346	0.750	3.150	5.906	0.138	0.9	1
	20062HRD-L	2	0.625	0.346	0.750	3.543	7.874	0.138	1.1	1
	20075HRD-S	3	0.750	0.472	0.750	2.559	4.921	0.138	1.1	2
	20075HRD-M	3	0.750	0.472	0.750	3.150	5.906	0.138	1.1	1
	20075HRD-L	3	0.750	0.472	1.000	3.543	7.874	0.138	1.1	1
	25062HRD-S	2	0.625	0.307	0.625	2.559	4.921	0.157	1.1	2
	25062HRD-M	2	0.625	0.307	0.625	3.150	5.906	0.157	1.1	1
	25062HRD-L	2	0.625	0.307	0.750	3.543	7.874	0.157	1.1	1
	25075HRD-S	2	0.750	0.433	0.750	2.559	4.921	0.157	0.9	2
	25075HRD-M	2	0.750	0.433	0.750	3.150	5.906	0.157	1.1	1
	25075HRD-L	2	0.750	0.433	1.000	3.543	7.874	0.157	1.3	1
	25100HRD-S	3	1.000	0.685	1.000	2.165	4.921	0.157	1.1	2
	25100HRD-M	3	1.000	0.685	1.000	3.543	7.874	0.157	1.3	1
	25100HRD-L	3	1.000	0.685	1.250	4.331	9.843	0.157	1.5	1

Available inserts

RDHW-E,F,S



RDKW



Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
2000 type	RDHW	0702M0E											●						
		0702M0F																	
		0702M0S																	
	RDKW	0702M0E									●								E15
2500 type	RDHW	0803M0E											●						E16
		0803M0F																	
		0803M0S																	
	RDKW	0803M0E																	

Parts

Specification	Screw	Wrench
Ø0.625~Ø0.750 (2000 type)	FTNA02555	TW07S
Ø0.625~Ø1.000 (2500 type)	FTNA0305 FTNA0306 (Ø0.750 over)	TW09S

Available inserts **E15, E16**

FMRSA3000



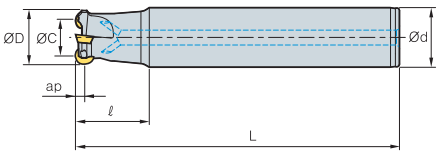


Fig. 1

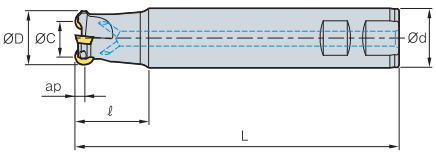


Fig. 2



• AR: 5°
• RR: -8°~ -5°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	3075HRD-M	1	0.750	0.358	0.750	1.575	5.906	0.197	0.9	1
	3087HRD-M	2	0.875	0.480	0.750	1.575	5.906	0.197	0.9	1
	3087HRD-M2	1	0.875	0.480	0.750	1.575	5.906	0.197	1.3	1
	3087HRD-L	2	0.875	0.480	0.750	1.969	7.874	0.197	1.3	1
	3087HRD-L2	2	0.875	0.480	0.750	1.969	7.874	0.197	1.1	1
	3100HRD-S	2	1.000	0.606	1.000	1.378	4.528	0.197	1.5	1
	3100HRD-M	2	1.000	0.606	1.000	2.756	7.874	0.197	1.5	1
	3100HRD-L	2	1.000	0.606	1.000	3.937	9.843	0.197	1.5	1
	3125HRD-S	2	1.250	0.858	1.250	1.575	4.921	0.197	1.5	1
	3125HRD-M	3	1.250	0.858	1.250	2.756	7.874	0.197	2.2	2
	3125HRD-L	3	1.250	0.858	1.250	5.906	11.811	0.197	2.9	1
	3150HRD-S	3	1.500	1.106	1.250	1.575	4.921	0.197	3.5	1
	3150HRD-M	4	1.500	1.106	1.250	2.756	7.874	0.197	2.9	2
	3150HRD-L	4	1.500	1.106	1.250	5.906	11.811	0.197	3.3	1
	3040HRD-L	4	1.500	1.106	1.250	1.575	4.921	0.197	4.0	1

Available inserts

RDKT-MF



RDKT-MM



RDCT-MA



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDCT	10T3M0-MA																●	E15 E16
RDKT	10T3M0-MF											●		●				
	10T3M0-MM			●						●		●	●	●				

Parts

Specification	Screw	Wrench
Ø0.750~Ø1.500	FTGA03508 (07)	TW15S

Available inserts **E15, E16**

FMRSA4000



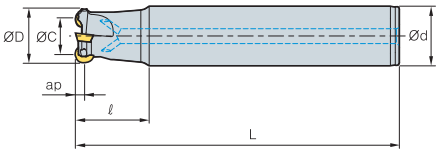


Fig. 1

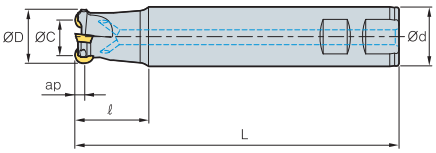


Fig. 2



• AR: 5°
• RR: -8°~ -5°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	4125HRD-S	2	1.250	0.708	1.250	1.575	4.921	0.197	1.8	2
	4125HRD-M	2	1.250	0.708	1.250	2.756	7.874	0.236	2.4	1
	4125HRD-L	2	1.250	0.708	1.250	5.906	11.811	0.236	3.5	1
	4150HRD-S	3	1.500	1.028	1.250	1.575	4.921	0.236	2.0	2
	4150HRD-M	3	1.500	1.028	1.250	2.756	7.874	0.236	2.4	1
	4150HRD-L	3	1.500	1.028	1.250	5.906	11.811	0.236	3.7	1
	4150HRD-S150	3	1.500	1.028	1.500	1.575	4.921	0.236	2.2	2
	4150HRD-M150	3	1.500	1.028	1.500	2.756	7.874	0.236	3.5	1
	4150HRD-L150	3	1.500	1.028	1.500	5.906	11.811	0.236	4.0	1
	4200HRD-S	4	2.000	1.528	1.500	1.969	5.906	0.236	2.9	2
	4200HRD-M	4	2.000	1.528	1.500	1.969	9.843	0.236	4.4	1
	4200HRD-L	4	2.000	1.528	1.500	1.969	11.811	0.236	5.3	1

Available inserts

RDKT-MF



RDKT-MM



RDCT-MA



Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDCT	1204M0-MA																●	E15 E16
RDKT	1204M0-MF											●		●				
	1204M0-MM			●						●		●	●	●				

Parts

Specification	Screw	Wrench
Ø1.250~Ø2.000	FTKA0410	TW15S

Available inserts **E15, E16**

FMRSA5000



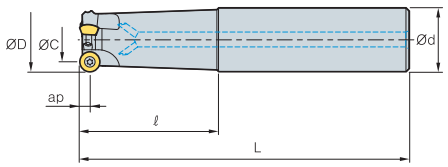


Fig. 1

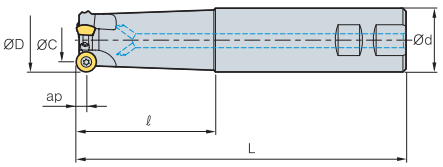


Fig. 2



• AR: 5°
• RR: -8°~ -5°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	5150HRD-S	2	1.500	0.870	1.250	1.575	4.921	0.315	3.1	2
	5150HRD-M	2	1.500	0.870	1.250	1.969	7.874	0.315	4.0	1
	5150HRD-L	2	1.500	0.870	1.250	1.969	11.811	0.315	4.4	1
	5150HRD-S150	2	1.500	0.870	1.500	1.575	4.921	0.315	3.5	2
	5150HRD-M150	2	1.500	0.870	1.500	2.756	7.874	0.315	4.0	1
	5150HRD-L150	2	1.500	0.870	1.500	5.906	11.811	0.315	5.3	1
	5200HRD-S	3	2.000	1.370	1.500	1.969	5.906	0.315	4.0	2
	5200HRD-M	3	2.000	1.370	1.500	1.969	9.843	0.315	5.3	1
	5200HRD-L	3	2.000	1.370	1.500	1.969	11.811	0.315	6.2	1
	5250HRD-S	4	2.500	1.862	1.500	1.969	5.906	0.315	4.0	2
	5250HRD-M	4	2.500	1.862	1.500	1.969	9.843	0.315	5.3	1
	5250HRD-L	4	2.500	1.862	1.500	1.969	11.811	0.315	5.7	1

Available inserts

	RDHW-E,F,S	RDKT-MF	RDKT-ML	RDKT-MM
				

Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDHW	1605M0E																	
	1605M0F																	
	1605M0S																	E15
RDKT	1605M0-MF																	E16
	1605M0-MM									●								
	1605M0-ML																	

Parts

Specification	Screw	Wrench
Ø1.500~Ø2.500	FTGA0513-P	TW20-100

Available inserts **E15, E16**

FMRSA6000



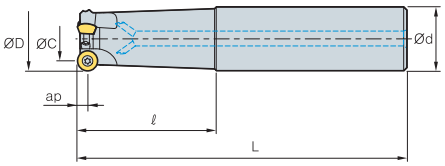


Fig. 1

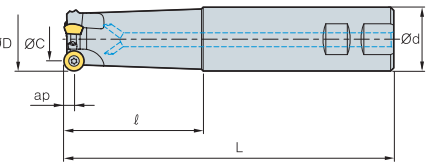


Fig. 2



• AR: 5°
• RR: -8°~ -5°

(inch)

Designation			ØD	ØC	Ød	ℓ	L	ap	lbs	Fig.
FMRSA	6200HRD-S	3	2.000	1.213	1.500	1.969	5.906	0.394	2.9	2
	6200HRD-M	3	2.000	1.213	1.500	1.969	9.843	0.394	3.1	1
	6200HRD-L	3	2.000	1.213	1.500	1.969	11.811	0.394	4.9	1
	6250HRD-S	4	2.500	1.713	1.500	1.969	5.906	0.394	5.3	2
	6250HRD-M	4	2.500	1.713	1.500	1.969	9.843	0.394	6.0	1
	6250HRD-L	4	2.500	1.713	1.500	1.969	11.811	0.394	6.6	1

Available inserts

RDHW-E,F,S



RDKT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDHW	2006M0E																	
	2006M0F																	E15
	2006M0S																	E16
RDKT	2006M0-MM									●								

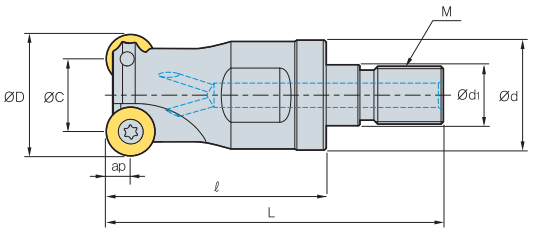
Parts

Specification	Screw	Wrench
Ø2.000~Ø2.500	FTGA0515-P	TW20-100

Available inserts **E15, E16**

FMRMA1000/1500







• AR: 0°~5°
• RR: -5°~ -1°

(inch)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	lbs
FMRMA	10031HRD-M06	1	0.312	0.118	0.256	0.374	0.984	1.575	M06	0.098	0.04
	10037HRD-M06	2	0.375	0.177	0.256	0.374	0.984	1.575	M06	0.098	0.04
	10050HRD-M06	2	0.500	0.303	0.256	0.433	0.984	1.575	M06	0.098	0.09
	10062HRD-M08	3	0.625	0.425	0.335	0.570	1.181	1.850	M08	0.098	0.09
	15037HRD-M06	1	0.375	0.138	0.256	0.374	0.984	1.575	M06	0.118	0.07
	15050HRD-M06	2	0.500	0.264	0.256	0.433	0.984	1.575	M06	0.118	0.04
	15062HRD-M08	3	0.625	0.390	0.335	0.700	1.181	1.850	M08	0.118	0.04
	15075HRD-M10	3	0.750	0.512	0.413	0.709	1.378	2.205	M10	0.118	0.15

Available inserts

RDHW-E,F,S



RDKW



Type	Designation	Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
1000 type	RDHW 0501M0E (F,S)											●						E15
	RDKW 0501M0E																	E16
1500 type	RDHW 06T1M0E (F,S)											●						
	RDKW 06T1M0E																	

Available adaptor

Designation		Available adaptor
FMRMA	10031HRD-M06	MATA-M06
	10037HRD-M06	
	10050HRD-M06	
	10062HRD-M08	MATA-M08
	15037HRD-M06	MATA-M06
	15050HRD-M06	
	15062HRD-M08	MATA-M08
	15075HRD-M10	MATA-M10

Designation: FMRMA10031HRD-M06
Modular head threading measure size (M06)

Adaptor spec.: MATA-M06-078-S038S
Adaptor threading measure (M06)

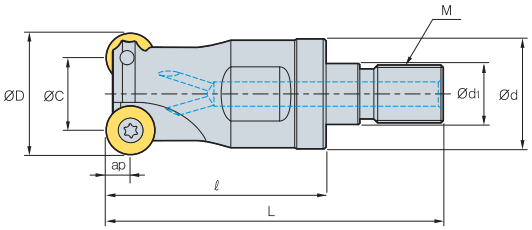
Parts

Specification	Screw	Wrench
Ø0.312~Ø0.625 (1000 type)	FTNA0203	TW06P
Ø0.375~Ø0.750 (1500 type)	FTNA02205	TW06P

Available inserts E15, E16 Available Adaptor E308~E309

FMRMA2000/2500







• AR: 0°~5°
• RR: -5°~ -1°

(inch)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	lbs
FMRMA	20062HRD-M08	2	0.625	0.350	0.335	0.570	1.181	1.850	M08	0.138	0.09
	20075HRD-M10	3	0.790	0.472	0.413	0.709	1.378	2.205	M10	0.138	0.15
	25062HRD-M08	2	0.625	0.311	0.335	0.570	1.181	1.850	M08	0.157	0.09
	25075HRD-M10	2	0.750	0.433	0.413	0.709	1.378	2.205	M10	0.157	0.15
	25100HRD-M12	3	1.000	0.685	0.492	0.886	1.772	2.717	M12	0.157	0.29

Available inserts

RDHW-E,F,S RDKW




Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
2000 type	RDHW	0702M0E (F,S)											●						E15 E16
	RDKW	0702M0E									●								
2500 type	RDHW	0803M0E (F,S)											●						
	RDKW	0803M0E																	
		1605MO-MF																	

Available adaptor

Designation		Available adaptor
FMRMA	20062HRD-M08	MATA - M08
	20075HRD-M08	MATA - M10
	25062HRD-M10	MATA - M08
	25075HRD-M10	MATA - M10
	25100HRD-M12	MATA - M12

Designation: FMRMA20075HRD-M10
Modular Head Threading Measure size (M10)

II

Adaptor spec.: MATA-M10-118-S075S
Adaptor Threading Measure (M10)

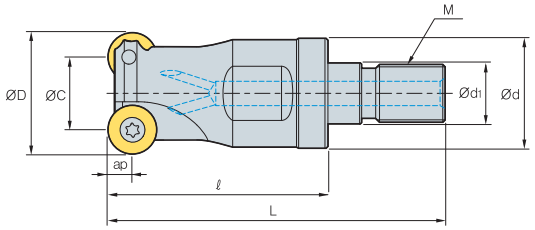
Parts

Specification	Screw	Wrench
Ø0.625~Ø0.790 (2000 type)	FTNA02555	TW07S
Ø0.625~Ø1.000 (2500 type)	FTNA0305	TW09S

Available inserts E15, E16 Available Adaptor E308~E309

FMRMA3000







• AR: 5°
•RR:-8°~ -5°

(inch)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	lbs
FMRMA	3087HRD-M10	2	0.875	0.480	0.413	0.709	1.378	2.205	M10	0.197	0.2
	3100HRD-M12	2	1.000	0.606	0.492	0.886	1.772	2.717	M12	0.197	0.3
	3125HRD-M16	3	1.250	0.858	0.650	1.142	1.969	3,031	M16	0.197	0.4
	3150HRD-M16	4	1.500	1.106	0.650	1.142	1.969	3.031	M16	0.197	0.5

Available inserts

RDHW-E,F,S | RDCT-MA | RDKT-MF | RDKT-ML | RDKT-MM



Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDCT	10T3M0-MA																●	E15 E16
RDKT	10T3M0-MF											●		●				
	10T3M0-MM			●						●		●	●	●				

Available adaptor

Designation		Available adaptor
FMRMA	3087HRD-M10	MATA-M10
	3100HRD-M12	MATA-M12
	3125HRD-M16	MATA-M16
	3150HRD-M16	

Designation: FMRMA3125HRD-M16
Modular Head Threading Measure size (M16)

=

Adaptor spec.: MATA-M16-137-S125S
Adaptor Threading Measure (M16)

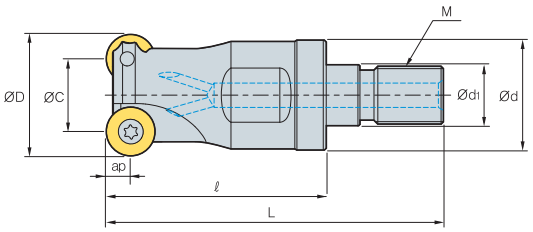
Parts

Specification	Screw	Wrench
Ø0.875~Ø1.500 (3000 type)	FTGA03508 (07)	TW15S

Available inserts **E15, E16** Available Adaptor **E308~E309**

FMRMA4000/5000







• AR: 5°
• RR: -8°~ -5°

(inch)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	lbs
FMRMA	4100HRD-M12	2	1.000	0.528	0.492	0.886	1.772	2.717	M12	0.236	0.3
	4125HRD-M16	2	1.250	0.780	0.669	1.142	1.969	3.031	M16	0.236	0.5
	4150HRD-M16	3	1.500	1.028	0.669	1.142	1.969	3.031	M16	0.236	0.5
	5150HRD-M16	2	1.500	0.870	0.669	1.142	1.969	3.031	M16	0.315	0.6

Available inserts

RDHW-E,F,S | RDCT-MA | RDKT-MF | RDKT-ML | RDKT-MM



Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
4000 type	RDCT	1204M0-MA																●	E15 E16
	RDKT	1204M0-MF											●		●				
		1204M0-MM			●						●		●	●	●				
5000 type	RDHW	1605M0E,F,S																	
	RDKT	1605M0-MF																	
		1605M0-ML																	
		1605M0-MM									●								

Available adaptor

Designation		Available adaptor
FMRMA	4100HRD-M12	MATA-M12
	4125HRD-M16	MATA-M16
	4150HRD-M16	
	5150HRD-M16	MATA-M16

Designation: FMRMA4150HRD-M16
Modular Head Threading Measure size (M16)

II

Adaptor spec.: MATA-M16-137-S125S
Adaptor Threading Measure (M16)

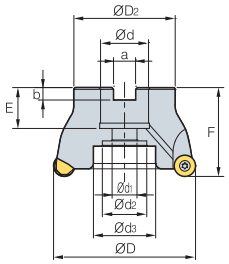
Parts

Specification	Screw	Wrench
Ø1.000~Ø1.500 (4000 type)	FTKA0410	TW15S
Ø1.500 (5000 type)	FTGA0513-P	TW20-100

Available inserts E15, E16 Available Adaptor E308~E309

FMRCA3000 new







• AR: 5°
• RR: -4°~ 0°

(inch)

Designation			ØD (inch)	ØD (mm)	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Insert size
FMRCA	3150HRP-5	5	1.500	38.100	1.417	0.500	0.287	0.433	0.252	0.169	0.630	1.500	0.20	0.49	0.394
	3200HRP-6	6	2.000	50.800	1.772	0.750	0.413	0.630	0.315	0.220	0.787	1.750	0.20	0.77	0.394
	3250HRP-6	6	2.500	63.500	2.205	1.000	0.551	0.827	0.374	0.248	0.787	1.750	0.20	1.21	0.394
	3250HRP-7	7	2.500	63.500	2.205	1.000	0.551	0.827	0.374	0.248	0.787	1.750	0.20	1.23	0.394

Available inserts


RPCT-MA


RPET-ML


RPMT-MF


RPMT-MM


RPMW

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	10T3M0-MA																●	E16
RPET	10T3M0E-ML													●	●			
RPMT	10T3M0E-MF										●			●	●			
	10T3M0S-MM							●	●		●			●	●			
RPMW	10T3M0E1							●	●		●			●	●			

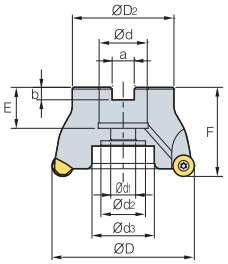
Parts

Specification	Screw	Wrench
Ø1.500~Ø2.500	FTGA03508	TW15S

Available inserts E16

FMRCA4000 new





• AR: 5°
• RR: -2°

(inch)

Designation			ØD (inch)	ØD (mm)	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Insert size
FMRCA	4200HRP-4	4	2.000	50.800	1.772	0.750	0.413	0.630	-	0.315	0.220	0.787	1.750	0.24	0.57	0.472
	4200HRP-5	5	2.000	50.800	1.772	0.750	0.413	0.630	-	0.315	0.220	0.787	1.750	0.24	0.62	0.472
	4250HRP-5	5	2.500	63.500	2.205	1.000	0.551	0.827	-	0.374	0.248	0.787	1.750	0.24	0.97	0.472
	4250HRP-6	6	2.500	63.500	2.205	1.000	0.551	0.827	-	0.374	0.248	0.787	1.750	0.24	1.06	0.472
	4300HRP-6	6	3.000	76.200	2.205	1.000	0.551	0.866	1.299	0.374	0.248	0.787	2.000	0.24	2.03	0.472
	4300HRP-7	7	3.000	76.200	2.205	1.000	0.551	0.866	1.299	0.374	0.248	0.787	2.000	0.24	1.98	0.472
	4400HRP-7	7	4.000	101.600	2.874	1.250	0.689	1.024	1.614	0.500	0.319	0.787	2.000	0.24	3.22	0.472

Available inserts

RPCT-MA | RPET-ML | RPMT-MF | RPMT-MM | RPMW



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	1204M0-MA																●	E16
RPET	1204M0E-ML													●	●			
RPMT	1204M0E-MF										●			●	●			
	1204M0S-MM							●	●		●			●	●			
RPMW	1204M0S1							●	●		●			●	●			
	1204M0S2													●	●			

Parts

Specification	Screw	Wrench
Ø2.000~Ø4.000	FTKA0410	TW15S

Available inserts E16

FMRCA5000 new



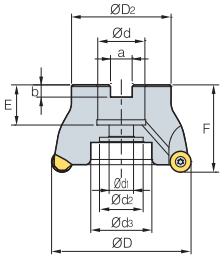


Fig. 1

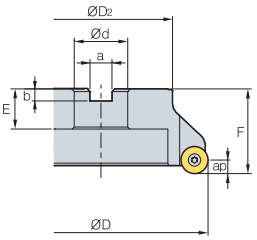


Fig. 2

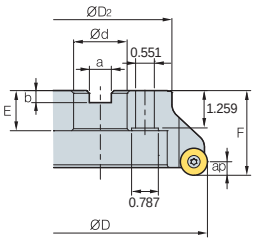


Fig. 3

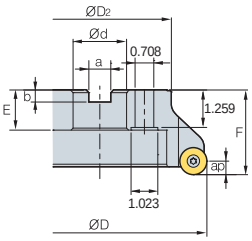


Fig. 4



• AR: 5°
• RR: -1°~ 0°

(inch)

Designation			ØD (inch)	ØD (mm)	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Fig.	Insert size
FMRCA	5250HRP-4	4	2.500	63.500	2.205	1.000	0.551	0.827	-	0.374	0.248	0.787	1.750	0.31	0.95	1	0.630
	5250HRP-5	5	2.500	63.500	2.205	1.000	0.551	0.827	-	0.374	0.248	0.787	1.750	0.31	0.97	1	0.630
	5300HRP-5	5	3.000	76.200	2.205	1.000	0.551	0.866	1.299	0.374	0.248	0.787	2.000	0.31	1.70	1	0.630
	5300HRP-6	6	3.000	76.200	2.205	1.000	0.551	0.866	1.299	0.374	0.248	0.787	2.000	0.31	1.81	1	0.630
	5400HRP-6	6	4.000	101.600	2.874	1.250	0.689	1.024	1.614	0.500	0.319	0.787	2.000	0.31	3.13	1	0.630
	5500HRP-7	7	5.000	127.000	3.386	1.500	0.827	1.220	1.969	0.626	0.394	1.063	2.500	0.31	6.13	1	0.630
	5500HRP-8	8	5.000	127.000	3.386	1.500	0.827	1.220	1.969	0.626	0.394	1.063	2.500	0.31	6.15	1	0.630
	5600RP-8	8	6.000	152.400	4.882	2.000	-	-	-	0.752	0.433	1.181	2.500	0.31	8.84	2	0.630

Available inserts

	RPCT-MA	RPET-ML	RPMT-MF	RPMT-MM	RPMW
					

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	1606M0-MA																●	E16
RPET	1606M0E-ML													●	●			
RPMT	1606M0E-MF										●			●	●			
	1606M0S-MM							●	●		●			●	●			
RPMW	1606M0S1							●	●		●			●	●			

Parts

Specification	Screw	Wrench
Ø2.500~Ø6.000	FTGA0512-P	TW20-100

Available inserts E16

FMRCA6000 new



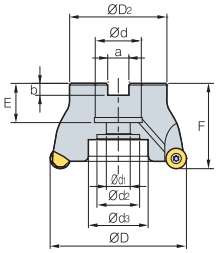


Fig. 1

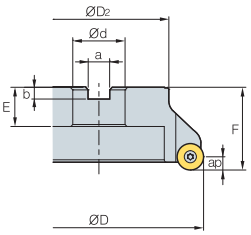


Fig. 2

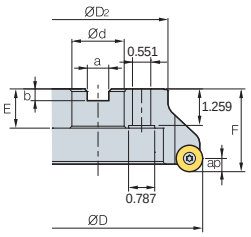


Fig. 3

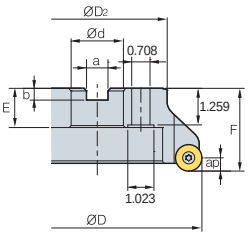


Fig. 4



• AR: 5°
• RR: 0°

(inch)

Designation			ØD (inch)	ØD (mm)	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Fig.	Insert size
FMRCA	6250HRP-4	4	2.500	63.500	2.205	1.000	0.551	0.787	-	0.374	0.248	0.787	1.750	0.39	0.82	1	0.787
	6300HRP-5	5	3.000	76.200	2.205	1.000	0.551	0.827	-	0.374	0.248	0.866	2.000	0.39	1.92	1	0.787
	6400HRP-5	5	4.000	101.600	2.874	1.250	0.689	1.024	1.614	0.500	0.319	0.787	2.000	0.39	2.89	1	0.787
	6400HRP-6	6	4.000	101.600	2.874	1.250	0.689	1.024	1.614	0.500	0.319	0.787	2.000	0.39	3.09	1	0.787
	6500HRP-5	5	5.000	127.000	3.386	1.500	0.827	1.220	1.969	0.626	0.394	1.063	2.500	0.39	6.11	1	0.787
	6500HRP-7	7	5.000	127.000	3.386	1.500	0.827	1.220	1.969	0.626	0.394	1.063	2.500	0.39	6.37	1	0.787
	6600RP-6	6	6.000	152.400	4.882	2.000	-	-	-	0.752	0.433	1.181	2.500	0.39	7.89	2	0.787
	6600RP-8	8	6.000	152.400	4.882	2.000	-	-	-	0.752	0.433	1.181	2.500	0.39	7.78	2	0.787
	6800RP-8	8	8.000	203.200	5.118	2.500	-	-	-	1.000	0.551	1.496	2.500	0.39	11.36	3	0.787
	61000RP-9	9	10.000	254.000	7.087	2.500	-	-	-	1.000	0.551	1.496	2.500	0.39	21.43	3	0.787

Available inserts


RPCT-MA


RPET-ML


RPMT-MF


RPMT-MM


RPMW

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	2007M0-MA																●	E16
RPET	2007M0E-ML													●	●			
RPMT	2007M0E-MF										●			●	●			
	2007M0S-MM							●	●		●			●	●			
RPMW	2007M0S1							●	●		●			●	●			

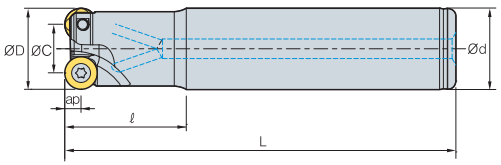
Parts

Specification	Screw	Wrench
Ø2.500~Ø10.000	FTKA0615-P	TW25-100

Available inserts E16

FMRSA2500 new







• AR: -4°
• RR: -4°~ -1°

(inch)

Designation			ØD (inch)	ØD (mm)	Ød	ℓ	L	ap	lbs	Insert size
FMRSA	25068HRP-2S062	2	0.688	17.463	0.625	1.378	3.543	0.16	0.24	0.315
	25068HRP-2M062	2	0.688	17.463	0.625	1.378	5.906	0.16	0.44	0.315
	25068HRP-2L062	2	0.688	17.463	0.625	1.378	7.874	0.16	0.60	0.315
	25075HRP-3S075	3	0.750	19.050	0.750	1.378	5.118	0.16	0.60	0.315
	25075HRP-3M075	3	0.750	19.050	0.750	3.937	7.087	0.16	0.79	0.315
	25075HRP-3L075	3	0.750	19.050	0.750	5.118	9.843	0.16	1.10	0.315
	25081HRP-3S075	3	0.813	20.638	0.750	1.378	5.118	0.16	0.62	0.315
	25081HRP-3M075	3	0.813	20.638	0.750	1.378	7.087	0.16	0.88	0.315
	25081HRP-3L075	3	0.813	20.638	0.750	1.378	9.843	0.16	1.21	0.315
	25100HRP-4S100	4	1.000	25.400	1.000	1.378	5.906	0.16	1.06	0.315
	25100HRP-4M100	4	1.000	25.400	1.000	2.362	7.087	0.16	1.32	0.315
	25100HRP-4L100	4	1.000	25.400	1.000	5.118	9.843	0.16	1.79	0.315
	25106HRP-4S100	4	1.063	26.988	1.000	1.378	5.906	0.16	1.06	0.315
	25106HRP-4L100	4	1.063	26.988	1.000	5.118	9.843	0.16	1.87	0.315

Available inserts

RPET-ML RPMT-MF RPMT-MM RPMW



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPET	0803M0E-ML													●	●			E16
RPMT	0803M0E-MF										●			●	●			
	0803M0S-MM							●	●		●			●	●			
RPMW	0803M0E1							●	●		●			●	●			

Parts

Specification	Screw	Wrench
Ø0.688 Ø0.750~Ø1.063	FTNA0305 FTNA0306	TW09S

Available inserts E16

FMRSA3000 new



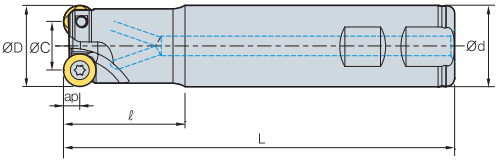


Fig. 1

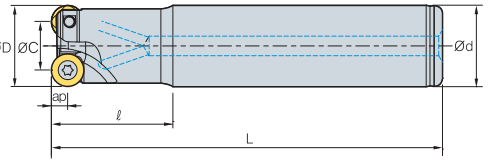


Fig. 2



• AR: -4°
• RR: -1°

(inch)

Designation			ØD (inch)	ØD (mm)	Ød	ℓ	L	ap	lbs	Fig.	Insert size
FMRSA	3100HRP-2M075	2	1.000	25.400	0.750	1.575	6.693	0.20	0.88	2	0.394
	3100HRP-2S100	2	1.000	25.400	1.000	1.575	4.724	0.20	0.86	1	0.394
	3100HRP-2M100	2	1.000	25.400	1.000	2.362	6.299	0.20	1.15	2	0.394
	3100HRP-2L100	2	1.000	25.400	1.000	5.118	9.843	0.20	1.76	2	0.394
	3106HRP-2L100	2	1.063	26.988	1.000	1.181	7.874	0.20	1.52	2	0.394
	3125HRP-3S125	3	1.250	31.750	1.250	1.575	4.921	0.20	1.50	1	0.394
	3125HRP-3L125	3	1.250	31.750	1.250	2.362	7.874	0.20	2.38	2	0.394
	3125HRP-4S125	4	1.250	31.750	1.250	1.575	4.921	0.20	1.46	1	0.394
	3125HRP-4L100	4	1.250	31.750	1.250	2.362	7.874	0.20	1.63	2	0.394
	3131HRP-4S125	4	1.313	33.338	1.250	1.575	4.921	0.20	1.48	1	0.394
	3131HRP-4M125	4	1.313	33.338	1.250	2.362	7.087	0.20	2.21	2	0.394
	3131HRP-4L125	4	1.313	33.338	1.250	7.087	11.811	0.20	3.62	2	0.394

Available inserts

RPCT-MA



RPET-ML



RPMT-MF



RPMT-MM



RPMW



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	10T3M0-MA																●	E16
RPET	10T3M0E-ML													●	●			
RPMT	10T3M0E-MF										●			●	●			
	10T3M0S-MM							●	●		●			●	●			
RPMW	10T3M0E1							●	●		●			●	●			

Parts

Specification	Screw	Wrench
Ø1.000~Ø1.063 Ø1.250~Ø1.313	FTGA03507 FTGA03508	TW15S

Available inserts E16

FMRSA4000 new



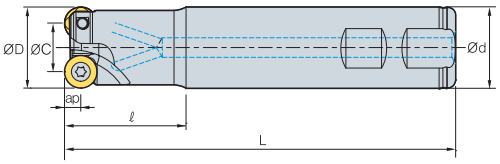


Fig. 1

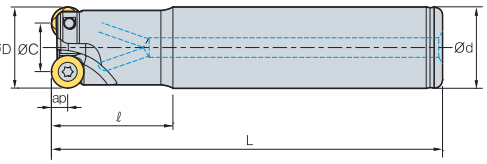


Fig. 2



• AR: -4°
• RR: -2°~ 0°

(inch)

Designation		⊚	ØD (inch)	ØD (mm)	Ød	ℓ	L	ap	lbs	Fig.	Insert size
FMRSA	4100HRP-2S100	2	1.000	25.400	1.000	2.362	6.299	0.24	1.01	1	0.472
	4106HRP-2L100	2	1.063	26.988	1.000	2.362	7.874	0.24	1.06	2	0.472
	4125HRP-2L100	2	1.250	31.750	1.000	1.575	7.480	0.24	1.50	2	0.472
	4125HRP-2S125	2	1.250	31.750	1.250	1.969	4.921	0.24	1.41	1	0.472
	4125HRP-2L125	2	1.250	31.750	1.250	1.969	9.843	0.24	3.09	2	0.472
	4125HRP-3S125	3	1.250	31.750	1.250	1.969	4.921	0.24	1.41	1	0.472
	4125HRP-3M125	3	1.250	31.750	1.250	2.362	6.299	0.24	1.87	2	0.472
	4131HRP-3M125	3	1.313	33.338	1.250	2.362	7.874	0.24	2.23	2	0.472
	4131HRP-3L125	3	1.313	33.338	1.250	2.362	11.811	0.24	3.68	2	0.472
	4150HRP-3S125	3	1.500	38.100	1.250	1.378	4.134	0.24	1.32	1	0.472
	4150HRP-3M125	3	1.500	38.100	1.250	1.969	6.299	0.24	2.12	2	0.472
	4150HRP-4S125	4	1.500	38.100	1.250	1.378	4.134	0.24	1.32	1	0.472
	4150HRP-4M125	4	1.500	38.100	1.250	1.378	5.906	0.24	1.92	2	0.472
	4150HRP-4L125	4	1.500	38.100	1.250	1.378	9.843	0.24	3.22	2	0.472
	4200HRP-4M125	4	2.000	50.800	1.250	1.969	5.906	0.24	2.43	2	0.472
	4200HRP-4M150	4	2.000	50.800	1.500	1.969	5.906	0.24	3.18	2	0.472

Available inserts



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	1204M0-MA																●	E16
RPET	1204M0E-ML													●	●			
RPMT	1204M0E-MF										●			●	●			
	1204M0S-MM							●	●		●			●	●			
RPMW	1204M0S1							●	●		●			●	●			
	1204M0S2													●	●			

Parts

Specification	Screw	Wrench
Ø1.000~Ø1.063	FTKA0408	TW15S
Ø1.250~Ø1.313	FTKA0410	

Available inserts E16

FMRSA5000/6000 new



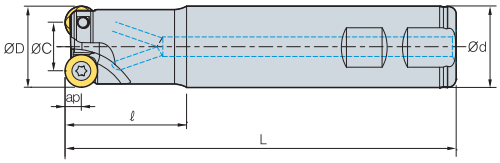


Fig. 1

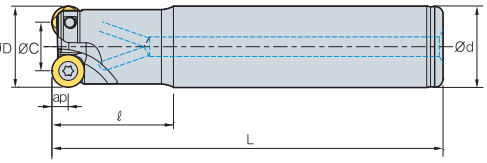


Fig. 2



• AR: -4°
• RR: 0°

(inch)

Designation			ØD (inch)	ØD (mm)	Ød	ℓ	L	ap	lbs	Insert size	Fig.
FMRSA	5150HRP-2M125	2	1.500	38.100	1.250	1.969	6.299	0.31	2.03	2	0.630
	5150HRP-2L125	2	1.500	38.100	1.250	1.969	9.843	0.31	3.20	2	0.630
	5200HRP-3M150	3	2.000	50.800	1.500	1.969	6.299	0.31	3.26	2	0.630
	5200HRP-3L150	3	2.000	50.800	1.500	1.969	11.811	0.31	6.31	2	0.630
	6200HRP-3S125	3	2.000	50.800	1.250	1.969	6.299	0.39	2.34	1	0.787
	6200HRP-3M125	3	2.000	50.800	1.250	1.969	7.874	0.39	2.87	2	0.787
	6200HRP-3S150	3	2.000	50.800	1.500	1.969	4.921	0.39	3.20	1	0.787
	6200HRP-3M150	3	2.000	50.800	1.500	1.969	7.874	0.39	4.08	2	0.787

Available inserts

RPCT-MA



RPET-ML



RPMT-MF



RPMT-MM



RPMW



Type	Designation		Cermet		Coated										Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
5000 type	RPCT	1606M0-MA																●	E16
	RPET	1606M0E-ML													●	●			
	RPMT	1606M0E-MF										●			●	●			
		1606M0S-MM										●			●	●			
	RPMW	1606M0S1							●	●		●			●	●			
6000 type	RPCT	2007M0-MA																●	E16
	RPET	2007M0E-ML													●	●			
	RPMT	2007M0E-MF										●			●	●			
		2007M0S-MM							●	●		●			●	●			
	RPMW	2007M0S1							●	●		●			●	●			

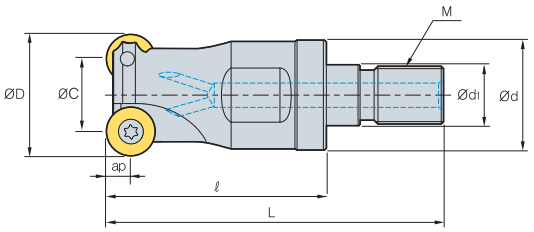
Parts

Specification	Screw	Wrench
Ø1.500~Ø2.000 (5000 type)	FTGA0511-P	TW20-100
Ø2.000 (6000 type)	FTKA0615-P	TW25-100

Available inserts E16

FMRMA2500 new







• AR: -4°
• RR: -4°~ 0°

(inch)

Designation			ØD (inch)	ØD (mm)	Ød	Ød1	ℓ	L	M	ap	lbs	Insert size
FMRMA	25068HRP-M08	2	0.688	17.463	0.571	0.335	0.984	1.654	M08	0.16	0.07	0.315
	25075HRP-M10	3	0.750	19.050	0.709	0.413	1.181	2.008	M10	0.16	0.13	0.315
	25100HRP-M12	4	1.000	25.400	0.906	0.492	1.378	2.323	M12	0.16	0.24	0.315
	25125HRP-M16	4	1.250	31.750	1.142	0.669	1.575	2.638	M16	0.16	0.49	0.315
	25150HRP-M16	5	1.500	38.100	1.142	0.669	1.575	2.638	M16	0.16	0.57	0.315

Available inserts

RPCT-MA new | RPET-ML new | RPMT-MF new | RPMT-MM new | RPMW new



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPET	0803M0E-ML													●	●			E16
RPMT	0803M0E-MF										●			●	●			
	0803M0S-MM							●	●		●			●	●			
RPMW	0803M0E1							●	●		●			●	●			

Available adaptor

Designation		Available adaptor
FMRMA	25068HRP-M08	MATA-M08
	25075HRP-M10	MATA-M10
	25100HRP-M12	MATA-M12
	25125HRP-M16	MATA-M16
	25150HRP-M16	MATA-M16

Designation: FMRMA25068HRP-M08
Modular Head Threading Measure size (M08)

=

Adaptor spec.: MATA-M08-078-S050S
Adaptor Threading Measure (M08)

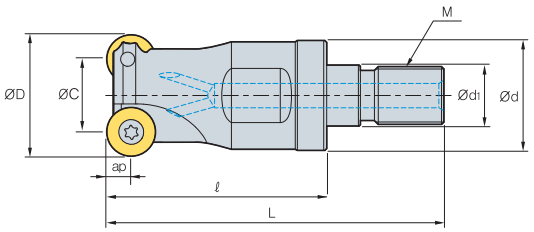
Parts

Specification	Screw	Wrench
Ø0.688 Ø0.750~Ø1.500	FTNA0305 FTNA0306	TW09S

Available inserts E16 Available Adaptor E308~E309

FMRMA3000 new







• AR: -4°
• RR: -1°~ 0°

(inch)

Designation			ØD (inch)	ØD (mm)	Ød	Ød1	ℓ	L	M	ap	lbs	Insert size
FMRMA	3100HRP-M12	2	1.000	25.400	0.906	0.492	1.378	2.323	M12	0.20	0.22	0.394
	3125HRP-M16	3	1.250	31.750	1.142	0.669	1.575	2.638	M16	0.20	0.44	0.394
	3150HRP-M16	3	1.500	38.100	1.142	0.669	1.575	2.638	M16	0.20	0.55	0.394

Available inserts



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	10T3M0-MA																●	E16
RPET	10T3M0E-ML													●	●			
RPMT	10T3M0E-MF										●			●	●			
	10T3M0S-MM							●	●		●			●	●			
RPMW	10T3M0E1							●	●		●			●	●			

Available adaptor

Designation		Available adaptor
FMRMA	3100HRP-M12	MATA-M12
	3125HRP-M16	MATA-M16
	3150HRP-M16	MATA-M16

Designation: FMRMA3125HRP-M16
Modular Head Threading Measure size (M16)

=

Adaptor spec.: MATA-M16-137-S125S
Adaptor Threading Measure (M16)

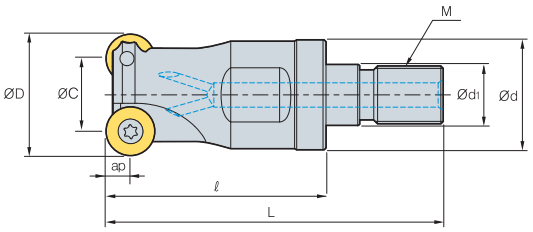
Parts

Specification	Screw	Wrench
Ø1.000	FTGA03507	TW15S
Ø1.250~Ø1.500	FTGA03508	

Available inserts E16 Available Adaptor E308~E309

FMRMA4000 new







• AR: -4°
• RR: 0°

(inch)

Designation			ØD (inch)	ØD (mm)	Ød	Ød1	ℓ	L	M	ap	lbs	Insert size
FMRMA	4100HRP-M12	2	1.000	25.400	0.906	0.492	1.378	2.323	M12	0.24	0.22	0.472
	4125HRP-M16	3	1.250	31.750	1.142	0.669	1.575	2.638	M16	0.24	0.46	0.472
	4150HRP-M16	4	1.500	38.100	1.142	0.669	1.575	2.638	M16	0.24	0.53	0.472

Available inserts



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	1204M0-MA																●	E16
RPET	1204M0E-ML													●	●			
RPMT	1204M0E-MF										●			●	●			
	1204M0S-MM							●	●		●			●	●			
RPMW	1204M0S1							●	●		●			●	●			
	1204M0S2													●	●			

Available adaptor

Designation		Available adaptor
FMRMA	4100HRP-M12	MATA-M12
	4125HRP-M16	MATA-M16
	4150HRP-M16	MATA-M16

Designation: FMRMA3125HRP-M16
Modular Head Threading Measure size (M16)

=

Adaptor spec.: MATA-M16-137-S125S
Adaptor Threading Measure (M16)

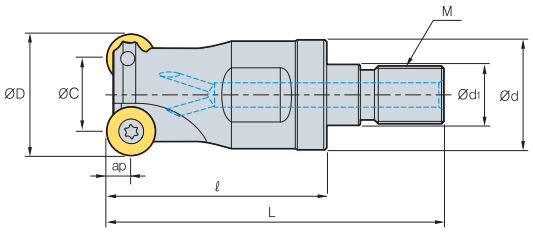
Parts

Specification	Screw	Wrench
Ø1.000	FTKA0408	TW15S
Ø1.250~Ø1.500	FTKA0410	

Available inserts E16 Available Adaptor E308~E309

FMRMA5000 new







• AR: -4°
• RR: 0°

(inch)

Designation			ØD (inch)	ØD (mm)	Ød	Ød1	ℓ	L	M	ap	lbs	Insert size
FMRMA	5150HRP-M16	2	1.500	38.100	1.142	0.669	1.575	2.638	M16	0.31	0.46	0.630

Available inserts



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	1606M0-MA																●	E16
RPET	1606M0E-ML													●	●			
RPMT	1606M0E-MF										●			●	●			
	1606M0S-MM							●	●		●			●	●			
RPMW	1606M0S1							●	●		●			●	●			

Available adaptor

Designation		Available adaptor
FMRMA	5150HRP-M16	MATA-M16

Designation: FMRMA3125HRP-M16
Modular Head Threading Measure size (M16)

=

Adaptor spec.: MATA-M16-137-S125S
Adaptor Threading Measure (M16)

Parts

Specification	Screw	Wrench	Wrench
Ø1.500	FTGA0511-P	-	TW20-100

Available inserts E16 Available Adaptor E308~E309

Stable machining, high efficiency milling tools for small diameter machining

HFM new

- Increase productivity through improved insert shape and size, high feed per tooth, and many cutting-edges, for small diameter machining
- Stable tool life through the combination of the reinforced toughness on corner and suitable grades of high hardness in the area of high speed and high hardness

Code system

• Shank type

HFM	S	A	1	043	H	R	-	2	S	037
High Feed Mill	Tool type	Inch type	Inscribed circle of insert	Tool dia.	Coolant type	Hand		No. of tooth	Shank length	Shank Dia.
	S: Shank		1: 04 type insert	043 : 0.438 inch	No code: None H: Thru-hole	R: Right L: Left		2: 2teeth	S: Standard type M: Middle type L: Long type	037 : 0.375 inch

• Modular type

HFM	M	A	1	043	H	R	-	M06
High Feed Mill	Tool type	Inch type	Inscribed circle of insert	Tool dia.	Coolant type	Hand		M Dimensions
	M: Modular		1: 04 type insert	043 : 0.438 inch	No code: None H: Thru-hole	R: Right L: Left		

• Modular adapter

MAT	A	-	M06	-	118	-	S039	S	-	C	-	315
Modular Adaptor	Inch type		M Dimensions		Neck length		Shank Dia.	Neck type		Adaptor material		Adaptor length
			M06		118: 1.181 inch		S039: Ø0.394 inch	T: Taper S: Straight		Unmarked: Steel C: Carbide		315 : 3.150 inch

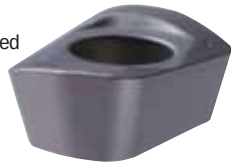
Features

- Apply helix cutting-edge on insert, low cutting load and reinforce toughness on corner
- Increased rigidity with double relief angle (11, 13), prevent interference with high feed
- To apply the negative axial rake angle when set up the holder, increased chipping resistance
- Tool life is increased with suitable C/B and grade for every material



• Holder setup
- To set up the negative axial rake angle, increased chipping resistance

• No. of tooth
- Increased tool life with increased flutes
- HRM(D) Ø0.75 (2 flutes) 鰯 HFM Ø0.75 (5 flutes)



• Relief angle
- 11, 13 double relief angle increase rigidity and prevent interference

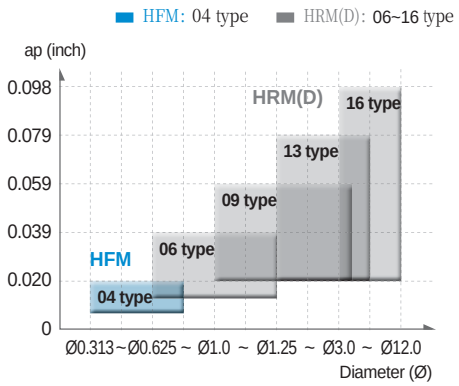
• Major cutting-edge
- Improved sharpness of principle edge
- Improved toughness of corner edge

Features of chip breakers

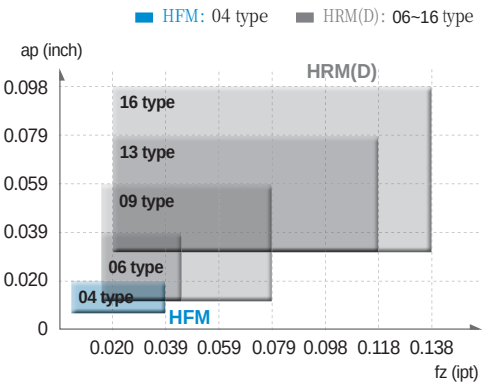
Chip breaker	Cutting-edge	Applications	Features
MF		Fine finishing Titanium & Inconel machining	• Low cutting resistance C/B, suitable for light cutting
None C/B		Super hard material machining	• High toughness shape, suitable for hard die steel cutting

Application area

Application area (ap & Diameter)

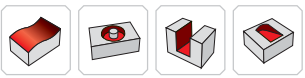


Application area (ap & fz)



Recommended cutting condition

(●: 1st, ○: 2nd)



Workpiece			USA (AISI)	GER (DIN)	KOR (KS)	HB (HRC)	Grades	Cutting conditions vc (sfm)	fz (ipt)	ap (inch)	ae (inch)	Chip breaker MF	Chip breaker None C/B
P	Mild steel		1020	C22	SM20C	120~180	PC5400 (PC5300)	328.1 ~721.8	0.039~0.020	0.020	0.7D~0.1D	●	-
P	Carbon steel		1045	C45	SM45C	200	PC5400 (PC5300)	328.1 ~656.2	0.039~0.020	0.020	0.7D~0.1D	●	-
P	Alloy steel		4140	41CrMo4	SCM440	270 (28)	PC5300	328.1 ~656.2	0.039~0.020	0.020	0.7D~0.1D	●	-
P	Pre-hardened steel		P20 (Improved)	1.2738 (Improved)	KP4M	300 (32)	PC5300 (PC2510) new	328.1 ~590.6	0.035~0.020	0.016	0.7D~0.1D	●	○
P	Pre-hardened steel		P21 (Improved)	-	NIMAX	370 (40)	PC5300 (PC2510) new	328.1 ~590.6	0.035~0.020	0.016	0.7D~0.1D	●	○
P	Pre-hardened steel		P21 (Improved)	-	CENA1	370 (40)	PC5300 (PC2510) new	328.1 ~590.6	0.035~0.020	0.016	0.7D~0.1D	●	○
P	Pre-hardened steel		P21 (Improved)	-	NAK80	400 (43)	PC5300	328.1 ~524.9	0.028~0.020	0.016	0.7D~0.1D	○	-
								328.1 ~590.6	0.035~0.020	0.016	0.7D~0.1D	-	●
P	Pre-hardened steel		420	X30Cr13	STAVAX	510 (52)	PC2510 new (PC5300)	262.5 ~492.1	0.024~0.012	0.016	0.7D~0.1D	●	-
P	Alloy tool steel		D2 H13	X155CrVMo12-1 X40CrMoV5-1	STD11 STD61	- (40~50)	PC2510 new (PC2505) new	262.5 ~426.5	0.022~0.012	0.012	0.7D~0.1D	-	●
P	Alloy tool steel		D2	X155CrVMo12-1	STD11 (Cold forging)	630 (60)	PC2505 new	98.4 ~246.1	0.020~0.012	0.008	0.7D~0.1D	-	●
M	Stainless steel		316	X5CrNiMo17-12-2	STS316	Under 270	PC5400 (PC5300)	229.7 ~492.1	0.028~0.020	0.020	0.7D~0.1D	●	-
K	Gray cast iron, Ductile cast iron		65-45-12	GGG40.3	GCD450	Tensile Strength Over 450Mpa	PC5300	426.5 ~721.8	0.031~0.024	0.016	0.7D~0.1D	●	-
S	HRSA	Fe series	N09901	- (WS 2.4662)	Incoloy901	- (25~35)	PC5300 (PC5400)	98.4 ~328.1	0.020~0.012	0.012	0.4D~0.7D	●	○
S	HRSA	Ni or Co series	N07718	NiCr19FeNbMo (WS 2.4668)	Inconel718	- (35~45)	PC5300 (PC5400)	65.6 ~164.0	0.024~0.012	0.012	0.4D~0.7D	●	○
S	Titanium		R56400	TiAl6V4	Ti-6Al-4V	- (40~45)	PC5300	98.4 ~164.0	0.039~0.016	0.012	0.7D~0.1D	●	-

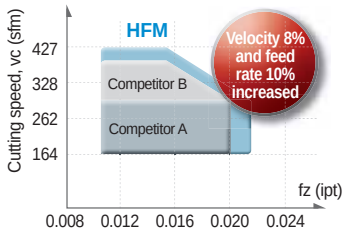
Performance evaluation

High speed machining

■Workpiece
D2 (HRC40~45)

■Insert
LPM(E)W0402□□R

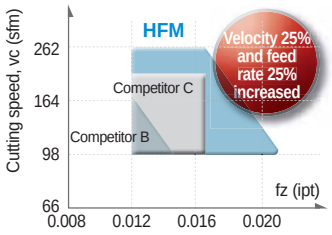
■Recommended grade
PC2505 (1st), PC2510 (2nd)



■Workpiece
D2 (Over HRC60)

■Insert
LPM(E)W0402□□R

■Recommended grade
PC2505 (1st), PC2510 (2nd)

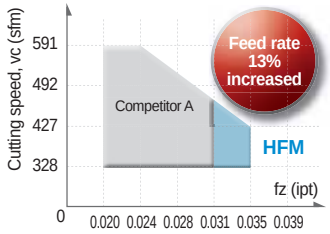


High feed machining

■Workpiece
P20 (HRC32),
P21 (HRC43)

■Insert
LPMT0402□□R-MF

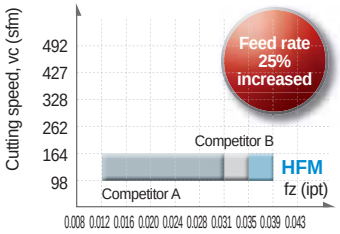
■Recommended grade
PC5300 (1st), PC2510 (2nd)



■Workpiece
R56400 (HRC40~45)

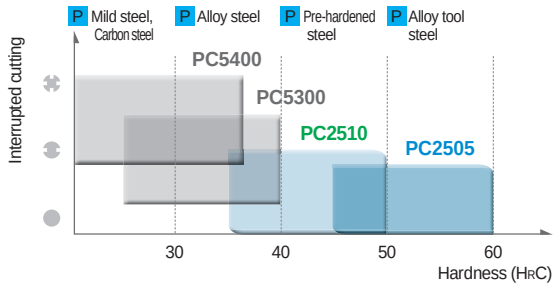
■Insert
LPMT0402□□R-MF

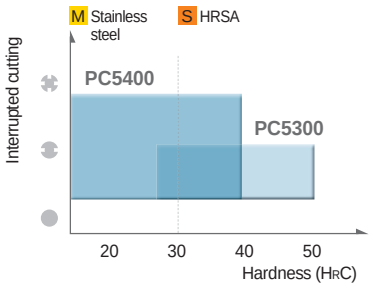
■Recommended grade
PC5300 (1st), PC2510 (2nd)



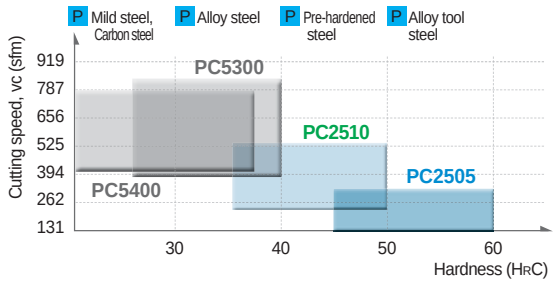
High hardness machining

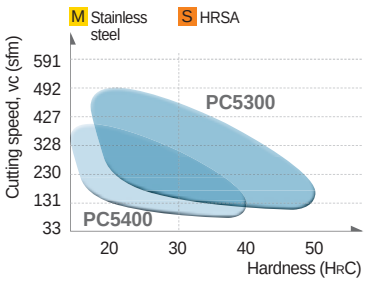
• Recommended grades according to interruption





• Recommended grades according to velocity

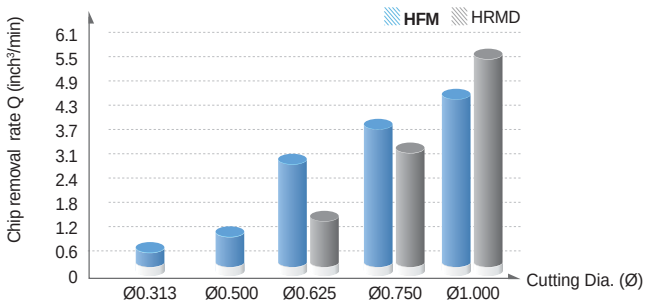




Effective machining

• Machining center
- BT40 and under, HFM recommended
- BT50 and above, HRM(D) recommended

• Chip removal rate Q (cm³/min)
- Ø0.313~Ø0.750, HFM recommended
- Ø0.750 and above, HRM(D) recommended

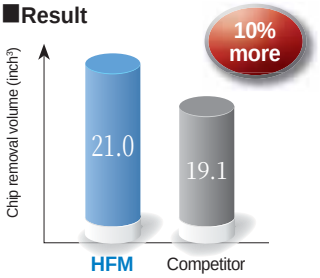


Performance evaluation

P Carbon steel [1045(AISI) / C45(DIN) / SM45C(KS), HB200]

Workpiece Mold
Cutting conditions vc (sfm) = 492, fz (ipt) = 0.024
ap (inch) = 0.016, ae (inch) = 0.197
dry
Tools **Insert** LPMT040210R-MF (PC5300)
Holder HFMSA1037HR-2S037

Result



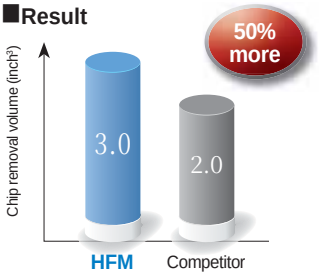


- Chip removal rate Q (inch³/min): 0.702
- Cutting time (min): 30

P Pre-hardened steel [P21(Improved) (AISI) / NAK80(KS), HRC40~41]

Workpiece Mold
Cutting conditions vc (sfm) = 328, fz (ipt) = 0.050
ap (inch) = 0.012, ae (inch) = 0.394
dry
Tools **Insert** LPMT040210R-MF (PC5300)
Holder HFMSA1062HR-4S062

Result



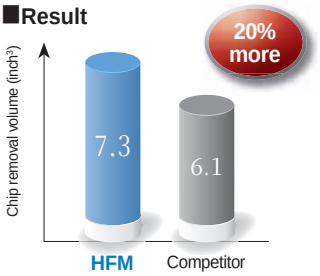


- Chip removal rate Q (inch³/min): 0.915
- Cutting time (min): 3.29

P Alloy tool steel [D2(AISI) / X155CrVMo12-1(DIN) / STD11(KS), HRC40~45]

Workpiece Mold
Cutting conditions vc (sfm) = 262, fz (ipt) = 0.020
ap (inch) = 0.012, ae (inch) = 0.394
dry
Tools **Insert** LPMW040210R (PC2510)
Holder HFMSA1062HR-4S062

Result



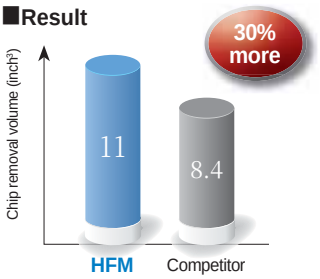


- Chip removal rate Q (inch³/min): 0.293
- Cutting time (min): 25

P Alloy tool steel [D2(AISI) / X155CrVMo12-1(DIN) / STD11(KS), HRC60]

Workpiece Mold
Cutting conditions vc (sfm) = 246, fz (ipt) = 0.016
ap (inch) = 0.006, ae (inch) = 0.197
dry
Tools **Insert** LPMW040210R (PC2505)
Holder HFMSA1037HR-2S037

Result



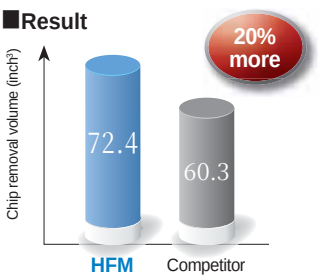


- Chip removal rate Q (inch³/min): 0.085
- Cutting time (min): 7.85

S HRSA [R56400(AISI) / TiAl6V4(DIN) / Ti-6Al-4V(KS), HRC48]

Workpiece Aviation parts
Cutting conditions vc (sfm) = 164, fz (ipt) = 0.047
ap (inch) = 0.012, ae (inch) = 0.394
wet
Tools **Insert** LPMT040210R-MF (PC5300)
Holder HFMSA1062HR-4S062

Result

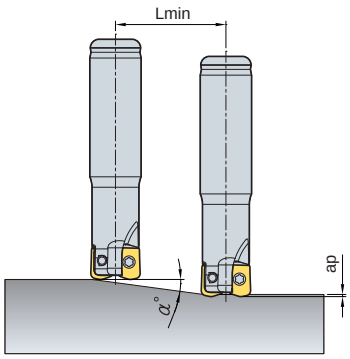




- Chip removal rate Q (inch³/min): 0.439
- Cutting time (min): 10.05

Ramping and helical cutting

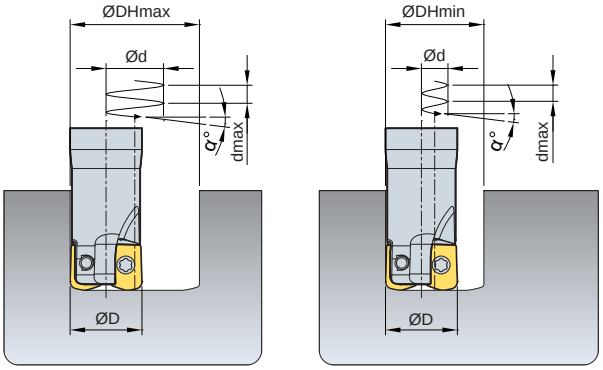
Ramping



$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (inch)}$$

※ Lmin: Min. inclination cutting length
α°: Max. ramping angle
ap: Depth of cut

Helical cutting



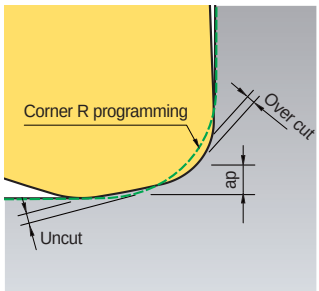
- ØD = Tool dia. (inch)
- Ød = Tool path (inch) = ØDH Min, Max - ØD
- ØDH Min (Min diameter, inch) = ØD × 2 - 5.4
- ØDH Max (Max diameter, inch) = ØD×2 - 2

(inch)

Designation	Tool dia. ØD	Depth of cut ap	Ramping		Helical cutting		
			Max ramping angle α (°)	Lmin	Max diameter ØDH Max	Min diameter ØDH Min	Max pitch dmax
HFMSA1037	0.375	0.016 ~0.021	3.5	0.256	0.709	0.591	0.016
HFMSA1043	0.438	0.016 ~0.021	3.1	0.295	0.787	0.669	0.016
HFMSA1050	0.500	0.016 ~0.021	2.7	0.335	0.866	0.748	0.016
HFMSA1056	0.563	0.016 ~0.021	2.2	0.374	0.945	0.827	0.016
HFMSA1062	0.625	0.016 ~0.021	1.8	0.413	1.024	0.906	0.016
HFMSA1068	0.688	0.016 ~0.021	1.7	0.453	1.102	0.984	0.016
HFMSA1075	0.750	0.016 ~0.021	1.4	0.492	1.181	1.063	0.016
HFMSA1081	0.813	0.016 ~0.021	1.3	0.531	1.260	1.142	0.016
HFMMA1100	1.000	0.016 ~0.021	1.1	0.571	1.339	1.220	0.016
HFMMA1106	1.063	0.016 ~0.021	1.0	0.610	1.417	1.299	0.016
HFMMA1118	1.188	0.016 ~0.021	0.9	0.650	1.496	1.378	0.016
HFMMA1125	1.250	0.016 ~0.021	0.8	0.689	1.575	1.457	0.016
HFMMA1131	1.313	0.016 ~0.021	0.8	0.846	1.890	1.772	0.016

- Adjust feed to under 70% of recommended cutting condition when ramping & helical cutting
- In helical ramping, max. cutting depth per 1 helical revolution of cutter should not exceed max. cutting depth as per insert size
- In ramping, max. cutting depth per 1 ramping process of cutter should not exceed max. depth of cut as per used insert size

Corner R programming



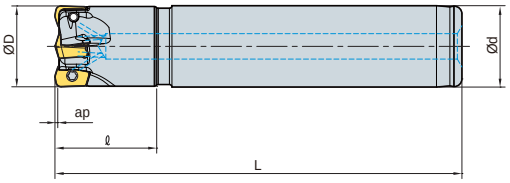
(inch)

Insert	Corner R programming	Cutting conditions		Over Cut	Uncut
		Nose R	Max. ap		
LPMT040210R-MF **LPMW040210R** **LPEW040210R**	R0.039	0.039	0.016	0.000	0.007
	R0.059			0.004	0.003
	R0.079			0.012	0.000
LPMT040220R-MF **LPMW040220R** **LPEW040220R**	R0.039	0.079	0.020	0.000	0.016
	R0.059			0.000	0.008
	R0.079			0.000	0.000

- When using CNC program, overcut & uncut occurs on the corner processing site if entering the correct program corner R value for each insert
- To prevent overcut, you will need to complete a CNC program considering the above overcut

HFMSA1000 new







AA 77°

- AR: -4°
- RR: -14°~ -7°

(inch)

Designation			ØD (Inch)	ØD (mm)	Ød	ℓ	L	ap	lbs
HFMSA	1031HR-1S037	1	0.313	7.938	0.375	0.787	3.150	0.016~0.020	0.07
	1031HR-1M037	1	0.313	7.938	0.375	0.984	3.937	0.016~0.020	0.07
	1031HR-1L037	1	0.313	7.938	0.375	1.378	4.724	0.016~0.020	0.07
	1037HR-2S031	2	0.375	9.525	0.312	0.787	3.150	0.016~0.020	0.07
	1037HR-2M031	2	0.375	9.525	0.312	0.984	3.937	0.016~0.020	0.09
	1037HR-2L031	2	0.375	9.525	0.312	1.378	4.724	0.016~0.020	0.09
	1037HR-2S037	2	0.375	9.525	0.375	0.787	3.150	0.016~0.020	0.09
	1037HR-2M037	2	0.375	9.525	0.375	0.984	4.134	0.016~0.020	0.11
	1037HR-2L031	2	0.375	9.525	0.375	1.378	4.724	0.016~0.020	0.13
	1043HR-2S037	2	0.438	11.113	0.375	0.787	3.150	0.016~0.020	0.09
	1043HR-2M037	2	0.438	11.113	0.375	0.984	4.134	0.016~0.020	0.13
	1043HR-2L037	2	0.438	11.113	0.375	1.378	4.724	0.016~0.020	0.15
	1050HR-3S037	3	0.500	12.700	0.375	0.787	3.150	0.016~0.020	0.11
	1050HR-3M037	3	0.500	12.700	0.375	0.984	4.134	0.016~0.020	0.13
	1050HR-3L037	3	0.500	12.700	0.375	1.378	4.724	0.016~0.020	0.15
	1050HR-3S050	3	0.500	12.700	0.500	0.787	3.150	0.016~0.020	0.13
	1050HR-3M050	3	0.500	12.700	0.500	0.984	4.134	0.016~0.020	0.18
	1050HR-3L050	3	0.500	12.700	0.500	1.378	4.724	0.016~0.020	0.20

Available inserts

LPMT-MF | LPMW | LPEW



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LPMT	040210R-MF							●					●	●				E11 E12
	040220R-MF							●					●	●				
LPMW	040210R						●	●					●					
	040220R						●	●					●					
LPEW	040210R						●	●					●					
	040220R						●	●					●					

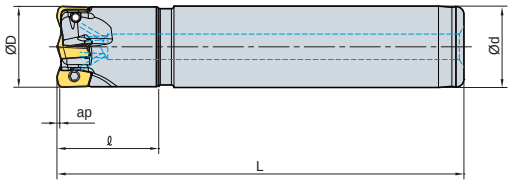
Parts

Specification	Screw	Wrench
Ø0.313~Ø0.375	FTKA01840	TW06S-A
Ø0.438~Ø0.813	FTKA01842	

Available inserts **E11, E12**

HFMSA1000 new





AA 77°

- AR: -4°
- RR: -6°~ -3°

(inch)

Designation			ØD (Inch)	ØD (mm)	Ød	ℓ	L	ap	lbs
HFMSA	1056HR-3S056	3	0.563	14.288	0.563	0.787	3.150	0.016~0.020	0.15
	1056HR-3M056	3	0.563	14.288	0.563	0.984	4.134	0.016~0.020	0.20
	1056HR-3L056	3	0.563	14.288	0.563	1.575	4.724	0.016~0.020	0.22
	1062HR-4S062	4	0.625	15.875	0.625	0.787	3.150	0.016~0.020	0.24
	1062HR-4M062	4	0.625	15.875	0.625	0.984	4.134	0.016~0.020	0.31
	1062HR-4L062	4	0.625	15.875	0.625	1.575	4.724	0.016~0.020	0.35
	1068HR-4S062	4	0.688	17.463	0.625	0.787	3.150	0.016~0.020	0.24
	1068HR-4M062	4	0.688	17.463	0.625	0.984	4.134	0.016~0.020	0.33
	1068HR-4L062	4	0.688	17.463	0.625	1.575	4.724	0.016~0.020	0.37
	1075HR-4S075	4	0.750	19.050	0.750	0.787	3.150	0.016~0.020	0.37
	1075HR-4M075	4	0.750	19.050	0.750	0.984	4.134	0.016~0.020	0.49
	1075HR-4L075	4	0.750	19.050	0.750	1.575	4.724	0.016~0.020	0.57
	1075HR-5S075	5	0.750	19.050	0.750	0.787	3.150	0.016~0.020	0.37
	1075HR-5M075	5	0.750	19.050	0.750	0.984	4.134	0.016~0.020	0.51
	1075HR-5L075	5	0.750	19.050	0.750	1.575	4.724	0.016~0.020	0.60
	1081HR-5S075	5	0.813	20.638	0.750	0.787	3.150	0.016~0.020	0.37
	1081HR-5M075	5	0.813	20.638	0.750	0.984	4.134	0.016~0.020	0.51
	1081HR-5L075	5	0.813	20.638	0.750	1.575	4.724	0.016~0.020	0.60

Available inserts

LPMT-MF new | LPMW new | LPEW new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LPMT	040210R-MF							●					●	●				
	040220R-MF							●					●	●				
LPMW	040210R						●	●					●					E11
	040220R						●	●					●					E12
LPEW	040210R						●	●					●					
	040220R						●	●					●					

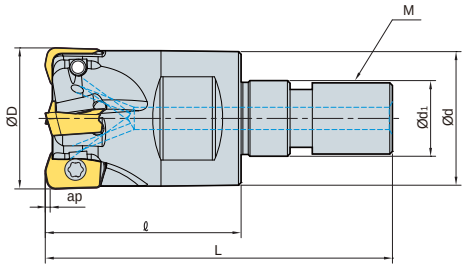
Parts

Specification	Screw	Wrench
Ø0.313~Ø0.375	FTKA01840	TW06S-A
Ø0.438~Ø0.813	FTKA01842	

Available inserts **E11, E12**

HFMMA new





AA 77°

- AR: -4°
- RR: -14°~ -3°

(inch)

Designation			ØD (Inch)	ØD (mm)	Ød	Ød1	ℓ	L	M	ap	kg
HFMMA	1031HR-M06	1	0.313	7.938	0.295	0.256	0.669	1.260	M6	0.016~0.020	0.02
	1037HR-M06	2	0.375	9.525	0.374	0.256	0.669	1.260	M6	0.016~0.020	0.02
	1043HR-M06	2	0.438	11.113	0.433	0.256	0.669	1.260	M6	0.016~0.020	0.02
	1050HR-M06	3	0.500	12.700	0.433	0.256	0.748	1.339	M6	0.016~0.020	0.02
	1062HR-M08	4	0.625	15.875	0.571	0.335	0.866	1.535	M8	0.016~0.020	0.07
	1068HR-M08	4	0.688	17.463	0.571	0.335	0.866	1.535	M8	0.016~0.020	0.07
	1075HR-M10	5	0.750	19.050	0.709	0.413	0.984	1.811	M10	0.016~0.020	0.13
	1081HR-M10	5	0.813	20.638	0.709	0.413	0.984	1.811	M10	0.016~0.020	0.13
	1100HR-M12	6	1.000	25.400	0.906	0.492	1.063	2.008	M12	0.016~0.020	0.24
	1106HR-M12	6	1.063	26.988	0.906	0.492	1.063	2.008	M12	0.016~0.020	0.24
	1118HR-M16	7	1.188	30.163	1.142	0.669	1.181	2.362	M16	0.016~0.020	0.37
	1125HR-M16	8	1.250	31.750	1.142	0.669	1.181	2.362	M16	0.016~0.020	0.40
	1131HR-M16	8	1.313	33.338	1.142	0.669	1.181	2.362	M16	0.016~0.020	0.40

Available inserts

LPMT-MF new　LPMW new　LPEW new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LPMT	040210R-MF							●					●	●				
	040220R-MF							●					●	●				
LPMW	040210R						●	●					●					E11
	040220R						●	●					●					E12
LPEW	040210R						●	●					●					
	040220R						●	●					●					

Parts

Specification	Screw	Wrench
Ø0.313~Ø0.375 Ø0.438~Ø1.313	FTKA01840 FTKA01842	TW06S-A

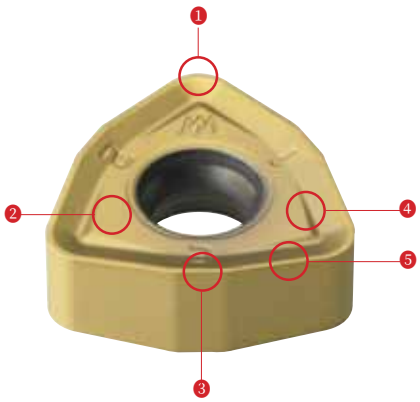
Available inserts E11, E12　Available Adaptor E308~E309

HRMD is more economical due to the use of 6 cutting-edges compared to HRM tool with a 3-edge positive insert

HRMDouble

- HRMD is more economical due to the use of 6 cutting-edges compared to HRM tool with a 3-edge positive insert
- High-rake angle cutting-edge and chip breaker reduces cutting load
- Negative geometry has been designed for rigidity of cutting-edge and double-sided function
- Screw on system and stable support achieves strong clamping force
- Unique insert design for high feed and multifunctional machining
- HRMD insert with symmetrical cutting-edge is applicable for both R and L type machining

Features of insert



❶ Nose-R

- Security of rigid edge in ramping pocket machining
- Round edge suitable for high feed rates insert geometry
- Possible to use R/L type machining

❷ Clamping surface

- Design for stable clamping
- Prevention of friction by chip

❸ Minor cutting-edge

- Improvement of surface roughness in high feed machining
- Special design for decreasing thrust force
- Symmetrical insert design for R/L type tool

❹ Chip breaker

- Reduction of cutting load due to High-rake angle
- Improvement of chip flow and evacuation in various applications
- Prevention of damage on clamping face of insert

❺ Major cutting-edge

- Symmetrical design insert for R/L type tool
- Superior cutting performance due to high rake angle cutting-edge
- Low cutting resistance in high feed
- Special design for decreasing thrust force

Features of cutter



Inner coolant system

- Improvement of chip control and evacuation
- Longer tool life due to reduced cutting temperature

3-surface constrained system

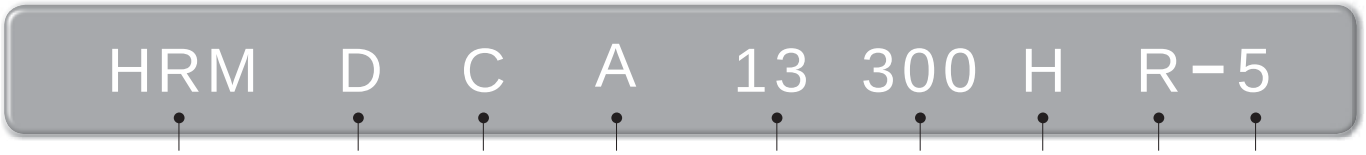
- Strong clamping system
- Stable clamping system against different cutting resistances in various machining applications

Simple screw on system

- Strong clamping of screw on system
- Convenient clamping system
- Wide chip pocket for better chip evacuation

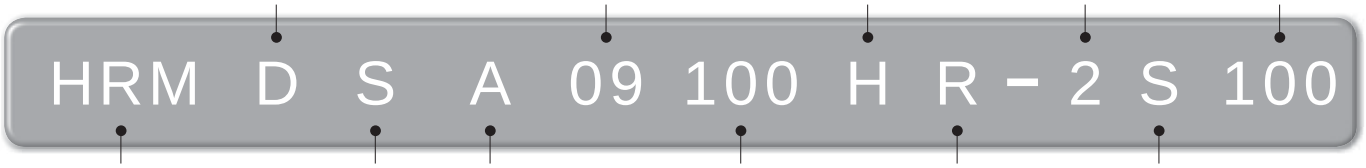
Code system

• Cutter type



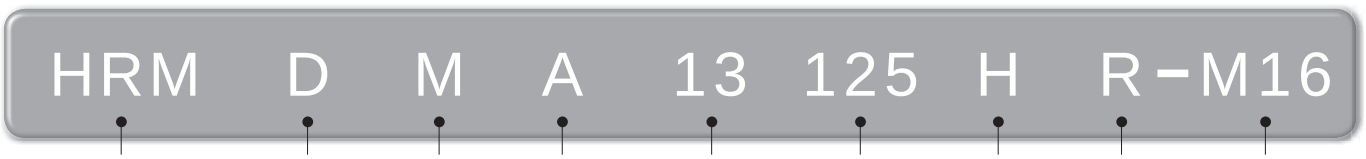
High Removal Milling	Double-sided Insert	Tool type	Unit	Inscribed circle of insert	Tool dia.	Coolant type	Hand	No. of tooth
		C: Cutter	A: Inch M: Metric	09: 09 type insert 13: 13 type insert 16: 16 type insert	300 : Ø3.0	No code: None H: Thru-hole	R: Right L: Left	5: 5 teeth

• Shank type



High Removal Milling	Double-sided Insert	Tool type	Unit	Inscribed circle of insert	Tool dia.	Coolant type	No. of tooth	Shank Dia.	Tool length
		S: Shank	ANSI: Inch ISO: mm	06: 06 type insert 09: 09 type insert 13: 13 type insert	100: Ø1.0	Unmarked: None H: Thru-hole	2: 2 teeth	100: Ø1.00	S: Standard type M: Middle type L : Long type

• Modular head



High Removal Milling	Double-sided Insert	Tool type	Unit	Inscreibed circle of insert	Tool dia.	Coolant type	Hand	M Dimensions
		M: Modular	ANSI: Inch ISO: mm	06: 06 type inser 09: 09 type insert 13: 13 type insert	125: Ø1.25	Unmarked: None H: Thru-hole	R: Right L: Left	

• Modular adaptor

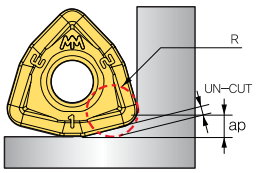


Modular Adaptor	M Dimensions	Neck length	Shank Dia.	Neck type	Adaptor material	Total length
		078: 0.78	S125: Ø1.25	T: Taper S: Straight	Unmarked: Steel C: Carbide	708: 7.08

Corner R programming

Designation	Cutting condition		Approx. R (inch)	
	Max.ap (inch)	Max.fz (ipt)	Input. R	Uncut
WNMX060312ZNN-MM	0.04	0.05	0.07	0.015
WNMX09T316ZNN-MM	0.06	0.08	0.10	0.024
WNMX130520ZNN-MM	0.08	0.12	0.12	0.032
WNMX160720ZNN-MM	0.10	0.14	0.14	0.047

·Information for uncut part by using "Input.R" for CAM program

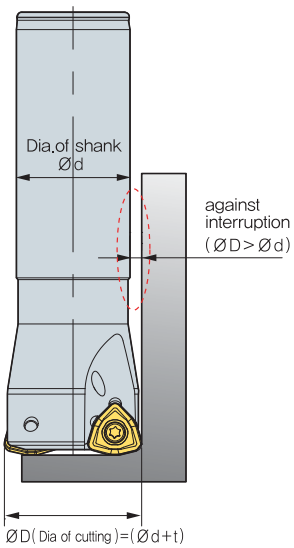


· Uncut part can be changed by poor machine condition or weak clamp of workpiece, etc

Interference prevent system

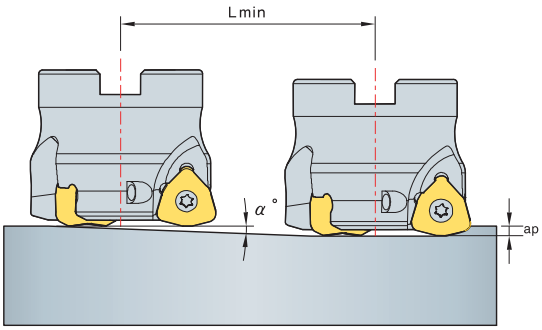
Designation	ØD (inch)	Ød (inch)	t (inch)
HRMDSA06068HR-2□062	0.6880	0.625	0.063
HRMDSA06087HR-2□075	0.8750	0.750	0.125
HRMDSA06112HR-3□100	1.1250	1.000	0.125
HRMDSA06137HR-4□125	1.3750	1.250	0.125
HRMDSA09106HR-2□100	1.0625	1.000	0.060
HRMDSA09131HR-3□125	1.3125	1.250	0.060
HRMDSA09137HR-4□125	1.3750	1.250	0.130
HRMDSA09150HR-4□125	1.5000	1.250	0.250
HRMDSA09200HR-4□150	2.0000	1.500	0.500
HRMDSA13131HR-2□125	1.3130	1.250	0.060
HRMDSA13137HR-2□125	1.3750	1.250	0.130
HRMDSA13150HR-3□125	1.5000	1.250	0.250
HRMDSA13162HR-3□125	1.6250	1.250	0.380
HRMDSA13162HR-3□150	1.6250	1.500	0.130
HRMDSA13200HR-3□150	2.0000	1.500	0.500
HRMDSA13250HR-4□150	2.5000	1.500	1.000

• The side clearance prevents to interference between tool and workpiece even in deep hole machining

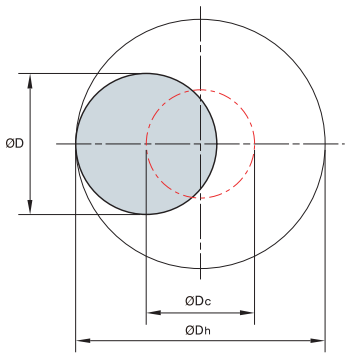


Ramping & helical cutting technical data

Ramping



Helical cutting



$$L_{min} = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

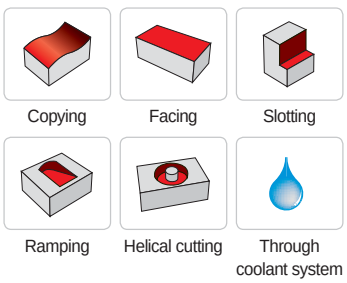
$$\text{ØDc} = \text{ØDh} - \text{ØD}$$

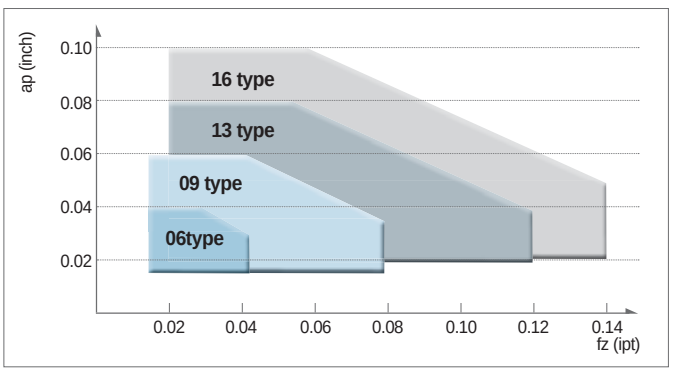
ØDc = Tool pass of tool center
ØDh = Desirable hole diameter on workpiece
ØD = Tool dia.

- Adjust feed to under 70% of Recommended cutting condition when ramping & helical cutting
- In helical ramping, max. cutting depth per 1 helical revolution of cutter should not exceed max. cutting depth as per insert size
- in ramping, max. cutting depth for 1 ramping process should not exceed max. depth of cut as per used insert size

Designation		Tool Dia.	Efficient cutting diameter ØDe (inch)	Ramping			Helical ramping	
				Max. ap (inch)	Max. angle α°	Cutting Length Lmin (inch)	Dh Min. Cutting diameter (inch)	Dh Max. Cutting diameter (inch)
HRMDSA	06068HR	0.688	0.433	0.039	3.7	0.603	1.052	1.281
	06075HR	0.750	0.495	0.039	3.3	0.676	1.177	1.406
	06087HR	0.875	0.619	0.039	2.1	1.063	1.427	1.656
	06100HR	1.000	0.741	0.039	2.6	0.858	1.677	1.909
	06112HR	1.125	0.866	0.039	1.9	1.175	1.927	2.156
	06125HR	1.250	0.992	0.039	0.6	3.724	2.177	2.406
	06137HR	1.375	1.115	0.039	0.4	5.586	2.427	2.656
HRMDSA	09100HR-2□□□	1.000	0.606	0.059	5.4	0.622	1.480	1.843
	09106HR-2□□□	1.063	0.646	0.059	5.0	0.669	1.559	1.921
	09118HR-3□□□	1.188	0.803	0.059	3.9	0.866	1.874	2.236
	09125HR-3□□□	1.250	0.878	0.059	3.5	0.965	2.031	2.394
	09131HR-3□□□	1.313	0.917	0.059	3.3	1.016	2.110	2.472
	09137HR-4□□□	1.375	1.000	0.059	3.0	1.114	2.268	2.630
	09150HR-4□□□	1.500	1.125	0.059	2.5	1.351	2.512	2.874
	09162HR-4□□□	1.625	1.189	0.059	2.5	1.358	2.661	3.024
	09200HR-□□□□	2.000	1.583	0.059	1.8	1.850	3.449	3.811
	13125HR-2□□□□	1.250	0.760	0.079	5.7	0.787	1.850	2.362
	13131HR-2□□□□	1.313	0.799	0.079	5.4	0.839	1.929	2.441
	13137HR-2□□□□	1.375	0.878	0.079	4.8	0.945	2.087	2.598
	13150HR-3□□□□	1.500	0.996	0.079	3.7	1.222	2.331	2.843
	13162HR-3□□□□	1.625	1.071	0.079	3.7	1.209	2.480	2.992
	13200HR-□□□□	2.000	1.457	0.079	2.6	1.732	3.268	3.780
	13250HR-□□□□	2.500	1.969	0.079	1.9	2.413	4.291	4.803
HRMDCA	09200HR-□	2.000	1.583	0.059	1.8	1.850	3.449	3.811
	09250HR-□	2.500	2.091	0.059	1.4	2.492	4.472	4.835
	09300HR-□	3.000	2.760	0.059	1.0	3.327	5.811	6.173
	09400HR-□	4.000	3.543	0.059	0.8	4.311	7.386	7.748
	13200HR-□	2.000	1.457	0.079	2.6	1.732	3.268	3.780
	13250HR-□	2.500	1.969	0.079	1.9	2.413	4.291	4.803
	13300HR-□	3.000	2.634	0.079	1.4	3.307	5.630	6.142
	13400HR-□	4.000	3.421	0.079	1.0	4.358	7.205	7.717
	13500HR-□	5.000	4.406	0.079	0.8	4.488	9.173	9.685
HRMDCA	16300HR-□	3.000	2.343	0.098	1.5	3.742	5.134	5.843
	16400HR-□	4.000	3.344	0.098	1.0	5.614	7.134	7.843
	16500HR-□	5.000	4.345	0.098	0.8	7.018	9.134	9.843
	16600R-□	6.000	5.345	0.098	0.6	9.357	11.134	11.843
	16800R-□	8.000	7.346	0.098	0.3	18.716	15.134	15.843
	161000R-□	10.000	9.346	0.098	0.2	28.074	19.134	19.843
	161200R-□	12.000	11.346	0.098	0.1	56.149	23.134	23.843

Application area





Recommended cutting condition

ISO	Workpiece		Material	Grades	Cutting speed, vc (sfm)
P	Carbon steel	Low carbon steel	1213, C=0.1~25	PC5300	919
				PC5400	804
		General carbon steel	C=0.30~55	PC5300	837
				PC5400	722
		High carbon steel	C=0.55~80	PC5300	787
				PC5400	673
	Low alloy steel (Alloy constituent < 5%)	-	4115, 4120, 4140	PC5300	640
				PC5400	558
		Hardened	-	PC5300	377
				PC5400	328
	High alloy steel (Alloy constituent > 5%)	annealed	H13	PC5300	492
				PC5400	427
		Hardened	M2, M35	PC5300	394
				PC5400	344
M	Stainless steel	Ferritic / martensitic	S41000, S42000, S43000	PC5300	525
				PC5400	443
		Austenitic	S30300, S30400, S31600	PC5300	427
				PC5400	361
		Duplex(Austenitic / Ferrictic)	31803	PC5300	328
				PC5400	279
K	Gray cast iron	Low tensile	No30B, No35B	PC5300	476
				PC5400	361
		Hight tensile	No45B, No50B	PC5300	394
				PC5400	295
	Ductile cast iron	Ferric	60-40-18, 80-55-06	PC5300	312
				PC5400	230
		Pearlitic	80-55-06, 100-70-03	PC5300	279
				PC5400	213
S	Fe Base	-	Incoloy	PC5300	197
				PC5400	164
	Ni Base	-	Inconel, Nimonic, Hastelloy	PC5300	180
				PC5400	148
	Co Base	-	stelite	PC5300	82
				PC5400	66
	Titanium alloys	-	pure Ti	PC5300	427
				PC5400	344
			alloy(TiAl6V4)	PC5300	213
				PC5400	180

Machining example



Working condition

■**Work piece** AISI 1045 (SM45C, HRC22)
■**Cutting speed** vc = 930 sfm
fz = 0.055 ipt
vf = 398 ipm
ap = 0.032 inch
ae = 1.378 inch
Coolant: Dry, Machining: Copying
Machine: Horizontal MCT
Overhang of tool: 10 inch

■**Tool information** HRMDCM13050HR-4
WNMX130520ZNN-MM (PC3500)

40% Increased productivity
80% Reduced tool cost

Test result In comparing HRMD with our competitor using the same cutting conditions, the cutting speed of HRMD was higher with the same depth of cut (ap×ae), the cycle time was reduced by 40% and the tool life was increased to over 60%. HRMD is economically more efficient due to the use of 6 cutting-edges compared to EDNW type with positive insert



Working condition

■**Work piece** AISI 304 (STS304)
■**Cutting speed** vc = 430 sfm
fz = 0.047 ipt
vf = 117 ipm
ap = 0.04 inch
ae = 3.15 inch
Coolant: Wet, Machining : Facing and Slotting
Machine: Facing and Slotting
Overhang of tool: 10 inch

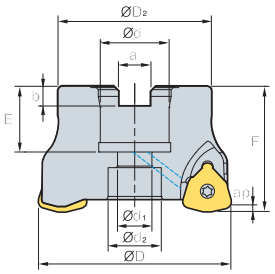
■**Tool information** HRMDCM13100HR-6
WNMX130520ZNN-MM (PC3545)

80% Increased productivity
25% Reduced tool cost

Test result In comparing HRMD with our competitor using the same cutting conditions, the cutting speed of HRMD was higher with the same depth of cut (ap×ae), the cycle time was reduced by 80% and the tool life was same, but HRMD is economically more efficient due to the use of 6 cutting-edges compared to SDKN type with positive insert

HRMDCA09





AA 76°

- AR: -7°
- RR: -12°~ -18°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Bolt
HRMDCA	09200HR-4	4	2.000	1.772	0.750	0.413	0.630	0.315	0.220	0.787	1.75	0.06	0.662	3/8-24UNF
	09200HR-5	5	2.000	1.772	0.750	0.413	0.630	0.315	0.220	0.787	1.75	0.06	0.662	3/8-24UNF
	09250HR-5	5	2.500	1.772	0.750	0.413	0.630	0.315	0.220	0.787	1.75	0.06	1.103	3/8-24UNF
	09250HR-6	6	2.500	1.772	0.750	0.413	0.630	0.315	0.220	0.787	1.75	0.06	1.103	3/8-24UNF
	09300HR-6	6	3.000	2.205	1.000	0.551	0.827	0.374	0.248	0.866	2.00	0.06	3.308	1/2-20UNF
	09300HR-7	7	3.000	2.205	1.000	0.551	0.827	0.374	0.248	0.866	2.00	0.06	3.308	1/2-20UNF
	09400HR-7	7	4.000	2.874	1.250	0.709	1.024	0.500	0.319	0.866	2.00	0.06	4.631	5/8-18UNF
	09400HR-8	8	4.000	2.874	1.250	0.709	1.024	0.500	0.319	0.866	2.00	0.06	4.631	5/8-18UNF

Available inserts

	WNMX-MF	WNMX-ML	WNMX-MM
			

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	09T316ZNN-MF									●			●	●				E28
	09T316ZNN-ML												●	●				
	09T316ZNN-MM						●	●	●	●	●		●	●				

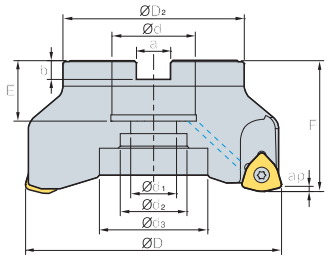
Parts

Specification	Screw	Wrench
Ø2.000~Ø4.000	FTKA0307	TW09S

Available inserts E28

HRMDCA13





AA 76°

- AR: -7°
- RR: -12°~ -4°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Bolt
HRMDCA	13200HR-3	3	2.0	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.08	0.662	3/8-24UNF
	13200HR-4	4	2.0	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.08	0.662	3/8-24UNF
	13250HR-4	4	2.5	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.08	1.103	3/8-24UNF
	13250HR-5	5	2.5	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.08	1.103	3/8-24UNF
	13300HR-5	5	3.0	2.205	1.00	0.551	0.827	-	0.374	0.248	0.866	2.00	0.08	2.205	1/2-20UNF
	13300HR-6	6	3.0	2.205	1.00	0.551	0.827	-	0.374	0.248	0.866	2.00	0.08	2.205	1/2-20UNF
	13400HR-6	6	4.0	2.874	1.25	0.709	1.024	-	0.500	0.319	0.866	2.00	0.08	3.528	5/8-18UNF
	13400HR-7	7	4.0	2.874	1.25	0.709	1.024	-	0.500	0.319	0.866	2.00	0.08	3.528	5/8-18UNF
	13500HR-7	7	5.0	3.433	1.50	0.827	1.220	2.125	0.626	0.394	1.181	2.50	0.08	4.410	3/4-16UNF
	13500HR-8	8	5.0	3.433	1.50	0.827	1.220	2.125	0.626	0.394	1.181	2.50	0.08	4.410	3/4-16UNF

Available inserts

WNMX-MF



WNMX-ML



WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	130520ZNN-MF									●			●	●				E28
	130520ZNN-ML												●	●				
	130520ZNN-MM						●	●	●	●	●		●	●				

Parts

Specification	Screw	Wrench
Ø2.0~Ø5.0	FTKA0412B	TW15S

Available inserts E28

HRMDCA16 new



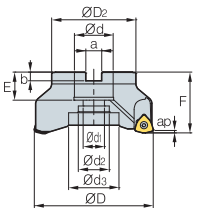


Fig. 1

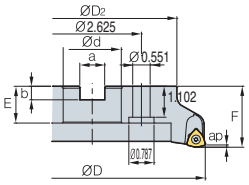


Fig. 2

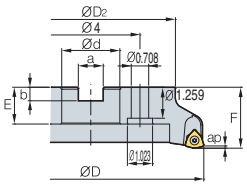


Fig. 3

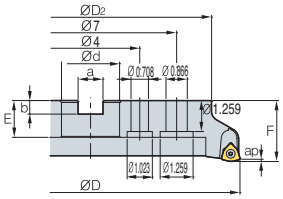


Fig. 4








AA 76°

- AR: -7°
- RR: -12°~ -4°

(inch)

Designation		⊚	ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs	Bolt	Fig.
HRMDCA	16300HR-4	4	3.0	2.362	1.00	0.551	0.827	-	0.374	0.248	0.866	2.00	0.098	1.94	1/2-20UNF	1
	16300HR-5	5	3.0	2.362	1.00	0.551	0.827	-	0.374	0.248	0.866	2.00	0.098	1.81	1/2-20UNF	1
	16400HR-5	5	4.0	3.346	1.25	0.709	1.024	-	0.500	0.319	0.866	2.00	0.098	3.77	5/8-18UNF	1
	16400HR-6	6	4.0	3.346	1.25	0.709	1.024	-	0.500	0.319	0.866	2.00	0.098	3.86	5/8-18UNF	1
	16500HR-6	6	5.0	3.937	1.50	0.827	1.220	2.205	0.626	0.394	1.181	2.50	0.098	7.23	3/4-16UNF	1
	16500HR-7	7	5.0	3.937	1.50	0.827	1.220	2.205	0.626	0.394	1.181	2.50	0.098	7.25	3/4-16UNF	1
	16600R-7	7	6.0	5.039	2.00	-	3.543	-	0.752	0.433	1.181	2.50	0.098	8.99	1-14UNF	2
	16600R-8	8	6.0	5.039	2.00	-	3.543	-	0.752	0.433	1.181	2.50	0.098	9.13	1-14UNF	2
	16800R-8	8	8.0	5.701	2.50	-	5.197	-	1.000	0.551	1.496	2.50	0.098	14.7	-	3
	16800R-10	10	8.0	5.701	2.50	-	5.197	-	1.000	0.551	1.496	2.50	0.098	14.79		3
	161000R-10	10	10.0	7.480	2.50	-	7.087	-	1.000	0.551	1.496	2.50	0.098	24.98	-	3
	161000R-12	12	10.0	7.480	2.50	-	7.087	-	1.000	0.551	1.496	2.50	0.098	24.89		3
	161200R-12	12	12.0	9.646	2.50	-	9.370	-	1.000	0.551	1.496	2.50	0.098	37.15	-	4
	161200R-14	14	12.0	9.646	2.50	-	9.370	-	1.000	0.551	1.496	2.50	0.098	37.39		4

Available inserts

WNMX-MF



WNMX-ML



WNMX-MM



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	160720ZNN-MF									●			●	●				E28
	160720ZNN-ML												●					
	160720ZNN-MM									●			●	●				

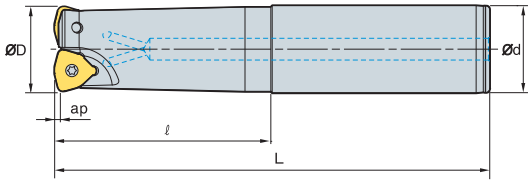
Parts

Specification	Screw	Wrench
Ø3.0~Ø12.0	FTGA0513-P	TW20-100

Available inserts E28

HRMDSA06 new





AA 76°

- AR: -7°
- RR: -17°~ -25°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMDSA	06068HR-2S062	2	0.688	0.625	0.787	4.331	0.039	0.32
	06068HR-2M062	2	0.688	0.625	0.787	5.906	0.039	0.44
	06068HR-2L062	2	0.688	0.625	0.787	7.874	0.039	0.60
	06075HR-2S075	2	0.750	0.750	1.969	5.118	0.039	0.55
	06075HR-2M075	2	0.750	0.750	3.937	7.087	0.039	0.75
	06075HR-2L075	2	0.750	0.750	5.118	9.843	0.039	1.06
	06087HR-2S075	2	0.875	0.750	0.787	5.118	0.039	0.59
	06087HR-2M075	2	0.875	0.750	0.787	7.087	0.039	0.82
	06087HR-2L075	2	0.875	0.750	0.787	9.843	0.039	1.14
	06100HR-3S100	3	1.000	1.000	2.362	5.512	0.039	1.01
	06100HR-3M100	3	1.000	1.000	3.150	7.087	0.039	1.31
	06100HR-3L100	3	1.000	1.000	4.724	9.843	0.039	1.84
	06112HR-3S100	3	1.125	1.000	1.181	5.512	0.039	1.09
	06112HR-3M100	3	1.125	1.000	1.181	7.087	0.039	1.40
	06112HR-3L100	3	1.125	1.000	1.181	9.843	0.039	1.95
	06125HR-4S125	4	1.250	1.250	2.756	5.906	0.039	1.76
	06125HR-4M125	4	1.250	1.250	3.937	7.874	0.039	2.38
	06125HR-4L125	4	1.250	1.250	7.087	11.811	0.039	3.58
	06137HR-4S125	4	1.375	1.250	1.575	7.874	0.039	2.53
	06137HR-4M125	4	1.375	1.250	1.575	9.843	0.039	3.17
	06137HR-4L125	4	1.375	1.250	1.575	11.811	0.039	3.81

Available inserts


WNMX-MF


WNMX-ML


WNMX-MM

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC3530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	060312ZNN-MF									●			●	●				E28
	060312ZNN-ML												●	●				
	060312ZNN-MM						●	●		●			●	●				

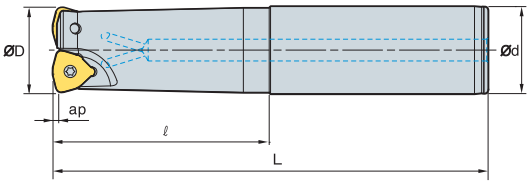
Parts

Specification	Screw	Wrench
Ø0.688~Ø1.375	ETNA02506	TW07S

Available inserts E28

HRMDSA09





AA 76°
• AR: -7°
• RR: -17°~ -25°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMDSA	09100HR-2S100	2	1.0000	1.00	2.362	5.512	0.06	1.103
	09100HR-2M100	2	1.0000	1.00	4.724	7.874	0.06	1.323
	09100HR-2L100	2	1.0000	1.00	7.087	11.811	0.06	2.205
	09106HR-2S100	2	1.0625	1.00	2.362	5.512	0.06	1.103
	09106HR-2M100	2	1.0625	1.00	2.362	7.874	0.06	1.544
	09106HR-2L100	2	1.0625	1.00	2.362	11.811	0.06	2.205
	09118HR-3S125	3	1.1875	1.25	2.756	5.906	0.06	1.764
	09118HR-3M125	3	1.1875	1.25	4.724	7.874	0.06	2.205
	09118HR-3L125	3	1.1875	1.25	7.087	11.811	0.06	3.308
	09125HR-3S125	3	1.2500	1.25	2.756	5.906	0.06	1.764
	09125HR-3M125	3	1.2500	1.25	4.724	7.874	0.06	2.426
	09125HR-3L125	3	1.2500	1.25	7.087	11.811	0.06	3.749

Available inserts

WNMX-MF | WNMX-ML | WNMX-MM







Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	09T316ZNN-MF									●			●	●				E28
	09T316ZNN-ML												●	●				
	09T316ZNN-MM						●	●	●	●	●		●	●				

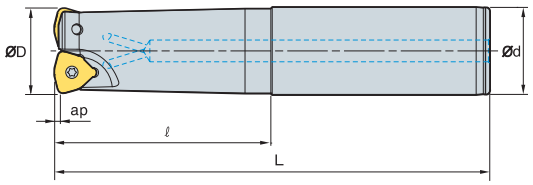
Parts

Specification	Screw	Wrench
Ø1.0000~Ø1.2500	FTKA0307	TW09S

Available inserts E28

HRMDSA09





AA 76°

- AR: -7°
- RR: -17°~ -25°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMDSA	09131HR-3S125	3	1.3125	1.25	2.756	5.906	0.06	1.764
	09131HR-3M125	3	1.3125	1.25	2.756	7.874	0.06	2.426
	09131HR-3L125	3	1.3125	1.25	2.756	11.811	0.06	3.749
	09137HR-4S125	4	1.3750	1.25	1.969	5.906	0.06	1.985
	09137HR-4M125	4	1.3750	1.25	1.969	7.874	0.06	2.426
	09137HR-4L125	4	1.3750	1.25	1.969	11.811	0.06	3.749
	09150HR-4S125	4	1.5000	1.25	1.969	5.906	0.06	1.985
	09150HR-4M125	4	1.5000	1.25	1.969	9.843	0.06	3.308
	09150HR-4L125	4	1.5000	1.25	1.969	11.811	0.06	3.969
	09200HR-4S150	4	2.0000	1.50	1.575	5.906	0.06	3.087
	09200HR-4M150	4	2.0000	1.50	1.575	9.843	0.06	5.292
	09200HR-4L150	4	2.0000	1.50	1.575	11.811	0.06	6.395
	09200HR-5S150	5	2.0000	1.50	1.575	5.906	0.06	3.087
	09200HR-5M150	5	2.0000	1.50	1.575	9.843	0.06	5.292
	09200HR-5L150	5	2.0000	1.50	1.575	11.811	0.06	6.395

Available inserts

WNMX-MF



WNMX-ML



WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	09T316ZNN-MF									●			●	●				E28
	09T316ZNN-ML												●	●				
	09T316ZNN-MM						●	●	●	●	●		●	●				

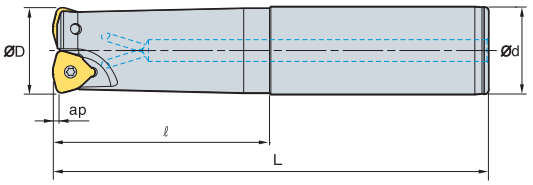
Parts

Specification	Screw	Wrench
Ø1.3125~Ø2.0000	FTKA0307	TW09S

Available inserts E28

HRMDSA13





AA 76°

- AR: -7°
- RR: -14°~ -16°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMDSA	13125HR-2S125	2	1.250	1.250	2.756	5.906	0.08	1.764
	13125HR-2M125	2	1.250	1.250	4.724	7.874	0.08	2.205
	13125HR-2L125	2	1.250	1.250	7.087	11.811	0.08	3.528
	13131HR-2S125	2	1.313	1.250	2.756	5.906	0.08	1.754
	13131HR-2M125	2	1.313	1.250	2.756	7.874	0.08	2.426
	13131HR-2L125	2	1.313	1.250	2.756	11.811	0.08	3.749
	13137HR-2S125	2	1.375	1.250	1.969	5.906	0.08	1.764
	13137HR-2M125	2	1.375	1.250	1.969	7.874	0.08	2.426
	13137HR-2L125	2	1.375	1.250	1.969	11.811	0.08	3.749
	13150HR-3S125	3	1.500	1.250	1.969	5.906	0.08	1.764
	13150HR-3M125	3	1.500	1.250	1.969	9.843	0.08	3.087
	13150HR-3L125	3	1.500	1.250	1.969	11.811	0.08	3.749
	13150HR-3S150	3	1.500	1.500	2.362	5.906	0.08	2.646
	13150HR-3M150	3	1.500	1.500	5.118	9.843	0.08	4.631
	13150HR-3L150	3	1.500	1.500	7.087	11.811	0.08	5.733

Available inserts

WNMX-MF



WNMX-ML



WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	130520ZNN-MF									●			●	●				E28
	130520ZNN-ML									●			●	●				
	130520ZNN-MM						●	●	●	●	●		●	●				

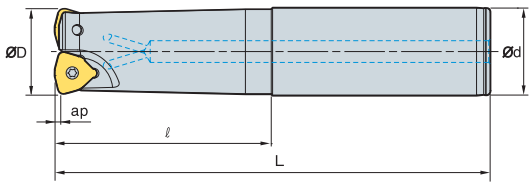
Parts

Specification	Screw	Wrench
Ø1.250~Ø1.500	FTKA0412B	TW15S

Available inserts E28

HRMDSA13





AA 76°

- AR: -7°
- RR: -14°~ -16°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMDSA	13162HR-3S125	3	1.625	1.250	1.969	5.906	0.08	1.985
	13162HR-3M125	3	1.625	1.250	1.969	9.843	0.08	2.646
	13162HR-3L125	3	1.625	1.250	1.969	11.811	0.08	3.969
	13162HR-3S150	3	1.625	1.500	1.969	5.906	0.08	2.867
	13162HR-3M150	3	1.625	1.500	1.969	9.843	0.08	4.851
	13162HR-3L150	3	1.625	1.500	1.969	11.811	0.08	5.954
	13200HR-3S150	3	2.000	1.500	1.969	5.906	0.08	2.426
	13200HR-3M150	3	2.000	1.500	1.969	9.843	0.08	3.749
	13200HR-3L150	3	2.000	1.500	1.969	11.811	0.08	4.410
	13200HR-4S150	4	2.000	1.500	1.969	5.906	0.08	3.308
	13200HR-4M150	4	2.000	1.500	1.969	9.843	0.08	5.292
	13200HR-4L150	4	2.000	1.500	1.969	11.811	0.08	6.395
	13250HR-4S150	4	2.500	1.500	1.969	5.906	0.08	3.087
	13250HR-4M150	4	2.500	1.500	1.969	9.843	0.08	4.631
	13250HR-4L150	4	2.500	1.500	1.969	11.811	0.08	5.292
	13250HR-5S150	5	2.500	1.500	1.969	5.906	0.08	3.969
	13250HR-5M150	5	2.500	1.500	1.969	9.843	0.08	6.174
	13250HR-5L150	5	2.500	1.500	1.969	11.811	0.08	7.056

Available inserts

WNMX-MF



WNMX-ML



WNMX-MM



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	130520ZNN-MF									●			●	●				E28
	130520ZNN-ML												●	●				
	130520ZNN-MM						●	●	●	●	●		●	●				

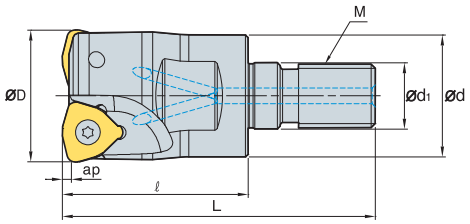
Parts

Specification	Screw	Wrench
Ø1.625~Ø2.500	FTKA0412B	TW15S

Available inserts E28

HRMDMA06 new





AA 76°

- AR: -7°
- RR: -18°~ -25°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
HRMDMA	06068HR-M08	2	0.688	0.571	0.335	0.984	1.654	M08	0.039	0.07
	06075HR-M10	2	0.750	0.689	0.413	1.181	2.008	M10	0.039	0.13
	06087HR-M10	2	0.875	0.709	0.413	1.181	2.008	M10	0.039	0.15
	06100HR-M12	3	1.000	0.906	0.492	1.378	2.323	M12	0.039	0.23
	06112HR-M12	3	1.125	0.906	0.492	1.378	2.323	M12	0.039	0.28
	06125HR-M16	4	1.250	1.142	0.669	1.575	2.638	M16	0.039	0.45
	06137HR-M16	4	1.375	1.142	0.669	1.575	2.638	M16	0.039	0.51

Available inserts

WNMX-MF new | WNMX-ML new | WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	060312ZNN-MF									●			●	●				E28
	060312ZNN-ML									●			●	●				
	060312ZNN-MM						●	●		●			●	●				

Available adaptor

Designation		Available adaptor
HRMDMA	06068HR-M08	MATA- M08
	06075HR-M10	MATA- M10
	06087HR-M10	MATA- M10
	06100HR-M12	MATA- M12

Designation		Available adaptor
HRMDMA	06112HR-M12	MATA- M12
	06125HR-M16	MATA- M16
	06137HR-M16	MATA- M16

Designation: HRMDMA06100HR-M12
Modular head threading measure size (M12)

=

Adaptor spec.: MATA-M12-118-S100S
Adaptor threading measure (M12)

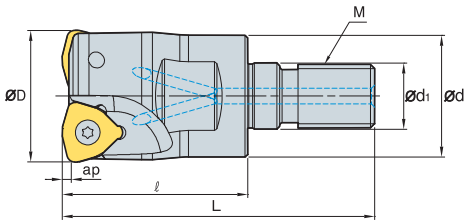
Parts

Specification	Screw	Wrench
Ø0.688~Ø1.375	ETNA02506	TW07S

Available inserts E28

HRMDMA09





AA 76°

- AR: -7°
- RR: -18°~ -25°

(inch)

Designation			ØD	Ød	ød1	ℓ	L	M	ap	lbs
HRMDMA	09100HR-M12	2	1.000	0.906	0.492	1.378	2.323	M12	0.06	0.22
	09106HR-M12	2	1.063	0.906	0.492	1.378	2.323	M12	0.06	0.24
	09118HR-M16	3	1.188	1.142	0.669	1.575	2.638	M16	0.06	0.42
	09125HR-M16	3	1.250	1.142	0.669	1.575	2.638	M16	0.06	0.44
	09131HR-M16	3	1.313	1.142	0.669	1.575	2.638	M16	0.06	0.46
	09137HR-M16	4	1.375	1.142	0.669	1.575	2.638	M16	0.06	0.49
	09150HR-M16	4	1.500	1.142	0.669	1.575	2.638	M16	0.06	0.55

Available inserts

WNMX-MF WNMX-ML WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	09T316ZNN-MF									●			●	●				E28
	09T316ZNN-ML												●	●				
	09T316ZNN-MM						●	●	●	●	●		●	●				

Available adaptor

Designation		Available adaptor
HRMDMA	09100HR-M12	MATA- M12
	09106HR-M12	
	09118HR-M16	MATA- M16
	09125HR-M16	
	09131HR-M16	
	09137HR-M16	
	09150HR-M16	

Designation: HRMDMA09125HR-M16
Modular head threading measure size (M16)

=

Adaptor spec.: MATA-M16-137-S125S
Adaptor threading measure (M16)

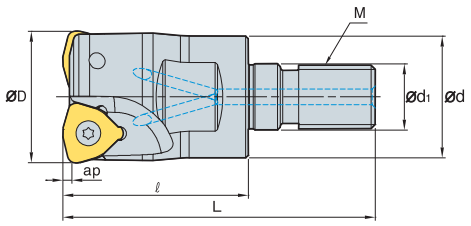
Parts

Specification	Screw	Wrench
Ø1.000~Ø1.500	FTKA0307	TW09S

Available inserts E28

HRMDMA13





AA 76°

- AR: -7°
- RR: -18°~ -25°

(inch)

Designation			ØD	Ød	ød1	ℓ	L	M	ap	lbs
HRMDMA	13125HR-M16	2	1.250	1.142	0.669	1.575	2.638	M16	0.08	0.44
	13131HR-M16	2	1.313	1.142	0.669	1.575	2.638	M16	0.08	0.44
	13137HR-M16	2	1.375	1.142	0.669	1.575	2.638	M16	0.08	0.49
	13150HR-M16	3	1.500	1.142	0.669	1.772	2.835	M16	0.08	0.57

Available inserts

WNMX-MF WNMX-ML WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	130520ZNN-MF									●			●	●				E28
	130520ZNN-ML									●			●	●				
	130520ZNN-MM						●	●	●	●	●		●	●				

Available adaptor

Designation		Available adaptor
HRMDMA	13125HR-M16	MATA-M16
	13131HR-M16	
	13137HR-M16	
	13150HR-M16	

Designation: HRMDMA13125HR-M16
Modular head threading measure size (M16)

||

Adaptor spec.: MATA-M16-137-S125S
Adaptor threading measure (M16)

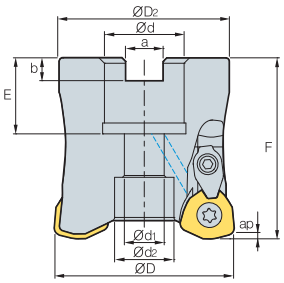
Parts

Specification	Screw	Wrench
Ø1.250~Ø1.500	FTKA0412B	TW15S

Available inserts E28 Available Adaptor E308~E309

HRMCA13





AA 75°

- AR: 7°
- RR: -15°~ -5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Bolt
HRMCA	13200HR-3	3	2	1.850	3 /4	0.433	0.646	0.321	0.220	0.787	1.75	0.08	0.88	3/8-24UNF
	13200HR-4	4	2	1.850	3 /4	0.433	0.646	0.321	0.220	0.787	1.75	0.08	0.88	3/8-24UNF
	13250HR-4	4	2 1/2	2.362	3/4	0.433	0.669	0.321	0.220	0.787	1.75	0.08	1.54	3/8-24UNF
	13300HR-5	5	3	2.992	1	0.709	1.024	0.384	0.248	0.866	2.00	0.08	3.52	1/2-20UNF

Available inserts

WDKT-MH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	130520ZDSR-MH						●	●	●	●	●	●	●	●				E27

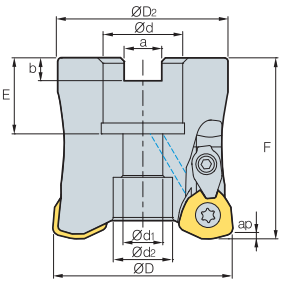
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench
Ø2~Ø3	FTGA0513-P	CHH4.5R1	CTX04513H	CR03	TW20-100

Available inserts E27

HRMCA15





AA 75°

- AR: 7°
- RR: -15°~ -5°

(inch)

Designation			ØD	ØD	Ød	Ød1	Ød2	a	b	E	F	ap	lbs	Bolt
HRMCA	15250HR-3	3	2 1/2	2.362	3/4	0.433	0.669	0.321	0.220	0.787	1.75	0.10	1.54	3/8-24UNF
	15300HR-4	4	3	2.992	1	0.709	1.024	0.384	0.248	0.866	2.00	0.10	3.74	1/2-20UNF
	15400HR-5	5	4	3.780	1 1/4	0.709	1.024	0.510	0.319	0.866	2.00	0.10	6.16	1/2-20UNF
	15400HR-6	6	4	3.780	1 1/4	0.709	1.024	0.510	0.319	0.866	2.00	0.10	7.04	1/2-20UNF
	15500HR-6	6	5	3.858	1 1/2	0.866	1.260	0.636	0.394	1.181	2.50	0.10	7.26	3/4-16UNF
	15600HR-7	7	6	3.937	2	-	2.835	0.758	0.433	1.181	2.50	0.10	9.46	1-14UNF

Available inserts

WDKT-MH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	150625ZDSR-MH								●	●	●	●	●	●				E27

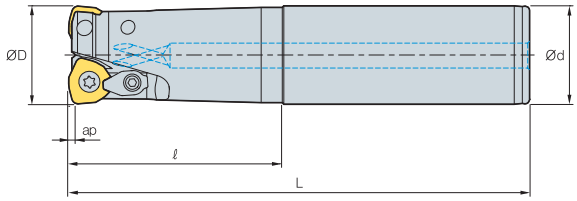
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench
Ø2 1/2~6	FTGA0513-P	CHH5.5R1	CTX0515	CR04	TW20-100

Available inserts E27

HRMSA08/10





AA 75°

- AR: 7°
- RR: -11°~ -5°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMSA	08075HR-2S075	2	3/4	3/4	1.969	5.118	0.04	0.66
	08075HR-2M075	2	3/4	3/4	3.937	7.087	0.04	0.88
	08075HR-2L075	2	3/4	3/4	5.118	9.843	0.04	1.10
	08087HR-2S075	2	7/8	3/4	1.969	5.118	0.04	0.66
	08087HR-2M075	2	7/8	3/4	1.969	7.087	0.04	0.88
	08087HR-2L075	2	7/8	3/4	1.969	9.843	0.04	1.10
	10100HR-2S100	2	1	1	2.362	5.512	0.06	0.88
	10100HR-2M100	2	1	1	4.724	7.874	0.06	0.32
	10100HR-2L100	2	1	1	7.087	11.811	0.06	0.98
	10106HR-2S100	2	1 1/16	1	2.362	5.512	0.06	0.88
	10106HR-2M100	2	1 1/16	1	2.362	7.874	0.06	1.32
	10106HR-2L100	2	1 1/16	1	2.362	11.811	0.06	2.20
	10118HR-2S125	2	1 3/16	1 1/4	2.756	5.906	0.06	1.76
	10118HR-2M125	2	1 3/16	1 1/4	4.724	7.874	0.06	2.20
	10118HR-2L125	2	1 3/16	1 1/4	7.087	11.811	0.06	3.30

Available inserts

WDKT-MH



Type	Designation		Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
08 type	WDKT	080316ZDSR-MH						●	●	●	●	●	●	●	●				E27
10 type	WDKT	10T320ZDSR-MH						●	●	●	●	●	●	●	●				

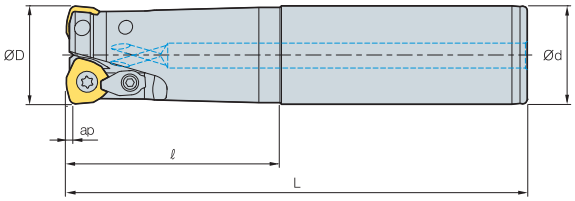
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench
Ø3/4~Ø7/8 (08 type)	FTNA0306	-	-	-	TW09P
Ø1~Ø1 3/16 (10 type)	FTKA0408	CHH3.5R1	CTX03510	CR03	TW15S

Available inserts E27

HRMSA13





AA 75°

- AR: 7°
- RR: -11°~ -5°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMSA	13125HR-2S125	2	1 1/4	1 1/4	2.756	5.906	0.08	1.76
	13125HR-2M125	2	1 1/4	1 1/4	4.724	7.874	0.08	2.20
	13125HR-2L125	2	1 1/4	1 1/4	7.087	11.811	0.08	3.52
	13131HR-2S125	2	1 5/16	1 1/4	2.756	5.906	0.08	1.76
	13131HR-2M125	2	1 5/16	1 1/4	2.756	7.874	0.08	2.42
	13131HR-2L125	2	1 5/16	1 1/4	2.756	11.811	0.08	3.74
	13137HR-2S125	2	1 3/8	1 1/4	1.969	5.906	0.08	1.76
	13137HR-2M125	2	1 3/8	1 1/4	1.969	7.874	0.08	2.42
	13137HR-2L125	2	1 3/8	1 1/4	1.969	11.811	0.08	3.74
	13150HR-3S125	3	1 1/2	1 1/4	1.969	5.906	0.08	1.76
	13150HR-3M125	3	1 1/2	1 1/4	1.969	9.843	0.08	3.08
	13150HR-3L125	3	1 1/2	1 1/4	1.969	11.811	0.08	3.74
	13150HR-3S150	3	1 1/2	1 1/2	2.362	5.906	0.08	2.64
	13150HR-3M150	3	1 1/2	1 1/2	5.118	9.843	0.08	4.62
	13150HR-3L150	3	1 1/2	1 1/2	7.087	11.811	0.08	5.72

Available inserts

WDKT-MH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	130520ZDSR-MH						●	●	●	●	●	●	●	●				E27

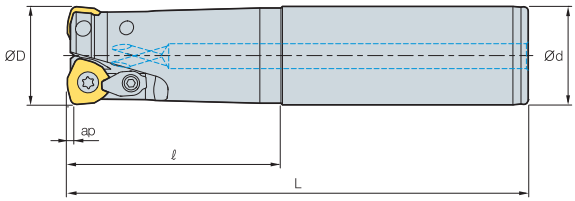
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench
Ø1 1/4, 1 5/16, 1 3/8	FTGA0510-P	CHH4.5R1	CTX04513H	CR03	TW20
Ø1 1/2	FTGA0512-P	CHH5.5R1	CTX04513H	CR03	TW20

Available inserts E27

HRMSA15





AA 75°

- AR: 7°
- RR: -8°~ -6°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
HRMSA	15200HR-3S125	3	2	1 1/4	1.969	5.906	0.10	2.20
	15200HR-3M125	3	2	1 1/4	1.969	9.843	0.10	3.52
	15200HR-3L125	3	2	1 1/4	1.969	11.811	0.10	4.18
	15200HR-3S150	3	2	1 1/2	1.969	5.906	0.10	3.08
	15200HR-3M150	3	2	1 1/2	1.969	9.843	0.10	5.06
	15200HR-3L150	3	2	1 1/2	1.969	11.811	0.10	6.16
	15250HR-4S125	4	2 1/2	1 1/4	1.969	5.906	0.10	2.86
	15250HR-4M125	4	2 1/2	1 1/4	1.969	9.843	0.10	4.18
	15250HR-4L125	4	2 1/2	1 1/4	1.969	11.811	0.10	4.84
	15250HR-4S150	4	2 1/2	1 1/2	1.969	5.906	0.10	3.74
	15250HR-4M150	4	2 1/2	1 1/2	1.969	9.843	0.10	5.72
	15250HR-4L150	4	2 1/2	1 1/2	1.969	11.811	0.10	6.82

Available inserts

WDKT-MH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC3530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	150625ZDSR-MH								●	●	●	●	●	●				E27

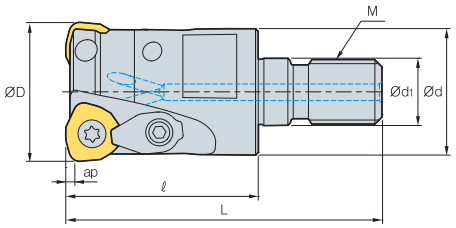
Parts

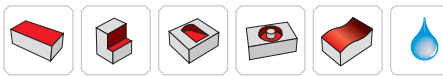
Specification	Screw	Clamp	Clamp screw	C-ring	Wrench
Ø2~Ø2 1/2	FTGA0513-P	CHH5.5R1	CTX0515	CR04	TW20

Available inserts E27

HRMMA08







AA 75°

- AR: 7°
- RR: -11°~ -5°

(inch)

Designation			ØD	Ød	ød1	ℓ	L	M	ap	lbs
HRMMA	08075HR-M10	2	3/4	0.689	0.413	1.181	2.008	M10	0.04	0.11
	08081HR-M10	2	13/16	0.689	0.413	1.181	2.008	M10	0.04	0.11
	08100HR-M12	3	1	0.906	0.492	1.378	2.323	M12	0.04	0.22
	08106HR-M12	3	1 1/16	0.906	0.492	1.378	2.323	M12	0.04	0.26
	08112HR-M12	3	1 1/8	0.906	0.492	1.378	2.323	M12	0.04	0.46
	08125HR-M16	4	1 1/4	1.142	0.669	1.575	2.638	M16	0.04	0.48
	08131HR-M16	4	1 5/16	1.142	0.669	1.575	2.638	M16	0.04	0.48
	08137HR-M16	4	1 3/8	1.142	0.669	1.575	2.638	M16	0.04	0.51
	08150HR-M16	5	1 1/2	1.142	0.669	1.575	2.638	M16	0.04	0.55

Available inserts

WDKT-MH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	080316ZDSR-MH						●	●	●	●	●	●	●	●				E27

Available adaptor

Designation		Available adaptor
HRMMA	08075HR-M10	MATA-M10
	08081HR-M10	
	08100HR-M12	MATA-M12
	08106HR-M12	
	08112HR-M12	
	08125HR-M16	MATA-M16
	08131HR-M16	
	08137HR-M16	
	08150HR-M16	

Designation: HRMMA08075HR-M10
Modular head threading measure size (M10)

II

Adaptor spec.: MATA-M10-118-S075S
Adaptor threading measure (M10)

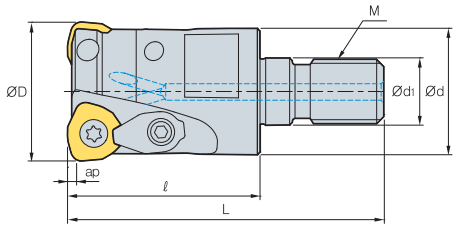
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench	Wrench
Ø3/4~Ø1 1/2	FTNA0306	-	-	-	-	-

Available inserts E27 Available Adaptor E308~E309

HRMMA10/13







AA 75°

- AR: 7°
- RR: -11°~ -5°

(inch)

Designation			ØD	Ød	ød1	ℓ	L	M	ap	lbs
HRMMA	10100HR-M12	2	1	0.906	0.492	1.378	2.323	M12	0.06	0.20
	10106HR-M12	2	1 1/16	0.906	0.492	1.378	2.323	M12	0.06	0.20
	10118HR-M16	2	1 3/16	1.142	0.669	1.575	2.638	M16	0.06	0.37
	10125HR-M16	3	1 1/4	1.142	0.669	1.772	2.835	M16	0.06	0.46
	10137HR-M16	3	1 3/8	1.142	0.669	1.772	2.835	M16	0.06	0.51
	10150HR-M16	4	1 1/2	1.142	0.669	1.772	2.835	M16	0.06	0.59
HRMMA	13125HR-M16	2	1 1/4	1.142	0.669	1.575	2.638	M16	0.08	0.37
	13131HR-M16	2	1 5/16	1.142	0.669	1.575	2.638	M16	0.08	0.37
	13137HR-M16	2	1 3/8	1.142	0.669	1.575	2.638	M16	0.08	0.42
	13150HR-M16	3	1 1/2	1.142	0.669	1.772	2.835	M16	0.08	0.53

Available inserts

WDKT-MH



Type	Designation		Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
10 type	WDKT	10T320ZDSR-MH						●	●	●	●	●	●	●	●				E27
13 type	WDKT	130520ZDSR-MH						●	●	●	●	●	●	●	●				

Available adaptor

Designation		Available adaptor
HRMMA	10100HR-M12	MATA-M12
	10106HR-M12	
	10118HR-M16	MATA-M16
	10125HR-M16	
	10137HR-M16	
	10150HR-M16	
	13125HR-M16	MATA-M16
	13131HR-M16	
	13137HR-M16	
	13150HR-M16	

Designation: HRMMA10125HR-M16
Modular head threading measure size (M16)

II

Adaptor spec.: MATA-M16-137-S125S
Adaptor threading measure (M16)

Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench	Wrench
Ø1~Ø1 1/2 (10 type)	FTKA0408	CHH3.5R1	CTX03510	CR03	TW15S	-
Ø1 1/4, 1 5/16, 1 3/8 (13 type)	FTGA0510-P	CHH4.5R1	CTX04513H	CR03	-	TW20
Ø1 1/2 (13 type)	FTGA0512-P	CHH5.5R1	CTX04513H	CR03	-	TW20

Available inserts E27 Available Adaptor E308~E309

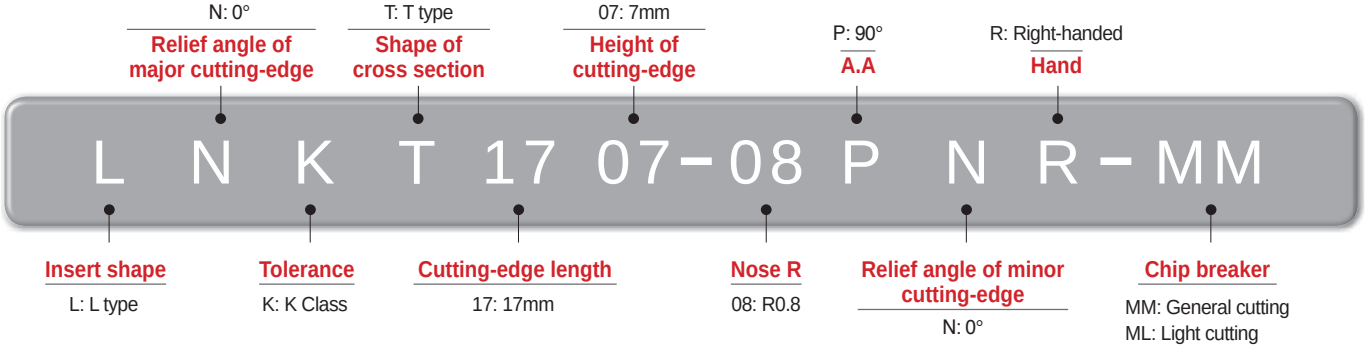
This milling tool series with its tangential clamping system increases stable machining and productivity, while improving perpendicularity

Tangen-Pro TP2P new

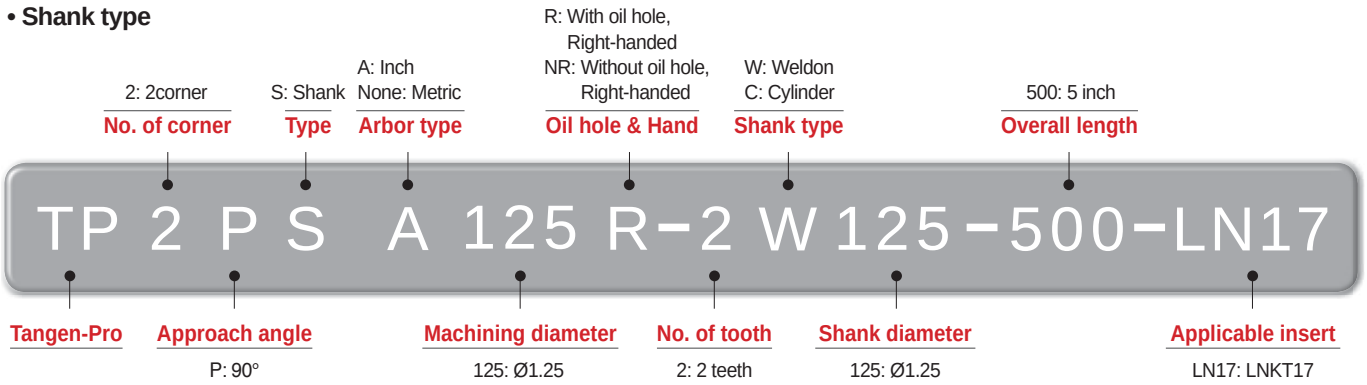
- Clamping stability gained through tangential clamping system and wedge-shaped inserts
- Excellent surface finish nearly perfect perpendicularity, and highly even flank surface compared to competitors' designs
- Improved productivity due to High-rake angles and sharp cutting-edges which lead to lower cutting resistance
  → Ideally suited for high speed and high feed machining

Code system

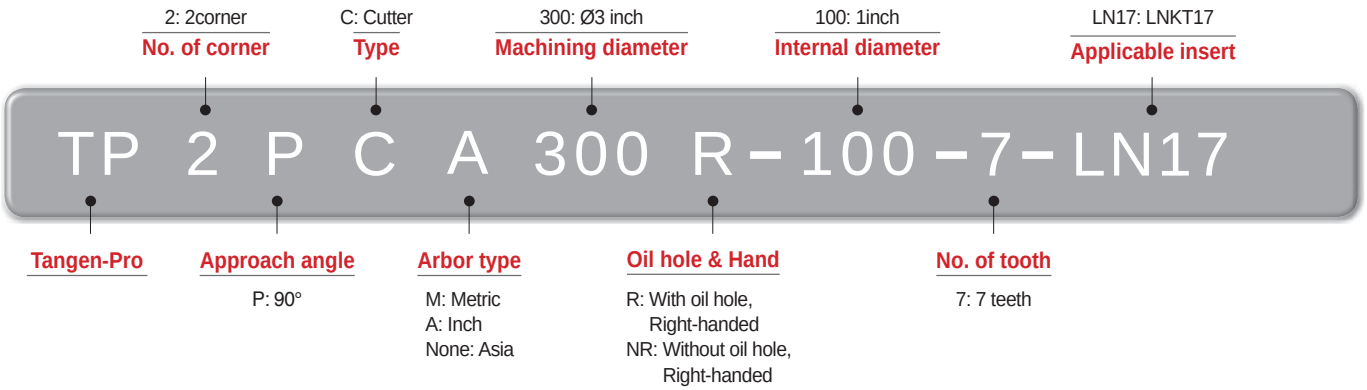
• Insert



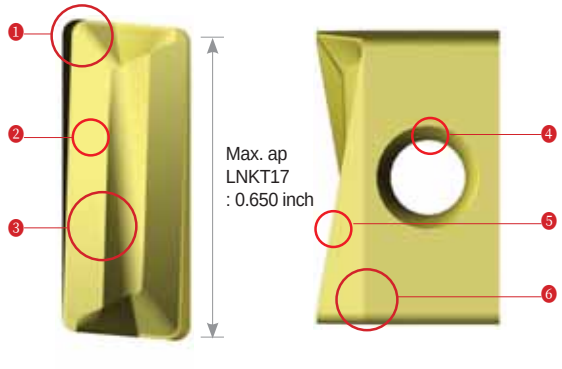
• Shank type



• Cutter type



Features of insert



1 Wedge type clamping area

- Clamping in wedge form on seats
  → Creates strong clamping force

2 High-rake angle chip breaker

- High-rake angle applied
- Produces smooth chip flow
  → Extended insert life

3 Convex projection

- Improved chip evacuation
- Enhances rigidity

4 Side hole (tangential type)

- Higher clamping stability

5 High-rake angle cutting-edges

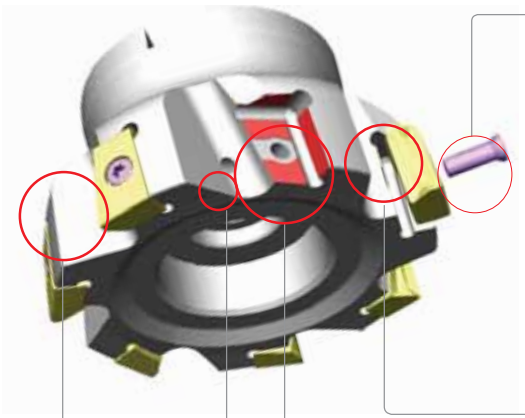
- Improves cutting performance while reducing cutting load

6 2-level flank relief surface

- 1st reverse positive relief surface enhances rigidity
- 2nd negative relief surface enables stable clamping
  → Improved chipping resistance and surface finish

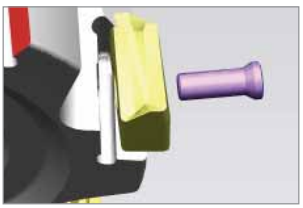
Features of cutter

- Tangential clamping system, wedge-shaped inserts and wide seat area
  → Higher clamping stability
  → Lower vibrations and cutting resistance during machining
- Optimized H/D design with curved surface for smooth chip flow
  → Excellent chip evacuation in ramping or deep shouldering



Tangential clamping

- Multi-corner use
  → High feed machining availability



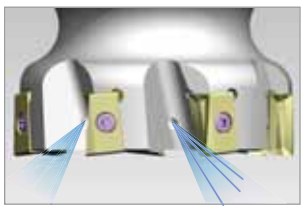
Efficient holder design

- Smoother chip evacuation in slotting or deep shouldering



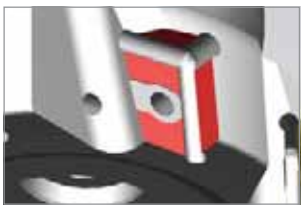
Through coolant system

- Improved chip evacuation
- Longer tool life due to insert cooling



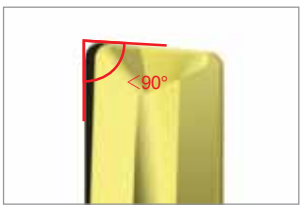
Wide seat area

- Strong clamping force



Wedge type clamping

- Stable insert life



Features of chip breaker

Chip breaker	Cutting-edge	Application	Features
ML		Light cutting	Chip breaker design for low cutting resistance that provides excellent tool life and quality surface finishes in light cutting and hard-to-cut materials
MM		General cutting	Universal design for general shoulder milling operations, highly suitable in most applications

Application guideline for grade

Workpiece		P		K
		Carbon steel	Alloy steel	Cast iron
Grades	High speed cutting	PC5300	PC5300	PC6510
	General cutting	PC5400	PC5300	PC6510
	Interrupted cutting	PC5400	PC5400	PC5300

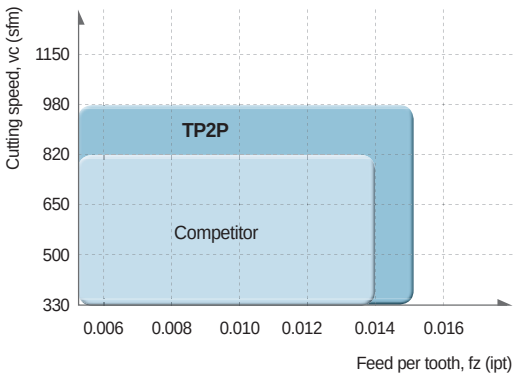
Recommended cutting condition

Workpiece		Grades	vc (sfm)	fz (ipt)	Max. ap (inch)	Applicable insert
P	Steel	PC5300	190~780	0.010~0.002	0.650	LNKT170708PNR-MM
		PC5400	430~680	0.010~0.002	0.650	
K	Cast iron	PC6510	330~820	0.010~0.002	0.650	LNKT170708PNR-ML

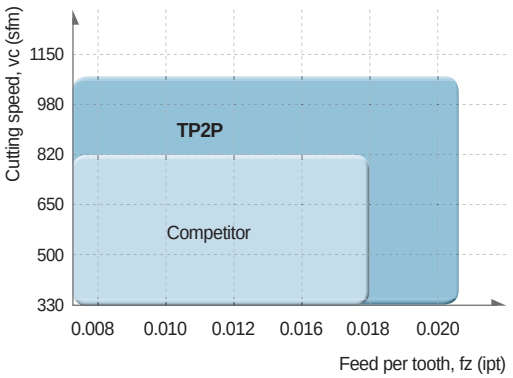
※ The above data refer to general cutting conditions and can be adjustable to the speed of 900 sfm and the feed per tooth of 0.02 ipt depending on user environment.

Application area

Application area: ap (inch) = 0.551, ae (inch) = 0.394

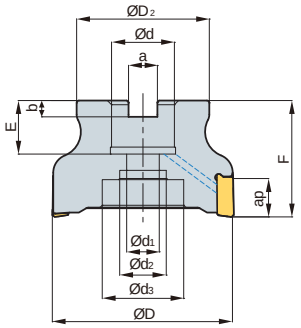


Application area: ap (inch) = 0.315, ae (inch) = 0.394



TP2PCA new







AA 0°

- AR: -6°
- RR: -21°~ -14°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	lbs
TP2PCA	150R-050-3-LN17	3	1.5	1.417	0.50	0.287	0.433	-	0.252	0.170	0.630	1.50	0.650	0.402
	150R-050-4-LN17	4	1.5	1.417	0.50	0.287	0.433	-	0.252	0.170	0.630	1.50	0.650	0.379
	200R-075-4-LN17	4	2.0	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.650	0.692
	200R-075-5-LN17	5	2.0	1.772	0.75	0.413	0.630	-	0.315	0.220	0.787	1.75	0.650	0.685
	250R-100-6-LN17	6	2.5	2.205	1.00	0.551	0.827	-	0.374	0.248	0.787	1.75	0.650	1.021
	250R-100-7-LN17	7	2.5	2.205	1.00	0.551	0.827	-	0.374	0.248	0.787	1.75	0.650	1.038
	300R-100-7-LN17	7	3.0	2.205	1.00	0.551	0.866	1.299	0.374	0.248	0.787	2.00	0.650	1.830
	300R-100-8-LN17	8	3.0	2.205	1.00	0.551	0.866	1.299	0.374	0.248	0.787	2.00	0.650	1.853
	400R-150-8-LN17	8	4.0	3.385	1.50	-	-	1.969	0.626	0.394	1.102	2.00	0.650	3.268
	400R-150-9-LN17	9	4.0	3.385	1.50	-	-	1.969	0.626	0.394	1.102	2.00	0.650	3.269
	500R-150-10-LN17	10	5.0	3.937	1.50	0.827	1.220	1.969	0.626	0.394	1.063	2.50	0.650	6.439
	500R-150-11-LN17	11	5.0	3.937	1.50	0.827	1.220	1.969	0.626	0.394	1.063	2.50	0.650	6.372

Available inserts

LNKT-MM new



LNKT-ML new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNKT	170708PNR-MM												●	●				E10
	170708PNR-ML											●	●	●				

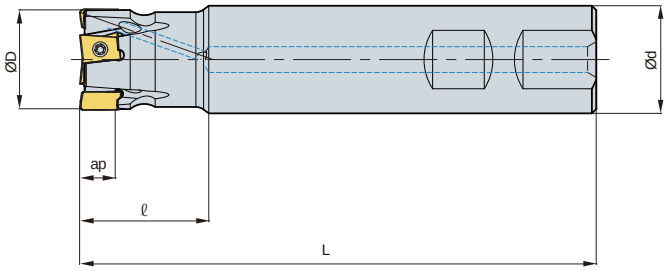
Parts

Specification	Screw	Wrench
Ø1.5 ~ Ø5.0	FTKA0412B	TW15S

Available inserts E10

TP2PSA new





AA 0°

- AR: -6°
- RR: -32°~ -21°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
TP2PSA	125R-2W125-500-LN17	2	1.25	1.25	1.575	5.00	0.650	1.420
	125R-3W125-500-LN17	3	1.25	1.25	1.575	5.00	0.650	1.416
	150R-3W125-500-LN17	3	1.50	1.25	1.575	5.00	0.650	1.510
	150R-4W125-500-LN17	4	1.50	1.25	1.575	5.00	0.650	1.507
	200R-4W125-500-LN17	4	2.00	1.25	1.575	5.00	0.650	1.790
	200R-5W125-500-LN17	5	2.00	1.25	1.575	5.00	0.650	1.802

Available inserts

LNKT-MM new



LNKT-ML new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNKT	170708PNR-MM												●	●				E10
	170708PNR-ML											●	●	●				

Parts

Specification	Screw	Wrench
Ø1.25 ~ Ø2.0	FTKA0412B	TW15S

Available inserts E10

Longer tool life is achieved due to the excellent insert grades' cutting performance

Laser Mill

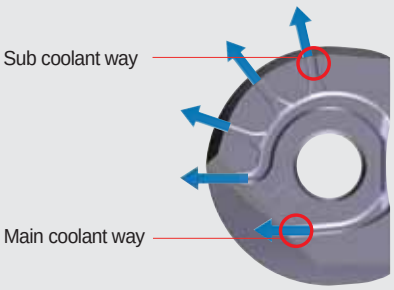
- Long tool life has been achieved due to the excellent cutting performance of the insert grade
- Optimum machining of molds has been achieved with the MQL available system
- Easy clamping with simple screw on system
- Various holder line up: steel shank, carbide shank, modular type
- High accuracy indexable endmills for mold finishing

MQL System

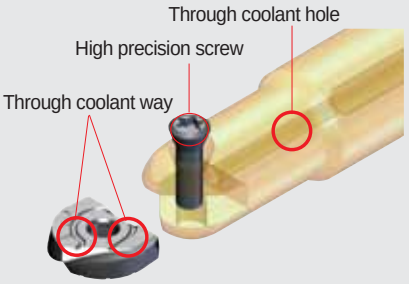


- Environmental friendly system
- Decreased coolant cost
- Lubrication of cutting-edge
- Improved chip control property
- Increased tool life & improved surface quality

Clamping system



- High precision (ground internal diameter) Run-out: 0.0008 inch Accuracy of 'R part: below 0.0004
- Through coolant system



Features

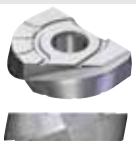
LBE



- Six types of inserts are available with one holder
- Single screw for clamping of insert: Easy clamping system
- Various types of holders (Steel shank, Carbide shank, Modular type)
- MQL applicable- environmentally responsible with longer tool life & improved surface quality.

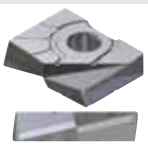
LBS, LR Order-made items

LBH-Ball



- Helical cutting-edge
- Suitable for harder material with high feed

LRH-Corner radius



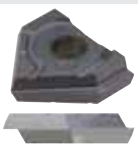
- Helical cutting-edge
- Variety of nose -R

LFH-High feed



- Helical cutting-edge
- Suitable for high feed

LCF-Chamfer



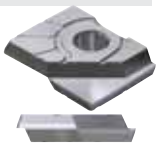
- Straight cutting-edge
- Center drilling and chamfering

LBS-Ball type



- Straight cutting-edge
- Suitable for precise

LR-Corner R type

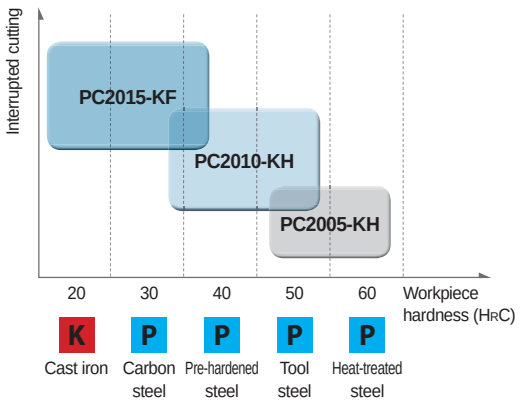


- Straight cutting-edge
- Variety of nose-R

Features of Laser Mill grades

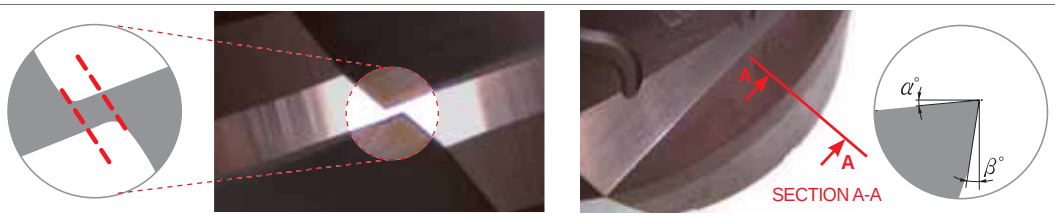
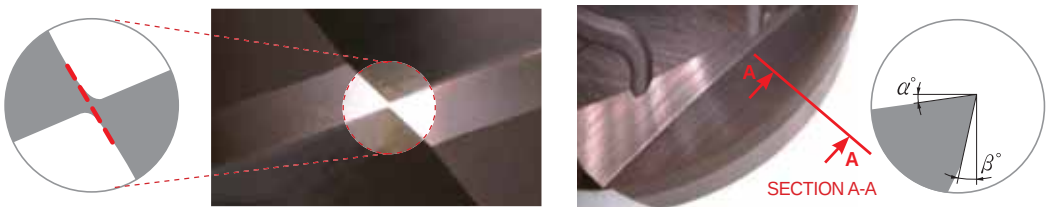
PC2005	• Extremely high hardness grade • The harmony between improved blade design and strong chip breaker • Optimized for machining heat-treated steel and high hardness steel
PC2010	• High wear resistance and excellent toughness • The harmony between excellent thermal shock resistance and strong cutting-edges. • Optimized for machining tool steel and pre-hardened steel
PC2015	• High welding resistance and excellent toughness • The harmony between tough grade and excellent cutting-edge design • Optimized for machining carbon steel

Application guideline per workpiece



Features of KF/KH chip breaker

- KF: Exclusive chip breaker for stable machining of carbon steel with its characteristics of high wear resistance at center part and improved blade design
- KH: Stronger insert with the combination of rake angle and relief angle that are ideal for machining high hardness workpiece

Type	Shape comparison
Standard (For general cutting)	 • Proper to general cutting • Insert shape for uniform performance
KH (For high hardness steel)	 • Center shaper proper for machining high hardness workpiece and uniformed tool life at center part • Improved cutting-edge design by higher rake angle (α˚) • Lower relief angle (ß°) increases strength of cutting-edges than universal inserts.
KF (For carbon steel)	 • Smaller chisel improves wear resistance at center for machining carbon steel. • Improved cutting-edge design by higher rake angle (α˚) • Longer tool life and better cutting performance with the use of excellent blade design

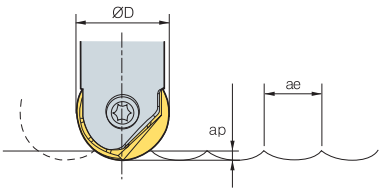
Recommended cutting condition

Workpiece				Grades	Chip breaker	Recommended cutting conditions			
ISO		Material	HB (HRC)			vc (sfm)	fz (ipt)	ap (inch)	ae (inch)
K	Gray cast iron	GC250	180 (8)	PC2015 PC2010 PC2005	KF	427~689	0.020~0.008	0.003D	0.003D
K	Ductile cast iron	GCD600	250 (24)						
P	Carbon steel	S20C~S50C	150			558~820	0.020~0.008	0.003D	0.003D
P	Alloy steel	SCM21~SCM5H	270 (28)	PC2010 PC2015 PC210F	KH	427~689	0.012~0.004	0.003D	0.003D
P	Pre-hardened steel	KP4M	300 (32)			328~525	0.012~0.004	0.020D	0.020D
P		NIMAX	370 (40)						
P		CENA1	370 (40)						
P		NAK80	400 (43)						
P		STAVAX	510 (52)						
P	High speed tool steel	SKH51~SKH59	550 (55)	PC2005 PC2010	KH	262~427	0.080~0.004	0.012D	0.012D
P	Alloy tool steel	STD61 (Hot forging)	630 (60)			230~394	0.080~0.004	0.020D	0.020D
P		STD11 (Cold forging)							

Overhang	vc (sfm)	fz (ipt)
Under 3D	100%	100%
3D~5D	70%	70%
5D~8D	60%	60%
8D~10D	50%	50%

Cutting condition formula for milling

Practical cutting speed	RPM
$vce = \frac{\pi \times De \times n}{1000}$ (sfm)	$n = \frac{vce \times 12}{\pi \times De}$ (min^{-1})
Feed per tooth	**Feed per minute**
$fz = \frac{vf}{z \times n}$ (ipt)	$vf = fz \times z \times n$ (ipm)
Chip removal amount	**Power requirement**
$Q = ap \times ae \times vf$ ($inch^3/min$)	$Pkw = \frac{Q \times kc}{60 \times 102 \times \eta}$ (kW) $Php = \frac{Pc}{0.75}$ (hp)



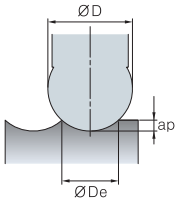
vc	= Cutting speed (sfm)	Pkw	= Power Requirement (kW)
vce	= Practical cutting speed (sfm)	Php	= Horsepower requirement (hp)
n	= Revolution per Minute (min^{-1})	Q	= Chip removal amount ($inch^3$/min)
D	= Cutting diameter (inch)	ap	= Depth of cut (inch)
De	= Actual diameter (inch)	ae	= Width of cut (inch)
vf	= Feed per minute (ipm)	kc	= Specific cutting resistance (kg/mm^2)
fz	= Feed per tooth (ipt)	η	= Mechanical efficiency (%)
z	= Number of tooth		

Practical cutting speed calculation formulas

1. Formula of actual diameter

• **Formula**
: Actual diameter

$De = 2\sqrt{ap\,(D - ap)}$



2. θ°Using: Calculating cutting speed at P point
(Cutting speed according to depth of cut when ramping)

• **Formula**
: Practical cutting speed

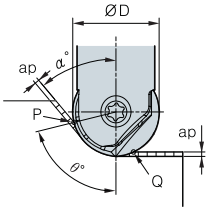
$vce = \frac{\pi\, Dsin\theta \times n}{12}$ (sfm)

$\theta = \cos^{-1}\left(\frac{D - 2ap}{D}\right) + (90 - \alpha°)$

3. In case of using ap: Calculating cutting speed at Q point

• **Formula**
: Pratical cutting speed

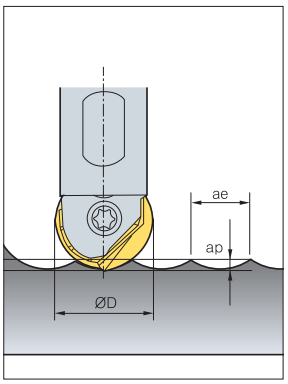
$vce = \frac{2\pi n\sqrt{ap\,(D - ap)}}{12}$



Practical cutting speed calculation formulas

ae (inch) / R (inch)	h (surface roughness) (μm)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
5	0.3	1.0	2.3	4.0	6.3	9.0	12.3	16.0	20.3	25.0
6	0.2	0.8	1.9	3.3	5.2	7.5	10.2	13.3	16.9	20.8
8	0.2	0.6	1.4	2.5	3.9	5.6	7.7	10.0	12.7	15.6
10	0.1	0.5	1.1	2.0	3.1	4.5	6.1	8.0	10.1	12.5
12.5	0.1	0.4	0.9	1.6	2.5	3.6	4.9	6.4	8.1	10.0
15	0.1	0.3	0.8	1.3	2.1	3.0	4.1	5.3	6.8	8.3
16	0.1	0.3	0.7	1.3	2.0	2.8	3.8	5.0	6.3	7.8

• Formula of surface roughness: h (surface finish) = $\frac{(ae)^2}{8R} \times 1000$ (μm)



Actual diameter data

ap \ ØD	Ø0.31	Ø0.38	Ø0.50	Ø0.63	Ø0.75	Ø1.00	Ø1.25
0.0039	0.0709	0.0787	0.0866	0.0984	0.1102	0.1260	0.1401
0.0079	0.0984	0.1102	0.1220	0.1417	0.1575	0.1772	0.1978
0.0118	0.1181	0.1339	0.1457	0.1693	0.1929	0.2126	0.2419
0.0197	0.1535	0.1732	0.1890	0.2205	0.2441	0.2756	0.2794
0.0394	0.2087	0.2362	0.2598	0.3031	0.3425	0.3858	0.4367
0.0591	0.2441	0.2795	0.3110	0.7598	0.4134	0.4685	0.5304
0.0787	0.2717	0.3150	0.3504	0.4173	0.4724	0.5354	0.6074
0.0984	0.2913	0.3425	0.3819	0.4567	0.5197	0.5906	0.6733
0.1181	0.3031	0.3622	0.4094	0.4921	0.5630	0.6378	0.7313
0.1378	0.3110	0.3740	04291	0.5197	0.5984	0.6811	0.7803
0.1575	0.3150	0.3858	0.4449	0.5472	0.6299	0.7205	0.8296
0.1969			0.4646	0.5827	0.6811	0.7874	0.9106
0.2362			0.4724	0.6102	0.7205	0.8425	0.9787
0.2756				0.6260	0.7520	0.8819	1.0364
0.3150				0.6299	0.7717	0.9173	1.0854
0.3937					0.7874	0.9646	1.1613

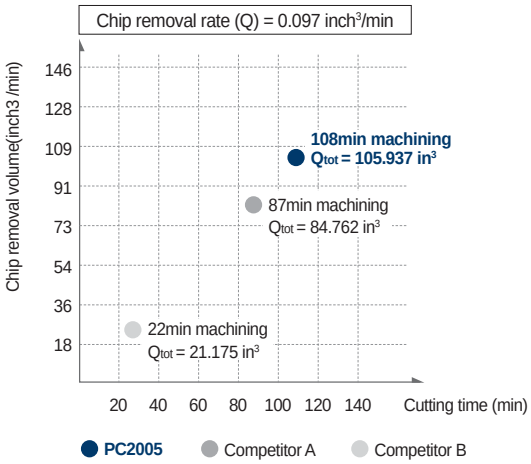
Performance evaluation

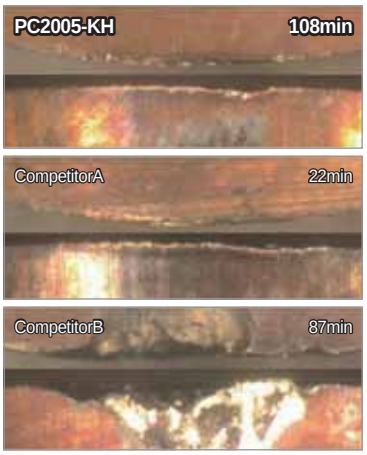
PC2005 tool life test — High hardness heat-treated steel (X100CrMoV5 1, heat-treated HRC60)



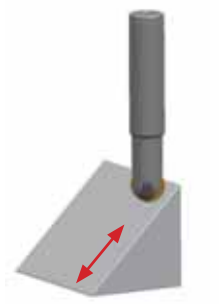
Cutting conditions
vc = 459 sfm
fz = 0.006 ipt
ap = 0.047 inch
ae = 0.047 inch
Coolant (Air)

Tools
Insert LBH0500-KH (PC2005)



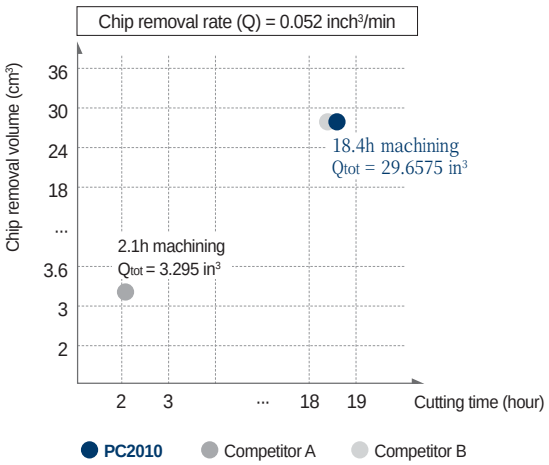


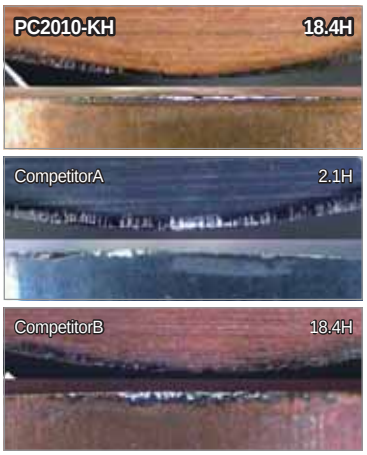
PC2010 tool life test — Pre-hardened steel (X40CrMnNiMo8-6-4)



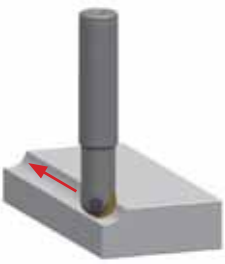
Cutting conditions
vc = 906 sfm
fz = 0.006 ipt
ap = 0.012 inch
ae = 0.047 inch
Wet

Tools
Insert LBH0500-KH (PC2010)



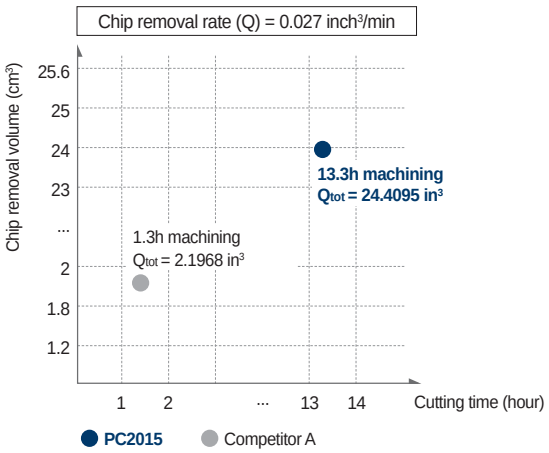


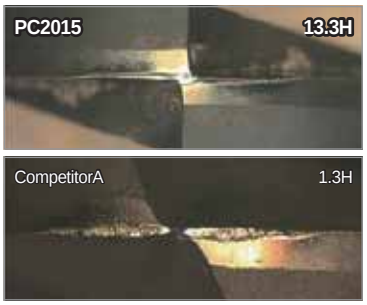
PC2015 tool life test — Carbon steel (C45)



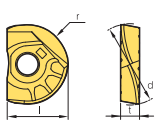
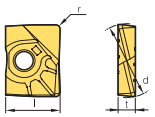
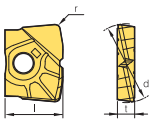
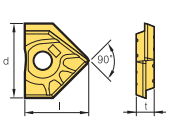
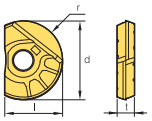
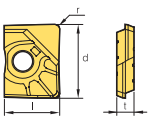
Cutting conditions
vc = 820 sfm
fz = 0.014 ipt
ap = 0.012 inch
ae = 0.012 inch
Dry

Tools
Insert LBH0500 (PC2015)





Available inserts

Holders			LFH (High feed type)	LCF (Chamfer type)	LBS(Ball type)	
					 R accuracy ±0.0002	
LBEA031	LBH0312 LBH0312-KF LBH0312-KH				LBS0312	
LBEA037	LBH0375 LBH0375-KF LBH0375-KF	LRH0375-R015 LRH0375-R031 LRH0375-R062	LFH0375		LBS0375	LR0375-R015 LR0375-R031 LR0375-R062
LBEA050	LBH0500 LBH0500-KF LBH0500-KH	LRH0500-R015 LRH0500-R031 LRH0500-R062	LFH0500		LBS0500	LR0500-R015 LR0500-R031 LR0500-R062
LBEA062	LBH0625 LBH0625-KF LBH0625-KH	LRH0625-R015 LRH0625-R062 LRH0625-R031 LRH0625-R125	LFH0625	LCF0625-D90	LBS0625	LR0625-R015 LR0625-R062 LR0625-R031 LR0625-R125
LBEA075	LBH0750 LBH0750-KF LBH0750-KH	LRH0750-R015 LRH0750-R062 LRH0750-R031 LRH0750-R125	LFH0750	LCF0750-D90	LBS0750	LR0750-R015 LR0750-R062 LR0750-R031 LR0750-R125
LBEA100	LBH1000 LBH1000-KF LBH1000-KH	LRH1000-R015 LRH1000-R062 LRH1000-R031 LRH1000-R125	LFH1000	LCF1000-D90	LBS1000	LR1000-R015 LR1000-R062 LR1000-R031 LR1000-R125
LBEA125	LBH1250 LBH1250-KF LBH1250-KH	LRH1250-R015 LRH1250-R031 LRH1250-R062	LFH1250		LBS1250	LR1250-R015 LR1250-R031 LR1250-R062

Available inserts **E08, E09**

* LBH for general cutting, LBH-KF for carbon steel, and LBH-KH for high hardened steel.

Long tool life due to high hardness grade

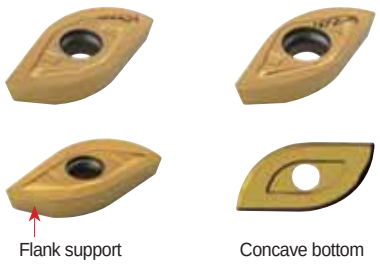
GBE

- Indexable Ball nose Endmill for Molds in medium & roughing applications
- Long tool life with high hardness grade
- Helical high accuracy cutting-edge
- Optimized mold machining process with our internal coolant system
- Able to adjust to medium processing in middle & big roughing mold process
- Wide variety of holders in normal & long style holders

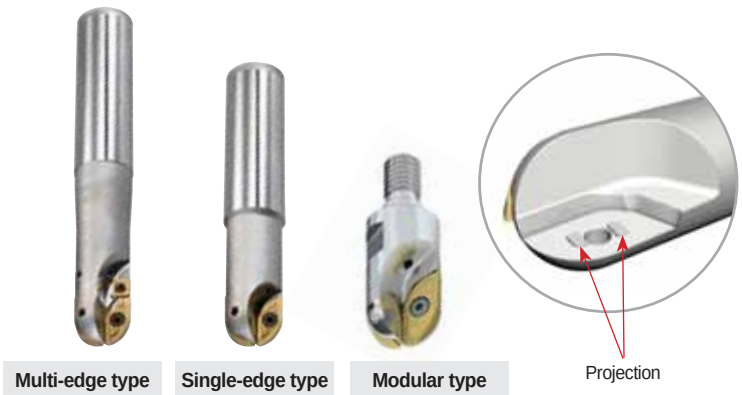
Holder code system

GBE	063	–	S	125
Product Name	**Machining Dia.**		**Type**	**Shank Dia.**
General Indexable Ball Endmill	Ø0.630, Ø0.790, Ø0.980, Ø1.180 Ø1.260, Ø1.530, Ø1.970		S: Standard shank L: Long shank	125 : Ø1.25

Internal | **External**



- Ability to handle high accuracy & large depth of cut applications
  - Run-out: within 0.002 inch
  - R accuracy: within 0.002 inch
- Various diameters (Ø0.630, Ø0.790, Ø0.980, Ø1.180, Ø1.260, Ø1.530, Ø1.970)
- Minimal cutting resistance due to Helical cutting-edge
- Anti-rotation of insert due to concave bottom & stable setting by flank support
- Long tool life & better processing due to 2 cutting inserts
- Better tool life with new grade



Multi-edge type | **Single-edge type** | **Modular type**

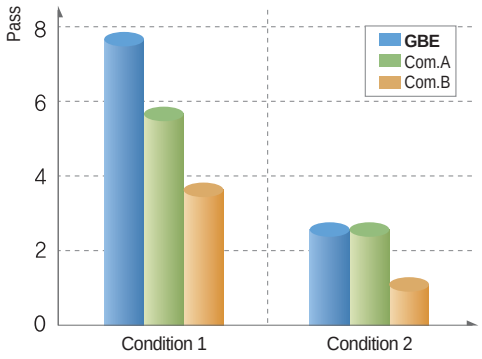
- Various diameters (Ø0.630, Ø0.790, Ø0.980, Ø1.180, Ø1.260, Ø1.530, Ø1.970)
- Improved chip treatment with internal coolant (cutting-edge portion)
- Long tool life & better processing
- Easy insert setting with projection part to prevent vibration during processing

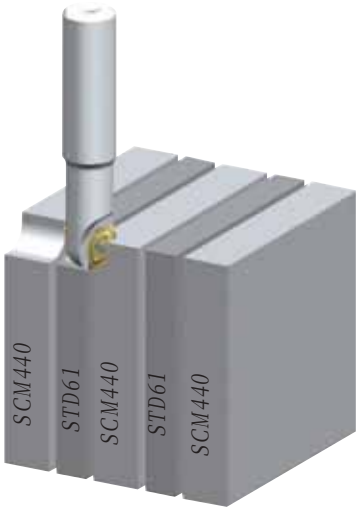
How to set insert



1. Set the insert to the holder projection seat
2. Push the insert into the pocket as shown by red arrows and screw down with wrench

Performance evaluation

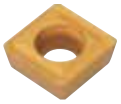




Cutting condition

Class.	Cutting speed (vc)	Feed (fz)	Depth of cut (ap)	Depth of cut (ae)	Workpiece	Etc.
Condition 1	492 sfm	0.006 ipt	0.197 inch	0.315 inch	H13(HRC50) + 4140(HRC20)	Dry
Condition 2	492 sfm	0.004 ipt	0.315 inch	0.315 inch		

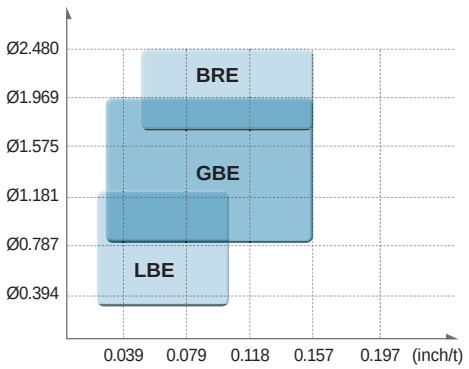
Inserts/parts

Type	Insert			Parts			
							
Dia.	**Internal I/S**	**External I/S**	**External main I/S**	**Screw**		**Wrench**	
				Int./Ext. type	**Ext. main type**	**Int./Ext. type**	**Ext. main type**
Ø0.630	ZPET080M-MM	ZPET080S-MM	-	FTKA02555S	-	TW08S	-
Ø0.709	ZPET090M-MM	ZPET090S-MM	-	FTKA0307	-	TW09S	-
Ø0.787	ZPET100M-MM	ZPET100S-MM	SPMT060304	FTKA0307	ETNA02506	TW09S	TW07P
Ø0.866	ZPET110M-MM	ZPET110S-MM	SPMT060304	FTKA0408	ETNA02506	TW15S	TW07P
Ø0.984	ZPET125M-MM	ZPET125S-MM	SPMT060304	FTKA0409	ETNA02506	TW15S	TW07P
Ø1.024	ZPET130M-MM	ZPET130S-MM	SDMT090308-MM	FTKA0409	ETNA0408	TW15S	TW15S
Ø1.102	ZPET140M-MM	ZPET140S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20	TW15S
Ø1.181	ZPET150M-MM	ZPET150S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S
Ø1.260	ZPET160M-MM	ZPET160S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S
Ø1.575	ZPET200M-MM	ZPET200S-MM	SPMT120408-MM	FTGA0614	ETNA0511	TW20-100	TW20S
Ø1.969	ZPET250M-MM	ZPET250S-MM	SPMT120408-MM	FTGA0818	ETNA0511	TW25S	TW20S

Recommended cutting condition

Workpiece	Machining type	Hardness (HRC)	vc (sfm)	fz (ipt)	ap (inch)	ae (inch)
Carbon, Alloy steel	Flank Groove Deep flank	Under 25	520~820 300~650 520~820	0.020~0.012 0.020~0.012 0.039~0.020	0.012~0.020D 0.012~0.020D 0.039~0.059D	0.008~0.012D - 0.004~0.008D
Carbon, Alloy steel	Flank Groove Deep flank	Under 45	300~650 300~520 300~650	0.020~0.012 0.020~0.012 0.039~0.020	0.012~0.020D 0.012~0.020D 0.039~0.059D	0.008~0.012D - 0.004~0.008D
Mold Alloy steel	Flank Groove Deep flank	30~40	300~650 300~520 300~650	0.012 0.012 0.039~0.012	0.012~0.020D 0.012~0.020D 0.039~0.059D	0.008~0.012D - 0.004~0.008D
Cast iron (GC, GCD)	Flank Groove Deep flank	20~30	150~300 150~300 150~300	0.028~0.012 0.028~0.012 0.039~0.028	0.012~0.020D 0.012~0.020D 0.039~0.059D	0.008~0.012D - 0.004~0.008D
Heat-treated steel	Flank Groove Deep flank	50~60	130~320 130~320 130~320	0.012 0.012 0.039~0.012	0.012~0.020D 0.012~0.020D 0.039~0.059D	0.008~0.012D - 0.004~0.008D

Line-up for indexable ball endmill



Type	Application				
	Machining Dignity	Machining Efficiency	Machining Dia. Equivalence	Economical	Flank Machining with LongEdge
Laser Mill	●	○	◐	○	○
GBE	◐	●	◐	◐	●
BRE	○	●	●	●	●

●: Very Good ◐: Good ○: Normal

Test result for wear resistance

Cutting conditioin	Wear resistance photos



Cutting time : 4 Pass

■**Workpiece**
KP4M(HRC33), Dry

■**Condition**
vc = 920 sfm
fz = 0.01 ipt
ap = 0.2~0.4 inch
ae = 0.2~0.4 inch
vf = 58.5 sfm
n = 2,971 rpm

■**Tool**
Holder : GBE300-S32
Insert : ZPET150M-MM (PC3500)
ZPET150S-MM (PC3500)

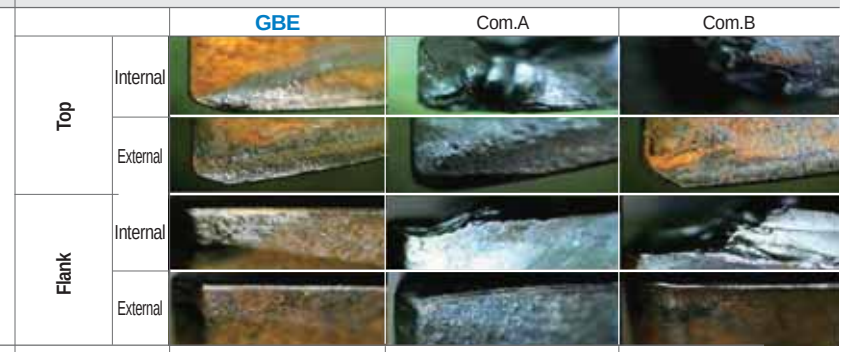


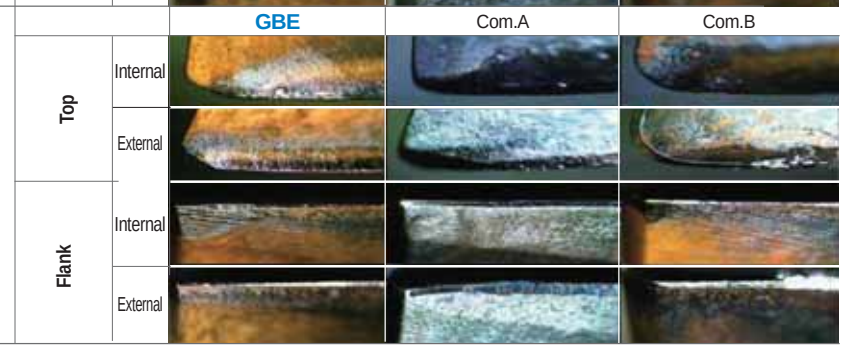
Cutting time : 4 Pass

■**Workpiece**
STD11(HRC20), Dry

■**Condition**
vc = 820 sfm
fz = 0.008 ipt
ap = 0.2 inch
ae = 0.2 inch
vf = 42.45 sfm
n = 2,653 rpm

■**Tool**
Holder : GBE300-S32
Insert : ZPET150M-MM (PC3500)
ZPET150S-MM (PC3500)





Better tool life and anti-breakage with special surface treatment on the holder

BRE

- Cutting performance: Good chip control & Superior cutting performance with optimal cutting-edge line
- High rigidity body: Better tool life and special surface treatment to strengthen the holder
  Easy to set and good durability with TCRX screw
  Good chip control with our 3D flute design & improved external quality
- Insert: Able to apply in high speed & feed applications due to special grade which has wear & breakage resistance and stable cutting performance with high cutting-edge toughness & high rake angle chip breaker

Multi-edge holder ISO View



• Good chip flow
• Good heat emission



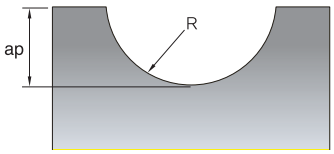
• Wider insert ensures cutting-edge strength

• Better setting force by recess



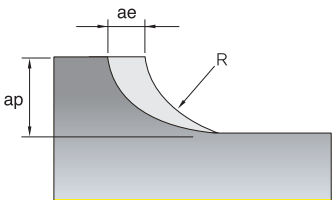
BRE machining type for roughing & Recommended cutting condition

Machining type 1



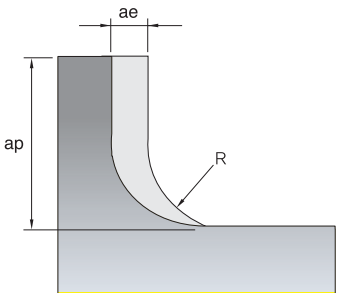
ap = 0.3D-0.5D

Machining type 2



ae = 0.2D-0.3D ap = 0.3D-0.5D

Machining type 3



ae = 0.1D-0.5D ap = 1.2D-1.5D

Workpiece	Machining type	Cutting speed (sfm)	Feed (ipt)	Grades
Carbon/alloy steel	1 2 3	390~720 390~720 330~590	0.016~0.004 0.016~0.008 0.012~0.004	**NCM325** **NCM325** **NCM325**
Alloy steel	1 2 3	330~655 330~655 260~525	0.016~0.004 0.016~0.008 0.012~0.004	**NCM325** **NCM325** **NCM325**
Tool steel	1 2 3	260~490 260~490 195~395	0.012~0.004 0.014~0.006 0.012~0.004	**NCM325** **NCM325** **NCM325**
High hardness material (HRC35~45)	1 2 3	195~395 195~395 165~260	0.012~0.004 0.012~0.004 0.008~0.004	**NCM325** **NCM325** **NCM325**
Cast iron	1 2 3	330~590 330~590 260~525	0.020~0.008 0.020~0.008 0.016~0.006	**NCM320K** **NCM320K** **NCM320K**

LBEA 031-C/037-C/050-C/062-C/075-C/100-C/125-C

Straight type

Carbide Shank (Ball type)



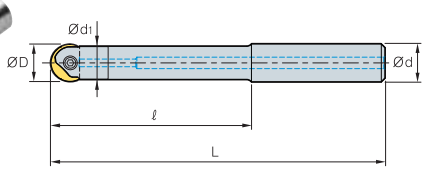


Fig. 1

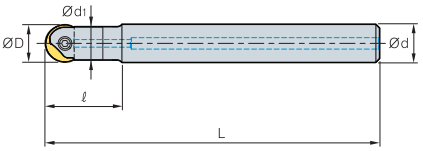
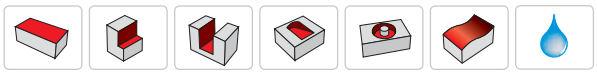


Fig. 2



(inch)

Designation		Dimensions					Parts		Available Inserts(Ø)	Fig.
		ØD	Ød	Ød1	ℓ	L	Clamp Screw	Wrench		
LBEA	031315S-S031C	5/16	5/16	0.283	3.150	5.354	ETND02506F	TWP07S	5/16	1
	031394S-S031C	5/16	5/16	0.283	3.937	6.142				
	031079S-S031C-512	5/16	5/16	0.283	0.787	5.118	ETND02506F	TWP07S	5/16	2
	031079S-S031C-591	5/16	5/16	0.283	0.787	5.906				
	037315S-S037C	3/8	3/8	0.335	3.150	5.354	ETND0307F	TWP08S	3/8	1
	037472S-S037C	3/8	3/8	0.335	4.724	6.929				
	037091S-S037C-512	3/8	3/8	0.335	0.906	5.118	ETND0307F	TWP08S	3/8	2
	037091S-S037C-669	3/8	3/8	0.335	0.906	6.693				
	050394S-S050C	1/2	1/2	0.433	3.937	6.142	ETND03509	TWP10S	1/2	1
	050591S-S050C	1/2	1/2	0.433	5.906	8.110				
	050098S-S050C-591	1/2	1/2	0.433	0.984	5.906	ETND03509	TWP10S	1/2	2
	050098S-S050C-787	1/2	1/2	0.433	0.984	7.874				
	062394S-S062C	5/8	5/8	0.571	3.937	6.299	ETND0413	TWP15S	5/8	1
	062591S-S063C	5/8	5/8	0.571	5.906	8.268				
	062118S-S062C-630	5/8	5/8	0.571	1.181	6.299	ETND0413	TWP15S	5/8	2
	062118S-S062C-827	5/8	5/8	0.571	1.181	8.268				
	075472S-S075C	3/4	3/4	0.689	4.724	7.480	ETKD0516	TWP20	3/4	1
	075669S-S075C	3/4	3/4	0.689	6.693	9.449				
	075138S-S075C-748	3/4	3/4	0.689	1.378	7.480	ETKD0516	TWP20	3/4	2
	075138S-S075C-945	3/4	3/4	0.689	1.378	9.449				
	100551S-S100C	1	1	0.906	5.512	8.661	ETKD0620	TWP25	1	1
	100669S-S100C	1	1	0.906	6.693	9.843				
	150157S-S100C-866	1	1	0.906	1.575	8.661	ETKD0620	TWP25	1	2
	150157S-S100C-984	1	1	0.906	1.575	9.843				
	125551S-S125C	1 1/4	1 1/4	1.142	5.512	9.055	ETGD0825	TWP40	1 1/4	1
	125669S-S125C	1 1/4	1 1/4	1.142	6.693	10.236				
	125197S-S125C-906	1 1/4	1 1/4	1.142	1.969	9.055	ETGD0825	TWP40	1 1/4	2
	125197S-S125C1024	1 1/4	1 1/4	1.142	1.969	10.236				

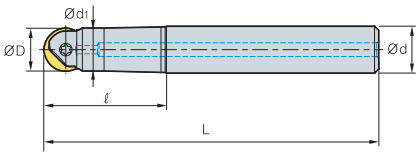
Available inserts **E08, E09**

LBEA 031/037/050/062/075/100/125

Taper type

Steel Shank (Ball type)





(inch)

Designation		Dimensions					Parts		Available Inserts(Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp Screw	Wrench	
LBEA	031138T-S050	5/16	1/2	0.283	1.378	3.583	ETND02506F	TWP07S	5/16
	031217T-S050	5/16	1/2	0.283	2.165	4.370			
	031295T-S050	5/16	1/2	0.283	2.953	5.157			
	037138T-S050	3/8	1/2	0.335	1.378	3.583	ETND0307F	TWP08S	3/8
	037217T-S050	3/8	1/2	0.335	2.165	4.370			
	037295T-S050	3/8	1/2	0.335	2.953	5.157			
	050217T-S050	1/2	1/2	0.433	2.165	4.370	ETND03509	TWP10S	1/2
	050335T-S050	1/2	5/8	0.433	3.346	5.709			
	062256T-S062	5/8	5/8	0.571	2.559	4.921	ETND0413	TWP15S	5/8
	062394T-S075	5/8	3/4	0.571	3.937	6.693			
	075295T-S100	3/4	1	0.689	2.953	5.709	ETKD0516	TWP20	3/4
	075453T-S100	3/4	1	0.689	4.528	7.677			
	100354T-S100	1	1	0.906	3.543	6.693	ETKD0620	TWP25	1
	100532T-S125	1	1 1/4	0.906	5.315	8.858			
	125413T-S125	1 1/4	1 1/4	1.142	4.134	7.677	ETGD0825	TWP40	1 1/4
	125630T-S125	1 1/4	1 1/4	1.142	6.299	9.843			

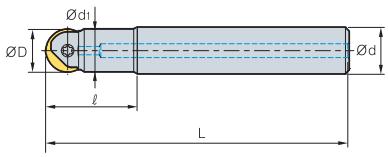
Available inserts **E08, E09**

LBEA 050/062/075/100/125

Straight type

Steel Shank (Ball type)





(inch)

Designation		Dimensions					Parts		Available inserts (Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp screw	Wrench	
LBEA	050138S-S050	1/2	1/2	0.433	1.378	3.583	ETND03509	TWP10S	1/2
	062138S-S062	5/8	5/8	0.571	1.378	3.74	ETND0413	TWP15S	5/8
	075157S-S075	3/4	3/4	0.689	1.575	4.331	ETKD0516	TWP20	3/4
	100177S-S100	1	1	0.906	1.772	4.921	ETKD0620	TWP25	1
	125217S-S125	1 1/4	1 1/4	1.142	2.165	5.709	ETGD0825	TWP40	1 1/4

Available inserts **E08, E09**

LREA-C/037-C/050-C/062-C/075-C/100-C/125-C

Straight type

Carbide Shank (Corner R type)



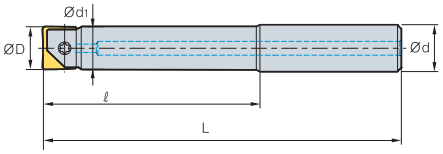


Fig. 1

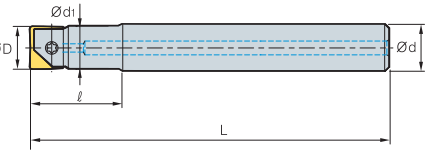


Fig. 2



(inch)

Designation		Dimensions					Parts		Available Inserts(Ø)	Fig.
		ØD	Ød	Ød1	ℓ	L	Clamp Screw	Wrench		
LREA	037315S-S037C	3/8	3/8	0.335	3.150	5.354	ETND0307F	TWP08S	3/8	1
	037472S-S037C	3/8	3/8	0.335	4.724	6.929				
	037091S-S037C-512	3/8	3/8	0.335	0.906	5.118	ETND0307F	TWP08S		2
	037091S-S037C-660	3/8	3/8	0.335	0.906	6.693				
	050394S-S050C	1/2	1/2	0.433	3.937	6.142	ETND03509	TWP10S	1/2	1
	050591S-S050C	1/2	1/2	0.433	5.906	8.110				
	050098S-S050C-591	1/2	1/2	0.433	0.984	5.906	ETND03509	TWP10S		2
	050098S-S050C-787	1/2	1/2	0.433	0.984	7.874				
	062394S-S062C	5/8	5/8	0.571	3.937	6.299	ETND0413	TWP15S	5/8	1
	062591S-S062C	5/8	5/8	0.571	5.906	8.268				
	062117S-S062C-630	5/8	5/8	0.571	1.181	6.299	ETND0413	TWP15S		2
	062117S-S062C-827	5/8	5/8	0.571	1.181	8.268				
	075472S-S075C	3/4	3/4	0.689	4.724	7.480	ETKD0516	TWP20	3/4	1
	075669S-S075C	3/4	3/4	0.689	6.693	9.449				
	075138S-S075C-748	3/4	3/4	0.689	1.378	7.480	ETKD0516	TWP20		2
	075138S-S075C-945	3/4	3/4	0.689	1.378	9.449				
	100551S-S100C	1	1	0.906	5.512	8.661	ETKD0620	TWP25	1	1
	100669S-S100C	1	1	0.906	6.693	9.843				
	100157S-S100C-866	1	1	0.906	1.575	8.661	ETKD0620	TWP25		2
	100157S-S100C-984	1	1	0.906	1.575	9.843				
	125551S-S125C	1 1/4	1 1/4	1.142	5.512	9.055	ETGD0825	TWP40	1 1/4	1
	125669S-S125C	1 1/4	1 1/4	1.142	6.693	10.236				
	125197S-S125C-906	1 1/4	1 1/4	1.142	1.969	9.055	ETGD0825	TWP40		2
	125197S-S125C1024	1 1/4	1 1/4	1.142	1.969	10.236				

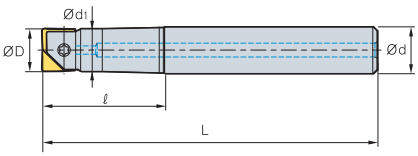
Available inserts **E08, E09**

LREA 037/050

Taper type

Steel Shank (Corner R type)





(inch)

Designation		Dimensions					Parts		Available inserts (Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp screw	Wrench	
LREA	037098T-S050	3/8	1/2	0.335	0.984	4.370	ETND0307F	TWP08S	3/8
	037197T-S050	3/8	1/2	0.335	1.969	5.906			
	050236T-S050	1/2	5/8	0.433	2.362	6.299	ETND03509	TWP10S	1/2

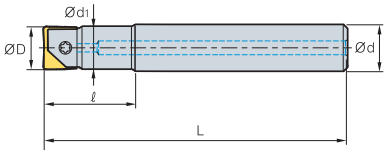
Available inserts **E08, E09**

LREA 050/062/075/100/125

Straight type

Steel Shank (Corner R type)





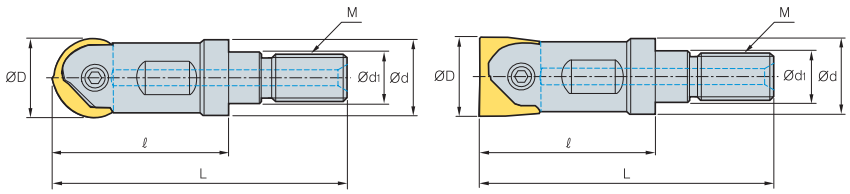
(inch)

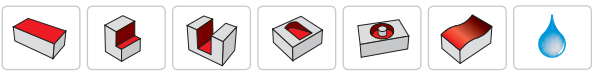
Designation		Dimensions					Parts		Available inserts (Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp screw	Wrench	
LREA	050117S-S050	1/2	1/2	0.433	1.181	4.370	ETND03509	TWP08S	1/2
	062197S-S062	5/8	5/8	0.571	1.969	5.157	ETND0413	TWP15S	5/8
	062236S-S062	5/8	5/8	0.571	2.362	6.299			
	075236S-S075	3/4	3/4	0.689	2.362	5.709	ETKD0516	TWP20	3/4
	075315S-S075	3/4	3/4	0.689	3.150	7.087			
	100276S-S100	1	1	0.906	2.756	5.709	ETKD0620	TWP20	1
	100394S-S100	1	1	0.906	3.937	8.858			
	125315S-S125	1 1/4	1 1/4	1.142	2.756	6.299	ETGD0825	TWP40	1 1/4
	125394S-S125	1 1/4	1 1/4	1.142	3.937	8.858			

Available inserts **E08, E09**

LBEA-MHD







(inch)

Designation		Dimensions						Parts		Available inserts (Ø)
		M	ØD	L	ℓ	Ød	Ød1	Clamp screw	Wrench	
LBEA	037-MHD-M06	M06	3/8	1.575	0.984	0.335	0.256	ETND0307F	TWP08S	3/8
	050-MHD-M06	M06	1/2	1.575	0.984	0.433	0.268	ETND03509	TWP10S	1/2
	062-MHD-M08	M08	5/8	1.850	1.181	0.571	0.335	ETND0413	TWP15S	5/8
	075-MHD-M10	M10	3/4	2.205	1.378	0.689	0.413	ETKD0516	TWP20	3/4
	100-MHD-M12	M12	1	2.717	1.772	0.906	0.492	ETKD0620	TWP25	1
	125-MHD-M16	M16	1 1/4	3.031	1.969	1.142	0.650	ETGD0825	TWP40	1 1/4

Available inserts **E08, E09** Available Adaptor **E308~E309**

Designation: LBEA125-MHD-M16
Modular head threading measure size (M16)

=

Adaptor spec.: MATA-M16-137-S125S
Adaptor threading measure (M16)

BFEA



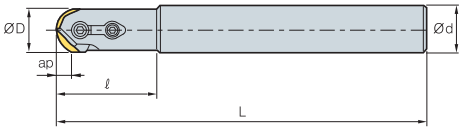


Fig. 1

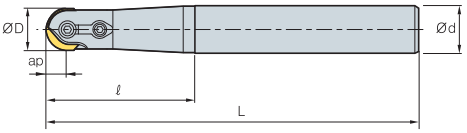
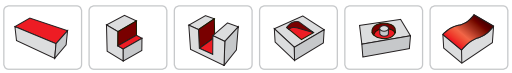


Fig. 2



(inch)

Designation		ØD	Ød	ℓ	L	ap	lbs	Fig.	Available inserts
BFEA	062-S	0.625	0.625	1.417	5.512	0.31	0.44	1	RC062
	062-M	0.625	0.750	2.559	6.693	0.31	0.66	2	
	062-L	0.625	1.000	2.559	7.874	0.31	1.10	2	
	075-S	0.750	0.750	1.772	6.299	0.39	0.88	1	RC075
	075-M	0.750	1.000	3.150	7.874	0.39	1.32	2	
	075-L	0.750	1.000	3.150	9.842	0.39	1.76	2	
	100-S	1.000	1.000	1.772	6.299	0.49	1.54	1	RC100
	100-M	1.000	1.250	3.543	8.268	0.49	2.42	2	
	100-L	1.000	1.250	3.543	11.811	0.49	3.74	2	
	125-S	1.250	1.250	2.205	6.890	0.63	1.98	2	RC125
	125-M	1.250	1.250	3.937	9.842	0.63	3.08	2	
	125-L	1.250	1.250	3.937	13.780	0.63	4.40	2	

Available inserts

RC



Designation		Coated PC210F	page
RC	062	●	E15
	075	●	
	100	●	
	125		

Recommended cutting condition

Workpiece		Cutting condition vc (sfm)	Cutting condition fz (ipt)
P	General steel (SS41, 1025) Over HB180	490~820	0.012~0.004
M	Alloy steel (1055, SCM) Under HB300	330~660	0.008~0.004
K	Cast iron Under HB300	330~660	0.012~0.004

Parts

Specification	Screw	Clamp	Clamp screw	Stopper Ring	Wrench
Ø0.625	FTGA0513	CBH4.5R1	CTX04513	ER03	TW20
Ø0.750	FTGA0517	CBH4.5R2	CTX04513	ER03	TW20
Ø1.000	FTGA0621	CBH5R1	CTX0517	ER04	TW20
Ø1.250	FTGA0826	CBH6R1	CTX0621	ER05	TW25

Available inserts **E15**

GBEA (Single-edge)



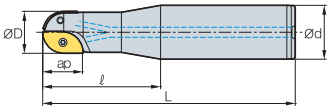


Fig. 1

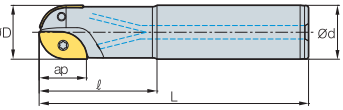


Fig. 2

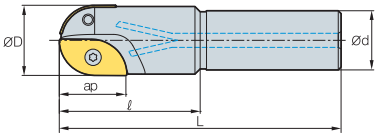
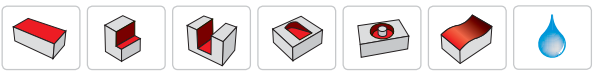


Fig. 3



(inch)

Designation		Dimensions					Available inserts		Parts		Fig.
		ØD	Ød	ℓ	L	ap	Internal	External	Screw	Wrench	
									Int./Ext. type	Ext. main type	
GBEA	063-S075	0.630	0.750	1.95	5.10	0.6	ZPET080M-MM	ZPET080S-MM	FTKA02555S	TW08S	1
	063-L075	0.630	0.750	3.50	7.90	0.6	ZPET080M-MM	ZPET080S-MM	FTKA02555S	TW08S	
	071-S075	0.709	0.750	2.35	5.10	0.7	ZPET090M-MM	ZPET090S-MM	FTKA0307	TW09S	
	071-L075	0.709	0.750	3.15	7.90	0.7	ZPET090M-MM	ZPET090S-MM	FTKA0307	TW09S	
	079-S100	0.787	1.000	2.35	5.50	0.7	ZPET100M-MM	ZPET100S-MM	FTKA0307	TW09S	
	079-L100	0.787	1.000	3.10	9.80	0.7	ZPET100M-MM	ZPET100S-MM	FTKA0307	TW09S	
	086-S100	0.866	1.000	2.75	5.50	0.8	ZPET110M-MM	ZPET110S-MM	FTKA0408	TW15S	
	086-L100	0.866	1.000	3.95	9.85	0.8	ZPET110M-MM	ZPET110S-MM	FTKA0408	TW15S	
	098-S125	0.984	1.250	2.70	5.90	0.9	ZPET125M-MM	ZPET125S-MM	FTKA0409	TW15S	
	098-L125	0.984	1.250	3.90	11.80	0.9	ZPET125M-MM	ZPET125S-MM	FTKA0409	TW15S	
	102-S125	1.024	1.250	2.75	5.90	1.0	ZPET130M-MM	ZPET130S-MM	FTKA0409	TW15S	
	102-L125	1.024	1.250	3.95	11.80	1.0	ZPET130M-MM	ZPET130S-MM	FTKA0409	TW15S	
	110-S125	1.102	1.250	2.75	5.90	1.0	ZPET140M-MM	ZPET140S-MM	FTGA0511-P	TW20	
	110-L125	1.102	1.250	4.70	11.80	1.0	ZPET140M-MM	ZPET140S-MM	FTGA0511-P	TW20	
	118-S125	1.181	1.250	2.70	6.30	1.0	ZPET150M-MM	ZPET150S-MM	FTGA0511-P	TW20-100	2
	118-L125	1.181	1.250	4.70	13.80	1.0	ZPET150M-MM	ZPET150S-MM	FTGA0511-P	TW20-100	
	126-S125	1.260	1.250	2.70	6.30	1.1	ZPET160M-MM	ZPET160S-MM	FTGA0511-P	TW20-100	
	126-L125	1.260	1.250	4.70	13.80	1.1	ZPET160M-MM	ZPET160S-MM	FTGA0511-P	TW20-100	
	157-S150	1.575	1.500	3.90	7.90	1.4	ZPET200M-MM	ZPET200S-MM	FTGA0614	TW20-100	
	157-L150	1.575	1.500	5.90	13.80	1.4	ZPET200M-MM	ZPET200S-MM	FTGA0614	TW20-100	
	197-S150	1.969	1.500	3.90	7.90	1.8	ZPET250M-MM	ZPET250S-MM	FTGA0818	TW25-100	3
	197-L150	1.969	1.500	3.90	13.80	1.8	ZPET250M-MM	ZPET250S-MM	FTGA0818	TW25-100	

Available inserts **E31**

GBEA-M (Multi-edge)



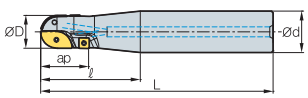


Fig. 1

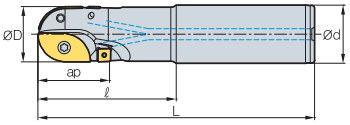


Fig. 2

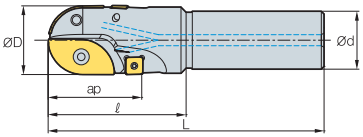


Fig. 3



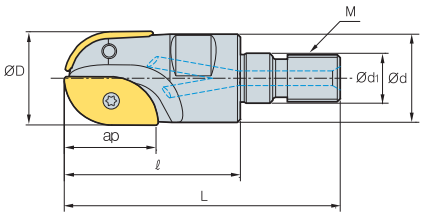
(inch)

Designation		Dimensions					Available inserts			Parts				Fig.
		ØD	Ød	ℓ	L	ap	Internal	External	Ext. main	Screw		Wrench		
										Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type	
GBEA	079M-S100	0.787	1.000	2.75	5.90	1.1	ZPET100M-MM	ZPET100S-MM	SPMT221	FTKA0307	ETNA02506	TW09S	TW07P	1
	079M-L100	0.787	1.000	2.75	9.80	1.1	ZPET100M-MM	ZPET100S-MM	SPMT221	FTKA0307	ETNA02506	TW09S	TW07P	
	086M-S100	0.866	1.000	3.15	5.90	1.2	ZPET110M-MM	ZPET110S-MM	SPMT060304	FTKA0408	ETNA02506	TW15S	TW07P	
	086M-L100	0.866	1.000	3.15	9.85	1.2	ZPET110M-MM	ZPET110S-MM	SPMT060304	FTKA0408	ETNA02506	TW15S	TW07P	
	098M-S125	0.984	1.250	3.10	7.10	1.3	ZPET125M-MM	ZPET125S-MM	SPMT221	FTKA0409	ETNA02506	TW15S	TW07P	
	098M-L125	0.984	1.250	3.10	11.80	1.3	ZPET125M-MM	ZPET125S-MM	SPMT221	FTKA0409	ETNA02506	TW15S	TW07P	
	102M-S125	1.024	1.250	3.15	7.10	1.5	ZPET130M-MM	ZPET130S-MM	SDMT090308-MM	FTKA0409	ETNA0408	TW15S	TW15S	
	102M-L125	1.024	1.250	3.15	11.80	1.5	ZPET130M-MM	ZPET130S-MM	SDMT090308-MM	FTKA0409	ETNA0408	TW15S	TW15S	
	110M-S125	1.102	1.250	3.15	7.10	1.6	ZPET140M-MM	ZPET140S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20	TW15S	
	110M-L125	1.102	1.250	3.15	11.80	1.6	ZPET140M-MM	ZPET140S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20	TW15S	
	118M-S125	1.181	1.250	3.90	7.90	1.6	ZPET150M-MM	ZPET150S-MM	SDMT322-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	
	118M-L125	1.181	1.250	3.90	13.80	1.6	ZPET150M-MM	ZPET150S-MM	SDMT322-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	
	126M-S125	1.260	1.250	3.90	7.90	1.6	ZPET160M-MM	ZPET160S-MM	SDMT322-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	2
	126M-L125	1.260	1.250	3.90	13.80	1.6	ZPET160M-MM	ZPET160S-MM	SDMT322-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	
	157M-S150	1.575	1.500	3.90	7.90	2.2	ZPET200M-MM	ZPET200S-MM	SPMT432-MM	FTGA0614	ETNA0511	TW20-100	TW20S	
	157M-L150	1.575	1.500	3.90	13.80	2.2	ZPET200M-MM	ZPET200S-MM	SPMT432-MM	FTGA0614	ETNA0511	TW20-100	TW20S	
	197M-S150	1.969	1.500	3.90	7.90	2.6	ZPET250M-MM	ZPET250S-MM	SPMT432-MM	FTGA0818	ETNA0511	TW25-100	TW20S	3
	197M-L150	1.969	1.500	3.90	13.80	2.6	ZPET250M-MM	ZPET250S-MM	SPMT432-MM	FTGA0818	ETNA0511	TW25-100	TW20S	

Available inserts **E25, E31**

GBEMA





(inch)

Designation		Dimensions							Available inserts	
		ØD	Ød	Ød1	ℓ	L	M	ap	Internal	External
GBEMA	063-M08	0.630	0.591	0.335	1.2	1.9	M08	0.6	ZPET080M-MM	ZPET080S-MM
	079-M10	0.787	0.732	0.413	1.4	2.2	M10	0.7	ZPET100M-MM	ZPET100S-MM
	098-M12	0.984	0.913	0.492	1.8	2.7	M12	0.9	ZPET125M-MM	ZPET125S-MM
	118-M16	1.181	1.094	0.669	2.0	3.0	M16	1.0	ZPET150M-MM	ZPET150S-MM
	126-M16	1.260	1.173	0.669	2.0	3.0	M16	1.1	ZPET160M-MM	ZPET160S-MM

Available inserts

ZPET-M


Internal

ZPET-S


External

SPMT


Ext. main

SPMT-MM


Ext. main

Designation		Coated				Page	Designation		Coated				Page
		NCM325	PC3500	PC5300	PC3545				NCM325	PC3500	PC5300	PC3545	
SPMT	221	●				E25	ZPET	080S-MM					E31
	432-MM		●	●	●	E25		090S-MM					
SDMT	322-MM	●	●	●		E18		100S-MM		●	●		
ZPET	080M-MM					E31		110S-MM					
	090M-MM							125S-MM		●	●		
	100M-MM		●	●				130S-MM					
	110M-MM							140S-MM					
	125M-MM		●	●				150S-MM		●	●		
	130M-MM							160S-MM		●	●		
	140M-MM							200S-MM		●			
	150M-MM		●	●				250S-MM					
	160M-MM		●	●									
	200M-MM		●										
	250M-MM												

Parts

Specification	Screw		Wrench	
	Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type
Ø0.630	FTKA02555	-	TW08S	-
Ø0.787	FTKA0307	ETNA02506	TW09S	TW07P
Ø0.984	FTKA0409	ETNA02506	TW15S	TW07P
Ø1.181	FTGA0511-P	ETNA0408	TW20-100	TW15S
Ø1.260	FTGA0511-P	ETNA0408	TW20-100	TW15S

Designation: GBEMA118-M16
Modular head threading measure size (M16)

II

Adaptor spec.: MATA-M16-137-S125S
Adaptor threading measure (M16)

Available inserts E18, E25, E31 Available Adaptor E308~E309

BREA



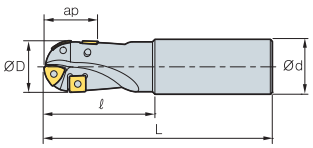


Fig. 1

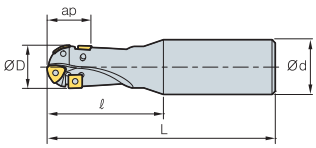


Fig. 2

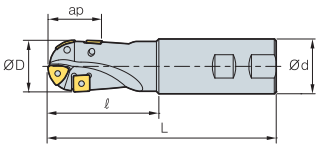


Fig. 3




• AR: 0°~10°
• RR: -3°~0°

Designation		Dimensions					Available inserts		Parts		kg	Fig.
		ØD	Ød	ℓ	L	ap	Internal	External	Screw	Wrench		
BREA	079-S	0.787	3/4	0.787	4.921	0.03	ZDMT08T2-R10-MM	SPMT221	ETNA02506	TW07P	0.3	1
	079-M	0.787	3/4	0.787	5.906	0.03						2
	079-L	0.787	1	0.787	7.874	0.03						3
	079-SL	0.787	1	0.787	4.921	0.03						
	098-S	0.984	1	0.906	5.906	0.04	ZDMT110312.5R-MM	SPMT221	ETNA02506	TW07P	0.5	1
	098-M	0.984	1	0.906	6.890	0.04						
	098-L	0.984	1 1/4	0.906	7.874	0.04					0.4	2
	098-SL	0.984	1	0.906	5.315	0.04						3

Available inserts


SDMT-MM


SPMT


ZDMT-R-MM

Designation		Coated						page
		NCM325	PC3500	PC5300	PC3525	PC3545	PC6510	
SDMT	322-MM		●	●				E18
SPMT	221	●						E25
ZDMT	080310R-MM		●	●				E30
	110312.5R-MM		●	●				
	130416R-MM		●	●				

Parts

Specification	Screw	Wrench
Ø0.787~Ø0.984	ETNA02506	TW07P

Available inserts **E18, E25, E30**

BREA



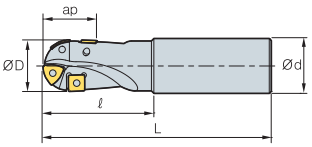


Fig. 1

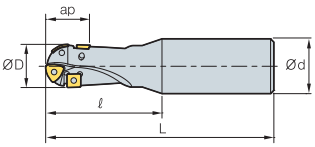


Fig. 2

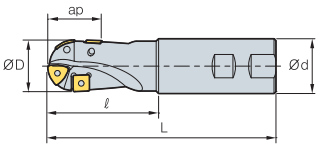


Fig. 3





• AR: 0°~10°
• RR: -3°~0°

Designation		Dimensions					Available inserts		Parts		kg	Fig.
		ØD	Ød	ℓ	L	ap	Main	Ext. main	Screw	Wrench		
BREA	126-S	1.260	1 1/4	1.220	6.890	0.05	ZDMT130416R-MM	SDMT322-MM	ETNA0408	TW15S	0.9	1
	126-M	1.260	1 1/4	1.220	7.874	0.05					0.9	1
	126-L	1.260	1 1/4	1.220	9.843	0.05					0.7	1
	126-SL	1.260	1 1/4	1.220	5.906	0.05					0.7	3
	157-S	1.575	1 1/2	1.614	6.890	0.06	ZPMT160520R-MM	SPMT432-MM SPMT442-MMN	ETNA0511	TW20-100	1.3	1
	157-S-150	1.575	1 1/2	1.614	6.890	0.06					1.3	1
	157-M	1.575	1 1/2	1.614	7.874	0.06					1.3	1
	157-M-150	1.575	1 1/2	1.614	7.874	0.06					1.3	1
	157-L	1.575	1 1/2	1.614	9.843	0.06					1.3	1
	157-L-150	1.575	1 1/2	1.614	9.843	0.06					1.3	1
	157-SL	1.575	1 1/2	1.614	6.299	0.06					1.3	3
	157-SL-150	1.575	1 1/2	1.614	6.299	0.06					1.3	3

Available inserts

SPMT-MM



ZPMT-R-MM



ZPMT-R-MR



Designation		Coated						page
		NCM325	PC3500	PC5300	PC3525	PC3545	PC6510	
SPMT	432-MM		●	●		●		E25
	442-MMN							
ZPMT	160520R-MM		●	●				E31
	160525R-MM		●	●				
	160525R-MR							
	160531.5R-MM			●				

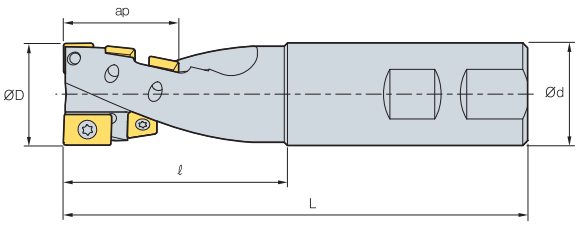
Parts

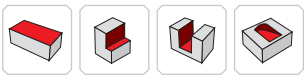
Specification	Screw	Wrench
Ø1.260	ETNA0408	TW15S
Ø1.575	ETNA0511	TW20-100

Available inserts **E25, E31**

THEA







AA 0°

• AR: 5°, 10°
• RR: -5°

(inch)

Designation		ØD	Ød	ℓ	L	ap	No. of flute	lbs	Available inserts			
									Lower cutting-edge		External cutting-edge	
THEA	098R	0.984	3/4	2.165	4.724	0.984	2	0.88	APLT070304R 1z	1	SPMT060304 4z	4
	125R	1.259	1	2.756	5.709	1.575	2	1.10	ADLT150308R 1z	1	SDMT090308-MM 5z	5
	157R	1.574	1 1/4	3.465	6.89	2.126	2	2.86	ZPMT1504PPSR-MM 1z	1	SPMT120408-MM 5z	5
	196R	1.968	1 1/2	3.346	6.89	2.126	4	3.08	ZPMT1504PPSR-MM 2z	2	SPMT120408-MM 10z	10

Available inserts

ADLT | APLT | SPMT-MM | SPMT | SDMT-MM | ZPMT-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPMT	221			●														E04 E05 E18 E25 E31
SDMT	322-MM								●				●					
SPMT	432-MM								●				●					
APLT	070304R												●					
ADLT	150308R			●									●					
ZPMT	1504PPSR-MM								●				●					

Recommended cutting condition

• Grooving

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	290~460	0.010~0.002	PC5300
M	165~295	0.010~0.002	PC5300
K	230~390	0.010~0.002	PC5300

• Side cutting

Workpiece	Cutting Condition		Grades
	vc (sfm)	fz (ipt)	
P	490~790	0.008~0.002	PC5300
M	295~490	0.008~0.002	PC5300
K	390~655	0.010~0.004	PC5300

Parts

Specification	Screw	Wrench	Wrench
Ø0.984	ETNA02506	TW07P	-
Ø1.259	ETNA0408	-	TW15S
Ø1.574	ETNA0511	-	TW20S
Ø1.968	ETNA0511	-	TW20S

Available inserts **E04, E05, E18, E25, E31**

All applications for chamfers

Chamfer Tool

- All chamfer applications
- Chamfer angles 15°, 30°, 45°, 60° for a variety of customer's needs
- The long cutting-edge provides a wide chamfering range



Back & Front Chamfer Tools



Long Chamfer Tools

Code system

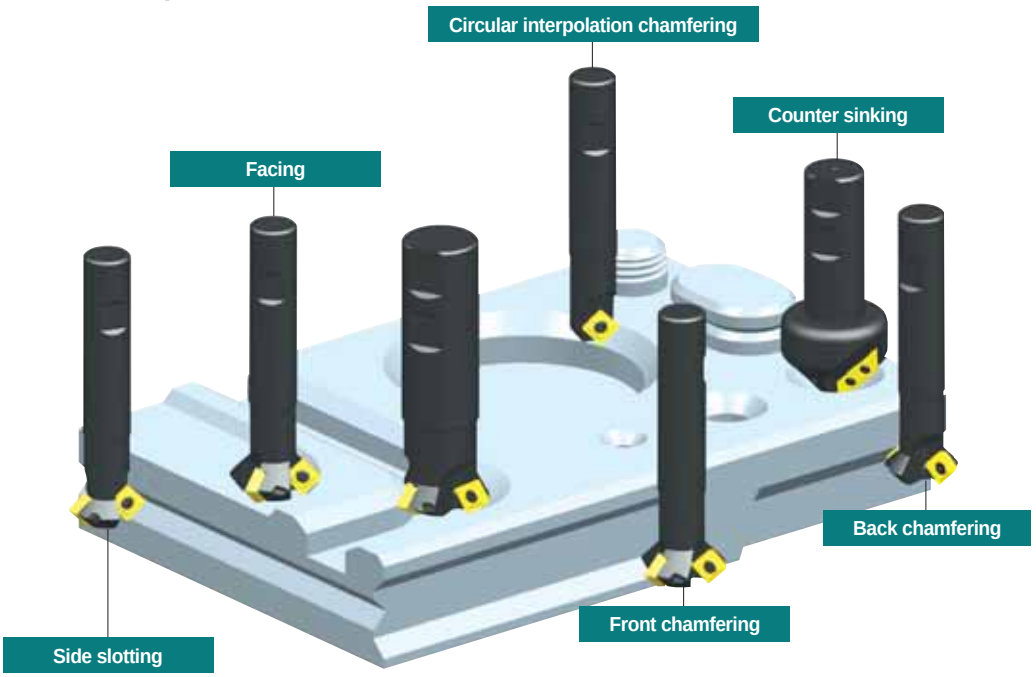
CEA 45 – 11 100 R – S 075

Chamfer Endmill	Chamfer angle	Inscribed circle of insert	Min. Cutting Dia.	Hand	Overall length	Shank Dia.
	45°	11: SPMT110408-KC 12: SPMN422 31: XCET310404ER-KC	Ø1 inch	R: Right L: Left	S: Standard M: Middle L: Long	Ø0.75 inch

Recommended cutting condition

Workpiece	Grades	ØD (Ø0.20~Ø0.79)		ØD (Ø0.10~Ø1.38)	
		vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)
P	PC3500	520~880	0.010~0.002	520~880	0.010~0.002
	PC5300	620~1010		620~1010	
	ST30A	200~330		200~330	
M	PC5300	330~520	0.008~0.002	330~520	0.012~0.004
	PC5400	230~390		230~390	
K	PC5300	360~590	0.012~0.004	360~590	0.020~0.012
	G10	160~290		160~290	

Application example



Multi-functional Chamfer Tool

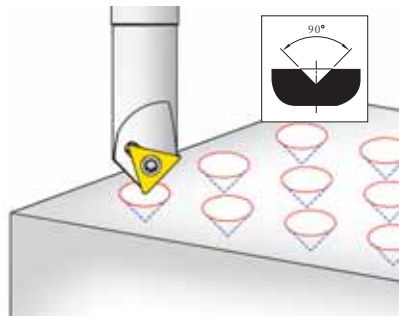
Code system

CEA 45 – 16 00 R – S 075

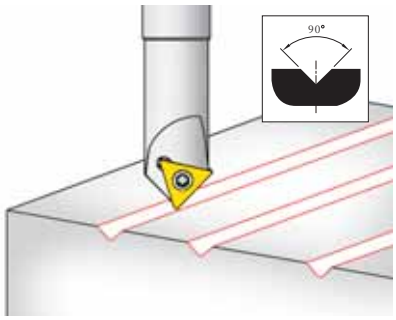
Chamfer Endmill	Chamfer angle	Inscribed circle of insert	Min. Cutting Dia.	Hand	Overall length	Shank Dia.
	45°	16: TWX16R-KC 22: TWX22R-KC	Ø0	R: Right L: Left	S: 3.543, 4.330 L: 7.874	Ø0.75 inch

Application area and recommended cutting condition

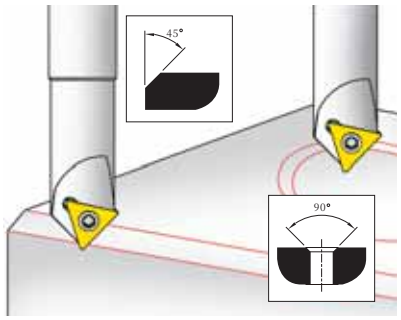
Centering



Grooving



Chamfering



Workpiece	Hardness (HRC)	Centering, Grooving		Chamfering	
		vc (ipm)	fz (ipt)	vc (ipm)	fz (ipt)
Mild steel, Carbon steel, Alloy steel	Under HRC 30	360~655	0.004~0.016	330~820	0.016~0.024
High Carbon steel, Alloy steel	HRC 30, 40	490~820	0.008~0.024	490~985	0.020~0.039
Aluminum, Copper	-	490~985	0.016~0.031	490~1,150	0.020~0.039
Cast iron	-	260~490	0.008~0.024	330~820	0.020~0.039
Stainless steel	-	195~395	0.004~0.012	195~490	0.012~0.024
HRSA		195~260	0.004~0.012	195~330	0.012~0.024

Note) Please keep fz. backtouch & chipping one caused by wrong fz

Machining example

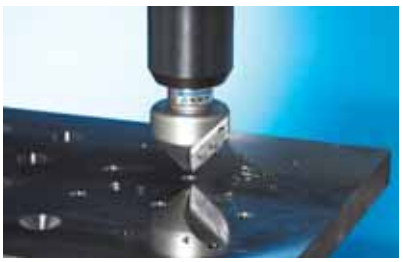
Chamfering



Grooving



Centering



CEA (Back & Front)



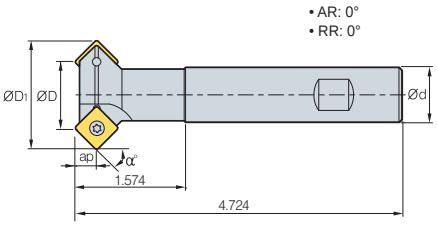


Fig. 1

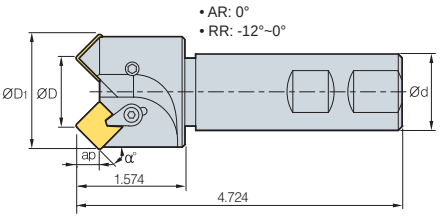


Fig. 2



(inch)

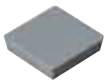
Designation		◎	ØD	ØD1	Ød	ap	Fig.	Available inserts	α° (Chamfer angle) Front	α° (Chamfer angle) Back	Machining range (Min~Max)	Uses
CEA	15-11100R-S075	2	1	1.217	3/4	0.374	1	SPMT110408 - KC	15°	-	Ø1.00~Ø1.18	Front chanfering
	30-11100R-S075	2	1	1.413	3/4	0.335	1		30°	60°	Ø1.00~Ø1.37	Front, Back chanfering
	45-11028R-S075	1	9/32	0.868	3/4	0.276	1		45°	-	Ø0.28~Ø0.82	Front chanfering
	45-11075R-S075	2	3/4	1.337	3/4	0.276	1		45°	45°	Ø0.75~Ø1.29	Front, Back chanfering
	45-11100R-S075	3	1	1.587	3/4	0.276	1		45°	45°	Ø1.00~Ø1.53	Front, Back chanfering
	60-11100R-S125	3	1	1.72	1 1/4	0.197	1		60°	30°	Ø1.00~Ø1.65	Front, Back chanfering
	45-12028R-S125	1	9/32	0.923	1 1/4	0.307	2	SPMN422	45°	-	Ø0.28~Ø0.86	Front chanfering
	45-12075R-S125	2	3/4	1.431	1 1/4	0.307	2		45°	-	Ø0.75~Ø1.41	Front chanfering
	45-12100R-S125	2	1	1.681	1 1/4	0.307	2		45°	-	Ø1.00~Ø1.61	Front chanfering
	45-12137R-S125	2	1 3/8	2.056	1 1/4	0.307	2		45°	-	Ø1.37~Ø2.00	Front chanfering

Available inserts

SPMT-KC



SPMN



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPMT	110408-KC								●						●	●		E25
SPMN	422														●			

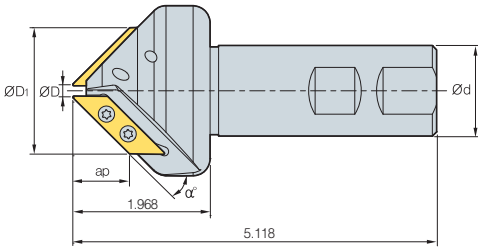
Parts

Specification	Screw	Clamp	C-Ring	Wrench	Wrench
Ø9/32~Ø1 (11□□□type)	FTKA0408	-	-	TW15S	-
Ø9/32~Ø1 3/8 (12□□□type)	CHX0617L	CH6R2	CR05	-	HW30L

Available inserts E25

CEA (Long chamfer)







• AR: -5°~1°
• RR: 0°

(inch)

Designation			ØD	ØD1	Ød	ap	α° (Chamfer angle)	Machining range (Min~Max)	Uses
CEA	30-31020R-S125	1	13/64	1.384	1 1/4	1.039	30°	Ø0.20~Ø1.37	Front Chamfering
	45-31020R0-S125	2	13/64	1.896	1 1/4	0.846	45°	Ø0.20~Ø1.89	Front Chamfering
	60-31020R-S125	2	13/64	2.278	1 1/4	0.598	60°	Ø0.20~Ø2.27	Front Chamfering

Available inserts

XCET-KC



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XCET	310404ER-KC								●						●	●		E29

Parts

Specification	Screw	Wrench
Ø13/64	FTKA03510	TW15S

Available inserts **E29**

CEA (Multi-functional)



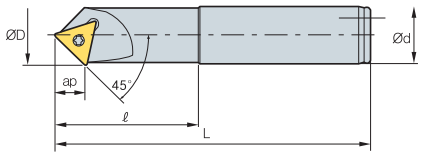


Fig. 1

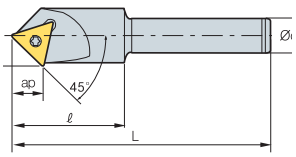
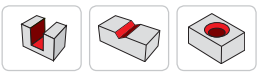


Fig. 2



• AR: -12°~15°
• RR: 0°

(inch)

Designation		ØD	Ød	ℓ	L	ap	Fig.	Available Inserts	Machining range (Min~Max)	Uses
CEA	45-1600R-S050	0.87	0.50	1.6	3.5	0.4	2	TWX16R-KC	Ø0.8	Centering Grooving Chamfering
	45-1600R-S075	0.87	0.75	2.0	4.5	0.4	1	TWX16R-KC	Ø0.8	
	45-1600R-L075	0.87	0.75	2.4	8.0	0.4	1	TWX16R-KC	Ø0.8	
	45-2200R-S050	1.14	0.50	1.6	3.5	0.6	2	TWX22R-KC	Ø1.1	
	45-2200R-S100	1.14	1.00	2.0	4.5	0.6	1	TWX22R-KC	Ø1.1	
	45-2200R-L100	1.14	1.00	2.4	8.0	0.6	1	TWX22R-KC	Ø1.1	

Available inserts

TWX-KC



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TWX	16R-KC								●									E27
	22R-KC								●									

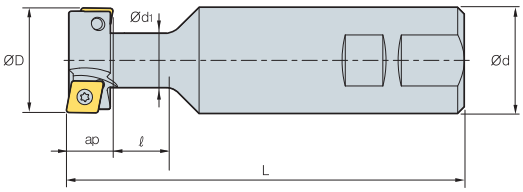
Parts

Specification	Screw	Wrench
Ø0.87~Ø1.14	FTNA0408	TW15L

Available inserts E27

TFEA







AA
90°

- AR: 5°
- RR: -5°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	ap	Available inserts
TFE	083100R/L	2	0.83	1.00	0.41	0.79	4.25	0.35	CPMT21.51-MM
	098100R/L	2	0.98	1.00	0.49	0.83	4.50	0.43	CPMT21.51-MM
	126125R/L	2	1.26	1.25	0.65	1.02	5.00	0.55	CPMT2.522-MM
	157125R/L	2	1.57	1.25	0.81	1.26	5.25	0.71	CPMT32.52-MM
	197125R/L	4	1.97	1.25	1.00	1.50	5.50	1.30	CPMH432-MM

Available inserts

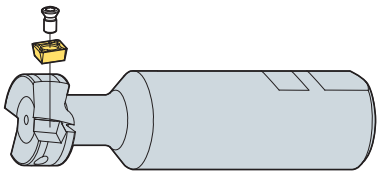
CPMT CPMH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
CPMT	21.51-MM								●									E07
	2.522-MM								●									
	32.52-MM								●									
CPMH	432-MM								●									

Parts

Specification	Screw	Wrench
Ø0.83	FTNA02555	TW08S
Ø0.98	FTNA0306	TW09S
Ø1.26	FTNA0407	TW15S
Ø1.57	PTMA0511A	TW15S
Ø1.97		

Assembling	
	

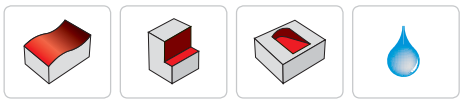
Available inserts E07

Buffed on top face of insert ensure good chip control and reduces built-up edge

Pro-A Mill

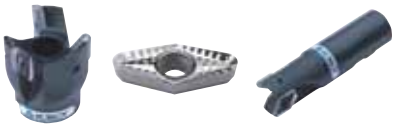
- Buffed top face of insert ensures good chip control and reduces built-up edge
- Small size modular type for aluminum machining
- Various line up of modular system for aluminum machining
- For shouldering, curved surface and ramping
- High rake angle chip breaker ensures excellent surface roughness, improved cooling effects, and chip control by through coolant system, even in deep pocket machining

Uses



Copying | Shouldering | Ramping | Through coolant system

Applied products

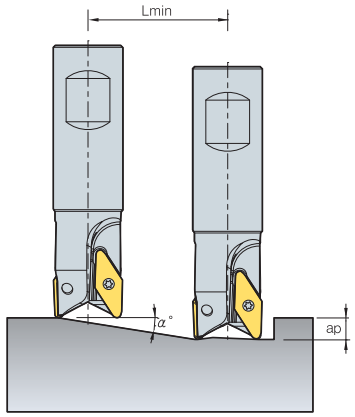
Type		Applied products	Through coolant system
Application of small-sized Aluminum machining	**Pro-A 2000**	 • Modular: Ø1/2~Ø1 1/2 • Shank: Ø1/2~Ø1 1/2 • Insert: VDKT11T210N-MA VDKT11T220N-MA	O
General application of Aluminum machining	**Pro-A 4000**	 • Cutter: Ø1 1/2~Ø4 • Shank: Ø5/8~Ø1 1/2 • Insert: VCKT220530N-MA	O

Recommended cutting condition

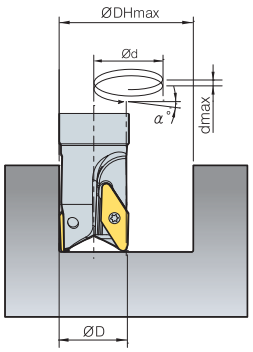
Workpiece		Cutting speed vc (sfm)
Aluminum alloy	Rm < 280 MPa	3300
	Rm > 280 MPa	2640
Copper alloy	Long chip	830
Thermo plastic	-	990
Aluminum alloy	Si < 12%	2640
Copper alloy	Short chip	1320
Magnesium alloy	-	1320
Duroplastics	-	500

Pro-A Mill ramping & helical cutting technical data

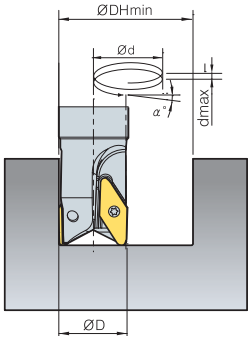
1. Ramping



2. Blind hole helical cutting



3. Thru hole helical cutting



Designation	ØD (inch)	Ramping		Blind hole helical cutting				Thru hole helical cutting	
		α° (max)	Lmin (inch)	ØDH Max (inch)	dmax (inch)	ØDH Min (inch)	dmax (inch)	ØDH Min (inch)	dmax (inch)
PASA2012HR	0.500	11.1	1.606	0.961	0.007	0.882	0.007	0.803	0.006
PASA2016HR	0.625	12.6	1.404	1.211	0.011	1.132	0.010	1.053	0.009
PASA2020HR	0.750	10.3	1.738	1.461	0.010	1.382	0.010	1.303	0.009
PASA2025HR	1.000	7.5	2.404	1.961	0.010	1.882	0.010	1.803	0.009
PASA2032HR	1.250	5.9	3.071	2.461	0.010	2.382	0.010	2.303	0.009
PASA2042HR	1.500	4.8	3.738	2.961	0.010	2.882	0.010	2.803	0.009
PASA4032HR	1.250	18.9	0.921	2.461	0.033	2.382	0.032	2.303	0.031
PASA4040HR	1.500	15.7	1.121	2.961	0.033	2.882	0.032	2.803	0.031
PASA4050HR	2.000	11.7	1.521	3.961	0.032	3.882	0.032	3.803	0.031
PASA4063HR	2.500	9.3	1.921	4.961	0.032	4.882	0.032	4.803	0.031
PACA4080HR	3.000	7.7	2.321	5.961	0.032	5.882	0.031	5.803	0.031
PACA4100HR	4.000	5.8	3.121	7.961	0.032	7.882	0.031	7.803	0.031

- Lmin: When ap = 0.315inch
- Lmin: Minimum inclination cutting length

$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (inch)}$$

α°: Max. rampig angle

ap: Depth of cut

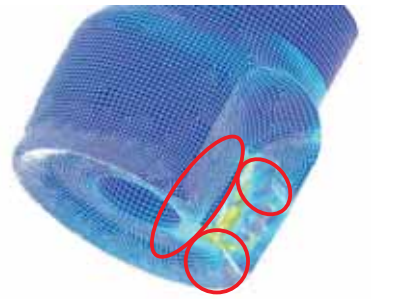
Strong clamping due to the concave design of insert bottom

Pro-X Mill

- Strong clamping due to the concave design of insert bottom
- Good chip flow and less build up edge achieved with the buffed surface of insert
- High rake angle of insert provides good surface finish and low cutting load
- Specially designed for high speed machining of aluminum
- Suitable for square shouldering and curved surface machining

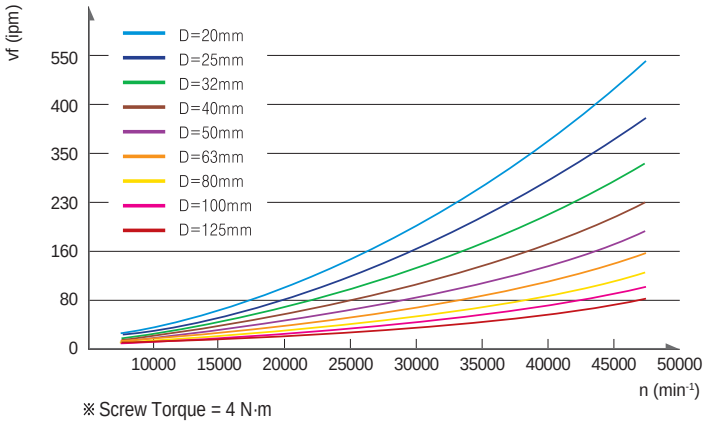
Clamping system for high speed





• Clamping design as per FEM analysis
• Strong clamping of insert

Centrifugal force as per RPM



※ Screw Torque = 4 N·m
※ Indexable insert: 6.8g

Marking [• Designation • Max. RPM]



Max. RPM as per cutting diameter

Cutting diameter ØD (inch)	5000 type		6000 type	
	n (min^{-1})	vc (sfm)	n (min^{-1})	vc (sfm)
3/4	14,000	2,883	-	-
1	28,000	7,215	15,000	3,865
1 1/4	25,000	8,245	23,000	7,585
1 1/2	22,000	9,068	20,000	8,245
2	20,000	10,305	18,000	9,275
2 1/2	18,000	11,686	16,000	10,387
3	16,000	13,192	14,000	11,542
4	14,000	14,429	13,000	13,399
5	13,000	16,749	11,000	14,170

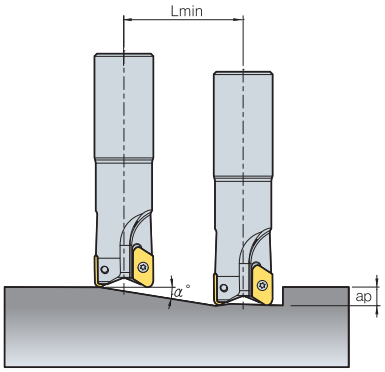
※ In case of actual machining accidental breakage of insert or tool could happen even under the written RPM special cover or door is necessary to prevent damage from broken insert or broken tool

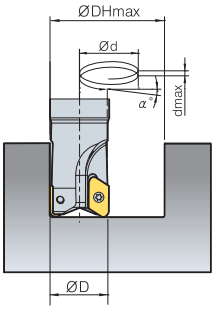
Recommended cutting condition

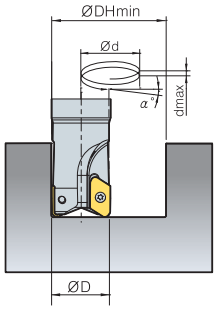
Workpiece		Cutting Speed vc (sfm)	Feed fz (ipt)
Aluminum alloy	Rm280 < MPa Rm280 > MPa	3960 3300	0.012 0.010
Copper alloy Thermo plastic	Long chipping -	1320 1150	0.008 0.006
Aluminum alloy	Si < 12% Si ≥ 12%	3300 980	0.010 0.009
Copper alloy	Short chipping	1650	0.008
Magnesium alloy	-	1480	0.008
Duroplastics	-	680	0.006

Pro-X Mill ramping & helical cutting technical data

1. Ramping | **2. Blind hole helical cutting** | **3. Thru hole helical cutting**





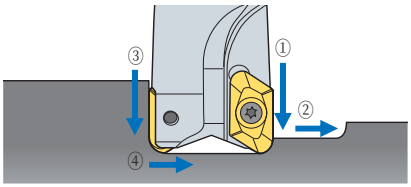


Designation	ØD (inch)	Ramping		Blind hole Helical cutting				Thru hole Helical cutting	
		α° (max)	Lmin (inch)	ØDH Max (inch)	dmax (inch)	ØDH Max (inch)	dmax (inch)	ØDH Max (inch)	dmax (inch)
PAXSA5075HR	0.75	9.1	2.47	1.264	0.008	1.185	0.007	0.988	0.006
PAXSA5100HR	1.00	11.9	1.86	1.764	0.015	1.685	0.014	1.488	0.012
PAXSA5125HR	1.25	9.0	2.49	2.264	0.014	2.185	0.014	1.988	0.012
PAXSA5150HR	1.50	7.2	3.11	2.764	0.014	2.685	0.013	2.488	0.012
PAXCA5200HR	2.00	5.2	4.36	3.764	0.013	3.685	0.013	3.488	0.012
PAXCA5250HR	2.50	4.0	5.61	4.764	0.013	4.685	0.013	4.488	0.012
PAXCA5300HR	3.00	3.3	6.86	5.764	0.013	5.685	0.013	5.488	0.012
PAXCA5400HR	4.00	2.4	9.36	7.764	0.013	7.685	0.013	7.488	0.012
PAXCA5500HR	5.00	1.9	11.86	9.764	0.013	9.685	0.013	9.488	0.012
PAXSA6100HR	1.00	9.0	2.48	1.764	0.011	1.685	0.011	1.488	0.009
PAXSA6125HR	1.25	6.8	3.31	2.264	0.011	2.185	0.010	1.988	0.009
PAXSA6150HR	1.50	10.8	2.07	2.764	0.021	2.685	0.020	2.488	0.019
PAXCA6200HR	2.00	7.7	2.91	3.764	0.020	3.685	0.020	3.488	0.019
PAXCA6250HR	2.50	6.0	3.74	4.764	0.020	4.685	0.019	4.488	0.019
PAXCA6300HR	3.00	4.9	4.57	5.764	0.020	5.685	0.019	5.488	0.019
PAXCA6400HR	4.00	3.6	6.24	7.764	0.019	7.685	0.019	7.488	0.019
PAXCA6500HR	5.00	2.9	7.91	9.764	0.019	9.685	0.019	9.488	0.019

- Lmin: When ap = 0.394inch
- Lmin: Minimum inclination cutting length
  α°: Max. rampig angle
  ap: Depth of cut

$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

Plunging, slotting, drilling technical data



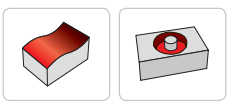
1. When drilling, grooving machining sequence is
   ① → ② → ③ → ④
2. When drilling, grooving, decrease the feed and cutting speed 30%~50% from the recommended data

• Cutting condition for drilling

Holder	ap (inch)	
	5000 type	6000 type
Ø3/4	0.315	-
Ø1	0.157	0.433
Ø1 1/4	0.157	0.236
Ø1 1/2~5	0.157	0.236

Insert	ap (inch)
XETK19	0.157
XETK25	0.236

Uses


Copying

Helical cutting


Slotting & Shouldering

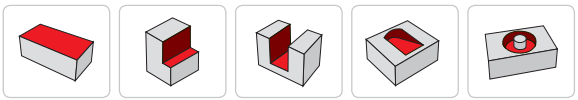

Ramping

New indexable milling tool for the machining of high quality workpieces

Pro-L Mill

- Improved perpendicularity and lower cutting resistance by composition of clearance face and high helix edge
- Productivity increase due to more than half as much of depth of cut comparing to existing product
- Strong clamping design by adaption of double screw on system
- Improved chip flow due to helical type design of chip pocket and application of coolant system

Uses



Facing | Shouldering | Slotting | Ramping | Helical cutting

Features



- Enhanced chip flow and increased tool life by inner coolant system
- Set of various Nose-R
- Strong clamping by 2 screw on system
- Improved perpendicularity and decreased cutting resistance due to application of high helix

Code system

• Shank type

PAL S A 200 H R – 3 S 200

Pro-L Mill	Tool type	Unit	Tool Dia.	Coolant type	Hand	No. of tooth	Tool length	Shank Dia.
	S: Shank	M: Metric A: inch	200: Ø2	Unmarked: None H: Thru-hole	R: Right L : Left M: Multi edge	3: 3 teeth	S: Standard type M: Middle type L: Long type	200: Ø2

• Cutter type

PAL C A 250 H R

Pro-L Mill	Tool type	Unit	Tool Dia.	Coolant type	Hand
	C: Cutter	M: Metric A: inch	250: Ø2.5	H : Thru-hole Unmarked : No Thru-hole	R: Right M: Multi-edge

Features of chip breaker

Usage	Insert's type		Edge type	Features
Al	MA			Application of the edge optimized for Aluminum machining and buffed finish ensure excellent machining quality
Hard-to-cut material	ML			Design of Low cutting resistance Chip Breaker ensures excellent machining quality for light cutting and Hard-to-cut material

Selection of grades and chip breaker

Category	M (Stainless steel)	N (Aluminum alloy)	S (HRSA)
Grades	PC5300/PC5400	H01	PC5300/PC5400
MA	-	○	-
ML	○	-	○

Application examples

N **AI6061 (HRC30)**

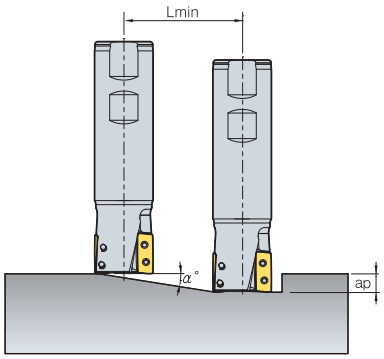


■**Cutting condition**

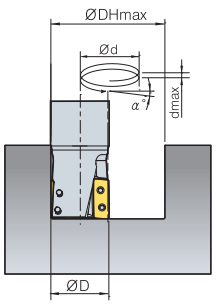
vc = 1640 sfm, fz = 0.007 ipt,
ap = 1.18~2.36 inch,
ae = 0.039~0.197 inch
z = 3

Pro-L Mill ramping & helical cutting technical data

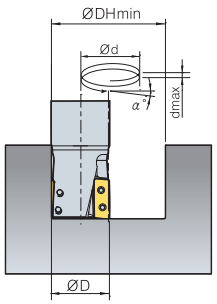
1. Ramping



2. Blind hole helical cutting



3. Thru hole helical cutting



Designation	Tool diameter ØD	ap	Ramping		Blind hole Helical cutting			
			Maximum angle (α°)	Lmin(inch)	Max. Dia ØDHmax	Max. pitch dmax	Min. Dia ØDHmin	MAX. pitch dmax
PALSA125HR-□□□□	1.25	0.984	1.22	37.087	2.441	0.05	60	0.043
PALSA150HR-□□□□	1.5	0.984	0.88	51.142	3.071	0.05	76	0.043
PALSA200HR-□□□□	2	1.339	0.85	80.039	3.858	0.06	96	0.051
PALSA250HR-□□□□	2.5	1.339	0.64	105.71	4.882	0.06	122	0.051

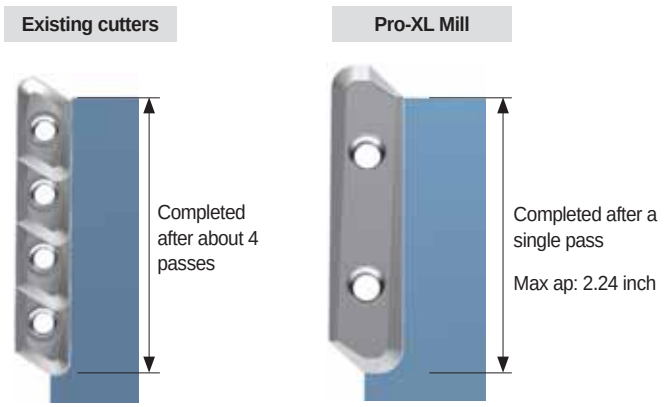
$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \text{ (inch)}$$

Deep cutting milling tools to maximize productivity in aluminum machining

Pro-XL Mill new

- **Productivity**- Cutting time is shortened by finishing the process with a single pass of deep shouldering in aluminum machining
- **High quality**- The single pass of shouldering enables perpendicular side faces without unevenness
- **Clamping stability**- Two-Screw On system secures clamping stability

Features of Pro-XL Mill





- 4 times shorter cutting time
- Satisfactory surface finish of side faces with no need for further processing

Application examples

N Al7075

■Cutting condition

vc = 1640.42 sfm, fz = 0.01 ipt,
ap = 2.205 inch, ae = 0.039 inch
z = 2

■Tools

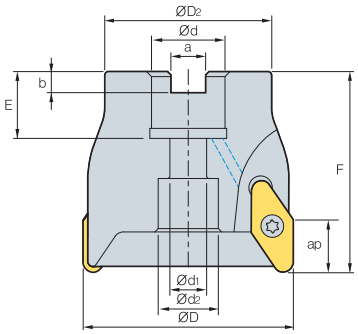
Insert LDET650550PPFR-MA
Grades H01
Holder BT50-PXL04090HR-2F (ØD = 1.575 inch)





PACA4000





AA 0°

- AR: 0°
- RR: -3°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
PACA	4150HR	3	1.50	1.378	0.50	0.287	0.433	0.250	0.169	0.787	2.165	0.591	0.20
	4200HR	3	2.00	1.772	0.75	0.413	0.630	0.313	0.220	0.787	2.165	0.591	0.37
	4250HR	4	2.50	1.969	0.75	0.413	0.630	0.313	0.220	0.787	2.362	0.591	0.64
	4300HR	4	3.00	2.205	1.00	0.551	0.827	0.375	0.248	0.984	2.362	0.591	0.83
	4400HR	5	4.00	2.874	1.25	0.708	1.024	0.500	0.319	0.866	2.362	0.591	1.60

Available inserts

VCKT-MA



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
VCKT	220530N-MA																●	E27

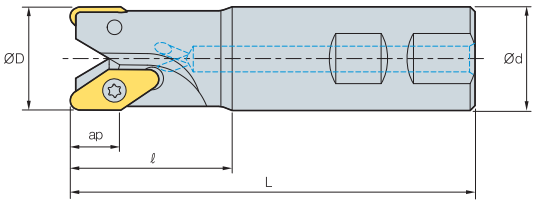
Parts

Specification	Screw	Wrench	
Ø1.50~Ø4.00	FTNC04509 (Ø1.50) FTNC04511	TW 20S	PHMA0834 (Ø1.50)

Available inserts E27

PASA2000/4000





AA 0°

- AR: 0°~7°
- RR: -21°~ -3°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
PASA	2050HR	1	0.500	0.625	0.984	3.346	0.315	0.22
	2062HR	2	0.625	0.625	0.984	3.543	0.315	0.23
	2075HR	2	0.750	0.750	0.181	3.937	0.315	0.42
	2100HR	3	1.000	1.000	0.378	4.528	0.315	0.84
	2125HR	4	1.250	1.250	1.575	4.921	0.315	1.42
	2150HR	5	1.500	1.250	1.654	5.118	0.315	1.67
	4125HR	2	1.250	1.250	1.969	4.921	0.315	1.32
	4150HR	3	1.500	1.250	1.969	5.512	0.315	1.61

Available inserts

VDKT-MA VCKT-MA




Type	Designation		Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
2000 type	VDKT	11T210N-MA																●	E27
		11T220N-MA																	
4000 type	VCKT	220530N-MA																●	

Parts

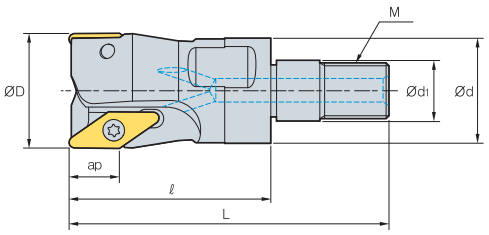
Specification	Screw	Wrench
Ø0.500~Ø1.500 (2000 type)	ETNA02505*	TW 07S
	ETNA02506	
Ø1.250~Ø1.500 (4000 type)	FTNC04509	TW 20S

* For PASA2050·2062

Available inserts E27

PAMA2000







AA 0°

- AR: 7°~10°
- RR: -21°~ -9°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
PAMA	2050HR-M06	1	0.500	0.433	0.256	1.299	1.870	M06	0.315	0.02
	2062HR-M08	2	0.625	0.571	0.335	1.417	2.087	M08	0.315	0.04
	2075HR-M10	2	0.75	0.709	0.413	1.417	2.205	M10	0.315	0.06
	2100HR-M12	3	1.000	0.886	0.492	1.614	2.480	M12	0.315	0.10
	2125HR-M16	4	1.250	1.122	0.669	1.772	2.717	M16	0.315	0.18

Available inserts

VDKT-MA



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
VDKT	11T210N-MA																●	E27

Available adaptor

Designation		Available adaptor
PAMA	2050HR-M06	MATA - M06
	2062HR-M08	MATA - M08
	2075HR-M10	MATA- M10
	2100HR-M12	MATA - M12
	2125HR-M16	MATA - M16

Designation: PAMA2125HR-M16
Modular head threading measure size (M16)

II

Adaptor spec.: MATA-M16-354-S125S-C
Adaptor threading measure (M16)

Parts

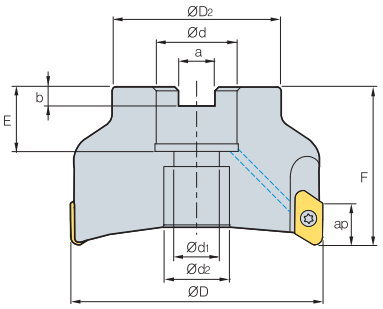
Specification	Screw	Wrench
Ø0.50~Ø1.250	ETNA02505* ETNA02506	TW 07S

Available inserts E27 Available Adaptor E308~E309

* For PAMA2050·2062

PAXCA5000





AA 0°

- AR: 8°~17.5°
- RR: -9.5°~ -5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	Max rpm	ap	lbs
PAXCA	5150HR-A,B	3	1.5	1.417	0.50	0.287	0.433	0.252	0.169	0.630	1.50	25,800	0.67	0.35
	5200HR-A,B	4	2.0	1.772	0.75	0.433	0.630	0.321	0.220	0.827	1.75	23,000	0.67	0.81
	5250HR-A,B	A:5, B:4	2.5	1.772	0.75	0.433	0.630	0.321	0.220	0.827	1.75	20,500	0.67	1.21
	5300HR-A,B	5	3.0	2.205	1.00	0.551	0.827	0.384	0.248	0.866	2.00	18,200	0.67	2.01
	5400HR-A,B	6	4.0	3.386	1.50	0.787	1.142	0.636	0.394	1.181	2.50	16,300	0.67	5.29
	5500HR-A,B	7	5.0	3.386	1.50	0.827	1.142	0.636	0.394	1.181	2.50	14,600	0.67	8.38

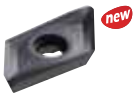
• A type: Insert NoseR 0.016~0.126, B type: Insert NoseR 0.157~0.197

Available inserts

XEKT-MA



XEKT-ML



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	19M504FR-MA													●			○	E29
	19M508FR-MA													●			○	
	19M512FR-MA													●			●	
	19M516FR-MA																○	
	19M518FR-MA																	
	19M520FR-MA													●			●	
	19M530FR-MA																○	
	19M532FR-MA													●			○	
	19M540FR-MA													●			●	
	19M550FR-MA													●			●	

Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	19M504ER-ML																	E29
	19M508ER-ML																	
	19M512ER-ML																	
	19M516ER-ML																	
	19M518ER-ML																	
	19M520ER-ML																	
	19M530ER-ML																	
	19M532ER-ML																	
	19M540ER-ML																	
	19M550ER-ML																	

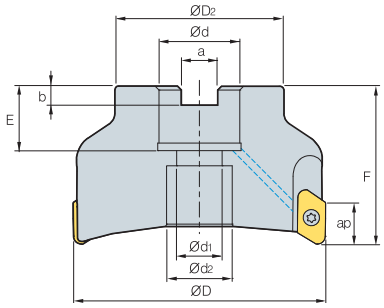
Parts

Specification	Screw	Wrench
Ø1.5~Ø5.0	PTKA0408	TW 15S

Available inserts E29

PAXCA6000





AA 0°

- AR: 8°~17.5°
- RR: -9.5°~ -5°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	Max rpm	ap	lbs
PAXCA	6200HR-A,B	2	2.0	1.772	0.75	0.416	0.433	0.315	0.220	0.787	1.75	23,000	0.91	0.720
	6250HR-A,B	3	2.5	1.772	0.75	0.416	0.630	0.315	0.220	0.787	1.75	20,500	0.91	1.190
	6300HR-A,B	4	3.0	2.205	1.00	0.551	0.866	0.374	0.248	0.768	2.00	18,200	0.91	1.560
	6400HR-A,B	5	4.0	2.874	1.25	0.689	1.024	0.500	0.319	0.787	2.50	16,300	0.91	4.030
	6500HR-A,B	6	5.0	3.386	1.50	0.827	1.220	0.626	0.394	1.181	2.50	14,600	0.91	6.860

• A type: Insert NoseR 0.016~0.126, B type: Insert NoseR 0.157~0.197

Available inserts

XEKT-MA



XEKT-ML



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	250604FR-MA																●	E29
	250608FR-MA																●	
	250612FR-MA																●	
	250616FR-MA																	
	250620FR-MA																●	
	250630FR-MA																	
	250632FR-MA																●	
	250640FR-MA																	
	250650FR-MA																●	

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	250604ER-ML																	E29
	250608ER-ML																	
	250612ER-ML																	
	250616ER-ML																	
	250620ER-ML																	
	250630ER-ML																	
	250632ER-ML																	
	250640ER-ML																	
	250650ER-ML																	

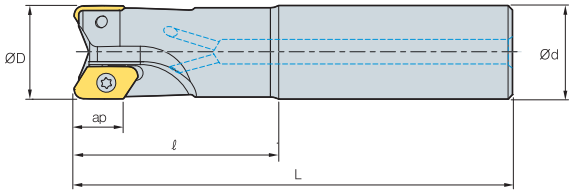
Parts

Specification	Screw	Wrench
Ø2.0~Ø5.0	FTGA0513-P	TW 20-100

Available inserts E29

PAXSA5000







AA 0°

- AR: 5°~10°
- RR: -14°~ -5°

(inch)

Designation			ØD	Ød	ℓ	L	Max rpm	ap	lbs
PAXSA	5075HR-A,B	1	0.75	0.75	2.36	5.12	15,000	0.67	0.480
	5100HR-A,B	2	1.00	1.00	2.36	5.51	32,600	0.67	0.950
	5125HR-A,B	2	1.25	1.25	2.76	5.91	28,800	0.67	1.630
	5150HR-A,B	3	1.50	1.50	2.76	6.30	25,800	0.67	1.510

• A type: Insert NoseR 0.016~0.126, B type: Insert NoseR 0.157~0.197

Available inserts

XEKT-MA



XEKT-ML



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	19M504FR-MA													●			●	E29
	19M508FR-MA													●			●	
	19M512FR-MA													●			●	
	19M516FR-MA																●	
	19M518FR-MA																	
	19M520FR-MA													●			●	
	19M530FR-MA																●	
	19M532FR-MA													●			●	
	19M540FR-MA													●			●	
	19M550FR-MA													●			●	

Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	19M504ER-ML																	E29
	19M508ER-ML																	
	19M512ER-ML																	
	19M516ER-ML																	
	19M518ER-ML																	
	19M520ER-ML																	
	19M530ER-ML																	
	19M532ER-ML																	
	19M540ER-ML																	
	19M550ER-ML																	

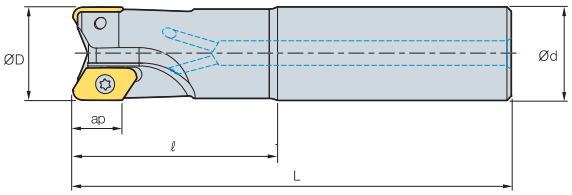
Parts

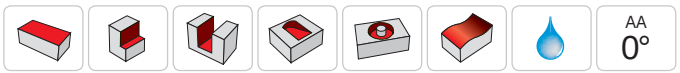
Specification	Screw	Wrench
Ø0.75	PTKA0407	TW 15S
Ø1~Ø1.5	PTKA0408	

Available inserts E29

PAXSA6000







AA 0°

- AR: 5°~10°
- RR: -14°~ -5°

(inch)

Designation			ØD	Ød	ℓ	L	Max rpm	ap	lbs
PAXSA	6100HR-A,B	1	1.00	1.00	2.36	5.51	32,600	0.91	0.93
	6125HR-A,B	1	1.25	1.25	2.76	5.91	28,800	0.91	1.68
	6150HR-A,B	2	1.50	1.50	2.76	6.30	25,800	0.91	2.65

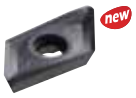
• A type: Insert NoseR 0.016~0.126, B type: Insert NoseR 0.157~0.197

Available inserts

XEKT-MA



XEKT-ML



Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	250604FR-MA															●		E29
	250608FR-MA															●		
	250612FR-MA															●		
	250616FR-MA																	
	250620FR-MA																	
	250630FR-MA																	
	250632FR-MA															●		
	250640FR-MA																	
	250650FR-MA															●		

Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	250604ER-ML																	E29
	250608ER-ML																	
	250612ER-ML																	
	250616ER-ML																	
	250620ER-ML																	
	250630ER-ML																	
	250632ER-ML																	
	250640ER-ML																	
	250650ER-ML																	

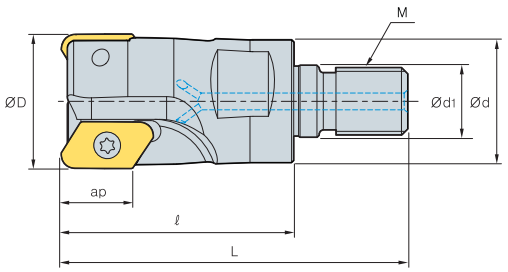
Parts

Specification	Screw	Wrench
Ø1~Ø1.25	FTGA0510-P	TW 20-100
Ø1.50	FTGA0513-P	

Available inserts E29

PAXMA5000







AA 0°

- AR: 6°~8°
- RR: -7°~ -5°

(inch)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	lbs
PAXMA	5100HR-A,B-M12	2	1.00	0.906	0.492	2.165	3.110	M12	0.67	0.12
	5125HR-A,B-M16	2	1.25	1.142	0.669	2.165	3.228	M16	0.67	0.24
	5150HR-A,B-M16	3	1.50	1.142	0.669	2.165	3.228	M16	0.67	0.32

Available inserts

XEKT-MA



XEKT-ML



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	19M504FR-MA													●			●	E29
	19M508FR-MA													●			●	
	19M512FR-MA													●			●	
	19M516FR-MA																●	
	19M518FR-MA																	
	19M520FR-MA													●			●	
	19M530FR-MA																●	
	19M532FR-MA													●			●	
	19M540FR-MA													●			●	
	19M550FR-MA													●			●	

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	19M504ER-ML																	E29
	19M508ER-ML																	
	19M512ER-ML																	
	19M516ER-ML																	
	19M518ER-ML																	
	19M520ER-ML																	
	19M530ER-ML																	
	19M532ER-ML																	
	19M540ER-ML																	
	19M550ER-ML																	

Available adaptor

Designation		Available adaptor
PAXMA	5100HR-A,B-M12	MATA-M12
	5125HR-A,B-M16	MATA-M16
	5150HR-A,B-M16	

Designation: PAXMA5125HR-M16
Modular head threading measure size (M16)

II

Adaptor spec.: MATA-M16-354-S125S-C
Adaptor threading measure (M16)

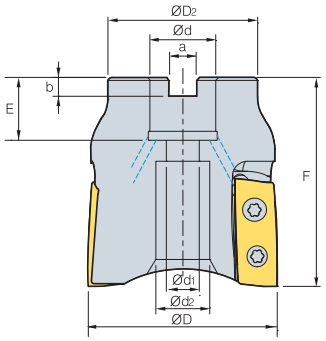
Parts

Specification	Screw	Wrench
Ø1.00~Ø1.50	PTKA0408	TW 15S

Available inserts E29 Available Adaptor E308~E309

PALCA











AA 0°

- AR: 16°
- RR: -8°

(inch)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	lbs
PALCA	250HR	4	2.5	1.77	0.75	0.413	0.827	0.314	0.22	0.787	1.75	1.339	0.57

Available inserts

LXET-MA LXET-ML




Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
LXET	340504PEFR-250-MA																●	E12
	3405PEFR-250-MA																●	
	340512PEFR-250-MA																	
	340516PEFR-250-MA																	
	340504PEER-250-ML																	
	3405PEER-250-ML																	
	340512PEER-250-ML																	
	340516PEER-250-ML																	

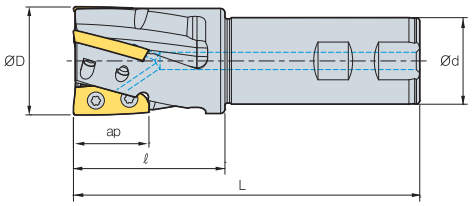
Parts

Specification	Screw	Wrench
Ø2.5	FTGA0511-P	TW20-100

Available inserts **E12**

PALSA (Single-edge)











AA 0°

- AR: 12°~16°
- RR: -5°~ -9°

(inch)

Designation		⦾	ØD	Ød	ℓ	L	ap	lbs
PALSA	125HR-2S100	2	1.25	1.00	1.969	5.512	0.984	1.09
	125HR-2S125	2	1.25	1.25	1.969	5.512	0.984	1.54
	150HR-2S125	2	1.50	1.25	1.969	5.512	0.984	1.73
	150HR-2S150	2	1.50	1.50	1.969	5.512	0.984	2.27

Available inserts

LXET-MA



LXET-ML



Type	Designation		Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
Ø1.25	LXET	250404PEFR-125-MA																	E12
		2504PEFR-125-MA																●	
		250412PEFR-125-MA																	
		250416PEFR-125-MA																	
		250404PEER-125-ML																	
		2504PEER-125-ML																	
		250412PEER-125-ML																	
		250416PEER-125-ML																	
Ø1.50	LXET	250404PEFR-150-MA																	
		2504PEFR-150-MA																	
		250412PEFR-150-MA																	
		250416PEFR-150-MA																	
		250404PEER-150-ML																	
		2504PEER-150-ML																	
		250412PEER-150-ML																	
		250416PEER-150-ML																	

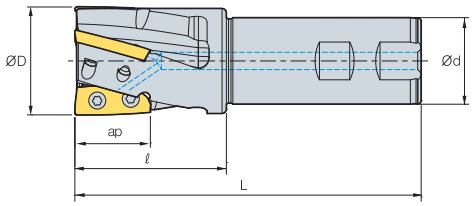
Parts

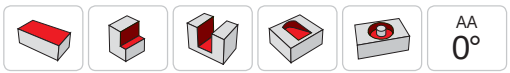
Specification	Screw	Wrench
Ø1.25	FTKA0408	TW15S
Ø1.50	FTKA0410	TW15S

Available inserts E12

PALSA (Single-edge)







AA 0°

- AR: 12°~16°
- RR: -5°~ -9°

(inch)

Designation			ØD	Ød	ℓ	L	ap	lbs
PALSA	200HR-3S125	3	2.00	1.25	2.756	6.299	1.339	2.43
	200HR-3S150	3	2.00	1.50	2.756	6.299	1.339	2.97
	250HR-4S125	4	2.50	1.25	2.756	6.299	1.339	3.32
	250HR-4S150	4	2.50	1.50	2.756	6.299	1.339	3.86

Available inserts

LXET-MA LXET-ML



Type	Designation		Cermet		Coated											Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
Ø2.00	LXET	340504PEFR-200-MA																	E12
		3405PEFR-200-MA																●	
		340512PEFR-200-MA																	
		340516PEFR-200-MA																	
		340504PEER-200-ML																	
		3405PEER-200-ML																	
		340512PEER-200-ML																	
		340516PEER-200-ML																	
Ø2.50	LXET	340504PEFR-250-MA																●	
		3405PEFR-250-MA																●	
		340512PEFR-250-MA																	
		340516PEFR-250-MA																	
		340504PEER-250-ML																	
		3405PEER-250-ML																	
		340512PEER-250-ML																	
		340516PEER-250-ML																	

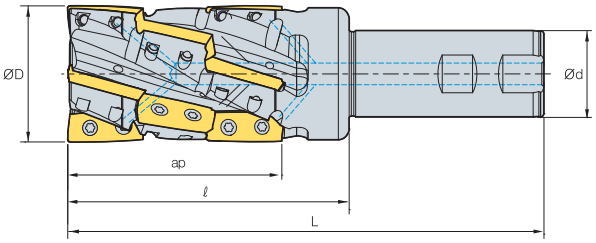
Parts

Specification	Screw	Wrench
Ø2.00	FTGA0510-P	TW20-100
Ø2.50	FTGA0511-P	TW20-100

Available inserts E12

PALSA (Multi-edge)







AA 0°

- AR: 16°
- RR: -8°

(inch)

Designation			Ød	Ød1	ℓ	L	ap	lbs
PALSA	250HM-4S125	12	2.5	1.25	5.118	8.661	3.78	4.97
	250HM-4S150	12	2.5	1.50	5.118	8.661	3.78	5.51

Available inserts

LXET-MA



LXET-ML



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LXET	340504PEFR-250-MA																●	E12
	3405PEFR-250-MA																●	
	340512PEFR-250-MA																	
	340516PEFR-250-MA																	
	340504PEER-250-ML																	
	3405PEER-250-ML																	
	340512PEER-250-ML																	
	340516PEER-250-ML																	

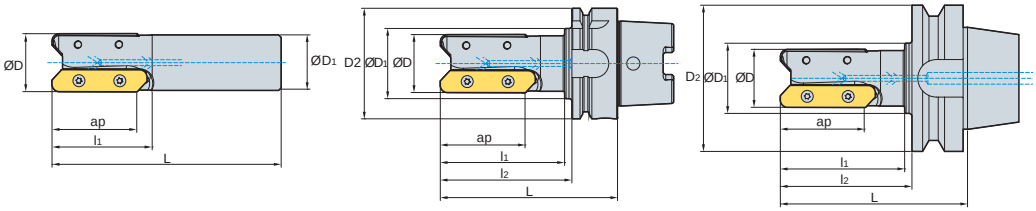
Parts

Specification	Screw	Wrench
Ø2.5	FTGA0511-P	TW20-100

Available inserts E12

PXLSA new





AA 90°

- AR: 5°~17.5°
- RR: -14°~ -5°

(inch)

Designation			ØD	ØD1	ØD2	l1	l2	L	ap	lbs	Fig.
PXLSA	150HR-2S150	2	1.5	1.5	-	3	-	7	2.24	2.735	1
	150HR-3S150	3	1.5	1.5	-	3	-	7	2.24	2.436	1
	200HR-3S150	3	2	1.5	-	3.5	-	7	2.24	3.455	1
HSK63A	PXLA150390HR-2F	2	1.5	2	2.48	3.5	3.9	4.223	2.24	4.923	2
HSK100A	PXLA150390HR-3F	3	1.5	2.5	3.937	3.5	3.9	5.041	2.24	5.58	2
	PXLA300350HR-5F	5	3	1.44	3.937	-	3.5	4.641	2.24	8.655	2
BT50	PXLA150390HR-2F	2	1.5	2	3.937	3.5	3.9	5.396	2.24	9.248	3

Available inserts

LDET-MA



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LDET	650540PPFR-MA																	E09
	650550PPFR-MA																	

Parts

Specification	Screw	Wrench
Ø1.5~3	FTGA0511-P	TW20-100

Available inserts E09

MATA (Steel shank type)



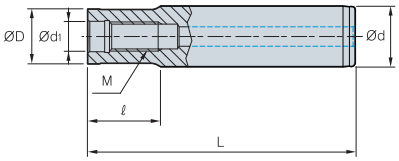


Fig. 1

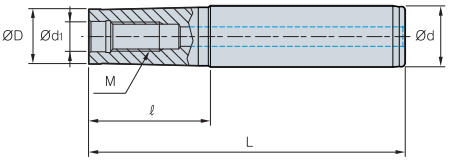


Fig. 2

(inch)

Designation		ØD	Ød	Ød1	ℓ	L	M	Fig.
MATA	M06-078-S038S	0.354	3/8	0.256	0.787	2.756	M06	1
	M06-157-S050T	0.354	1/2	0.256	1.575	3.780	M06	1
	M06-255-S063T	0.354	5/8	0.256	2.559	4.921	M06	1
	M6B-078-S050S	0.433	1/2	0.256	0.787	2.992	M08	1
	M6B-157-S050S	0.433	1/2	0.256	1.575	3.780	M10	1
	M6B-255-S063T	0.433	5/8	0.256	2.559	4.921	M12	1
	M6B-315-S063T	0.433	5/8	0.256	3.150	5.512	M16	1
	M08-078-S063S	0.571	5/8	0.335	0.787	3.150	M06	2
	M08-157-S063T	0.571	5/8	0.335	1.575	3.937	M06	2
	M08-255-S063T	0.571	5/8	0.335	2.559	4.921	M06	2
	M08-315-S075T	0.571	3/4	0.335	3.150	5.906	M06	2
	M08-433-S100T	0.571	1	0.335	4.331	7.480	M08	2
	M10-118-S075S	0.689	3/4	0.413	1.181	3.937	M08	2
	M10-196-S075T	0.689	3/4	0.413	1.969	4.724	M08	2
	M10-275-S075T	0.689	3/4	0.413	2.756	5.512	M08	2
	M10-354-S100T	0.689	1	0.413	3.543	6.693	M10	2
	M10-433-S100T	0.689	1	0.413	4.331	7.480	M10	2
	M10-511-S125T	0.689	1 1/4	0.413	5.118	8.661	M10	2
	M12-118-S100S	0.906	1	0.492	1.181	4.331	M10	2
	M12-196-S100T	0.906	1	0.492	1.969	5.118	M10	2
	M12-275-S100T	0.906	1	0.492	2.756	5.906	M12	2
	M12-354-S100T	0.906	1	0.492	3.543	6.693	M12	2
	M12-433-S125T	0.906	1 1/4	0.492	4.331	7.874	M12	2
	M12-689-S150T	0.906	1 1/2	0.492	6.890	11.811	M12	2
	M16-137-S125S	1.142	1 1/4	0.669	1.378	4.921	M12	2
	M16-216-S125T	1.142	1 1/4	0.669	2.165	5.709	M16	2
	M16-315-S125T	1.142	1 1/4	0.669	3.150	6.693	M16	2
	M16-472-S125T	1.142	1 1/4	0.669	4.724	8.268	M16	2
	M16-689-S150T	1.142	1 1/2	0.669	6.890	11.811	M16	2

• S: straight neck adaptor • T: taper neck adaptor

FMRMA type



E210, 212, 221

LBEA-MHD type



E274

PAMA/PAXMA type



E297, 302

AMMA type



E169, 170, 171

RM3PMA type



E90

RM4PMA type



E102

RM4ZMA type



E104

HFMMA type



E231

HRMMA type



E254

HRMDMA type



E246, 247

GBEMA type



E278

MATA-C (Carbide shank type)



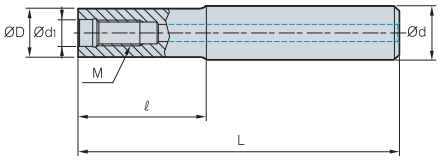


Fig. 1

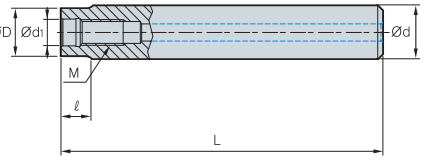


Fig. 2

(inch)

	Designation	ØD	Ød	Ød1	ℓ	L	M	Fig.
MATA-	M06-118-S039S-C-315	0.374	0.394	0.256	1.181	3.150	M06	1
	M06-196-S039S-C-393	0.374	0.394	0.256	1.969	3.937	M06	1
	M06-315-S039S-C-511	0.374	0.394	0.256	3.150	5.118	M06	1
	M06B-118-S039S-C-315	0.433	0.394	0.256	1.181	3.150	M06	1
	M06B-196-S039S-C-393	0.433	0.394	0.256	1.969	3.937	M06	1
	M06B-315-S039S-C-511	0.433	0.394	0.256	3.150	5.118	M06	1
	M08-315-S063S-C	0.571	5/8	0.335	3.150	5.906	M08	1
	M08-433-S063S-C	0.571	5/8	0.335	4.331	7.087	M08	1
	M08-590-S063S-C	0.571	5/8	0.335	5.906	9.843	M08	1
	M08-394-S063S-C-590	0.571	5/8	0.335	0.394	5.906	M08	2
	M08-394-S063S-C-708	0.571	5/8	0.335	0.394	7.087	M08	2
	M08-394-S063S-C-984	0.571	5/8	0.335	0.394	9.843	M08	2
	M10-354-S075S-C	0.689	3/4	0.413	3.543	6.693	M10	1
	M10-433-S075S-C	0.689	3/4	0.413	4.331	7.874	M10	1
	M10-689-S075S-C	0.689	3/4	0.413	6.890	11.811	M10	1
	M10-394-S075S-C-669	0.689	3/4	0.413	0.394	6.693	M10	2
	M10-394-S075S-C-787	0.689	3/4	0.413	0.394	7.874	M10	2
	M10-394-S075S-C-1181	0.689	3/4	0.413	0.394	11.811	M10	2
	M12-354-S100S-C	0.906	1	0.492	3.543	6.693	M12	1
	M12-433-S100S-C	0.906	1	0.492	4.331	7.874	M12	1
	M12-689-S100S-C	0.906	1	0.492	6.890	11.811	M12	1
	M12-059-S100S-C-669	0.906	1	0.492	0.591	6.693	M12	2
	M12-059-S100S-C-787	0.906	1	0.492	0.591	7.874	M12	2
	M12-059-S100S-C-1181	0.906	1	0.492	0.591	11.811	M12	2
	M16-354-S125S-C	1.142	1 1/4	0.669	3.543	7.087	M16	1
	M16-472-S125S-C	1.142	1 1/4	0.669	4.824	8.268	M16	1
	M16-689-S125S-C	1.142	1 1/4	0.669	6.890	11.811	M16	1
	M16-078-S125S-C-708	1.142	1 1/4	0.669	0.787	70.87	M16	2
	M16-078-S125S-C-826	1.142	1 1/4	0.669	0.787	8.268	M16	2
	M16-078-S125S-C-1181	1.142	1 1/4	0.669	0.787	11.811	M16	2

FMRMA type



E210, 212, 221

LBEA-MHD type



E274

PAMA/PAXMA type



E297, 302

AMMA type



E169, 170, 171

RM3PMA type



E90

RM4PMA type



E102

RM4ZMA type



E104

HFMMA type



E231

HRMMA type



E254

HRMDMA type



E246, 247

GBEMA type



E278

Adjusting side cutter

Code system

P: Plane type



B: Boss type



A: Adjusting side cutter — **Adjusting**

Cutter type

For half side cutter, minimum width of the cutter will be written only — **Max. width of cutter**

R	A	FC	B	A	500	055	071	–	R
Insert clamping way		Insert configuration		inch type	Cutter Dia.	Min. width of cutter			Hand

Insert clamping way



R: Radial type (Using SDXT)



T: Tangential type (Using CNHQ)

Insert configuration



FC Full side cutter



HC Half side cutter

Hand

Unmarked	R	L
Neutral	Right	Left
Full side cutter (Plane type)	Half side cutter (Boss type)	

Tangential type (High rigidity)

• CNHQ



- Medium/Roughing
- Excellent performance at medium to roughing range (0.551~1.181 inch) table operation due to the strong rigidity of the cutter
- Good performance in heavy interruption and deep depth of cut application

Radial type (Low cutting load)

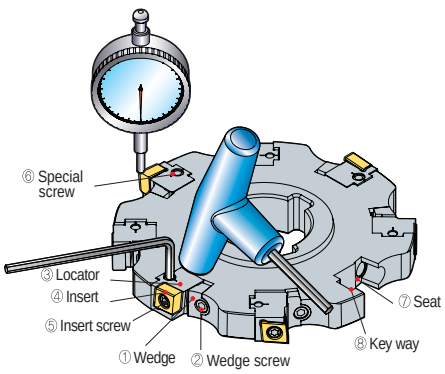


- Medium/Finishing
- Suitable for small width cutting operation (0.472~0.945 inch)
- 3 dimensional chip breaker provides smooth cutting operation
- Several chip breakers as per applications are available (MF, MM, FA)
- Economical insert using 4 cutting-edges per insert

Insert features

- Precise adjustable side cutter can control the width of the cutter by 5㎛ unit
- Since the width of the cutter is adjustable up to ±1.5mm, single cutter can cover various cutting width
- Specially designed clamping system of the locator provides excellent rigidity by using elastic deformation of the locator
- Tangential type clamping system of insert provides enough strength can withstand large width cutting operations
- 3-dimensional chip breaker of insert provides smooth cutting with low cutting load at medium to finishing range

Operating manual



• How to assemble the adjusting side cutter

1. Clamp ①wedge slightly on ⑦locator-wedge pocket by using ②wedge screw
2. Put ③locator on ⑦locator-wedge pocket along with the ⑧key-way
3. Tighten the ⑥taper screw little bit to set proper position of locator
4. Tighten the ②wedge screw tightly by using 70~80N.m torque
5. After, put the ④insert on insert pocket of ③locator, clamp it with ⑤insert screw by using 40~50N.m torque

• How to adjust Run-out & cutting width

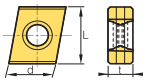
1. Settle the adjusting side cutter after cleaning to the jig for measurement
2. Un-screw the ②Wedge screw first, then tighten ①wedge slightly again by using 8N.m torque
3. Adjusting the height of cutting-edge by using a dial gauge to set the width of the cutter
4. Tighten the ②wedge screw tightly by using 70~80N.m torque
5. To finish the setting, tighten the ⑥taper screw for strong clamp

Tangential type

Cutting width per insert & type of cutter

CNHQ





(inch)

Designation		Coated		Cutting width for half side cutter (ap)	Cutting width for full side cutter (ap)	L	d	t
		NCM325	PC6510					
CNHQ1005	- C0.5			0.354	0.551~0.709	0.394	0.394	0.213
	- R0.5							
	- C1.0			0.335	0.551~0.669			
	- R1.0							
CNHQ1305	- C0.5			0.472	0.709~0.827/0.827~0.945	0.500	0.394	0.213
	- R0.5							
	- C1.0			0.453	0.709~0.827 / 0.827~0.910			
	- R1.0							
	- C1.5			0.433	0.709~0.827 / 0.827~0.866			
	- R1.5							
CNHQ1606	- C0.5			0.591	0.945~1.063 / 1.063~1.181	0.630	0.472	0.252
	- R0.5							
	- C1.0			0.571	0.945~1.063 / 1.063~1.142			
	- R1.0							
	- C1.5			0.561	0.945~1.063 / 1.063~1.102			
	- R1.5							
	- C2.0			0.531	0.945~1.063			
	- R2.0							

Applicable holder **E312, E313**

●: Korea Stock ●: US Stock

Recommended cutting condition

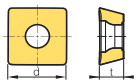
ISO	Grades	vc (sfm)	fz (ipt)
P	NCM325	490~990	0.012~0.004
	PC3500	330~990	
M	PC5300	330~590	0.012~0.004
	NCM335	400~660	
K	PC6510	490~990	0.012~0.004

Radial type

Cutting width as per insert & type of cutter

MA MF MM





(inch)

Designation		Coated										Uncoated	Cutting width for half side cutter (ap)	Cutting width for full side cutter (ap)	d	t
		NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01				
SDXT	09M405R-MA												●	0.315	0.472~0.551 0.551~0.630	0.375	0.157
	09M405L-MA																
	09M405R-MF	●						●	●	●	●	●					
	09M405L-MF																
	09M405R-MM	●	●				●	●	●	●	●	●					
	09M405L-MM							●		●							
	130508R-MA												●	0.413	0.630~0.709 0.709~0.787 0.787~0.866 0.866~0.945	0.531	0.219
	130508L-MA																
	130508R-MF	●						●	●	●	●	●					
	130508L-MF																
	130508R-MM	●	●				●	●	●	●	●	●					
	130508L-MM																

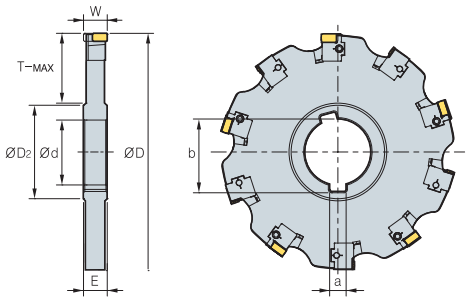
Applicable holder **E312, E313**

●: Korea Stock ●: US Stock

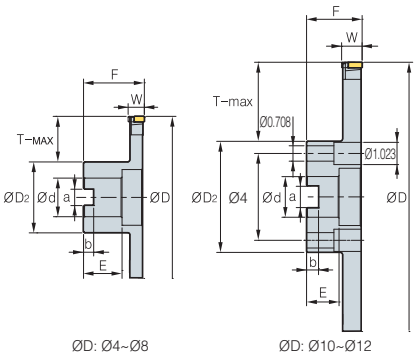
Recommended cutting condition

ISO	Grades	vc (sfm)	fz (ipt)
P	NCM325	400~820	0.013~0.003
	NCM335	400~730	0.010~0.003
	PC3500	330~730	0.010~0.004
M	PC9530	260~590	0.010~0.004
	PC5300		
K	PC8110	490~760	0.010~0.004
	PC6510	590~760	

Tangential type (Full side cutter)



• TAFCPA



• TAFCBA

(inch)

Designation		Ød	E	ØD2	a	b	T-MAX
TAFCPA	400-055-071	1 1/4	0.551	1.890	5/16	1.386	0.976
	500-055-071	1 1/2	0.551	2.205	3/8	1.665	1.299
	600-055-071	1 1/2	0.551	2.205	3/8	1.665	1.819
	800-055-071	2	0.551	2.835	1/2	2.197	2.465
	1000-055-071	2	0.551	2.835	1/2	2.197	3.465
	1200-055-071	2	0.551	2.835	1/2	2.197	4.445
	400-071-082	1 1/4	0.709	1.890	5/16	1.386	0.976
	500-071-082	1 1/2	0.709	2.205	3/8	1.665	1.299
	600-071-082	1 1/2	0.709	2.205	3/8	1.665	1.819
	800-071-082	2	0.709	2.835	1/2	2.197	2.465
	1000-071-082	2	0.709	2.835	1/2	2.197	3.465
	1200-071-082	2	0.709	2.835	1/2	2.197	4.445
	400-082-094	1 1/4	0.827	1.890	5/16	1.386	0.976
	500-082-094	1 1/2	0.827	2.205	3/8	1.665	1.299
	600-082-094	1 1/2	0.827	2.205	3/8	1.665	1.819
	800-082-094	2	0.827	2.835	1/2	2.197	2.465
	1000-082-094	2	0.827	2.835	1/2	2.197	3.465
	1200-082-094	2	0.827	2.835	1/2	2.197	4.445
	500-094-106	1 1/2	0.945	2.205	3/8	1.665	1.299
	600-094-106	1 1/2	0.945	2.205	3/8	1.665	1.819
	800-094-106	2	0.945	2.835	1/2	2.197	2.465
	1000-094-106	2	0.945	2.835	1/2	2.197	3.465
	1200-094-106	2	0.945	2.835	1/2	2.197	4.445
	500-106-118	1 1/2	1.063	2.205	3/8	1.665	1.299
	600-106-118	1 1/2	1.063	2.205	3/8	1.665	1.819
	800-106-118	2	1.063	2.835	1/2	2.197	2.465
	1000-106-118	2	1.063	2.835	1/2	2.197	4.445
	1200-106-118	2	1.063	2.835	1/2	2.197	4.445

Designation		Ød	F	ØD2	a	b	E	T-MAX
TAFCBA	400-055-071R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-055-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-055-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-055-071R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-055-071R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-055-071R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	400-071-082R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-071-082R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-071-082R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-071-082R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-071-082R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-071-082R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	400-082-094R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-082-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-082-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-082-094R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-082-094R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-082-094R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-094-106R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-094-106R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-094-106R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-094-106R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-094-106R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-106-118R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-106-118R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-106-118R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-106-118R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-106-118R/L	2.5	2.559	5.118	1	0.551	1.496	3.343

Dimensions		
ØD	W	No. of tooth
4	0.551-0.708	6
5	0.551-0.708	8
6	0.551-0.708	10
8	0.551-0.708	12
10	0.551-0.708	16
12	0.551-0.708	20
4	0.708-0.826	6
5	0.708-0.826	8
6	0.708-0.826	10
8	0.708-0.826	12
10	0.708-0.826	16
12	0.708-0.826	20
4	0.826-0.944	6
5	0.826-0.944	8
6	0.826-0.944	10
8	0.826-0.944	12
10	0.826-0.944	16
12	0.826-0.944	20
5	0.944-1.062	8
6	0.944-1.062	10
8	0.944-1.062	12
10	0.944-1.062	16
12	0.944-1.062	20
5	1.062-1.181	8
6	1.062-1.181	10
8	1.062-1.181	12
10	1.062-1.181	16
12	1.062-1.181	20

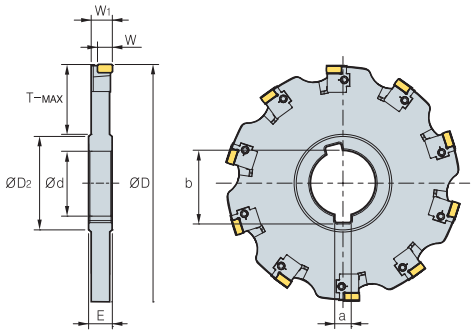
Available inserts and Recommended cutting condition **E311** • The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.02 or R0.02

Parts

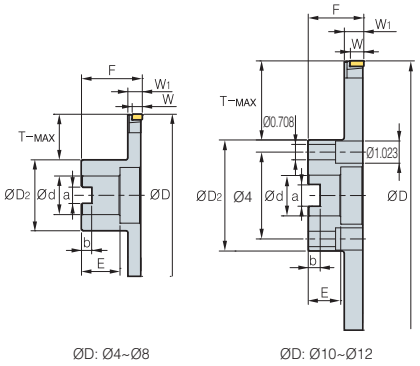
Specification Edge width (TAHCP/B)	Insert	Locator	Wedge	Insert screw	Wedge screw	Locator screw	Insert wrench	Wedge Wrench	Locator Wrench
□□□055-071R/L	CNHQ1005-□□□	LSA-CH10R/L	WSA10N	FTKA0410	DHA0617	SHGA0411	TW15S	HW30	-
□□□071-082R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□082-094R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□094-1067R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L
□□□106-118R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L

• Note) The Wedge screw for 1001821, 1002124 cutter is DHA0818F

Tangential type (Half side cutter)



• TAHCPA



ØD: Ø4~Ø8 ØD: Ø10~Ø12

• TAHCBA

(inch)

Designation		Ød	E	ØD2	a	b	T-MAX
TAHCPA	400-055R/L	1 1/4	0.551	1.890	5/16	1.386	0.976
	500-055R/L	1 1/2	0.551	2.205	3/8	1.665	1.299
	600-055R/L	1 1/2	0.551	2.205	38/	1.665	1.819
	800-055R/L	2	0.551	2.835	1/2	2.197	2.465
	1000-055R/L	2	0.551	2.835	1/2	2.197	3.465
	1200-055R/L	2	0.551	2.835	1/2	2.197	4.445
	400-071R/L	1 1/4	0.709	1.890	5/16	1.386	0.976
	500-071R/L	1 1/2	0.709	2.205	3/8	1.665	1.299
	600-071R/L	1 1/2	0.709	2.205	38/	1.665	1.819
	800-071R/L	2	0.709	2.835	1/2	2.197	2.465
	1000-071R/L	2	0.709	2.835	1/2	2.197	3.465
	1200-071R/L	2	0.709	2.835	1/2	2.197	4.445
	400-082R/L	1 1/4	0.827	1.890	5/16	1.386	0.976
	500-082R/L	1 1/2	0.827	2.205	3/8	1.665	1.299
	600-082R/L	1 1/2	0.827	2.205	38/	1.665	1.819
	800-082R/L	2	0.827	2.835	1/2	2.197	2.465
	1000-082R/L	2	0.827	2.835	1/2	2.197	3.465
	1200-082R/L	2	0.827	2.835	1/2	2.197	4.445
	500-094R/L	1 1/2	0.945	2.205	3/8	1.665	1.299
	600-094R/L	1 1/2	0.945	2.205	38/	1.665	1.819
	800-094R/L	2	0.945	2.835	1/2	2.197	2.465
	1000-094R/L	2	0.945	2.835	1/2	2.197	3.465
	1200-094R/L	2	0.945	2.835	1/2	2.197	4.445
	500-106R/L	1 1/2	1.063	2.205	3/8	1.665	1.299
	600-106R/L	1 1/2	1.063	2.205	38/	1.665	1.819
	800-106R/L	2	1.063	2.835	1/2	2.197	2.465
	1000-106R/L	2	1.063	2.835	1/2	2.197	3.465
	1200-106R/L	2	1.063	2.835	1/2	2.197	4.445

Designation		Ød	F	ØD2	a	b	E	T-MAX
TAFCBA	400-055R/L	1 1/4	1.969	2.126	1/2	0.315	1.26	0.858
	500-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-055R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-055R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-055R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	400-071R/L	1 1/4	1.969	2.126	1/2	0.315	1.26	0.858
	500-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-071R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-071R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-071R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	400-082R/L	1 1/4	1.969	2.126	1/2	0.315	1.26	0.858
	500-082R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-082R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-082R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-082R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-082R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-094R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-094R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-094R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-106R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-106R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-106R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-106R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-106R/L	2.5	2.559	5.118	1	0.551	1.496	3.343

Dimensions			
ØD	W	W1	No. of tooth
4	0.354	0.522	6
5	0.354	0.522	8
6	0.354	0.522	10
8	0.354	0.522	12
10	0.354	0.522	16
12	0.354	0.522	20
4	0.472	0.659	6
5	0.472	0.659	8
6	0.472	0.659	10
8	0.472	0.659	12
10	0.472	0.659	16
12	0.472	0.659	20
4	0.472	0.778	6
5	0.472	0.778	8
6	0.472	0.778	10
8	0.472	0.778	12
10	0.472	0.778	16
12	0.472	0.778	20
5	0.591	0.896	8
6	0.591	0.896	10
8	0.591	0.896	12
10	0.591	0.896	16
12	0.591	0.896	20
5	0.591	1.014	8
6	0.591	1.014	10
8	0.591	1.014	12
10	0.591	1.014	16
12	0.591	1.014	20

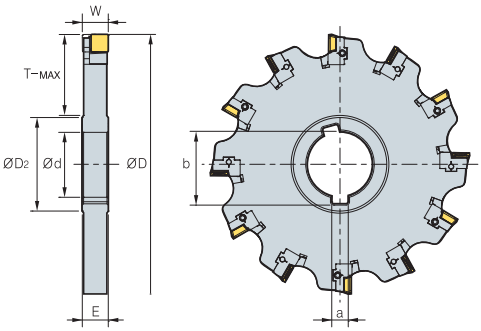
Available inserts and Recommended cutting condition **E311** • The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.02 or R0.02

Parts

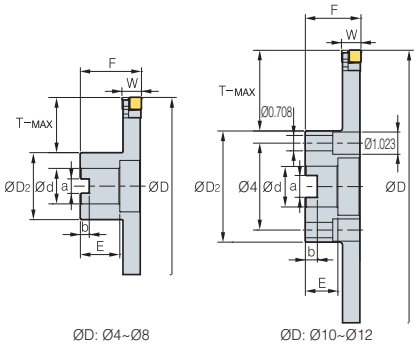
Specification Edge width (TAHCP/B)	Insert	Locator	Wedge	Insert screw	Wedge screw	Locator screw	Insert wrench	Wedge Wrench	Locator Wrench
□□□055R/L	CNHQ1005-□□□	LSA-CH10R/L	WSA10N	FTKA0410	DHA0617	SHGA0411	TW15S	HW30	-
□□□071R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□082R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□094R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L
□□□106R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L

• Note) The Wedge screw for 10018, 10021 cutter is DHA0818F

Radial type (Full side cutter)



• RAFCPA



• RAFCBA

(inch)

Designation		Ød	E	ØD2	a	b	T-MAX
RAFCPA	400-047-055	1 1/4	0.472	1.890	5/16	1.386	0.976
	500-047-055	1 1/2	0.472	2.205	3/8	1.665	1.299
	600-047-055	1 1/2	0.472	2.205	3/8	1.665	1.819
	800-047-055	2	0.472	2.835	1/2	2.197	2.465
	1000-047-055	2	0.472	2.835	1/2	2.197	3.465
	1200-047-055	2	0.472	2.835	1/2	2.197	4.445
	400-055-063	1 1/4	0.551	1.890	5/16	1.386	0.976
	500-055-063	1 1/2	0.551	2.205	3/8	1.665	1.299
	600-055-063	1 1/2	0.551	2.205	3/8	1.665	1.819
	800-055-063	2	0.551	2.835	1/2	2.197	2.465
	1000-055-063	2	0.551	2.835	1/2	2.197	3.465
	1200-055-063	2	0.551	2.835	1/2	2.197	4.445
	500-063-071	1 1/2	0.629	2.205	3/8	1.665	1.299
	600-063-071	1 1/2	0.629	2.205	3/8	1.665	1.819
	800-063-071	2	0.629	2.835	1/2	2.197	2.465
	1000-063-071	2	0.629	2.835	1/2	2.197	3.465
	1200-063-071	2	0.629	2.835	1/2	2.197	4.445
	500-071-079	1 1/2	0.708	2.205	3/8	1.665	1.299
	600-071-079	1 1/2	0.708	2.205	3/8	1.665	1.819
	800-071-079	2	0.708	2.835	1/2	2.197	2.465
	1000-071-079	2	0.708	2.835	1/2	2.197	3.465
	1200-071-079	2	0.708	2.835	1/2	2.197	4.445
	500-079-086	1 1/2	0.787	2.205	3/8	1.665	1.299
	600-079-086	1 1/2	0.787	2.205	3/8	1.665	1.819
	800-079-086	2	0.787	2.835	1/2	2.197	2.465
	1000-079-086	2	0.787	2.835	1/2	2.197	3.465
	1200-079-086	2	0.787	2.835	1/2	2.197	4.445
	500-086-094	1 1/2	0.866	2.205	3/8	1.665	1.299
	600-089-094	1 1/2	0.866	2.205	3/8	1.665	1.819
	800-089-094	2	0.866	2.835	1/2	2.197	2.465
	1000-089-094	2	0.866	2.835	1/2	2.197	3.465
	1200-089-094	2	0.866	2.835	1/2	2.197	4.445

Designation		Ød	F	ØD2	a	b	E	T-MAX
RAFCBA	400-047-055R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-047-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-047-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-047-055R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-047-055R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-047-055R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	400-055-063R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-055-063R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-055-063R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-055-063R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-055-063R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-055-063R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-063-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-063-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-063-071R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-063-071R	2.5	2.559	5.118	1	0.551	1.496	2.362
	L1200-063-071R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-071-079R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-071-079R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-071-079R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-071-079R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-071-079R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-079-086R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-079-086R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-079-086R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-079-086R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-079-086R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-086-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-089-094R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-089-094R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-089-094R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-089-094R/L	2.5	2.559	5.118	1	0.551	1.496	3.343

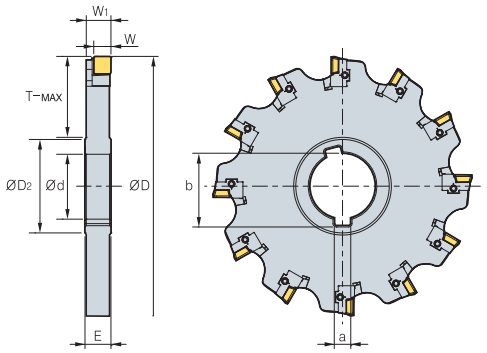
Dimensions		
ØD	W	No. of tooth
4	0.472-0.551	6
5	0.472-0.551	8
6	0.472-0.551	10
8	0.472-0.551	12
10	0.472-0.551	16
12	0.472-0.551	20
4	0.551-0.629	6
5	0.551-0.629	8
6	0.551-0.629	10
8	0.551-0.629	12
10	0.551-0.629	16
12	0.551-0.629	20
5	0.629-0.708	8
6	0.629-0.708	10
8	0.629-0.708	12
10	0.629-0.708	16
12	0.629-0.708	20
5	0.708-0.787	8
6	0.708-0.787	10
8	0.708-0.787	12
10	0.708-0.787	16
12	0.708-0.787	20
5	0.787-0.866	8
6	0.787-0.866	10
8	0.787-0.866	12
10	0.787-0.866	16
12	0.787-0.866	20
5	0.866-0.944	8
6	0.866-0.944	10
8	0.866-0.944	12
10	0.866-0.944	16
12	0.866-0.944	20

Available inserts and Recommended cutting condition **E311** • The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

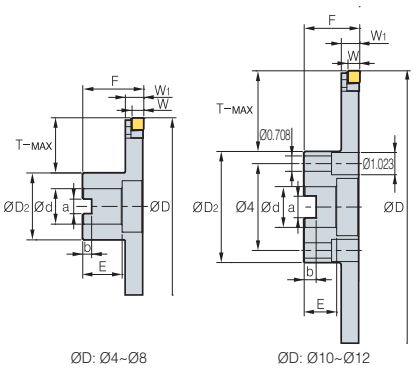
Parts

Specification Edge width (TAHCP/B)	Insert	Locator	Wedge (WSD09N / WSA10N)	Insert screw	Wedge screw	Locator screw	Insert wrench	Wedge, locator wrench
□□□047-055R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□055-063R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□063-071R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□071-079R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□079-086R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□086-094R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30

Radial type (Half side cutter)



• RAHCPA



• RAHCBA

(inch)

Designation		Ød	E	ØD2	a	b	T-MAX
RAHCPA	400-047R/L	1 1/4	0.472	1.890	5/16	1.386	0.976
	500-047R/L	1 1/2	0.472	2.205	3/8	1.665	1.299
	600-047R/L	1 1/2	0.472	2.205	3/8	1.665	1.819
	800-047R/L	2	0.472	2.835	1/2	2.197	2.465
	1000-047R/L	2	0.472	2.835	1/2	2.197	3.465
	1200-047R/L	2	0.472	2.835	1/2	2.197	4.445
	400-055R/L	1 1/4	0.551	1.890	5/16	1.386	0.976
	500-055R/L	1 1/2	0.551	2.205	3/8	1.665	1.299
	600-055R/L	1 1/2	0.551	2.205	3/8	1.665	1.819
	800-055R/L	2	0.551	2.835	1/2	2.197	2.465
	1000-055R/L	2	0.551	2.835	1/2	2.197	3.465
	1200-055R/L	2	0.551	2.835	1/2	2.197	4.445
	500-063R/L	1 1/2	0.629	2.205	3/8	1.665	1.299
	600-063R/L	1 1/2	0.629	2.205	3/8	1.665	1.819
	800-063R/L	2	0.629	2.835	1/2	2.197	2.465
	1000-063R/L	2	0.629	2.835	1/2	2.197	3.465
	1200-063R/L	2	0.629	2.835	1/2	2.197	4.445
	500-071R/L	1 1/2	0.708	2.205	3/8	1.665	1.299
	600-071R/L	1 1/2	0.708	2.205	3/8	1.665	1.819
	800-071R/L	2	0.708	2.835	1/2	2.197	2.465
	1000-071R/L	2	0.708	2.835	1/2	2.197	3.465
	1200-071R/L	2	0.708	2.835	1/2	2.197	4.445
	500-079R/L	1 1/2	0.787	2.205	3/8	1.665	1.299
	600-079R/L	1 1/2	0.787	2.205	3/8	1.665	1.819
	800-079R/L	2	0.787	2.835	1/2	2.197	2.465
	1000-079R/L	2	0.787	2.835	1/2	2.197	3.465
	1200-079R/L	2	0.787	2.835	1/2	2.197	4.445
	500-086R/L	1 1/2	0.866	2.205	3/8	1.665	1.299
	600-086R/L	1 1/2	0.866	2.205	3/8	1.665	1.819
	800-086R/L	2	0.866	2.835	1/2	2.197	2.465
	1000-086R/L	2	0.866	2.835	1/2	2.197	3.465
	1200-086R/L	2	0.866	2.835	1/2	2.197	4.445

Designation		Ød	F	ØD2	a	b	E	T-MAX
RAHCBA	400-047R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-047R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-047R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-047R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-047R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-047R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	400-055R/L	1 1/4	1.969	2.126	1/2	0.315	1.260	0.858
	500-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-055R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-055R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-055R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-055R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-063R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-063R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-063R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-063R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-063R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-071R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-071R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-071R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-071R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-079R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-079R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-079R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-079R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-079R/L	2.5	2.559	5.118	1	0.551	1.496	3.343
	500-086R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.024
	600-086R/L	1 1/2	2.362	2.756	5/8	0.394	1.496	1.543
	800-086R/L	2	2.559	3.543	3/4	0.433	1.496	2.150
	1000-086R/L	2.5	2.559	5.118	1	0.551	1.496	2.362
	1200-086R/L	2.5	2.559	5.118	1	0.551	1.496	3.343

Dimensions			
ØD	W	W1	No. of tooth
4	0.315	0.437	6
5	0.315	0.437	8
6	0.315	0.437	10
8	0.315	0.437	12
10	0.315	0.437	16
12	0.315	0.437	20
4	0.315	0.516	6
5	0.315	0.516	8
6	0.315	0.516	10
8	0.315	0.516	12
10	0.315	0.516	16
12	0.315	0.516	20
5	0.413	0.591	8
6	0.413	0.591	10
8	0.413	0.591	12
10	0.413	0.591	16
12	0.413	0.591	20
5	0.413	0.669	8
6	0.413	0.669	10
8	0.413	0.669	12
10	0.413	0.669	16
12	0.413	0.669	20
5	0.413	0.748	8
6	0.413	0.748	10
8	0.413	0.748	12
10	0.413	0.748	16
12	0.413	0.748	20
5	0.413	0.827	8
6	0.413	0.827	10
8	0.413	0.827	12
10	0.413	0.827	16
12	0.413	0.827	20

Available inserts and Recommended cutting condition **E311**

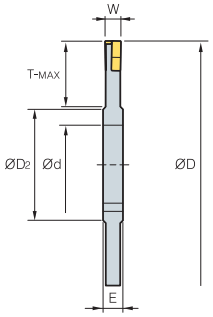
• The ap (Maximum width of cutter) size written above is the number when using insert having corner size R0.02. The ap is subject to change as per insert corner size
• The ap (Maximum width of cutter) size written above is the number when using SDXT09M405R-MM. The ap is subject to change as per insert corner size

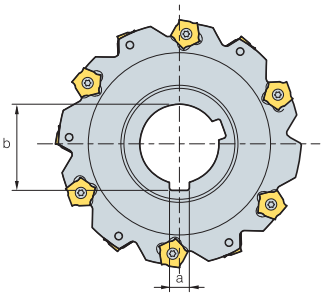
Parts

Specification Edge width (TAHCP/B)	Insert	Locator	Wedge (WSD09N / WSA10N)	Insert screw	Wedge screw	Locator screw	Insert wrench	Wedge, locator wrench
□□□047R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□055R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□063R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□071R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□079R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□086R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30

SPPA









•AR: -2°
•RR: -28°

(inch)

Designation			ØD	W	T-MAX	Ød	a	b	E	ØD2	Insert	Screw	Wrench
SPPA	300-187	8	3.0	0.187	0.686	1	0.250	1.104	0.312	1.575	PNEJ1223N	PTMA0403F	TW15S
	300-218	8	3.0	0.218	0.702	1	0.250	1.104	0.312	1.575	PNEJ1230N	PTMA0404F	TW15S
	300-250	8	3.0	0.250	0.718	1	0.250	1.104	0.312	1.575	PNEJ1235N	PTMA0405F	TW15S
	400-187	10	4.0	0.187	0.938	1 1/4	0.313	1.385	0.312	1.850	PNEJ1223N	PTMA0403F	TW15S
	400-218	10	4.0	0.218	0.953	1 1/4	0.313	1.385	0.312	1.850	PNEJ1230N	PTMA0404F	TW15S
	400-250	10	4.0	0.250	0.969	1 1/4	0.313	1.385	0.312	1.850	PNEJ1235N	PTMA0405F	TW15S
	400-312	10	4.0	0.312	1.000	1 1/4	0.313	1.385	0.312	1.850	PNEJ1245N	PTKA0407F	TW15S
	400-375	10	4.0	0.375	0.938	1 1/4	0.313	1.385	0.500	1.850	PNEJ1250N	PTKA0408F	TW15S
	400-437	10	4.0	0.437	0.969	1 1/4	0.313	1.385	0.500	1.850	PNEJ1255N	PTKA0409F	TW15S
	500-187	12	5.0	0.187	1.188	1 1/2	0.375	1.666	0.312	2.205	PNEJ1223N	PTMA0403F	TW15S
	500-218	12	5.0	0.218	1.203	1 1/2	0.375	1.666	0.312	2.205	PNEJ1230N	PTMA0404F	TW15S
	500-250	12	5.0	0.250	1.219	1 1/2	0.375	1.666	0.312	2.205	PNEJ1235N	PTMA0405F	TW15S
	500-312	12	5.0	0.312	1.250	1 1/2	0.375	1.666	0.312	2.205	PNEJ1245N	PTKA0407F	TW15S
	500-375	12	5.0	0.375	1.188	1 1/2	0.375	1.666	0.500	2.205	PNEJ1250N	PTKA0408F	TW15S
	500-437	12	5.0	0.437	1.219	1 1/2	0.375	1.666	0.500	2.205	PNEJ1255N	PTKA0409F	TW15S
	600-187	16	6.0	0.187	1.688	1 1/2	0.375	1.666	0.312	2.598	PNEJ1223N	PTMA0403F	TW15S
	600-218	16	6.0	0.218	1.703	1 1/2	0.375	1.666	0.312	2.598	PNEJ1230N	PTMA0404F	TW15S
	600-250	16	6.0	0.250	1.719	1 1/2	0.375	1.666	0.312	2.598	PNEJ1235N	PTMA0405F	TW15S
	600-312	16	6.0	0.312	1.750	1 1/2	0.375	1.666	0.312	2.598	PNEJ1245N	PTKA0407F	TW15S
	600-375	16	6.0	0.375	1.688	1 1/2	0.375	1.666	0.500	2.598	PNEJ1250N	PTKA0408F	TW15S
	600-437	16	6.0	0.437	1.719	1 1/2	0.375	1.666	0.500	2.598	PNEJ1255N	PTKA0409F	TW15S
	600-500	16	6.0	0.500	1.750	1 1/2	0.375	1.666	0.500	2.598	PNEJ1265N	PTKA0411F	TW15S
	600-562	16	6.0	0.562	1.719	1 1/2	0.375	1.666	0.625	2.598	PNEJ1275N	PTKA0413F	TW15S
	800-250	18	8.0	0.250	2.385	2	0.500	2.198	0.312	2.756	PNEJ1235N	PTMA0405F	TW15S
	800-312	18	8.0	0.312	2.416	2	0.500	2.198	0.312	2.756	PNEJ1245N	PTKA0407F	TW15S
	800-375	18	8.0	0.375	2.353	2	0.500	2.198	0.500	2.756	PNEJ1250N	PTKA0408F	TW15S
	800-437	18	8.0	0.437	2.384	2	0.500	2.198	0.500	2.756	PNEJ1255N	PTKA0409F	TW15S
	800-500	18	8.0	0.500	2.416	2	0.500	2.198	0.500	2.756	PNEJ1265N	PTKA0411F	TW15S
	800-562	18	8.0	0.562	2.384	2	0.500	2.198	0.625	2.756	PNEJ1275N	PTKA0413F	TW15S

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (sfm)	fz (ipt)	
P	490~820 400~660 330~490	0.010~0.004 0.012~0.004 0.012~0.004	**NCM325** **PC3500** **ST30A**
M	260~590 260~490	0.012~0.004 0.012~0.004	**PC9530** **ST30A**
K	430~660 330~490	0.014~0.004 0.016~0.004	**PC6510** **G10**

Code system

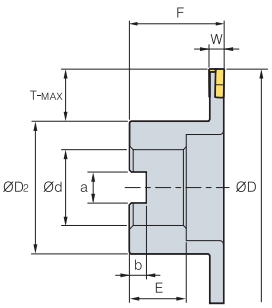
S P P A 160 - 06 R

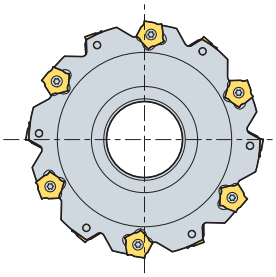
- S — Cutter use (S - Side cutter)
- P — Insert Shape (P - Pentagonal Insert)
- P — Cutter type (P - Plane type, B - Boss type)
- A — Arbor type
- 160 — Cutter diameter (ØD)
- 06 — Width of cut (W)
- R — Hand of tool (R/L)

Available inserts E15

SPBA









•AR: -2°
•RR: 28°

(inch)

Designation			ØD	W	T-MAX	ØD2	Ød	a	b	F	E	Insert	Screw	Wrench
SPBA	300-187R/L	8	3.0	0.187	0.713	1.575	1	0.49	0.276	1.969	0.866	PNEJ1223N	PTMA0403F	TW15S
	300-218R/L	8	3.0	0.218	0.713	1.575	1	0.49	0.276	1.969	0.866	PNEJ1230N	PTMA0404F	TW15S
	300-250R/L	8	3.0	0.250	0.713	1.575	1	0.49	0.276	1.969	0.866	PNEJ1235N	PTMA0405F	TW15S
	400-187R/L	10	4.0	0.187	0.937	2.126	1 1/4	0.57	0.315	1.969	0.866	PNEJ1223N	PTMA0403F	TW15S
	400-218R/L	10	4.0	0.218	0.937	2.126	1 1/4	0.57	0.315	1.969	0.866	PNEJ1230N	PTMA0404F	TW15S
	400-250R/L	10	4.0	0.250	0.937	2.126	1 1/4	0.57	0.315	1.969	0.866	PNEJ1235N	PTMA0405F	TW15S
	400-312R/L	10	4.0	0.312	0.937	2.126	1 1/4	0.57	0.315	1.969	0.866	PNEJ1245N	PTMA0407F	TW15S
	400-437R/L	10	4.0	0.437	0.937	2.126	1 1/4	0.57	0.315	1.969	0.866	PNEJ1255N	PTMA0409F	TW15S
	500-250R/L	12	5.0	0.250	1.122	2.756	1 1/2	0.65	0.315	2.362	1.181	PNEJ1235N	PTMA0405F	TW15S
	500-312R/L	12	5.0	0.312	1.122	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1245N	PTKA0407F	TW15S
	500-375R/L	12	5.0	0.375	1.122	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1250N	PTKA0408F	TW15S
	600-187R/L	16	6.0	0.187	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1223N	PTMA0403F	TW15S
	600-250R/L	16	6.0	0.250	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1235N	PTMA0405F	TW15S
	600-375R/L	16	6.0	0.375	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1250N	PTKA0408F	TW15S
	600-437R/L	16	6.0	0.437	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1255N	PTKA0409F	TW15S
	600-500R/L	16	6.0	0.500	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1265N	PTKA0411F	TW15S
	600-562R/L	16	6.0	0.562	1.622	2.756	1 1/2	0.65	0.354	2.362	1.181	PNEJ1275N	PTKA0413F	TW15S
	800-250R/L	18	8.0	0.250	2.228	3.543	2	0.65	0.354	2.559	1.181	PNEJ1235N	PTMA0405F	TW15S
	800-437R/L	18	8.0	0.437	2.228	3.543	2	0.65	0.354	2.559	1.181	PNEJ1255N	PTKA0409F	TW15S
	800-500R/L	18	8.0	0.500	2.228	3.543	2	0.65	0.354	2.559	1.181	PNEJ1265N	PTKA0411F	TW15S

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (sfm)	fz (ipt)	
P	490~820 400~660 330~490	0.010~0.004 0.012~0.004 0.012~0.004	**NCM325** **PC3500** **ST30A**
M	260~590 260~490	0.010~0.004 0.012~0.004	**PC9530** **ST30A**
K	430~660 330~490	0.014~0.004 0.016~0.004	**PC6510** **G10**

Notice (When mounting inserts)

- Insert chip breaker should face chip pocket of the cutter
- Fasten screw after insert contacts securely on its seat
- If there is a gap between insert and its seat after mounting it may cause tool troubles

Available inserts **E15**

SPSA



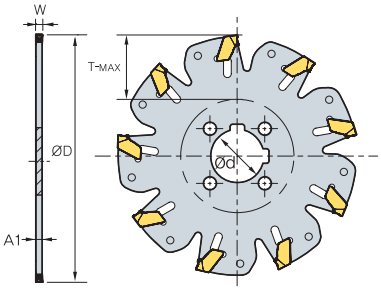


Fig. 1

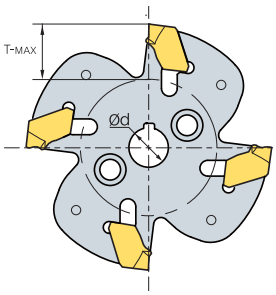


Fig. 2

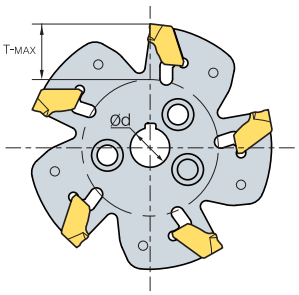


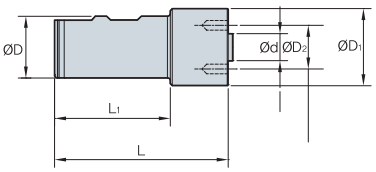
Fig. 3

(inch)

Designation			ØD	W	T-MAX	Ød	A_1	Fig.	Insert	Adaptor	
										WS	DF
SPSA	200-08704-0500R	4	2	0.087	0.449	0.5	0.071	2	SPFN200-N	WS2528-M4	-
	250-08705-0500R	5	2.5	0.087	0.62	0.5	0.071	3		WS2532-M5	-
	300-08707-0875R/F	7	3	0.087	0.713 (0.594)	0.875	0.071	1		WS3240-M5	DF22-46
	400-08709-0875R/F	9	4	0.087	1.213 (1.094)	0.875	0.071	1		WS3240-M5	DF22-26
	500-08711-1250F	11	5	0.087	1.417	1.25	0.071	1		-	DF32-55
	600-08714-1250F	14	6	0.087	1.917	1.25	0.071	3		-	DF32-55
	250-11805-0500R	5	2.5	0.118	0.62	0.5	0.1	3	SPFN300-N	WS2532-M5	-
	300-11807-0875R/F	7	3	0.118	0.713 (0.594)	0.875	0.1	1		WS3240-M5	-
	400-11809-0875R/F	9	4	0.118	1.213 (1.094)	0.875	0.1	1		WS3240-M5	DF22-46
	500-11811-1250F	11	5	0.118	1.417	1.25	0.1	1		-	DF22-26
	600-11814-1250F	14	6	0.118	1.917	1.25	0.1	1		-	DF32-55
	800-11818-1500F	18	8	0.118	2.425	1.5	0.1	1		-	DF32-55
	300-15706-0875R/F	6	3	0.157	0.713 (0.594)	0.875	0.134	1	SPFN400-N	WS3240-M5	-
	400-15708-0875R/F	8	4	0.157	1.213 (1.094)	0.875	0.134	1		WS3240-M5	DF22-46
	500-15710-1250F	10	5	0.157	1.417	1.25	0.134	1		-	DF22-26
	600-15713-1250F	13	6	0.157	1.917	1.25	0.134	1		-	DF32-55
	800-15717-1500F	17	8	0.157	2.425	1.5	0.134	1		-	DF32-55

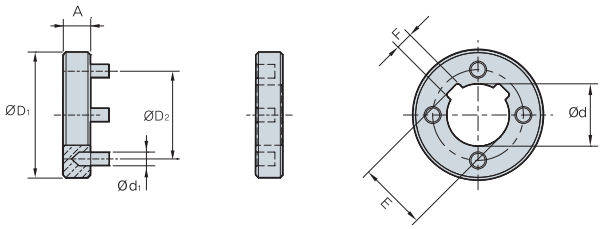
• Applicable wrench : SW17P (Separately sold) • T-max : ( )=> In use of DF adaptor

WS( )-( ) (Weldon shank)



Designation	L	L_1	D	D_1	D_2	d	Screw
WSA2528-M4	4.431	3.346	0.984	1.102	0.709	0.500	PTKA0408
WSA2532-M5	4.431	3.346	0.984	1.260	0.866	0.500	PTKA0515
WSA3240-M5	4.724	3.543	1.260	1.575	1.260	0.875	PTKA0515

DF( )-( ) (Drive flange set)



Designation	D_1	D_2	d	d_1	A	E	F
DFA22-46	1.811	1.260	0.875	0.197	0.394	0.948	0.125
DFA32-55	2.165	1.772	1.250	0.236	0.394	1.385	0.313
DFA40-80	3.150	2.480	1.500	0.433	0.472	1.666	0.375
DFA50-110	4.331	3.150	2.000	0.551	0.551	2.198	0.500

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (sfm)	fz (ipt)	
P	492(328~656)	0.010~0.005	PC3500
M	525(394~656)	0.009~0.004	PC5300
K	361(230~492)	0.010~0.004	PC6510

Available inserts E25

For slotting workpieces with corner radii of varying sizes and widths

Wind Mill

- Optimal machining for slotting applications
- A unique recess design on the minor cutting-edge reduces cutting load and improves tool life
- Special clamping system prevents incorrect clamping and fracture

Item description

• Insert



• Cutter



WFSPA - Plane type



WFSBA - Boss type

Cutter code system

W	FS	P(B)	A	300	–	156	R
Wind Mill	Insert arrangement	Cutter type	inch type	ØD		Width of cut(W)	BOSS type(R/L)
	FS : Full side HS : Half side	P : Plane type B : Boss type					

Insert code system

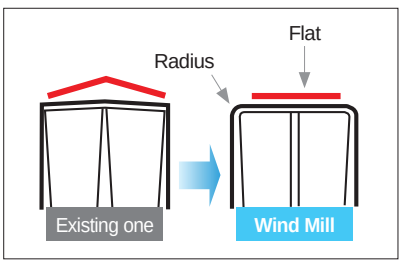
S	N	H	T	12	045	08	R/L	–	WX
Insert shape	Relief angle of major cutting edge	tolerance	Shape of cross section	Ød	Height of cutting edge	Nose R	R/L		Chip breaker

Features

• Ideal geometry for superior surface roughness and extended tool life



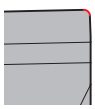
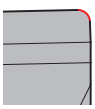
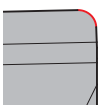
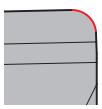
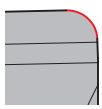
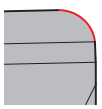
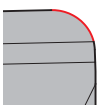
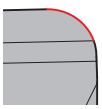
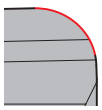
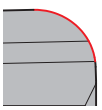
• Perpendicular slot



• Protruded part on tip seat prevents wrong clamping and fracture



• Workpieces with corner radii of varying size and width (R0.008~R0.079)

R0.008	R0.016	R0.023	R0.031	R0.039	R0.047	R0.055	R0.063	R0.07	R0.079
									

Application example

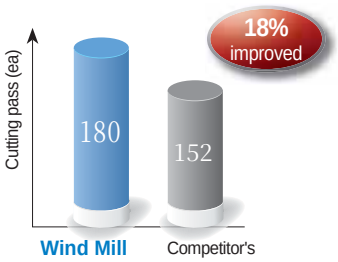
■**Use** Carriers for Motor Vehicles

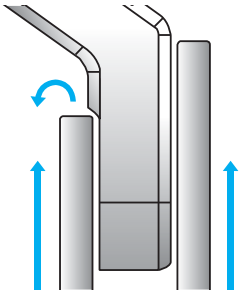
■**Workpiece** FCD500K

■**Cutting conditions**
vc (sfm) = 656
fz (ipt) = 0.008
vf (ipm)= 23.6
ap (inch) = 0.08~0.12

■**Tool** KSF140R-T14-HM-2
SNHT1205408R/L-WX (PC5300)

■**Test result**





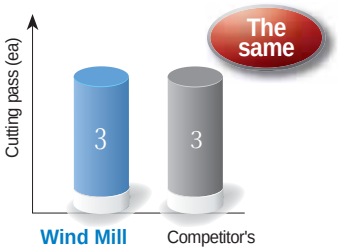
■**Use** Lug for Vessel

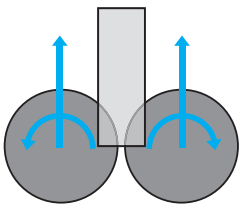
■**Workpiece** Mild steel

■**Cutting conditions**
vc (sfm) = 1837
fz (ipt) = 0.0035
vf (ipm)= 29
ap (inch) = 0.24

■**Tool** WFSP178R/L-T06
SNHT1203508R/L-WX (PC5300)

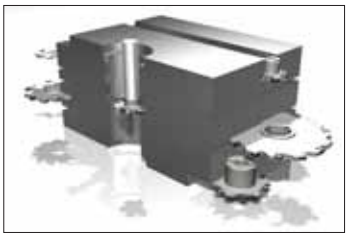
■**Test result**





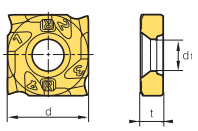
Recommended cutting condition

Workpiece	Cutting conditions		Grades
	vc (sfm)	fz (ipt)	
P	490~820	0.010~0.004	PC5300
M	390~655	0.012~0.004	PC5300
K	330~490	0.012~0.004	PC5300



List of inserts

Designation		Coated	Dimensions (inch)				Nose R	Configuration
		PC5300	Ød	Ød1	t	W		
SNHT	11023□□R/L-WX	●	0.433	0.157	0.090	0.157	0.008 ~ 0.063	
	1103□□R/L-WX	●	0.433	0.157	0.120	0.197	0.008 ~ 0.063	
	1203□□R/L-WX		0.500	0.197	0.130	0.217	0.008 ~ 0.079	
	12035□□R/L-WX	●	0.500	0.197	0.140	0.236	0.008 ~ 0.079	
	1204□□R/L-WX		0.500	0.197	0.160	0.276	0.008 ~ 0.079	
	12045□□R/L-WX	●	0.500	0.197	0.180	0.315	0.008 ~ 0.079	
	1205□R/L-WX	●	0.500	0.197	0.196	0.354	0.008 ~ 0.079	
	12054□R/L-WX	●	0.500	0.197	0.215	0.394	0.008 ~ 0.079	
	1206□□R/L-WX		0.500	0.197	0.236	0.433	0.008 ~ 0.079	
	12065□□R/L-WX		0.500	0.197	0.256	0.472	0.008 ~ 0.079	
	1207□□R/L-WX		0.500	0.197	0.276	0.512	0.008 ~ 0.079	
	12075□□R/L-WX		0.500	0.197	0.295	0.551	0.008 ~ 0.079	



• Inserts with various nose R sizes can be supplied in 2~3 weeks

WFSBA (Boss type)



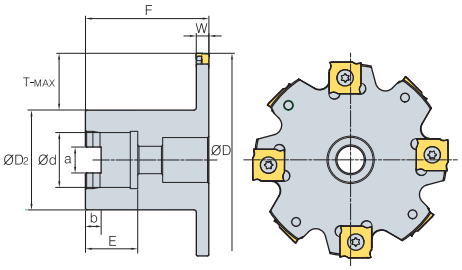


Fig. 1

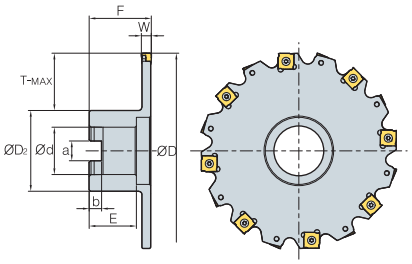


Fig. 2

•AR: -2°
•RR:-12°

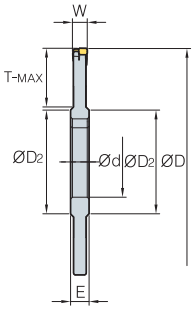
(inch)

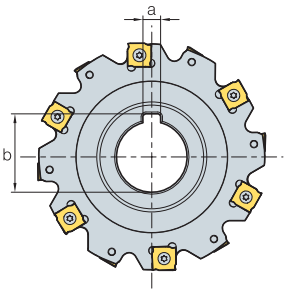
Designation			ØD	W	T-MAX	ØD2	Ød	a	b	F	E	Insert	Screw	Wrench
WFSBA	300-156R/L	8	3.0	0.156	0.7	1.58	3/4	0.315	0.220	1.50	0.787	SNHT11023R/L-WX	PTMA03503	TW09S
	300-187R/L	8	3.0	0.187	0.7	1.58	3/4	0.315	0.220	1.50	0.787	SNHT1103R/L-WX	PTMA03504	TW09S
	300-250R/L	8	3.0	0.250	0.7	1.58	3/4	0.315	0.220	1.50	0.787	SNHT12035R/L-WX	PTMA0405F	TW15S
	400-156R/L	10	4.0	0.156	0.9	1.89	1	0.374	0.250	1.50	0.866	SNHT11023R/L-WX	PTMA03503	TW09S
	400-187R/L	10	4.0	0.187	0.9	1.89	1	0.374	0.250	1.50	0.866	SNHT1103R/L-WX	PTMA03504	TW09S
	400-250R/L	10	4.0	0.250	0.9	1.89	1	0.374	0.250	1.50	0.866	SNHT12035R/L-WX	PTMA0405F	TW15S
	400-312R/L	10	4.0	0.312	0.9	1.89	1	0.374	0.250	1.50	0.866	SNHT12045R/L-WX	PTMA0406F	TW15S
	400-375R/L	10	4.0	0.375	0.9	1.89	1	0.374	0.250	1.50	0.866	SNHT1205R/L-WX	PTMA0408F	TW15S
	500-187R/L	12	5.0	0.187	1.1	2.75	1 1/4	0.500	0.320	1.75	0.866	SNHT1103R/L-WX	PTMA03504	TW09S
	500-250R/L	12	5.0	0.250	1.1	2.75	1 1/4	0.500	0.320	1.75	0.866	SNHT12035R/L-WX	PTMA0405F	TW15S
	500-312R/L	12	5.0	0.312	1.1	2.75	1 1/4	0.500	0.320	1.75	0.866	SNHT12045R/L-WX	PTMA0406F	TW15S
	500-375R/L	12	5.0	0.375	1.1	2.75	1 1/4	0.500	0.320	1.75	0.866	SNHT1205R/L-WX	PTMA0408F	TW15S
	600-187R/L	16	6.0	0.187	1.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT1103R/L-WX	PTMA03504	TW09S
	600-250R/L	16	6.0	0.250	1.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT12035R/L-WX	PTMA0405F	TW15S
	600-312R/L	16	6.0	0.312	1.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT12045R/L-WX	PTMA0406F	TW15S
	600-375R/L	16	6.0	0.375	1.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT1205R/L-WX	PTMA0408F	TW15S
	600-500R/L	16	6.0	0.500	1.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT1207R/L-WX	PTKA0411	TW15S
	800-250R/L	18	8.0	0.250	2.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT12035R/L-WX	PTMA0405F	TW15S
	800-312R/L	18	8.0	0.312	2.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT12045R/L-WX	PTMA0406F	TW15S
	800-375R/L	18	8.0	0.375	2.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT1205R/L-WX	PTMA0408F	TW15S
	800-500R/L	18	8.0	0.500	2.1	3.75	1 1/2	0.630	0.394	2.00	1.181	SNHT1207R/L-WX	PTKA0411	TW15S

Available inserts **E23**

WFSPA (Plane type)









•AR: -2°
•RR:-12°

(inch)

Designation			ØD	W	T-MAX	ØD2	Ød	a	b	F	E	Insert	Screw	Wrench
WFSPA	300-156	8	3.0	0.156	0.690	1.62	1	0.250	1.104	1.50	0.312	SNHT11023R/L-WX	PTMA03503	TW09S
	300-187	8	3.0	0.187	0.690	1.62	1	0.250	1.104	1.50	0.312	SNHT1103R/L-WX	PTMA03504	TW09S
	300-250	8	3.0	0.250	0.690	1.62	1	0.250	1.104	1.50	0.312	SNHT12035R/L-WX	PTMA0405F	TW15S
	400-156	10	4.0	0.156	1.125	1.75	1 1/4	0.312	1.385	1.50	0.312	SNHT11023R/L-WX	PTMA03503	TW09S
	400-187	10	4.0	0.187	1.125	1.75	1 1/4	0.312	1.385	1.50	0.312	SNHT1103R/L-WX	PTMA03504	TW09S
	400-250	10	4.0	0.250	1.125	1.75	1 1/4	0.312	1.385	1.50	0.312	SNHT12035R/L-WX	PTMA0405F	TW15S
	400-312	10	4.0	0.312	1.125	1.75	1 1/4	0.312	1.385	1.50	0.500	SNHT12045R/L-WX	PTMA0407F	TW15S
	400-375	10	4.0	0.375	1.125	1.75	1 1/4	0.312	1.385	1.50	0.500	SNHT1205R/L-WX	PTMA0408F	TW15S
	500-187	12	5.0	0.187	1.565	1.87	1 1/4	0.312	1.666	1.75	0.312	SNHT1103R/L-WX	PTMA03504	TW09S
	500-250	12	5.0	0.250	1.565	1.87	1 1/4	0.312	1.666	1.75	0.312	SNHT12035R/L-WX	PTMA0405F	TW15S
	500-312	12	5.0	0.312	1.565	1.87	1 1/4	0.312	1.666	1.75	0.500	SNHT12045R/L-WX	PTMA0407F	TW15S
	500-375	12	5.0	0.375	1.565	1.87	1 1/4	0.312	1.666	1.75	0.500	SNHT1205R/L-WX	PTMA0408F	TW15S
	600-187	16	6.0	0.187	1.875	2.25	1 1/2	0.375	1.666	2.00	0.312	SNHT1103R/L-WX	PTMA03504	TW09S
	600-250	16	6.0	0.250	1.875	2.25	1 1/2	0.375	1.666	2.00	0.312	SNHT12035R/L-WX	PTMA0405F	TW15S
	600-312	16	6.0	0.312	1.875	2.25	1 1/2	0.375	1.666	2.00	0.500	SNHT12045R/L-WX	PTMA0407F	TW15S
	600-375	16	6.0	0.375	1.875	2.25	1 1/2	0.375	1.666	2.00	0.500	SNHT1205R/L-WX	PTMA0408F	TW15S
	600-500	16	6.0	0.500	1.875	2.25	1 1/2	0.375	1.666	2.00	0.500	SNHT1207R/L-WX	PTKA0411	TW15S
	800-250	18	8.0	0.250	2.625	2.75	1 1/2	0.375	2.198	2.00	0.312	SNHT12035R/L-WX	PTMA0405F	TW15S
	800-312	18	8.0	0.312	2.625	2.75	1 1/2	0.375	2.198	2.00	0.500	SNHT12045R/L-WX	PTMA0407F	TW15S
	800-375	18	8.0	0.375	2.625	2.75	1 1/2	0.375	2.198	2.00	0.500	SNHT1205R/L-WX	PTMA0408F	TW15S
	800-500	18	8.0	0.500	2.625	2.75	1 1/2	0.375	2.198	2.00	0.500	SNHT1207R/L-WX	PTKA0411	TW15S

Available inserts **E23**

High feed cutter with extra pitch for cast iron and light alloy steels

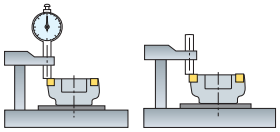
High feed Cutter

- High feed cutter employs extra pitch for cast iron and light alloy steels
- Quick change type for reduction of cutter change time
- Cutting-edge chatter is controlled
- Quick change type for cutter size under ø6.0, 2piece types for cutter size over ø8.0

Guide of insert setting

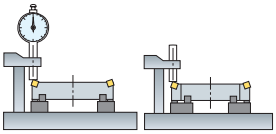
• Special equipment has to be used to get precise run out with high feed cutter.

Adaptor type



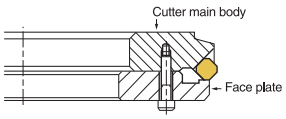
- Mainly under ø6.0 diameter is used in 1 piece type
- Available for fixed size of cutter and assembling & checking can be done at the same time

Roller type



- Mainly over ø8.0 diameter is used in 2piece type
- Due to 3 adjustable guide rollers, variety size of cutter can be assembled

Plate type



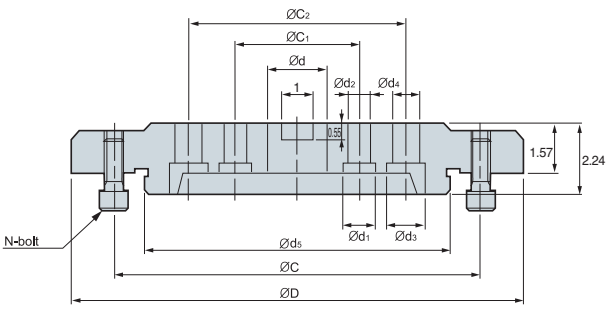
- Suitable for small size cutter due to the simple structure
- It is unnecessary to unclamp the cutter from the machine, it's possible to reassemble the cutter as it mounted on the machine
- You should make plate by yourself

• Guide of insert setting in adaptor/roller type

1. Clean the cutter and equipment
2. Pointer should be assembled with same height with cutter
3. Move to each insert on tip seat to end of pointer and tighten (torque 2N.m) wedge
4. Exchange pointer to dial gauge
5. Measure the run-out totally
6. When a insert over run-out, loosen wedge and adjust run-out. (for roughing 10~20μ, for finishing 5~10μ)
7. Tighten (torque 7-8N.m) wedge
8. Measure the final run-out by dial gauge

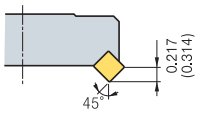
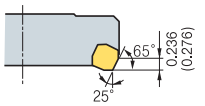
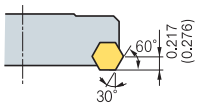
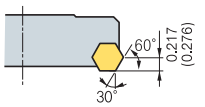
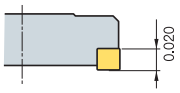
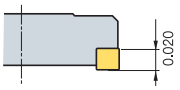
Note: When you clamp wedge too tightly, run-out will get worse due to cutter distortion.
When you clamp the wedge, use torque wrench to set precisely.

Adaptor (Ø7.874-Ø17.717)



Designation		ØD	Ød	Ød1	Ød2	Ød3	Ød4	Ød5	ØC	ØC1	ØC2	N	Cutter
APR	200	7.087	2.5	1.204	0.709	-	-	3.150	4.724	4.0	-	4	Ø7.874
	250	9.055	2.5	1.204	0.709	-	-	4.724	6.693	4.0	-	4	Ø9.842
	315	11.614	2.5	1.204	0.709	1.26	0.827	7.087	9.055	4.0	7.0	6	Ø12.402
	355	13.189	2.5	1.204	0.709	1.26	0.827	8.661	10.630	4.0	7.0	6	Ø13.976
	400	14.567	2.5	1.204	0.709	1.26	0.827	9.843	11.811	4.0	7.0	8	Ø15.748
	450	16.535	2.5	1.204	0.709	1.26	0.827	11.811	13.780	4.0	7.0	8	Ø17.716

High feed cutters type and features

Designation	Cutter diameter	Workpiece, Application range	Min. surface roughness	Approach angle and Max. cutting depth is for 5000 type	Axial rake angle	Radial rake angle	Available insert
ANH4000 ANH5000	Ø4.0~Ø18.0	Cast iron Roughing	25Z		-5°	-6°	SNCN43ENN SNCN53ENN
CDH4000 CDH5000	Ø4.0~Ø18.0	Cast iron Roughing Finishing	18Z		+10°	+5°	SDCN42R SDCN53R
DEH5000	Ø4.0~Ø18.0	Al alloy Roughing	20Z		+14°	+6°	HECN532FN
DPH5000	Ø4.0~Ø18.0	Cast iron Roughing Finishing	12Z		+5°	-3°	HPEN532FN/SN/EN HPEN532-WC
PNH4000 PNH5000	Ø5.0~Ø18.0	Cast iron Finishing	12Z		-5°	-6°	SNEF435 SNEF535
PPH4000	Ø5.0~Ø18.0	Cast iron Finishing	12Z		+5°	-5°	SPEN434-WC

Recommended cutting condition

Workpiece	Cutting condition		Grades	Remark
	vc (sfm)	fz (ipt)		
Cast iron	330~460	0.002~0.008	**PC6510**	PVD Coated
	260~490	0.002~0.008	**H01,G10**	Uncoated
Al alloy	1650~	0.002~0.008	**PC6510**	PVD Coated
	1650~	0.002~0.008	**H01,G10**	Uncoated

Special Korloy cutter for cast iron roughing

Cube Mill

- Special Korloy cutter for cast iron roughing
- 8-corner using insert (maximum 16-corner available with 2 cutter, R/L cutter)
- Excellent cutting performance with positive rake angle made by 3-dimensional chip breaker
- Excellent tool life by a wide combination of grade varieties and chip breakers to match most working conditions
- 2 different type of inserts (chamfer/nose R) are available with 1 type cutter



Roughing for cast iron

Code system

CBM E A 3 300 R (2) – 28Z

Cutter	AA	Inch type	Inscreibed circle of Insert	Cutter Dia	Hand	Cutter shape	No. of tooth(Z)
CBM : CUBE MILL	Q : 2° C : 25° F : 5° A : 45° E : 15°		3 : 9.525 4 : 12.7	Ø300	R : Right L : Left	Unmarked : Normal type 2 : Quick change type (2 pieces type)	

• Cube Mill and Cube Mill Couple are available by order made.

Insert (R/L type)

Chamfer type	Nose R type
	

Cutter body

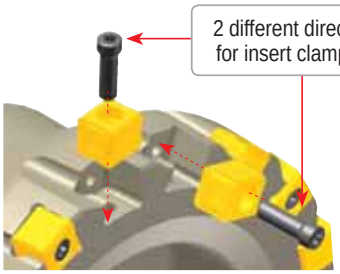
Cutter diameter (Ø)	General	Quick change
	3.0~12.0 inch	8.0~18.0 inch
AA: 2°, 5°, 15°, 25°, 45°		

Cutter



Special design to make actual positive rake angle

Simple screw on system



2 different direction for insert clamping

Screw on clamping system

Parts

	Screw	Wrench
 Cube Mill 3000	FTGA0417CBM	TW15-100
	ETGA0520CBM	TW20-100

Ideal combination of aluminum body with cast iron high feed cutter

Couple Mill

- Ideal combination of Aluminum body with cast iron high feed cutter
- Since the weight of the cutter has been reduced 50% vs. a steel cutter, it is very easy to handle and very effective in preventing loading accidents
- Applicable for Cube Mill, Storm Mill

Cube-couple code system

CBM E A 3 1400 R 28Z – CP

Cutter	AA	Inch type	Inscreibed circle of Insert	Cutter Dia	Hand	No. of tooth(Z)	Couple Mill
CBM : CUBE MILL	Q : 2˚ C : 25˚ F : 5˚ A : 45˚ E : 15˚		3 : 9.525 4 : 12.7	ISO : mm ASA : inch	R : Right L : Left	28Z : 28	

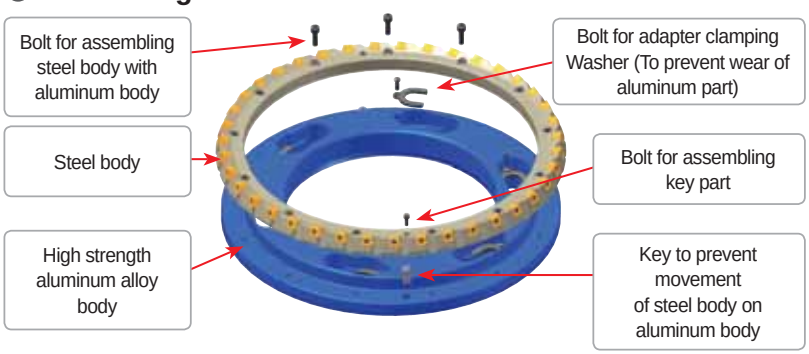
• Cube Mill and Cube Mill Couple are available by order made.

Storm-couple code system

S Q N A 3 1400 R 28Z – CP

Cutter	AA	Relief angle of insert	Inch type	Inscreibed circle of Insert	Cutter Dia	Hand	No. of tooth(Z)	Couple Mill
S : STORM MILL	Q : 2˚ E : 15˚ F : 5˚ A : 45˚	N : Negative(0°)		3 : 9.525 4 : 12.7	ISO : mm ASA : inch	R : Right L : Left	28Z : 28	

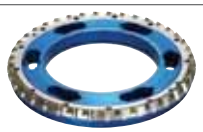
Assembling structure



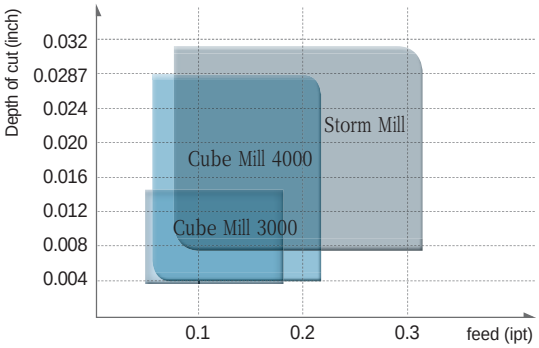
Cutter body

	Quick change
Cutter diameter (Ø)	14.0~18.0 inch

Parts

			 Screw	 Wrench	 Wrench	 Bolt for body	 Bolt for key	 Key for body
Cube-Couple	3000 type		FTGA0417CBM	TW15-100	-	BHA0616	MHBO410	PN1019-DRV
	4000 type		ETGA0520CBM	TW20-100		BHA0620		
Storm-Couple	3000 type		FTNA0513	-	TW15S	-	-	-

Application range of high feed cutters for cast iron



Recommended cutting condition

Cube Mill		Gray cast iron		Ductile cast iron	
		vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)
PVD	PC6510	490~990	0.007~0.003	330~660	0.007~0.003
Uncoated	G10	300~400	0.007~0.005	200~430	0.007~0.005

Excellent tool life achieved by the wide variety of grades to match work conditions

Storm Mill

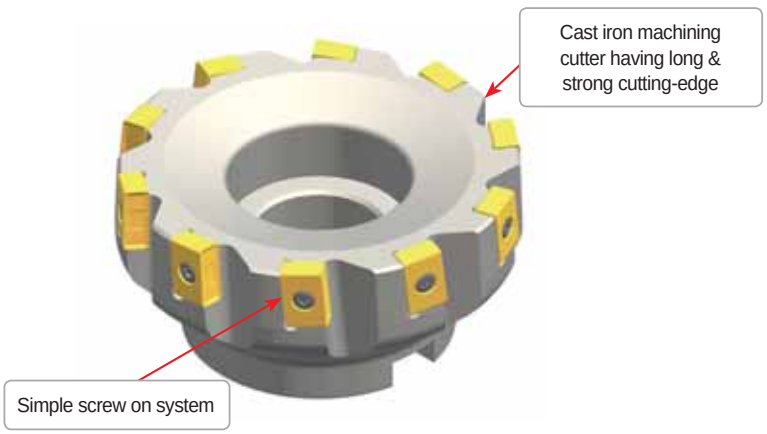
- Conventional cutter with wide coverage
- Using 4 corners (Maximum 8 corner available with R/L type cutter)
- Effective on large depth of cut applications due to the long cutting-edge
- Excellent tool life guaranteed by wide variety of grades to suit any working conditions
- 2 different types of inserts (chamfer/nose R) are available with 1 type of cutter

Code system

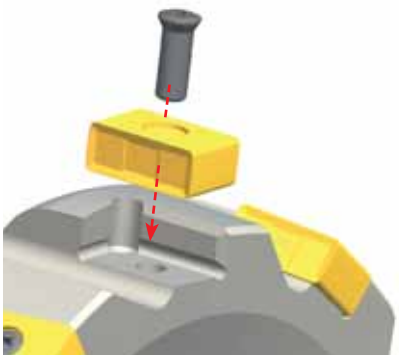
S	Q	N	A	3	300	R	(2)	–	28Z

Cutter	Approach angle	Relief angle of insert	Inch type	Insert	Cutter Dia.	Hand	Cutter shape	No. of tooth
S : Storm Mill	Q : 2˚ F : 5˚ A : 45˚ E : 15˚	N : Negative (0˚)		3 : 3/8inch 4 : 1/2inch	inch unit	R : Right L : Left	No code : Normal type 2 : Quick change type (2 pieces type)	

Features



Clamping of insert



Recommended cutting condition

Designation / Grades	Gray cast iron		Ductile cast iron	
	GC		GCD	
	vc (sfm)	fz (ipt)	vc (sfm)	fz (ipt)
PC3500	492~820	0.011~0.003	328~591	0.011~0.003
PC6510	492~984	0.011~0.004	328~656	0.011~0.004
PC3545	492~820	0.009~0.003	328~591	0.009~0.003
H01	328~656	0.009~0.003	230~459	0.009~0.003
G10	295~394	0.011~0.003	197~427	0.011~0.003

Optimal cutter for steel and cast iron machining with easily adjustable run-out

Shave Mill

- Adjustable Range (Adjustable range: 0.1 mm, Adjustable allowance: within 2 ㎛)
- Wiper crown type 8-cornered insert reduces machining cost and realizes excellent surface roughness
- Grades with high toughness and wear resistance ensures long tool life
- The cBN grade achieves superior surface finish

Cutter code system

SVM	A	4	250	R	Z6
Shave Mill	Inch Type	Inscribed Circle 4 : 0.5inch	Cutter Dia.(Ø) ISO : mm ASA : inch	Hand of tool R: right handed L: left handed	No. of tooth(Z)

Insert code system

■Carbide

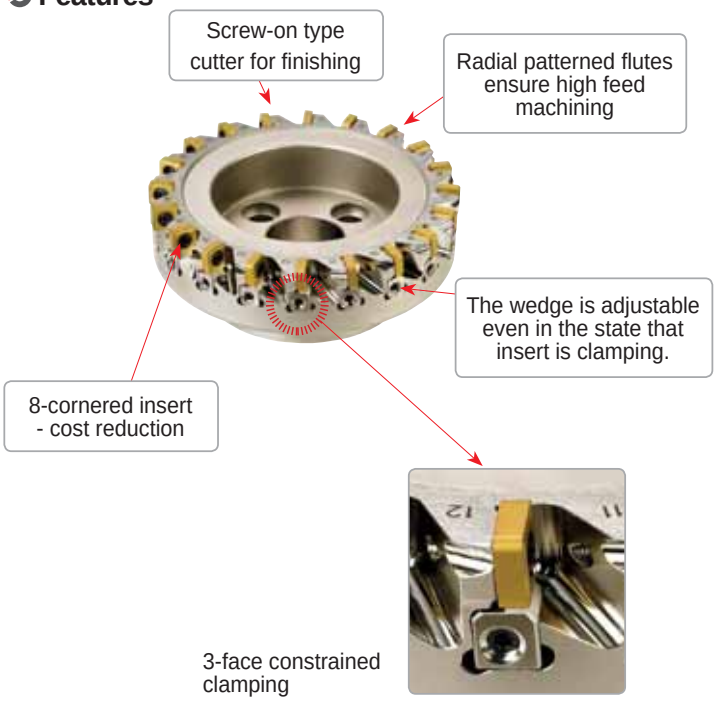
Nose R type	SNEU120420-MF
Chamfer type	SNEU1204ANN-MF
Low cutting type	SNEU1204-WMF

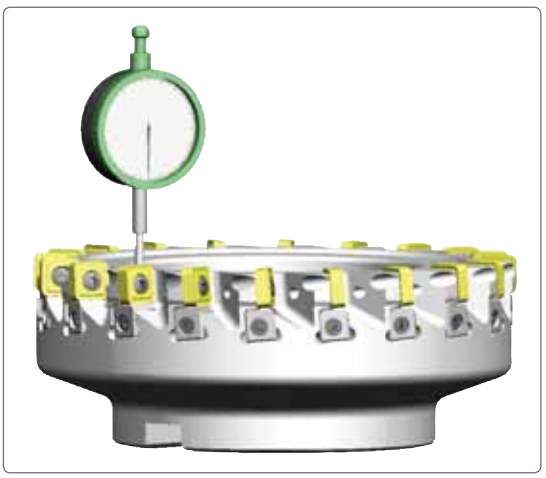
■cBN

SNEU1204-TBW

T: Nagaland
B: cBN
W: Wiper

Features

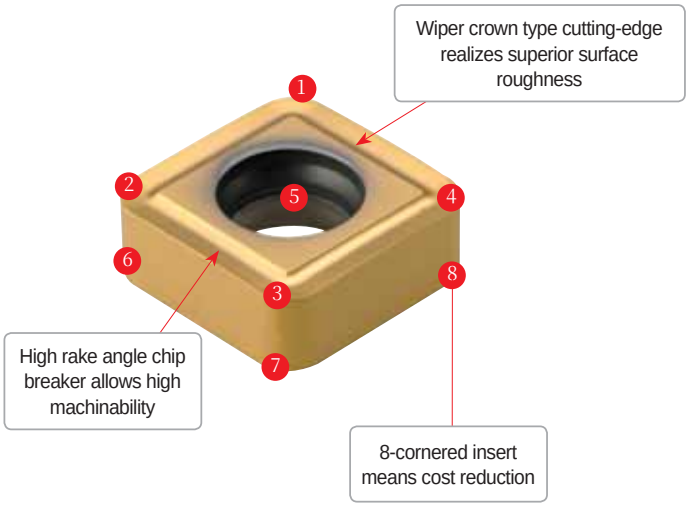




Adjustment

- Adjustable range: 2.54 inch
- Adjustability: below 2μ
- Operation: easy and simple

Features of insert



SNEU120420-MF	SNEU1204ANN-MF
	
Nose R type	Chamfer type

SNEU1204-WMF	SNEU1204-TBW
	
For low cutting load	Wiper for high speed machining

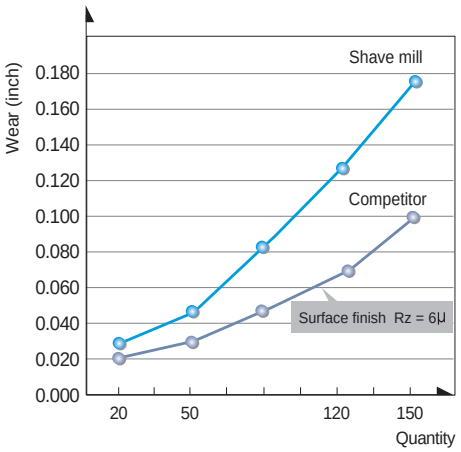
Recommended cutting condition

Workpiece	Cutting condition			Grades
	vc (sfm)	fz (ipt)	ap (inch)	
P	492~1820	0.008~0.002	~ 0.02	PC3500
K	492~984 1968~3280	0.012~0.002 0.008~0.002	~ 0.02 ~ 0.02	PC6510 DBN920

Application example

■Work piece Cylinder head (facing)
■Cutting conditions vc = 656, fz = 0.006, ap = 0.02, Dry
■Tools **Cutter** SVMM4250R
Insert PC6510 SNEU120420-MF

■Work piece FC25 (HB250) Cylinder head (facing)
■Cutting conditions vc = 2296, fz = 0.004, ap = 0.02, Dry
■Tools **Cutter** SVMM4160R
Insert DBN920 SNEU1204-cBN



• Results

	Tool life	Surface finish	Machinability
Shave Mill	250 pcs	Rz = 3μ	High
Competitor	180 pcs	Rz = 3.5μ	Normal

• Korloy's shave mills ensure twice the machinability, adjustability, and surface roughness than competitor's, along with twice the tool life.

Better tool life with special grade which has both toughness and wear resistance

Shave Mill-Ultra

- Superior surface roughness for this Finishing cutter when applied to heavy work pieces
- Easy to handle and good rigidity with simple screw on system
- Superior surface finishes due to the wiper crown cutting-edge
- Better tool life with special grade which has both toughness and wear resistance
- Two different types: economical normal type and adjustable run-out type 'B'

Code system of cutter

SVU	A	6	300	R	Z6	-	B
Shave Mill Ultra	Inch Type	Inscribed Circle 6 : 0.75inch	Cutter Dia.(Ø) ISO : mm ASA : inch	Hand of tool R : Right L : Left	No. of tooth(Z)		Cutter Type None : Normal B : Adjustable

Code System of Insert

L	N	C	S	1	9	0	7	-	R3.0	-	WC
			Shave Mill Ultra						Corner Type C : Chamfer R : Round		Wiper Crown

Features

Normal type

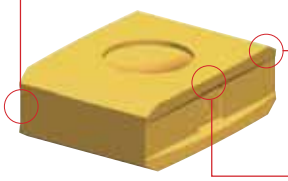


- Good rigidity and economical due to simple screw on type
- Better surface roughness when you use only 1 insert but adjust the 'ap' under 0.001 inch

Adjustable cutting-edge (Type B)



- Easy to handle the run-out due to Korloy exclusive high toughness cutting-edge special parts



- Good cutting performance & chip flow due to positive rake angle chip breaker
- Economical 4 corner insert
- Good surface roughness by wiper crown cutting-edge design

Adjustable Range	· Range: 0.039 inch · Allowance: Within 2μ

Recommended cutting condition

Workpiece	Cutting condition			Tooth	Grades
	vc (sfm)	fz (ipt)	ap (inch)		
P	492~820	0.008~0.002	~0.024	Full use	PC3500
	492~820	0.197~0.079	~0.001	1use	
K	192~984	0.008~0.002	~0.024	Full use	PC6510
	192~984	0.197~0.079	~0.001	1use	

PNHA4000/5000



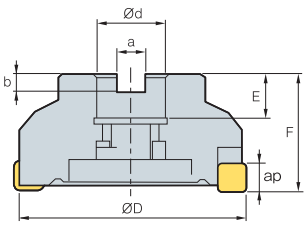


Fig. 1

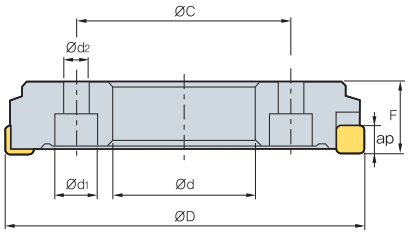


Fig. 2



AA
0°

- AR: -5°
- RR: -6°

(inch)

Designation		⚙	ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	lbs	Fig.
PNHA	44500R/L	10	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.5	7.48	1
	4600R/L	14	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.5	12.10	1
	4800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.5	12.10	2
	41000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.5	16.94	2
	41200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.5	23.10	2
	41400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.5	28.38	2
	41600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.5	35.42	2
	41800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.5	42.02	2
PNHA	5500R/L	10	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.625	7.48	1
	5600R/L	14	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.625	11.66	1
	5800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.625	11.88	2
	51000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.625	16.72	2
	51200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.625	22.88	2
	51400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.625	28.16	2
	51600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.625	34.98	2
	51800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.625	41.58	2

Available inserts

SNEF

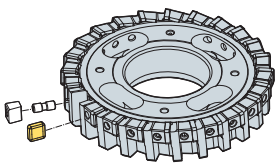


Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEF	435																	E21

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (sfm)	fz (ipt)	
K	330 ~ 660	0.012 ~ 0.002	PC6510
	260 ~ 490	0.012 ~ 0.004	H01
	260 ~ 490	0.012 ~ 0.004	G10

Assembling



Parts

Specification	Wedge	Wedge screw	Wrench
Ø5.0-Ø18.0	WPNH4N	DHA0821F	HW40
Ø5.0-Ø18.0	WPNH5N		

Available inserts E21

PPHA4000



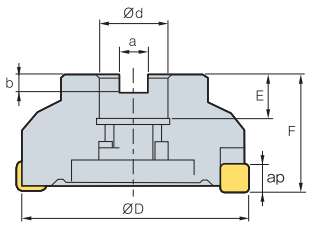


Fig. 1

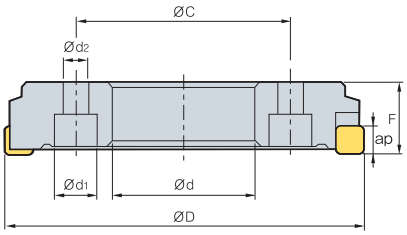


Fig. 2



AA
0°

- AR: 5°
- RR: -6°

(inch)

Designation			ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	lbs	Fig.
PPHA	4500R/L	10	5.0	1.500	-	-	0.625	0.394	1.181	2.500	-	0.5	7.48	1
	4600R/L	14	6.0	2.000	-	-	0.750	0.433	1.181	2.500	-	0.5	11.66	1
	4800R/L	18	8.0	3.150	0.945	0.551	-	-	-	1.575	4.724	0.5	12.10	2
	41000R/L	24	10.0	4.724	1.181	0.709	-	-	-	1.575	6.693	0.5	16.94	2
	41200R/L	30	12.0	6.693	1.181	0.709	-	-	-	1.575	8.661	0.5	23.10	2
	41400R/L	34	14.0	8.661	1.181	0.709	-	-	-	1.575	10.630	0.5	28.60	2
	41600R/L	38	16.0	9.843	1.181	0.709	-	-	-	1.575	11.811	0.5	35.20	2
	41800R/L	44	18.0	11.811	1.181	0.709	-	-	-	1.575	13.780	0.5	41.80	2

Available inserts

SPEN-WC

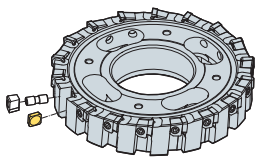


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPEN	434-WC																	E24

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (sfm)	fz (ipt)	
K	330 ~ 660	0.012 ~ 0.002	PC6510
	260 ~ 490	0.012 ~ 0.004	H01
	260 ~ 490	0.012 ~ 0.004	G10

Assembling



Parts

Specification	Wedge	Wedge screw	Wrench
Ø15~Ø18	WPPH4R/L	DHA0821F	HW40

Available inserts E24

SVMA4000



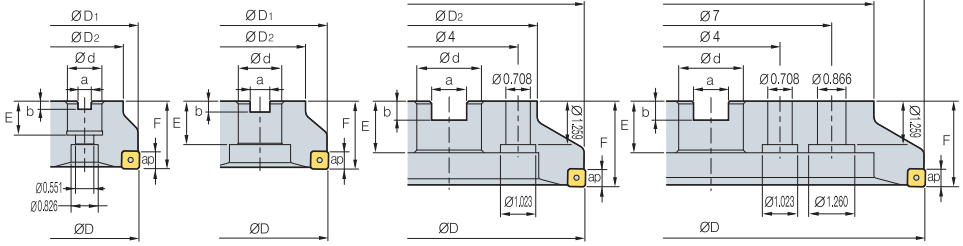


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(inch)

Designation		⌾	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
SVMA	4300R/L-Z8	8	3.00	2.88	2.20	1.00	0.375	0.248	0.866	2.0	0.04	2.32	1
	4400R/L-Z12	12	4.00	3.88	2.87	1.25	0.500	0.319	0.866	2.0	0.04	5.07	1
	4500R/L-Z16	16	5.00	4.88	3.39	1.50	0.625	0.394	1.181	2.5	0.04	7.94	2
	4600R/L-Z18	18	6.00	5.88	4.88	2.00	0.750	0.433	1.181	2.5	0.04	10.8	2
	4800R/L-Z24	24	8.00	6.88	5.12	2.50	1.000	0.551	1.496	2.5	0.04	16.67	3
	41000R/L-Z30	30	10.0	9.88	7.09	2.50	1.000	0.551	1.496	2.5	0.04	26.48	3
	41200R/L-Z34	34	12.0	11.88	9.45	2.50	1.000	0.551	1.496	2.5	0.04	40.79	4

Available inserts



SNEU-MF SNEU1204ANN-MF SNEU-WMF SNEU-TBW

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
SNEU	120420-MF												●					E21 E22
	1204ANN-MF																	
	1204R-WMF																	
	1204-TBW																	

Parts

Specification	Wedge	Wedge screw	Contract Screw	Wrench
Ø3.00~Ø12.0	WKAJ3	DTA0619	XTKA0412	TW15-100

Available inserts **E21, E22**

SVUA6000



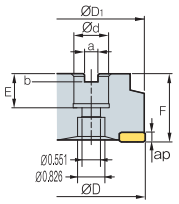


Fig. 1

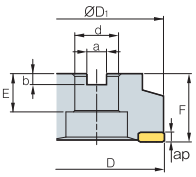


Fig. 2

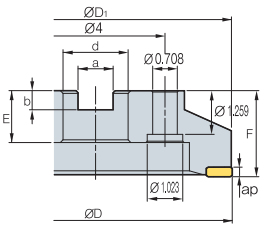


Fig. 3

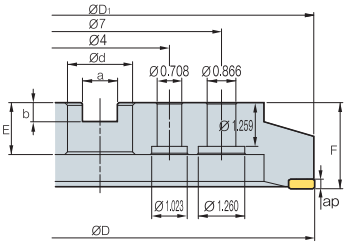


Fig. 4

(inch)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
SVUA	6300R/L-4Z	4	3.00	2.960	2.200	1.00	0.375	0.248	0.866	2.0	0.55	2.60	1
	6400R/L-4Z	4	4.00	3.920	2.874	1.25	0.500	0.319	1.181	2.0	0.55	5.07	1
	6500R/L-4Z	4	5.00	4.921	3.386	1.50	0.625	0.394	1.181	2.5	0.55	7.72	2
	6600R/L-4Z	4	6.00	5.921	4.882	2.00	0.750	0.433	1.181	2.5	0.55	11.02	3
	6800R/L-6Z	6	8.00	7.921	5.118	2.50	1.000	0.551	1.496	2.5	0.55	15.87	3
	61000R/L-6Z	6	10.0	9.921	7.087	2.50	1.000	0.551	1.496	2.5	0.55	26.45	3
	61200R/L-8Z	8	12.0	11.921	9.449	2.50	1.000	0.551	1.496	2.5	0.55	43.00	4

Available inserts

LNCS (R3.0)



LNCS (C1.5)



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNCS	1907-R3.0-WC																	E10
	1907-C1.5-WC																	

Parts

Specification	Screw	Wrench
Ø3.00~Ø12.0	FTNA0513	TW20-100

Available inserts **E10**

SVUA6000-B



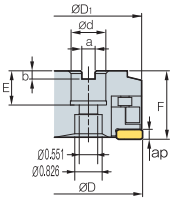


Fig. 1

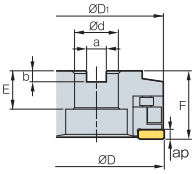


Fig. 2

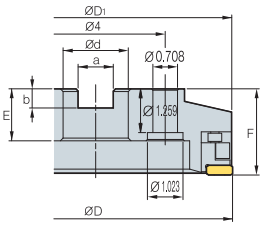


Fig. 3

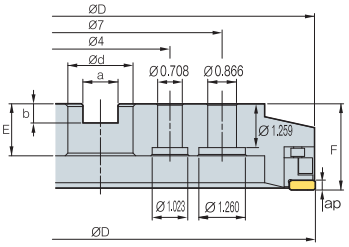


Fig. 4

(inch)

Designation		⊙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	lbs	Fig.
SVUA	6300R/L-4Z-B	8	3.0	3.118	2.205	1.00	0.375	0.248	0.866	2.0	0.53	2.60	1
	6400R/L-4Z-B	10	4.0	4.118	2.874	1.25	0.500	0.319	1.181	2.0	0.53	5.07	2
	6500R/L-4Z-B	14	5.0	5.118	3.386	1.50	0.625	0.394	1.181	2.5	0.53	7.72	2
	6600R/L-4Z-B	18	6.0	6.118	4.882	2.00	0.750	0.433	1.181	2.5	0.53	11.02	2
	6800R/L-6Z-B	24	8.0	8.118	5.118	2.50	1.000	0.551	1.496	2.5	0.53	15.87	3
	61000R/L-6Z-B	30	10.0	10.118	7.087	2.50	1.000	0.551	1.496	2.5	0.53	26.45	3
	61200R/L-8Z-B	34	12.0	12.118	9.449	2.50	1.000	0.551	1.496	2.5	0.53	43.00	4

Available inserts

LNCS (R3.0)



LNCS (C1.5)



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNCS	1907-R3.0-WC																	E10
	1907-C1.5-WC																	

Parts

Specification	Locator	Wedge	Wedge screw	Adjust Screw	Contract Screw	Wrench
Ø3.0~Ø12.0	LSH4R	WSH4	DHA0724F	AZ0619F-D	FTNA0512	TW20-100

Available inserts E10

Gear cutter applicable example

Applicable example-external tooth gear

Finishing: M20



- **Cutter Dia**: Ø15.7
- **Tooth No**: 20 tooth
- **External tooth gear**: Formal cutter for gear processing which can be expected to KS 4 level accuracy
- Cutter can simultaneously chamfer while milling



M20XZ130-EX

Semi-finishing



- **Cutter Dia**: Ø11.02
- **Tooth No**: 48 tooth
- Designed for processing of external gear involute curve line shape
- Possible to work for gear root portion R with optimal insert R design



M20-M22-ROU

Roughing



- **Cutter Dia**: Ø11.81
- **Tooth No**: 60 tooth
- High feed rate with low cutting resistance due to V shape insert setting design



LNE333-02-1



LNE434-02-1



KEL1906-C0.6-MF

Applicable example-internal tooth gear

Finishing: M16



- **Cutter Dia**: Ø15.7
- **Tooth No**: 20 tooth
- **Internal tooth gear**: Formal cutter for gear processing which can be expected to KS 4 level accuracy
- Cutter can simultaneously chamfer while milling



M16XZ130

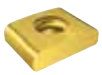
Semi-finishing



- **Cutter Dia**: Ø11.02
- **Tooth No**: 48 tooth
- The semi-finishing cutter was designed for processing of external gear involute curb line shape



M16-M18-ROU

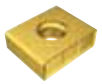


LNE433-R60

Roughing



- **Cutter Dia**: Ø22
- **Tooth No**: 40 tooth
- Possible to use for gear processing of all module due to step type of insert setting design



KEL1906-C0.6-MF



LNE434-02-1

Gear cutter machining example

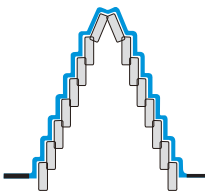
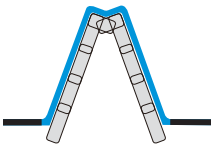
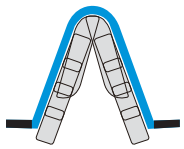
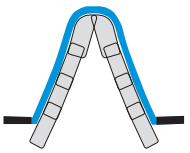
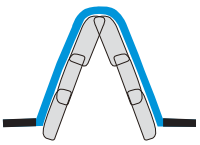
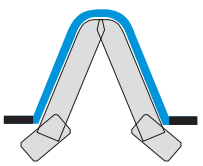
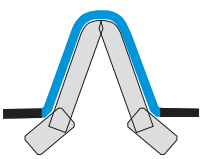
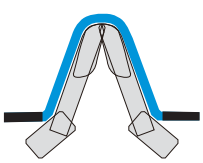


- **Machine**
  Gleason - PFAUTER CNC Hobbing Machine (Power: 52 kW)
- **Cutting condition**
  vc = 393.64 sfm, n = 86.8 rpm
  fz = 0.020 ipt, vf = 17.717 ipm
  ae = 1.417 inch
  Dry
- **Tools**
  M16-PT-RACK-KOR03 (Ø17.3 x W3.54)
- **Semi-finishing cutter (low cut, low resistance)**



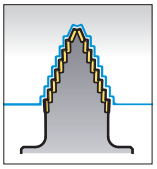


- **Machine**
  KARATS (30kw)
- **Cutting condition**
  vc = 492.13 sfm, n = 119 rpm
  fz = 0.004 ipt, vf = 3.213 ipm
  ae = 1.772 inch
  Dry
- **Tools**
  M24 Semi-finishing External type
  Applicable Insert
  M40-ROU (Main),
  CPE424-01 (Flank)

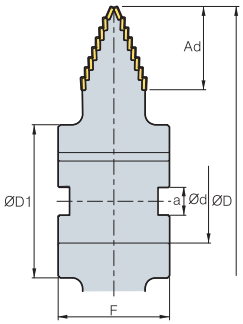
Type	Cutter shape	Cutting-edge shape	Type	Figure
Roughing			Step type	• Working for big sized gear tooth • Low cutting resistance with step type insert setting
			V shape type	• Low cutting resistance with V shape cutting insert setting • Optimal cutting-edge line setting according to Rach type & cutting-edge shape
Semi-finishing			Low cutting resistance type	• 4-Corner insert on Root portion • 3D chip breaker shape on flank • Optimal cutting-edge line setting for low cutting resistance
			External gear high rigidity type	• Optimal R type insert setting on Root portion • Superior Semi-finishing cutting with high rigidity shape of cutter & insert
			Internal gear high rigidity type	• Exclusive semi-finishing Internal Gear insert • Optimal cutting-edge line setting with Internal tooth shape
Finishing			External gear	• Concave shape of cutting-edge line according to external gear type • Optimal cutting insert setting design according to a customer conditions
			Internal gear	• 2-corner insert setting on right & left side and chamfering insert setting • Adjustable chamfering cartridge use for chamfering control
			2STEP type	• Exclusive insert for machining the root part • 4-cornered insert

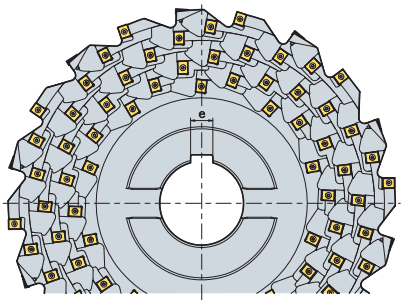
• Optimal cutting insert setting design according to customer condition

Gear Roughing Cutter (Step type)







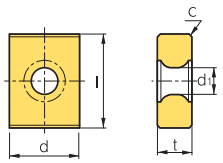


(inch)

m	⚙	ØD	Ad	Ød	ØD1	a	e	F
30	96	450	90	100	180	25	14	140
	108	500	90	100	180	25	14	140
	120	560	90	120	220	40	32	160
40	112	450	105	100	180	25	14	140
	126	500	105	100	180	25	14	140
	140	560	105	120	220	40	32	160
50	160	560	119	120	220	40	32	160

M This is metric size. We can also provide in inch type

Available inserts

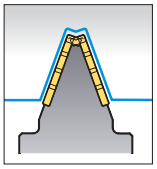
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	c	
 Reinforced cutting-edge	LNE	434-02-1			○	◎			19.05	14.29	6.35	5.4	0.6	
 Low cutting resistance	KEL	1906-C0.6-MF			○	◎			19.05	14.29	6.35	5.4	0.6	
		190610-MR			○	◎			19.05	14.29	6.35	5.4	-	

M This is metric size. We can also provide in inch type

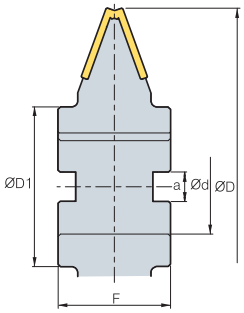
◎: 1st Rec ○: 2nd Rec

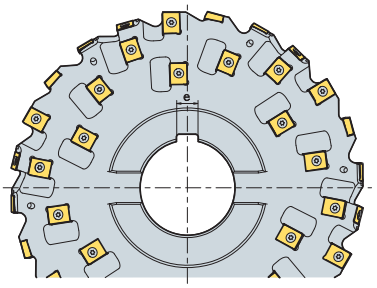
※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Roughing Cutter (V shape type)







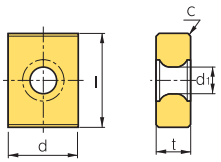
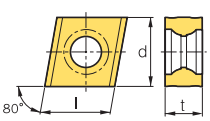


(inch)

m	Type	⊚	ØD	Ød	ØD1	a	e	F
20	rack	48	280	80	135	25	18	95
22	rack	48	280	80	135	25	18	95
24	rack	48	320	80	145	25	18	105
26	rack	60	320	80	145	25	18	105
28	rack	96	400	100	180	25	24	130
30	rack	96	400	100	180	25	24	130
32	rack	96	400	100	180	25	24	130
34	rack	112	400	100	180	25	24	130
36	rack	112	450	100	180	25	24	130
38	rack	112	450	100	180	25	24	130
40	rack	128	450	100	180	25	24	160
42	rack	128	450	100	180	25	24	160
44	rack	128	560	120	220	32	32	160
46	rack	144	560	120	220	32	32	160
48	rack	144	560	120	220	32	32	160
50	rack	144	560	120	220	32	32	160

M This is metric size. We can also provide in inch type

Available inserts

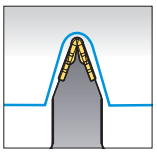
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	c	
 Reinforced cutting-edge	LNE	434-02-1			◦	◉			19.05	14.29	6.35	5.4	0.6	
 Low cutting resistance	LNE	1906-C0.6-MF			◦	◉			19.05	14.29	6.35	5.4	0.6	
		190610-MR							19.05	14.29	6.35	5.4	-	
 Reinforced cutting-edge	KEL	333-02-1			◦	◉			14.3	12.7	6.35	5.8	0.8	
	CNHQ	1005-C0.5							10	10	5.4	-	-	

M This is metric size. We can also provide in inch type

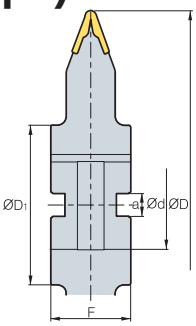
◎: 1st Rec ○: 2nd Rec

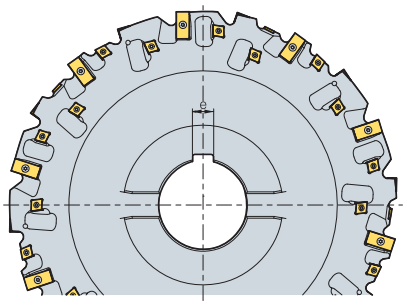
※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Semi-finishing Cutter
(Low cutting resistance type)







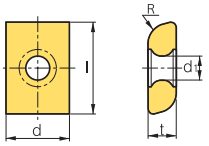
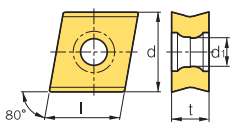


(inch)

m	No.of teeth	◎	ØD	Ød	ØD1	a	e	F
6	30,60,120	18	250	60	100	25	18	70
8	30,60,120	18	250	60	100	25	18	80
10	30,60,120	24	250	60	100	25	18	80
12	30,60,120	24	250	60	100	25	18	90
14	30,60,120	24	280	80	135	25	24	95
16	30,60,120	32	280	80	135	25	24	100
18	30,60,120	32	320	80	145	25	24	105
20	30,60,120	64	400	100	180	25	24	110
22	30,60,120	64	400	100	180	25	24	110
24	30,60,120	64	400	100	180	25	24	120

M This is metric size. We can also provide in inch type

Available inserts

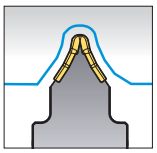
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	c	
		M6-2ST			○	◎			19.05	11.6	3.8	4.4	2.25	
		M8-2ST			○	◎			19.05	11.6	4	4.4	3	
		M10-2ST			○	◎			19.05	11.6	4.76	4.4	3.75	
		M12-2ST			○	◎			19.05	14.3	6.35	5.5	4.5	
		M14-2ST			○	◎			25.4	14.3	6.35	5.5	5.25	
		M16-2ST			○	◎			31.8	14.3	7.14	5.5	6	
		M18-2ST			○	◎			31.8	14.3	7.14	5.5	6.75	
		M20-2ST			○	◎			31.8	14.3	9.52	5.5	7.5	
		M22-2ST			○	◎			31.8	14.3	9.52	5.5	8.25	
		M24-2ST			○	◎			31.8	14.3	9.52	5.5	9	
	KEC	120606-MX			○	◎			12	12.7	6.35	4.5	-	
		150708-MX			○	◎			15.15	15	7.6	5.8	-	

M This is metric size. We can also provide in inch type

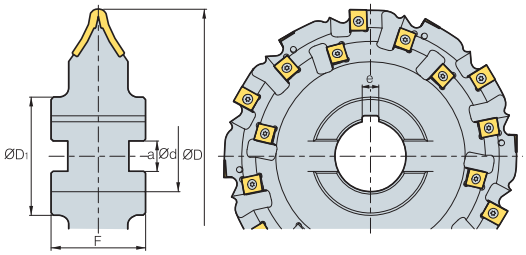
◎: 1st Rec ○: 2nd Rec

※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Semi-finishing Cutter
(High rigid edge type, External gear)





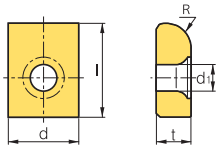
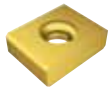
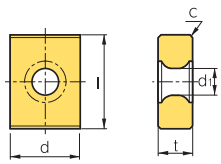


(inch)

m	No.of teeth		ØD	Ød	ØD1	a	e	F
12	30,60,120	24	250	60	100	25	14	70
14	30,60,120	36	250	60	100	25	14	80
16	30,60,120	36	250	60	100	25	14	80
18	30,60,120	36	250	60	100	25	14	90
20	30,60,120	48	280	80	135	25	18	95
22	30,60,120	48	280	80	135	25	18	100
24	30,60,120	48	320	80	145	25	18	105
26	30,60,120	72	400	100	180	25	24	110
28	30,60,120	72	400	100	180	25	24	110
30	30,60,120	72	400	100	180	25	24	120
32	30,60,120	84	400	100	180	25	24	130
34	30,60,120	84	400	100	180	25	24	130

M This is metric size. We can also provide in inch type

Available inserts

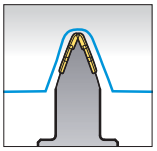
Picture	Designation	Coated				Uncoated		Dimensions						Configuration
		NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	R	c	
	**M8-ROU**			◦	鞭			15.875	11	4.76	4.6	4.6	-	
	M12-M14-ROU			◦	鞭			19.05	14.29	6.35	5.4	5.4	-	
	M16-M18-ROU			◦	鞭			19.05	14.29	7	5.4	5.4	-	
	M20-M22-ROU			◦	鞭			19.05	14.29	7.94	5.4	5.4	-	
	M40-ROU			◦	鞭			25.4	14.29	9.52	5.4	5.4	-	
	LNE **434-02-1**			◦	鞭			19.05	14.29	6.35	5.4	-	0.6	
	KEL **1906-C0.6-MF**			◦	鞭			19.05	14.29	6.35	5.4	-	0.6	
	190610-MR			◦	鞭			19.05	14.29	6.35	5.4		-	

M This is metric size. We can also provide in inch type

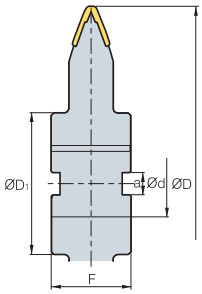
◎: 1st Rec ○: 2nd Rec

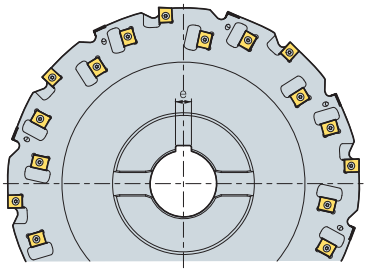
※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Semi-finishing Cutter
(High rigid edge type, Internal gear)







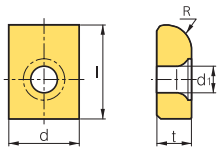
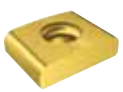
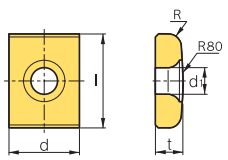


(inch)

m	No.of teeth		ØD	Ød	ØD1	a	e	F
12	30,60,120	24	250	60	100	25	14	70
14	30,60,120	36	250	60	100	25	14	80
16	30,60,120	36	250	60	100	25	14	80
18	30,60,120	36	250	60	100	25	14	90
20	30,60,120	48	280	80	135	25	18	95
22	30,60,120	48	280	80	135	25	18	100
24	30,60,120	48	320	80	145	25	18	105
26	30,60,120	72	400	100	180	25	24	110
28	30,60,120	72	400	100	180	25	24	110
30	30,60,120	72	400	100	180	25	24	120
32	30,60,120	84	400	100	180	25	24	130
34	30,60,120	84	400	100	180	25	24	130

M This is metric size. We can also provide in inch type

Available inserts

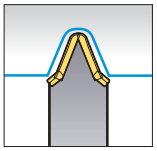
Picture	Designation	Coated				Uncoated		Dimensions					Configuration
		NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	c	
	**M8-ROU**			◦	轉			15.875	11	4.76	4.6	2	
	M12-M14-ROU			◦	轉			19.05	14.29	6.35	5.4	3	
	M16-M18-ROU			◦	轉			19.05	14.29	7	5.4	5	
	M20-M22-ROU			◦	轉			19.05	14.29	7.94	5.4	7	
	M40-ROU			◦	轉			25.4	14.29	9.52	5.4	10	
	**LNE 433-R80**			◦	轉			19.05	14.29	5.56	5.4	2.5	

M This is metric size. We can also provide in inch type

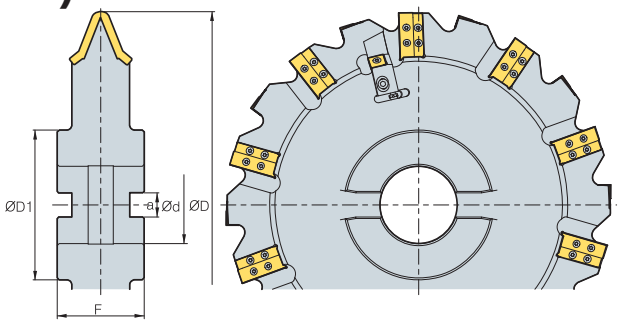
◎: 1st Rec ○: 2nd Rec

※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Finishing Cutter
(1 Step type, External gear)





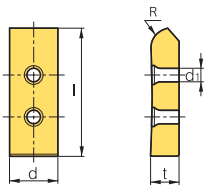
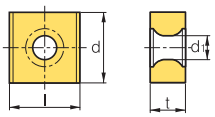


(inch)

m	⊙	ØD	Ød	ØD1	a	F
6	20	400	80	155	25	90
8	20	400	80	155	25	90
10	20	400	80	155	25	90
12	20	400	80	155	25	90
14	20	400	80	155	25	90
16	20	400	80	155	25	90
18	20	400	80	155	25	90
20	20	400	80	155	25	90
22	20	400	80	155	25	90
24	20	400	80	155	25	90

M This is metric size. We can also provide in inch type

Available inserts

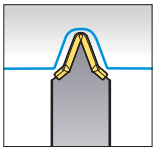
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	R	
		M6			◦	轉			19	14.3	5	5.5	2.25	
		M8			◦	轉			27	14.3	5.4	5.5	3	
		M10			◦	轉			29	14.3	6.35	5.5	3.75	
		M12			◦	轉			33	14.3	6.35	5.5	4.5	
		M14			◦	轉			39	14.3	6.35	5.5	5.25	
		M16			◦	轉			43	14.3	7.94	5.5	6	
		M18			◦	轉			50	14.3	7.94	5.5	6.75	
		M20			◦	轉			54	14.3	9.53	5.5	7.5	
		M22			◦	轉			57	14.3	9.53	5.5	8.25	
		M24			◦	轉			64	14.3	9.53	5.5	9	
	SNEQ	1507-C0.8			◦	轉			15.875	15.875	7.94	-	-	

M This is metric size. We can also provide in inch type

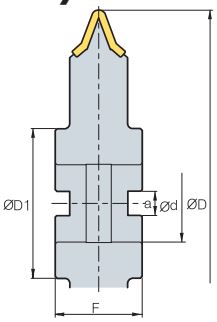
◎: 1st Rec ○: 2nd Rec

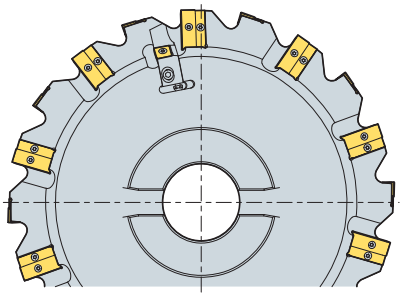
※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Finishing Cutter
(1 Step type, Internal gear)







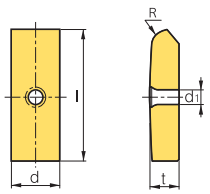
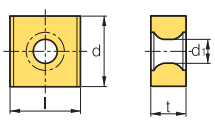


(inch)

m	⊚	ØD	Ød	ØD1	a	F
6	20	400	80	155	25	90
8	20	400	80	155	25	90
10	20	400	80	155	25	90
12	20	400	80	155	25	90
14	20	400	80	155	25	90
16	20	400	80	155	25	90
18	20	400	80	155	25	90
20	20	400	80	155	25	90
22	20	400	80	155	25	90
24	20	400	80	155	25	90

M This is metric size. We can also provide in inch type

Available inserts

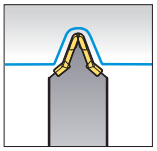
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	R	
		**M6**			◦	轉			19	14.3	5	5.5	2.25	
		M8			◦	轉			27	14.3	5.4	5.5	3	
		M10			◦	轉			29	14.3	6.35	5.5	3.75	
		M12			◦	轉			33	14.3	6.35	5.5	4.5	
		M14			◦	轉			39	14.3	6.35	5.5	5.25	
		M16			◦	轉			43	14.3	7.94	5.5	6	
		M18			◦	轉			50	14.3	7.94	5.5	6.75	
		M20			◦	轉			54	14.3	9.53	5.5	7.5	
		M22			◦	轉			57	14.3	9.53	5.5	8.25	
		M24			◦	轉			64	14.3	9.53	5.5	9	
	**SNEQ**	**1507-C0.8**			◦	轉			15.875	15.875	7.94	-	-	

M This is metric size. We can also provide in inch type

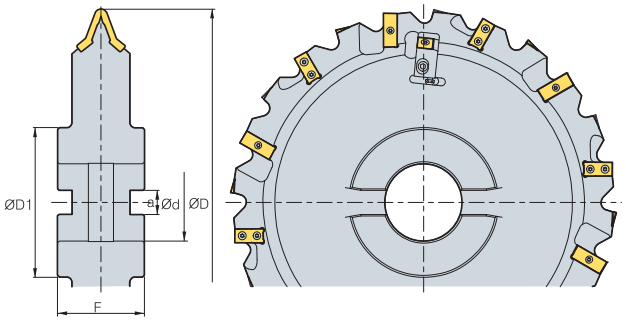
◎: 1st Rec ○: 2 nd Rec

※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear Finishing Cutter
(2 Step type, Internal/Externa gear)





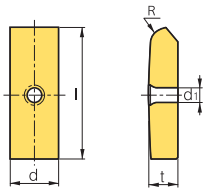
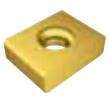
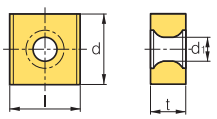
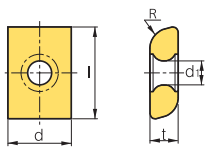


(inch)

m	⚙	ØD	Ød	ØD1	a	F
6	24	400	80	155	25	90
8	24	400	80	155	25	90
10	24	400	80	155	25	90
12	24	400	80	155	25	90
14	24	400	80	155	25	90
16	24	400	80	155	25	90
18	24	400	80	155	25	90
20	24	400	80	155	25	90
22	24	400	80	155	25	90
24	24	400	80	155	25	90

M This is metric size. We can also provide in inch type

Available inserts

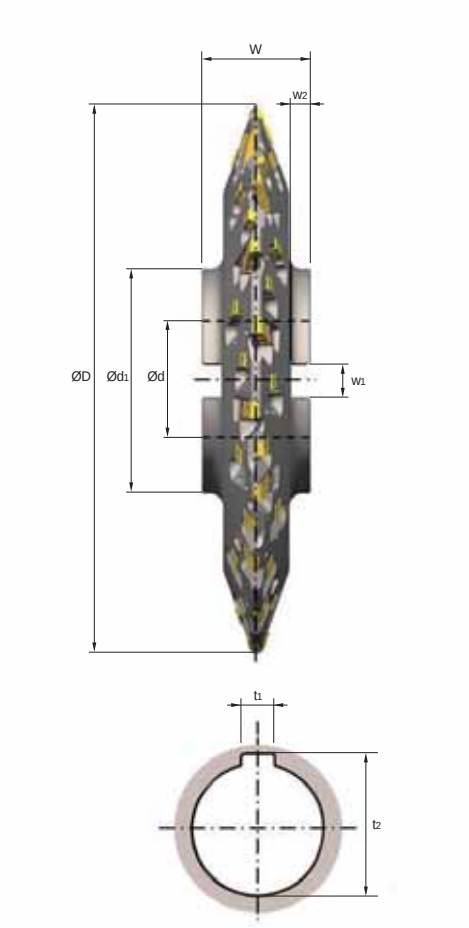
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	R	
		M6		◦		◎			19	14.3	5	5.5	2.25	
		M8		◦		◎			27	14.3	5.4	5.5	3	
		M10		◦		◎			29	14.3	6.35	5.5	3.75	
		M12		◦		◎			33	14.3	6.35	5.5	4.5	
		M14		◦		◎			39	14.3	6.35	5.5	5.25	
		M16		◦		◎			43	14.3	7.94	5.5	6	
		M18		◦		◎			50	14.3	7.94	5.5	6.75	
		M20		◦		◎			54	14.3	9.53	5.5	7.5	
		M22		◦		◎			57	14.3	9.53	5.5	8.25	
		M24		◦		◎			64	14.3	9.53	5.5	9	
	SNEQ	1507-C0.8		◦		◎			15.875	15.875	7.94	-	-	
		M6-2ST							19.05	11.6	3.8	4.4	2.25	
		M8-2ST							19.05	11.6	4	4.4	3	
		M10-2ST							19.05	11.6	4.76	4.4	3.75	
		M12-2ST							19.05	14.3	6.35	5.5	4.5	
		M14-2ST							25.4	14.3	6.35	5.5	5.25	
		M16-2ST							31.8	14.3	7.14	5.5	6	
		M18-2ST							31.8	14.3	7.14	5.5	6.75	
		M20-2ST							31.8	14.3	9.52	5.5	7.5	
		M22-2ST							31.8	14.3	9.52	5.5	8.25	
		M24-2ST							31.8	14.3	9.52	5.5	9	

M This is metric size. We can also provide in inch type

◎: 1st Rec ○: 2nd Rec

※ The above specification is subject to change according to customer related condition & Korloy technical condition

Gear cutter order form



Cutter type

☐ **Roughing** ☐ **Semi-finishing** ☐ **Finishing**

☐ Step ☐ Low cutting resistance ☐ 1 Step

☐ V shape ☐ High rigid edge ☐ 2 Step

■Stock for finishing (one side) (inch):

■Outside diameter D (inch):

■Bore diameter d (inch):

■Hub diameter d1 (inch):

■Cutter width W (inch):

■Radial keyway w1 (inch):

■Radial keyway w2 (inch):

■Axial keyway t1 (inch):

■Axial keyway t2 (inch):

Involute gear data

☐ **External gear** ☐ **Internal gear** ☐ **Rack gear**

■Diametral pitch DP:

■No.of teeth Z:

■Pressure angle α (°):

■Helix angle β (°):

■Addendum modification coefficient x:

■Tip diameter da (inch):

■Root diameter d_f (inch):

■Root radius ρ_{fp} (inch)

■Base tangent length W_k (inch)

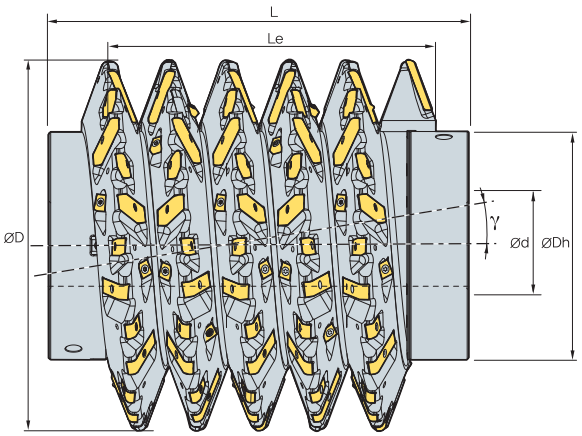
■No. of measuring teeth K:

■Dimensions/Dimension over balls M_d (inch):

■Ball diameter D_M (inch):

■Gear quality (DIN, AGMA):

Indexable HOB

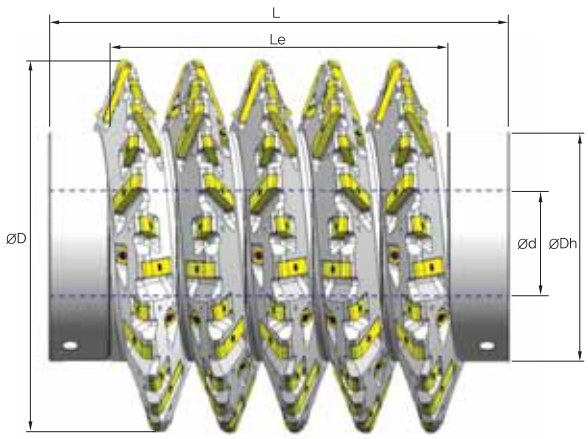


(inch)

Gear module	ØD	ØDh	Ød	No.Segm. (Pitch)	Le	Segment insert	Total insert	γ (Lead Ang.)
6	180	125	40	6	(113)	15	90	2.084
	210	125	50	6	(113)	17	102	1.763
	240	160	60	6	(113)	19	114	1.528
7	180	125	40	6	(132)	15	90	2.469
	210	125	50	6	(132)	17	102	2.084
	240	160	60	6	(132)	19	114	1.803
8	210	125	50	6	(151)	17	102	2.413
	240	160	60	6	(151)	19	114	2.084
	270	180	80	6	(151)	21	126	1.834
9	210	125	50	6	(169)	17	102	2.751
	240	160	60	6	(169)	19	114	2.372
	270	180	80	6	(169)	21	126	2.084
10	210	125	50	6	(189)	17	102	3.099
	240	160	60	6	(189)	19	114	2.666
	270	180	80	6	(189)	21	126	2.339
12	240	140	60	6	(226)	18	108	3.276
	270	180	80	6	(226)	22	132	2.866
	350	215	80	6	(226)	26	156	2.149
14	270	180	80	6	(264)	22	132	3.415
	350	215	80	6	(264)	26	156	2.547
16	270	160	80	6	(302)	22	132	3.989
	350	215	80	6	(302)	26	156	2.959
18	270	145	80	5	(283)	22	110	4.589
	350	215	80	5	(283)	26	130	3.383
20	350	215	80	5	(314)	26	130	3.823
	450	265	100	5	(314)	34	170	2.866

M This is metric size. We can also provide in inch type

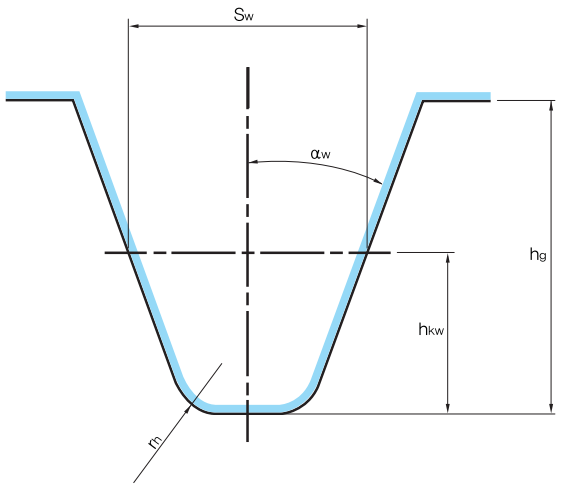
Indexable HOB



Tool SPEC.

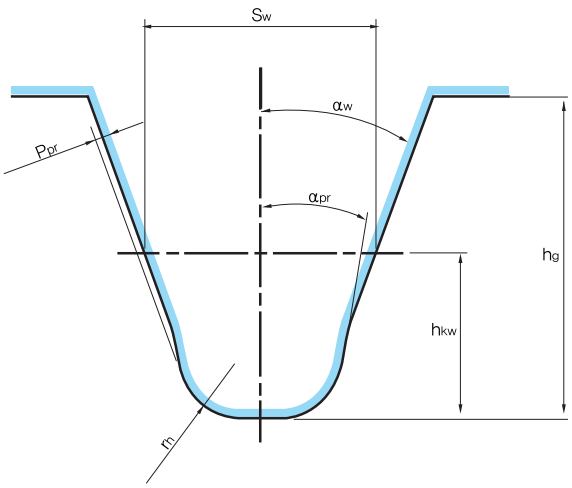
- Outside diameter ØD (inch):
- Bore diameter Ød (inch):
- Hub diameter ØDh (inch):
- Hob length L (inch):
- Cutting length Le (inch):
- Spiral direction RH/LH:
- Quality class acc. to DIN 3968:

Profile of hob [Module m6~]



- Module M (inch):
- Addendum hkw (inch):
- Tooth thickness Sw (inch):
- Tooth depth hg (inch):

Profile of roughing hob [Module m8~]



- Pressure angle α_w (inch):
- Protuberance amount P_{pr} (inch):
- Protuberance angle α_{pr} (inch):
- Tip radius r_h (inch):

F

ENDMILLS

Korloy Endmills, with New technology and our technical know-how,
are the best for increasing productivity and machinability



Technical Information for Endmills

F02 Endmill Code System
F04 KORLOY Endmills

Solid Endmills

F09 Technical Information for H Endmill
F12 H Endmill
F14 Technical Information for V Endmill
F16 V Endmill
F17 Technical Information for Z Endmill
F20 Z Endmill
F24 Technical Information for F Endmill
F26 F Endmill
F27 Technical Information for T Endmill
F29 Special T Endmill Order Form
F30 Technical Information for I+ Endmill
F33 I+ Endmill
F45 Technical Information for Z+ Endmill
F48 Z+ Endmill
F62 Technical Information for S+ Endmill
F64 S+ Endmill

Solid Endmills

F65 Technical Information for R+ Endmill
F70 R+ Endmill
F76 Technical Information for Solid Endmill for Aluminum
F77 Solid Endmill for Aluminum
F79 Technical Information for A+ Endmill
F81 A+ Endmill
F84 Technical Information for C-Max
F85 C-Max
F88 Technical Information for D Endmill
F90 D Endmill
F95 Technical Information for Composite Router Endmill
F96 Composite Router Endmill
F100 Technical Information for PCD Endmill
F101 PCD Endmill

Brazed Endmills

F102 Technical Information for Brazed Endmill
F104 Brazed Endmill

Special Endmill order Form

F109 Special Endmill Order Form

C F E A 2 01250 - 2.50 -

1	2	3	4	5	6	7
Series	Type	Endmill	America	No. of Flutes	Cutting Dia.	Overall Length

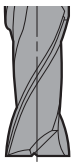
1 Series

C F E A 2 01250 - 2.50 - R T - V N S

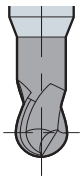
IP, Z: Infinity-Max Endmill
HP, P: High performance-Max Endmill
C: Copper-Max Endmill
D: Dia coated-Max Endmill
V: Variable Endmill
FM: Feed-up Endmill
SSEA, AP: Aluminum Endmill
SP: Stainless Endmill
CC: Composite Rough Endmill
T: Dental Endmill

2 Type

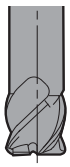
C F E A 2 01250 - 2.50 - R T - V N S



Flat type — F



Ball type — B



Radius type — R

3 Endmill

C F E A 2 01250 - 2.50 - R T - V N S

4 America

C F E A 2 01250 - 2.50 - R T - V N S

5 No. of Flutes

C F E A 2 01250 - 2.50 - R T - V N S



2 Flutes — 2



3 Flutes — 3



4 Flutes — 4

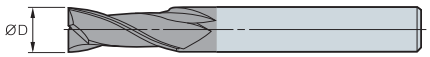


6 Flutes — 6

※ The above code system is not applied for SSEA and ZSE

6 Cutting Dia

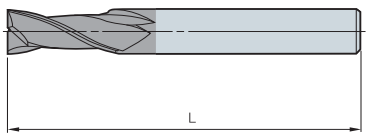
C F E A 2 01250 - 2.50 - R T - V N S



Notation	ØD
01250	Ø0.1250
01562	Ø0.1562
02500	Ø0.2500
05000	Ø0.5000

7 Overall Length

C F E A 2 01250 - 2.50 - R T - V N S



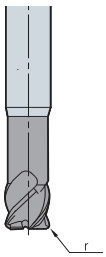
Overall Length	
Notation	L (inch)
2.50	2.50
4.00	4.00
6.00	6.00

R.01 T000 - V0.62 N0.65 S1875

8 Corner Radius | 9 Taper Angle | 10 Length | 11 Neck Length | 12 Shank Diameter

8 Corner Radius

C F E A 2 01250 - 2.50 - **R** T - V N S



Corner Radius	
Notation	**R (inch)**
R.01	r 0.01
R.02	r 0.02
R.04	r 0.04
R.06	r 0.06

9 Taper Angle

C F E A 2 01250 - 2.50 - R **T** - V N S

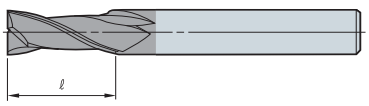


T(θ°): Taper Angle

Taper Angle	
Notation	**T (θ°)**
T010	1°
T015	1.5°
T100	10°

10 Taper Length

C F E A 2 01250 - 2.50 - R T - **V** N S

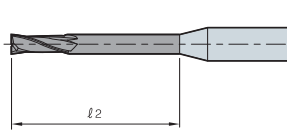


Taper Length	
Notation	**ℓ (inch)**
V0.62	0.62
V0.75	0.75
V1.00	1.00

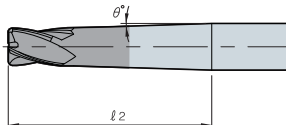
※ This code system is also for special endmills

11 Neck Length

C F E A 2 01250 - 2.50 - R T - V **N** S



Long Neck



Taper Long Neck

ℓ_2(mm): Neck Length

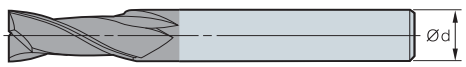
T(θ°): Taper Angle

Long Neck	
Notation	**ℓ_2 (inch)**
N0.65	0.65
N0.80	0.80
N1.25	1.25
N1.30	1.30

Taper Long Neck	
Notation	**ℓ_2 + T (θ°)**
N0.6210	0.62+1°
N0.7515	0.75+1.5°
N1.0020	1.00+2°
N1.2525	1.25+2.5°

12 Shank Diameter

C F E A 2 01250 - 2.50 - R T - V N **S**



Shank Diameter	
Notation	**Ød**
S1250	Ø0.1250
S1875	Ø0.1875
S2500	Ø0.2500
S3750	Ø0.3750
S4375	Ø0.4375

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
								Min	Max	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal	S Heat resistant alloy, Titanium alloy	H Hardened steel	
new H Endmill	Ball	PBE2000	PC303S		○	High speed High hardness	2	0.5	12	◎		◎		○	◎	F12
	Radius	PRE4000	PC310U		○	High speed High hardness	4	3	12	◎		◎		○	◎	F13
V Endmill	Flat	VFE4000	PC215F		○	General	4	2.5	16	◎	○	○		○	○	F16
new Z Endmill	Flat	ZFE2000	PC315E		○	General	2	1	16	◎	○	◎		○		F20
		ZFE4000	PC315E		○	General	4	1	16	◎	○	◎		○		F21
	Short flat	ZSFE2000	PC315E		○	General	2	1	12	◎	○	◎		○		F22
		ZSFE4000	PC315E		○	General	4	1	12	◎	○	◎		○		F22
	Ball	ZBE2000	PC315E		○	General	2	1	12	◎	○	◎		○		F23
F Endmill	Standard	FME4000	PC203F		○	High speed High hardness	4	6	12	○		○		◎	◎	F26
	Long	FMLE4000	PC203F		○	High speed High hardness	4	6	12	○		○		◎	◎	F26
new T Endmill	Ball	TZBE	ND3000		○	Dental, Zirconia	2	0.6	3				◎			F27
		TTBE	PC2510		○	Dental, Metal	2	0.6	3					◎		F27
		TWBE	H01		–	Dental, Wax	2	0.6	3				◎			F27
I+ Endmill	Flat	IPFE2000	PC320		○	General	2	1	20	◎	○	◎		○		F33
		IPFE4000	PC320		○	General	4	1	20	◎	○	◎		○		F35
	Long flat	IPLFE2000	PC320		○	General	2	1	20	◎	○	◎		○		F34
		IPLFE4000	PC320		○	General	4	1	20	◎	○	◎		○		F36
	Ball	IPBE2000	PC320		○	General	2	1	20	◎	○	◎		○		F37

M This is metric size. We can also provide in inch type

◎: Excellent ○: Good

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
I+ Endmill	Ball	IPBE4000	PC320		○	General	4	1	20	◎	○	◎		○		F39
	Long ball	IPLBE2000	PC320		○	General	2	1	16	◎	○	◎		○		F38
	Radius	IPRE2000	PC320		○	General	2	1	12	◎	○	◎		○		F40 F41
		IPRE4000	PC320		○	General	4	2	12	◎	○	◎		○		F43
	Long radius	IPLRE2000	PC320		○	General	2	3	12	◎	○	◎		○		F42
		IPLRE4000	PC320		○	General	4	3	12	◎	○	◎		○		F44
Z+ Endmill new	Flat	ZPFE2000	PC320U		○	General	2	1	20	◎	○	◎		○		F48
	Short flat	ZPSFE2000	PC320U		○	General	2	1	16	◎	○	◎		○		F49
	Long flat	ZPLFE2000	PC320U		○	General	2	2	20	◎	○	◎		○		F49
	Long flute	ZPLFE2000	PC320U		○	General	2	2	20	◎	○	◎		○		F50
	Flat	ZPFE4000	PC320U		○	General	4	1	20	◎	○	◎		○		F51
	Short flat	ZPSFE4000	PC320U		○	General	4	1	16	◎	○	◎		○		F52
	Long flat	ZPLFE4000	PC320U		○	General	4	2	20	◎	○	◎		○		F53
	Long flute	ZPLFE4000	PC320U		○	General	4	1	20	◎	○	◎		○		F54
	Flat	ZPFE3000	PC320U		○	General	3	2	25	◎	○	◎		○		F55
		ZPFE6000	PC320U		○	General	6	6	20	◎	○	◎		○		F55
	Ball	ZPBE2000	PC320U		○	General	2	0.8	20	◎	○	◎		○		F56
	Long ball	ZPLBE2000	PC320U		○	General	2	2	12	◎	○	◎		○		F57

M This is metric size. We can also provide in inch type

◎: Excellent ○: Good

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
								Min	Max	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal	S Heat resistant alloy, Titanium alloy	H Hardened steel	
Z+ Endmill (new)	Ball	ZPBE4000	PC320U		○	General	4	2	20	◎	○	◎		○		F57
	Radius	ZPRE2000	PC320U		○	General	2	1	16	◎	○	◎		○		F58
	Long radius	ZPLRE2000	PC320U		○	General	2	6	16	◎	○	◎		○		F59
	radius	ZPRE4000	PC320U		○	General	4	1.5	16	◎	○	◎		○		F60
	Long radius	ZPLRE4000	PC320U		○	General	4	6	16	◎	○	◎		○		F61
S+ Endmill	Flat	SPFE4000	PC320S		–	STS	4	1	12	○	◎	○		◎		F64
	Long flat	SPLFE4000	PC320S		–	STS	4	1	12	○	◎	○		◎		F64
R+ Endmill (new)	Roughing	EM09CA	PC30T		○	General	4	5	20	◎	○	◎		○		F70
		EM11CA	FN30T		–	Aluminum	3	6	25				◎			F70
		EM36CA	PC30T		○	General	4	5	20	◎	○	◎		○		F71
		EM37CA	PC30T		○	General	4	5	20	◎	○	◎		○		F71
		EM38CA	PC40T		○	General	4	5	20	◎	○	◎		○		F72
		EM43CA	PC30T		○	General	4	5	20	◎	○	◎		○		F72
		EM11PM	HC30T		○	General	4	6	20	◎	○	◎		○		F73
		EM16PM	HC30T		○	General	4	6	20	◎	○	◎		○		F73
		EM17PM	HC30T		○	General	4	6	20	◎	○	◎		○		F74
		EM06H9M	HC10T HC20T		○	General	4	6	50	◎	○	◎		○		F75
Solid Endmills for aluminum	Flat	SSEAA2000	H01 PD3000		– (○)	Aluminum	2	1/16	3/4	○			◎			F77

M This is metric size. We can also provide in inch type

◎: Excellent ○: Good

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
Solid Endmills for aluminum	Flat	SSEAA3000	H01 PD3000		– (○)	Aluminum	3	3/32	5/8	○			◎			F77
	Ball	SSBEAA2000	H01 PD3000		– (○)	Aluminum	2	1/16	3/4	○			◎			F78
A+ Endmill	Flat	APFE2000	H05S		–	Aluminum	2	2.5	20	○			◎			F81
		APFE3000	H05S		–	Aluminum	3	2.5	20	○			◎			F81
	Long flat	APLFE2000	H05S		–	Aluminum	2	3	20	○			◎			F82
		APLFE3000	H05S		–	Aluminum	3	3	20	○			◎			F82
	Ball	APBE2000	H05S		–	Aluminum	2	1	12	○			◎			F83
	Roughing	APRE3000	H05S		–	Aluminum	3	4	25	○			◎			F83
C-Max	Flat	CFEA2000	PC210C		○	Copper, Copper alloy	2	1/16	1/2	○			◎			F85
	Long neck flat	CFNEA2000	PC210C		○	Copper, Copper alloy	2	1/32	5/32	○			◎			F85
	Ball	CBEA2000	PC210C		○	Copper, Copper alloy	2	1/16	1/2	○			◎			F86
	Long neck ball	CBNEA2000	PC210C		○	Copper, Copper alloy	2	1/32	5/32	○			◎			F86
	Radius	CREA2000	PC210C		○	Copper, Copper alloy	2	3/32	1/2	○			◎			F87
	Long neck radius	CRNEA2000	PC210C		○	Copper, Copper alloy	2	1/32	5/32	○			◎			F87
D Endmill new	Flat	DFE2000	ND3000		○	Graphite, Ceramics	2	1.0	12				◎			F90
		DFE4000	ND3000		○	Graphite, Ceramics	4	2	12				◎			F91
	Ball	DBE2000	ND3000		○	Graphite, Ceramics	2	0.6	12				◎			F92 F93
		DBE4000	ND3000		○	Graphite, Ceramics	4	2	12				◎			F94

M This is metric size. We can also provide in inch type

◎: Excellent ○: Good

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
Composite Router Endmill (new)	Flat	**CCDR4000**	ND2100		○	Composite CFRP, GFRP	4	6	8				◎			F96
		CCDR6000	ND2100		○	Composite CFRP, GFRP	6	10	12				◎			F96
		CCR2000	ND2100		○	Composite CFRP, GFRP	2	4	12				◎			F97
		CCLR4000	ND2100		○	Composite CFRP, GFRP	4	4	12				◎			F98
		CCRR6000	ND2100		○	Composite CFRP, GFRP	6	6	8				◎			F99
		CCRR8000	ND2100		○	Composite CFRP, GFRP	8	10	12				◎			F99
PCD Endmill	Flat	**PDEA1000**	DP200		–	Nonferrous, High speed	1	0.188	0.188				◎			F101
		PDEA2000	DP200		–	Nonferrous, High speed	2	0.250	0.500				◎			F101
Brazed Endmill	Flat	**ZSE200**	FCC PC221F		–(○)	Cast iron, Steel	2	14	50	○	○	◎		○		F104
		ZSE300	FCC PC221F		–(○)	Cast iron, Steel	3	14	50	○	○	◎		○		F104 F105
		ZSE400	FCC PC221F		–(○)	Cast iron, Steel	4	14	50	○	○	◎		○		F105
		ZSE600	FCC PC221F		–(○)	Cast iron, Steel	6	34	50	○	○	◎		○		F105
		ZSEA200	FCC		–	Aluminum, Copper	2	15	50				◎			F106
	Long flat	**ZSEL200**	FCC PC221F		–	Cast iron, Steel	2	14	50	○	○	◎		○		F107
		ZSEL400	FCC PC221F		–	Cast iron, Steel	4	16	40	○	○	◎		○		F107
		ZSEXL200	FCC PC221F		–	Cast iron, Steel	2	20	25	○	○	◎		○		F107
	Ball	**ZSBE200**	FCC PC221F		–	Cast iron, Steel	2	13	50	○	○	◎		○		F108

M This is metric size. We can also provide in inch type

◎: Excellent ○: Good

Endmill for high speed machining for high hardened steel

H Endmill new

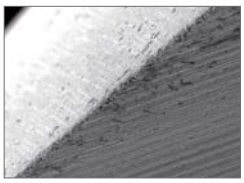
- For cutting high hardened and heat-treated steel under HRC70
- New coating technology improves wear resistance
- A new shape improves machinability
- High speed and highly accurate machining available

Features

- New grade (PC303S, PC310U) - Ultra fine substrate and AlTiSiN coating guarantee excellent wear resistance
- Special edge treatment - Special cutting edge design was applied for less chipping and longer tool life
- High accuracy with tolerance h5 - High quality production system enables tolerance-h5 throughout the whole series

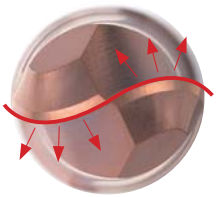


After special edge treatment



before

PBE (Ball)



Cutting load is dispersed

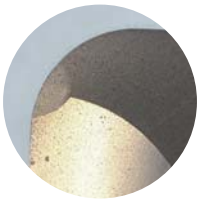
S shape of ball

- The S shape of ball disperses cutting loads
- The tolerance of ball R is under ±0.005 mm

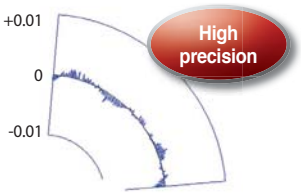
PRE (Radius)



H Endmill radius



New shape of corner R



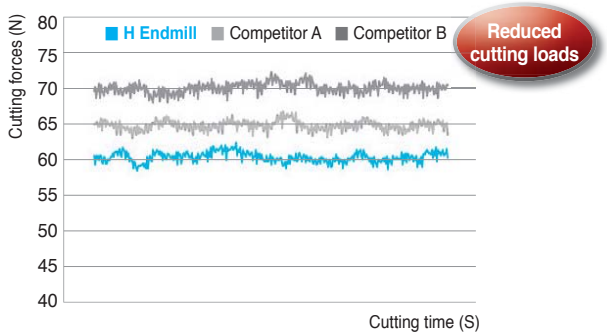
Measurement result of tolerance of corner R

- The new shape of corner R reduces cutting loads
- The tolerance of corner R is under ±0.005 mm

Performance evaluation

- **Workpiece** D2(AISI)/X100CrMoV5 1(DIN)/SKD11(JIS), HRC60
- **Cutting conditions** Diameter = Ø8.0, n (min^{-1}) = 4,000, vc (m/min) = 100
  vf (mm/min) = 800, fz (mm/t) = 0.05
  ap (mm) = 8.0, ae (mm) = 0.25, dry
- **Tools** PRE4080-100-R05

※ Special cutting edge design reduces cutting loads and prolongs tool life

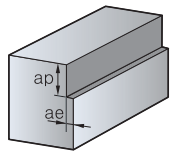


M This is metric size. We can also provide in inch type

Recommended cutting conditions (PRE4000 radius)

Workpiece / Conditions / Diameter (Ø)	Pre-hardened steel (HRC35~45)		Hardened steel (HRC45~55)		High hardened steel (HRC55~70)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
3	17,300	1,250	11,500	840	7,500	256
4	13,200	1,300	8,800	880	5,600	268
5	12,500	1,500	8,300	1,000	5,100	296
6	10,350	1,400	6,900	950	4,200	280
8	7,800	1,350	5,200	900	3,200	264
10	6,150	1,260	4,100	840	2,550	248
12	5,250	1,260	3,500	840	2,100	240

Application tip



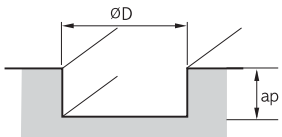
- Shouldering depth (ap) and radial depth (ae)
  - ap = 0.1D
  - ae = 0.03D

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Recommended cutting conditions (PRE4000 radius)

Workpiece / Conditions / Diameter (Ø)	Pre-hardened steel (HRC35~45)		Hardened steel (HRC45~55)		High hardened steel (HRC55~70)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
3	17,300	544	11,500	336	7,500	128
4	13,200	560	8,800	352	5,600	136
5	12,500	644	8,300	400	5,100	144
6	10,350	616	6,900	384	4,200	144
8	7,800	576	5,200	356	3,200	132
10	6,150	544	4,100	332	2,550	124
12	5,250	544	3,500	332	2,100	124

Application tip

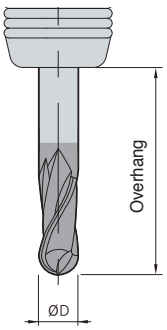


- Slotting depth (ap)
  - ap = 0.05D
  - ae = 1.0D

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Cutting condition by overhang

- Cutting conditions of the shank taper type in case of being clamped at neck
  - When the overhang is increased by 1D, decrease R.P.M and feed 10%
- In case of the straight type adjust conditions according to the overhang
  - Ex: When the overhang is 3D and is increased by 1D, decrease R.P.M and feed 10%



Notice

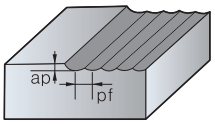
- Cutting conditions are up to the machine's condition and the shape of cutting
- Use cutting fluid that is proper to the workpiece and produces few temperature reactions

M This is metric size. We can also provide in inch type

Recommended cutting conditions (PBE2000 ball)

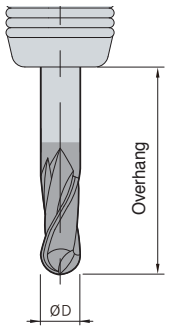
Workpiece / Conditions / Diameter(Ø)	Pre-hardened steel (HRC35~45)		Hardened steel (HRC45~55)		High hardened Steel (HRC55~HRC70)	
	R.P.M n (min-1)	Feed vf (mm/min)	R.P.M n (min-1)	Feed vf (mm/min)	R.P.M n (min-1)	Feed vf (mm/min)
0.5	35,000	1,470	31,500	1,330	28,000	1,050
1	35,000	2,940	31,500	2,660	28,000	2,000
1.2	33,600	3,010	30,100	2,695	26,600	2,100
1.5	33,600	3,150	30,100	2,800	25,900	2,150
2	33,460	3,360	28,000	2,800	24,500	2,200
2.5	25,900	3,710	22,400	2,800	17,500	2,200
3	22,260	3,710	18,550	2,800	16,500	2,200
4	16,730	3,710	14,000	2,800	13,000	2,200
5	17,800	4,900	15,000	3,750	12,500	2,100
6	13,400	4,100	11,000	3,100	10,000	2,500
8	10,700	3,500	9,000	2,700	8,000	2,150
10	8,900	3,100	7,500	2,400	6,600	1,900
12	6,680	2,500	5,600	1,900	5,000	1,550

Application tip



- ap = 0.02D
- pf = 0.05D

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio



Cutting condition by overhang

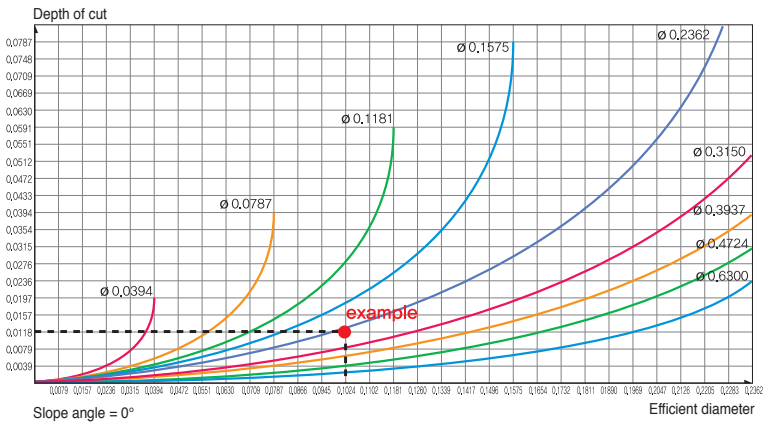
- Cutting conditions of the shank taper type in case of being clamped at neck
  - When the overhang is increased by 1D, decrease R.P.M and feed 10%
- In case of the straight type adjust conditions according to the overhang
  - Ex: When the overhang is 3D and is increased by 1D, decrease R.P.M and feed 10%

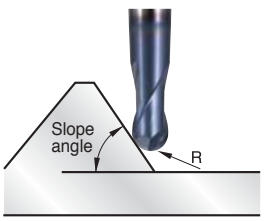
Cutting speed formulas (Ball endmills)

- Efficient cutting speed Veff = (π × Deff × n)/1000 (n = min^{-1})
- Efficient diameter Deff calculation formula Deff = ($2\sqrt{ap(D-ap)} \times \alpha$)
  D = Ø (Tool diameter), Deff = Efficient diameter
- Efficient cutting speed formulas: When slope Ø is 0° Veff = (π × Deff × n)/1000
  Deff = Efficient, diameter Calculate Deff as ap with various ball endmills

α:
α = 1	Slope angle θ = 0°
α = 1.2	Slope angle θ = 7°
α = 1.5	Slope angle θ = 15°
α = 1.7	Slope angle θ = 30°
α = 2.17	Slope angle θ = 45°
α = 2.3	Slope angle θ = 60°

Cutting speed formulas (Ball endmills, slope angle = 0°)





Ex) **Diameter**: 0.236 inch, ap = 0.0118 inch,
Deff = 0.1 inch, N = 14,000 (min^{-1})
Slope angle 0°: Veff = 373 (sfm)
Slope angle 15°: Veff = 373 x 1.5 = 559.5 (sfm)

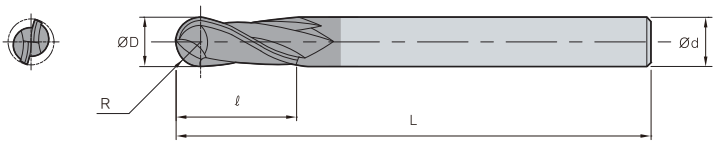
Notice

- Cutting conditions are up to the machine's condition and the shape of cutting
- Use cutting fluid that is proper to the workpiece and produces few temperature reactions

M This is metric size. We can also provide in inch type

PBE2000 (Ball)







ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025



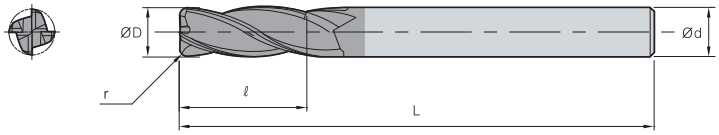
(mm)

Designation		R	ØD	Ød	ℓ	L
PBE 2	2005-040	0.25	0.5	6	1	40
	2010-050	0.5	1	6	2.5	50
	2012-050	0.6	1.2	6	3	50
	2015-050	0.75	1.5	6	4	50
	2020-050	1	2	6	5	50
	2025-060	1.25	2.5	6	7	60
	2030-060	1.5	3	6	8	60
	2040-070	2	4	6	8	70
	2050-080	2.5	5	6	10	80
	2060-090	3	6	6	12	90
	2080-100	4	8	8	14	100
	2100-100	5	10	10	18	100
	2120-110	6	12	12	22	110

M This is metric size. We can also provide in inch type

PRE4000 (Radius)





4 | H·A 30° | h5 shank | Substrate PC310U

ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025



(mm)

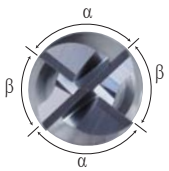
Designation		ØD	Ød	ℓ	L	r
PRE 4	4030-060-R01	3	6	8	60	0.1
	4030-060-R02	3	6	8	60	0.2
	4030-060-R03	3	6	8	60	0.3
	4030-060-R05	3	6	8	60	0.5
	4040-070-R01	4	6	10	70	0.1
	4040-070-R02	4	6	10	70	0.2
	4040-070-R03	4	6	10	70	0.3
	4040-070-R05	4	6	10	70	0.5
	4040-070-R10	4	6	10	70	1
	4060-090-R02	6	6	15	90	0.2
	4060-090-R03	6	6	15	90	0.3
	4060-090-R05	6	6	15	90	0.5
	4060-090-R10	6	6	15	90	1
	4080-100-R02	8	8	20	100	0.2
	4080-100-R03	8	8	20	100	0.3
	4080-100-R05	8	8	20	100	0.5
	4080-100-R10	8	8	20	100	1
	4100-100-R03	10	10	25	100	0.3
	4100-100-R05	10	10	25	100	0.5
	4100-100-R10	10	10	25	100	1
	4120-110-R03	12	12	30	110	0.3
	4120-110-R05	12	12	30	110	0.5
	4120-110-R10	12	12	30	110	1

M This is metric size. We can also provide in inch type

Improved productivity with effective machining due to less vibration

V Endmill

Variable Endmill





- Irregular helix angle
- Irregular indexing angle

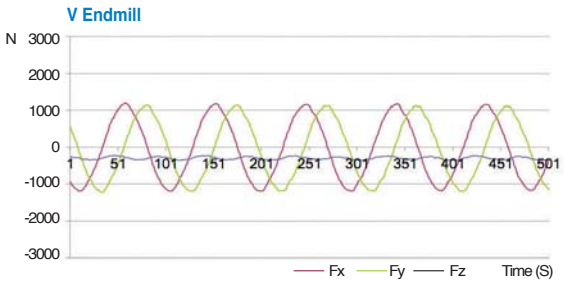
※ Irregular flute spacing = Decreased vibration

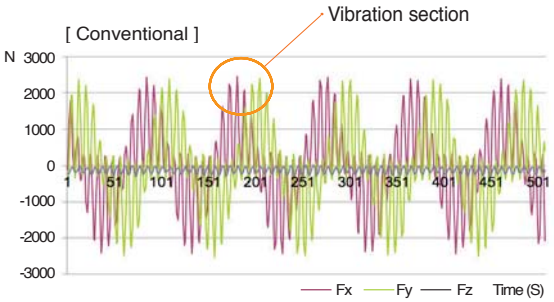
Features

- 30% increased cutting speed (vc) and feed rate (vf) to boost productivity
- High quality machining available thanks to minimized tool vibrations and excellent surface finish

Performance (Vibration test)

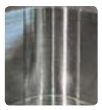
- **Workpiece** SCM440
- **Cutting condition** D = Ø8.0, n (m/min) = 3183, vc (m/min) = 80, vf (mm/min) = 713, fz (mm/t) = 0.055, ap (mm) = 8.0, ae (mm) = 8, Dry
- **Tools** V Endmill (VFE4080-060) Conventional endmill

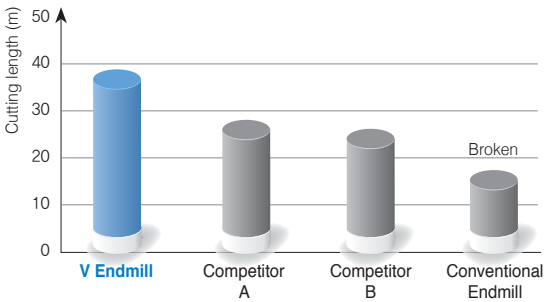




Performance (Surface finish)

- **Workpiece** STS304
- **Cutting condition** D = Ø8.0, n (min^{-1}) = 3979, vc (m/min) = 100, vf (mm/min) = 796, fz (mm/t) = 0.05, ap (mm) = 12, ae (mm) = 0.8, Dry
- **Tools** VFE4080-060

Edge			
Surface finish			
Division	V Endmill	Competitor A Irregular flute spacing Endmill	Competitor B Irregular flute spacing Endmill



Application examples

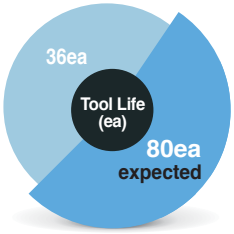
- **Workpiece** SNCM439 (HRC 43~45)
- **Cutting condition** D = Ø8.0, n (m/min) = 6000, vc (m/min) = 150, vf (mm/min) = 600, fz (mm/t) = 0.025, ap (mm) = 7, ae (mm) = 0.8, Wet (Water-soluble)
- **Tools** VFE4080-060



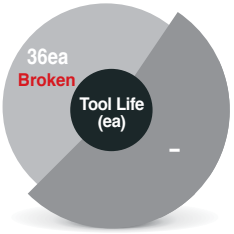
V Endmill



Conventional Endmill



V Endmill(VFE4080)



Conventional Endmill

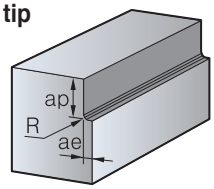
M This is metric size. We can also provide in inch type

Cutting condition

■ Shouldering

Diameter (ØD)	Alloy & Carbon steel, HRC25 or less (SM, SCM)				Mold steel, HRC35~45 (STS, KP4M)			
	R.P.M (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)	R.P.M (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)
2.5	15,915	1,241	3.8	0.7	12.732	891	0.3	0.3
3.0	13,263	1,241	4.5	0.8	10,610	891	0.3	0.3
3.5	11,368	1,241	5.3	0.9	9,095	891	0.4	0.4
4.0	9,947	1,241	6.0	1.1	7,958	891	0.4	0.4
5.0	7,958	1,241	7.5	1.4	6,366	891	0.5	0.5
6.0	6,631	1,241	9.0	1.6	5,305	891	0.6	0.6
7.0	5,684	1,241	10.5	1.9	4,547	891	0.7	0.7
8.0	4,974	1,194	12.0	2.2	3,979	891	0.8	0.8
9.0	4,421	1,194	13.5	2.4	3,537	891	0.9	0.9
10.0	3,979	1,194	15.0	2.7	3,183	891	1.0	1.0
12.0	3,316	1,194	18.0	3.2	2,653	891	1.2	1.2
14.0	2,842	1,194	21.0	3.8	2,274	891	1.4	1.4
16.0	2,487	1,194	24.0	4.3	1,989	891	1.6	1.6

Application tip



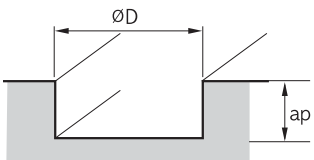
※ Cutting condition by overhang

1. Standard overhang: Follow cutting condition above
2. Long overhang: When the overhang is increased by 10mm, decrease feed 5% & ae 5%

■ Slotting

Diameter (ØD)	Alloy & Carbon steel, HRC25 or less (SM, SCM)			Mold steel, HRC35~45 (STS, KP4M)		
	R.P.M (min^{-1})	Feed (mm/min)	ap (mm)	R.P.M (min^{-1})	Feed (mm/min)	ap (mm)
2.5	15.915	1,035	2.8	12,732	700	2.5
3.0	13,263	1,035	3.3	10,610	700	3.0
3.5	11,268	1,035	3.9	9,095	700	3.5
4.0	9,947	1,035	4.4	7,958	700	4.0
5.0	7,958	1,035	5.5	6,366	700	5.0
6.0	6,631	1,035	6.6	5,305	700	6.0
7.0	5,687	1,035	7.7	4,549	700	7.0
8.0	4,974	1,035	8.8	3,979	700	8.0
9.0	4,421	1,035	9.9	3,537	700	9.0
10.0	3,979	1,035	11.0	3,183	700	10.0
12.0	3,316	1,035	13.2	2,653	700	12.0
14.0	2,842	1,035	15.4	2,274	700	14.0
16.0	2,487	1,035	17.6	1,989	700	16.0

Application tip



※ Cutting condition by overhang

1. Standard overhang: Follow cutting condition above
2. Long overhang: When the overhang is increased by 10mm, decrease feed 5% & ae 5%

M This is metric size. We can also provide in inch type

VFE4000 (Flat)



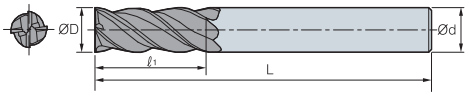


Fig. 1

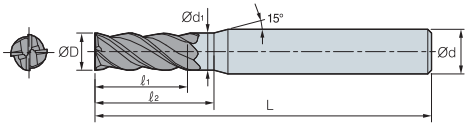


Fig. 2









ØD	Tolerance
Ø2.5~Ø9	0.00~ -0.02
Ø10~Ø16	0.00~ -0.03









(mm)

Designation		ØD	Ød	d1	ℓ1	ℓ2	L	Fig.
VFE	4025-045	2.5	6.0	2.48	6.0	8.0	45	2
4	4030-050	3.0	6.0	2.98	7.0	9.5	50	2
	4035-050	3.5	6.0	3.48	8.0	11.0	50	2
	4040-050	4.0	6.0	3.98	9.0	12.0	50	2
	4050-050	5.0	6.0	4.98	12.0	16.0	50	2
	4060-050	6.0	6.0	-	14.0	-	50	1
	4070-060	7.0	8.0	6.97	16.0	21.0	60	2
	4080-060	8.0	8.0	-	19.0	-	60	1
	4090-070	9.0	10.0	8.97	20.0	27.0	70	2
	4100-075	10.0	10.0	-	23.0	-	75	1
	4120-080	12.0	12.0	-	27.0	-	80	1
	4140-085	14.0	14.0	-	31.0	-	85	1
	4160-090	16.0	16.0	-	36.0	-	90	1

M This is metric size. We can also provide in inch type

Endmill for general cutting

Z Endmill new

- Endmill for general cutting of various workpieces under HRC45 (carbon steel, alloy steel, cast iron, pre-hardened steel, etc.)
- New shape and coating improves performance and tool life
- Optimized blade design for less chipping and stable machining

Features

- New grade (PC315E) - Fine substrate and lubricative coating guarantee excellent performance at high speed and high temperature
- Special edge treatment - Special cutting-edge design was applied for less chipping and longer tool life
- High accuracy with tolerance-h5 - High quality production system enables tolerance-h5 throughout the whole series

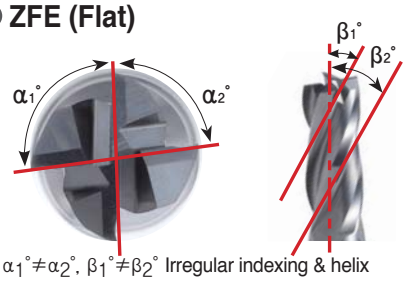


After special edge treatment



before

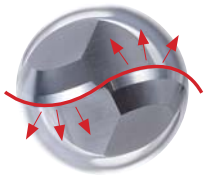
ZFE (Flat)



$\alpha_1^\circ \neq \alpha_2^\circ$, $\beta_1^\circ \neq \beta_2^\circ$ Irregular indexing & helix

- Irregular indexing & helix prevent chattering and improve surface

ZBE (Ball)



Cutting load is dispersed

S shape of ball

- The S shape of ball disperses cutting loads
- The tolerance of ball R is under ±0.005 mm

Application examples

- **Workpiece** Carbon steel [1045(AISI)/C45(DIN)/S45C(JIS), HRC20]
- **Cutting condition** D = Ø8.0, n (min^{-1}) = 7,165, vc (m/min) = 180, vf (mm/min) = 1.433, fz (mm/t) = 0.05, ap (mm) = 8, ae (mm) = 0.8, dry
- **Tools** ZFE4080-070

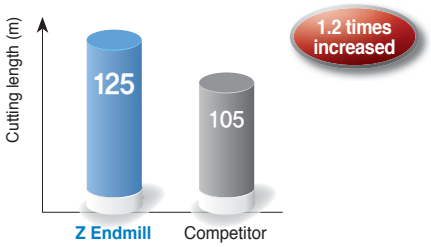


Z Endmill



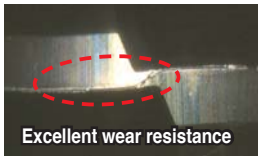
Competitor

■ Test result

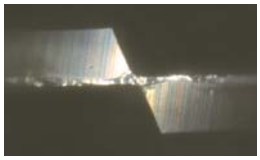


- Cutting edge treatment for less chipping

- **Workpiece** Carbon steel [1045(AISI)/C45(DIN)/S45C(JIS), HRC20]
- **Cutting condition** D = Ø8.0, n (min^{-1}) = 5,175, vc (m/min) = 130, vf (mm/min) = 1.035, fz (mm/t) = 0.1, ap (mm) = 0.5, ae (mm) = 1.6, dry
- **Tools** ZFE2080-100

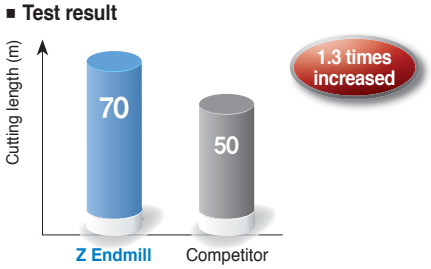


Z Endmill



Competitor

■ Test result



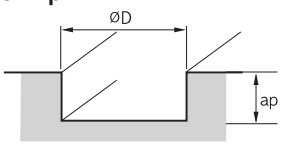
- New grade improves wear resistance

M This is metric size. We can also provide in inch type

Recommended cutting conditions (ZFE2000/ZSFE2000 flat)

Workpiece / Condition / Diameter (Ø)	Alloy steel & carbon steel (under HRC30)		Pre-hardened steel (HRC30~45)		Stainless steel	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
1	19,745	175	13,057	100	10,500	70
2	11,560	190	7,560	120	6,300	90
3	8,920	210	5,560	140	4,620	120
4	7,560	300	4,620	180	3,880	150
5	6,300	320	3,780	190	3,160	160
6	5,560	350	3,360	220	2,840	180
8	4,200	380	2,520	200	2,100	180
10	3,260	330	2,000	160	1,680	160
12	2,740	280	1,680	130	1,360	130
16	2,200	220	1,360	110	1,060	110

Application tip



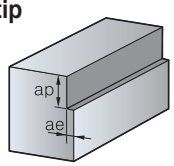
■ Slotting depth (ap)
- D ≤ Ø3 (ap = 0.2D)
- D > Ø3 (ap = 0.5D)

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Recommended cutting conditions (ZFE4000/ZSFE4000 flat)

Workpiece / Condition / Diameter (Ø)	Alloy steel & carbon steel (under HRC30)		Pre-hardened steel (HRC30~45)		Stainless steel	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
2	11,560	280	7,560	170	6,300	140
3	8,920	320	5,560	200	4,620	170
4	7,560	570	4,620	350	3,880	280
5	6,300	600	3,780	360	3,160	300
6	5,560	660	3,360	410	2,840	330
8	4,200	710	2,520	380	2,100	350
10	3,260	610	2,000	300	1,680	300
12	2,740	520	1,680	250	1,360	240
16	2,200	410	1,360	200	1,100	200

Application tip



■ Shouldering depth (ap) and radial depth (ae)
- ap = 1.0D
- ae = 0.05D

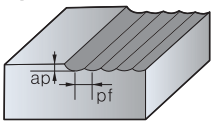
※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

M This is metric size. We can also provide in inch type

Recommended cutting conditions (ZBE2000 ball)

Workpiece / Condition / Diameter (Ø)	Alloy steel & carbon steel (under HRC30)		Pre-hardened steel (HRC30~45)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
1	30,000	2,880	30,000	2,520
1.2	30,000	3,060	28,800	2,580
1.5	30,000	3,240	28,800	2,700
2	29,820	3,420	28,680	2,880
3	19,860	3,600	19,080	3,180
4	14,940	3,600	14,340	3,180
5	11,160	3,480	10,680	2,940
6	8,340	2,910	8,040	2,460
8	6,660	2,520	6,420	2,100
10	5,580	2,220	5,340	1,860
12	4,170	1,770	4,008	1,500

Application tip

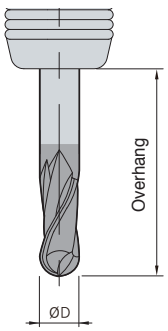


- ap = 0.03D
- pf = 0.05D

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Cutting condition by overhang

- Cutting conditions of the shank taper type in case of being clamped at neck
  - When the overhang is increased by 1D, decrease R.P.M and feed 10%
- In case of the straight type adjust conditions according to the overhang
  - ex: When the overhang is 3D and is increased by 1D, decrease R.P.M and feed 10%



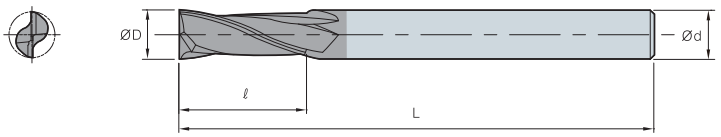
Notice

- Cutting conditions are up to the machine's condition and the shape of cutting
- Use cutting fluid that is proper to the workpiece and produces few temperature reactions

M This is metric size. We can also provide in inch type

ZFE2000 (Flat)







ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025



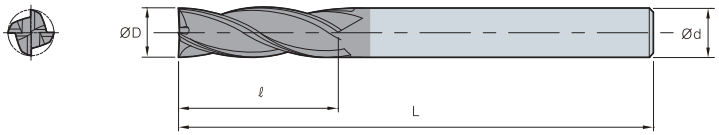
(mm)

Designation		ØD	Ød	ℓ	L
ZFE 2	2010-050-S4	1	4	2.5	50
	2010-050-S6	1	6	2.5	50
	2012-050-S4	1.2	4	3	50
	2012-050-S6	1.2	6	3	50
	2015-050-S4	1.5	4	4	50
	2015-050-S6	1.5	6	4	50
	2020-050-S4	2	4	6	50
	2020-050-S6	2	6	6	50
	2025-050-S4	2.5	4	7.5	50
	2025-050-S6	2.5	6	7.5	50
	2030-050-S4	3	4	9	50
	2030-050-S6	3	6	9	50
	2035-050	3.5	6	10	50
	2040-050-S4	4	4	11	50
	2040-050-S6	4	6	11	50
	2045-050	4.5	6	14	50
	2050-060	5	6	15	60
	2055-060	5.5	6	15	60
	2060-060	6	6	15	60
	2065-060	6.5	8	18	60
	2070-060	7	8	20	60
	2075-060	7.5	8	20	60
	2080-070	8	8	20	70
	2085-070	8.5	10	22	70
	2090-070	9	10	22	70
	2095-070	9.5	10	24	70
	2100-075	10	10	25	75
	2120-080	12	12	30	80
	2140-100	14	14	35	100
	2160-100	16	16	40	100

M This is metric size. We can also provide in inch type

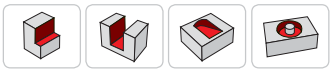
ZFE4000 (Flat)





4 | Multiple H·A | h5 shank | Substrate PC315E

ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025



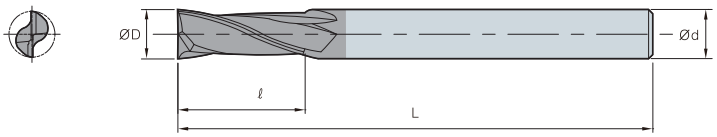
(mm)

Designation		ØD	Ød	ℓ	L
ZFE 4	4010-050-S4	1	4	2.5	50
	4010-050-S6	1	6	2.5	50
	4012-050-S4	1.2	4	3	50
	4012-050-S6	1.2	6	3	50
	4015-050-S4	1.5	4	4	50
	4015-050-S6	1.5	6	4	50
	4020-050-S4	2	4	6	50
	4020-050-S6	2	6	6	50
	4025-050-S4	2.5	4	7.5	50
	4025-050-S6	2.5	6	7.5	50
	4030-050-S4	3	4	9	50
	4030-050-S6	3	6	9	50
	4035-050	3.5	6	10	50
	4040-050-S4	4	4	11	50
	4040-050-S6	4	6	11	50
	4045-050	4.5	6	14	50
	4050-060	5	6	15	60
	4055-060	5.5	6	15	60
	4060-060	6	6	15	60
	4065-060	6.5	8	18	60
	4070-060	7	8	20	60
	4075-060	7.5	8	20	60
	4080-070	8	8	20	70
	4085-070	8.5	10	22	70
	4090-070	9	10	22	70
	4095-070	9.5	10	24	70
	4100-075	10	10	25	75
	4120-080	12	12	30	80
	4140-100	14	14	35	100
	4160-100	16	16	40	100

M This is metric size. We can also provide in inch type

ZSFE2000/4000 (Short flat)





2 | 4 | H A 35° | h5 shank | Substrate PC315E

ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025



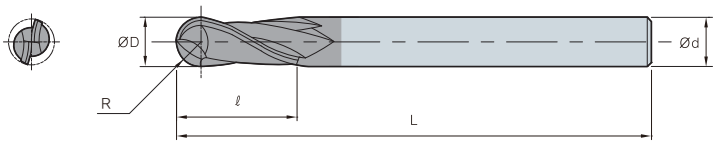
(mm)

Designation		ØD	Ød	ℓ	L
ZSFE 2	2010-040-S4	1	4	1.5	40
	2010-040-S6	1	6	1.5	40
	2012-040-S4	1.2	4	1.5	40
	2012-040-S6	1.2	6	1.5	40
	2015-040-S4	1.5	4	2.2	40
	2015-040-S6	1.5	6	2.2	40
	2020-040-S4	2	4	3	40
	2020-040-S6	2	6	3	40
	2025-040-S4	2.5	4	4	40
	2025-040-S6	2.5	6	4	40
	2030-045-S4	3	4	4.5	45
	2030-045-S6	3	6	4.5	45
	2040-045-S4	4	4	6	45
	2040-045-S6	4	6	6	45
	2060-050	6	6	9	50
	2080-060	8	8	12	60
	2100-065	10	10	15	65
	2120-070	12	12	18	70
ZSFE 4	4010-040-S4	1	4	1.5	40
	4010-040-S6	1	6	1.5	40
	4012-040-S4	1.2	4	1.5	40
	4012-040-S6	1.2	6	1.5	40
	4015-040-S4	1.5	4	2.2	40
	4015-040-S6	1.5	6	2.2	40
	4020-040-S4	2	4	3	40
	4020-040-S6	2	6	3	40
	4025-040-S4	2.5	4	4	40
	4025-040-S6	2.5	6	4	40
	4030-045-S4	3	4	4.5	45
	4030-045-S6	3	6	4.5	45
	4040-045-S4	4	4	6	45
	4040-045-S6	4	6	6	45
	4060-050	6	6	9	50
	4080-060	8	8	12	60
	4100-065	10	10	15	65
	4120-070	12	12	18	70

M This is metric size. We can also provide in inch type

ZBE2000 (Ball)







ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025



(mm)

Designation		R	ØD	Ød	ℓ	L
ZBE 2	2010-050-S4	0.5	1	4	2.5	50
	2010-050-S6	0.5	1	6	2.5	50
	2012-050-S4	0.6	1.2	4	3	50
	2012-050-S6	0.6	1.2	6	3	50
	2015-050-S4	0.75	1.5	4	4	50
	2015-050-S6	0.75	1.5	6	4	50
	2020-050-S4	1	2	4	5	50
	2020-050-S6	1	2	6	5	50
	2025-060-S4	1.25	2.5	4	6	60
	2025-060-S6	1.25	2.5	6	6	60
	2030-060-S4	1.5	3	4	8	60
	2030-060-S6	1.5	3	6	8	60
	2035-070	1.75	3.5	6	8	70
	2040-070-S4	2	4	4	8	70
	2040-070-S6	2	4	6	8	70
	2045-080	2.25	4.5	6	9	80
	2050-080	2.5	5	6	10	80
	2055-090	2.75	5.5	6	11	90
	2060-090	3	6	6	12	90
	2065-090	3.25	6.5	8	13	90
	2070-090	3.5	7	8	14	90
	2080-100	4	8	8	14	100
	2085-100	4.25	8.5	10	16	100
	2090-100	4.5	9	10	18	100
	2100-100	5	10	10	18	100
	2120-110	6	12	12	22	110

M This is metric size. We can also provide in inch type

High efficiency and high feed machining

F Endmill

Feed-up Endmill

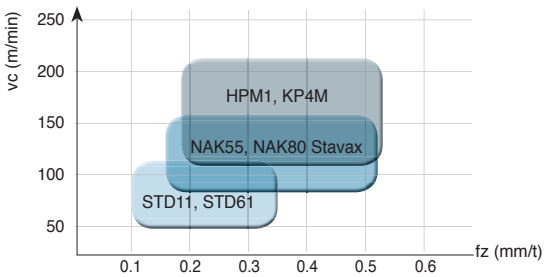
- Improved productivity and shortened working time thanks to high feed capability
- Reduced costs thanks to the highly efficient machining process

Feature



- Wider chip pocket area highly efficient operation
- High feed machining possible by dispersing cutting forces

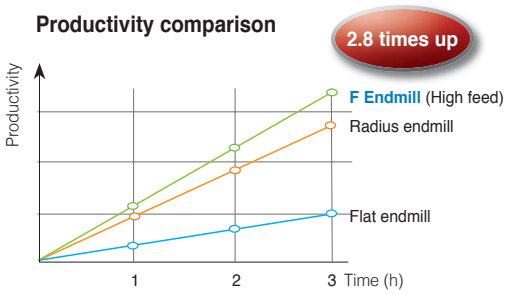
Application by workpiece



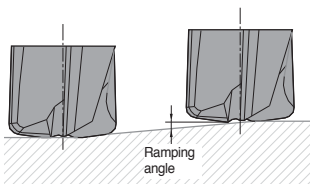
Productivity example

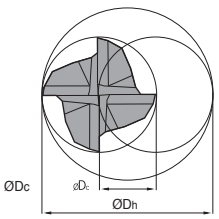
Type	Speed (vc)	Feed (fz)	D.O.C		Machining volume (mm^3/min)
			ap	ae	
F-Endmill (High feed)	180	**0.30**	0.5	5.0	**135,000**
Radius Endmill	200	0.09	1.0	5.0	90,000
Flat Endmill	120	0.05	8.0	0.2	48,000

Higher productivity by feed increase. 2.8 times

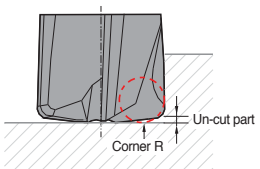


Programing information

Ramping	Ramping angle	Feed
	1°	100%
	2°	80%
	3°	60%
	4°	50%

Helical Ramping	Diameter (ØD)	Min. diameter	Max. diameter
	6	7.8	12
	8	10.2	16
	10	12.4	20
	12	14.9	24

∗ ØDc: Feed (Tool center) ∗ ØDh: Machining area

CAM Ramping	Diameter (ØD)	Endmill-R	CAM-Radius	Un-cut part
	6	0.5	0.7	0.21
	8	0.5	0.8	0.32
	10	1.0	1.3	0.36
	12	1.2	1.6	1.45

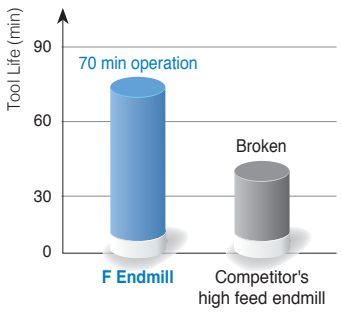
M This is metric size. We can also provide in inch type

Application examples

- **Workpiece** STD61+SKT (HRC45~50)
- **Cutting condition** D = Ø12, n (min^{-1}) = 4.000, vc (m/min) = 150.8, vf (mm/min) = 4.000, fz (mm/t) = 0.25, ap (mm) = 3.6, ae (mm) = 0.6, dry
- **Tools** FME4120-075-R12



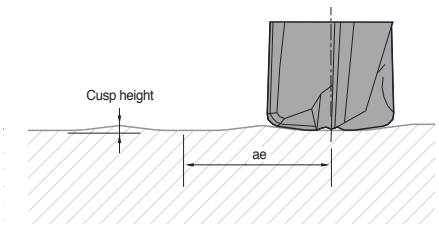
■ **Test result**



Cutting condition

■ Cusp height by radial depth of cut

Diameter (ØD)	Radial depth ae (mm)					
	0.1 x D	0.2 x D	0.3 x D	0.4 x D	0.5 x D	0.6 x D
6	0	0	0	0.02	0.06	0.11
8	0	0	0	0.04	0.10	0.15
10	0	0	0.01	0.07	0.14	0.21
12	0	0	0.01	0.08	0.17	0.25



■ Medium cut

Diameter (ØD)	Mold steel HRC35~45 (HPM1, KP4M)				Mold steel HRC45~55 (NAK55, NAK80, STAVAX)				Heat treated HRC55 (SKD11, STD61)			
	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)
6	11,600	11,200	0.24	1.6	9,000	7,570	0.21	1.6	5,800	3,500	0.18	1.6
8	8,700		0.32	2.2	6,700		0.28	2.2	4,300		0.24	2.2
10	7,000		0.40	2.7	5,400		0.35	2.7	3,500		0.30	2.7
12	5,800		0.48	3.3	4,500		0.42	3.3	2,900		0.36	3.3

■ Roughing cut

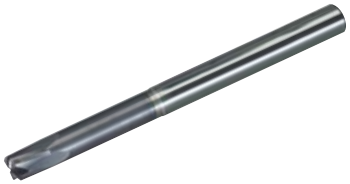
Diameter (ØD)	Mold steel HRC35~45 (HPM1, KP4M)				Mold steel HRC45~55 (NAK55, NAK80, STAVAX)				Heat treated HRC55 (SKD11, STD61)			
	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)
6	8,488	9,167	0.27	3.0	6,366	6,112	0.24	3.0	4,244	2,546	0.21	3.0
8	6,366		0.36	4.0	4,775		0.32	4.0	3,183		0.28	4.0
10	5,093		0.45	5.0	3,820		0.40	5.0	2,546		0.35	5.0
12	4,244		0.54	6.0	3,183		0.48	6.0	2,122		0.42	6.0

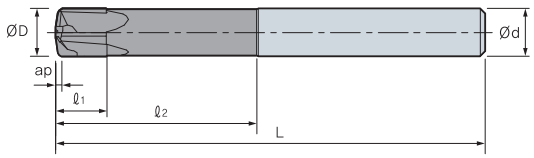
* Cutting condition by overhang

1. Standard overhang: Follow cutting conditions above
2. Long type: Apply 80% feed & 80% ae
3. Long overhang: When the overhang is increased by 10mm, decrease feed 5% & ae 5%

M This is metric size. We can also provide in inch type

FME4000 (Standard)












ØD	Tolerance
Ø6~Ø12	-0.01~ -0.03

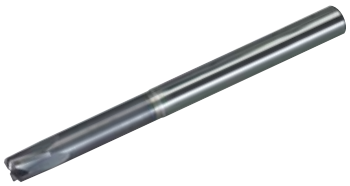


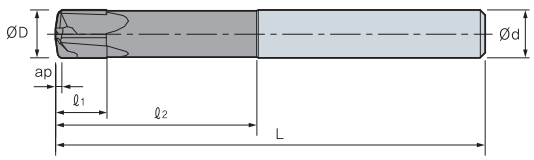
(mm)

Designation		R	ØD	Ød	ℓ1	ℓ2	L	Max. ap (mm)	CAM-Radius
FME	4060-050-R05	0.5	6	6	4.5	18	50	0.35	0.7
4	4080-060-R05	0.5	8	8	6	24	60	0.45	0.8
	4100-070-R10	1.0	10	10	7.5	30	70	0.65	1.3
	4120-075-R12	1.2	12	12	9	36	75	0.78	1.6

M This is metric size. We can also provide in inch type

FMLE4000 (Long)












ØD	Tolerance
Ø6~Ø12	-0.01~ -0.03



(mm)

Designation		R	ØD	Ød	ℓ1	ℓ2	L	Max. ap (mm)	CAM-Radius
FMLE	4060-090-R05	0.5	6	6	4.5	30	90	0.35	0.7
4	4080-090-R05	0.5	8	8	6	40	90	0.45	0.8
	4100-100-R10	1.0	10	10	7.5	50	100	0.65	1.3
	4120-110-R12	1.2	12	12	9	60	110	0.78	1.6

M This is metric size. We can also provide in inch type

Endmill for machining dental prostheses

T Endmill new

- For machining dental prostheses made of zirconia, titanium, Co-Cr, wax, PMMA, etc
- Optimized cutting performance by matching a proper grade with each type of materials
- Inhibited unevenness and excellent finish in machined surfaces due to the optimized cutting-edge design
- Specialized tool shape for each machine type

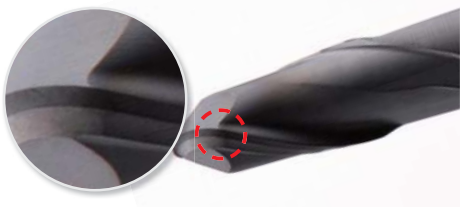
Code system

T Z E 2 030 - 050 - N100 S04 (Z-MATCH)

- **T Endmill**
- **Workpiece**
  - Z: Zirconia
  - T: Ti/Co-Cr
  - W: Wax/PMMA
- **Type**
  - BE: Ball Endmill
  - FE: Flat Endmill
  - RE: Radius Endmill
- **No. of flutes**
  - 2: 2 Flute
- **Drill dia.**
  - 030: 3 mm
- **Overall length**
  - 050: 50 mm
- **Neck length**
  - N100: 10 mm
- **Shank dia.**
  - S04: 4 mm
- **Machine Maker**

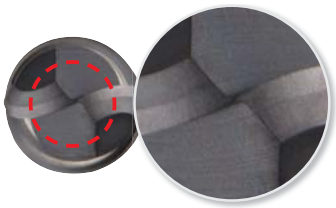
Features

- A dedicated tool for each machine - Meets marketplace demands
- A specialized grade for each workpiece - Provides optimized performance for various materials of implants
- Optimized cutting-edge design - Enables excellent machinability



Tangential cutting-edge shape

- One-Pass Grinding applied
- Inhibited unevenness and excellent finish in machined surfaces



Center-Matched ball shape

- High Center-Matched shape ensures relief angle at the ball point
- Cutting edges of the ball point shape provide excellent wear resistance and cutting performance

Grade solution for zirconia

·Development of ND3000 (Diamond-coated grade)

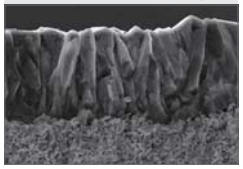
- High hardness diamond coating that is excellent in machining graphite and ceramic
- Optimized for high speed and medium duty cutting thanks to its excellent grip to coated layers

Surface of ND3000



High hardness diamond coating (Hv 10,000) provides excellent wear resistance

Cross section of coated layers

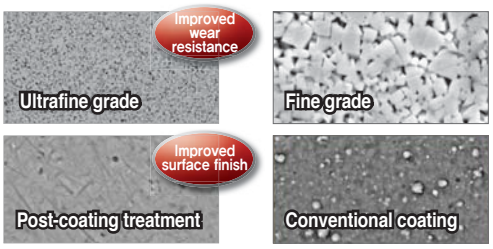


Specialized grade for Zirconia provides excellent adhesion

Grade solution for titanium

·Development of PC2510 (Coated grade for high hardened steel)

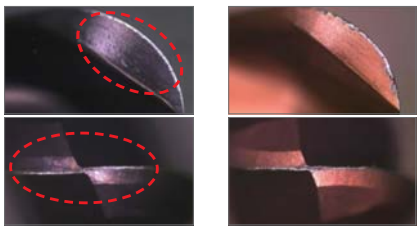
- Post-coating treatment was applied to improve surface finish
- A grade optimized for interrupted machining of high hardness steels and wet treatment accompanying high thermal shock. Its ultrafine substrate features high toughness which allows stable performance



M This is metric size. We can also provide in inch type

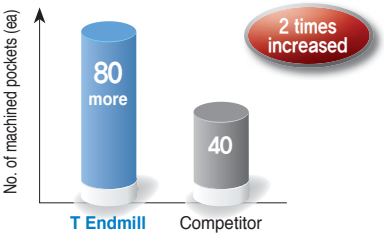
Performance evaluation

- **Workpiece** Co-Cr
- **Cutting conditions** vc (m/min) = 150, Use
  fz (mm/t) = 0.08
  ap (mm) = 0.13
  ae (mm) = 0.7, wet
- **Tools** TTBE2030-050



T Endmill Competitor

■ Test result



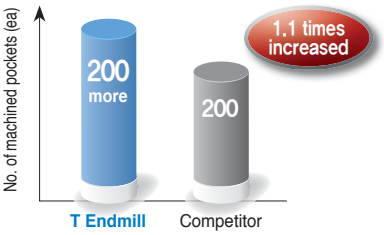
Excellent resistance to toughness and wear thanks to the new grade PC2510

Application examples

- **Use** Implant crowns
- **Workpiece** Zirconia
- **Cutting conditions** vc (m/min) = 140
  fz (mm/t) = 0.05
  ae (mm) = 0.6, dry
- **Tools** TZBE2020-044-N200S03 (DOF)



■ Test result



Recommended cutting conditions (Titanium & Co-Cr)

Diameter (Ø)	Application	ap (mm)	ae (mm)	n (min^{-1})	vf (mm/min)
3.0	Roughing	0.12	0.7	10,500	1,150
2.5	Medium	0.08	0.53	11,500	850
2.0	Medium	0.08	0.42	14,500	850
1.5	Finishing	0.04	0.32	19,000	850
1.0	Finishing	0.02	0.07	28,500	850
0.6	Finishing	0.02	0.07	28,500	850

Recommended cutting conditions for zirconia

Diameter (Ø)	Application	ap (mm)	ae (mm)	n (min^{-1})	vf (mm/min)
3.0	Roughing	0.5	1.5	23,500	1,600
2.5	Medium	0.3	1.25	28,000	1,200
2.0	Finishing	0.3	1.0	35,000	1,200
1.0	Finishing	0.1	0.2	38,500	1,050
0.6	Finishing	0.1	0.2	63,500	630

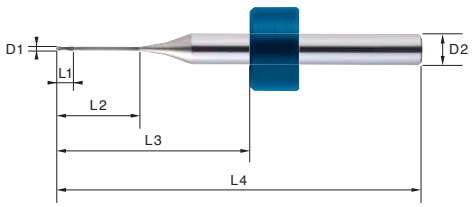
M This is metric size. We can also provide in inch type

Special T Endmill order form

• Stop rings and other tool resources can be made to order

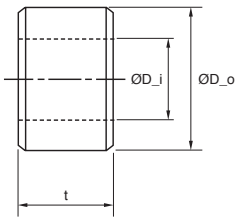
[Data sheet]

Type of machine	
Workpiece	
Dental material	
Cutting diameter (D1)	
Shank diameter (D2)	
Cutting length (L1)	
Neck length (L2)	
Stop ring position (L3)	
Overall length (L4)	
Stop ring shape	

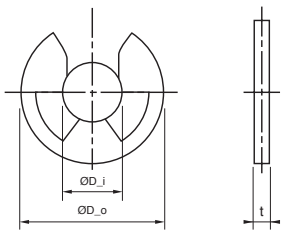


※ Should you make a special order, please complete this form and send it to an adjacent KORLOY sales office

[Stop ring specification]



< Plastic ring >



< E type ring >

(mm)

Type	Stop ring			Shank diameter		
	ØD_o	ØD_i	t	Ø3	Ø4	Ø6
Plastic ring	Ø7.55	Ø3	4.45	●		
	Ø7.7	Ø4	5.0		●	
	Ø10.5	Ø6	6.5			●
E type ring	Ø6.0	Ø2.5	0.4	●		

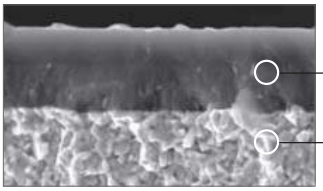
※ Stop ring can be made to order when specified sizes are send to an adjacent KORLOY sales office

M This is metric size. We can also provide in inch type

Stable performance guaranteed for workpiece workpieces under HRC45

I+ Endmill

- Tough substrate & wear-resisting coating technology applied
- Wide application range in general use
  - Stable performance guaranteed for workpiece which is under 45 HRC
- Saving cost by higher productivity

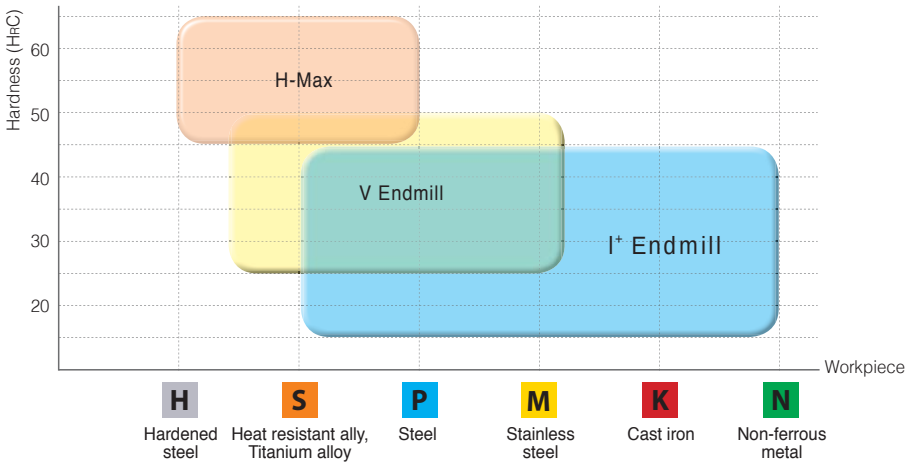


PC320

Product line-up

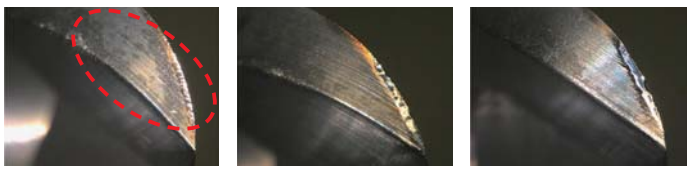
- IPBE: I Plus Ball Endmill (Ø1~Ø20)
- IPFE: I Plus Flat Endmill (Ø1~Ø20)
- IPRE: I Plus Radius Endmill (Ø1~Ø12)

Application area



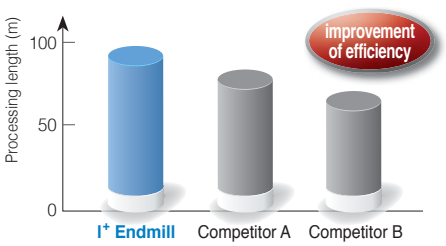
Performance evaluation

- **Workpiece** SM45C
- **Cutting conditions** Diameter = Ø8.0, n (min^{-1}) = 5.173, vc (m/min) = 130.0, vf (mm/min) = 1.034, fz (mm/t) = 0.1, ap (mm) = 0.5, ae (mm) = 1.6, dry
- **Tools** IPBE2080-060



I+ Endmill | Competitor A | Competitor B

Test result



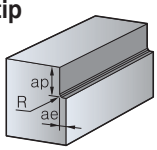
M This is metric size. We can also provide in inch type

Recommended cutting condition (flat)

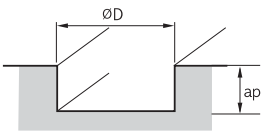
■ IPFE2000

Diameter (ØD)	Carbon steel, Alloy steel~HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre-hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
1.0	30,000	600	480	20,000	400	320	12,600	300	180
1.5	20,000	600	480	14,000	400	320	8,400	300	180
2.0	15,000	600	480	10,000	400	400	6,300	300	180
2.5	12,000	600	480	8,200	400	320	5,100	300	180
3.0	10,000	600	480	7,000	400	320	4,200	300	180
4.0	7,500	600	480	5,200	400	320	3,100	300	180
5.0	6,000	600	480	4,200	400	320	2,500	300	180
6.0	5,000	600	480	3,500	400	320	2,100	300	180
8.0	4,000	520	410	2,800	350	280	1,600	260	150
10.0	3,200	450	360	2,200	300	240	1,300	230	130
12.0	2,700	410	320	1,900	270	210	1,100	210	120
16.0	2,000	240	190	1,400	210	160	840	160	100
20.0	1,600	200	160	1,100	170	130	680	140	80

Application tip



■ **Shouldering depth (ap) and radial depth (ae)**
- ap: ≤ 1.5 (All dia.)
- ae: ≤ 0.1D (D ≤ Ø3)
  ≤ 0.2D (D > Ø3)

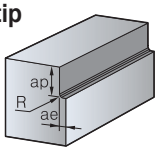


■ **Slotting depth (ap)**
- ap: ≤ 0.1D (D ≤ Ø2)
  ≤ 0.2D (D > Ø2)

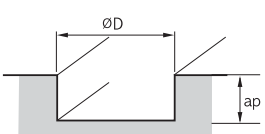
■ IPFE4000

Diameter (ØD)	Carbon steel, Alloy steel ~HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre-hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
1.0	30,000	900	720	20,000	600	480	12,600	450	270
1.5	20,000	900	720	14,000	600	480	8,400	450	270
2.0	15,000	900	720	10,000	600	480	6,300	450	270
2.5	12,000	900	720	8,200	600	480	5,100	450	270
3.0	10,000	900	720	7,000	600	480	4,200	450	270
4.0	7,500	900	720	5,200	600	480	3,100	450	270
5.0	6,000	900	720	4,200	600	480	2,500	450	270
6.0	5,000	900	720	3,500	600	480	2,100	450	270
8.0	4,000	780	620	2,800	520	410	1,600	390	230
10.0	3,200	680	540	2,200	450	360	1,300	340	200
12.0	2,700	620	490	1,900	410	320	1,100	310	180
16.0	2,000	360	280	1,400	310	240	840	240	140
20.0	1,600	300	240	1,100	250	200	680	210	120

Application tip



■ **Shouldering depth (ap) and radial depth (ae)**
- ap: ≤ 1.5 (All dia.)
- ae: ≤ 0.1D (D ≤ Ø3)
  ≤ 0.2D (D > Ø3)



■ **Slotting depth (ap)**
- ap: ≤ 0.1D (D ≤ Ø2)
  ≤ 0.2D (D > Ø2)

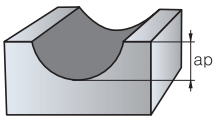
M This is metric size. We can also provide in inch type

Recommended cutting condition (ball)

■ IPBE2000

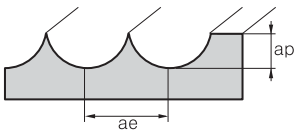
Diameter (ØD)	Carbon steel (SM50C)		Alloy steel (SCM, STD, STS, KP4M, NAK)		Mold steel~HRC45 (STD61)		Non-ferrous metal (Aluminum)	
	R.P.M (min^{-1})	Feed (mm/min)	R.P.M (min^{-1})	Feed (mm/min)	R.P.M (min^{-1})	Feed (mm/min)	R.P.M (min^{-1})	Feed (mm/min)
1.0	40,000	1,200	38,000	1,200	29,000	900	40,000	1,000
1.5	30,000	1,270	25,500	1,100	19,000	700	40,000	1,360
2.0	24,000	1,160	19,000	800	14,300	600	40,000	2,000
2.5	19,000	1,000	15,300	670	11,500	510	38,000	2,400
3.0	16,000	930	13,000	600	9,600	460	32,000	2,400
3.5	13,700	930	11,400	580	8,200	450	27,300	2,400
4.0	12,000	930	10,000	570	7,200	450	24,000	2,400
5.0	9,600	930	8,000	560	5,700	450	19,000	2,400
6.0	8,000	930	6,400	540	4,800	450	16,000	2,400
8.0	6,000	900	4,800	540	3,600	450	12,000	2,400
10.0	4,800	900	3,800	540	2,900	450	9,600	2,300
12.0	4,000	900	3,200	540	2,400	450	8,000	2,100
14.0	3,400	900	2,750	540	2,050	450	6,800	2,000
16.0	3,000	900	2,400	540	1,800	450	6,000	2,000
20.0	2,400	900	1,900	520	1,450	450	4,800	2,000

Application tip



■ Slotting depth (ap)

• ap: 0.1×R (~45HRC)
0.08 ×R (~50HRC)



(R0.1~0.5 = 0.2×R)
0.3×R

■ Shouldering depth (ap) and radial depth (ae)

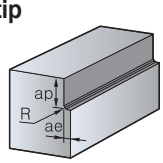
~0.16×R R ≦ 0.3 (~45HRC)
~0.25×R R ≦ 3 (~45HRC)
~0.17×R R ≦ 4 (~45HRC)
~0.05×R (~50HRC)

Recommended cutting condition (Radius)

■ IPRE2000

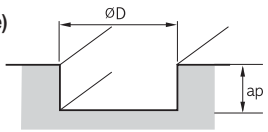
Diameter (ØD)	Carbon steel, Alloy steel~HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre-hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
2.0	11,000	180	180	7,200	110	110	6,000	90	90
3.0	8,500	200	160	5,300	130	100	4,400	110	66
4.0	7,200	360	290	4,400	220	180	3,000	180	110
5.0	6,000	380	300	3,600	230	180	2,400	190	110
6.0	5,300	420	340	3,200	240	190	2,200	210	130
8.0	4,000	450	360	2,400	240	190	1,600	220	130
10.0	3,200	390	310	1,900	190	150	1,300	190	110
12.0	2,700	330	260	1,600	160	130	1,000	150	90

Application tip



■ Shouldering depth (ap) and radial depth (ae)

• ap: ≤ 1.5D
• ap: ≤ 0.1D



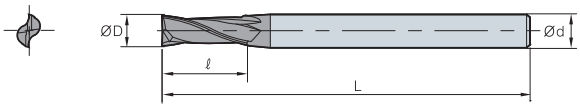
■ Slotting depth (ap)

• ap: ≤ 0.3D

M This is metric size. We can also provide in inch type

IPFE2000 (Flat)





2 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03



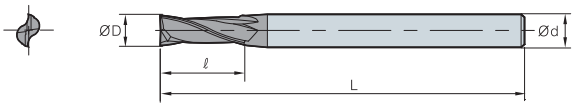
(mm)

Designation		ØD	Ød	ℓ	L
IPFE 2	2010-050-S3	1	3	3	50
	2010-050-S4	1	4	3	50
	2010-050	1	6	3	50
	2015-050-S3	1.5	3	4	50
	2015-050-S4	1.5	4	4	50
	2015-050	1.5	6	4	50
	2020-050-S3	2	3	6	50
	2020-050-S4	2	4	6	50
	2020-050	2	6	6	50
	2025-050-S3	2.5	3	8	50
	2025-050-S4	2.5	4	8	50
	2025-050	2.5	6	8	50
	2030-050-S3	3	3	8	50
	2030-050-S4	3	4	8	50
	2030-050	3	6	8	50
	2035-050-S4	3.5	4	10	50
	2035-050	3.5	6	10	50
	2040-050-S4	4	4	11	50
	2040-050	4	6	11	50
	2045-050	4.5	6	13	50
	2050-050	5	6	13	50
	2055-050	5.5	6	13	50
	2060-050	6	6	16	50
	2065-060	6.5	8	16	60
	2070-060	7	8	16	60
	2075-060	7.5	8	19	60
	2080-060	8	8	20	60
	2085-075	8.5	10	20	75
	2090-075	9	10	20	75
	2095-075	9.5	10	25	75
	2100-075	10	10	25	75
	2105-075	10.5	12	25	75
	2110-075	11	12	30	75
	2115-075	11.5	12	30	75
	2120-075	12	12	32	75
	2140-100	14	16	40	100
	2160-100	16	16	40	100
	2180-100	18	20	45	100
	2200-100	20	20	45	100

M This is metric size. We can also provide in inch type

IPLFE2000 (Long flat)













ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03



Long shank type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 2	2060-075	6	6	16	75
	2060-100	6	6	16	100
	2080-075	8	8	20	75
	2080-100	8	8	20	100
	2100-100	10	10	25	100
	2100-150	10	10	25	150
	2120-100	12	12	32	100
	2120-150	12	12	32	150

M This is metric size. We can also provide in inch type

Long flute type

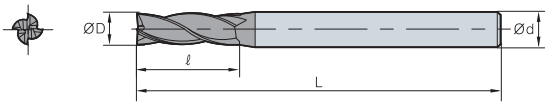
(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 2	2010-050-V7S4	1	4	7	50
	2015-050-V9S4	1.5	4	9	50
	2020-050-V12S4	2	4	12	50
	2025-050-V12S4	2.5	4	12	50
	2030-060-V15S6	3	6	15	60
	2035-060-V15S6	3.5	6	15	60
	2040-075-V20S6	4	6	20	75
	2045-075-V20S6	4.5	6	20	75
	2050-075-V25S6	5	6	25	75
	2055-075-V25S6	5.5	6	25	75
	2060-075-V30S6	6	6	30	75
	2070-100-V30S8	7	8	30	100
	2080-100-V40S8	8	8	40	100
	2090-100-V40S10	9	10	40	100
	2100-100-V40S10	10	10	40	100
	2110-100-V40S12	11	12	40	100
	2120-100-V50S12	12	12	50	100
	2140-150-V50S16	14	16	50	150
	2160-150-V60S16	16	16	60	150
	2200-200-V90S20	20	20	90	200

M This is metric size. We can also provide in inch type

IPFE4000 (Flat)





4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03



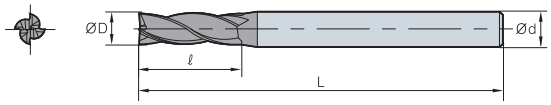
(mm)

Designation		ØD	Ød	ℓ	L
IPFE 4	4010-050-S3	1	3	3	50
	4010-050-S4	1	4	3	50
	4010-050	1	6	3	50
	4015-050-S3	1.5	3	4	50
	4015-050-S4	1.5	4	4	50
	4015-050	1.5	6	4	50
	4020-050-S3	2	3	6	50
	4020-050-S4	2	4	6	50
	4020-050	2	6	6	50
	4025-050-S3	2.5	3	8	50
	4025-050-S4	2.5	4	8	50
	4025-050	2.5	6	8	50
	4030-050-S3	3	3	8	50
	4030-050-S4	3	4	8	50
	4030-050	3	6	8	50
	4035-050-S4	3.5	4	10	50
	4035-050	3.5	6	10	50
	4040-050-S4	4	4	11	50
	4040-050	4	6	11	50
	4045-050	4.5	6	13	50
	4050-050	5	6	13	50
	4055-050	5.5	6	13	50
	4060-050	6	6	16	50
	4065-060	6.5	8	16	60
	4070-060	7	8	16	60
	4075-060	7.5	8	19	60
	4080-060	8	8	20	60
	4085-075	8.5	10	20	75
	4090-075	9	10	20	75
	4095-075	9.5	10	25	75
	4100-075	10	10	30	75
	4105-075	10.5	12	30	75
	4110-075	11	12	30	75
	4115-075	11.5	12	30	75
	4120-075	12	12	32	75
	4140-100	14	16	40	100
	4160-100	16	16	40	100
	4180-100	18	20	45	100
	4200-100	20	20	45	100

M This is metric size. We can also provide in inch type

IPLFE4000 (Long flat)





4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03



Long shank type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 4	4060-075	6	6	16	75
	4060-100	6	6	16	100
	4080-075	8	8	20	75
	4080-100	8	8	20	100
	4100-100	10	10	30	100
	4100-150	10	10	30	150
	4120-100	12	12	32	100
	4120-150	12	12	32	150

Long flute type

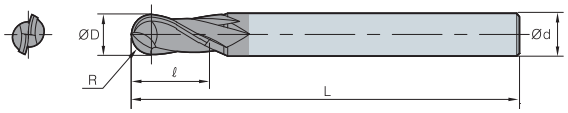
(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 4	4010-050-V6S4	1	4	6	50
	4015-050-V9S4	1.5	4	9	50
	4020-050-V12S4	2	4	12	50
	4025-050-V12S4	2.5	4	12	50
	4030-060-V15S6	3	6	15	60
	4035-060-V15S6	3.5	6	15	60
	4040-075-V20S6	4	6	20	75
	4045-075-V20S6	4.5	6	20	75
	4050-075-V25S6	5	6	25	75
	4055-075-V25S6	5.5	6	25	75
	4060-075-V30S6	6	6	30	75
	4070-100-V30S8	7	8	30	100
	4080-100-V40S8	8	8	40	100
	4090-100-V40S10	9	10	40	100
	4100-100-V40S10	10	10	40	100
	4110-100-V40S12	11	12	40	100
	4120-100-V50S12	12	12	50	100
	4140-150-V50S16	14	16	50	150
	4160-150-V60S16	16	16	60	150
	4200-200-V90S20	20	20	90	200

M This is metric size. We can also provide in inch type

IPBE2000 (Ball)





2 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03



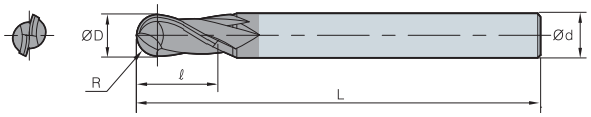
(mm)

Designation		R	ØD	Ød	ℓ	L
IPBE 2	2010-050-S3	0.5	1	3	2	50
	2010-050-S4	0.5	1	4	2	50
	2010-050	0.5	1	6	2	50
	2015-050-S3	0.75	1.5	3	3	50
	2015-050-S4	0.75	1.5	4	3	50
	2015-050	0.75	1.5	6	3	50
	2020-050-S3	1	2	3	4	50
	2020-050-S4	1	2	4	4	50
	2020-050	1	2	6	4	50
	2025-050-S3	1.25	2.5	3	5	50
	2025-050-S4	1.25	2.5	4	5	50
	2025-050	1.25	2.5	6	5	50
	2030-050-S3	1.5	3	3	6	50
	2030-050-S4	1.5	3	4	6	50
	2030-050	1.5	3	6	6	50
	2035-050-S4	1.75	3.5	4	7	50
	2035-050	1.75	3.5	6	7	50
	2040-050-S4	2	4	4	8	50
	2040-050	2	4	6	8	50
	2045-050	2.25	4.5	6	9	50
	2050-050	2.5	5	6	10	50
	2060-050	3	6	6	12	50
	2070-060	3.5	7	8	14	60
	2080-060	4	8	8	16	60
	2090-075	4.5	9	10	18	75
	2100-075	5	10	10	20	75
	2120-075	6	12	12	24	75
	2140-100	7	14	16	28	100
	2160-100	8	16	16	32	100
	2180-100	9	18	20	36	100
	2200-100	10	20	20	40	100

M This is metric size. We can also provide in inch type

IPLBE2000 (Long ball)







ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø16	0.00~ -0.03



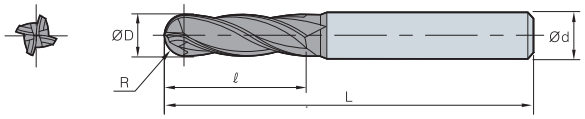
(mm)

Designation		R	ØD	Ød	ℓ	L
IPLBE 2	2010-075	0.5	1	6	2	75
	2010-100	0.5	1	6	2	100
	2015-075	0.75	1.5	6	3	75
	2015-100	0.75	1.5	6	3	100
	2020-075	1	2	6	4	75
	2020-100	1	2	6	4	100
	2025-075	1.25	2.5	6	5	75
	2025-100	1.25	2.5	6	5	100
	2030-075	1.5	3	6	6	75
	2030-100	1.5	3	6	6	100
	2035-100	1.75	3.5	6	7	100
	2040-075	2	4	6	8	75
	2040-100	2	4	6	8	100
	2050-075	2.5	5	6	10	75
	2050-100	2.5	5	6	10	100
	2060-075	3	6	6	12	75
	2060-100	3	6	6	12	100
	2060-150	3	6	6	12	150
	2080-075	4	8	8	16	75
	2080-100	4	8	8	16	100
	2080-150	4	8	8	16	150
	2100-100	5	10	10	20	100
	2100-150	5	10	10	20	150
	2100-200	5	10	10	20	200
	2120-100	6	12	12	24	100
	2120-150	6	12	12	24	150
	2120-200	6	12	12	24	200
	2160-150	8	16	16	32	150
	2160-200	8	16	16	32	200

M This is metric size. We can also provide in inch type

IPBE4000 (Ball)







ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03



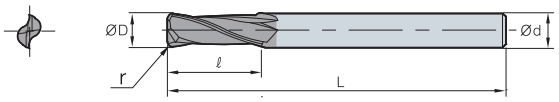
(mm)

Designation		R	ØD	Ød	ℓ	L
IPBE 4	4010-050-S4	0.5	1	4	2	50
	4010-050	0.5	1	6	2	50
	4015-050-S4	0.75	1.5	4	3	50
	4015-050	0.75	1.5	6	3	50
	4020-050-S4	1	2	4	4	50
	4020-050	1	2	6	4	50
	4025-050-S4	1.25	2.5	4	5	50
	4025-050	1.25	2.5	6	5	50
	4030-050-S3	1.5	3	3	6	50
	4030-050-S4	1.5	3	4	6	50
	4030-050	1.5	3	6	6	50
	4035-050-S4	1.75	3.5	4	7	50
	4035-050	1.75	3.5	6	7	50
	4040-050-S4	2	4	4	8	50
	4040-050	2	4	6	8	50
	4045-050	2.25	4.5	6	9	50
	4050-050	2.5	5	6	10	50
	4060-050	3	6	6	12	50
	4070-060	3.5	7	8	14	60
	4080-060	4	8	8	16	60
	4090-075	4.5	9	10	18	75
	4100-075	5	10	10	20	75
	4120-075	6	12	12	24	75
	4140-100	7	14	16	28	100
	4160-100	8	16	16	32	100
	4180-100	9	18	20	36	100
	4200-100	10	20	20	40	100

M This is metric size. We can also provide in inch type

IPRE2000 (Radius)












ØD	Tolerance
Ø1~Ø12	0.00~ -0.02



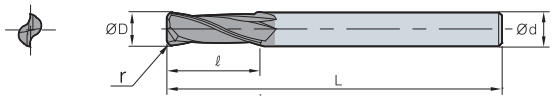
(mm)

Designation		ØD	Ød	ℓ	L	r
IPRE	2010-050-R01	1	4	3	50	0.1
	2010-050-R02	1	4	3	50	0.2
	2010-050-R03	1	4	3	50	0.3
	2015-050-R02	1.5	4	4	50	0.2
	2015-050-R03	1.5	4	4	50	0.3
	2020-050-R02	2	4	6	50	0.2
	2020-050-R03	2	4	6	50	0.3
	2020-050-R05	2	4	6	50	0.5
	2025-050-R02	2.5	4	8	50	0.2
	2030-050-R02-S3	3	3	8	50	0.2
	2030-050-R03-S3	3	3	8	50	0.3
	2030-050-R05-S3	3	3	8	50	0.5
	2030-050-R10-S3	3	3	8	50	1
	2030-050-R02	3	4	8	50	0.2
	2030-050-R03	3	4	8	50	0.3
	2030-050-R05	3	4	8	50	0.5
	2030-050-R10	3	4	8	50	1
	2040-050-R02	4	4	10	50	0.2
	2040-050-R03	4	4	10	50	0.3
	2040-050-R05	4	4	10	50	0.5
	2040-050-R10	4	4	10	50	1
	2040-050-R15	4	4	10	50	1.5
	2050-050-R02	5	6	13	50	0.2
	2050-050-R03	5	6	13	50	0.3
	2050-050-R05	5	6	13	50	0.5
	2050-050-R10	5	6	13	50	1
	2060-050-R02	6	6	15	50	0.2
	2060-050-R03	6	6	15	50	0.3
	2060-050-R05	6	6	15	50	0.5
	2060-050-R10	6	6	15	50	1
	2060-050-R15	6	6	15	50	1.5
	2060-050-R20	6	6	15	50	2

M This is metric size. We can also provide in inch type

IPRE2000 (Radius)





2 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02



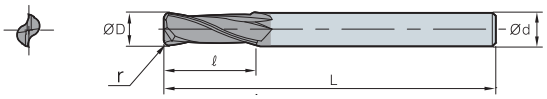
(mm)

Designation		ØD	Ød	ℓ	L	r
IPRE 2	2080-060-R03	8	8	20	60	0.3
	2080-060-R05	8	8	20	60	0.5
	2080-060-R10	8	8	20	60	1
	2080-060-R15	8	8	20	60	1.5
	2080-060-R20	8	8	20	60	2
	2080-060-R25	8	8	20	60	2.5
	2080-060-R30	8	8	20	60	3
	2100-075-R03	10	10	25	75	0.3
	2100-075-R05	10	10	25	75	0.5
	2100-075-R10	10	10	25	75	1
	2100-075-R15	10	10	25	75	1.5
	2100-075-R20	10	10	25	75	2
	2100-075-R25	10	10	25	75	2.5
	2100-075-R30	10	10	25	75	3
	2120-075-R03	12	12	30	75	0.3
	2120-075-R05	12	12	30	75	0.5
	2120-075-R10	12	12	30	75	1
	2120-075-R15	12	12	30	75	1.5
	2120-075-R20	12	12	30	75	2
	2120-075-R25	12	12	30	75	2.5
	2120-075-R30	12	12	30	75	3

M This is metric size. We can also provide in inch type

IPLRE2000 (Long radius)













ØD	Tolerance
Ø3~Ø12	0.00~ -0.02



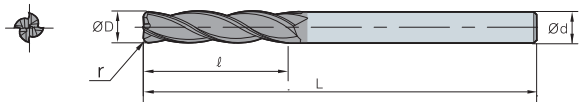
(mm)

Designation		ØD	Ød	ℓ	L	r
IPLRE	2030-075-R03	3	3	8	75	0.3
2	2030-075-R05	3	3	8	75	0.5
	2030-075-R10	3	3	8	75	1
	2040-075-R03	4	4	10	75	0.3
	2040-075-R05	4	4	10	75	0.5
	2040-075-R10	4	4	10	75	1
	2040-075-R15	4	4	10	75	1.5
	2060-100-R03	6	6	15	100	0.3
	2060-100-R05	6	6	15	100	0.5
	2060-100-R10	6	6	15	100	1
	2060-100-R15	6	6	15	100	1.5
	2060-100-R20	6	6	15	100	2
	2080-100-R03	8	8	20	100	0.3
	2080-100-R05	8	8	20	100	0.5
	2080-100-R10	8	8	20	100	1
	2080-100-R15	8	8	20	100	1.5
	2080-100-R20	8	8	20	100	2
	2080-100-R25	8	8	20	100	2.5
	2080-100-R30	8	8	20	100	3
	2100-100-R03	10	10	25	100	0.3
	2100-100-R05	10	10	25	100	0.5
	2100-100-R10	10	10	25	100	1
	2100-100-R15	10	10	25	100	1.5
	2100-100-R20	10	10	25	100	2
	2100-100-R25	10	10	25	100	2.5
	2100-100-R30	10	10	25	100	3
	2120-100-R03	12	12	30	100	0.3
	2120-100-R05	12	12	30	100	0.5
	2120-100-R10	12	12	30	100	1
	2120-100-R15	12	12	30	100	1.5
	2120-100-R20	12	12	30	100	2
	2120-100-R25	12	12	30	100	2.5
	2120-100-R30	12	12	30	100	3

M This is metric size. We can also provide in inch type

IPRE4000 (Radius)





4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø2~Ø12	0.00~ -0.02



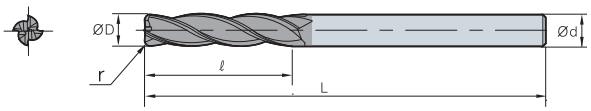
(mm)

Designation		ØD	Ød	ℓ	L	r
IPRE 4	4020-050-R02	2	4	6	50	0.2
	4020-050-R03	2	4	6	50	0.3
	4020-050-R05	2	4	6	50	0.5
	4025-050-R02	2.5	4	8	50	0.2
	4030-050-R02-S3	3	3	8	50	0.2
	4030-050-R03-S3	3	3	8	50	0.3
	4030-050-R05-S3	3	3	8	50	0.5
	4030-050-R10-S3	3	3	8	50	1
	4030-050-R02	3	4	8	50	0.2
	4030-050-R03	3	4	8	50	0.3
	4030-050-R05	3	4	8	50	0.5
	4030-050-R10	3	4	8	50	1
	4040-050-R02	4	4	10	50	0.2
	4040-050-R03	4	4	10	50	0.3
	4040-050-R05	4	4	10	50	0.5
	4040-050-R10	4	4	10	50	1
	4040-050-R15	4	4	10	50	1.5
	4050-050-R02	5	6	13	50	0.2
	4050-050-R03	5	6	13	50	0.3
	4050-050-R05	5	6	13	50	0.5
	4050-050-R10	5	6	13	50	1
	4060-050-R02	6	6	15	50	0.2
	4060-050-R03	6	6	15	50	0.3
	4060-050-R05	6	6	15	50	0.5
	4060-050-R10	6	6	15	50	1
	4060-050-R15	6	6	15	50	1.5
	4060-050-R20	6	6	15	50	2
	4080-060-R03	8	8	20	60	0.3
	4080-060-R05	8	8	20	60	0.5
	4080-060-R10	8	8	20	60	1
	4080-060-R15	8	8	20	60	1.5
	4080-060-R20	8	8	20	60	2
	4080-060-R25	8	8	20	60	2.5
	4080-060-R30	8	8	20	60	3
	4100-075-R03	10	10	25	75	0.3
	4100-075-R05	10	10	25	75	0.5
	4100-075-R10	10	10	25	75	1
	4100-075-R15	10	10	25	75	1.5
	4100-075-R20	10	10	25	75	2
	4100-075-R25	10	10	25	75	2.5
	4100-075-R30	10	10	25	75	3
	4120-075-R03	12	12	30	75	0.3
	4120-075-R05	12	12	30	75	0.5
	4120-075-R10	12	12	30	75	1
	4120-075-R15	12	12	30	75	1.5
	4120-075-R20	12	12	30	75	2
	4120-075-R25	12	12	30	75	2.5
	4120-075-R30	12	12	30	75	3

M This is metric size. We can also provide in inch type

IPLRE4000 (Long radius)





4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø3~Ø12	0.00~ -0.02



(mm)

Designation		ØD	Ød	ℓ	L	r
IPLRE 4	4030-075-R03	3	3	8	75	0.3
	4030-075-R05	3	3	8	75	0.5
	4030-075-R10	3	3	8	75	1
	4040-075-R03	4	4	10	75	0.3
	4040-075-R05	4	4	10	75	0.5
	4040-075-R10	4	4	10	75	1
	4040-075-R15	4	4	10	75	1.5
	4060-100-R03	6	6	15	100	0.3
	4060-100-R05	6	6	15	100	0.5
	4060-100-R10	6	6	15	100	1
	4060-100-R15	6	6	15	100	1.5
	4060-100-R20	6	6	15	100	2
	4080-100-R03	8	8	20	100	0.3
	4080-100-R05	8	8	20	100	0.5
	4080-100-R10	8	8	20	100	1
	4080-100-R15	8	8	20	100	1.5
	4080-100-R20	8	8	20	100	2
	4080-100-R25	8	8	20	100	2.5
	4080-100-R30	8	8	20	100	3
	4100-100-R03	10	10	25	100	0.3
	4100-100-R05	10	10	25	100	0.5
	4100-100-R10	10	10	25	100	1
	4100-100-R15	10	10	25	100	1.5
	4100-100-R20	10	10	25	100	2
	4100-100-R25	10	10	25	100	2.5
	4100-100-R30	10	10	25	100	3
	4120-100-R03	12	12	30	100	0.3
	4120-100-R05	12	12	30	100	0.5
	4120-100-R10	12	12	30	100	1
	4120-100-R15	12	12	30	100	1.5
	4120-100-R20	12	12	30	100	2
	4120-100-R25	12	12	30	100	2.5
	4120-100-R30	12	12	30	100	3

M This is metric size. We can also provide in inch type

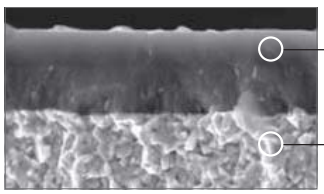
Highly efficient and economical endmill for general cutting

Z+ Endmill

- Wide range of workpiece materials up to HRC47
- Wide application range from roughing to finishing
- Increased tool life thanks to a new substrate and advanced coating layers
- Prevented chipping and extended cutting time thanks to its optimized blade design

Features

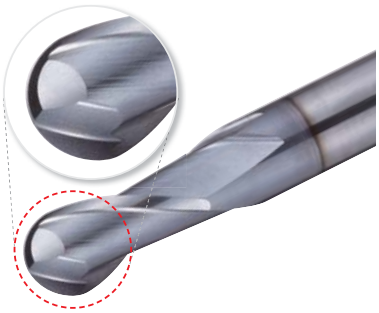
- Wide range of workpiece materials - Carbon steel, alloy steel, cast iron, etc
- Extended tool life - Newly invented substrate and high-tech coating layers applied
- Higher productivity - Wide application range from roughing to finishing

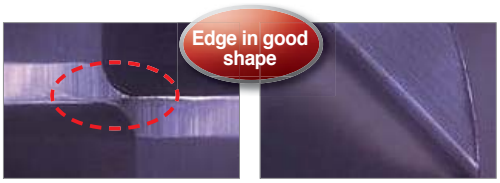


AlCrSiN coating layer
: Coating lubrication making possible high temperature/high speed machining

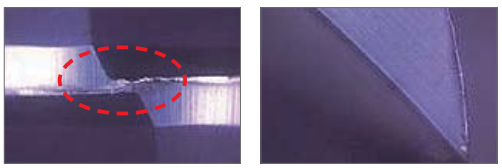
Ultra-fine substrate
: Substrate with excellent wear resistance applied

PC320U





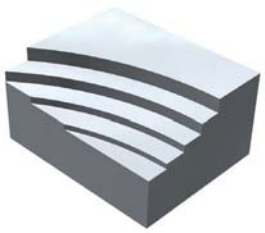
Z+ Endmill
Exceptional cutting edge rigidity



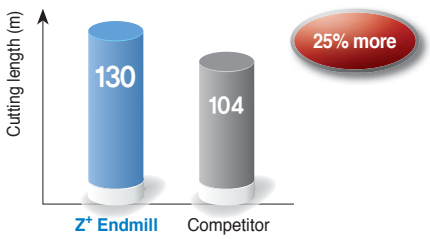
Competitor

Application examples

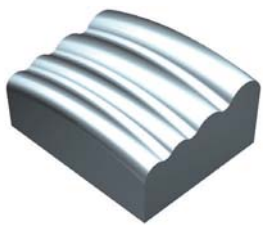
- **Workpiece** Carbon steel (C45, ~HRC20)
- **Cutting conditions** vc (m/min) = 180, fz (mm/t) = 0.05
  ap (mm) = 8, dry
- **Tools** ZPFE4080-060



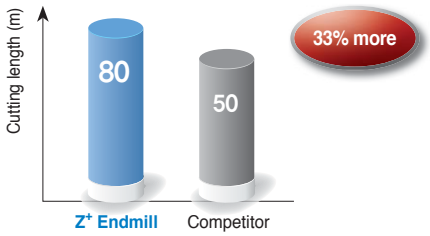
■ **Test result**



- **Workpiece** Carbon steel (C45, ~HRC20)
- **Cutting conditions** vc (m/min) = 130, fz (mm/t) = 0.1
  ap (mm) = 0.5, dry
- **Tools** ZPBE2080-100



■ **Test result**

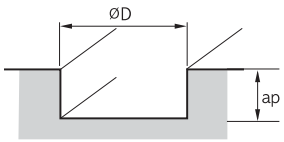


M This is metric size. We can also provide in inch type

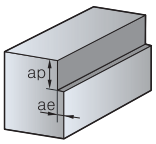
Recommended cutting conditions (ZPFE2000/ZPSFE2000 flat)

Workpiece / Cutting conditions / Diameter (Ø)	Alloy steel and Carbon steel (under HRC30)		Pre-hardened steel (HRC30~47)		Stainless steel	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
1	19,745	175	13,057	100	10,500	70
2	11,560	190	7,560	120	6,300	90
3	8,920	210	5,560	140	4,620	120
4	7,560	300	4,620	180	3,880	150
5	6,300	320	3,780	190	3,160	160
6	5,560	350	3,360	220	2,840	180
8	4,200	380	2,520	200	2,100	180
10	3,260	330	2,000	160	1,680	160
12	2,740	280	1,680	130	1,360	130
16	2,200	220	1,360	110	1,060	110

Application tip



■ **Slotting depth (ap)**
- D ≤ Ø2.5 (ap = 0.3D)
- D > Ø2.5 (ap = 0.5D)



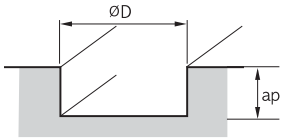
■ **Shouldering depth (ap)**
- D ≤ Ø2.5 (ap = 1.5D, ae = 0.05D)
- D > Ø2.5 (ap = 1.5D, ae = 0.1D)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

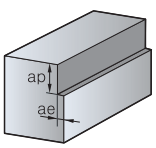
Recommended cutting conditions (ZPFE4000/ZPSFE4000 flat)

Workpiece / Cutting conditions / Diameter (Ø)	Alloy steel and Carbon steel (under HRC30)		Pre-hardened steel (HRC30~47)		Stainless steel	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
2	11,560	280	7,560	170	6,300	140
3	8,920	320	5,560	200	4,620	170
4	7,560	570	4,620	350	3,880	280
5	6,300	600	3,780	360	3,160	300
6	5,560	660	3,360	410	2,840	330
8	4,200	710	2,520	380	2,100	350
10	3,260	610	2,000	300	1,680	300
12	2,740	520	1,680	250	1,360	240
16	2,200	410	1,360	200	1,100	200

Application tip



■ **Slotting depth (ap)**
- D ≤ Ø2.5 (ap = 0.3D)
- D > Ø2.5 (ap = 0.5D)



■ **Shouldering depth (ap)**
- D ≤ Ø2.5 (ap = 1.5D, ae = 0.05D)
- D > Ø2.5 (ap = 1.5D, ae = 0.1D)

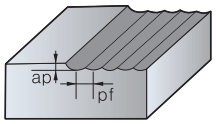
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

M This is metric size. We can also provide in inch type

Recommended cutting conditions (ZPBE2000 ball)

Workpiece / Cutting conditions / Diameter (Ø)	Alloy steel and Carbon steel (under HRC30)		Pre-hardened steel (HRC30~47)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
1	30,000	2,880	30,000	2,520
1.2	30,000	3,060	28,800	2,580
1.5	30,000	3,240	28,800	2,700
2	29,820	3,420	28,680	2,880
3	19,860	3,600	19,080	3,180
4	14,940	3,600	14,340	3,180
5	11,160	3,480	10,680	2,940
6	8,340	2,910	8,040	2,460
8	6,660	2,520	6,420	2,100
10	5,580	2,220	5,340	1,860
12	4,170	1,770	4,008	1,500

Application tip



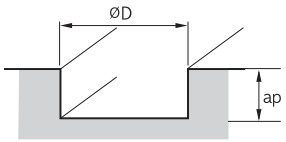
- ap = 0.03D
- pf = 0.05D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

Recommended cutting conditions (ZPRE2000 radius)

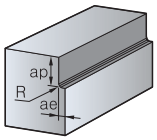
Workpiece / Cutting conditions / Diameter (Ø)	Alloy steel and Carbon steel (under HRC30)		Pre-hardened steel (HRC30~47)		Stainless steel	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	5,300	420	3,200	240	2,400	180
8	4,000	450	2,700	210	2,040	150
10	3,200	390	2,400	180	1,600	120
12	2,700	330	2,040	150	1,300	100
14	2,400	270	1,600	120	1,000	70
16	2,040	200	1,300	100	1,300	60

Application tip



■ **Slotting depth (ap)**

- ap: ≤ 0.3D



■ **Shouldering depth (ap)**

- ap: ≤ 1.5D
- ae: ≤ 0.1D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

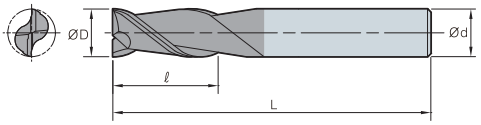
Notice

- Please adjust the recommended cutting conditions properly, according to the condition of your machines, the target shapes, and your purpose for machining
- Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio
- In case of overhang over 3D, reduce RPM and feed rate

M This is metric size. We can also provide in inch type

ZPFE2000 (Flat)













ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



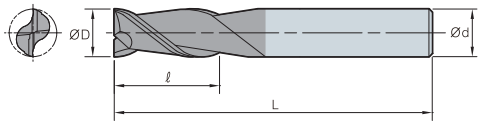
(mm)

Designation		ØD	Ød	ℓ	L
ZPFE 2	2010-050-S4	1.0	4	3	50
	2015-050-S4	1.5	4	4	50
	2020-050-S4	2.0	4	6	50
	2025-050-V6S4	2.5	4	6	50
	2025-050-V8S4	2.5	4	8	50
	2030-050-S4	3.0	4	9	50
	2030-050	3.0	6	9	50
	2035-050-S4	3.5	4	9	50
	2035-050	3.5	6	9	50
	2040-050-S4	4.0	4	11	50
	2040-050	4.0	6	11	50
	2045-050	4.5	6	11	50
	2050-050	5.0	6	13	50
	2060-050	6.0	6	16	50
	2065-060	6.5	8	16	60
	2070-060	7.0	8	20	60
	2075-060	7.5	8	20	60
	2080-060	8.0	8	20	60
	2085-075	8.5	10	23	75
	2090-075	9.0	10	23	75
	2095-075	9.5	10	25	75
	2100-075	10.0	10	25	75
	2105-075	10.5	12	26	75
	2110-075	11.0	12	28	75
	2120-075	12.0	12	30	75
	2140-100	14.0	14	34	100
	2150-090	15.0	16	36	90
	2160-100	16.0	16	36	100
	2170-100	17.0	20	40	100
	2180-100	18.0	18	40	100
	2190-100	19.0	20	40	100
	2200-100	20.0	20	40	100

M This is metric size. We can also provide in inch type

ZPSFE2000 (Short flat)





2 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



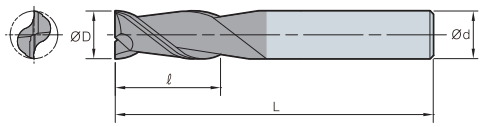
(mm)

Designation		ØD	Ød	ℓ	L
ZPSFE 2	2010-050-S4	1.0	4	2	50
	2015-050-S4	1.5	4	2	50
	2020-050-S4	2.0	4	3	50
	2025-050-S4	2.5	4	4	50
	2030-050-S4	3.0	4	5	50
	2040-050-S4	4.0	4	6	50
	2050-050	5.0	6	8	50
	2060-050	6.0	6	9	50
	2070-050	7.0	8	10	50
	2080-050	8.0	8	12	50
	2100-075	10.0	10	15	75
	2120-075	12.0	12	18	75
	2160-100	16.0	16	24	100

M This is metric size. We can also provide in inch type

ZPLFE2000 (Long flat)





2 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



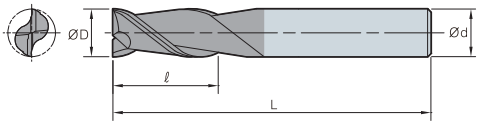
(mm)

Designation		ØD	Ød	ℓ	L
ZPLFE 2	2020-075-S4	2.0	4	6	75
	2030-075-S4	3.0	4	9	75
	2030-075	3.0	6	12	75
	2040-075-S4	4.0	4	11	75
	2050-075	5.0	6	20	75
	2060-100	6.0	6	16	100
	2060-100-V20S6	6.0	6	20	100
	2080-075	8.0	8	20	75
	2080-100	8.0	8	25	100
	2100-100	10.0	10	30	100
	2120-100	12.0	12	35	100
	2160-150	16.0	16	36	150
	2200-150	20.0	20	45	150

M This is metric size. We can also provide in inch type

ZPLFE2000 (Long flute)





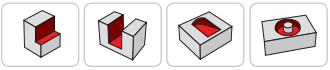








ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



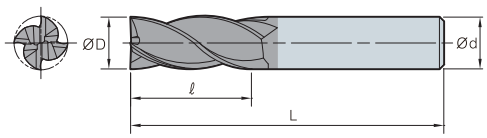
(mm)

Designation		ØD	Ød	ℓ	L
ZPLFE 2	2020-075-V15S4	2.0	4	15	75
	2030-075-V25S4	3.0	4	25	75
	2040-075-V30S4	4.0	4	30	75
	2050-075-V30S6	5.0	6	30	75
	2060-075-V35S6	6.0	6	35	75
	2080-100-V40S8	8.0	8	40	100
	2100-100-V45S10	10.0	10	45	100
	2120-100-V50S12	12.0	12	50	100
	2140-100-V55S14	14.0	14	55	100
	2160-150-V50S16	16.0	16	50	150
	2160-150-V60S16	16.0	16	60	150
	2180-150-V65S18	18.0	18	65	150
	2200-150-V70S20	20.0	20	70	150

M This is metric size. We can also provide in inch type

ZPFE4000 (Flat)





4 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



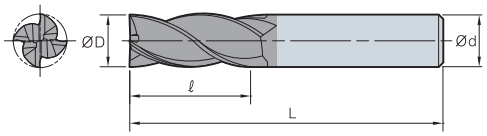
(mm)

Designation		ØD	Ød	ℓ	L
ZPFE 4	4010-050-S4	1.0	4	3	50
	4015-050-S4	1.5	4	5	50
	4015-050	1.5	6	5	50
	4020-050-S4	2.0	4	6	50
	4020-050	2.0	6	6	50
	4025-050-S4	2.5	4	8	50
	4025-050	2.5	6	8	50
	4030-050	3.0	6	6	50
	4030-050-S4	3.0	4	9	50
	4030-050-V9S6	3.0	6	9	50
	4035-050-S4	3.5	4	11	50
	4035-050	3.5	6	9	50
	4040-050-S4	4.0	4	11	50
	4040-050	4.0	6	11	50
	4045-050	4.5	6	11	50
	4050-050	5.0	6	8	50
	4050-050-V13S6	5.0	6	13	50
	4055-050	5.5	6	16	50
	4060-050	6.0	6	16	50
	4065-060	6.5	8	16	60
	4070-060	7.0	8	20	60
	4075-060	7.5	8	20	60
	4080-060	8.0	8	20	60
	4085-075	8.5	10	23	75
	4090-075	9.0	10	23	75
	4095-075	9.5	10	23	75
	4100-075	10.0	10	25	75
	4110-075	11.0	12	28	75
	4120-075	12.0	12	30	75
	4130-100	13.0	14	32	100
	4140-075	14.0	14	32	75
	4140-100	14.0	14	34	100
	4150-100	15.0	16	36	100
	4160-100	16.0	16	36	100
	4160-100-V40S16	16.0	16	40	100
	4160-100-V45S16	16.0	16	45	100
	4170-100-S18	17.0	18	38	100
	4180-100-S18	18.0	18	45	100
	4200-100-S20	20.0	20	45	100

M This is metric size. We can also provide in inch type

ZPSFE4000 (Short flat)





4 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

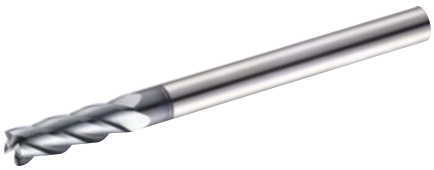


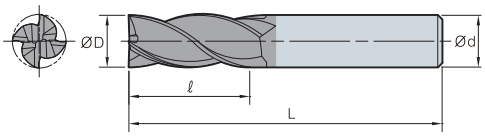
(mm)

Designation		ØD	Ød	ℓ	L
ZPSFE 4	4010-050-S4	1.0	4	2	50
	4015-050-S4	1.5	4	2	50
	4020-050-S4	2.0	4	3	50
	4025-050-S4	2.5	4	4	50
	4030-050-S4	3.0	4	5	50
	4040-050-S4	4.0	4	6	50
	4050-050	5.0	6	8	50
	4060-050	6.0	6	9	50
	4070-050	7.0	8	10	50
	4080-050	8.0	8	12	50
	4100-075	10.0	10	15	75
	4120-075	12.0	12	18	75
	4160-100	16.0	16	24	100

M This is metric size. We can also provide in inch type

ZPLFE4000 (Long flat)





4 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

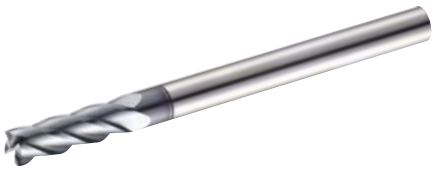


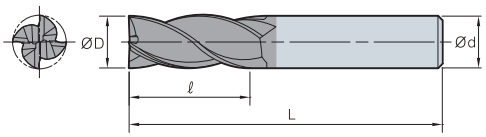
(mm)

Designation		ØD	Ød	ℓ	L
ZPLFE 4	4020-075-S4	2.0	4	10	75
	4030-075-S4	3.0	4	12	75
	4040-075-S4	4.0	4	11	75
	4040-050-V15S4	4.0	4	15	75
	4050-075	5.0	6	20	75
	4060-075	6.0	6	16	75
	4060-075-V20S6	6.0	6	20	75
	4080-075	8.0	8	20	75
	4080-100-S8	8.0	8	25	100
	4100-100	10.0	10	30	100
	4100-100-V35S10	10.0	10	35	100
	4120-100	12.0	12	35	100
	4160-150	16.0	16	36	150
	4200-150	20.0	20	45	150

M This is metric size. We can also provide in inch type

ZPLFE4000 (Long flute)





4 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



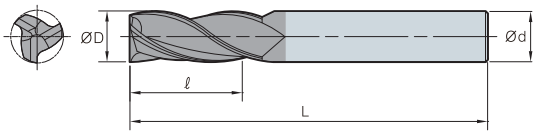
(mm)

Designation		ØD	Ød	ℓ	L
ZPLFE 4	4010-050-V04S4	1.0	4	4	50
	4020-050-V10S4	2.0	4	10	50
	4030-060-V15S4	3.0	4	15	60
	4030-060-V16S6	3.0	6	16	60
	4040-060-V20S4	4.0	4	20	60
	4040-075-V20S6	4.0	6	20	75
	4040-075-V30S4	4.0	4	30	75
	4050-075-V25S6	5.0	6	25	75
	4050-075-V30S6	5.0	6	30	75
	4060-075-V30S6	6.0	6	30	75
	4060-075-V35S6	6.0	6	35	75
	4080-100-V35S8	8.0	8	35	100
	4080-100-V40S8	8.0	8	40	100
	4100-100-V45S10	10.0	10	45	100
	4100-100-V50S10	10.0	10	50	100
	4120-100-V45S12	12.0	12	45	100
	4120-100-V50S12	12.0	12	50	100
	4140-100-V45S14	14.0	14	45	100
	4160-150-V50S16	16.0	16	50	150
	4160-150-V60S16	16.0	16	60	150
	4160-150-V70S16	16.0	16	70	150
	4180-150-V70S18	18.0	18	70	150
	4200-150-V70S20	20.0	20	70	150

M This is metric size. We can also provide in inch type

ZPFE3000 (Flat)





3 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



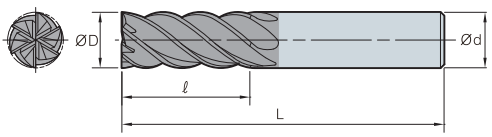
(mm)

Designation		ØD	Ød	ℓ	L
ZPFE 3	3020-050-S4	2.0	4	6	50
	3030-050-S4	3.0	4	9	50
	3040-050-S4	4.0	4	11	50
	3050-050	5.0	6	13	50
	3060-050	6.0	6	16	50
	3065-060	6.5	8	16	60
	3080-060	8.0	8	20	60
	3095-075	9.5	10	24	75
	3100-075	10.0	10	25	75
	3120-075	12.0	12	30	75
	3106-100	16.0	16	36	100
	3180-100	18.0	18	40	100
	3200-100	20.0	20	45	100
	3250-100	25.0	25	50	100

M This is metric size. We can also provide in inch type

ZPFE6000 (Flat)





6 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



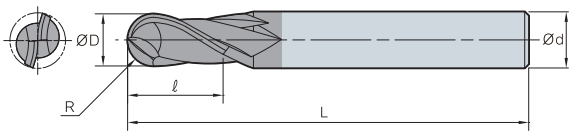
(mm)

Designation		ØD	Ød	ℓ	L
ZPFE 6	6060-050	6.0	6	15	50
	6080-060	8.0	8	20	60
	6100-075	10.0	10	25	75
	6120-075	12.0	12	30	75
	6160-100	16.0	16	36	100
	6200-100	20.0	20	45	100

M This is metric size. We can also provide in inch type

ZPBE2000 (Ball)





2 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

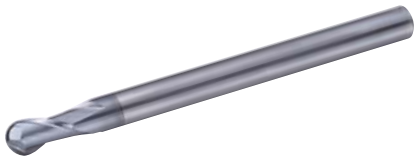


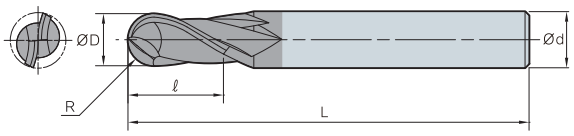
(mm)

Designation		R	ØD	Ød	ℓ	L
ZPBE 2	2008-050-S4	0.4	0.8	4	1.6	50
	2009-050-S4	0.5	0.9	4	1.8	50
	2010-050-S4	0.5	1.0	4	2	50
	2015-050-S4	0.8	1.5	4	3	50
	2020-050-S4	1.0	2.0	4	4	50
	2020-050	1.0	2.0	6	4	50
	2025-050-S4	1.3	2.5	4	5	50
	2030-050-S4	1.5	3.0	4	6	50
	2030-050	1.5	3.0	6	6	50
	2040-050-S4	2.0	4.0	4	8	50
	2040-050	2.0	4.0	6	8	50
	2050-050	2.5	5.0	6	10	50
	2060-050	3.0	6.0	6	12	50
	2070-060	3.5	7.0	8	14	60
	2080-060	4.0	8.0	8	14	60
	2090-075	4.5	9.0	10	16	75
	2100-075	5.0	10.0	10	18	75
	2110-075	5.5	11.0	12	20	75
	2120-075	6.0	12.0	12	22	75
	2130-090	6.5	13.0	14	26	90
	2140-090	7.0	14.0	14	26	90
	2150-090	7.5	15.0	16	30	90
	2160-100	8.0	16.0	16	30	100
	2200-100	10.0	20.0	20	38	100

M This is metric size. We can also provide in inch type

ZPLBE2000 (Long ball)





2 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

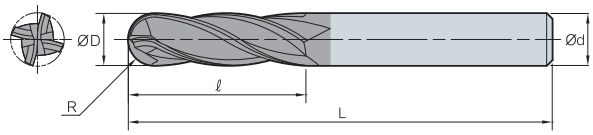


(mm)

Designation		R	ØD	Ød	ℓ	L
ZPLBE 2	2020-075-S4	1.0	2.0	4	4	75
	2030-075-S4	1.5	3.0	4	6	75
	2030-075	1.5	3.0	6	6	75
	2040-075-S4	2.0	4.0	4	8	75
	2040-075	2.0	4.0	6	8	75
	2050-075	2.5	5.0	6	10	75
	2060-075	3.0	6.0	6	12	75
	2080-100	4.0	8.0	8	14	100
	2100-100	5.0	10.0	10	18	100
	2120-100	6.0	12.0	12	20	100

ZPBE4000 (Ball)





4 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



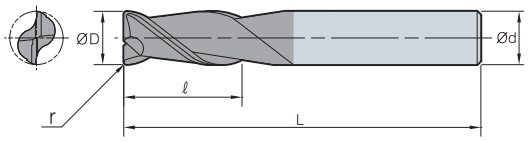
(mm)

Designation		R	ØD	Ød	ℓ	L
ZPBE 4	4020-050-S4	1.0	2.0	4	4	50
	4025-050-S4	1.3	2.5	4	5	50
	4030-050-S4	1.5	3.0	4	6	50
	4030-050	1.5	3.0	6	6	50
	4040-050-S4	2.0	4.0	4	8	50
	4040-050	2.0	4.0	6	8	50
	4050-050	2.5	5.0	6	10	50
	4060-050	3.0	6.0	6	12	50
	4070-060	3.5	7.0	8	14	60
	4080-060	4.0	8.0	8	14	60
	4090-075	4.5	9.0	10	16	75
	4100-075	5.0	10.0	10	18	75
	4110-075	5.5	11.0	12	20	75
	4120-075	6.0	12.0	12	22	75
	4140-075	7.0	14.0	14	24	75
	4160-100	8.0	16.0	16	30	100
	4200-100	10.0	20.0	20	38	100

M This is metric size. We can also provide in inch type

ZPRE2000 (Radius)





2 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



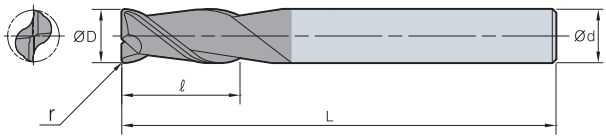
(mm)

Designation		ØD	Ød	ℓ	L	r
ZPRE 2	2010-050-S4-R02	1.0	4	3	50	0.2
	2020-050-S4-R02	2.0	4	6	50	0.2
	2030-050-S4-R02	3.0	4	9	50	0.2
	2030-050-R02	3.0	6	9	50	0.2
	2030-050-S4-R03	3.0	4	9	50	0.3
	2030-050-R03	3.0	6	9	50	0.3
	2030-050-S4-R05	3.0	4	9	50	0.5
	2030-050-R05	3.0	6	9	50	0.5
	2040-050-S4-R02	4.0	4	11	50	0.2
	2040-050-R02	4.0	6	11	50	0.2
	2040-050-S4-R03	4.0	4	11	50	0.3
	2040-050-R03	4.0	6	11	50	0.3
	2040-050-S4-R05	4.0	4	11	50	0.5
	2040-050-R05	4.0	6	11	50	0.5
	2040-050-S4-R10	4.0	4	11	50	1.0
	2050-050-R02	5.0	6	13	50	0.2
	2050-050-R03	5.0	6	13	50	0.3
	2050-050-R05	5.0	6	13	50	0.5
	2050-050-R010	5.0	6	13	50	1.0
	2060-050-R05	6.0	6	16	50	0.5
	2060-050-R10	6.0	6	16	50	1.0
	2060-050-R15	6.0	6	16	50	1.5
	2060-050-R20	6.0	6	16	50	2.0
	2080-060-R03	8.0	8	20	60	0.3
	2080-060-R05	8.0	8	20	60	0.5
	2080-060-R10	8.0	8	20	60	1.0
	2080-060-R15	8.0	8	20	60	1.5
	2080-060-R20	8.0	8	20	60	2.0
	2100-075-R03	10.0	10	25	75	0.3
	2100-075-R06	10.0	10	25	75	0.6
	2100-075-R10	10.0	10	25	75	1.0
	2100-075-R15	10.0	10	25	75	1.5
	2100-075-R20	10.0	10	25	75	2.0
	2100-075-R30	10.0	10	25	75	3.0
	2120-075-R05	12.0	12	30	75	0.5
	2120-075-R10	12.0	12	30	75	1.0
	2120-075-R15	12.0	12	30	75	1.5
	2120-075-R20	12.0	12	30	75	2.0
	2120-075-R30	12.0	12	30	75	3.0
	2160-100-R10	16.0	16	36	100	1.0
	2160-100-R20	16.0	16	36	100	2.0
	2160-100-R30	16.0	16	36	100	3.0

M This is metric size. We can also provide in inch type

ZPLRE2000 (Long radius)





2 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



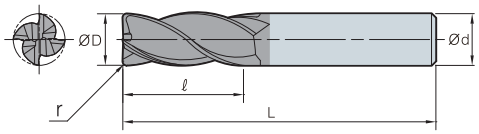
(mm)

Designation		ØD	Ød	ℓ	L	r
ZPLRE 2	2060-075-R05	6.0	6	16	75	0.5
	2060-075-R10	6.0	6	16	75	1.0
	2060-075-R15	6.0	6	16	75	1.5
	2080-100-R05	8.0	8	20	100	0.5
	2080-100-R10	8.0	8	20	100	1.0
	2080-100-R15	8.0	8	20	100	1.5
	2100-100-R05	10.0	10	25	100	0.5
	2100-100-R10	10.0	10	25	100	1.0
	2100-100-R15	10.0	10	25	100	1.5
	2100-100-R20	10.0	10	25	100	2.0
	2120-100-R05	12.0	12	30	100	0.5
	2120-100-R10	12.0	12	30	100	1.0
	2120-100-R15	12.0	12	30	100	1.5
	2120-100-R20	12.0	12	30	100	2.0
	2160-150-R05	16.0	16	36	150	0.5
	2160-150-R10	16.0	16	36	150	1.0
	2160-150-R15	16.0	16	36	150	1.5
	2160-150-R20	16.0	16	36	150	2.0

M This is metric size. We can also provide in inch type

ZPRE4000 (Radius)





4 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



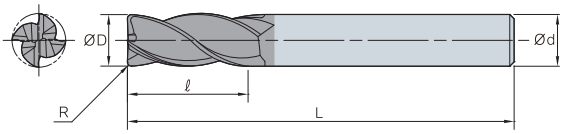
(mm)

Designation		ØD	Ød	ℓ	L	r
ZPRE 4	4015-050-S4-R02	1.5	4	5	50	0.2
	4020-050-S4-R02	2.0	4	6	50	0.2
	4030-050-S4-R02	3.0	4	9	50	0.2
	4030-050-S4-R03	3.0	4	9	50	0.3
	4030-050-S4-R05	3.0	4	9	50	0.5
	4040-050-S4-R02	4.0	4	11	50	0.2
	4040-050-S4-R03	4.0	4	11	50	0.3
	4040-050-S4-R05	4.0	4	11	50	0.5
	4040-050-S4-R10	4.0	4	11	50	1.0
	4045-050-R10	4.5	6	12	50	1.0
	4050-050-R02	5.0	6	13	50	0.2
	4050-050-R05	5.0	6	13	50	0.5
	4050-050-R10	5.0	6	13	50	1.0
	4050-050-R15	5.0	6	13	50	1.5
	4060-050-R05	6.0	6	16	50	0.5
	4060-050-R10	6.0	6	16	50	1.0
	4060-050-R15	6.0	6	16	50	1.5
	4080-060-R03	8.0	8	20	60	0.3
	4080-060-R05	8.0	8	20	60	0.5
	4080-060-R10	8.0	8	20	60	1.0
	4080-060-R15	8.0	8	20	60	1.5
	4080-060-R20	8.0	8	20	60	2.0
	4100-075-R03	10.0	10	25	75	0.3
	4100-075-R05	10.0	10	25	75	0.5
	4100-075-R10	10.0	10	25	75	1.0
	4100-075-R15	10.0	10	25	75	1.5
	4100-075-R20	10.0	10	25	75	2.0
	4100-075-R25	10.0	10	25	75	2.5
	4100-075-R30	10.0	10	25	75	3.0
	4120-075-R05	12.0	12	30	75	0.5
	4120-075-R10	12.0	12	30	75	1.0
	4120-075-R15	12.0	12	30	75	1.5
	4120-075-R20	12.0	12	30	75	2.0
	4120-075-R25	12.0	12	30	75	2.5
	4120-075-R30	12.0	12	30	75	3.0
	4160-100-R05	16.0	16	36	100	0.5
	4160-100-R10	16.0	16	36	100	1.0
	4160-100-R20	16.0	16	36	100	2.0
	4160-100-R30	16.0	16	36	100	3.0

M This is metric size. We can also provide in inch type

ZPLRE4000 (Long radius)





4 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



(mm)

Designation		ØD	Ød	ℓ	L	r
ZPLRE 4	4060-075-R05	6.0	6	16	75	0.5
	4060-075-R10	6.0	6	16	75	1.0
	4060-075-R15	6.0	6	16	75	1.5
	4080-100-R05	8.0	8	20	100	0.5
	4080-100-R10	8.0	8	20	100	1.0
	4080-100-R15	8.0	8	20	100	1.5
	4080-100-R20	8.0	8	20	100	2.0
	4100-100-R05	10.0	10	25	100	0.5
	4100-100-R10	10.0	10	25	100	1.0
	4100-100-R15	10.0	10	25	100	1.5
	4100-100-R20	10.0	10	25	100	2.0
	4120-100-R05	12.0	12	30	100	0.5
	4120-100-R10	12.0	12	30	100	1.0
	4120-100-R15	12.0	12	30	100	1.5
	4120-100-R20	12.0	12	30	100	2.0
	4120-100-R30	12.0	12	30	100	3.0
	4160-150-R05	16.0	16	36	150	0.5
	4160-150-R10	16.0	16	36	150	1.0
	4160-150-R15	16.0	16	36	150	1.5
	4160-150-R20	16.0	16	36	150	2.0
	4160-150-R30	16.0	16	36	150	3.0

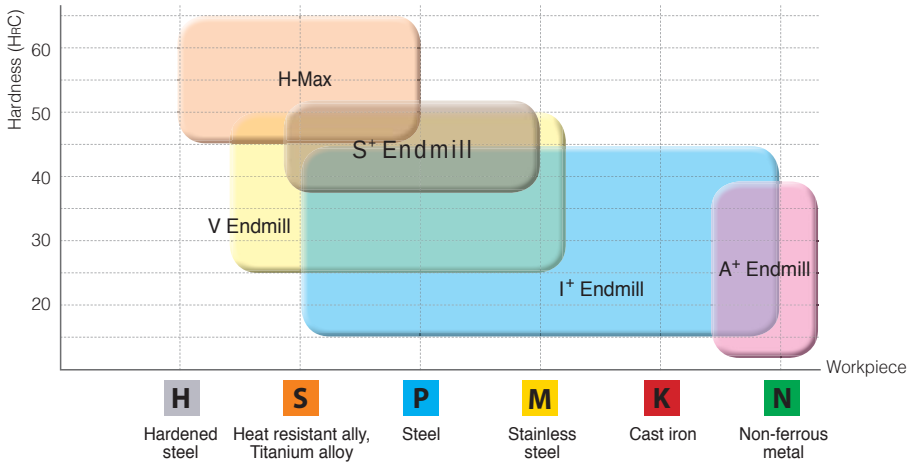
M This is metric size. We can also provide in inch type

Stainless endmill

S+ Endmill

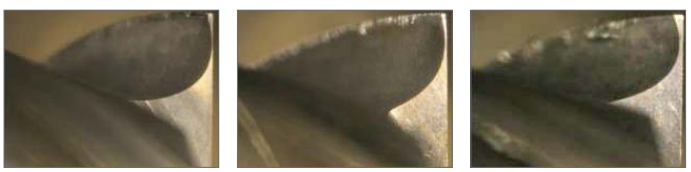
- Strong cutting edge ensures long tool life
- Special coating with high oxidation resistance
- High rake angle and curvilinear chip pocket allow chip evacuation
- Special cutting edge prevents hardening of tools
- Optimal machinability in stainless steel machining
- Available for steel, alloy steel and hardening steel machining
- Available for multiple operations (Shouldering, slotting and ramping etc.)

Application area



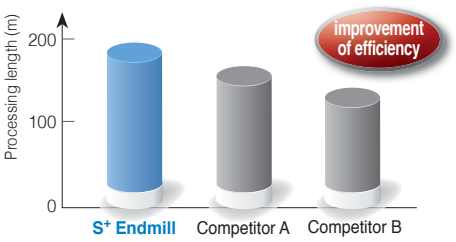
Performance evaluation

- **Workpiece** STS304
- **Cutting conditions** Diameter = Ø8.0, n (min^{-1}) = 4.000, vc (m/min) = 100, vf (mm/min) = 480, fz (mm/t) = 0.04, ap (mm) = 8, ae (mm) = 0.8, dry
- **Tools** SPFE4080-060



S+ Endmill | Competitor A | Competitor B

Test result

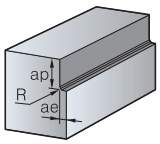


M This is metric size. We can also provide in inch type

Recommend cutting conditions

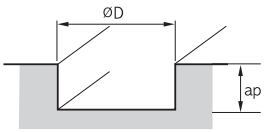
Workpiece / Condition / Diameter (Ø)	Stainless steel STS		Titanium alloy /Inconel		Normal steel (SS, SM) (Under HRC 25)		Alloy steel (SCM) (HRC 25~35)		Hardened steel (STD) (HRC 40~50)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
2	5,500	240	2,600	90	9,000	540	6,000	3,200	4,000	240
4	4,000	260	2,000	90	6,600	600	4,500	340	3,000	280
6	3,000	360	1,200	90	4,800	720	3,000	360	2,500	280
8	2,000	390	1,000	100	3,600	750	2,200	460	2,000	300
10	1,700	410	800	120	2,800	750	1,800	460	1,500	300
12	1,500	380	700	100	2,400	710	1,500	410	1,200	280
14	1,200	320	600	95	2,200	660	1,300	370	1,000	270
16	1,000	270	500	90	1,800	490	1,100	320	800	230
20	750	250	400	85	900	270	900	270	600	200

Application tip



■ **Shouldering depth (ap) and radial depth (ae)**

- Normal steel, Alloy steel, Stainless steel: ae = 0.1D, ap = 1.5D
- Titanium alloy, Inconel, Hardened steel: ae = 0.05D, ap = 1.5D



■ **Slotting depth (ap)**

- Normal steel, Alloy steel: ap = 1.0D
- Stainless steel: ap = 0.3D
- Titanium alloy, Inconel, Hardened steel: ap = 0.2D

Stainless steel machining

- Low thermal conductivity of stainless steel alloy causes conducting heat to the tool and fracture and chipping
- Stainless steel alloy machining gets produces high wear and high cutting resistance
- High temperature in stainless steel alloy machining lowers cutting conditions and decrease the quality of surface roughness

Trouble shooting for stainless steel

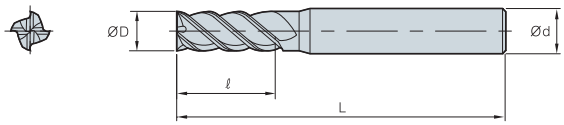
- Getting low cutting conditions
- Getting deeper ap than the work hardened layer and use tools with sharp cutting edge
- Use coolant



M This is metric size. We can also provide in inch type

SPFE4000 (Flat)





4 | H·A 45° | Substrate PC320S | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02

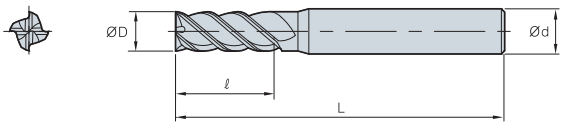
(mm)

Designation		ØD	Ød	ℓ	L
SPFE 4	4010-050	1.0	4	3	50
	4015-050	1.5	4	4	50
	4020-050	2.0	4	6	50
	4025-050	2.5	4	8	50
	4030-050	3.0	4	9	50
	4030-050-S6	3.0	6	9	50
	4040-050	4.0	4	11	50
	4040-050-S6	4.0	6	11	50
	4050-050	5.0	6	13	50
	4060-050	6.0	6	16	50
	4080-060	8.0	8	20	60
	4100-075	10.0	10	30	75
	4120-075	12.0	12	32	75

M This is metric size. We can also provide in inch type

SPLFE4000 (Long flat)





4 | H·A 45° | Substrate PC320S | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02

(mm)

Designation		ØD	Ød	ℓ	L
SPLFE 4	4010-050	1.0	4	4	50
	4015-050	1.5	4	6	50
	4020-050	2.0	4	8	50
	4025-050	2.5	4	10	50
	4030-050-S6	3.0	6	12	50
	4040-050-S6	4.0	6	16	50
	4050-060	5.0	6	20	60
	4060-060	6.0	6	24	60
	4080-075	8.0	8	35	75
	4100-100	10.0	10	45	100
	4120-100	12.0	12	45	100

M This is metric size. We can also provide in inch type

High efficient roughing endmill

R+ Endmill new

- Cost-effective cutting-edge design for rough machining
- Specifically designed corners as irregular flute spacing and lead angle

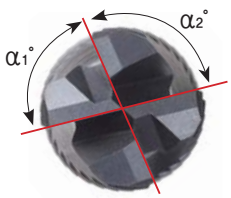
Feature

- Excellent machining efficiency - Special design for medium to rough cutting
- Longer cutting life - Extended tool cost thanks to newly applied grades
- Higher cutting performance - Blade design ideal for roughing



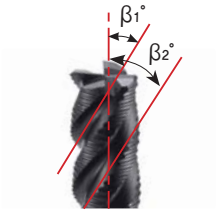
Lower cutting
- Ideal for medium to rough cutting
- Special edge design

Soft cutting
- Serrated cutting edges
- 3 Combo R



- Irregular flute spacing to prevent chattering

$(\alpha_1^\circ \neq \alpha_2^\circ)$



- Irregular lead angles to disperse cutting force

$(\beta_1^\circ \neq \beta_2^\circ)$

Grade system

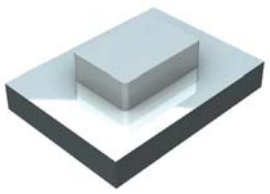
Carbide roughing		HSS roughing	
FN30T	Carbide, uncoated	HN30T	HSS, uncoated
PC10T	Carbide, TiCN coated	HC10T	HSS, TiCN coated
PC20T	Carbide, TiN coated	HC20T	HSS, TiN coated
PC30T	Carbide, TiAlN coated	HC20T	HSS, TiAlN coated
PC40T	Carbide, TiAlCrN coated		

Application examples

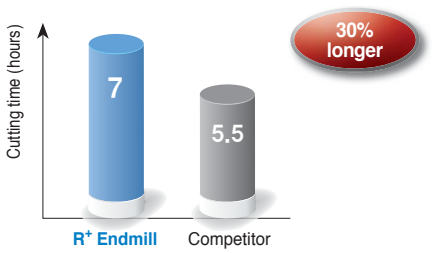
■ **Workpiece** Mold

■ **Cutting conditions** vc (m/min) = 57, fz (mm/t) = 0.03
ap (mm) = 8, dry

■ **Tools** EM16PM-080



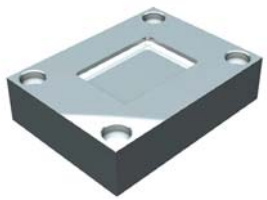
■ **Test result**



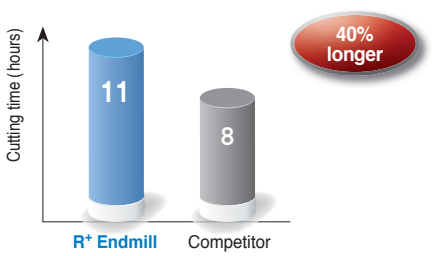
■ **Workpiece** Mold

■ **Cutting conditions** vc (m/min) = 2,700, fz (mm/t) = 0.06
ap (mm) = 8, dry

■ **Tools** EM43PM-080



■ **Test result**

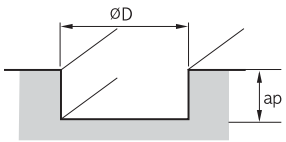


M This is metric size. We can also provide in inch type

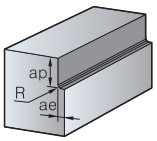
Recommended cutting conditions (EM09CA)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)		Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	12,000	1,090	10,600	770	15,800	1,800	14,300	1,300
8	9,000	1,160	8,100	830	11,900	1,890	10,700	1,370
10	7,200	1,160	6,400	830	9,500	1,890	8,500	1,370
12	6,000	1,080	5,400	800	8,000	1,800	7,100	1,300
14	5,200	1,080	4,750	770	7,000	1,760	6,250	1,260
16	4,500	1,080	4,100	740	6,000	1,720	5,400	1,230
18	4,400	1,000	3,650	680	5,400	1,610	4,850	1,140
20	3,600	930	3,200	630	4,800	1,500	4,300	1,050
25	3,200	840	2,800	600	4,400	1,400	3,800	980

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 1.0D (≤ HRC25)
  ≤ 0.8D (HRC25~40)



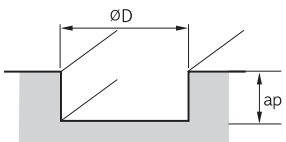
■ **Shouldering depth (ap)**
- ap: ≤ 1.0D
- ae: ≤ 0.5D (≤ HRC25)
  ≤ 0.35D (HRC25~40)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

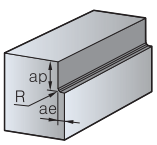
Recommended cutting conditions (EM11CA)

Workpiece / Conditions / Diameter (Ø)	Aluminum, Non-ferrous metal		Aluminum, Non-ferrous metal	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	13,000	1,125	13,000	1,400
8	10,400	1,300	10,400	1,600
10	10,400	1,585	10,400	2,000
12	10,400	1,950	10,400	1,650
14	7,800	1,675	7,800	2,050
16	7,800	1,755	7,800	2,250
18	5,200	1,300	5,200	1,700
20	5,200	1,495	5,200	1,800
25	5,000	1,495	5,000	1,800

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 0.2D



■ **Shouldering depth (ap)**
- ap: ≤ 1.5D
- ae: ≤ 0.15D

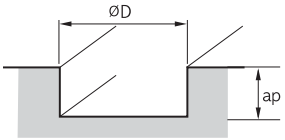
※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

M This is metric size. We can also provide in inch type

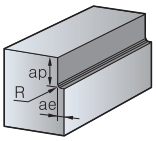
Recommended cutting conditions (EM36CA/EM43CA)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)		Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	12,000	1,550	10,600	1,100	15,800	2,570	14,300	1,850
8	9,000	1,650	8,100	1,180	11,900	2,700	10,700	1,950
10	7,200	1,650	6,400	1,180	9,500	2,700	8,500	1,950
12	6,000	1,540	5,400	1,140	8,000	2,570	7,100	1,850
14	5,200	1,540	4,750	1,095	7,000	2,510	6,250	1,800
16	4,500	1,540	4,100	1,050	6,000	2,450	5,400	1,750
18	4,400	1,435	3,650	975	5,400	2,295	4,850	1,625
20	3,600	1,330	3,200	900	4,800	2,140	4,300	1,500
25	3,200	1,200	2,800	850	4,400	2,000	3,800	1,400

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 1.0D (≤ HRC25)
  ≤ 0.8D (HRC25~40)



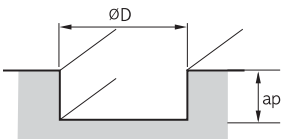
■ **Shouldering depth (ap)**
- ap: ≤ 1.0D
- ae: ≤ 0.5D (≤ HRC25)
  ≤ 0.35D (HRC25~40)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

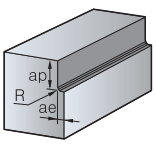
Recommended cutting conditions (EM37CA)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel (≤ HRC35)		Pre-hardened steel (HRC35~HRC45)		High hardened steel (HRC45~HRC55)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	12,400	840	8,400	570	3,400	260
8	9,200	840	6,300	570	2,400	240
10	7,600	840	5,100	570	2,000	290
12	6,000	840	4,200	570	1,680	260
14	5,200	840	3,600	570	1,400	200
16	4,800	760	3,300	510	1,200	160
18	4,400	720	2,700	420	1,100	150
20	3,600	560	2,400	360	1,000	150
25	3,200	620	2,160	410	900	160

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 0.3D (≤ HRC45)
  ≤ 0.05D (HRC45~55)



■ **Shouldering depth (ap)**
- ap: ≤ 1.0D
- ae: ≤ 0.3D (≤ HRC45)
  ≤ 0.05D (HRC45~55)

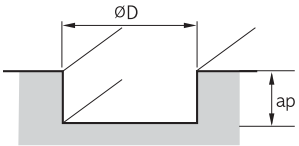
※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

M This is metric size. We can also provide in inch type

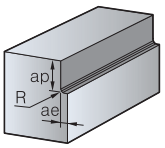
Recommended cutting conditions (EM38CA)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)		Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	12,000	1,240	10,600	800	15,800	2,060	14,300	1,480
8	9,000	1,320	8,100	940	11,900	2,160	10,700	1,560
10	7,200	1,320	6,400	940	9,500	2,160	8,500	1,560
12	6,000	1,230	5,400	910	8,000	2,060	7,100	1,480
14	5,200	1,230	4,750	880	7,000	2,010	6,250	1,440
16	4,500	1,230	4,100	840	6,000	1,960	5,400	1,400
18	4,400	1,150	3,650	780	5,400	1,840	4,850	1,300
20	3,600	1,060	3,200	720	4,800	1,710	4,300	1,200
25	3,200	960	2,800	680	4,400	1,600	3,800	1,120

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 1.0D (≤ HRC25)
  ≤ 0.8D (HRC25~40)



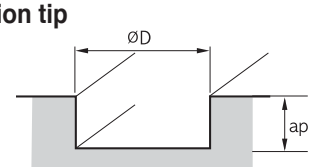
■ **Shouldering depth (ap)**
- ap: ≤ 1.0D
- ae: ≤ 0.5D (≤ HRC25)
  ≤ 0.35D (HRC25~40)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

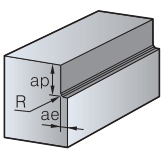
Recommended cutting conditions (EM06H9)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel, High speed steel		Alloy steel, Carbon steel, High speed steel (≤ HRC20)		Alloy steel, Carbon steel, High speed steel (HRC20~HRC30)		Alloy steel, Carbon steel, High speed steel (HRC30~HRC40)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	1,800	80	1,600	60	1,200	55	800	30
8	1,400	105	1,100	75	900	65	560	45
10	1,100	150	900	120	800	110	450	60
12	900	180	800	140	630	110	400	70
14	800	180	700	140	560	110	350	70
16	700	180	560	140	450	110	280	70
18	630	180	500	140	400	110	250	70
20	560	180	450	140	400	110	220	70
22	500	220	450	170	350	140	220	70
25	450	220	400	170	310	140	180	85
28	400	210	350	160	280	130	160	85
30	350	210	310	160	250	130	160	85
32	350	210	280	160	220	130	140	85
36	310	210	250	160	200	130	120	85
40	280	200	220	150	180	120	110	80
50	220	200	180	170	160	140	90	80

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 0.15D



■ **Shouldering depth (ap)**
- ap: ≤ 1.5D
- ae: ≤ 0.1D

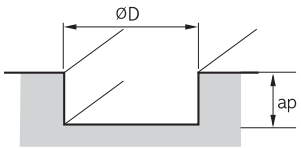
※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

M This is metric size. We can also provide in inch type

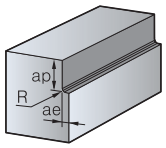
Recommended cutting conditions (EM17PM/EM16PM/EM11PM)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel, High speed steel		Alloy steel, Carbon steel, High speed steel (≤ HRC20)		Alloy steel, Carbon steel, High speed steel (HRC20~HRC30)		Alloy steel, Carbon steel, High speed steel (HRC30~HRC40)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	2,700	200	2,100	155	1,500	100	1,250	90
8	2,300	250	1,800	200	1,300	140	1,000	110
10	1,800	360	1,400	275	1,000	170	850	140
12	1,500	360	1,150	290	850	200	700	155
14	1,300	360	1,000	290	720	200	600	155
16	1,150	360	900	290	625	200	520	155
18	1,000	360	850	290	580	200	470	155
20	920	370	720	290	500	200	420	155
22	850	370	620	290	450	200	380	155
25	750	360	570	275	400	190	340	155

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 0.15D



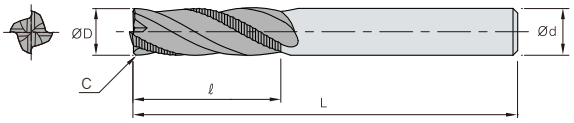
■ **Shouldering depth (ap)**
- ap: ≤ 1.5D (All dia.)
- ae: ≤ 0.5D (All dia.)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

M This is metric size. We can also provide in inch type

EM09CA (Roughing endmill with finishing capability)





4 | H·A 30° | Substrate PC30T | h6 shank

ØD	Tolerance
Ø6~Ø10	0.00~ -0.058
Ø10~Ø18	0.00~ -0.070
Ø18~Ø20	0.00~ -0.084



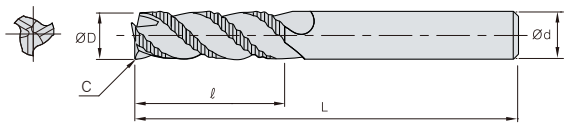
(mm)

Designation		ØD	Ød	ℓ	L	C
EM09CA-	060	6.0	6	14	52	0.25
4	070	7.0	8	18	63	0.3
	080	8.0	8	18	63	0.3
	090	9.0	10	22	80	0.3
	100	10.0	10	22	80	0.3
	110	11.0	12	26	80	0.4
	120	12.0	12	26	80	0.4
	140	14.0	14	30	80	0.4
	160	16.0	16	34	105	0.6
	180	18.0	18	38	105	0.6
	200	20.0	20	42	105	0.6

M This is metric size. We can also provide in inch type

EM11CA (Roughing endmill for wave form of Al)





3 | H·A 45° | Substrate FN30T | h6 shank

ØD	Tolerance
Ø6~Ø10	0.00~ -0.058
Ø10~Ø18	0.00~ -0.070
Ø18~Ø25	0.00~ -0.084



(mm)

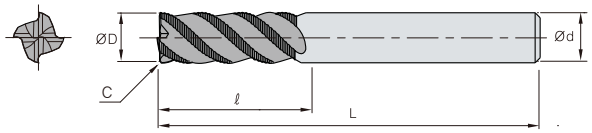
Designation		ØD	Ød	ℓ	L	C
EM11CA-	060	6.0	6	18	63	0.3
3	070	7.0	8	23	63	0.3
	080	8.0	8	23	63	0.3
	090	9.0	10	30	80	0.3
	100	10.0	10	30	80	0.3
	110	11.0	12	32	80	0.5
	120	12.0	12	32	80	0.5
	140	14.0	14	32	80	0.5
	160	16.0	16	48	105	0.5
	180	18.0	18	48	105	0.5
	200	20.0	20	50	105	0.5
	250	25.0	25	50	105	0.5

M This is metric size. We can also provide in inch type

EM36CA (Long type roughing endmill for fine pitches)

High helix angle, irregular flute spacing and lead





4 | H·A 40/42° | Substrate PC30T | h6 shank

ØD	Tolerance
Ø5~Ø20	0.00~ -0.05



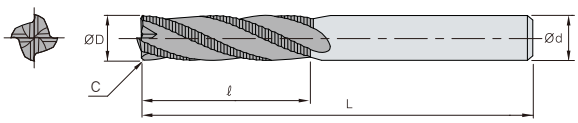
(mm)

Designation		ØD	Ød	ℓ	L	C
EM36CA-	050	5.0	6	19	63	0.3
4	060	6.0	8	19	63	0.5
	080	8.0	8	28	72	0.5
	100	10.0	10	34	82	0.5
	120	12.0	12	40	97	0.5
	140	14.0	16	40	97	0.6
	160	16.0	16	48	108	0.6
	180	18.0	20	48	108	0.6
	200	20.0	20	56	122	0.6

M This is metric size. We can also provide in inch type

EM37CA (Roughing endmill for fine pitches)





4 | H·A 18/23° | Substrate PC30T | h6 shank

ØD	Tolerance
Ø5~Ø20	0.00~ -0.05



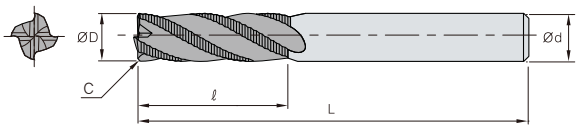
(mm)

Designation		ØD	Ød	ℓ	L	C
EM37CA-	050	5.0	6	13	60	0.3
4	060	6.0	8	13	80	0.5
	080	8.0	8	19	80	0.5
	100	10.0	10	22	80	0.5
	120	12.0	12	26	80	0.5
	140	14.0	16	26	85	0.6
	160	16.0	16	32	100	0.6
	180	18.0	20	32	100	0.6
	200	20.0	20	38	105	0.6

M This is metric size. We can also provide in inch type

EM38CA (Standard roughing endmill)





4 | H·A 30° | Substrate PC40T | h6 shank

ØD	Tolerance
Ø5~Ø20	0.00~ -0.05



(mm)

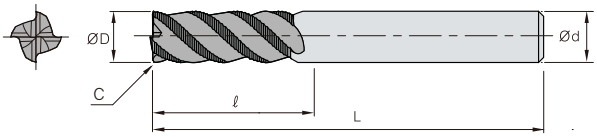
Designation		ØD	Ød	ℓ	L	C
EM38CA-	050	5.0	6	13	50	0.3
4	060	6.0	6	16	50	0.3
	080	8.0	8	20	60	0.3
	100	10.0	10	25	75	0.3
	120	12.0	12	30	80	0.4
	140	14.0	16	35	100	0.6
	160	16.0	16	40	100	0.6
	180	18.0	20	40	110	0.6
	200	20.0	20	45	110	0.6

M This is metric size. We can also provide in inch type

EM43CA (Standard roughing endmill for fine pitches)

High helix angle, irregular flute spacing and lead





4 | H·A 40/42° | Substrate PC30T | h6 shank

ØD	Tolerance
Ø5~Ø20	0.00~ -0.05



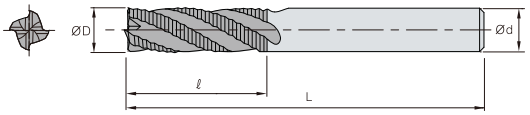
(mm)

Designation		ØD	Ød	ℓ	L	C
EM43CA-	050	5.0	6	13	57	0.3
4	060	6.0	6	13	57	0.5
	080	8.0	8	19	63	0.5
	100	10.0	10	22	72	0.5
	120	12.0	12	26	82	0.5
	140	14.0	16	26	82	0.6
	160	16.0	16	32	92	0.6
	180	18.0	20	32	92	0.6
	200	20.0	20	38	104	0.6

M This is metric size. We can also provide in inch type

EM11PM (Roughing endmill)





4 | H·A 30° | HSSE PM | Substrate HN30T HC30T | h6 shank

ØD	Tolerance
Ø6~Ø10	±0.075
Ø10~Ø18	±0.090
Ø18~Ø20	±0.105



(mm)

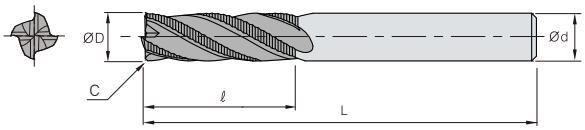
Designation		ØD	Ød	ℓ	L
EM11PM-	060	6.0	6	20	60
4	070	7.0	10	20	70
	080	8.0	10	25	75
	090	9.0	10	30	75
	100	10.0	10	35	85
	120	12.0	12	40	100
	140	14.0	16	40	100
	160	16.0	16	50	110
	180	18.0	20	50	110
	200	20.0	20	60	125

M This is metric size. We can also provide in inch type

EM16PM (Roughing endmill for fine pitches)

Irregular flute spacing





4 | H·A 25/30° | HSSE PM | Substrate HC30T | h6 shank

ØD	Tolerance
Ø6~Ø10	±0.075
Ø10~Ø18	±0.090
Ø1~Ø20	±0.105



(mm)

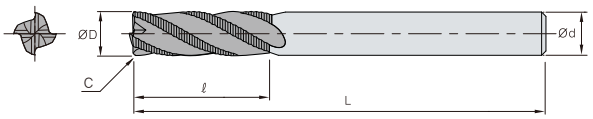
Designation		ØD	Ød	ℓ	L	C
EM16PM-	060	6.0	6	20	60	0.5
4	070	7.0	10	20	70	0.5
	080	8.0	10	25	75	0.5
	090	9.0	10	30	75	0.5
	100	10.0	10	35	85	0.5
	120	12.0	12	40	100	0.6
	140	14.0	12	40	100	0.6
	160	16.0	16	50	110	0.6
	180	18.0	16	50	110	0.6
	200	20.0	20	60	125	0.6

M This is metric size. We can also provide in inch type

EM17PM (Roughing endmill for fine pitches)

Irregular flute spacing





4 | H·A 25/30 | HSSE PM | Substrate HC30T | h6 shank

ØD	Tolerance
Ø6~Ø10	±0.075
Ø10~Ø18	±0.090
Ø18~Ø20	±0.105



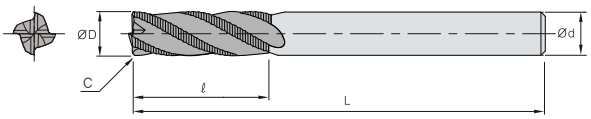
(mm)

Designation		ØD	Ød	ℓ	L	C
EM17PM-	060	6.0	6	13	80	0.5
4	070	7.0	10	16	80	0.5
	080	8.0	10	19	85	0.5
	090	9.0	10	19	95	0.5
	100	10.0	10	22	100	0.5
	120	12.0	12	26	110	0.6
	140	14.0	12	26	110	0.6
	160	16.0	16	32	125	0.6
	180	18.0	16	32	125	0.6
	200	20.0	20	38	140	0.6

M This is metric size. We can also provide in inch type

EM06H9M (Roughing endmill)





4 | H·A 30° | HSSE Co 8% | Substrate HC20T HC10T | h6 shank

ØD	Tolerance
Ø6~Ø10	±0.075
Ø10~Ø18	±0.090
Ø18~Ø20	±0.105



(mm)

Designation		ØD	Ød	ℓ	L
EM06H9-	060	6.0	6	15	60
4	070	7.0	8	20	65
	080	8.0	8	20	65
	090	9.0	10	25	75
	100	10.0	10	25	75
	110	11.0	12	30	80
	120	12.0	12	30	80
	130	13.0	12	35	90
	140	14.0	12	35	90
	150	15.0	12	40	95
	160	16.0	16	40	95
	170	17.0	16	40	95
	180	18.0	16	40	105
	190	19.0	16	45	110
	200	20.0	20	45	110
	210	21.0	20	45	110
	220	22.0	20	45	110
	230	23.0	20	45	110
	240	24.0	25	50	120
	250	25.0	25	50	120
	260	26.0	25	50	120
	270	27.0	25	55	125
	280	28.0	25	55	125
	300	30.0	25	55	125
	320	32.0	32	60	145
	340	34.0	32	60	145
	350	35.0	32	60	145
	360	36.0	32	60	145
	380	38.0	32	65	150
	400	40.0	32	65	150
	420	42.0	42	65	155
	440	44.0	42	65	155
	450	45.0	42	70	160
	460	46.0	42	70	160
	500	50.0	42	70	160

M This is metric size. We can also provide in inch type

Good chip evacuation

Solid Endmills for Aluminum

- Minimum cutting load and built-up edge
- Good surface finish
- DLC coating
  - Higher hardness (Hv3000-7000), longer tool life comparing uncoated endmill
  - Excellent lubrication by low friction co-efficient (u < 0.1)
  - Good chip evacuation
- Superior in Aluminum, Aluminum alloys, Copper and Copper alloys

Copper & aluminum machining

- Built-up edge
- Low heat resistance could create unnecessary stress or accuracy problem after machining
- Scratch due to low hardness
- Low tool life due to flank wear

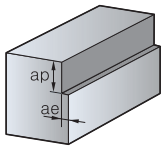
Trouble shooting for copper & aluminum machining

- Use a higher rake, sharp edge, oil (MQL) mist to decrease cutting load and built-up edge
- Increase Vc and reduce the depth of cut for a better surface finish

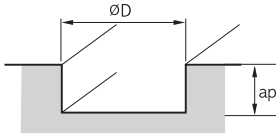
Recommended cutting condition (SSEAA2000)

Workpiece / Condition / Diameter (Ø)	Shouldering				Slotting			
	Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)		Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)	
	R.P.M n (min^{-1})	Feed vf (ipm)	R.P.M n (min^{-1})	Feed vf (ipm)	R.P.M n (min^{-1})	Feed vf (ipm)	R.P.M n (min^{-1})	Feed vf (ipm)
1/16	40,000	27	39,000	21	39,000	21	36,000	14
3/32	40,000	39	31,500	28	31,500	28	26,500	18
1/8	32,000	44	25,000	30	25,000	30	21,000	19
5/32	24,000	47	19,000	31	19,000	31	13,000	20
3/16	19,000	50	15,000	35	15,000	31	13,000	22
7/32	17,500	55	14,000	36	14,000	33	11,000	23
1/4	15,000	60	12,125	38	12,125	35	10,250	24
9/32	14,000	60	11,250	38	11,250	36	9,500	24
5/16	12,000	60	9,500	38	9,500	38	8,000	25
3/8	10,125	60	8,075	38	8,075	38	6,800	25
7/16	8,750	60	6,900	38	7,000	38	5,850	25
1/2	7,500	60	6,000	38	6,000	36	4,975	25
9/16	7,000	60	5,600	38	5,600	35	4,650	24
5/8	6,000	60	4,800	38	4,800	31	4,000	23
11/16	5,550	47	4,425	39	4,425	31	3,700	22
3/4	5,100	47	4,050	39	4,050	31	3,400	21

Application tip



■ **Shouldering depth (ap) and radial deoth (ae)**
- ae: ≤ 0.2D (D < Ø3)
  : ≤ 0.5D (D ≥ Ø3)
- ap: ≤ 2.0D

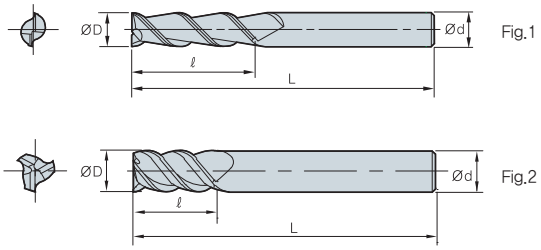


■ **Slotting depth (ap)**
- ap: ≤ D (max: 0.472 inch)

※ Workpiece should be clamped rigidly In case of vibrations, reduce R.P.M and feed rate by the same ratio

SSEAA2000/3000 (Flat)





2 | 3 | H·A 45° | Carbide DLC | Substrate H01 PD3000

ØD	Tolerance
Ø0.0625~Ø0.2188	-0.0004 ~ -0.0012
~Ø0.3750	-0.0006~ -0.0016
~Ø0.5000	-0.0008~ -0.0020

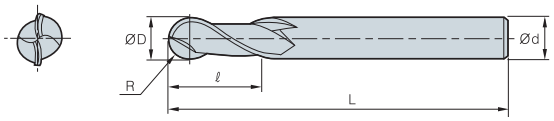
(inch)

Designation		ØD		Ød	ℓ	L	Fig.
SSEAA	200625-1.50	1/16	0.0625	0.1250	0.1562	1.50	1
2	200938-1.50	3/32	0.0938	0.1250	0.2812	1.50	1
	201250-2.00	1/8	0.1250	0.1250	0.3750	2.00	1
	201562-2.00	5/32	0.1562	0.1875	0.5000	2.00	1
	201875-2.00	3/16	0.1875	0.1875	0.6250	2.00	1
	202188-2.00	7/32	0.2188	0.2500	0.6250	2.00	1
	202500-2.50	1/4	0.2500	0.2500	0.7500	2.50	1
	202812-2.50	9/32	0.2812	0.3125	0.7500	2.50	1
	203125-2.50	5/16	0.3125	0.3125	0.7500	2.50	1
	203750-2.75	3/8	0.3750	0.3750	0.7500	2.75	1
	204375-3.00	7/16	0.4375	0.4375	1.0000	3.00	1
	205000-3.50	1/2	0.5000	0.5000	1.2500	3.50	1
	205625-3.50	9/16	0.5625	0.5625	1.5000	3.50	1
	206250-3.50	5/8	0.6250	0.6250	1.5000	3.50	1
	206875-4.00	11/16	0.6875	0.7500	2.0000	4.00	1
	207500-4.00	3/4	0.7500	0.7500	2.0000	4.00	1
SSEAA	200938-1.50	3/32	0.0938	0.1250	0.2812	1.50	2
	201250-2.00	1/8	0.1250	0.1250	0.3750	2.00	2
	201562-2.00	5/32	0.1562	0.1875	0.5000	2.00	2
	201875-2.00	3/16	0.1875	0.1875	0.6250	2.00	2
	202188-2.00	7/32	0.2188	0.2500	0.6250	2.00	2
	202500-2.50	1/4	0.2500	0.2500	0.7500	2.50	2
3	202812-2.50	9/32	0.2812	0.3125	0.7500	2.50	2
	203125-2.50	5/16	0.3125	0.3125	0.7500	2.50	2
	203750-2.75	3/8	0.3750	0.3750	0.7500	2.75	2
	204375-3.00	7/16	0.4375	0.4375	1.0000	3.00	2
	205000-3.50	1/2	0.5000	0.5000	1.2500	3.50	2
	205625-3.50	9/16	0.5625	0.5625	1.5000	3.50	2
	206250-3.50	5/8	0.6250	0.6250	1.5000	3.50	2

Special endmills order: SSEAA3□□□□□× ℓ- L
Ex.1) 3 flutes, diameter: 0.26, ℓ: 0.70, L: 2.40 - SSEAA3026000 × 0.70-2.40L

SSBEAA2000 (Ball)





2 | H·A 45° | Carbide DLC | Substrate H01 PD3000

ØD	Tolerance
All	0~ -0.0012

(inch)

Designation		R	ØD		Ød	ℓ	L
SSBEAA 2	200625-2.75	1/32	1	0.0625	0.1250	0.1562	2.75
	200938-2.75	3/64	1.5	0.0938	0.1250	0.3125	2.75
	201250-2.75	1/16	2	0.1250	0.1250	0.3750	2.75
	201562-2.75	5/64	2.5	0.1562	0.1875	0.5000	2.75
	201875-3.00	3/32	3	0.1875	0.1875	0.6250	3.00
	202188-3.00	7/64	3.5	0.2188	0.2500	0.6250	3.00
	202500-3.50	1/8	4	0.2500	0.2500	0.7500	3.50
	202812-3.50	9/64	4.5	0.2812	0.3125	0.7500	3.50
	203125-3.50	5/32	5	0.3125	0.3125	0.7500	3.50
	203750-4.00	3/16	5.5	0.3750	0.3750	1.0000	4.00
	204375-4.50	7/32	6	0.4375	0.4375	1.2500	4.50
	205000-4.50	1/4	6.5	0.5000	0.5000	1.2500	4.50
	205625-4.50	9/32	7	0.5625	0.5625	1.2500	4.50
	206250-5.00	5/16	7.5	0.6250	0.6250	1.5000	5.00
	206875-5.00	11/32	8	0.6875	0.7500	2.0000	5.00
	207500-5.00	3/8	8.5	0.7500	0.7500	2.0000	5.00

Special endmills order: SSBEA2□□□□□× ℓ - L
Ex.1) 2 flutes, diameter: 0.26. ℓ: 0.70, L: 2.40 × SSBEAA2026000×0.70-2.40L

Technique of machining copper/aluminum steel

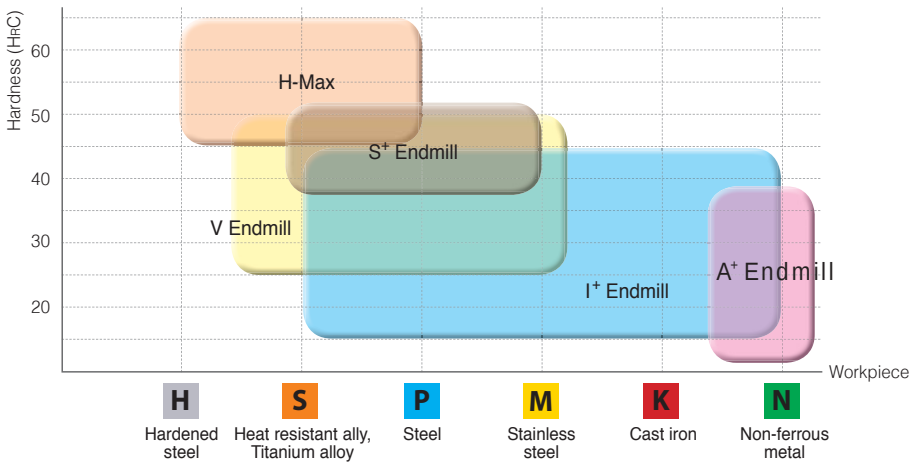
- With high rake angle cutting edge, sharp tools and oil mist, able to minimize cutting load and built-up-edge
- Applying higher cutting speed and shallower depth, able to make surface finishing and productivity improved

Aluminum Endmill

A+ Endmill

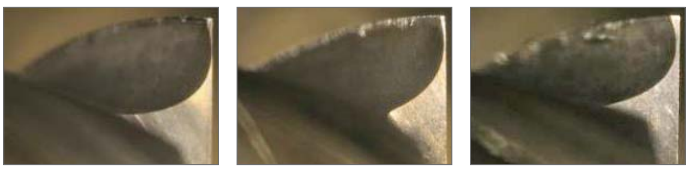
- Exclusive U-shaped flute
  - Excellent chip evacuation even in high feed machining
  - U shaped and buffed flute reduces built-up-edge
- Double relief angle
  - High rigidity of cutting edge ensures high productivity
- Sharp cutting edge
  - For both roughing and finishing (Shouldering, slotting and ramping etc.)

Application area



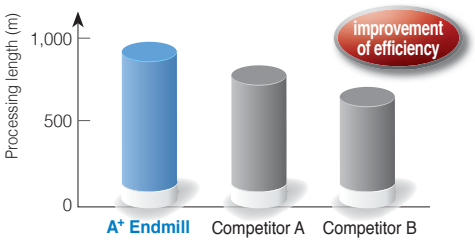
Performance evaluation

- **Workpiece** A7075
- **Cutting conditions** Diameter = Ø8.0, n (min-1) = 8.000, vc (m/min) = 200, vf (mm/min) = 1.200, fz (mm/t) = 0.05, ap (mm) = 8, ae (mm) = 2.0, wet
- **Tools** APFE3080-060



A+ Endmill | Competitor A | Competitor B

Test result

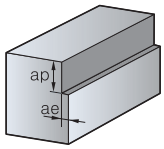


M This is metric size. We can also provide in inch type

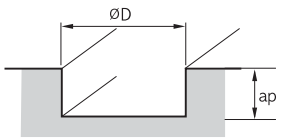
Recommended cutting condition

Workpiece / Condition / Diameter (Ø)	Shouldering				Slotting			
	Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)		Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
1	40,000	480	40,000	368	40,000	368	40,000	280
2	40,000	880	38,000	680	38,000	680	32,000	440
3	32,000	1,120	25,000	760	25,000	760	21,000	480
4	24,000	1,200	19,000	800	19,000	800	13,000	520
5	19,000	1,280	15,000	880	15,000	800	13,000	560
6	16,000	1,520	13,000	960	13,000	880	11,000	600
8	12,000	1,520	9,500	960	9,500	960	8,000	640
10	9,500	1,520	7,600	960	7,600	960	6,400	640
12	8,000	1,520	6,400	960	6,400	960	5,300	640
16	6,000	1,520	4,800	960	4,800	800	4,000	576
20	4,800	1,200	3,800	800	3,800	776	3,200	528

Application tip



■ **Shouldering depth (ap) and radial deoth (ae)**
- ae: ≤ 0.2D (D < Ø3)
  : ≤ 0.5D (D ≥ Ø3)
- ap: ≤ 2.0D



■ **Slotting depth (ap)**
- ap: ≤ D (max: 12 mm)

※ Workpiece should be clamped rigidly In case of vibrations, reduce R.P.M and feed rate by the same ratio

Aluminum machining

- Built-up edge
- Low heat resistance could create residual stress or inaccuracy after machining
- Scratch due to low hardness
- Low tool life due to flank wear

Trouble shooting for aluminum machining

- Use a higher rake, sharp edge and oil (MQL) mist to decrease cutting load and built-up edge
- Increase Vc and reduce the depth of cut for better surface finish



M This is metric size. We can also provide in inch type

APFE2000/3000 (Flat)



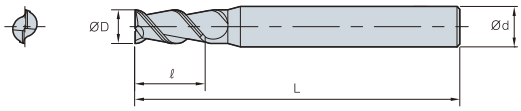


Fig.1

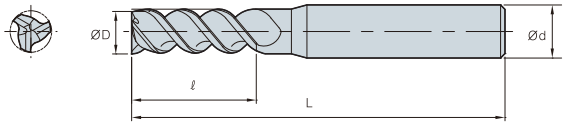


Fig.2



ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03

(mm)

Designation		ØD	Ød	ℓ	L	Fig.
APFE 2	2010-050-S6	1	6	3	50	1
	2015-050-S6	1.5	6	4	50	1
	2020-050-S4	2	4	6	50	1
	2025-050	2.2	6	8	50	1
	2030-050	3.0	6	9	50	1
	2040-050	4.0	6	12	50	1
	2050-050	5.0	6	15	50	1
	2060-050	6.0	6	18	50	1
	2080-060	8.0	8	20	60	1
	2100-075	10.0	10	30	75	1
	2120-075	12.0	12	32	75	1
	2160-100	16.0	16	45	100	1
	2200-100	20.0	20	45	100	1
APFE 3	3010-050-S4	1	4	3	50	2
	3015-050-S4	1.5	4	4	50	2
	3020-050-S4	2	4	6	50	2
	3025-050	2.5	6	8	50	2
	3030-050	3.0	6	9	50	2
	3040-050	4.0	6	12	50	2
	3050-050	5.0	6	15	50	2
	3060-050	6.0	6	18	50	2
	3080-060	8.0	8	20	60	2
	3100-075	10.0	10	30	75	2
	3120-075	12.0	12	32	75	2
	3160-100	16.0	16	45	100	2
	3200-100	20.0	20	45	100	2

M This is metric size. We can also provide in inch type

APLFE2000/3000 (Long flat)



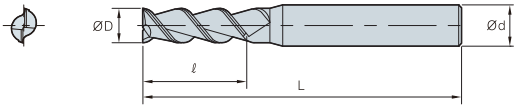


Fig.1

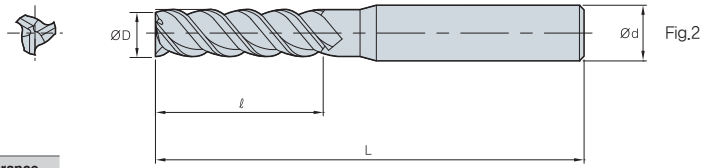


Fig.2

2 | 3 | H·A 50° | Substrate H05S | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03

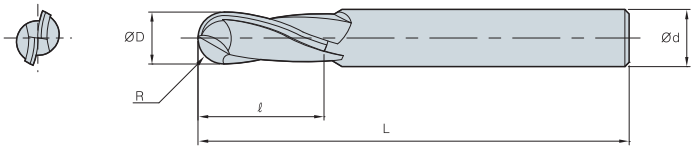
(mm)

Designation		ØD	Ød	ℓ	L	Fig.
APLFE 2	2030-060	3.0	6	12	60	1
	2040-060	4.0	6	16	60	1
	2050-060	5.0	6	20	60	1
	2060-075	6.0	6	25	75	1
	2080-075	8.0	8	32	75	1
	2100-100	10.0	10	45	100	1
	2120-100	12.0	12	45	100	1
	2160-150	16.0	16	65	150	1
	2200-150	20.0	20	75	150	1
APLFE 3	3030-060	3.0	6	12	60	2
	3040-060	4.0	6	16	60	2
	3050-060	5.0	6	20	60	2
	3060-075	6.0	6	25	75	2
	3080-075	8.0	8	32	75	2
	3100-100	10.0	10	45	100	2
	3120-100	12.0	12	45	100	2
	3160-150	16.0	16	65	150	2
	3200-150	20.0	20	75	150	2

M This is metric size. We can also provide in inch type

APBE2000 (Ball)





2 | H·A 25° | Substrate H05S | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02

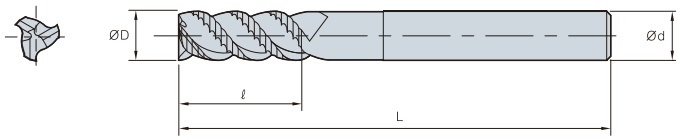
(mm)

Designation		ØD	Ød	ℓ	L
APBE	2010-050	1.0	4	2	50
2	2015-050	1.5	4	3	50
	2020-050	2.0	4	4	50
	2025-050	2.5	4	5	50
	2030-050	3.0	4	6	50
	2035-050	3.5	4	7	50
	2040-050	4.0	4	8	50
	2045-050	4.5	6	9	50
	2050-050	5.0	6	10	50
	2055-050	5.5	6	11	50
	2060-050	6.0	6	12	50
	2080-060	8.0	8	16	60
	2100-075	10.0	10	20	75
	2120-075	12.0	12	24	75

M This is metric size. We can also provide in inch type

APRE3000 (Roughing)





3 | H·A 45° | Substrate H05S | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02

(mm)

Designation		ØD	Ød	ℓ	L
APRE	3040-050	4.0	6	8	50
3	3050-050	5.0	6	13	50
	3060-050	6.0	6	15	50
	3065-060	6.5	8	16	60
	3070-060	7.0	8	16	60
	3075-060	7.5	8	20	60
	3080-060	8.0	8	20	60
	3085-075	8.5	10	20	75
	3090-075	9.0	10	20	75
	3095-075	9.5	10	22	75
	3100-075	10.0	10	25	75
	3110-075	11.0	12	30	75
	3120-075	12.0	12	30	75
	3130-075	13.0	14	30	75
	3140-075	14.0	16	32	75
	3150-075	15.0	16	32	75
	3160-100	16.0	16	35	100
	3170-100	17.0	20	35	100
	3180-100	18.0	20	35	100
	3200-100	20.0	20	45	100
	3250-105	25.0	25	50	105

M This is metric size. We can also provide in inch type

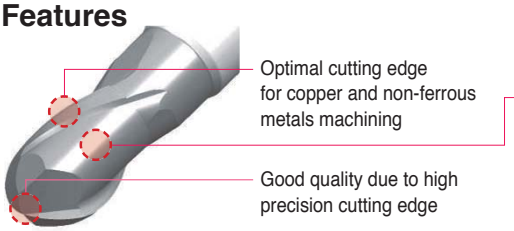
Long tool life and good surface roughness for electrode machining

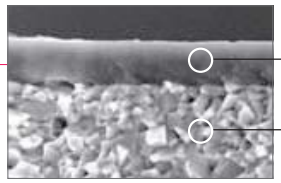
C-Max

Copper

- Superior lubricity, wear resistance & chipping resistance due to the K-Silver coating layer and optimal substrate
- Optimal for copper and non-ferrous metal machining
- Wide line up (ball, flat, radius & long neck type)
- Long tool life and good surface roughness for electrode machining

Features

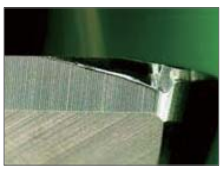




PC210C

Application example

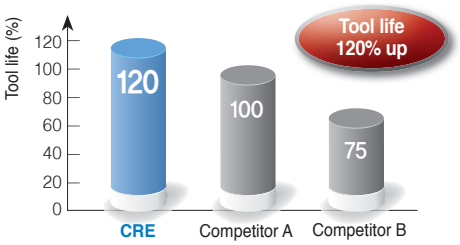
- **Workpiece** Cu
- **Cutting conditions** vc (sfm) = 230, fz (ipt) = 0.0016, ap (inch) = 0.0.024, ae (inch) = 0.118
- **Tools** CRE4100-070-R10


CRE


Competitor A


Competitor B

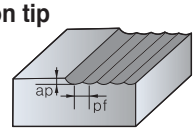
■ **Test result**



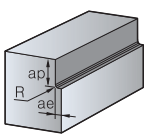
Recommended cutting condition

Workpiece / Condition / Diameter (Ø)	CBE/CBNE		CFE/CFNE		CRE/CRNE	
	Copper Alloys					
	R.P.M n (min^{-1})	Feed vf (ipm)	R.P.M n (min^{-1})	Feed vf (ipm)	R.P.M n (min^{-1})	Feed vf (ipm)
1/32	40,000	126	40,000	94	30,000	94
3/64	40,000	142	31,500	74	25,000	74
1/16	40,000	157	23,000	54	20,000	54
5/64	32,000	126	15,000	35	15,000	35
3/32	25,000	98	12,000	30	12,000	30
7/64	23,000	91	11,000	27	11,000	27
1/8	19,750	78	9,500	22	9,500	22
9/64	18,500	73	9,000	21	9,000	21
5/32	16,000	63	8,000	19	8,000	19
3/16	15,050	54	6,800	16	6,800	16
7/32	11,000	43	5,900	14	5,900	14
1/4	10,000	31	4,900	12	4,900	12

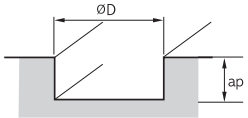
Application tip



• ap = 0.1D
• pf = 0.2D



• ap = 1.5D
• ae = 0.1D

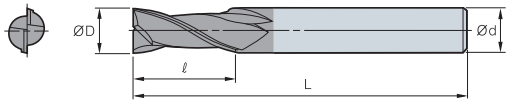


• ap ≤ 1.5D

※ Workpiece should be clamped rigidly In case of vibrations, reduce R.P.M and feed rate by the same ratio

CFEA2000 (Flat)







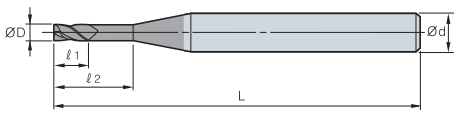
ØD	Tolerance	R Tolerance
Ø0.0313~ -0.2188	Ø0~ -0.0004	±0.0002
Ø0.2500~ -0.5000	Ø0~ -0.0004	±0.0002

(inch)

Designation		ØD		Ød	ℓ	L
CFEA	200625-1.50	1/16	0.0625	0.1250	0.1562	1.50
2	200938-2.00	3/32	0.0938	0.1250	0.1875	2.00
	201250-2.00	1/8	0.1250	0.1250	0.3125	2.00
	201562-2.00	5/32	0.1562	0.1875	0.4375	2.00
	201875-2.50	3/16	0.1875	0.1875	0.5000	2.50
	202188-2.50	7/32	0.2188	0.2500	0.5000	2.50
	202500-2.50	1/4	0.2500	0.2500	0.5000	2.50
	202812-2.50	9/32	0.2812	0.3125	0.6250	2.50
	203125-2.50	5/16	0.3125	0.3125	0.7500	2.50
	203750-2.75	3/8	0.3750	0.3750	0.8750	2.75
	204375-2.75	7/16	0.4375	0.4375	0.8750	2.75
	205000-3.00	1/2	0.5000	0.5000	1.0000	3.00

CFNEA2000 (Long neck flat)







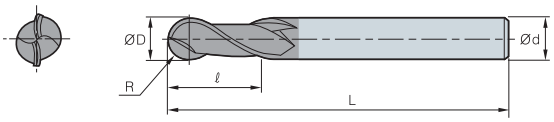
ØD	Tolerance
Ø0.0313~0.2188	0~ -0.004
Ø0.2500~0.5000	0~ -0.004

(inch)

Designation		ØD		Ød	ℓ1	ℓ2	L
CFNEA	200313-2.00-N01576	1/32	0.0313	0.1250	0.05910	0.1576	2.00
2	200313-2.00-N02364	1/32	0.0313	0.1250	0.05910	0.2364	2.00
	200313-2.00-N03152	1/32	0.0313	0.1250	0.05910	0.3152	2.00
	200313-2.00-N03940	1/32	0.0313	0.1250	0.05910	0.3940	2.00
	200625-2.00-N02364	1/16	0.0625	0.1250	0.09062	0.2364	2.00
	200625-2.00-N03152	1/16	0.0625	0.1250	0.09062	0.3152	2.00
	200625-2.00-N03940	1/16	0.0625	0.1250	0.09062	0.3940	2.00
	200625-2.00-N04728	1/16	0.0625	0.1250	0.09062	0.4728	2.00
	200938-2.00-N02364	3/32	0.0938	0.1250	0.11820	0.2364	2.00
	200938-2.00-N03152	3/32	0.0938	0.1250	0.11820	0.3152	2.00
	200938-2.00-N03940	3/32	0.0938	0.1250	0.11820	0.3940	2.00
	200938-2.00-N04728	3/32	0.0938	0.1250	0.11820	0.4728	2.00
	201250-2.00-N03940	1/8	0.1250	0.1875	0.17730	0.3940	2.00
	201250-2.00-N04728	1/8	0.1250	0.1875	0.17730	0.4728	2.00
	201250-2.50-N05516	1/8	0.1250	0.1875	0.17730	0.5516	2.50
	201250-2.50-N06304	1/8	0.1250	0.1875	0.17730	0.6304	2.50
	201562-2.00-N04728	5/32	0.1562	0.2500	0.23640	0.4728	2.00
	201562-2.00-N06304	5/32	0.1562	0.2500	0.23640	0.6304	2.00
	201562-2.50-N07880	5/32	0.1562	0.2500	0.23640	0.7880	2.50

CBEA2000 (Ball)





2 | H·A 30° | CrN | Substrate PC210C

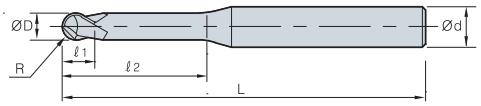
ØD	Tolerance	R Tolerance
Ø0.0313~ -0.2188	Ø0~ -0.0004	±0.0002
Ø0.2500~ -0.5000	Ø0~ -0.0004	±0.0002

(inch)

Designation		R	ØD		Ød	ℓ	L
CBEA 2	200625-2.00	1/32	1/16	0.0625	0.1250	0.1562	2.00
	200938-2.00	3/64	3/32	0.0938	0.1250	0.1875	2.00
	201250-2.25	1/16	1/8	0.1250	0.1250	0.3125	2.25
	201562-2.75	5/64	5/32	0.1562	0.1875	0.3125	2.75
	201875-3.00	3/32	3/16	0.1875	0.1875	0.3750	3.00
	202188-3.00	7/64	7/32	0.2188	0.2500	0.5000	3.00
	202500-3.00	1/8	1/4	0.2500	0.2500	0.5000	3.00
	202812-3.50	9/64	9/32	0.2812	0.3125	0.5625	3.50
	203125-3.50	5/32	5/16	0.3125	0.3125	0.5625	3.50
	203750-4.00	3/16	3/8	0.3750	0.3750	0.6875	4.00
	204375-4.00	7/32	7/16	0.4375	0.4375	0.6875	4.00
	205000-4.50	1/4	1/2	0.5000	0.5000	0.8750	4.50

CBNEA2000 (Long neck ball)





2 | H·A 30° | CrN | Substrate PC210C

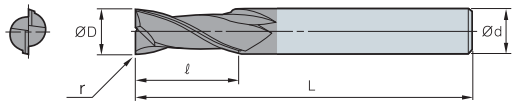
ØD	Tolerance	R Tolerance
Ø0.0313~ -0.2188	Ø0~ -0.0004	±0.0002
Ø0.2500~ -0.5000	Ø0~ -0.0004	±0.0002

(inch)

Designation		R	ØD		Ød	ℓ1	ℓ2	L
CBNEA 2	200313-2.00-N01576	1/64	1/32	0.0313	0.1250	0.0394	0.1576	2.00
	200313-2.00-N02364	1/64	1/32	0.0313	0.1250	0.0394	0.2364	2.00
	200313-2.00-N03152	1/64	1/32	0.0313	0.1250	0.0394	0.3152	2.00
	200313-2.00-N03940	1/64	1/32	0.0313	0.1250	0.0394	0.3940	2.00
	200625-2.00-N03152	1/32	1/16	0.0625	0.1250	0.0591	0.3152	2.00
	200625-2.00-N03940	1/32	1/16	0.0625	0.1250	0.0591	0.3940	2.00
	200625-2.00-N04728	1/32	1/16	0.0625	0.1250	0.0591	0.4728	2.00
	200625-2.00-N05516	1/32	1/16	0.0625	0.1250	0.0591	0.5516	2.00
	200938-2.00-N03152	3/64	3/32	0.0938	0.1250	0.0788	0.3152	2.00
	200938-2.00-N03940	3/64	3/32	0.0938	0.1250	0.0788	0.3940	2.00
	200938-2.00-N04728	3/64	3/32	0.0938	0.1250	0.0788	0.4728	2.00
	200938-2.00-N05516	3/64	3/32	0.0938	0.1250	0.0788	0.5516	2.00
	201250-2.00-N03940	1/16	1/8	0.1250	0.1875	0.1182	0.3940	2.00
	201250-2.00-N04728	1/16	1/8	0.1250	0.1875	0.1182	0.4728	2.00
	201250-2.00-N05516	1/16	1/8	0.1250	0.1875	0.1182	0.5516	2.00
	201250-2.00-N06304	1/16	1/8	0.1250	0.1875	0.1182	0.6304	2.00
	201562-2.50-N06304	5/64	5/32	0.1562	0.2500	0.1576	0.6304	2.50
	201562-2.50-N07880	5/64	5/32	0.1562	0.2500	0.1576	0.7880	2.50
	201562-3.00-N09850	5/64	5/32	0.1562	0.2500	0.1576	0.9850	3.00
	201562-3.00-N11820	5/64	5/32	0.1562	0.2500	0.1576	1.1820	3.00

CREA2000 (Radius)





2 | H·A 30° | CrN | Substrate PC210C

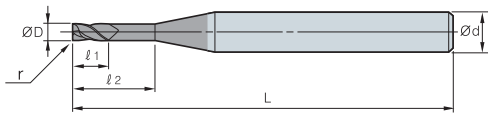
ØD	Tolerance
Ø0.0313~0.2188	0~ -0.004
Ø0.2500~0.5000	0~ -0.004

(inch)

Designation		r	ØD		Ød	ℓ	L
CRE	200938-2.00	0.02	3/32	0.0938	0.1250	0.2188	2.00
2	201250-2.00	0.02	1/8	0.1250	0.1250	0.3125	2.00
	201562-2.00	0.02	5/32	0.1562	0.1875	0.4375	2.00
	201875-2.50	0.02	3/16	0.1875	0.1875	0.5000	2.50
	202188-2.50	0.02	7/32	0.2188	0.2500	0.5000	2.50
	202500-2.50	0.02	1/4	0.2500	0.2500	0.5000	2.50
	202812-2.50	0.02	9/32	0.2812	0.3125	0.6250	2.50
	203125-2.50	0.04	5/16	0.3125	0.3125	0.7500	2.50
	203750-2.75	0.04	3/8	0.3750	0.3750	0.8750	2.75
	204375-2.75	0.04	7/16	0.4375	0.4375	0.8750	2.75
	205000-3.00	0.04	1/2	0.5000	0.5000	1.0000	3.00

CRNEA2000 (Long neck radius)





2 | H·A 30° | CrN | Substrate PC210C

ØD	Tolerance
Ø0.0313~0.2188	0~ -0.004
Ø0.2500~0.5000	0~ -0.004

(inch)

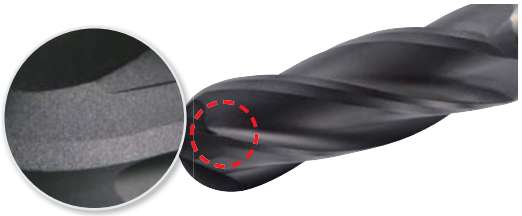
Designation		r	ØD		Ød	ℓ1	ℓ2	L
CRNE	200313-2.00-R.01N01576	0.01	1/32	0.0313	0.1250	0.0591	0.1576	2.00
2	200313-2.00-R.01N02364	0.01	1/32	0.0313	0.1250	0.0591	0.2364	2.00
	200313-2.00-R.01N03152	0.01	1/32	0.0313	0.1250	0.0591	0.3152	2.00
	200313-2.00-R.01N03940	0.01	1/32	0.0313	0.1250	0.0591	0.3940	2.00
	200625-2.00-R.01N02364	0.01	1/16	0.0625	0.1250	0.0906	0.2364	2.00
	200625-2.00-R.01N03152	0.01	1/16	0.0625	0.1250	0.0906	0.3152	2.00
	200625-2.00-R.01N03940	0.01	1/16	0.0625	0.1250	0.0906	0.3940	2.00
	200625-2.00-R.01N04728	0.01	1/16	0.0625	0.1250	0.0906	0.4728	2.00
	200938-2.00-R.02N02364	0.02	3/32	0.0938	0.1250	0.1182	0.2364	2.00
	200938-2.00-R.02N03152	0.02	3/32	0.0938	0.1250	0.1182	0.3152	2.00
	200938-2.00-R.02N03940	0.02	3/32	0.0938	0.1250	0.1182	0.3940	2.00
	200938-2.00-R.02N04728	0.02	3/32	0.0938	0.1250	0.1182	0.4728	2.00
	201250-2.00-R.02N03940	0.02	1/8	0.1250	0.1875	0.1773	0.3940	2.00
	201250-2.00-R.02N04728	0.02	1/8	0.1250	0.1875	0.1773	0.4728	2.00
	201250-2.50-R.02N05516	0.02	1/8	0.1250	0.1875	0.1773	0.5516	2.50
	201250-2.50-R.02N06304	0.02	1/8	0.1250	0.1875	0.1773	0.6304	2.50
	201562-2.00-R.02N04728	0.02	5/32	0.1562	0.2500	0.2364	0.4728	2.00
	201562-2.00-R.02N06304	0.02	5/32	0.1562	0.2500	0.2364	0.6304	2.00
	201562-2.50-R.02N07880	0.02	5/32	0.1562	0.2500	0.2364	0.7880	2.50

Diamond coated endmill

D Endmill new

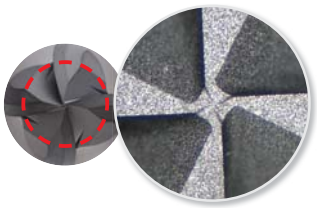
- Tangential cutting-edge geometries for excellent surface finish
- Excellent wear resistance due to high hardness and high purity diamond coating
- Advanced surface finish and cutting performance thanks to sharp edges and tangential tool geometries

Features



Tangential cutting-edge geometries

- One-Pass grinding system
- Prevents stepped cone on the machined surface
- 2-flutes and 4-flutes tooling with a ball nose

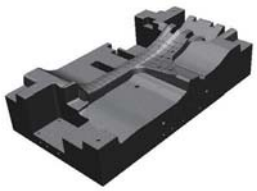


Center-matched ball shape (4-flutes)

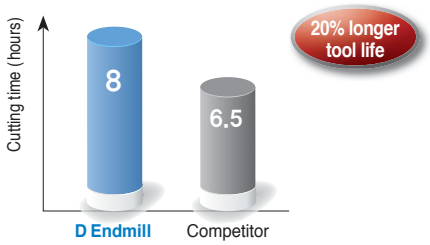
- Ball point shape for high feed machining
- Improved rigidity and excellent surface finish

Application examples

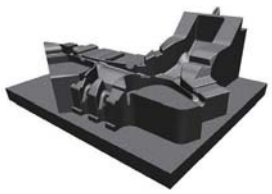
- **Workpiece** Graphite mold
- **Cutting conditions** vc (m/min) = 100, fz (mm/t) = 0.11, ap (mm) = 0.26, dry
- **Tools** DBE4060-110-N250S06



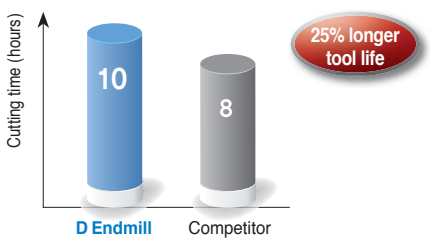
■ Test result



- **Workpiece** Graphite mold
- **Cutting conditions** vc (m/min) = 180, fz (mm/t) = 0.1, ap (mm) = 0.2, dry
- **Tools** DBE2060-110-N250S06



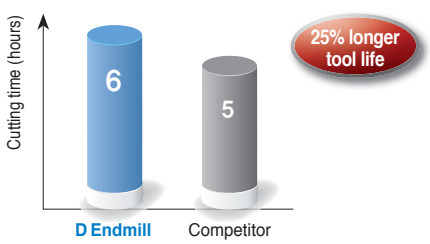
■ Test result



- **Workpiece** Graphite mold
- **Cutting conditions** vc (m/min) = 300, fz (mm/t) = 0.1, ap (mm) = 0.15, dry
- **Tools** DBE2060-080-N250S06



■ Test result

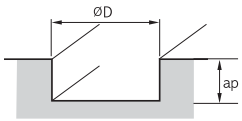


M This is metric size. We can also provide in inch type

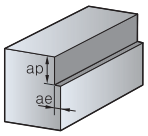
Recommended cutting conditions (Flat type)

Tool	DFE2000 (Slotting)		DFE2000 (Shouldering)		DFE4000 (Shouldering)	
Workpiece	Graphite					
Conditions / Diameter (Ø)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
1	40,000	500	40,000	700	-	-
2	25,000	570	25,000	800	25,000	1,600
3	20,000	570	20,000	800	20,000	1,600
4	18,000	680	18,000	950	18,000	1,900
5	14,000	960	14,000	1,200	14,000	2,400
6	11,000	1,000	11,000	1,400	11,000	2,800
8	8,000	930	8,000	1,300	8,000	2,600
10	6,500	860	6,500	1,200	6,500	2,400
12	5,500	860	5,500	1,200	5,500	2,400

Application tip



■ **Slotting depth (ap)**
- D ≤ Ø2.5, ap = 0.3D
- D > Ø2.5, ap = 0.5D



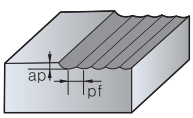
■ **Shouldering depth (ap)**
- D ≤ Ø2.5, ap = 1.5D, ae = 0.05D
- D > Ø2.5, ap = 1.5D, ae = 0.1D

※ Workpiece should be clamped rigidly In case of vibrations, reduce R.P.M and feed rate by the same ratio

Recommended cutting conditions (Ball type)

Tool	DBE2000		DBE4000	
Workpiece	Graphite			
Conditions / Diameter (Ø)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
1	16,000	400	-	-
2	16,000	800	16,000	1,200
3	16,000	1,450	16,000	2,000
4	16,000	2,100	16,000	3,100
5	15,500	2,550	15,000	3,800
6	15,000	2,950	15,000	4,400
8	13,000	3,000	13,000	4,500
10	11,500	3,000	12,000	4,600
12	10,700	3,200	10,000	4,700

Application tip



■ **Depth of cut (ap)**
- ap = 0.2D
- pf = 0.2D

※ Workpiece should be clamped rigidly In case of vibrations, reduce R.P.M and feed rate by the same ratio

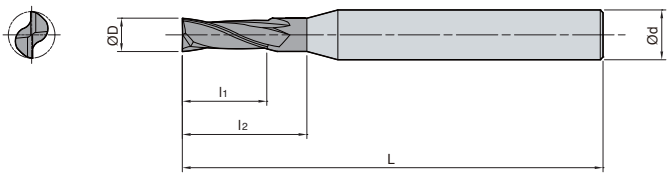
Notice

- Cutting conditions are up to the machine's condition and the shape of cutting
- Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio
- When the overhang is longer than 3D, reduce RPM and feed rate

M This is metric size. We can also provide in inch type

DFE2000 (Flat)












ØD	Tolerance
~Ø5.9	0.00~ -0.02
Ø6.0~	0.00~ -0.03

(mm)

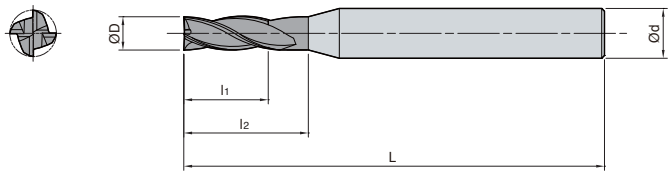
Designation		ØD	Ød	l_1	l_2	L
DFE	2010-045-N050S04	1	4	3	5	45
	2010-060-N050S04	1	4	3	5	60
	2010-060-N100S04	1	4	3	10	60
	2010-060-N150S04	1	4	3	15	60
	2010-060-N200S04	1	4	3	20	60
	2010-060-N250S04	1	4	3	25	60
	2015-060-N050S04	1.5	4	4	5	60
	2015-060-N100S04	1.5	4	4	10	60
	2015-060-N150S04	1.5	4	4	15	60
	2015-060-N200S04	1.5	4	4	20	60
	2015-060-N250S04	1.5	4	4	25	60
	2020-045-N080S04	2	4	6	8	45
	2020-080-N080S04	2	4	6	8	80
	2020-080-N100S04	2	4	6	10	80
	2020-080-N150S04	2	4	6	15	80
	2020-080-N200S04	2	4	6	20	80
	2020-080-N250S04	2	4	6	25	80
	2020-080-N300S04	2	4	6	30	80
	2020-080-N400S04	2	4	6	40	80
	2030-050-N100S06	3	6	9	10	50
	2030-080-N100S04	3	4	9	10	80
	2030-080-N200S04	3	4	9	20	80
	2030-080-N250S04	3	4	9	25	80
	2030-080-N300S04	3	4	9	30	80
	2030-080-N400S04	3	4	9	40	80
	2040-050-N160S06	4	6	12	16	50
	2040-080-N160S04	4	4	12	16	80
	2050-060-N200S06	5	6	15	20	60
	2050-110-N200S06	5	6	15	20	110
	2060-060-N180S06	6	6	18	-	60
	2060-110-N250S06	6	6	18	25	110
	2060-150-N250S06	6	6	18	25	150
	2080-070-N250S08	8	8	25	-	70
	2080-150-N400S08	8	8	25	40	150
	2100-080-N300S10	10	10	30	-	80
	2100-150-N500S10	10	10	30	50	150
	2120-080-N350S12	12	12	35	-	80
	2120-150-N600S12	12	12	35	60	150

M This is metric size. We can also provide in inch type



DFE4000 (Flat)













ØD	Tolerance
~Ø5.9	0.00~ -0.02
Ø6.0~	0.00~ -0.03

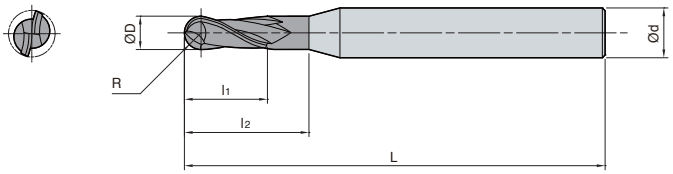
(mm)

Designation		ØD	Ød	l_1	l_2	L
DFE	4020-045-N060S04	2	4	6	8	45
4	4020-060-N100S04	2	4	10	12	60
	4030-050-N100S06	3	6	10	12	50
	4030-060-N150S04	3	4	15	18	60
	4040-050-N150S06	4	6	15	18	50
	4040-080-N200S04	4	4	20	-	80
	4060-060-N180S06	6	6	18	-	60
	4060-110-N300S06	6	6	30	-	110
	4060-150-N300S06	6	6	30	-	150
	4080-070-N250S08	8	8	25	-	70
	4080-110-N400S08	8	8	40	-	110
	4080-150-N400S08	8	8	40	-	150
	4100-080-N250S10	10	10	25	-	80
	4100-110-N400S10	10	10	40	-	110
	4100-150-N500S10	10	10	50	-	150
	4120-080-N300S12	12	12	30	-	80
	4120-110-N400S12	12	12	40	-	110
	4120-150-N500S12	12	12	50	-	150

M This is metric size. We can also provide in inch type

DBE2000 (Ball)












ØD	Tolerance
~Ø5.9	0.00~ -0.02
Ø6.0~	0.00~ -0.03

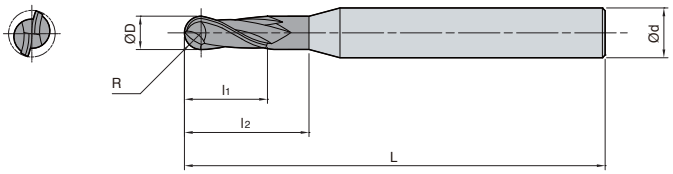
(mm)

Designation		R	ØD	Ød	l_1	l_2	L
DBE	2006-045-N020S04	0.3	0.6	4	2	2	45
	2006-045-N050S04	0.3	0.6	4	2	5	45
	2006-045-N080S04	0.3	0.6	4	2	8	45
	2006-045-N100S04	0.3	0.6	4	2	10	45
	2008-045-N030S04	0.4	0.8	4	2.5	3	45
	2008-045-N050S04	0.4	0.8	4	2.5	5	45
	2008-045-N100S04	0.4	0.8	4	2.5	10	45
	2010-060-N030S04	0.5	1	4	3	3	60
	2010-060-N050S04	0.5	1	4	3	5	60
	2010-060-N080S04	0.5	1	4	3	8	60
	2010-060-N100S04	0.5	1	4	3	10	60
	2010-060-N120S04	0.5	1	4	3	12	60
	2010-060-N150S04	0.5	1	4	3	15	60
	2010-060-N200S04	0.5	1	4	3	20	60
	2010-080-N250S04	0.5	1	4	3	25	80
	2010-080-N300S04	0.5	1	4	3	30	80
	2010-080-N350S04	0.5	1	4	3	35	80
	2010-080-N400S04	0.5	1	4	3	40	80
	2015-060-N050S04	0.75	1.5	4	4	5	60
	2015-080-N100S04	0.75	1.5	4	4	10	80
	2015-080-N150S04	0.75	1.5	4	4	15	80
	2015-080-N200S04	0.75	1.5	4	4	20	80
	2015-080-N250S04	0.75	1.5	4	4	25	80
	2015-080-N300S04	0.75	1.5	4	4	30	80
	2015-080-N350S04	0.75	1.5	4	4	35	80
	2015-080-N400S04	0.75	1.5	4	4	40	80
	2020-060-N080S04	1	2	4	6	8	60
	2020-080-N100S04	1	2	4	6	10	80
	2020-080-N150S04	1	2	4	6	15	80
	2020-080-N200S04	1	2	4	6	20	80
	2020-080-N250S04	1	2	4	6	25	80
	2020-080-N300S04	1	2	4	6	30	80
	2020-080-N350S04	1	2	4	6	35	80
	2020-100-N400S04	1	2	4	6	40	100
	2020-100-N450S04	1	2	4	6	45	100
	2020-100-N500S04	1	2	4	6	50	100

M This is metric size. We can also provide in inch type

DBE2000 (Ball)













ØD	Tolerance
~Ø5.9	0.00~ -0.02
Ø6.0~	0.00~ -0.03

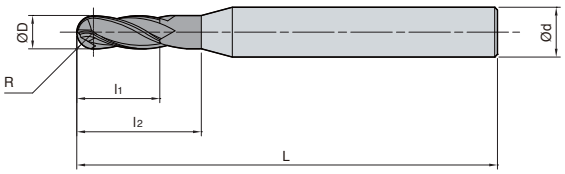
(mm)

Designation		R	ØD	Ød	l1	l2	L
DBE	2030-060-N100S04	1.5	3	4	9	10	60
2	2030-100-N150S04	1.5	3	4	9	15	100
	2030-100-N200S04	1.5	3	4	9	20	100
	2030-100-N250S04	1.5	3	4	9	25	100
	2030-100-N300S04	1.5	3	4	9	30	100
	2030-100-N350S04	1.5	3	4	9	35	100
	2030-100-N400S04	1.5	3	4	9	40	100
	2030-100-N500S04	1.5	3	4	9	50	100
	2040-060-N160S04	2	4	4	12	16	60
	2040-080-N160S04	2	4	4	12	16	80
	2040-080-N300S04	2	4	4	12	30	80
	2040-100-N160S04	2	4	4	12	16	100
	2040-100-N400S04	2	4	4	12	40	100
	2040-130-N160S04	2	4	4	12	16	130
	2040-130-N400S04	2	4	4	12	40	130
	2050-110-N200S06	2.5	5	6	15	20	110
	2060-080-N250S06	3	6	6	20	25	80
	2060-110-N250S06	3	6	6	20	25	110
	2060-150-N300S06	3	6	6	20	30	150
	2080-080-N300S08	4	8	8	25	30	80
	2080-110-N300S08	4	8	8	25	30	110
	2080-150-N500S08	4	8	8	25	50	150
	2080-200-N400S08	4	8	8	25	40	200
	2100-080-N400S10	5	10	10	30	40	80
	2100-110-N400S10	5	10	10	30	40	110
	2100-150-N600S10	5	10	10	30	60	150
	2100-200-N500S10	5	10	10	30	50	200
	2120-110-N500S12	6	12	12	35	50	110
	2120-150-N500S12	6	12	12	35	50	150
	2120-200-N600S12	6	12	12	35	60	200

M This is metric size. We can also provide in inch type

DBE4000 (Ball)





4 | H·A 30° | Substrate ND3000 | h6 shank

ØD	Tolerance
~Ø5.9	0.00~ -0.02
Ø6.0~	0.00~ -0.03

(mm)

Designation		R	ØD	Ød	l_1	l_2	L
DBE 4	4020-060-N080S04	1	2	4	6	8	60
	4020-080-N100S04	1	2	4	6	10	80
	4020-080-N200S04	1	2	4	6	20	80
	4020-080-N300S04	1	2	4	6	30	80
	4020-080-N400S04	1	2	4	6	40	80
	4030-060-N100S04	1.5	3	4	9	10	60
	4030-100-N150S04	1.5	3	4	9	15	100
	4030-100-N200S04	1.5	3	4	9	20	100
	4030-100-N300S04	1.5	3	4	9	30	100
	4030-100-N400S04	1.5	3	4	9	40	100
	4030-100-N500S04	1.5	3	4	9	50	100
	4040-060-N160S04	2	4	4	12	16	60
	4040-080-N160S04	2	4	4	12	16	80
	4040-100-N160S04	2	4	4	12	16	100
	4040-130-N160S04	2	4	4	12	16	130
	4060-080-N250S06	3	6	6	20	25	80
	4060-110-N250S06	3	6	6	20	25	110
	4060-150-N300S06	3	6	6	20	30	150
	4080-080-N300S08	4	8	8	25	30	80
	4080-110-N300S08	4	8	8	25	30	110
	4080-150-N350S08	4	8	8	25	35	150
	4080-200-N400S08	4	8	8	25	40	200
	4100-080-N350S10	5	10	10	30	35	80
	4100-110-N350S10	5	10	10	30	35	110
	4100-150-N400S10	5	10	10	30	40	150
	4100-200-N500S10	5	10	10	30	50	200
	4120-110-N500S12	6	12	12	35	50	110
	4120-150-N500S12	6	12	12	35	50	150
	4120-200-N600S12	6	12	12	35	60	200

M This is metric size. We can also provide in inch type

Router endmill for machining composite materials

Composite Router Endmill new

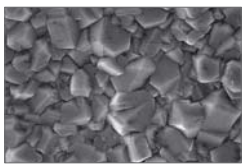
- Router endmills optimized for machining composite materials (CFRP/GFRP)
- Excellent tool life thanks to nano-crystal diamond coating
- Blade design for reducing flaking and burrs
- Improved productivity through high efficiency machining

Features

- Diamond-coated grade ND2110 for machining composite materials
- High hardness diamond coating (over Hv 8,000)
- Nano-diamond coating with excellent resistance to friction and welding
- Improved resistance to flaking thanks by applying the specialized grade for diamond coating



Nano-diamond coating


Existing diamond coating

CCR (Router Endmill)

- Down cut design for low vibrations and cutting force
- Endmill for roughing, profiling, and grooving



CCDR (Dual Helix Router Endmill)

- Dual helix design to inhibit flaking on upper and lower faces of workpieces
- Endmill for finishing, profiling, and grooving



CCLR (Low Helix Router Endmill)

- Fewer burrs thanks to the low axial cutting force
- Endmill for finishing, profiling, and blind groove making



CCRR (Reverse Helix Router Endmill)

- Reverse helix design to inhibit a drift in the workpiece's course
- Endmill for finishing, profiling, and through groove making



M This is metric size. We can also provide in inch type

CCDR4000/6000 (Flat)



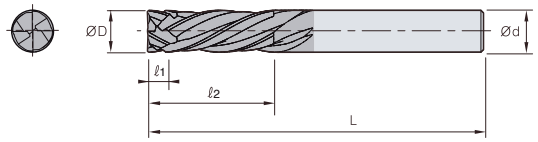


Fig.1

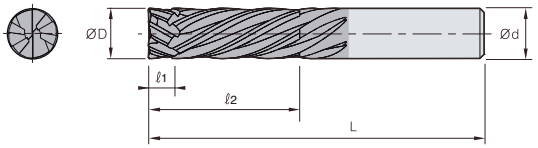


Fig.2

4 6 H·A 30°/30° Substrate ND2100 h5 shank

ØD	Tolerance
Ø6~12	0.00~ -0.03 mm

(mm)

Designation		ØD	Ød	ℓ1	ℓ2	L	Fig.
CCDR 4	4060-065	6	6	3	18	65	1
	4080-075	8	8	4	24	75	1
CCDR 6	6100-085	10	10	5	30	85	2
	6120-100	12	12	6	36	100	2

4 6 H·A 30°/30° Substrate ND2100 h5 shank

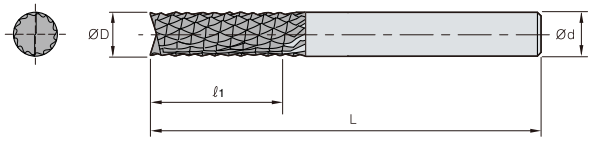
ØD	Tolerance
Ø0.250~0.500	0.0000~ -0.0012 inch

(inch)

Designation		ØD	Ød	ℓ1	ℓ2	L	Fig.
CCDR 4	402500	1/4 0.250	0.250	0.125	0.750	2.500	1
	402500L	1/4 0.250	0.250	0.125	1.500	4.000	1
CCDR 6	603750	3/8 0.375	0.375	0.125	1.000	3.250	2
	603750L	3/8 0.375	0.375	0.125	1.500	4.000	2
	605000	1/2 0.500	0.500	0.125	1.000	3.250	2
	605000L	1/2 0.500	0.500	0.125	1.500	4.000	2

CCR2000 (Flat)





2 | H·A -27° | Substrate ND2100 | h5 shank

ØD	Tolerance
Ø4~12	-0.02~-0.08 mm

(mm)

Designation		ØD	Ød	ℓ1	L
CCR 2	2040-050	4	4	12	50
	2050-050	5	5	15	50
	2060-065	6	6	18	65
	2080-075	8	8	24	75
	2100-085	10	10	30	85
	2120-100	12	12	36	100

2 | H·A -27° | Substrate ND2100 | h5 shank

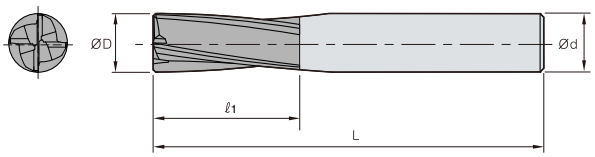
ØD	Tolerance
Ø0.250~0.500	-0.0008~-0.0032 inch

(inch)

Designation		ØD		Ød	ℓ1	L
CCR 2	202500	1/4	0.250	0.250	0.750	2.500
	202500L	1/4	0.250	0.250	1.500	4.000
	203750	3/8	0.375	0.375	1.000	3.250
	203750L	3/8	0.375	0.375	1.500	4.000
	205000	1/2	0.500	0.500	1.000	3.250
	205000L	1/2	0.500	0.500	1.500	4.000

CCLR4000 (Flat)





4 | H·A 15° | Substrate ND2100 | h5 shank

ØD	Tolerance
Ø4~12	0.00~ -0.03 mm

(mm)

Designation		ØD	Ød	ℓ1	L
CCLR 4	4040-050	4	4	12	50
	4050-050	5	5	15	50
	4060-065	6	6	18	65
	4080-075	8	8	24	75
	4100-085	10	10	30	85
	4120-100	12	12	36	100

4 | H·A 15° | Substrate ND2100 | h5 shank

ØD	Tolerance
Ø0.250~0.500	0.0000~ -0.0012 inch

(inch)

Designation		ØD		Ød	ℓ1	L
CCLR 4	402500	1/4	0.250	0.250	0.750	2.500
	402500L	1/4	0.250	0.250	1.500	4.000
	403750	3/8	0.375	0.375	1.000	3.250
	403750L	3/8	0.375	0.375	1.500	4.000
	405000	1/2	0.500	0.500	1.000	3.250
	405000L	1/2	0.500	0.500	1.500	4.000

CCRR6000/8000 (Flat)



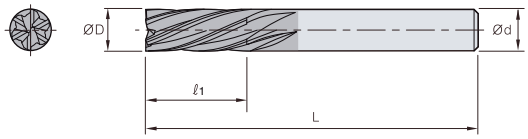


Fig.1

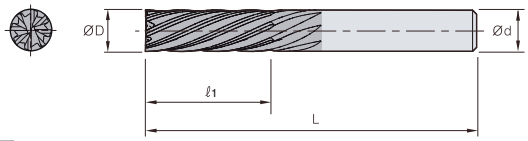


Fig.2

6 | 8 | H·A -25° | Substrate ND2100 | h5 shank

ØD	Tolerance
Ø6~12	0.00~ -0.03 mm

(mm)

Designation		ØD	Ød	ℓ1	L	Fig.
CCRR 6	6060-065	6	6	18	65	1
	6080-075	8	8	24	75	1
CCRR 8	8100-085	10	10	30	85	2
	8120-100	12	12	36	100	2

6 | 8 | H·A -25° | Substrate ND2100 | h5 shank

ØD	Tolerance
Ø0.250~0.500	0.0000~ -0.0012 inch

(inch)

Designation		ØD		Ød	ℓ1	L	Fig.
CCRR 6	602500	1/4	0.250	0.250	0.750	2.500	1
	602500L	1/4	0.250	0.250	1.500	4.000	1
CCRR 8	803750	3/8	0.375	0.375	1.000	3.250	2
	803750L	3/8	0.375	0.375	1.500	4.000	2
	805000	1/2	0.500	0.500	1.000	3.250	2
	805000L	1/2	0.500	0.500	1.500	4.000	2

Longer tool life and good surface finishes

PCD Endmill



- Longer tool life and good surface roughness
- Reducing burrs at non-ferrous metals machining
- 1000 type: Ultra finishing for non-ferrous metals
- 2000 type: Optimal for aluminum alloy, carbon steel, graphite and reinforced Plastic machining

PCD endmill code system

PDEA	2	03750
Endmill	**No. of Flute**	**Diameter**
PDE: PCD Endmill	2 Flutes	03750: Ø0.3750

Recommended cutting condition

Workpiece	vc (sfm)	n (min^{-1})	fz (ipt)
Aluminum Alloy, Copper	100~985	2,000~12,000	0.008~0.0028
Reinforced Plastic	115~985	2,800~16,000	0.0016~0.0047
Carbon steel, Graphite	35~330	5,300~16,000	0.0016~0.0080

Special endmill order form



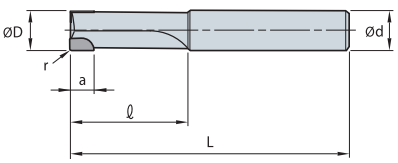


Fig.1

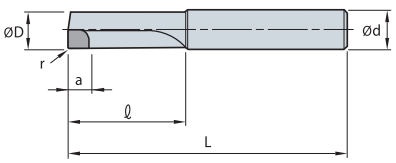


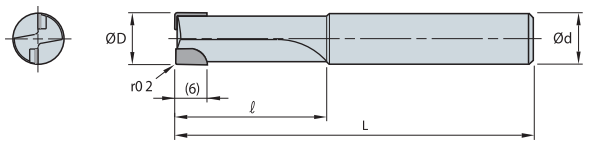
Fig.2

Designation	Fig.	No. of Flute	Dimension (mm)					
			ØD	Ød	r	a	ℓ	L
PDESA								

※ Depending on customer requests, we can make special Endmill

PDEA1000/2000 (Flat)







(inch)

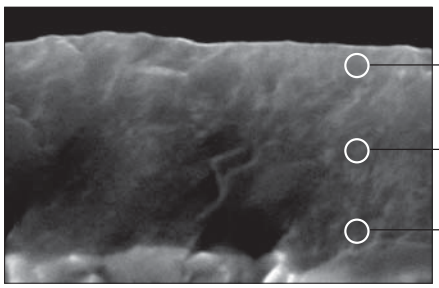
Designation		ØD	Ød	ℓ	L
PDEA 1	101875	0.1875	0.1875	0.63	2.0
PDEA 2	202500	0.2500	0.2500	0.75	2.25
	203130	0.3130	0.3750	0.75	2.50
	203750	0.3750	0.3750	1.00	2.75
	205000	0.5000	0.5000	1.00	3.00

High precision machining with our high stiffness design

Brazed Endmills

- Possible to machine with high precision due to high stiffness design
- High speed cutting by increasing wear resistance, decreasing frictional resistance through PVD coating and substrate
- Long tool life due to absorbing impact through brazed body in heavy interruption
- General steel, Alloy steel, mild steel, dice steel, stainless steel, cast iron, ductile cast iron
- ZSEA: Aluminum, Aluminum alloy, Copper, Copper alloy, Non-ferrous materials
- Coating brazed endmills (special) – Guaranteed long tool life due to high new-concept hardness and oxidation resistant coating

Features



PC221F Coating

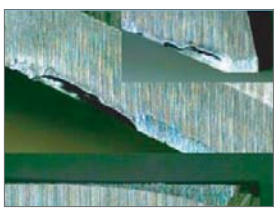
Brazed Endmills code system

Z	S	E	2	14	-	S
Brazed	Spiral	Endmill	No. of flutes	Diameter		Shank dia.
		E: Flat (Steel) EA: Flat (Al, Cu) EL: Flat Long (Steel) EXL: Flat Long (Steel) BE: Ball (Steel)	2: 2 Flutes 3: 3 Flutes	Ø14		S: Ø42.0 Q: Coated SQ: Ø42.0 Coated Standard Shank Diameter: none

Wear resistance test



Coated ZSE(PC221F)



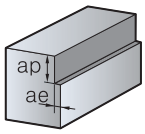
Carbide ZSE

M This is metric size. We can also provide in inch type

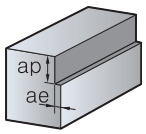
Recommended cutting conditions (ZSE200 flat)

Workpiece / Condition / Diameter (Ø)	SM50C,SCM,GC (~HRC30)		STD61,STD11 (HRC30~45)		STD61 (HRC45~55)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
20	1,600	152	950	88	560	44
25	1,300	136	750	72	450	36
30	1,100	120	650	64	370	32
40	800	96	500	56	280	24
50	650	88	400	48	220	20

Application tip



■ **Side milling (under HRC45)**
- ap: ≤ 1.5D
- ae: ≤ 0.1D



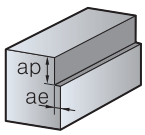
■ **Side milling (over HRC45)**
- ap: ≤ 1D (Max: 1mm)

※ Above table based on side milling, when it enters to ae direction, you should apply reduced cutting condition
※ When it enters to ae direction, for finishing you should increase revolution speed and feed in the table

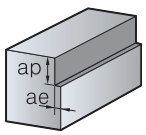
Recommended cutting conditions (ZSE400 flat)

Workpiece / Condition / Diameter (Ø)	SM50C,SCM,GC (~HRC30)		STD61,STD11 (HRC30~45)		STD61 (HRC45~55)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
20	1,600	230	950	133	560	66
25	1,300	205	750	109	450	54
30	1,100	180	650	96	370	48
40	800	145	500	85	280	36
50	650	135	400	72	220	30

Application tip



■ **Side milling (under HRC45)**
- ap: ≤ 1.5D
- ae: ≤ 0.1D



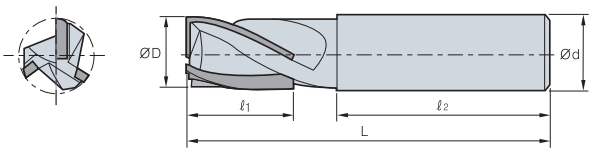
■ **Side milling (over HRC45)**
- ap: ≤ 1D (Max: 1mm)

※ Above table based on side milling, when it enters to ae direction, you should apply reduced cutting condition
※ When it enters to ae direction, for finishing you should increase revolution speed and feed in the table

M This is metric size. We can also provide in inch type

ZSE200/300 (Flat)





2 | 3 | H·A 24°~26° | Carbide | Substrate FCC PC221F

ØD	Tolerance
All	0.00~ -0.05

(mm)

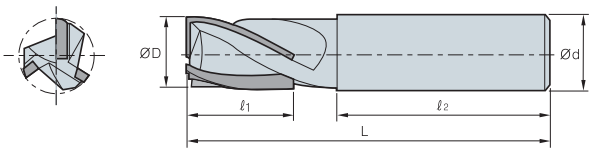
Designation		ØD	Ød	ℓ1	ℓ2	L
ZSE 2	214	14	16	28	57	95
	215	15	16	28	57	95
	216(Q)	16	16	28	55	95
	217	17	20	30	70	115
	218	18	20	30	70	115
	219	19	20	30	70	115
	220(Q)	20	20	30	70	115
	221	21	20	35	65	115
	222	22	20	35	65	115
	223	23	25	35	75	125
	224	24	25	35	75	125
	225	25	25	35	75	125
	226(Q)	26	25	35	75	125
	227	27	25	35	75	125
	228	28	25	35	75	125
	229	29	32	40	95	150
	230(Q)	30	32	40	95	150
	231	31	32	40	95	150
	232	32	32	45	90	150
	233	33	32	45	90	150
	234	34	32	50	85	150
	235	35	32	50	85	150
	236	36	32	50	85	150
	237	37	32	55	80	150
	238	38	32	55	80	150
	238S	38	42	55	80	150
	240(Q)	40	32	60	75	150
	240S	40	42	60	75	150
	242	42	32	60	75	150
	244	44	32	65	80	160
	245	45	32	65	80	160
	245S	45	42	65	80	160
	247	47	32	65	80	160
	248	48	32	65	80	160
	248S	48	42	65	80	160
	250	50	32	65	80	160
	250S	50	42	65	80	160
ZSE 3	314	14	16	28	57	95
	315	15	16	28	57	95
	316	16	16	28	55	95
	317	17	20	30	70	115
	318	18	20	30	70	115
	319	19	20	30	70	115
	320	20	20	30	70	115
	322	22	20	35	65	115
	325	25	25	35	75	125
	326	26	25	35	75	125
	328	28	25	35	75	125
	330	30	32	40	95	150
	331	31	32	40	95	150

Special Endmills order: ZSE○○○○I-L
Ex.1) 2 flutes, diameter: 6.3, I: 10, L: 60 ZSBE2063 10-60L
Ex.2) 2 flutes, diameter: 6.3, standard type ZSE2063

M This is metric size. We can also provide in inch type

ZSE300/400/600 (Flat)





3 4 6 | H·A 24°~26° | Carbide | Substrate FCC PC221F

ØD	Tolerance
All	0.00~ -0.05

(mm)

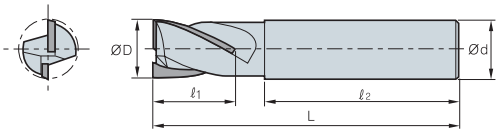
Designation		ØD	Ød	ℓ1	ℓ2	L
ZSE 3	332	32	32	45	90	150
	333	33	32	45	90	150
	334	34	32	50	85	150
	335	35	32	50	85	150
	338	38	32	55	80	150
	338S	38	42	55	80	150
	340	40	32	60	75	150
	340S	40	42	60	75	150
	342	42	32	60	75	150
	345	45	32	65	80	160
	345S	45	42	65	80	160
	350	50	32	65	80	160
	350S	50	42	65	80	160
ZSE 4	414	14	16	28	57	95
	415	15	16	28	57	95
	416(Q)	16	16	28	55	95
	417	17	20	30	70	115
	418	18	20	30	70	115
	419	19	20	30	70	115
	420(Q)	20	20	30	70	115
	421	21	20	35	65	115
	422	22	20	35	65	115
	423	23	25	35	75	125
	424	24	25	35	75	125
	425(Q)	25	25	35	75	125
	426	26	25	35	75	125
	427	27	25	35	75	125
	428	28	25	35	75	125
	429	29	32	40	95	150
	430	30	32	40	95	150
	432(Q)	32	32	45	90	150
	435	35	32	50	80	150
	438	38	32	55	85	150
	438S	38	42	55	85	150
	440(Q)	40	32	60	75	150
	440S	40	42	60	75	150
	445	45	32	65	80	160
	445S	45	42	65	80	160
	450	50	32	65	80	160
	450S	50	42	65	80	160
ZSE 6	634	34	32	50	85	150
	635	35	32	50	85	150
	638	38	32	55	80	150
	638S	38	42	55	80	150
	640	40	32	60	75	150
	640S	40	42	60	75	150
	645	45	32	65	80	160
	645S	45	42	65	80	160
	650	50	32	65	80	160
	650S	50	42	65	80	160

Special Endmills order: ZSE○○○○I-L
Ex.1) 2 flutes, diameter: 6.3, I: 10, L: 60 ZSBE2063 10-60L
Ex.2) 2 flutes, diameter: 6.3, standard type ZSE2063

M This is metric size. We can also provide in inch type

ZSEA200 (Flat)













ØD	Tolerance
All	0.00~ -0.05

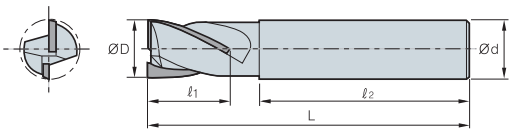
(mm)

Designation		ØD	Ød	ℓ1	ℓ2	L
ZSEA	215	15	16	28	57	95
2	216	16	16	28	55	95
	218	18	20	30	70	115
	219	19	20	30	70	115
	220	20	20	30	70	115
	221	21	20	35	65	115
	222	22	20	35	65	115
	223	23	25	35	75	125
	224	24	25	35	75	125
	225	25	25	35	75	125
	228	28	25	35	75	125
	230	30	32	40	95	150
	232	32	32	45	90	150
	238	38	32	55	80	150
	240	40	32	60	75	150
	250	50	32	65	80	160

M This is metric size. We can also provide in inch type

ZSEL200/400, ZSEXL200 (Long flat)





2 | 4 | H·A 24°~26° | Carbide | Substrate FCC PC221F

ØD	Tolerance
All	0.00~ -0.05

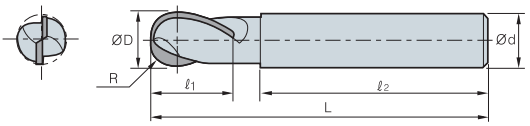
(mm)

Designation		ØD	Ød	ℓ1	ℓ2	L
ZSEL 2	214	14	16	50	55	120
	216	16	16	50	55	120
	218	18	20	60	65	140
	220	20	20	60	65	140
	222	22	20	60	65	140
	225	25	25	70	65	150
	230	30	32	80	85	180
	232	32	32	90	85	190
	235	35	32	100	85	200
	240	40	42	100	105	220
	245	45	42	120	95	230
	250	50	42	120	95	230
ZSEL 4	416	16	16	50	55	120
	420	20	20	60	65	140
	425	25	25	70	65	150
	430	30	32	80	85	180
	435	35	32	100	85	200
	440	40	42	100	105	220
ZSEXL 2	220	20	20	120	65	200
	222	22	20	120	65	200
	225	25	25	140	65	220

M This is metric size. We can also provide in inch type

ZSBE200 (Ball)





2 | H·A 24°~26° | Carbide | Substrate FCC PC221F

ØD	Tolerance
All	0.00~ -0.05

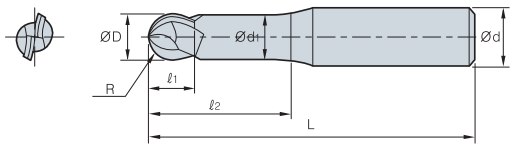
(mm)

Designation		R	ØD	Ød	ℓ1	ℓ2	L
ZSBE	213	6.5	13	16	30	60	100
2	214	7	14	16	30	65	100
	215	7.5	15	16	35	55	100
	216Q	8	16	16	35	55	100
	217	8.5	17	20	35	65	110
	218	9	18	20	35	65	110
	219	9.5	19	20	35	65	110
	220Q	10	20	20	35	65	110
	221	10.5	21	20	35	65	110
	222	11	22	20	35	65	110
	223	11.5	23	25	40	65	120
	224	12	24	25	40	70	120
	225	12.5	25	25	40	70	120
	230	15	30	32	40	70	130
	231	15.5	31	32	40	80	130
	232	16	32	32	50	75	140
	233	16.5	33	32	50	75	140
	234	17	34	32	50	85	150
	235	17.5	35	32	50	85	150
	235S	17.5	35	42	50	85	150
	236	18	36	32	50	85	150
	236S	18	36	42	50	85	150
	237	18.5	37	32	50	95	160
	237S	18.5	37	42	50	95	160
	238	19	38	32	50	95	160
	238S	19	38	42	50	95	160
	239	19.5	39	32	50	95	160
	239S	19.5	39	42	50	95	160
	240	20	40	32	50	95	160
	240S	20	40	42	50	95	160
	245	22.5	45	32	50	105	170
	245S	22.5	45	42	50	105	170
	250	25	50	32	50	105	170
	250S	25	50	42	50	105	170

M This is metric size. We can also provide in inch type

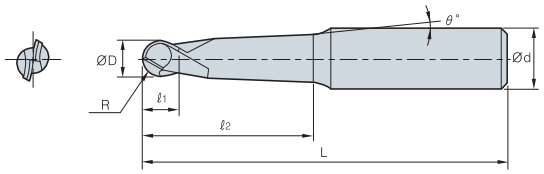
- **ZSBE200**
  Special Endmills order: ZSBE2◎◎I-L
  Ex 1) 2 flutes diameter: 6 3 I: 10 L: 60 ZSBE 206310-60L
  Ex.2) 2 flutes, diameter: 6.3, standard type ZSBE2063
- **ZSEA200**
  Special Endmills order : ZSEA2◎◎I-L
  Ex.1) 2 flutes, diameter: 16.3, I: 28, L: 95 ZSEA2163 28-95L
  Ex.2) 2 flutes, diameter: 17.0, standard type ZSEA2170
- **ZSEL200/400, ZSEXL200**
  Special Endmills orde r: ZSEL◎◎◎I-L





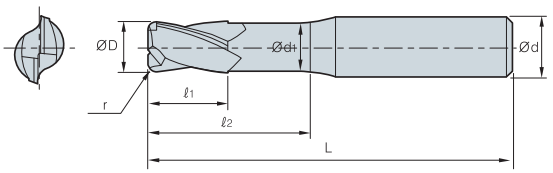
Designation	Flute	R	ØD	Ød	Ød1	ℓ1	ℓ2	L





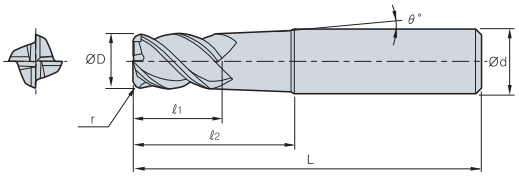
Designation	Flute	R	ØD	Ød	ℓ1	ℓ2	L	θ°





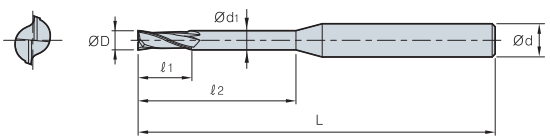
Designation	Flute	ØD	Ød	Ød1	r	ℓ1	ℓ2	L





Designation	Flute	ØD	r	Ød	ℓ1	ℓ2	L	θ°





Designation	Flute	ØD	Ød	Ød1	ℓ1	ℓ2	L

G

DRILL

Korloy drills provide a total solution for hole making,
based on tooling know-how as well as extensive research and
development for our tools



Technical Information for Drills

G02 KORLOY Drills
G04 Available Insert

Indexable Drills

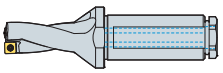
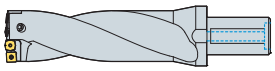
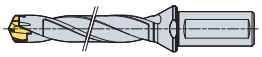
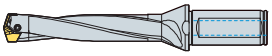
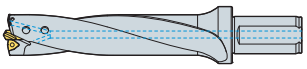
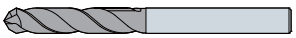
G06 Technical Information for King Drill
G12 King Drill
G16 Technical Information for King Drill (for large diameter drilling)
G17 King Drill (for large diameter drilling)
G18 Technical Information for TPDC
G21 TPDC
G24 Technical Information for TPDB
G27 TPDB
G31 Technical Information for WPDC
G34 Center Drill
G35 WPDC

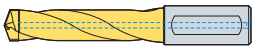
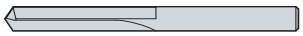
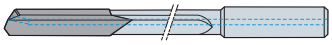
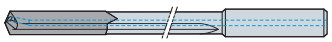
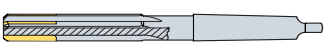
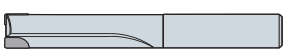
Solid Drills

G37 Technical Information for Mach Solid Drill Plus
G39 Mach Solid Drill Plus
G45 Technical Information for Mach Solid Drill plus CFRP
G47 Mach Solid Drill Plus CFRP
G48 Technical Information for Mach Solid Drill
G52 Mach Solid Drill
G54 Technical Information for Mach Solid Flat Drill
G57 Mach Solid Flat Drill
G61 Technical Information for Mach long Drill Plus
G63 Mach long Drill Plus
G66 Technical Information for Mach long Solid Drill
G68 Mach long Solid Drill
G69 Mach step Drills Order Form
G70 Technical Information for Vulcan Drill
G71 Vulcan Drill
G73 Technical Information for Carbide Drill (SSDP)
G74 Carbide Drill (SSDP)
G76 Burnishing Drill
G77 Top Solid Drill
G78 PCD Drill
G79 Technical Information for Gun Drill
G83 Gun Drill

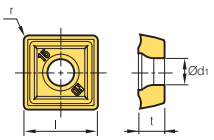
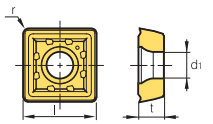
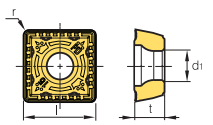
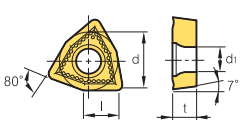
Reamer

G85 Technical Information for Indexable Reamer
G88 Available Insert for Indexable Reamer
G89 Indexable Reamer
G90 Chucking/Machine Reamer
G93 PCD Reamer

Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Indexable Drills	King Dril HP	K□DA..HP	 Available insert: SP□T, XO□T	Ø0.484~Ø2.375	2D~5D	G12~G15
	King Drill (for large diameter drilling)	K□DA	 Available insert: SP□T, XO□T	Ø2.40~Ø3.94	2D~4D	G17
	TPDC new	TPDCA	 Available insert: TPD□□□□CAP	Ø0.472~Ø0.786	3D~8D	G22
	TPDB	TPDBA	 Available insert: TPD□□□BA	Ø0.394~Ø1.298	3D~8D	G28~G30
	Indexable Drills & Drill with center	WPDCA	 Available insert: WC□T	Ø1.000~Ø3.130	5D~8D	G35~G36
Solid Drills	Mach Solid Drill Plus new	MSDPA		Ø0.0394~Ø0.7874	3D~7D	G39~G44
		MSDPHA		Ø0.0984~Ø0.7874	3D~7D	G40~G44
	Mach Solid Drill Plus CFRP new	MSDP-C		Ø0.187~Ø0.5	5D	G47
	Mach Solid Drill	MSDA		Ø0.2188~Ø0.7500	3D~7D	G52
		MSDHA		Ø0.2188~Ø0.7500	3D~7D	G53
	Mach Solid Flat Drill new	MSFDA		Ø0.0984~Ø0.4724	2D	G57~G58
		MSFDHA		Ø0.0984~Ø0.4724	3D	G59~G60
	Mach Long Drill Plus new	MLDA□□□□N		Ø0.1181~Ø0.3937	10D~25D	G63~G65
	Mach Long Drill	MLDPA		Ø0.2188~Ø0.3750	-	G68
		MLDA		Ø0.2188~Ø0.3750	10D~25D	G68

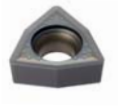
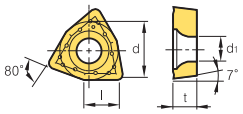
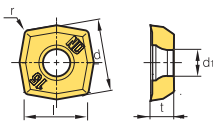
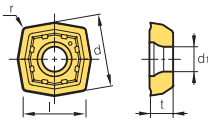
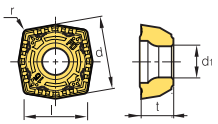
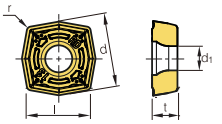
Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Solid Drills	Vulcan Drill	VZD		Ø12.6~Ø40.5	-	G71~G72
	Carbide Drill new	SSDP		Ø0.0394~Ø0.5905	-	G74~G75
	Burnishing Drill	BDS		Ø4.0~Ø16.0	5D~7D	G76
		BDT		Ø4.2~Ø10.3	2D~4D	G76
	Top solid Drill	TSDMA		Ø0.3150~Ø0.9840	5D~8D	G77
	PCD Drill	PDDA		Ø0.1875~Ø0.5000	5D	G78
	Gun Drill	KGDSA		Ø0.079~Ø1.299	50D~100D	G83
		KGDTA		Ø0.236~Ø1.043	50D~100D	G84
Reamer	Indexable Reamer	IRTA	 Available Insert: RI	Ø0.375~Ø1.250	3D~5D	G89
		IRBA	 Available Insert: RI	Ø0.375~Ø1.250	3D~5D	G89
	Chucking/Machine Reamer	SCRS		Ø5.0~Ø20.0 M This is metric size	2D~3D	G91
		SCRH		Ø5.0~Ø20.0 M This is metric size	2D~3D	G91
		TCRS		Ø7.0~Ø30.0 M This is metric size	2D~3D	G92
		TMRS		Ø7.0~Ø30.0 M This is metric size	3D~5D	G92
	PCD Reamer	PDR		Ø0.2187~Ø0.7500	3D~5D	G93

Available insert

Picture	Designation	Coated							Uncoated	Dimensions (inch)					Configuration	Page
		NC5330	PC3500	PC3600	PC9530	PC6510	PC5300	PC5335	H01	l	d	t	r	d1		
SPET-ND 	040204-ND								●	0.185	-	0.094	0.016	0.091		G12~ G17
	050204-ND								●	0.201	-	0.094	0.016	0.091		
	060205-ND								●	0.244	-	0.098	0.020	0.098		
	07T208-ND								●	0.295	-	0.110	0.028	0.110		
	090308-ND								●	0.362	-	0.130	0.031	0.134		
	11T308-ND								●	0.433	-	0.157	0.031	0.157		
	130410-ND								●	0.512	-	0.177	0.039	0.177		
	15M510-ND								●	0.598	-	0.197	0.039	0.217		
	180510-ND								●	0.717	-	0.217	0.039	0.236		
SPMT-LD 	060205-LD							●		0.244	-	0.098	0.020	0.098		G12~ G17
	07T208-LD							●		0.295	-	0.110	0.028	0.110		
	090308-LD							●		0.362	-	0.130	0.031	0.134		
	11T308-LD							●		0.433	-	0.157	0.031	0.157		
	130410-LD							●		0.512	-	0.177	0.039	0.177		
	15M510-LD							●		0.598	-	0.197	0.039	0.217		
	180510-LD							●		0.717	-	0.217	0.039	0.236		
SPMT-PD 	040204-PD	●	●			●	●			0.185	-	0.094	0.016	0.091		G12~ G17
	050204-PD	●	●			●	●			0.201	-	0.094	0.016	0.091		
	060205-PD	●	●			●	●			0.244	-	0.098	0.020	0.098		
	07T208-PD	●	●			●	●			0.295	-	0.110	0.028	0.110		
	090308-PD	●	●			●	●			0.362	-	0.130	0.031	0.134		
	11T308-PD	●	●			●	●			0.433	-	0.157	0.031	0.157		
	130410-PD	●	●			●	●			0.512	-	0.177	0.039	0.177		
	15M510-PD	●	●			●	●			0.598	-	0.197	0.039	0.217		
	180510-PD	●	●			●	●			0.717	-	0.217	0.039	0.236		
WCMT-C20N 	030208-C20N							●	●	0.150	7/32	3/32	1/32	0.110		-
	040208-C20N							●	●	0.169	1/4	3/32	1/32	0.118		
	050308-C20N							●	●	0.213	5/16	1/8	1/32	0.134		
	06T308-C20N							●	●	0.256	3/8	5/32	1/32	0.146		
	080408-C20N							●	●	0.343	1/2	3/16	1/32	0.169		
	080412-C20N							●	●	0.343	1/2	3/16	3/64	0.169		

● : Korea Stock ● : US Stock

Available insert

Picture	Designation	Coated							Uncoated	Dimensions (inch)					Configuration	Page
		NC5330	PC3500	PC3600	PC9530	PC6510	PC5300	PC5335	H01	l	d	t	r	d_1		
WCMT-C21N 	030204-C21N									0.150	7/32	3/32	1/64	0.100		G35 G36
	040204-C21N									0.169	1/4	3/32	1/64	0.110		
	040208-C21N									0.169	1/4	3/32	1/32	0.110		
	050308-C21N									0.213	5/16	1/8	1/32	0.134		
	06T308-C21N									0.256	3/8	5/32	1/32	0.173		
	080408-C21N									0.343	1/2	3/16	1/32	0.217		
XOET-ND 	040204-ND								●	0.169	0.193	0.094	0.016	0.091		-
	050204-ND								●	0.189	0.213	0.094	0.016	0.091		
	060204-ND								●	0.228	0.260	0.098	0.016	0.098		
	07T205-ND								●	0.272	0.307	0.110	0.020	0.110		
	090305-ND								●	0.331	0.378	0.130	0.020	0.134		
	11T306-ND								●	0.394	0.449	0.157	0.024	0.157		
	130406-ND								●	0.469	0.535	0.177	0.024	0.177		
	15M508-ND								●	0.547	0.626	0.197	0.031	0.217		
	180508-ND								●	0.650	0.744	0.217	0.031	0.236		
XOMT-LD 	060204-LD							●		0.228	0.260	0.098	0.016	0.098		G12~ G17
	07T205-LD							●		0.272	0.307	0.110	0.020	0.110		
	090305-LD							●		0.331	0.378	0.130	0.020	0.134		
	11T306-LD							●		0.394	0.449	0.157	0.024	0.157		
	130406-LD							●		0.469	0.535	0.177	0.024	0.177		
	15M508-LD							●		0.547	0.626	0.197	0.031	0.217		
	180508-LD							●		0.650	0.744	0.217	0.031	0.236		
XOMT-PD 	040204-PD						●			0.169	0.193	0.094	0.016	0.091		G12~ G17
	050204-PD						●			0.189	0.213	0.094	0.016	0.091		
	060204-PD						●			0.228	0.260	0.098	0.016	0.098		
	07T205-PD						●			0.272	0.307	0.110	0.020	0.110		
	090305-PD						●			0.331	0.378	0.130	0.020	0.134		
	11T306-PD						●			0.394	0.449	0.157	0.024	0.157		
	130406-PD						●			0.469	0.535	0.177	0.024	0.177		
	15M508-PD						●			0.547	0.626	0.197	0.031	0.217		
	180508-PD						●			0.650	0.744	0.217	0.031	0.236		
XOMT-RD new 	07T207-RD						●			0.272	0.307	0.110	0.028	0.110		G12~ G17
	090308-RD						●			0.331	0.378	0.130	0.031	0.134		
	11T309-RD						●			0.394	0.449	0.157	0.035	0.157		
	130410-RD						●			0.469	0.535	0.177	0.039	0.177		
	15M511-RD						●			0.547	0.626	0.197	0.043	0.217		
	180512-RD						●			0.650	0.744	0.217	0.047	0.236		

● : Korea Stock ● : US Stock

Optimized insert design for maximum drilling efficiency

King Drill

Code system of holder

K 5D A 1000 125 □ – 07

KING/KORLOY

Aspect ratio (L/D)
2D, 2.5D, 3D, 3.5D,
4D, 4.5D, 5D

Type
A: Inch Type
No mark: Metric Type

Drill Dia.
Ø1.000
(Three decimal place marked)

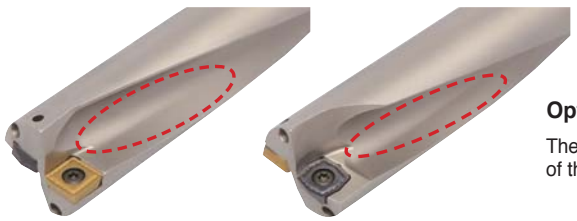
Shank Dia.
Ø0.75, Ø1.00
Ø1.25, Ø1.50
Two decimal place marked

Shank shape
No mark: Flange Shank, Weldone
HP: Flange Shank, Weldon, PT Tap
F1: Flange Shank, Whistle Notch
F2: Flange Shank, Without Side Lock
S: Straight Shank, Weldone
S1: Straight Shank, Whistle Notch
S2: Straight Shank, Without Side Lock
M0, M1, M2, M3...: MT0, MT1, MT2, MT3...
H63, H100: HSK63, HSK100
B30, B40, B50: BT30, BT40, BT50

Inscribed circle of insert
05, 06, 07, 09
11 13, 15, 18

Features

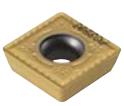
- Optimized design of inserts for maximum drilling efficiency
- Excellent cutting performance and chip control due to the optimized geometry and chip breaker of both inserts, central & peripheral
- Different inserts, optimized for the central and peripheral insert locations in order to maximize cutting tool life



Optimized flute system - 2 coolant holes applied

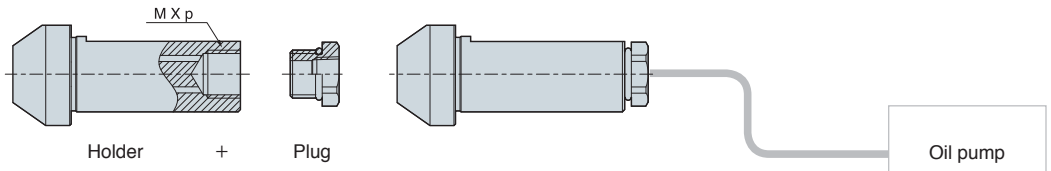
The optimized shape of the flute increases the rigidity of the drill body and improves chip evacuation

Features of chip breaker

Chip breaker	PD		LD		ND		RD
Features	- Universal - At medium speed and medium feed		- Superior chip control for machining mild steel and stainless steel - Light cutting (at low~medium speed and low feed)		- Sharp cutting edge for aluminum machining - Insert surface buffed for high quality result - E Class Tolerance		- Improved chipping resistance - Excellent performance in case of frequent fracture and chipping on the cutting edge
Insert	Peripheral insert	Central insert	Peripheral insert	Central insert	Peripheral insert	Central insert	Central insert
Shape							
Grades for workpiece	NC5330: P, M, K PC3500: P PC5300: P, M, K, S PC6510: K	PC5300: P, M, K, S	PC5335: P, M		H01: N		PC5300: P,M,K,S

King Drill - With through coolant system for lathe

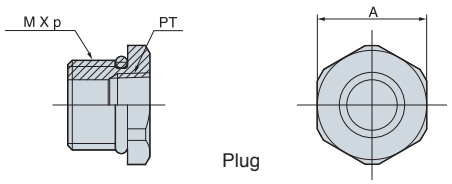
- Through coolant system with drill holder, plug, oil-hole hose and oil-hole pump
- PT TAP in the plug is combined to PT TAP connected to oil hose
- Available to use the drill without a plug in milling machine



• Clamping oil hose to the bottom of plug and connect the oil pump to the holder

(inch)

Tap type	Diameter	Shank dia.	M x p	Plug
K□DA0484075~0625075HP-□□	Ø0.484~Ø0.625	Ø0.75	M12x1.5	PLG12PT18
K□DA0687100~0875100HP-□□	Ø0.687~Ø0.875	Ø1.00	M16x1.5	PLG16PT18
K□DA0937125~1375125HP-□□	Ø0.937~Ø1.375	Ø1.25	M20x2.0	PLG20PT14
K□DA1437150~2375150HP-□□	Ø1.437~Ø2.375	Ø1.50	M27x2.0	PLG27PT38



• Plug is assembled

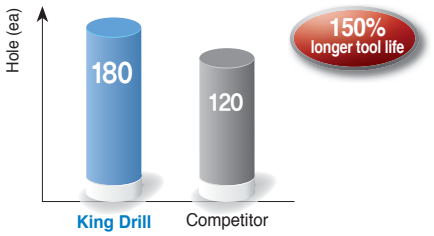
Plug type	M x p	PT tap	A
PLG12PT18	M12x1.5	1/8	5/8
PLG16PT18	M16x1.5	1/8	7/8
PLG20PT14	M20x2.0	1/4	1 1/8
PLG27PT38	M27x2.0	3/8	11/8

Application examples

- **Use** Track link bush (AISI4140)
- **Cutting conditions** vc (sfm) = 394, fn (ipr) = 0.0039, Through coolant system
- **Tools** **inserts** SPMT07T208-PD (PC3500), XOMT07T205-PD (PC5300)
  Holder K5DA0812100HP-07
- **Machine** Drilling machine



■ **Test result**

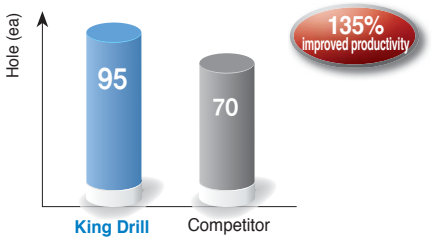


• Superior surface finish and chip evacuation

- **Use** Track link bush (AISI4130)
- **Workpiece** SCM415H
- **Cutting conditions** King Drill: vc (sfm) = 459, fn (ipr) = 0.0047, Competitor: vc (sfm) = 459, fn (ipr) = 0.0039
- **Tools** **inserts** SPMT090308-PD (PC3500), XOMT090305-PD (PC3500)
  Holder K3DA1062125HP-09
- **Machine** MCT



■ **Test result**



• Increased productivity due to higher capabilities for cutting conditions compared to the competitor

Recommended cutting condition

(inch)

Workpiece				Insert			vc (sfm)	Depth of cut = 2D, 3D, 4D Fn (ipr) depending on drill Dia. (inch)				
ISO		Workpiece	Hardness (HB)	Chip breaker	Grade			Ø0.47~Ø0.63	Ø0.64~Ø0.91	Ø0.92~Ø1.14	Ø1.15~Ø1.65	Ø1.66~Ø2.36
					Central	Peripheral						
P	Carbon steel	Low carbon steel	80~180	LD	PC5335	PC5335	394 (197~558)	0.0016~0.0031	0.0016~0.0031	0.0016~0.0031	0.0016~0.0031	0.0016~0.0031
				PD/RD	PC5300	PC3500	492 (394~591)					
						NC5330	591 (459~722)					
		High carbon steel	180~280	PD	PC5300	PC3500	394 (295~492)	0.0016~0.0039	0.0016~0.0047	0.002~0.0063	0.0024~0.0063	0.0024~0.0071
						NC5330	492 (361~623)	0.0016~0.0024	0.0016~0.0028	0.0016~0.0031	0.0016~0.0031	0.0016~0.0031
	Alloy steel	Low alloy steel	140~260	LD	PC5335	PC5335	394 (197~525)	0.0024~0.0039	0.0024~0.0039	0.0024~0.0047	0.0024~0.0055	0.0024~0.0055
				PD	PC5300	PC3500	492 (394~558)	0.0024~0.0047	0.0024~0.0047	0.0024~0.0055	0.0024~0.0063	0.0024~0.0063
						NC5330	591 (459~689)	0.0024~0.0031	0.0024~0.0031	0.0024~0.0039	0.0024~0.0047	0.0024~0.0047
		Hardened low alloy steel	200~400	PD	PC5300	PC5300	328 (164~492)	0.0016~0.0039	0.0024~0.0039	0.0024~0.0047	0.0024~0.0055	0.0024~0.0055
		High alloy steel	260~320	PD	PC5300	PC3500	328 (164~525)	0.002~0.0043	0.002~0.0043	0.002~0.0051	0.002~0.0059	0.002~0.0059
		Hardened high alloy steel	300~450	PD	PC5300	PC5300	230 (98~394)	0.0016~0.0031	0.0024~0.0031	0.0024~0.0039	0.0024~0.0047	0.0024~0.0047
M	Stainless steel	Stainless steel	135-275	LD	PD5335	PC5335	394 (262~459)	0.0016~0.0028	0.0016~0.0028	0.0016~0.0028	0.0016~0.0031	0.0016~0.0031
				PD	PC5300	PC5300	427 (328~525)	0.0016~0.0028	0.0016~0.0028	0.0016~0.0028	0.0016~0.0031	0.0016~0.0031
K	Cast iron	Gray cast iron	150~230	PD	PC5300	PC6510	623 (492~820)	0.0016~0.0047	0.002~0.0055	0.0024~0.0071	0.0039~0.0087	0.0039~0.0102
		Ductile cast iron	150~230	PD	PC5300	PC6510	427 (328~525)	0.0016~0.0028	0.0016~0.0031	0.0016~0.0039	0.002~0.0047	0.002~0.0047
S	Heat resisting alloy	Ni-heat resisting alloy	130~400	PD	PC5300	PC5300	164 (98~328)	0.0016~0.0039	0.0016~0.0039	0.0016~0.0039	0.0016~0.0039	0.0016~0.0039
		Ti-heat resisting alloy	130~400	LD	PC5335	PC5335	197 (131~262)	0.0016~0.0031	0.0016~0.0039	0.0024~0.0047	0.0024~0.0055	0.0024~0.0063
				PD	PC5300	PC5300	197 (131~262)	0.0016~0.0031	0.0016~0.0039	0.0024~0.0047	0.0024~0.0055	0.0024~0.0063
		High hardened steel	over 400	PD	PC5300	PC5300	131 (66~262)	0.0016~0.002	0.0016~0.0024	0.0016~0.0031	0.0016~0.0031	0.0016~0.0031
N	Aluminium	Aluminium	30~150	ND	H01	H01	984 (820~1312)	0.0020~0.0055	0.0024~0.0063	0.0039~0.0087	0.0063~0.0039	0.0047~0.0098
		Alloyed copper	150-160	ND	H01	H01	820 (656~984)	0.0020~0.0055	0.0024~0.0063	0.0039~0.0087	0.0063~0.0039	0.0047~0.0098

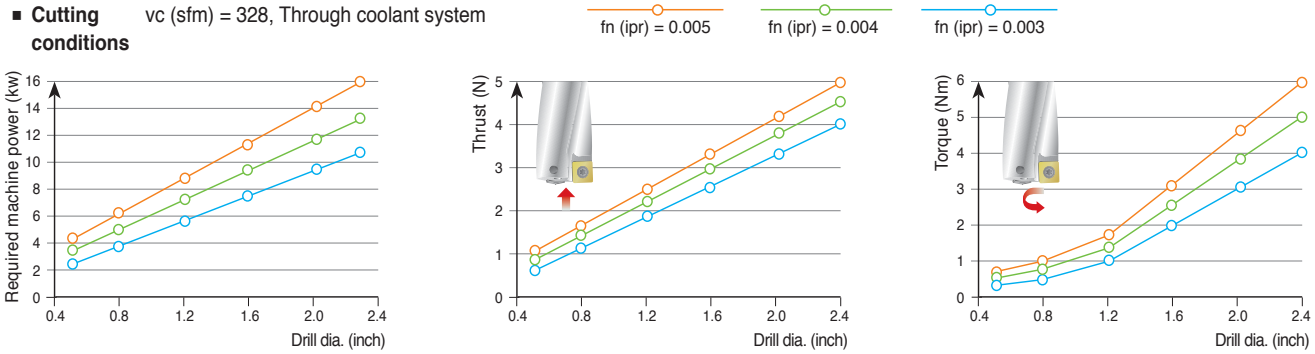
• The Max. feed of 5D holders is 70%~80% of the max. conditions of 2D/3D/4D holders
• In interrupted machining part, reduce 30~50% of feed from the above machining around interrupted part

Required machine power

- The graphs below show the cutting force required in drilling
- Machining with the King Drill and a machine with high rigidity and power

■ **Workpiece** AISI4140 (240HB)

■ **Cutting conditions** vc (sfm) = 328, Through coolant system

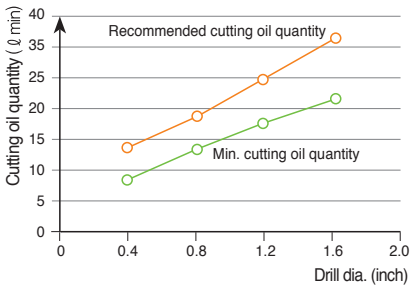


Cutting oil quantity

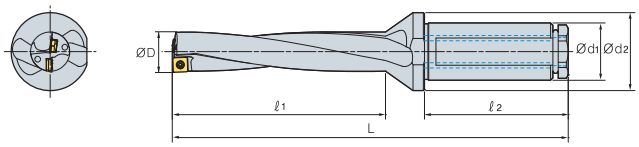
■ **Workpiece** AISI4140 (240HB)

■ **Cutting conditions** vc (sfm) = 328, Through coolant system

- The data of the graph above could be changed depending on workpiece and cutting condition



Drill tolerance and hole tolerance

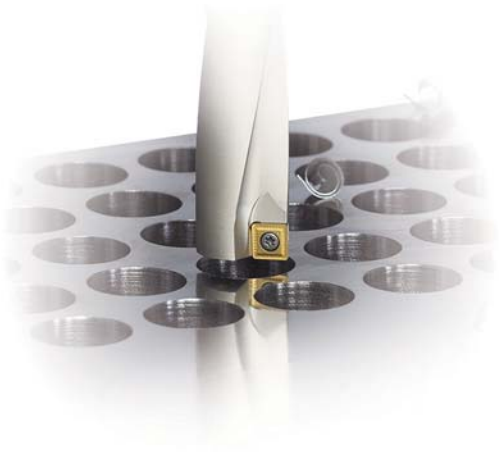


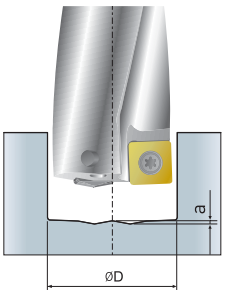
(inch)

Drill dia.		Ø0.484~Ø1.125	Ø1.187~Ø1.750	Ø1.812~Ø2.375
2D~3D	Drill tolerance (ØD)	~ -0.006	~ -0.006	~ -0.006
	Hole tolerance	-0.016~ +0.008	-0.004~ +0.010	-0.004~ +0.011
4D~5D	Drill tolerance (ØD)	~ -0.006	~ -0.006	~ -0.006
	Hole tolerance	-0.002~ +0.010	-0.002~ +0.012	-0.002~ +0.013

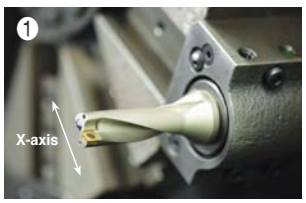
The shape of the bottom of blind hole

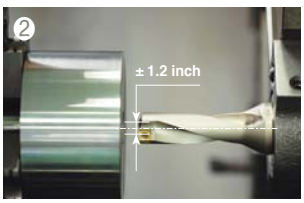
Drill diameter (inch)	Peripheral insert	Central insert	a (inch)
Ø0.484~Ø0.531	SP□T040204-□□	XO□T040204-□□	0.016
Ø0.562~Ø0.625	SP□T050204-□□	XO□T050204-□□	0.016
Ø0.687~Ø0.750	SP□T060205-□□	XO□T060204-□□	0.020
Ø0.812~Ø0.875	SP□T07T208-□□	XO□T07T205-□□	0.020
Ø0.937~Ø1.125	SP□T090308-□□	XO□T090305-□□	0.028
Ø1.187~Ø1.375	SP□T11T308-□□	XO□T11T306-□□	0.031
Ø1.437~Ø1.687	SP□T130410-□□	XO□T130406-□□	0.039
Ø1.750~Ø2.000	SP□T15M510-□□	XO□T15M508-□□	0.043
Ø2.062~Ø2.375	SP□T180510-□□	XO□T180508-□□	0.047

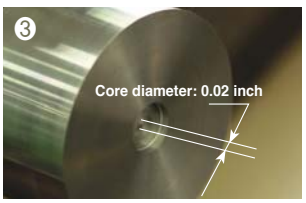




Notice for setting the drill in the lathe







- Set the peripheral insert parallel to the X axis. (based on the side lock)
- If the machined core is 0.024 inch after machining 0.2 inch, that is the proper setting

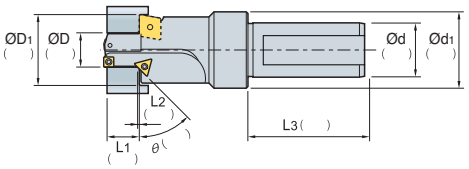
※ Please make sure that the location of the side lock could be different depending on manufacturers of machine

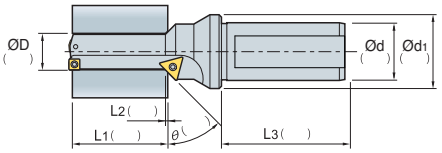
Insert and parts

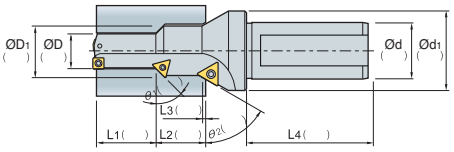
Drill dia. (inch)	Peripheral insert	Central insert	Screw	Wrench	Torque (Nm)
Ø0.484~Ø0.531	SP□T040204-□□	XO□T040204-□□	FTNA0204	TW06P	0.4
Ø0.562~Ø0.625	SP□T050204-□□	XO□T050204-□□	FTNA0204	TW06P	0.4
Ø0.687~Ø0.750	SP□T060205-□□	XO□T060204-□□	FTKA02206S	TW07P	0.8
Ø0.812~Ø0.875	SP□T07T208-□□	XO□T07T205-□□	FTKA02565	TW07S	0.8
Ø0.937~Ø1.125	SP□T090308-□□	XO□T090305-□□	FTKA0307	TW09S	1.2
Ø1.187~Ø1.375	SP□T11T308-□□	XO□T11T306-□□	FTKA03508	TW15S	3.0
Ø1.437~Ø1.687	SP□T130410-□□	XO□T130406-□□	FTKA0410	TW15S	3.0
Ø1.750~Ø2.000	SP□T15M510-□□	XO□T15M508-□□	FTNC04511	TW20S	5.0
Ø2.062~Ø2.375	SP□T180510-□□	XO□T180508-□□	FTNA0511	TW20-100	5.0

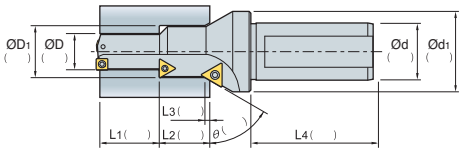
- In clamping an insert, please clean the tip seat and apply CASMOLY1000 on the screw
- Please make sure to use a Korloy-produced wrench and screw only

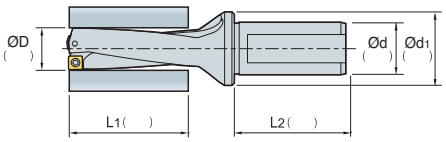
Special drill order form





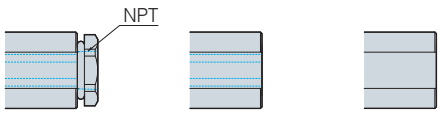






■ Coolant type

☐ Through coolant plug type (Standard) ☐ Through coolant non plug type ☐ No coolant



■ Hole type

☐ Blind hole ☐ Thru hole

■ Types of shank

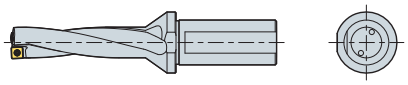
☐ Flat type

☐ Weldon type

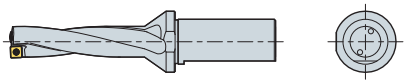
☐ Whistle notch type

■ Location of side lock

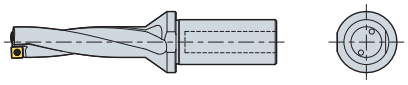
☐ Parallel to peripheral insert (Standard)



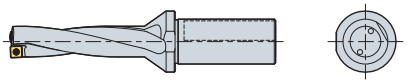
☐ 90°angle to peripheral insert (Standard)



☐ 180°angle to peripheral insert (Standard)



☐ 270° angle to peripheral insert (Standard)



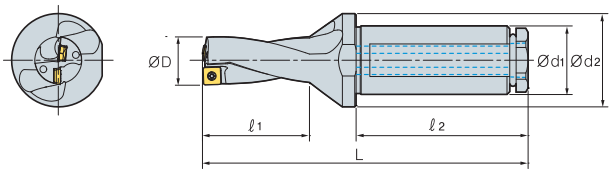
■ Note

- Currently using tool:
- Current cutting condition
  - RPM or vc (sfm):
  - vf (inch/min) or fn (ipr):
  - Depth of cut (inch):
- Standard of measuring tool life:
- Currently using machine
  - Machining center:
  - General lathe:
  - CNC lathe:

King Drill-2D

For through coolant system with a lathe





(inch)

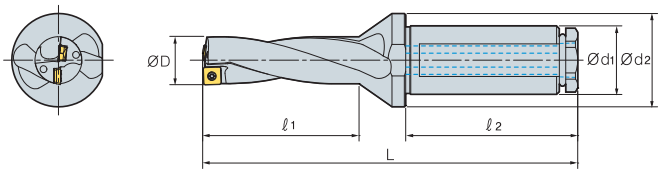
Designation		ØD		Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K2DA	0484075HP-04	0.484	31/64	0.75	0.98	1.06	1.97	3.58	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	0500075HP-04	0.500	1/2	0.75	0.98	1.14	1.97	3.66			
	0531075HP-04	0.531	17/32	0.75	0.98	1.14	1.97	3.66			
	0562075HP-05	0.562	9/16	0.75	0.98	1.22	1.97	3.78	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	0625075HP-05	0.625	5/8	0.75	0.98	1.38	1.97	3.98			
	0687100HP-06	0.687	11/16	1.00	1.34	1.46	2.20	4.29	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	0750100HP-06	0.750	3/4	1.00	1.34	1.61	2.20	4.49			
	0812100HP-07	0.812	13/16	1.00	1.34	1.77	2.20	4.72	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	0875100HP-07	0.875	7/8	1.00	1.34	1.85	2.20	4.80			
	0937125HP-09	0.937	15/16	1.25	1.73	2.01	2.36	5.24	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	1000125HP-09	1.000	1	1.25	1.73	2.09	2.36	5.31			
	1031125HP-09	1.031	1 1/32	1.25	1.73	2.17	2.36	5.39			
	1062125HP-09	1.062	1 1/16	1.25	1.73	2.24	2.36	5.51			
	1125125HP-09	1.125	1 1/8	1.25	1.73	2.40	2.36	5.71			
	1187125HP-11	1.187	1 3/16	1.25	1.73	2.48	2.36	5.91	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	1250125HP-11	1.250	1 1/4	1.25	1.73	2.64	2.36	6.06			
	1312125HP-11	1.312	1 5/16	1.25	1.73	2.72	2.36	6.18			
	1375125HP-11	1.375	1 3/8	1.25	1.73	2.87	2.36	6.34			
	1437150HP-13	1.437	1 7/16	1.50	1.89	2.99	2.76	6.93	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	1500150HP-13	1.500	1 1/2	1.50	1.89	3.15	2.76	7.13			
	1562150HP-13	1.562	1 9/16	1.50	1.89	3.31	2.76	7.32			
	1625150HP-13	1.625	1 5/8	1.50	1.89	3.39	2.76	7.40			
	1687150HP-13	1.687	1 11/16	1.50	2.28	3.58	2.76	7.72			
	1750150HP-15	1.750	1 3/4	1.50	2.28	3.66	2.76	7.80	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	1812150HP-15	1.812	1 13/16	1.50	2.28	3.82	2.76	7.99			
	1875150HP-15	1.875	1 7/8	1.50	2.28	3.98	2.76	8.19			
	1937150HP-15	1.937	1 15/16	1.50	2.28	4.06	2.76	8.27			
	2000150HP-15	2.000	2	1.50	2.68	4.25	2.76	8.58			
	2062150HP-18	2.062	2 1/16	1.50	2.68	4.33	2.76	8.66	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	2125150HP-18	2.125	2 1/8	1.50	2.68	4.49	2.76	8.82			
	2187150HP-18	2.187	2 3/16	1.50	2.68	4.65	2.76	9.06			
	2250150HP-18	2.250	2 1/4	1.50	2.68	4.76	2.76	9.17			
	2313150HP-18	2.313	2 5/16	1.50	2.68	5.00	2.76	9.41			
	2375150HP-18	2.375	2 3/8	1.50	2.68	5.12	2.76	9.53			

Applicable inserts **G04~05**

King Drill-3D

For through coolant system with a lathe





(inch)

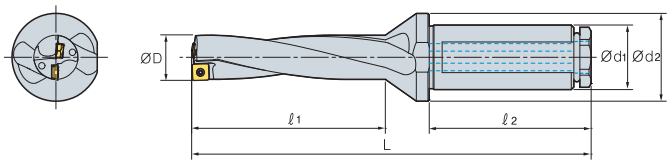
Designation		ØD		Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K3DA	0484075HP-04	0.484	31/64	0.75	0.98	1.54	1.97	4.06	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	0500075HP-04	0.500	1/2	0.75	0.98	1.65	1.97	4.17			
	0531075HP-04	0.531	17/32	0.75	0.98	1.65	1.97	4.17			
	0562075HP-05	0.562	9/16	0.75	0.98	1.77	1.97	4.33	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	0625075HP-05	0.625	5/8	0.75	0.98	2.01	1.97	4.61			
	0687100HP-06	0.687	11/16	1.00	1.34	2.13	2.20	4.96	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	0750100HP-06	0.750	3/4	1.00	1.34	2.36	2.20	5.24			
	0812100HP-07	0.812	13/16	1.00	1.34	2.60	2.20	5.55	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	0875100HP-07	0.875	7/8	1.00	1.34	2.72	2.20	5.67			
	0937125HP-09	0.937	15/16	1.25	1.73	2.95	2.36	6.18	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	1000125HP-09	1.000	1	1.25	1.73	3.07	2.36	6.30			
	1031125HP-09	1.031	1 1/32	1.25	1.73	3.19	2.36	6.42			
	1062125HP-09	1.062	1 1/16	1.25	1.73	3.31	2.36	6.57			
	1125125HP-09	1.125	1 1/8	1.25	1.73	3.54	2.36	6.85			
	1187125HP-11	1.187	1 3/16	1.25	1.73	3.66	2.36	7.09	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	1250125HP-11	1.250	1 1/4	1.25	1.73	3.90	2.36	7.32			
	1312125HP-11	1.312	1 5/16	1.25	1.73	4.02	2.36	7.48			
	1375125HP-11	1.375	1 3/8	1.25	1.73	4.25	2.36	7.72			
	1437150HP-13	1.437	1 7/16	1.50	1.89	4.41	2.76	8.35	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	1500150HP-13	1.500	1 1/2	1.50	1.89	4.65	2.76	8.62			
	1562150HP-13	1.562	1 9/16	1.50	1.89	4.88	2.76	8.90			
	1625150HP-13	1.625	1 5/8	1.50	1.89	5.00	2.76	9.02			
	1687150HP-13	1.687	1 11/16	1.50	2.28	5.28	2.76	9.41			
	1750150HP-15	1.750	1 3/4	1.50	2.28	5.39	2.76	9.53	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	1812150HP-15	1.812	1 13/16	1.50	2.28	5.63	2.76	9.80			
	1875150HP-15	1.875	1 7/8	1.50	2.28	5.87	2.76	10.08			
	1937150HP-15	1.937	1 15/16	1.50	2.28	5.98	2.76	10.20			
	2000150HP-15	2.000	2	1.50	2.68	6.26	2.76	10.59			
	2062150HP-18	2.062	2 1/16	1.50	2.68	6.38	2.76	10.71	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	2125150HP-18	2.125	2 1/8	1.50	2.68	6.61	2.76	10.94			
	2187150HP-18	2.187	2 3/16	1.50	2.68	6.85	2.76	11.26			
	2250150HP-18	2.250	2 1/4	1.50	2.68	7.01	2.76	11.42			
	2313150HP-18	2.313	2 5/16	1.50	2.68	7.32	2.76	11.73			
	2375150HP-18	2.375	2 3/8	1.50	2.68	7.48	2.76	11.89			

Applicable inserts **G04~05**

King Drill-4D

For through coolant system with a lathe





(inch)

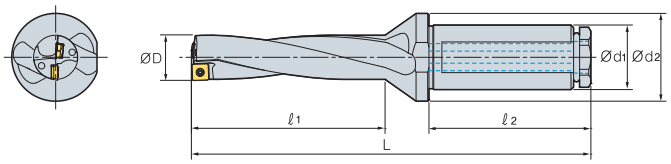
Designation		ØD		Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K4DA	0484075HP-04	0.484	31/64	0.75	0.98	2.01	1.97	4.53	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	0500075HP-04	0.500	1/2	0.75	0.98	2.17	1.97	4.69			
	0531075HP-04	0.531	17/32	0.75	0.98	2.17	1.97	4.69			
	0562075HP-05	0.562	9/16	0.75	0.98	2.32	1.97	4.88	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	0625075HP-05	0.625	5/8	0.75	0.98	2.64	1.97	5.24			
	0687100HP-06	0.687	11/16	1.00	1.34	2.80	2.20	5.63	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	0750100HP-06	0.750	3/4	1.00	1.34	3.11	2.20	5.98			
	0812100HP-07	0.812	13/16	1.00	1.34	3.43	2.20	6.38	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	0875100HP-07	0.875	7/8	1.00	1.34	3.58	2.20	6.54			
	0937125HP-09	0.937	15/16	1.25	1.73	3.90	2.36	7.13	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	1000125HP-09	1.000	1	1.25	1.73	4.06	2.36	7.28			
	1031125HP-09	1.031	1 1/32	1.25	1.73	4.21	2.36	7.44			
	1062125HP-09	1.062	1 1/16	1.25	1.73	4.37	2.36	7.64			
	1125125HP-09	1.125	1 1/8	1.25	1.73	4.69	2.36	7.99			
	1187125HP-11	1.187	1 3/16	1.25	1.73	4.84	2.36	8.27	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	1250125HP-11	1.250	1 1/4	1.25	1.73	5.16	2.36	8.58			
	1312125HP-11	1.312	1 5/16	1.25	1.73	5.31	2.36	8.78			
	1375125HP-11	1.375	1 3/8	1.25	1.73	5.63	2.36	9.09			
	1437150HP-13	1.437	1 7/16	1.50	1.89	5.83	2.76	9.76	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	1500150HP-13	1.500	1 1/2	1.50	1.89	6.14	2.76	10.12			
	1562150HP-13	1.562	1 9/16	1.50	1.89	6.46	2.76	10.47			
	1625150HP-13	1.625	1 5/8	1.50	1.89	6.61	2.76	10.63			
	1687150HP-13	1.687	1 11/16	1.50	2.28	6.97	2.76	11.10			
	1750150HP-15	1.750	1 3/4	1.50	2.28	7.13	2.76	11.26	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	1812150HP-15	1.812	1 13/16	1.50	2.28	7.44	2.76	11.61			
	1875150HP-15	1.875	1 7/8	1.50	2.28	7.76	2.76	11.97			
	1937150HP-15	1.937	1 15/16	1.50	2.28	7.91	2.76	12.13			
	2000150HP-15	2.000	2	1.50	2.68	8.27	2.76	12.60			
	2062150HP-18	2.062	2 1/16	1.50	2.68	8.43	2.76	12.76	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	2125150HP-18	2.125	2 1/8	1.50	2.68	8.74	2.76	13.07			
	2187150HP-18	2.187	2 3/16	1.50	2.68	9.06	2.76	13.46			
	2250150HP-18	2.250	2 1/4	1.50	2.68	9.25	2.76	13.66			
	2313150HP-18	2.313	2 5/16	1.50	2.68	9.65	2.76	14.06			
	2375150HP-18	2.375	2 3/8	1.50	2.68	9.84	2.76	14.25			

Applicable inserts **G04~05**

King Drill-5D

For through coolant system with a lathe





(inch)

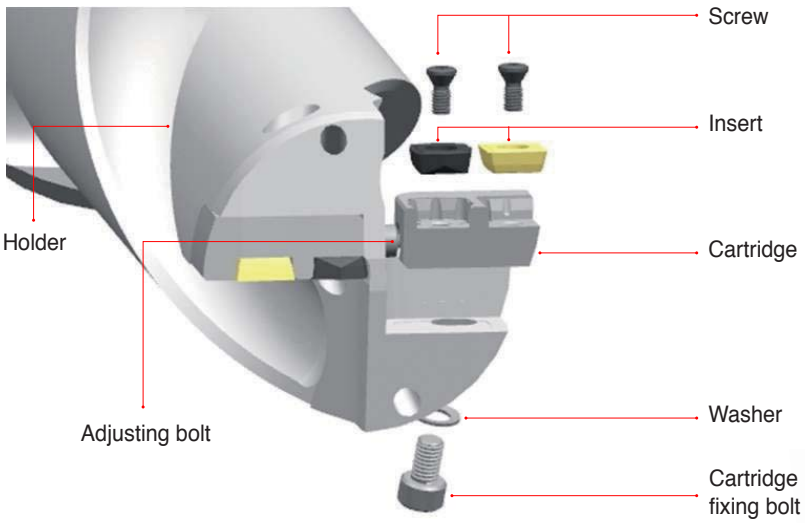
Designation		ØD		Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K5DA	0484075HP-04	0.484	31/64	0.75	0.98	2.48	1.97	5.00	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	0500075HP-04	0.500	1/2	0.75	0.98	2.48	1.97	5.00			
	0531075HP-04	0.531	17/32	0.75	0.98	2.68	1.97	5.20			
	0562075HP-05	0.562	9/16	0.75	0.98	2.87	1.97	5.43	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	0625075HP-05	0.625	5/8	0.75	0.98	3.27	1.97	5.87			
	0687100HP-06	0.687	11/16	1.00	1.34	3.46	2.20	6.30	SP□T07T208-□□ XO□T07T205-□□	FTKA02206S	TW07P
	0750100HP-06	0.750	3/4	1.00	1.34	3.86	2.20	6.73			
	0812100HP-07	0.812	13/16	1.00	1.34	4.25	2.20	7.20	SP□T090308-□□ XO□T090305-□□	FTKA02565	TW07S
	0875100HP-07	0.875	7/8	1.00	1.34	4.45	2.20	7.40			
	0937125HP-09	0.937	15/16	1.25	1.73	4.84	2.36	8.07	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	1000125HP-09	1.000	1	1.25	1.73	5.04	2.36	8.27			
	1031125HP-09	1.031	1 1/32	1.25	1.73	5.24	2.36	8.46			
	1062125HP-09	1.062	1 1/16	1.25	1.73	5.43	2.36	8.70			
	1125125HP-09	1.125	1 1/8	1.25	1.73	5.83	2.36	9.13			
	1187125HP-11	1.187	1 3/16	1.25	1.73	6.02	2.36	9.45	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	1250125HP-11	1.250	1 1/4	1.25	1.73	6.42	2.36	9.84			
	1312125HP-11	1.312	1 5/16	1.25	1.73	6.61	2.36	10.08			
	1375125HP-11	1.375	1 3/8	1.25	1.73	7.01	2.36	10.47			
	1437150HP-13	1.437	1 7/16	1.50	1.89	7.24	2.76	11.18	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	1500150HP-13	1.500	1 1/2	1.50	1.89	7.64	2.76	11.61			
	1562150HP-13	1.562	1 9/16	1.50	1.89	8.03	2.76	12.05			
	1625150HP-13	1.625	1 5/8	1.50	1.89	8.23	2.76	12.24			
	1687150HP-13	1.687	1 11/16	1.50	2.28	8.66	2.76	12.80			
	1750150HP-15	1.750	1 3/4	1.50	2.28	8.86	2.76	12.99	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	1812150HP-15	1.812	1 13/16	1.50	2.28	9.25	2.76	13.43			
	1875150HP-15	1.875	1 7/8	1.50	2.28	9.65	2.76	13.86			
	1937150HP-15	1.937	1 15/16	1.50	2.28	9.84	2.76	14.06			
	2000150HP-15	2.000	2	1.50	2.68	10.28	2.76	14.61			
	2062150HP-18	2.062	2 1/16	1.50	2.68	10.47	2.76	14.80	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	2125150HP-18	2.125	2 1/8	1.50	2.68	10.87	2.76	15.20			
	2187150HP-18	2.187	2 3/16	1.50	2.68	11.26	2.76	15.67			
	2250150HP-18	2.250	2 1/4	1.50	2.68	11.50	2.76	15.91			
	2313150HP-18	2.313	2 5/16	1.50	2.68	11.97	2.76	16.38			
	2375150HP-18	2.375	2 3/8	1.50	2.68	12.20	2.76	16.61			

Applicable inserts **G04~05**

High rigidity drill produces cost efficiency due to cartridge replacement

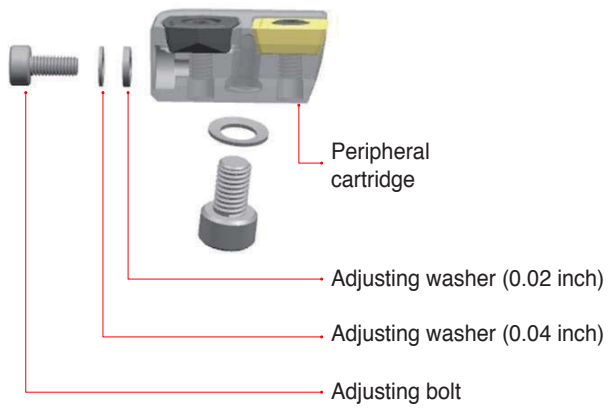
King Drill (For large diameter drilling)

- Cartridge type for Ø2.4~Ø3.94 drilling
- Peripheral cartridge can adjust the drilling diameter within 0.197 inch
- Easy to adjust drilling diameter with adjusting bolt





Adjustment of drill diameter

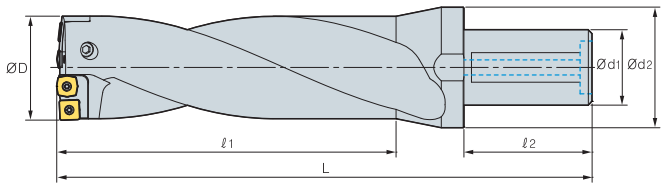


Adjustment Ø (inch)	Adjusting washer	
	Designation	Width (inch)
1	WA0305	0.020
2	WA0310	0.040
3	WA0305+WA0310	0.059
4	WA0310x2	0.079
5	WA0305+WA0310x2	0.098

※ Adjusting washer adjusts the drilling diameter within 0.197 inch

King Drill

For large diameter drilling



(inch)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Cartridge		Screw	Wrench
								Internal	External		
K2DA	240256200HP-11	2.40~2.56	2.0	3.15	5.12	3.35	10.24	KDC240256C	KDC240256P	FTKA03508	TW15S
	256276200HP-13	2.56~2.76	2.0	3.46	5.51	3.35	10.63	KDC256276C	KDC256276P	FTKA0410	TW15S
	276295200HP-13	2.76~2.95	2.0	3.46	5.91	3.35	11.02	KDC276295C	KDC276295P	FTKA0410	TW15S
	295315200HP-13	2.95~3.15	2.0	3.46	6.30	3.35	11.42	KDC295315C	KDC295315P	FTKA0410	TW15S
	315335200HP-15	3.15~3.35	2.0	3.46	6.69	3.35	11.81	KDC315335C	KDC315335P	FTNC04511	TW20S
	335354200HP-15	3.35~3.54	2.0	3.74	7.09	3.35	12.20	KDC335354C	KDC335354P	FTNC04511	TW20S
	354374200HP-15	3.54~3.74	2.0	3.74	7.48	3.35	12.60	KDC354374C	KDC354374P	FTNC04511	TW20S
	374394200HP-18	3.74~3.94	2.0	3.74	7.87	3.35	12.99	KDC374394C	KDC374394P	FTNA0511	TW20-100
K3DA	240256200HP-11	2.40~2.56	2.0	3.15	7.68	3.35	12.80	KDC240256C	KDC240256P	FTKA03508	TW15S
	256276200HP-13	2.56~2.76	2.0	3.46	8.27	3.35	13.39	KDC256276C	KDC256276P	FTKA0410	TW15S
	276295200HP-13	2.76~2.95	2.0	3.46	8.86	3.35	13.98	KDC276295C	KDC276295P	FTKA0410	TW15S
	295315200HP-13	2.95~3.15	2.0	3.46	9.45	3.35	14.57	KDC295315C	KDC295315P	FTKA0410	TW15S
	315335200HP-15	3.15~3.35	2.0	3.46	10.04	3.35	15.16	KDC315335C	KDC315335P	FTNC04511	TW20S
	335354200HP-15	3.35~3.54	2.0	3.74	10.63	3.35	15.75	KDC335354C	KDC335354P	FTNC04511	TW20S
	354374200HP-15	3.54~3.74	2.0	3.74	11.22	3.35	16.34	KDC354374C	KDC354374P	FTNC04511	TW20S
	374394200HP-18	3.74~3.94	2.0	3.74	11.81	3.35	16.93	KDC374394C	KDC374394P	FTNA0511	TW20-100
K4DA	240256200HP-11	2.40~2.56	2.0	3.15	10.24	3.35	15.35	KDC240256C	KDC240256P	FTKA03508	TW15S
	256276200HP-13	2.56~2.76	2.0	3.46	11.02	3.35	16.14	KDC256276C	KDC256276P	FTKA0410	TW15S
	276295200HP-13	2.76~2.95	2.0	3.46	11.81	3.35	16.93	KDC276295C	KDC276295P	FTKA0410	TW15S
	295315200HP-13	2.95~3.15	2.0	3.46	12.60	3.35	17.72	KDC295315C	KDC295315P	FTKA0410	TW15S
	315335200HP-15	3.15~3.35	2.0	3.46	13.39	3.35	18.50	KDC315335C	KDC315335P	FTNC04511	TW20S
	335354200-HP15	3.35~3.54	2.0	3.74	14.17	3.35	19.29	KDC335354C	KDC335354P	FTNC04511	TW20S
	354374200HP-15	3.54~3.74	2.0	3.74	14.96	3.35	20.08	KDC354374C	KDC354374P	FTNC04511	TW20S
	374394200HP-18	3.74~3.94	2.0	3.74	15.75	3.35	20.87	KDC374394C	KDC374394P	FTNA0511	TW20-100

Applicable inserts **G04~05**

Parts

(inch)

Cartridge		Range (Ø)	Insert				Screw	Wrench
Internal	External		Designation	Quantity	Designation	Quantity		
KDC240256C	KDC240256P	2.40~2.56	XOM□T11T306-□□	2	SPM□T11T308-□□	2	FTKA03508	TW15S
KDC256276C	KDC256276P	2.56~2.76	XOM□T130406-□□	2	SPM□T130410-□□	2	FTKA0410	TW15S
KDC276295C	KDC276295P	2.76~2.95	XOM□T130406-□□	2	SPM□T130410-□□	2	FTKA0410	TW15S
KDC295315C	KDC295315P	2.95~3.15	XOM□T130406-□□	2	SPM□T130410-□□	2	FTKA0410	TW15S
KDC315335C	KDC315335P	3.15~3.35	XOM□T15M508-□□	2	SPM□T15M510-□□	2	FTNC04511	TW20S
KDC335354C	KDC335354P	3.35~3.54	XOM□T15M508-□□	2	SPM□T15M510-□□	2	FTNC04511	TW20S
KDC354374C	KDC354374P	3.54~3.74	XOM□T15M508-□□	2	SPM□T15M510-□□	2	FTNC04511	TW20S
KDC374394C	KDC374394P	3.74~3.94	XOM□T180508-□□	2	SPM□T180510-□□	2	FTNA0511	TW20-100

Cone shaped head indexable drill

TPDC new

- Clamping design
  - One step clamp system → Increased stability
  - Clamping system allowing to change inserts while the holder is attached on the machine → Shortened setting time
- Optimized blade design
  - Excellent chip control → Possibility to use for various types of workpieces
- Helical shaped coolant hole system
  - Wide chip pocket area secured → Better lubrication + chip flow improved
- Material technology
  - Ultra-fine substrate + Multi-layer coating applied → Excellent anti chipping & wear resistance

Code system of holder

TPD C A 5D – 0591 075 – 2953

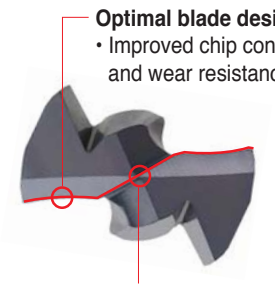
Top solid Piercing Drill	Insert type	Type	Aspect ratio(L/D)	Drill dia.	Shank dia.	Flute length (inch)
	C: Cone type	A: Inch type No code: Metric type	3D, 5D, 8D	0591: Ø0.591inch	075: Ø0.75 inch	2953: 2.953

Code system of insert

TPD 0591 C A P

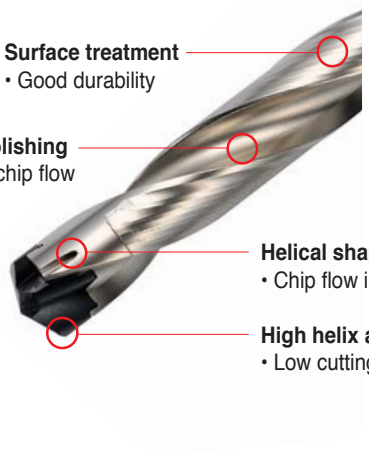
Top solid Piercing Drill	Drill dia.	Insert type	Type	Machining area
	0591: Ø0.591”	C: Cone type	A: Inch type No code: Metric type	P: Steel, Universal M: Stainless steel K: Cast iron N: Aluminium C: Carbon fiber Reinforced plastic

Features



Optimal blade design
• Improved chip control and wear resistance

Overlap thinning
• Excellent centering and penetration



Surface treatment
• Good durability

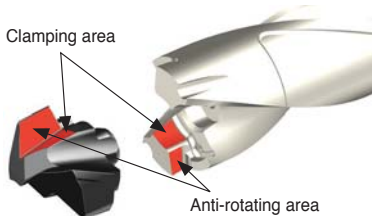
Flute polishing
• Better chip flow

Helical shaped coolant hole system
• Chip flow improved

High helix angle
• Low cutting load and good machinability

Features of clamping system

- One Step Clamp System ➡ Easy and quick tool change with good repeatability
  - Clamping area: Easy and fast tool change
  - Anti-rotating area: Performs as a stopper
  - Clamping and anti-rotating area make an acute angle to prevent insert rotation while machining



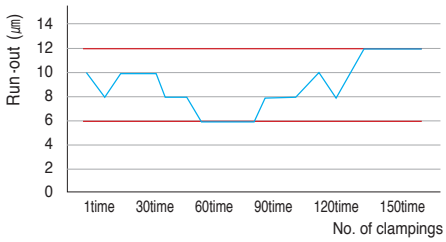
Performance evaluation

Durability test

- **Workpiece** Alloy steel (AISI4140, HRC22)
- **Cutting conditions** Drill dia. (inch) = Ø0.591
  vc (sfm) = 259.3, fn (ipr) = 0.01
  ap (inch) = 2.362, Wet
- **Tools** **Inserts** TPD0591CAP
  Holder TPDCA5D-0591075-2953

After using 40 inserts, the setting run-out remains below 15㎛

Sustainability test



Excellent Sustaina-bility

After clamping 150 times, the drill run-out remains

Application examples

- **Use** Part of machine
- **Workpiece** Alloy steel (AISI4140, HRC22)
- **Cutting conditions** Drill dia.(inch) = Ø0.748
  vc (sfm) = 328.1
  fn (ipr) = 0.012
  ap (inch) = 3.543, Wet
- **Tools** **Inserts** TPD0758CAP (PC5335)
  Holder TPDCA5D-0748100-3740

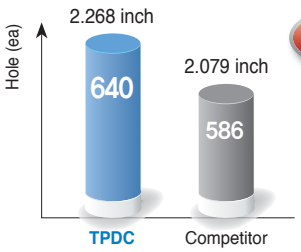


TPDC



Competitor

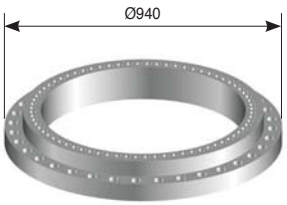
Test result



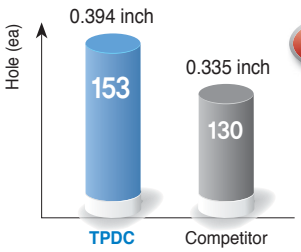
1.1 times more

Lubricative multi-layer coating prevents chipping on cutting edges

- **Use** Part of machine
- **Workpiece** Carbon steel (AISI1045, HRC40)
- **Cutting conditions** Drill dia.(inch) = Ø0.709
  vc (sfm) = 196.9
  fn (ipr) = 0.006
  ap (inch) = 2.559, Wet
- **Tools** **Inserts** TPD0709CAP (PC5335)
  Holder TPDCA5D-0709100-3543



Test result



1.2 times more

Lubricative multi-layer coating enhances wear resistance

Recommended cutting condition

Workpiece				Grade	vc	Depth of cut = 3D, 5D Feed rate (ipr) per drill dia. (inch)	
ISO		Workpiece	HB		sfm	Ø0.472~Ø0.629	Ø0.630~Ø1.220
P	Carbon steel	Low carbon steel	80~120	PC5335	360 (262~459)	0.0060~0.0118	0.0079~0.0138
		High carbon steel	180~280	PC5335	328 (230~426)	0.0060~0.0118	0.0079~0.0138
	Alloy steel	Low alloy steel	140~260	PC5335	360 (262~459)	0.0070~0.0138	0.0090~0.0150
		Low pre-hardened steel	200~400	PC5335	246 (164~328)	0.0070~0.0138	0.0090~0.0150
		High alloy steel	260~320	PC5335	230 (164~295)	0.0070~0.0138	0.0079~0.0138
		High pre-hardened steel	300~450	PC5335	197 (131~262)	0.0070~0.0138	0.0079~0.0138

- In case of 8D, reduce the cutting condition 40~50% lower than above after machining the beginning of hole(1.5D)
- In case of interrupted machining, reduce the feed to 0.004~0.006 around the interrupted part

How to make good insert clamping



① Clean the mounting seat with air or cloth

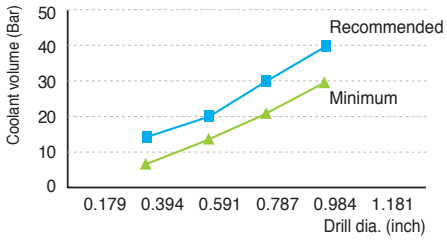
② Put an insert on the holder

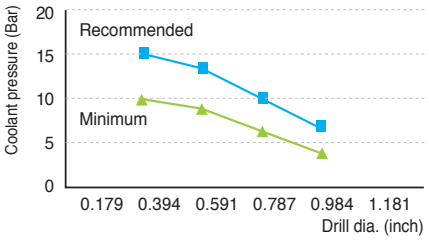
③ A part of wrench and B part of insert must be parallel to each other before clamp the insert
Turn the wrench clockwise to finish clamping

Clamped state

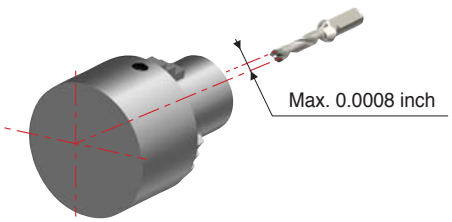
Coolant tip

- **Workpiece** Alloy steel (AISI4140, HRC22)
- **Cutting conditions** vc (sfm) = 328, Wet

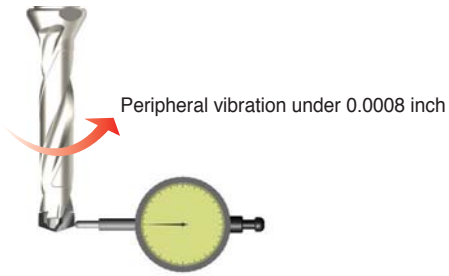




Precautions when setting

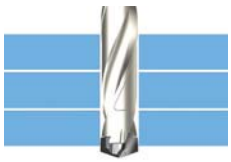
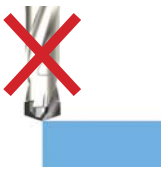
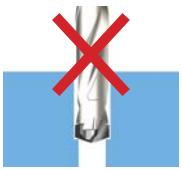


Setting of the horizontal equipment

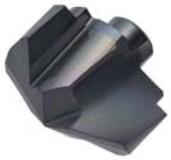


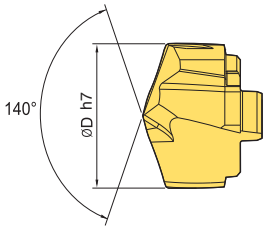
Setting of the vertical equipment

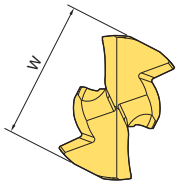
Precautions when drilling

Ramping	Overlapped	Plunging	Boring
			
1. A slope inclined more than 6° is not allowed 2. When entering, reduce the feed to 30~50%	1. Space between panels affects chip evacuation problem 2. Do not make space between panels	Not allowed	Not allowed

TPDC Insert new







(inch)

Designation		Drill dia. (ØD)	W	Grade	Holder	Wrench
TPD	0472CAP	0.472~0.491	0.448	PC5335	TPDCA(3,5,8)D-0472063-(1417,2362,3780)	TPDC-W12
	0492CAP	0.492~0.511	0.448	PC5335	TPDCA(3,5,8)D-0492063-(1496,2480,3937)	
	0512CAP	0.512~0.531	0.448	PC5335	TPDCA(3,5,8)D-0512063-(1535,2559,4094)	TPDC-W13
	0532CAP	0.532~0.550	0.448	PC5335	TPDCA(3,5,8)D-0532063-(1614,2677,4252)	
	0551CAP	0.551~0.570	0.528	PC5335	TPDCA(3,5,8)D-0551063-(1654,2756,4409)	TPDC-W14
	0571CAP	0.571~0.590	0.528	PC5335	TPDCA(3,5,8)D-0571063-(1732,2874,4567)	
	0591CAP	0.591~0.629	0.563	PC5335	TPDCA(3,5,8)D-0591075-(1772,2953,4724)	TPDC-W15
	0630CAP	0.630~0.668	0.602	PC5335	TPDCA(3,5,8)D-0630075-(1890,3150,5039)	TPDC-W16
	0669CAP	0.669~0.708	0.642	PC5335	TPDCA(3,5,8)D-0669075-(2008,3346,5354)	TPDC-W17
	0709CAP	0.709~0.747	0.681	PC5335	TPDCA(3,5,8)D-0709100-(2126,3543,5669)	TPDC-W18
	0748CAP	0.748~0.786	0.721	PC5335	TPDCA(3,5,8)D-0748100-(2244,3740,5984)	TPDC-W19
	0787CAP	0.787~0.826	0.756	PC5335	TPDCA(3,5,8)D-0787100-(2362,3937,6299)	TPDC-W20
	0827CAP	0.827~0.865	0.791	PC5335	TPDCA(3,5,8)D-0827100-(2480,4134,6614)	TPDC-W21
	0866CAP	0.866~0.905	0.827	PC5335	TPDCA(3,5,8)D-0866100-(2598,4331,6929)	TPDC-W22
	0906CAP	0.906~0.944	0.862	PC5335	TPDCA(3,5,8)D-0906100-(2717,4528,7244)	TPDC-W23
	0945CAP	0.945~0.983	0.902	PC5335	TPDCA(3,5,8)D-0945126-(2835,4724,7559)	TPDC-W24
	0984CAP	0.984~1.023	0.941	PC5335	TPDCA(3,5,8)D-0984126-(2953,4921,7874)	TPDC-W25
	1024CAP	1.024~1.062	0.980	PC5335	TPDCA(3,5,8)D-1024126-(3071,5118,8189)	TPDC-W26
	1063CAP	1.063~1.101	1.020	PC5335	TPDCA(3,5,8)D-1063126-(3189,5315,8504)	TPDC-W27
	1102CAP	1.102~1.141	1.059	PC5335	TPDCA(3,5,8)D-1102126-(3307,5512,8819)	TPDC-W28
	1142CAP	1.142~1.180	1.098	PC5335	TPDCA(3,5,8)D-1142126-(3425,5709,9134)	TPDC-W29
	1182CAP	1.181~1.220	1.138	PC5335	TPDCA(3,5,8)D-1182126-(3543,5906,9449)	TPDC-W30

※ Order made items available

Parts (Recommended torque per wrench)

(inch)

Designation	Drill dia. (ØD)	Torque (In.lbf)
TPDC-W12	0.472~0.511	22.1
TPDC-W13	0.512~0.550	22.1
TPDC-W14	0.551~0.590	22.1
TPDC-W15	0.591~0.629	22.1
TPDC-W16	0.630~0.668	22.1
TPDC-W17	0.669~0.708	31.0
TPDC-W18	0.709~0.747	31.0
TPDC-W19	0.748~0.786	31.0
TPDC-W20	0.787~0.826	31.0
TPDC-W21	0.827~0.865	31.0
TPDC-W22	0.866~0.905	31.0
TPDC-W23	0.906~0.944	31.0
TPDC-W24	0.945~0.983	31.0
TPDC-W25	0.984~1.023	31.0
TPDC-W26	1.024~1.062	48.7
TPDC-W27	1.063~1.101	48.7
TPDC-W28	1.102~1.141	48.7
TPDC-W29	1.142~1.180	48.7
TPDC-W30	1.181~1.220	48.7

TPDC3D/5D/8D new



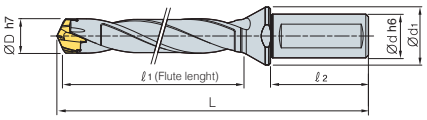


Fig.1

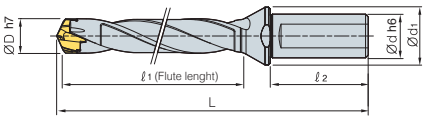


Fig.2

(inch)

Designation		ØD	Ød	Ød$_1$	ℓ$_1$	ℓ$_2$	L	Insert	Fig.
TPDCA	3D-0472063-1417	0.472~0.491	0.625	0.787	1.417	1.890	3.898	TPD0472CA□-0491CA□	1
	3D-0492063-1496	0.492~0.511	0.625	0.787	1.496	1.890	3.976	TPD0492CA□-0511CA□	1
	3D-0512063-1535	0.512~0.531	0.625	0.787	1.535	1.890	4.055	TPD0512CA□-0531CA□	1
	3D-0532063-1614	0.532~0.550	0.625	0.787	1.614	1.890	4.134	TPD0532CA□-0550CA□	1
	3D-0551063-1654	0.551~0.570	0.625	0.787	1.654	1.890	4.173	TPD0551CA□-0570CA□	1
	3D-0571063-1732	0.571~0.590	0.625	0.787	1.732	1.890	4.213	TPD0571CA□-0590CA□	1
	3D-0591075-1772	0.591~0.629	0.750	0.984	1.772	1.969	4.449	TPD0591CA□-0629CA□	2
	3D-0630075-1890	0.630~0.668	0.750	0.984	1.890	1.969	4.606	TPD0630CA□-0668CA□	2
	3D-0669075-2008	0.669~0.708	0.750	0.984	2.008	1.969	4.724	TPD0669CA□-0708CA□	2
	3D-0709100-2126	0.709~0.747	1.000	1.299	2.126	2.205	5.197	TPD0709CA□-0747CA□	2
	3D-0748100-2244	0.748~0.786	1.000	1.299	2.244	2.205	5.315	TPD0748CA□-0786CA□	2
	5D-0472063-2362	0.472~0.491	0.625	0.787	2.362	1.890	4.843	TPD0472CA□-0491CA□	1
	5D-0492063-2480	0.492~0.511	0.625	0.787	2.480	1.890	4.961	TPD0492CA□-0511CA□	1
	5D-0512063-2559	0.512~0.531	0.625	0.787	2.559	1.890	5.079	TPD0512CA□-0531CA□	1
	5D-0532063-2677	0.532~0.550	0.625	0.787	2.677	1.890	5.197	TPD0532CA□-0550CA□	1
	5D-0551063-2756	0.551~0.570	0.625	0.787	2.756	1.890	5.276	TPD0551CA□-0570CA□	1
	5D-0571063-2874	0.571~0.590	0.625	0.787	2.874	1.890	5.354	TPD0571CA□-0590CA□	1
	5D-0591075-2953	0.591~0.629	0.750	0.984	2.953	1.969	5.630	TPD0591CA□-0629CA□	2
	5D-0630075-3150	0.630~0.668	0.750	0.984	3.150	1.969	5.866	TPD0630CA□-0668CA□	2
	5D-0669075-3346	0.669~0.708	0.750	0.984	3.346	1.969	6.063	TPD0669CA□-0708CA□	2
	5D-0709100-3543	0.709~0.747	1.000	1.299	3.543	2.205	6.614	TPD0709CA□-0747CA□	2
	5D-0748100-3740	0.748~0.786	1.000	1.299	3.740	2.205	6.811	TPD0748CA□-0786CA□	2
	8D-0472063-3780	0.472~0.491	0.625	0.787	3.780	1.890	6.260	TPD0472CA□-0491CA□	1
	8D-0492063-3937	0.492~0.511	0.625	0.787	3.937	1.890	6.417	TPD0492CA□-0511CA□	1
	8D-0512063-4094	0.512~0.531	0.625	0.787	4.094	1.890	6.614	TPD0512CA□-0531CA□	1
	8D-0532063-4252	0.532~0.550	0.625	0.787	4.252	1.890	6.811	TPD0532CA□-0550CA□	1
	8D-0551063-4409	0.551~0.570	0.625	0.787	4.409	1.890	6.929	TPD0551CA□-0570CA□	1
	8D-0571063-4567	0.571~0.590	0.625	0.787	4.567	1.890	7.087	TPD0571CA□-0590CA□	1
	8D-0591075-4724	0.591~0.629	0.750	0.984	4.724	1.969	7.402	TPD0591CA□-0629CA□	2
	8D-0630075-5039	0.630~0.668	0.750	0.984	5.039	1.969	7.756	TPD0630CA□-0668CA□	2
	8D-0669075-5354	0.669~0.708	0.750	0.984	5.354	1.969	8.071	TPD0669CA□-0708CA□	2
	8D-0709100-5669	0.709~0.747	1.000	1.299	5.669	2.205	8.740	TPD0709CA□-0747CA□	2
	8D-0748100-5984	0.748~0.786	1.000	1.299	5.984	2.205	9.055	TPD0748CA□-0786CA□	2

※ The shank is based on DIN6535 and ISO9677

TPDC3D/5D/8D new



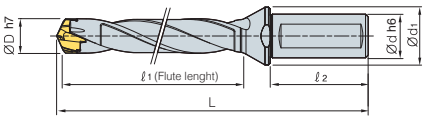


Fig.1

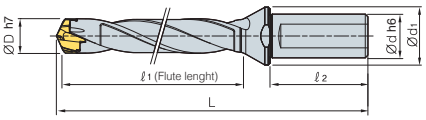


Fig.2

(inch)

Designation		ØD	Ød	Ød$_1$	ℓ$_1$	ℓ$_2$	L	Insert	Fig.
TPDCA	3D-0787100-2362	0.787~0.826	1.000	1.299	2.362	2.205	5.433	TPD0787CA□-0826CA□	2
	3D-0827100-2480	0.827~0.865	1.000	1.299	2.480	2.205	5.551	TPD0827CA□-0865CA□	2
	3D-0866100-2598	0.866~0.905	1.000	1.299	2.598	2.205	5.709	TPD0866CA□-0905CA□	2
	3D-0906100-2717	0.906~0.944	1.000	1.299	2.717	2.205	5.866	TPD0906CA□-0944CA□	2
	3D-0945125-2835	0.945~0.983	1.250	1.693	2.835	2.362	6.260	TPD0945CA□-0983CA□	2
	3D-0984125-2953	0.984~1.023	1.250	1.693	2.953	2.362	6.378	TPD0984CA□-1023CA□	2
	3D-1024125-3071	1.024~1.062	1.250	1.693	3.071	2.362	6.819	TPD1024CA□-1062CA□	2
	3D-1063125-3189	1.063~1.101	1.250	1.693	3.189	2.362	6.941	TPD1063CA□-1101CA□	2
	3D-1102125-3307	1.102~1.141	1.250	1.693	3.307	2.362	7.102	TPD1102CA□-1141CA□	2
	3D-1142125-3425	1.142~1.180	1.250	1.693	3.425	2.362	7.270	TPD1142CA□-1180CA□	2
	3D-1181125-3543	1.181~1.220	1.250	1.693	3.543	2.362	7.392	TPD1181CA□-1220CA□	2
	5D-0787100-3937	0.787~0.826	1.000	1.299	3.937	2.205	7.008	TPD0787CA□-0826CA□	2
	5D-0827100-4134	0.827~0.865	1.000	1.299	4.134	2.205	7.205	TPD0827CA□-0865CA□	2
	5D-0866100-4331	0.866~0.905	1.000	1.299	4.331	2.205	7.441	TPD0866CA□-0905CA□	2
	5D-0906100-4528	0.906~0.944	1.000	1.299	4.528	2.205	7.677	TPD0906CA□-0944CA□	2
	5D-0945125-4724	0.945~0.983	1.250	1.693	4.724	2.362	8.150	TPD0945CA□-0983CA□	2
	5D-0984125-4921	0.984~1.023	1.250	1.693	4.921	2.362	8.346	TPD0984CA□-1023CA□	2
	5D-1024125-5118	1.024~1.062	1.250	1.693	5.118	2.362	8.866	TPD1024CA□-1062CA□	2
	5D-1063125-5315	1.063~1.101	1.250	1.693	5.315	2.362	9.067	TPD1063CA□-1101CA□	2
	5D-1102125-5512	1.102~1.141	1.250	1.693	5.512	2.362	9.307	TPD1102CA□-1141CA□	2
	5D-1142125-5709	1.142~1.180	1.250	1.693	5.709	2.362	9.554	TPD1142CA□-1180CA□	2
	5D-1181125-5906	1.181~1.220	1.250	1.693	5.906	2.362	9.754	TPD1181CA□-1220CA□	2
	8D-0787100-6299	0.787~0.826	1.000	1.299	6.299	2.205	9.370	TPD0787CA□-0826CA□	2
	8D-0827100-6614	0.827~0.865	1.000	1.299	6.614	2.205	9.685	TPD0827CA□-0865CA□	2
	8D-0866100-6929	0.866~0.905	1.000	1.299	6.929	2.205	10.039	TPD0866CA□-0905CA□	2
	8D-0906100-7244	0.906~0.944	1.000	1.299	7.244	2.205	10.394	TPD0906CA□-0944CA□	2
	8D-0945125-7559	0.945~0.983	1.250	1.693	7.559	2.362	10.984	TPD0945CA□-0983CA□	2
	8D-0984125-7874	0.984~1.023	1.250	1.693	7.874	2.362	11.299	TPD0984CA□-1023CA□	2
	8D-1024125-8189	1.024~1.062	1.250	1.693	8.189	2.362	11.937	TPD1024CA□-1062CA□	2
	8D-1063125-8504	1.063~1.101	1.250	1.693	8.504	2.362	12.256	TPD1063CA□-1101CA□	2
	8D-1102125-8819	1.102~1.141	1.250	1.693	8.819	2.362	12.614	TPD1102CA□-1141CA□	2
	8D-1142125-9134	1.142~1.180	1.250	1.693	9.134	2.362	12.979	TPD1142CA□-1180CA□	2
	8D-1181125-9449	1.181~1.220	1.250	1.693	9.449	2.362	13.297	TPD1181CA□-1220CA□	2

※ The shank is based on DIN6535 and ISO9677

High precision grinding and superior clamping precision with auto-centering system

TPDB

- High precision clamping system - High precision grinding and superior clamping precision with auto-centering system
- Screw on clamping system - Easy clamping system of TPDB insert
- Sharp cutting edge - Improved chip evacuation, low cutting load, longer tool life with ultra-fine substrate and exclusive coating layer
- Holder with excellent durability - Holder with high rigidity and superb wear resistance due to special surface treatment

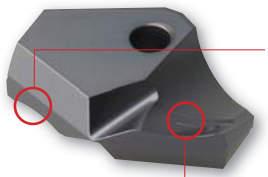
Code system of holder

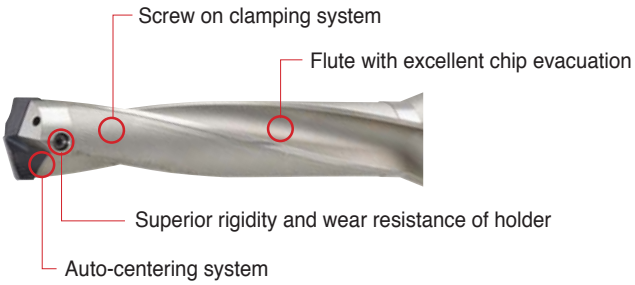
TPD	B	A	0610 – 075	□	– 5
Top Solid Piercing Drill	Insert type	type	Drill dia.	Shank dia.	Shank shape	Aspect ratio
	B: Blade type	A: Inch type No code: Metric type	0610: Ø0.610	075: Ø0.75		3D, 5D, 8D

Code system of insert

TPD	0630	B	A
Top Solid Piercing Drill	Drill dia.	Insert type	type
	0630: Ø0.630	B: Blade type	A: Inch type No code: Metric type

Features

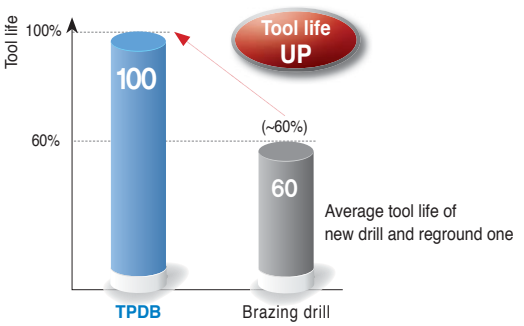




Tool cost

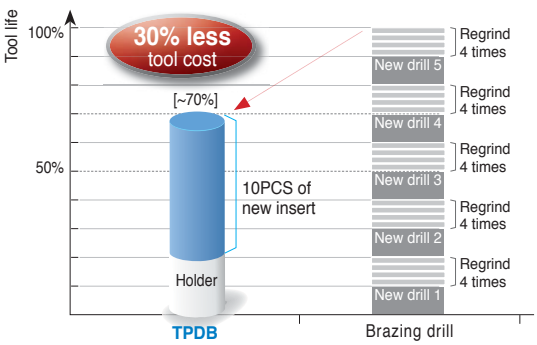
Comparison of 1 insert tool life

- Exclusive coating and substrate
- Usable till the end of wear (no need regrinding)



Comparison of tool cost when machining 1000PCS of workpiece (Alloy steel AISI 4140)

- 40% longer tool life
- No need regrind
- Less insert change
- 30% less tool cost

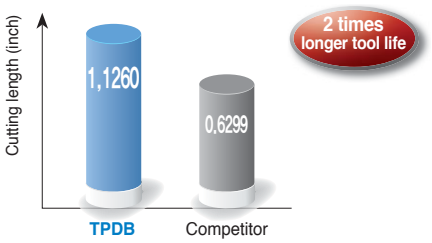


Application example

- **Use** Part of Automobile
- **Workpiece** AISI80-55-06
- **Cutting conditions** vc (sfm) = 324.8, fn (ipr) = 0.0122
  ap (inch) = 1.575, Inner coolant system
- **Tools** **Inserts** TPD0768BA (PC5300)
  Holder TPDBA0768-100-5
- **Machine** MCT (Vertical)



■ **Test result**

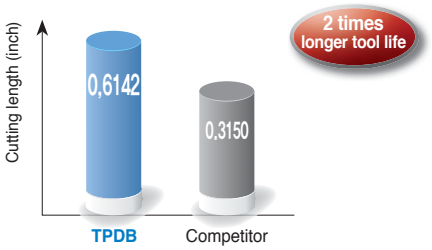


• 200% longer tool life than competitor's

- **Use** Part of Heavy Equipment
- **Workpiece** Hot Forged steel
- **Cutting conditions** vc (sfm) = 281.8, fn (ipr) = 0.0079
  ap (inch) = 0.787, Inner coolant system
- **Tools** **Inserts** TPD0827BA (PC5300)
  Holder TPDBA0827-100-3
- **Machine** MCT (Vertical)



■ **Test result**



• 200% longer tool life than competitor's

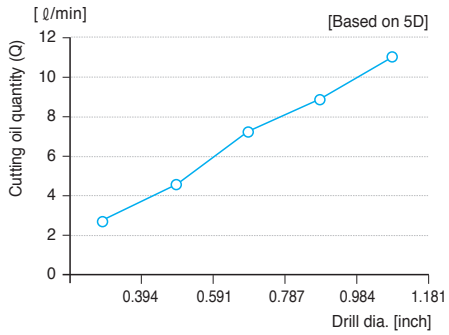
Recommended cutting condition

Workpiece				Grade	vc	Depth of cut = 3D~5D Feed rate (ipr) per drill dia. (inch)		
ISO		Workpiece	HB		sfm	Ø0.3937~Ø0.6260	Ø0.6300~Ø0.9803	Ø0.9843~Ø1.1772
P	Carbon steel	Low carbon steel	80~120	PC5300, PC5335	365 (265~464)	0.0059~0.0118	0.0079~0.0138	0.0098~0.0157
		High carbon steel	180~280	PC5300, PC5335	332 (232~431)	0.0059~0.0118	0.0079~0.0138	0.0098~0.0157
	Alloy steel	Low alloy steel	140~260	PC5300	365 (265~464)	0.0071~0.0138	0.0091~0.015	0.0110~0.0169
		Low pre-hardened steel	200~400	PC5300	249 (166~332)	0.0071~0.0138.	0.0091~0.015	0.0110~0.0169
		High alloy steel	260~320	PC5300	232 (166~298)	0.0071~0.0118	0.0079~0.0138	0.0098~0.0157
		High pre-hardened steel	300~450	PC5300	199 (133~265)	0.0071~0.0118	0.0079~0.0138	0.0098~0.0157
M	Stainless steel	Austenite series	135~275	PC5300	166 (99~232)	0.0051~0.0098	0.0059~0.0118	0.0067~0.0130
		Ferrite series Martensite series	13~275	PC5300	182 (133~232)	0.0051~0.0098	0.0059~0.0118	0.0067~0.0130
K	Cast iron	Gray cast iron	150~230	PC5300	365 (265~464)	0.0071~0.0138	0.0079~0.0157	0.0098~0.0177
		Ductile cast iron	160~260	PC5300	332 (232~431)	0.0071~00.0138	0.0079~0.0157	0.0098~0.0177
S	Heat resisting steel	Ni-heat resisting alloy	130~400	PC5300	133 (66~199)	0.0039~0.0079	0.0047~0.0087	0.0051~0.0098
		Ti-heat resisting alloy	130~400	PC5300	133 (66~199)	0.0039~0.0079	0.0047~0.0087	0.0051~0.0098
		High-hardened steel	Over 400	PC5300	116 (66~166)	0.0039~0.0079	0.0047~0.0087	0.0051~0.0098

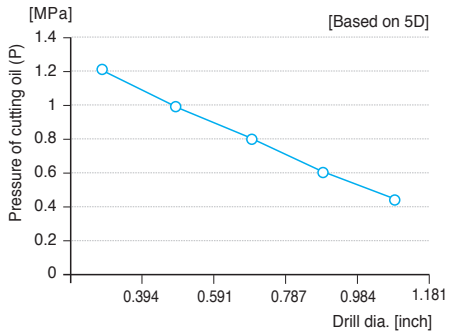
• In case of 8D, reduce the cutting conditions to 40~50% or machine the beginning of hole first.(1.5D)
• In case of interrupted machining, reduce the feed to 30~50% machining around the interrupted part

Technical information

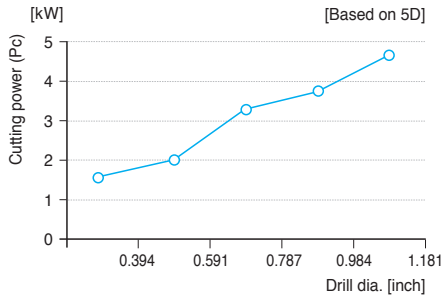
Cutting oil quantity



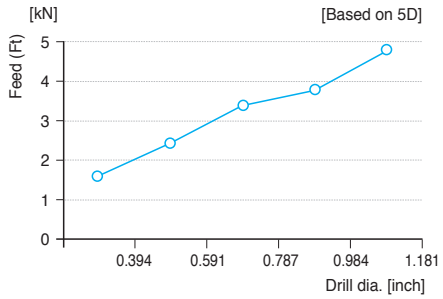
Pressure of cutting oil



Cutting power



Feed



How to clamp a TPDB insert



Clamping an insert on a holder

- Put an insert in the holder
- As the Fig.1, clamp the insert while pushing it to the V shaped groove of the holder
- Screw the insert

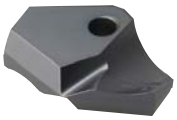


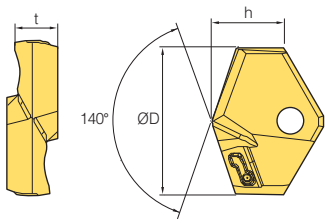


Changing an insert on the machine

- Separate the insert from the holder
- As the Fig.2, clean the insert seat
- Place the insert to the mounting seat
- As the Fig.3, clamp the insert while pushing it to the V shaped groove of the holder

TPDB Insert





(inch)

Designation		Grade	ØD	h	t
TPD	0394~0432BA	PC5300	0.394~0.432	0.217	0.138
	0433~0471BA	PC5300	0.433~0.471	0.228	0.138
	0472~0511BA	PC5300	0.472~0.511	0.248	0.138
	0512~0550BA	PC5300	0.512~0.550	0.256	0.157
	0551~0590BA	PC5300	0.551~0.590	0.268	0.157
	0591~0629BA	PC5300	0.591~0.629	0.276	0.157
	0630~0668BA	PC5300	0.630~0.668	0.303	0.217
	0669~0708BA	PC5300	0.669~0.708	0.311	0.217
	0709~0747BA	PC5300	0.709~0.747	0.319	0.236
	0748~0786BA	PC5300	0.748~0.786	0.327	0.236
	0787~0826BA	PC5300	0.787~0.826	0.382	0.256
	0827~0865BA	PC5300	0.827~0.865	0.370	0.256
	0866~0905BA	PC5300	0.866~0.905	0.378	0.276
	0906~0944BA	PC5300	0.906~0.944	0.386	0.276
	0945~0983BA	PC5300	0.945~0.983	0.421	0.295
	0984~1023BA	PC5300	0.984~1.023	0.429	0.295
	1024~1062BA	PC5300	1.024~1.062	0.433	0.335
	1063~1101BA	PC5300	1.063~1.101	0.465	0.335
	1102~1141BA	PC5300	1.102~1.141	0.496	0.374
	1142~1180BA	PC5300	1.142~1.180	0.508	0.374
	1181~1219BA	PC5300	1.181~1.219	0.514	0.394
	1220~1259BA	PC5300	1.220~1.259	0.523	0.394
	1260~1298BA	PC5300	1.260~1.298	0.531	0.394

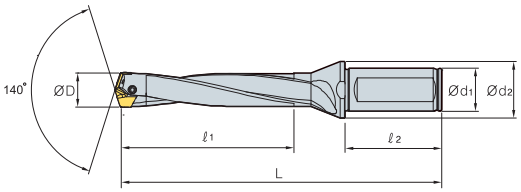
Parts

(inch)

Designation		Drill dia. (ØD)	Screw	Wrench	Torque (NM)
TPD	0394BA~0508BA	0.394~0.508	FTNB0209	TW06P	0.4
	0513BA~0587BA	0.513~0.587	FTNB02512	TW07S	0.8
	0591BA~0705BA	0.591~0.705	FTNB02514	TW07S	0.8
	0709BA~0783BA	0.709~0.783	FTNB0316	TW09S	1.2
	0787BA~0941BA	0.787~0.941	FTNB0319	TW09S	1.2
	0945BA~1018BA	0.945~1.018	FTNB03522	TW15S	3
	1024BA~1098BA	1.024~1.098	FTNB03524	TW15S	3
	1102BA~1177BA	1.102~1.177	FTNB0426	TW15S	3
	1181BA~1298BA	1.181~1.298	FTNB0528	TW20-100	4

TPDB-3D





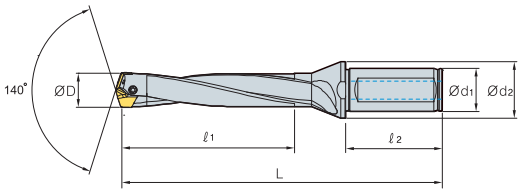
(inch)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDBA	0394-063-3	0.394~0.412	0.625	0.787	1.181	1.890	3.740	TPD0394BA–0412BA
	0413-063-3	0.413~0.432	0.625	0.787	1.240	1.890	3.780	TPD0413BA–0432BA
	0433-063-3	0.433~0.452	0.625	0.787	1.299	1.890	3.858	TPD0433BA–0452BA
	0453-063-3	0.453~0.471	0.625	0.787	1.358	1.890	3.898	TPD0453BA–0471BA
	0472-063-3	0.472~0.491	0.625	0.787	1.417	1.890	4.016	TPD0472BA-0491BA
	0492-063-3	0.492~0.511	0.625	0.787	1.476	1.890	4.094	TPD0492BA-0511BA
	0512-063-3	0.512~0.530	0.625	0.787	1.535	1.890	4.213	TPD0512BA-0530BA
	0531-063-3	0.531~0.550	0.625	0.787	1.594	1.890	4.291	TPD0531BA-0550BA
	0551-063-3	0.551~0.570	0.625	0.787	1.654	1.890	4.370	TPD0551BA-0570BA
	0571-063-3	0.571~0.590	0.625	0.787	1.713	1.890	4.488	TPD0571BA-0590BA
	0591-075-3	0.591~0.609	0.750	0.984	1.772	1.969	4.646	TPD0591BA-0609BA
	0610-075-3	0.610~0.629	0.750	0.984	1.831	1.969	4.724	TPD0610BA-0629BA
	0630-075-3	0.630~0.649	0.750	0.984	1.890	1.969	4.803	TPD0630BA-0649BA
	0650-075-3	0.650~0.668	0.750	0.984	1.949	1.969	4.882	TPD0650BA-0668BA
	0669-075-3	0.669~0.688	0.750	0.984	2.008	1.969	5.000	TPD0669BA-0688BA
	0689-075-3	0.689~0.708	0.750	0.984	2.067	1.969	5.079	TPD0689BA-0708BA
	0709-100-3	0.709~0.727	1.000	1.299	2.126	2.205	5.394	TPD0709BA-0727BA
	0728-100-3	0.728~0.747	1.000	1.299	2.185	2.205	5.472	TPD0728BA-0747BA
	0748-100-3	0.748~0.767	1.000	1.299	2.244	2.205	5.591	TPD0748BA-0767BA
	0768-100-3	0.768~0.786	1.000	1.299	2.303	2.205	5.669	TPD0768BA-0786BA
	0787-100-3	0.787~0.806	1.000	1.299	2.362	2.205	5.748	TPD0787BA-0806BA
	0807-100-3	0.807~0.826	1.000	1.299	2.421	2.205	5.827	TPD0807BA-0826BA
	0827-100-3	0.827~0.845	1.000	1.299	2.480	2.362	5.945	TPD0827BA-0845BA
	0846-100-3	0.846~0.865	1.000	1.299	2.539	2.362	6.024	TPD0846BA-0865BA
	0866-100-3	0.866~0.885	1.000	1.299	2.598	2.362	6.102	TPD0866BA-0885BA
	0886-100-3	0.886~0.905	1.000	1.299	2.657	2.362	6.181	TPD0886BA-0905BA
	0906-100-3	0.906~0.924	1.000	1.299	2.717	2.362	6.299	TPD0906BA-0924BA
	0925-100-3	0.925~0.944	1.000	1.299	2.776	2.362	6.378	TPD0925BA-0944BA
	0945-125-3	0.945~0.964	1.250	1.693	2.835	2.362	6.614	TPD0945BA-0964BA
	0965-125-3	0.965~0.983	1.250	1.693	2.894	2.362	6.693	TPD0965BA-0983BA
	0984-125-3	0.984~1.003	1.250	1.693	2.953	2.362	6.811	TPD0984BA-1003BA
	1004-125-3	1.004~1.023	1.250	1.693	3.012	2.362	6.890	TPD1004BA-1023BA
	1024-125-3	1.024~1.062	1.250	1.693	3.071	2.362	6.969	TPD1024BA-1062BA
	1063-125-3	1.063~1.101	1.250	1.693	3.189	2.362	7.165	TPD1063BA-1101BA
	1102-125-3	1.102~1.141	1.250	1.693	3.307	2.362	7.323	TPD1102BA-1141BA
	1142-125-3	1.142~1.180	1.250	1.693	3.425	2.362	7.520	TPD1142BA-1180BA
	1181-125-3	1.181~1.219	1.250	1.693	3.543	2.362	7.638	TPD1181BA-1219BA
	1220-125-3	1.220~1.259	1.250	1.693	3.661	2.362	7.835	TPD1220BA-1259BA
	1260-125-3	1.260~1.298	1.250	1.693	3.780	2.362	7.913	TPD1260BA-1299BA

Applicable inserts **G27**

TPDB-5D





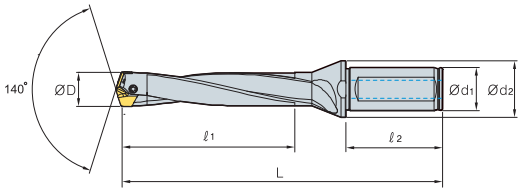
(inch)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDBA	0394-063-5	0.394~0.412	0.625	0.787	1.969	1.890	4.528	TPD0394BA–0412BA
	0413-063-5	0.413~0.432	0.625	0.787	2.067	1.890	4.606	TPD0413BA–0432BA
	0433-063-5	0.433~0.452	0.625	0.787	2.165	1.890	4.724	TPD0433BA–0452BA
	0453-063-5	0.453~0.471	0.625	0.787	2.264	1.890	4.843	TPD0453BA–0471BA
	0472-063-5	0.472~0.491	0.625	0.787	2.362	1.890	4.961	TPD0472BA-0491BA
	0492-063-5	0.492~0.511	0.625	0.787	2.461	1.890	5.079	TPD0492BA-0511BA
	0512-063-5	0.512~0.530	0.625	0.787	2.559	1.890	5.236	TPD0512BA-0530BA
	0531-063-5	0.531~0.550	0.625	0.787	2.657	1.890	5.354	TPD0531BA-0550BA
	0551-063-5	0.551~0.570	0.625	0.787	2.756	1.890	5.472	TPD0551BA-0570BA
	0571-063-5	0.571~0.590	0.625	0.787	2.854	1.890	5.630	TPD0571BA-0590BA
	0591-075-5	0.591~0.609	0.750	0.984	2.953	1.969	5.827	TPD0591BA-0609BA
	0610-075-5	0.610~0.629	0.750	0.984	3.051	1.969	5.945	TPD0610BA-0629BA
	0630-075-5	0.630~0.649	0.750	0.984	3.150	1.969	6.063	TPD0630BA-0649BA
	0650-075-5	0.650~0.668	0.750	0.984	3.248	1.969	6.181	TPD0650BA-0668BA
	0669-075-5	0.669~0.688	0.750	0.984	3.346	1.969	6.339	TPD0669BA-0688BA
	0689-075-5	0.689~0.708	0.750	0.984	3.445	1.969	6.457	TPD0689BA-0708BA
	0709-100-5	0.709~0.727	1.000	1.299	3.543	2.205	6.811	TPD0709BA-0727BA
	0728-100-5	0.728~0.747	1.000	1.299	3.642	2.205	6.929	TPD0728BA-0747BA
	0748-100-5	0.748~0.767	1.000	1.299	3.740	2.205	7.087	TPD0748BA-0767BA
	0768-100-5	0.768~0.786	1.000	1.299	3.839	2.205	7.205	TPD0768BA-0786BA
	0787-100-5	0.787~0.806	1.000	1.299	3.937	2.205	7.323	TPD0787BA-0806BA
	0807-100-5	0.807~0.826	1.000	1.299	4.035	2.205	7.441	TPD0807BA-0826BA
	0827-100-5	0.827~0.845	1.000	1.299	4.134	2.362	7.598	TPD0827BA-0845BA
	0846-100-5	0.846~0.865	1.000	1.299	4.232	2.362	7.717	TPD0846BA-0865BA
	0866-100-5	0.866~0.885	1.000	1.299	4.331	2.362	7.835	TPD0866BA-0885BA
	0886-100-5	0.886~0.905	1.000	1.299	4.429	2.362	7.953	TPD0886BA-0905BA
	0906-100-5	0.906~0.924	1.000	1.299	4.528	2.362	8.110	TPD0906BA-0924BA
	0925-100-5	0.925~0.944	1.000	1.299	4.626	2.362	8.228	TPD0925BA-0944BA
	0945-125-5	0.945~0.964	1.250	1.693	4.724	2.362	8.504	TPD0945BA-0964BA
	0965-125-5	0.965~0.983	1.250	1.693	4.823	2.362	8.622	TPD0965BA-0983BA
	0984-125-5	0.984~1.003	1.250	1.693	4.921	2.362	8.780	TPD0984BA-1003BA
	1004-125-5	1.004~1.023	1.250	1.693	5.020	2.362	8.898	TPD1004BA-1023BA
	1024-125-5	1.024~1.062	1.250	1.693	5.118	2.362	9.016	TPD1024BA-1062BA
	1063-125-5	1.063~1.101	1.250	1.693	5.315	2.362	9.291	TPD1063BA-1101BA
	1102-125-5	1.102~1.141	1.250	1.693	5.512	2.362	9.528	TPD1102BA-1141BA
	1142-125-5	1.142~1.180	1.250	1.693	5.709	2.362	9.803	TPD1142BA-1180BA
	1181-125-5	1.181~1.219	1.250	1.693	5.906	2.362	10.000	TPD1181BA-1219BA
	1220-125-5	1.220~1.259	1.250	1.693	6.102	2.362	10.276	TPD1220BA-1259BA
	1260-125-5	1.260~1.298	1.250	1.693	6.299	2.362	10.433	TPD1260BA-1299BA

Applicable inserts **G27**

TPDB-8D





(inch)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDBA	0394-063-8	0.394~0.412	0.625	0.787	3.150	1.890	5.709	TPD0394BA–0412BA
	0413-063-8	0.413~0.432	0.625	0.787	3.307	1.890	5.866	TPD0413BA–0432BA
	0433-063-8	0.433~0.452	0.625	0.787	3.465	1.890	6.024	TPD0433BA–0452BA
	0453-063-8	0.453~0.471	0.625	0.787	3.622	1.890	6.181	TPD0453BA–0471BA
	0472-063-8	0.472~0.491	0.625	0.787	3.780	1.890	6.378	TPD0472BA-0491BA
	0492-063-8	0.492~0.511	0.625	0.787	3.937	1.890	6.555	TPD0492BA-0511BA
	0512-063-8	0.512~0.530	0.625	0.787	4.094	1.890	6.772	TPD0512BA-0530BA
	0531-063-8	0.531~0.550	0.625	0.787	4.252	1.890	6.949	TPD0531BA-0550BA
	0551-063-8	0.551~0.570	0.625	0.787	4.409	1.890	7.126	TPD0551BA-0570BA
	0571-063-8	0.571~0.590	0.625	0.787	4.567	1.890	7.343	TPD0571BA-0590BA
	0591-075-8	0.591~0.609	0.750	0.984	4.724	1.969	7.598	TPD0591BA-0609BA
	0610-075-8	0.610~0.629	0.750	0.984	4.882	1.969	7.776	TPD0610BA-0629BA
	0630-075-8	0.630~0.649	0.750	0.984	5.039	1.969	7.953	TPD0630BA-0649BA
	0669-075-8	0.669~0.668	0.750	0.984	5.197	1.969	8.130	TPD0650BA-0668BA
	0670-075-8	0.670~0.688	0.750	0.984	5.354	1.969	8.346	TPD0669BA-0688BA
	0689-075-8	0.689~0.708	0.750	0.984	5.512	1.969	8.524	TPD0689BA-0708BA
	0709-100-8	0.709~0.727	1.000	1.299	5.669	2.205	8.937	TPD0709BA-0727BA
	0728-100-8	0.728~0.747	1.000	1.299	5.827	2.205	9.114	TPD0728BA-0747BA
	0748-100-8	0.748~0.767	1.000	1.299	5.984	2.205	9.331	TPD0748BA-0767BA
	0768-100-8	0.768~0.786	1.000	1.299	6.142	2.205	9.508	TPD0768BA-0786BA
	0787-100-8	0.787~0.806	1.000	1.299	6.299	2.205	9.685	TPD0787BA-0806BA
	0807-100-8	0.807~0.826	1.000	1.299	6.457	2.205	9.862	TPD0807BA-0826BA
	0827-100-8	0.827~0.845	1.000	1.299	6.614	2.362	10.079	TPD0827BA-0845BA
	0846-100-8	0.846~0.865	1.000	1.299	6.772	2.362	10.256	TPD0846BA-0865BA
	0866-100-8	0.866~0.885	1.000	1.299	6.929	2.362	10.433	TPD0866BA-0885BA
	0886-100-8	0.886~0.905	1.000	1.299	7.087	2.362	10.610	TPD0886BA-0905BA
	0906-100-8	0.906~0.924	1.000	1.299	7.244	2.362	10.827	TPD0906BA-0924BA
	0925-100-8	0.925~0.944	1.000	1.299	7.402	2.362	11.004	TPD0925BA-0944BA
	0945-125-8	0.945~0.964	1.250	1.693	7.559	2.362	11.339	TPD0945BA-0964BA
	0965-125-8	0.965~0.983	1.250	1.693	7.717	2.362	11.516	TPD0965BA-0983BA
	0984-125-8	0.984~1.003	1.250	1.693	7.874	2.362	11.732	TPD0984BA-1003BA
	1004-125-8	1.004~1.023	1.250	1.693	8.031	2.362	11.909	TPD1004BA-1023BA
	1024-125-8	1.024~1.062	1.250	1.693	8.189	2.362	12.087	TPD1024BA-1062BA
	1063-125-8	1.063~1.101	1.250	1.693	8.504	2.362	12.480	TPD1063BA-1101BA
	1102-125-8	1.102~1.141	1.250	1.693	8.819	2.362	12.835	TPD1102BA-1141BA
	1142-125-8	1.142~1.180	1.250	1.693	9.134	2.362	13.228	TPD1142BA-1180BA
	1181-125-8	1.181~1.219	1.250	1.693	9.449	2.362	13.543	TPD1181BA-1219BA
	1220-125-8	1.220~1.259	1.250	1.693	9.764	2.362	13.937	TPD1220BA-1259BA
	1260-125-8	1.260~1.298	1.250	1.693	10.079	2.362	14.213	TPD1260BA-1299BA

Applicable inserts **G27**

Convenient and quickly adjustable drill height

WPDC

Indexable Drill Clamped with Center Drill

Code system for drill



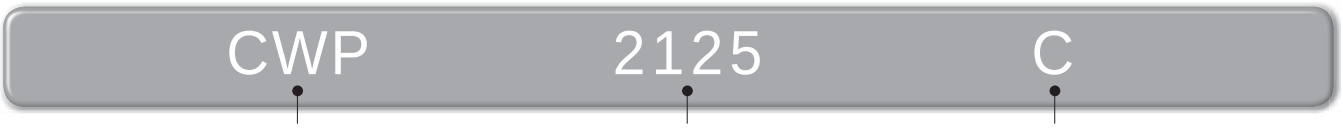
Type
Using W-type I/S center drill

Drill dia.
1250: Ø1.250
238256: Ø2.38~2.56

Shank dia.
125: Ø1.25
150: Ø1.50

Aspect ratio
5: 5D
6.5: 6.5D
8: 8D

Code system for cartridge



Type
CWP: Cartridge-WPDC

Drill dia.
2125: Ø2.125
238256: Ø2.38~2.56

Classification
C: Central
P: Peripheral

Code system for center drill



Type
Center Dril

Coolant
H: Coolant
Unmarked: None

Diameter × length of tool
23612: Ø0.236 X 1.2
31514: Ø0.315 X 1.4
39414: Ø0.394 X 1.4
47215: Ø0.472 X 1.5
63018: Ø0.630 X 1.8

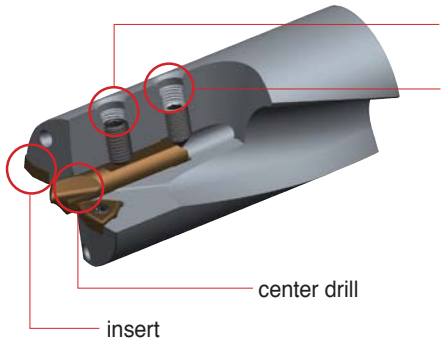
Grade of center drill



Product name
PVD coating

Coating layer
40H: TiN coating

How to clamp the drills



Feature of corn-point system

- Convenient and quick adjustable heights when inserting the center drill
- In case the center drill brakes while in usage, it can be replaced with the bolt for adjusting cone point
- The bolt for adjusting cone point prevents chattering on the center drill

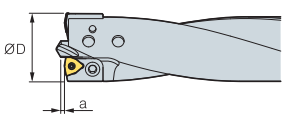
Clamping

❶	❷	❸	❹	❺
				
Place a center drill	Clamp insert and cartridge	Adjust the center drill with the bolt for adjusting cone point	Clamp the center drill firmly with fixing bolt	Reassure the clamp with bolt for adjusting cone point

※ Use safety covers for your safety when clamping the center drill and insert
※ When machining, be careful of the drill disk

Length of the ‘a’ part of center drill

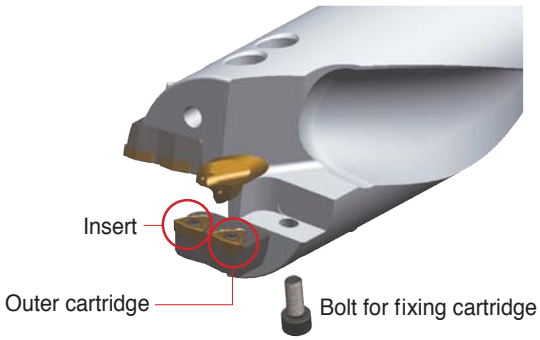
The length of ‘a’ being too short can cause bad surface finish or high cutting load
On the other hand, the length of ‘a’ being too long can make tool failure and chattering while drilling



Diameter (ØD)	Length of the ‘a’ part of center drill		
	Steel	Alloy steel	Non-ferrous metal
1.000~1.188	0.05	0.04	0.06
1.189~1.567	0.06	0.05	0.07
1.567~2.000	0.07	0.06	0.09
2.001~2.313	0.09	0.07	0.10
2.314~2.940	0.10	0.08	0.11
2.941~3.130	0.12	0.10	0.14

Adjusting diameter of cartridge type drill

- Disassemble a cartridge from the holder by loosening the bolt fixed for outer cartridge
- Machine after calculating the hole size on the side of the outer cartridge
- Trim the sharp part after machining
- Clamp the bolt for fixing cartridge without any gap in between the holder and the machined outer cartridge



- **Range of adjustable drill diameter**
  1. Single cartridge type (Drill diameter Ø1.625~Ø2.313) ···› 0.039 inch
  2. Dual cartridge type (Drill diameter Ø2.380~Ø3.310) ···› 0.197 inch

- **Diameter of the standard drills is provided with maximum size of standards**

  Ex) WPDCA256275-150-8 ···› Drill diameter 2.75 inch

Ex) How to adjust drill diameter to Ø2.60 machining with WPDCA256275-150-8
···› To make the drill diameter of outer cartridge to Ø2.60, machine 0.075 inch. (Ø2.75-Ø2.56 = 0.15 ···› 0.15 ÷ 2 = 0.075 (radius))

Recommended cutting condition

Workpiece				Chip breaker	Grade	vc	Depth of cut = 5D, 6.5D, 8D Feed rate (ipr) per drill dia. (inch)					
ISO		Workpiece	HB			sfm	~Ø1.188	Ø1.250~Ø1.563	Ø1.625~Ø1.938	Ø2.000~Ø2.313	Ø2.38~Ø2.94	Ø2.94~Ø3.13
P	Carbon steel	Low carbon steel (~0.25%)	80~180	C21N	PC5335	623 (524~722)	0.0028~0.0043	0.0031~0.0047	0.0039~0.0055	0.0047~0.0063	0.0047~0.0063	0.0047~0.0063
		High carbon steel (0.25%~)	180~280	C21N	PC5335	459 (361~558)	0.0028~0.0043	0.0031~0.0047	0.0039~0.0055	0.0047~0.0063	0.0047~0.0063	0.0047~0.0063
	Alloy steel	Low alloy steel	140~260	C21N	PC5335	426 (328~525)	0.0031~0.0047	0.0031~0.0047	0.0039~0.0055	0.0047~0.0071	0.0047~0.0071	0.0047~0.0071
		High alloy steel	50~260	C21N	PC5335	328 (230~426)	0.0024~0.0039	0.0031~0.0047	0.0031~0.0047	0.0039~0.0063	0.0039~0.0063	0.0039~0.0063
M	Stainless steel	Stainless steel	135~275	C21N	PC5335	328 (230~426)	0.0024~0.0039	0.0031~0.0047	0.0039~0.0047	0.0047~0.0055	0.0047~0.0055	0.0047~0.0055
K	Cast iron	Gray cast iron	150~220	C21N	PC5335	525 (426~623)	0.0035~0.0059	0.0039~0.0063	0.0047~0.0079	0.0055~0.0087	0.0055~0.0087	0.0055~0.0087
		Ductile cast iron	200~300	C21N	PC5335	459 (558~361)	0.0035~0.0059	0.0039~0.0063	0.0047~0.0079	0.0055~0.0087	0.0055~0.0087	0.0055~0.0087
		Malleable cast iron	130~230	C21N	PC5335	492 (591~394)	0.0035~0.0059	0.0039~0.0063	0.0047~0.0079	0.0055~0.0087	0.0055~0.0087	0.0055~0.0087
N	Alloyed aluminum	Alloyed aluminum	30~150	C21N	PC5335	984 (820~1148)	0.0031~0.0047	0.0039~0.0055	0.0047~0.0063	0.0055~0.0071	0.0055~0.0071	0.0055~0.0071
	Alloyed copper	Alloyed copper	150~160	C21N	PC5335	820 (656~984)	0.0031~0.0047	0.0039~0.0055	0.0047~0.0063	0.0055~0.0071	0.0055~0.0071	0.0055~0.0071
S	Heat resistant alloy	Heat resistant alloy	130~400	C21N	PC5335	164 (98~230)	0.0020~0.0031	0.0020~0.0031	0.0024~0.0039	0.0024~0.0039	0.0024~0.0039	0.0024~0.0039

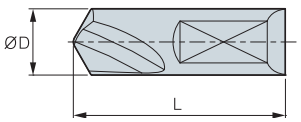
Parts of WPDC type indexable drills

Deaignation		machining hole	Insert			Center drill			Catridge		
			Insert	Screw	Wrench	Center drill	fixed bolt	cone point bolt	Inner	Outer	Fixed bolt
WPDCA	1000-125-□	1.000	WC□T030204-C21N	FTKA02206	TW06P	CDA23612	KHA0508	KHC0510			
	1063-125-□	1.063	WC□T040204-C21N	FTKA02565	TW07S						
	1125-125-□	1.125									
	1188-125-□	1.188					KHA0510				
	1250-125-□	1.250	WC□T050308-C21N	FTKA0307	TW09S	CDA31514	KHA0610	KHC0610			
	1313-125-□	1.313									
	1375-125-□	1.375									
	1438-125-□	1.438					KHA0612				
	1500-125-□	1.500									
	1563-125-□	1.563									
	1625-150-□	1.625	WC□T06T308-C21N	FTKA03508	TW15S	CDHA39414	KHA0812	KHC0812	CWP16251750C	CWP1625P	BHA0510
	1688-150-□	1.688								CWP1688P	
	1750-150-□	1.750								CWP1750P	
	1813-150-□	1.813					KHA0815		CWP18131938C	CWP1813P	BHA0512
	1875-150-□	1.875								CWP1875P	
	1938-150-□	1.938								CWP1938P	
	2000-150-□	2.000	WC□T080408-C21N	FTKA0411K	TW15S	CDHA47215	KHA1015	KHC1016	CWP20002125C	CWP2000P	BHA0612
	2063-150-□	2.063								CWP2063P	
	2125-150-□	2.125								CWP2125P	
	2188-150-□	2.188							CWP21882313C	CWP2188P	BHA0614
	2250-150-□	2.250								CWP2250P	
	2313-150-□	2.313								CWP2313P	
	238256-150-□	2.38~2.56	WC□T050308-C21N	FTKA0307	TW09S		KHA1020	KHC1020	CWP238256C	CWP238256P	BHA0510
	256275-150-□	2.56~2.75							CWP256275C	CWP256275P	
	275294-150-□	2.75~2.94							CWP275294C	CWP275294P	
	294313-150-□	2.94~3.13	WC□T06T308-C21N	FTKA03508	TW15S	CDHA63018			CWP294313C	CWP294313P	BHA0612

Applicable inserts **G04~05**

Center Drill





(inch)

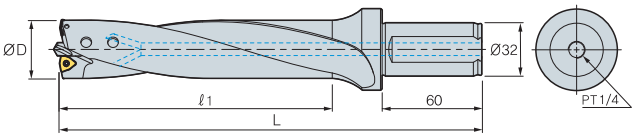
Designation	Grade	ØD	L	Oil-hole
CDA 23612	PC40H	0.236	1.2	×
CDA 31514	PC40H	0.315	1.4	×
CDHA 39414	PC40H	0.394	1.4	○
CDHA 47215	PC40H	0.472	1.5	○
CDHA 63018	PC40H	0.630	1.8	○

• This is HSS with Tin coating

WPDC-5D/6.5D/8D

Standard type





(inch)

Designation		ØD	5D		6.5D		8D		Insert	Center drill
			ℓ1	L	ℓ1	L	ℓ1	L		
WPDCA	**1000-125-□**	1.000	5.91	9.45	7.28	10.83	8.66	12.20	WC□T030204-C21N	CDA23612
	1063-125-□	1.063	5.91	9.45	7.28	10.83	8.66	12.20	WC□T040204-C21N	
	1125-125-□	1.125	5.91	9.45	7.28	10.83	8.66	12.20		
	1188-125-□	1.188	5.91	9.45	7.28	10.83	8.66	12.20		
	1250-125-□	1.250	6.89	10.43	8.58	12.13	10.24	13.78	WC□T050308-C21N	CDA31514
	1313-125-□	1.313	6.89	10.43	8.58	12.13	10.24	13.78		
	1375-125-□	1.375	6.89	10.43	8.58	12.13	10.24	13.78		
	1438-125-□	1.438	7.87	11.42	9.84	13.39	11.81	15.35		
	1500-125-□	1.500	7.87	11.42	9.84	13.39	11.81	15.35		
	1563-125-□	1.563	7.87	11.42	9.84	13.39	11.81	15.35		

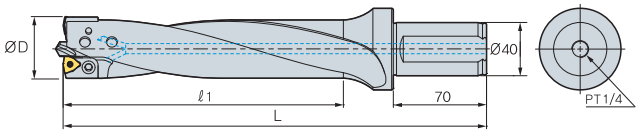
Applicable inserts **G04~05**

* We can provide if you order exact diameter
Ex) machining hole 1.225 inch * 6.5D ···› WPDCA1225-125-6.5

WPDC-5D/6.5D/8D

Single insert catridge type





(inch)

Designation		ØD	5D		6.5D		8D		Insert	Center drill	Cartridge	
			ℓ1	L	ℓ1	L	ℓ1	L			Inner	Outer
WPDCA	1625-150-□	1.625	8.86	12.99	11.14	15.28	13.39	17.52	WC□T06T308-C21N	CDHA39414	CWP16251750C	CWP1625P
	1688-150-□	1.688	8.86	12.99	11.14	15.28	13.39	17.52				CWP1688P
	1750-150-□	1.750	8.86	12.99	11.14	15.28	13.39	17.52				CWP1750P
	1813-150-□	1.813	9.84	13.98	12.4	16.54	14.96	19.09			CWP18131938C	CWP1813P
	1875-150-□	1.875	9.84	13.98	12.4	16.54	14.96	19.09				CWP1875P
	1938-150-□	1.938	9.84	13.98	12.4	16.54	14.96	19.09				CWP1938P
	2000-150-□	2.000	10.83	14.96	17.83	17.83	16.54	20.67	WC□T080408-C21N	CDHA7215	CWP20002125C	CWP2000P
	2063-150-□	2.063	10.83	14.96	17.83	17.83	16.54	20.67				CWP2063P
	2125-150-□	2.125	10.83	14.96	17.83	17.83	16.54	20.67				CWP2125P
	2188-150-□	2.188	11.81	15.94	14.96	19.09	18.11	22.24			CWP21882313C	CWP2188P
	2250-150-□	2.250	11.81	15.94	14.96	19.09	18.11	22.24				CWP2250P
	2313-150-□	2.313	11.81	15.94	14.96	19.09	18.11	22.24				CWP2313P

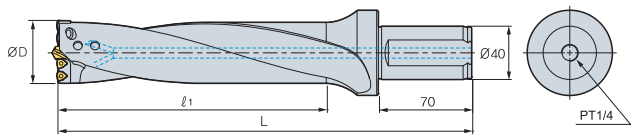
Applicable inserts **G04~05**

* We can provide if you order exact diameter
Ex) machining hole 1.800 inch * 5D -> WPDCA1800-150-5

WPDC-5D/6.5D/8D

Dual insert cartridge type





(inch)

Designation		ØD	5D		6.5D		8D		Insert	Center drill	Cartridge	
			ℓ1	L	ℓ1	L	ℓ1	L			Inner	Outer
WPDCA	238256-150-□	2.38~2.56	12.80	16.93	16.65	20.79	20.47	24.61	WC□T050308-C21N	CDHA47215	CWP238256C	CWP238256P
	256275-150-□	2.56~2.75	13.78	17.91	17.91	22.05	22.05	26.18			CWP256275C	CWP256275P
	275294-150-□	2.75~2.94	14.76	18.90	19.21	23.35	23.62	27.76			CWP275294C	CWP275294P
	294313-150-□	2.94~3.13	15.75	19.88	20.47	24.61	25.20	29.33	WC□T06T308-C21N	CDHA63018	CWP294313C	CWP294313P

Applicable inserts **G04~05**

* We can provide if you order exact diameter
Ex) machining hole 2.850 inch ×6.5D -> WPDCA2850-150-6.5

Highly efficient hole making for various workpieces including automobile components

MSD Plus new

Mach Solid Drill Plus

Code system

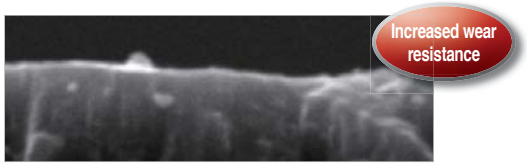
MSDP(H) A 01574 – 5 P

Oil hole	Inch unit	Drill Dia.(ØD)	Standard type	Machining area
None: MSDP With oil hole: MSDPH		Ø0.1574	Aspect ratio(L/D) 3D, 5D, 7D	P: Carbon steel, alloy steel M: Stainless steel K: Cast iron N: Aluminum, copper alloy

Features

New grade (PC325U)

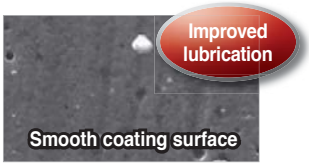
- Lubricative coating layer improves welding resistance at middle to high speed.
- Increase wear resistance in machining carbon steel



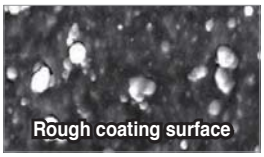
PC325U

Surface of coating layer

- Increased welding resistance and lower cutting load
- Reduced frictional resistance at cutting edges and on the flute



PC325U



Competitor

Chip control

- **Workpiece** S30400
- **Cutting conditions** vc (sfm) = 295, fn (ipr) = 0.008
ap (inch) = 1.181, wet
- **Tools** MSDP(H)A02362-5M (PC325U)

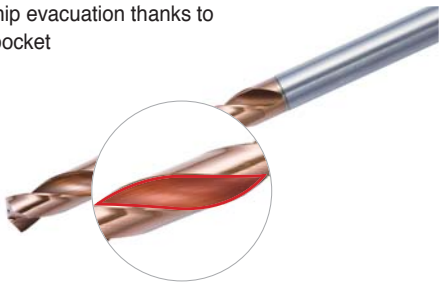


MSD Plus

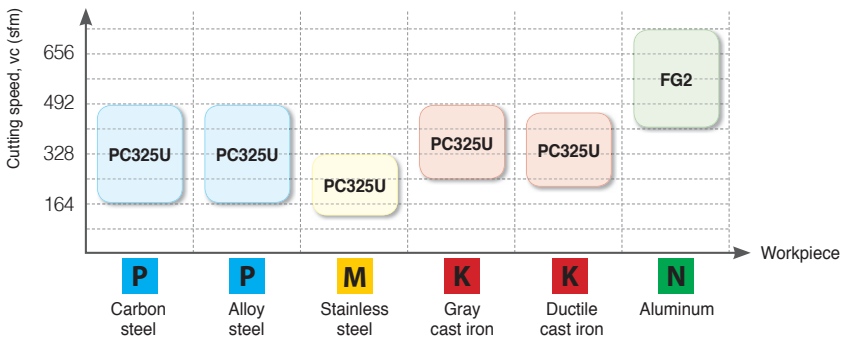
Competitor

Flute shape

- Improved chip evacuation thanks to wider chip pocket

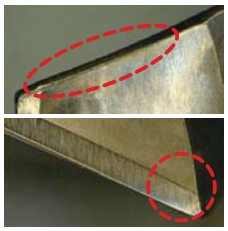


Application area

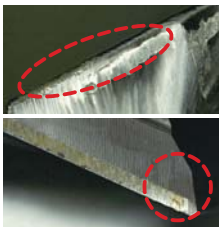


Application examples

- **Use** Part of Automobile
- **Workpiece** 1045
- **Cutting conditions** vc (sfm) = 407, fn (ipr) = 0.006
  ap (inch) = 1.181, Through coolant
- **Tools** MSDPHA02362-5P (PC325U)

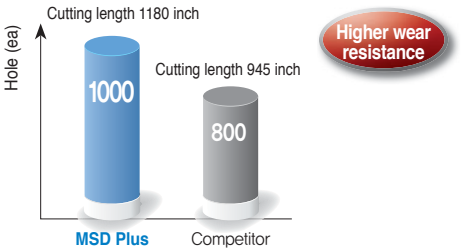


MSD Plus



Competitor

■ **Test result**

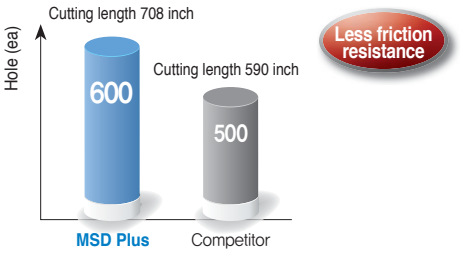


Lubricative coating layer of the new grade PC325U maximizes wear resistance

- **Use** Part of Automobile
- **Workpiece** 1053
- **Cutting conditions** vc (sfm) = 197, fn (ipr) = 0.010
  ap (inch) = 1.181, External coolant
- **Tools** MSDPA04724-5P (PC325U)



■ **Test result**



Special treatment on coating surface minimized frictional resistance

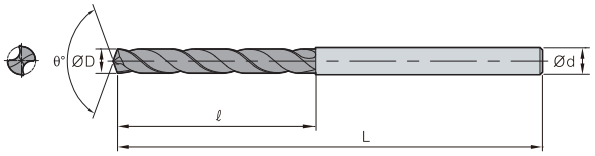
Recommended cutting conditions

Workpiece				Grade	vc (sfm)	Depth of cut = 10D~25D Feed rate (ipr) per drill dia. (inch)				
ISO		Workpiece	HB			Ø0.0984~Ø0.1575	Ø0.1614~Ø0.3150	Ø0.3189~Ø0.4724	Ø0.4764~Ø0.6299	Ø0.6339~Ø0.7874
P	Carbon steel	Low carbon steel	80~120	PC325U	295 (262~492)	0.0039~0.0059	0.0062~0.0094	0.0078~0.0118	0.0098~0.0141	0.0118~0.0157
		High carbon steel	Over 250	PC325U	164 (131~262)	0.0031~0.0078	0.0031~0.0078	0.0039~0.0098	0.0059~0.0098	0.0059~0.0118
	Alloy steel	Low alloy steel	140~260	PC325U	295 (262~492)	0.0039~0.0059	0.0062~0.0094	0.0078~0.0118	0.0098~0.0141	0.0118~0.0157
		Hardened low alloy steel	200~400	PC325U	196 (164~328)	0.0039~0.0059	0.0062~0.0094	0.0078~0.0118	0.0098~0.0141	0.0118~0.0157
		High alloy steel	50~260	PC325U	164 (131~262)	0.0031~0.0078	0.0031~0.0078	0.0039~0.0098	0.0059~0.0098	0.0059~0.0118
		Hardened high alloy steel	Over 250	PC325U	164 (131~262)	0.0031~0.0078	0.0031~0.0078	0.0039~0.0098	0.0059~0.0098	0.0059~0.0118
M	Stainless steel	Austenite series	135~275	PC325U	147 (82~262)	0.0019~0.0078	0.0019~0.0078	0.0039~0.0098	0.0039~0.0098	0.0059~0.0118
		Ferrite series Martensite series	135~275	PC325U	164 (98~262)	0.0019~0.0078	0.0019~0.0078	0.0039~0.0098	0.0039~0.0098	0.0059~0.0118
K	Cast iron	Gray cast iron	150~230	PC325U	328 (262~492)	0.0039~0.0059	0.0062~0.0094	0.0078~0.0118	0.0098~0.0141	0.0118~0.0157
		Ductile cast iron	160~260	PC325U	295 (229~459)	0.0039~0.0059	0.0062~0.0094	0.0078~0.0118	0.0098~0.0141	0.0118~0.0157
N	Aluminum	Aluminum alloy	30~150	FG2	492 (410~721)	0.0094~0.0149	0.0149~0.0208	0.0208~0.0295	0.0240~0.0334	0.0267~0.0385
	Copper alloy	Copper alloy	150~160	FG2	492 (410~721)	0.0039~0.0059	0.0062~0.0094	0.0078~0.0118	0.0098~0.0141	0.0118~0.0157

• Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied
• In case of external coolant system, reduce the above feed values by 20%

MSDP-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

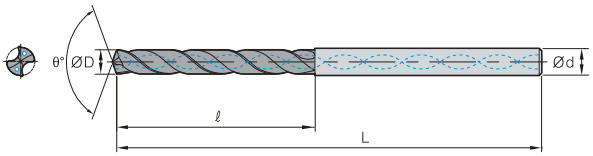
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N	
				ℓ	L	ℓ	L
MSDPA	00393 - □ P,M,K,N	0.0394	0.1181	0.236	1.772	0.472	2.598
	00433 - □ P,M,K,N	0.0433	0.1181	0.276	1.772	0.472	2.598
	00469 - □ P,M,K,N	3/64, 0.0469	0.1181	0.276	1.772	0.472	2.598
	00472 - □ P,M,K,N	0.0472	0.1181	0.315	1.772	0.472	2.598
	00511 - □ P,M,K,N	0.0512	0.1181	0.315	1.772	0.472	2.598
	00551 - □ P,M,K,N	0.0551	0.1181	0.354	1.772	0.472	2.598
	00590 - □ P,M,K,N	0.0591	0.1181	0.354	1.772	0.472	2.598
	00626 - □ P,M,K,N	1/16, 0.0626	0.1181	0.354	1.772	0.472	2.598
	00629 - □ P,M,K,N	0.0630	0.1181	0.394	1.772	0.591	2.598
	00669 - □ P,M,K,N	0.0669	0.1181	0.394	1.772	0.591	2.598
	00708 - □ P,M,K,N	0.0709	0.1181	0.433	1.772	0.591	2.598
	00748 - □ P,M,K,N	0.0748	0.1181	0.433	1.772	0.591	2.598
	00780 - □ P,M,K,N	5/64, 0.0780	0.1181	0.433	1.772	0.591	2.598
	00787 - □ P,M,K,N	0.0787	0.1181	0.551	2.087	0.787	2.598
	00826 - □ P,M,K,N	0.0827	0.1181	0.551	2.087	0.787	2.598
	00866 - □ P,M,K,N	0.0866	0.1181	0.551	2.087	0.787	2.598
	00905 - □ P,M,K,N	0.0906	0.1181	0.551	2.087	0.787	2.598
	00937 - □ P,M,K,N	3/32, 0.0937	0.1181	0.551	2.087	0.787	2.598
	00944 - □ P,M,K,N	0.0945	0.1181	0.551	2.087	0.787	2.598

MSDP(H)-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

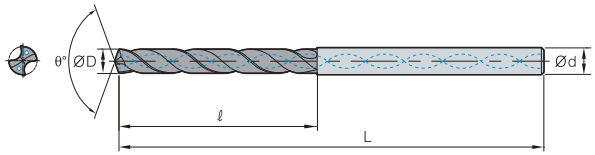
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)A	00984 - □ P,M,K,N	0.0984	0.1181	0.551	2.087	0.787	2.598	1.181	2.756
	01023 - □ P,M,K,N	0.1024	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01062 - □ P,M,K,N	0.1063	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01094 - □ P,M,K,N	7/64, 0.1094	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01102 - □ P,M,K,N	0.1102	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01141 - □ P,M,K,N	0.1142	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01181 - □ P,M,K,N	0.1181	0.1181	0.669	2.087	0.787	2.598	1.181	2.756
	01220 - □ P,M,K,N	0.1220	0.1575	0.787	2.283	1.102	2.913	1.181	2.756
	01248 - □ P,M,K,N	1/8, 0.1248	0.1575	0.787	2.283	1.102	2.913	1.181	2.756
	01259 - □ P,M,K,N	0.1260	0.1575	0.787	2.283	1.102	2.913	1.181	2.756
	01279 - □ P,M,K,N	0.1280	0.1575	0.787	2.283	1.102	2.913	1.181	2.756
	01299 - □ P,M,K,N	0.1299	0.1575	0.787	2.283	1.102	2.913	1.181	2.756
	01338 - □ P,M,K,N	0.1339	0.1575	0.787	2.283	1.102	2.913	1.476	2.953
	01377 - □ P,M,K,N	0.1378	0.1575	0.787	2.283	1.102	2.913	1.476	2.953
	01405 - □ P,M,K,N	9/64, 0.1406	0.1575	0.787	2.283	1.102	2.913	1.476	2.953
	01417 - □ P,M,K,N	0.1417	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01456 - □ P,M,K,N	0.1457	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01496 - □ P,M,K,N	0.1496	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01535 - □ P,M,K,N	0.1535	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01562 - □ P,M,K,N	5/32, 0.1563	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01574 - □ P,M,K,N	0.1575	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01590 - □ P,M,K,N	0.1591	0.1575	0.866	2.283	1.260	2.913	1.476	2.953
	01614 - □ P,M,K,N	0.1614	0.1969	0.945	2.441	1.417	3.228	1.476	2.953
	01653 - □ P,M,K,N	0.1654	0.1969	0.945	2.441	1.417	3.228	1.476	2.953
	01692 - □ P,M,K,N	0.1693	0.1969	0.945	2.441	1.417	3.228	1.772	3.346
	01720 - □ P,M,K,N	11/64, 0.1720	0.1969	0.945	2.441	1.417	3.228	1.772	3.346
	01732 - □ P,M,K,N	0.1732	0.1969	0.945	2.441	1.417	3.228	1.772	3.346
	01771 - □ P,M,K,N	0.1772	0.1969	0.945	2.441	1.417	3.228	1.772	3.346
	01811 - □ P,M,K,N	0.1811	0.1969	1.024	2.441	1.496	3.228	1.772	3.346
	01830 - □ P,M,K,N	0.1831	0.1969	1.024	2.441	1.496	3.228	1.772	3.346
	01850 - □ P,M,K,N	0.1850	0.1969	1.024	2.441	1.496	3.228	1.772	3.346
	01874 - □ P,M,K,N	3/16 0.1874	0.1969	1.024	2.441	1.496	3.228	1.772	3.346
	01889 - □ P,M,K,N	0.1890	0.1969	1.024	2.441	1.496	3.228	1.969	3.543
	01929 - □ P,M,K,N	0.1929	0.1969	1.024	2.441	1.496	3.228	1.969	3.543
	01968 - □ P,M,K,N	0.1969	0.1969	1.024	2.441	1.496	3.228	1.969	3.543
	02007 - □ P,M,K,N	0.2008	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02011 - □ P,M,K,N	0.2012	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02031 - □ P,M,K,N	13/64, 0.2031	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02047 - □ P,M,K,N	0.2047	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02066 - □ P,M,K,N	0.2067	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02086 - □ P,M,K,N	0.2087	0.2362	1.102	2.598	1.732	3.228	1.969	3.543

MSDP(H)-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

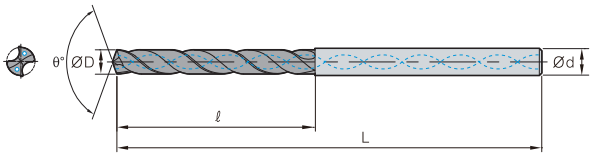
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)A	02125 - □ P,M,K,N	0.2126	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02129 - □ P,M,K,N	0.2130	0.2362	1.102	2.598	1.732	3.228	1.969	3.543
	02165 - □ P,M,K,N	0.2165	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02185 - □ P,M,K,N	0.2185	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02188 - □ P,M,K,N	7/32, 0.2189	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02204 - □ P,M,K,N	0.2205	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02244 - □ P,M,K,N	0.2244	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02283 - □ P,M,K,N	0.2283	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02322 - □ P,M,K,N	0.2323	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02342 - □ P,M,K,N	15/64, 0.2343	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02362 - □ P,M,K,N	0.2362	0.2362	1.102	2.598	1.732	3.228	2.244	3.819
	02401 - □ P,M,K,N	0.2402	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02440 - □ P,M,K,N	0.2441	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02480 - □ P,M,K,N	0.2480	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02500 - □ P,M,K,N	1/4, 0.2500	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02519 - □ P,M,K,N	0.2520	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02559 - □ P,M,K,N	0.2559	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02570 - □ P,M,K,N	0.2571	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02598 - □ P,M,K,N	0.2598	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02637 - □ P,M,K,N	0.2638	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02657 - □ P,M,K,N	17/64, 0.2657	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02677 - □ P,M,K,N	0.2677	0.2756	1.339	2.913	1.969	3.583	2.598	4.173
	02716 - □ P,M,K,N	0.2717	0.2756	1.339	2.913	1.969	3.583	2.992	4.567
	02755 - □ P,M,K,N	0.2756	0.2756	1.339	2.913	1.969	3.583	2.992	4.567
	02795 - □ P,M,K,N	0.2795	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02811 - □ P,M,K,N	9/32, 0.2811	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02834 - □ P,M,K,N	0.2835	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02874 - □ P,M,K,N	0.2874	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02913 - □ P,M,K,N	0.2913	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02952 - □ P,M,K,N	0.2953	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02968 - □ P,M,K,N	19/64, 0.2969	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	02992 - □ P,M,K,N	0.2992	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03031 - □ P,M,K,N	0.3031	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03070 - □ P,M,K,N	0.3071	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03110 - □ P,M,K,N	0.3110	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03125 - □ P,M,K,N	5/16, 0.3126	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03149 - □ P,M,K,N	0.3150	0.3150	1.614	3.110	2.087	3.583	2.992	4.567
	03188 - □ P,M,K,N	0.3189	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03228 - □ P,M,K,N	0.3228	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03267 - □ P,M,K,N	0.3268	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03279 - □ P,M,K,N	21/64, 0.3280	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03307 - □ P,M,K,N	0.3307	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03346 - □ P,M,K,N	0.3346	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03385 - □ P,M,K,N	0.3386	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03425 - □ P,M,K,N	0.3425	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03437 - □ P,M,K,N	11/32, 0.3437	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03464 - □ P,M,K,N	0.3465	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03503 - □ P,M,K,N	0.3504	0.3543	1.693	3.307	2.283	3.858	3.425	5.157

MSDP(H)-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

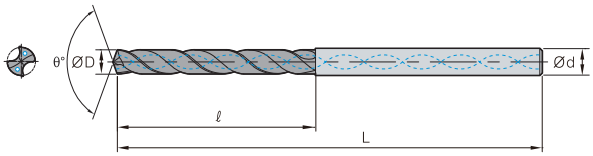
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)A	03543 - □ P,M,K,N	0.3543	0.3543	1.693	3.307	2.283	3.858	3.425	5.157
	03582 - □ P,M,K,N	0.3583	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03594 - □ P,M,K,N	23/64, 0.3594	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03622 - □ P,M,K,N	0.3622	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03641 - □ P,M,K,N	0.3642	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03661 - □ P,M,K,N	0.3661	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03677 - □ P,M,K,N	0.3677	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03700 - □ P,M,K,N	0.3701	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03740 - □ P,M,K,N	0.3740	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03748 - □ P,M,K,N	3/8, 0.3748	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03779 - □ P,M,K,N	0.3780	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03818 - □ P,M,K,N	0.3819	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03858 - □ P,M,K,N	0.3858	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03897 - □ P,M,K,N	0.3898	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03905 - □ P,M,K,N	25/64, 0.3906	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03937 - □ P,M,K,N	0.3937	0.3937	1.850	3.504	2.402	4.134	3.740	5.472
	03976 - □ P,M,K,N	0.3976	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04015 - □ P,M,K,N	0.4016	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04055 - □ P,M,K,N	0.4055	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04062 - □ P,M,K,N	13/32, 0.4063	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04094 - □ P,M,K,N	0.4094	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04133 - □ P,M,K,N	0.4134	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04173 - □ P,M,K,N	0.4173	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04212 - □ P,M,K,N	0.4213	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04220 - □ P,M,K,N	27/64, 0.4220	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04251 - □ P,M,K,N	0.4252	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04291 - □ P,M,K,N	0.4291	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04330 - □ P,M,K,N	0.4331	0.4331	2.165	3.740	2.677	4.488	4.173	6.102
	04370 - □ P,M,K,N	0.4370	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04374 - □ P,M,K,N	7/16, 0.4374	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04409 - □ P,M,K,N	0.4409	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04448 - □ P,M,K,N	0.4449	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04488 - □ P,M,K,N	0.4488	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04527 - □ P,M,K,N	0.4528	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04531 - □ P,M,K,N	29/64, 0.4531	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04566 - □ P,M,K,N	0.4567	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04606 - □ P,M,K,N	0.4606	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04645 - □ P,M,K,N	0.4646	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04685 - □ P,M,K,N	0.4685	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04688 - □ P,M,K,N	15/32, 0.4689	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04724 - □ P,M,K,N	0.4724	0.4724	2.165	4.016	2.795	4.724	4.488	6.417
	04763 - □ P,M,K,N	0.4764	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	04803 - □ P,M,K,N	0.4803	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	04842 - □ P,M,K,N	31/64, 0.4843	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	04881 - □ P,M,K,N	0.4882	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	04921 - □ P,M,K,N	0.4921	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	04960 - □ P,M,K,N	0.4961	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	05000 - □ P,M,K,N	1/2, 0.5000	0.5118	2.362	4.213	3.031	4.882	5.236	7.165

MSDP(H)-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

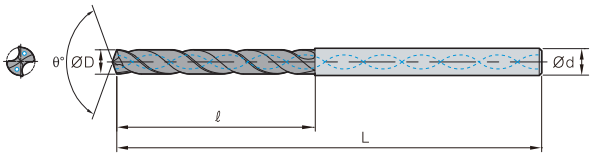
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)A	05039 - □ P,M,K,N	0.5039	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	05078 - □ P,M,K,N	0.5079	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	05118 - □ P,M,K,N	0.5118	0.5118	2.362	4.213	3.031	4.882	5.236	7.165
	05157 - □ P,M,K,N	0.5157	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05196 - □ P,M,K,N	0.5197	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05236 - □ P,M,K,N	0.5236	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05275 - □ P,M,K,N	0.5276	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05311 - □ P,M,K,N	17/32, 0.5311	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05314 - □ P,M,K,N	0.5315	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05354 - □ P,M,K,N	0.5354	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05393 - □ P,M,K,N	0.5394	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05433 - □ P,M,K,N	0.5433	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05468 - □ P,M,K,N	35/64, 0.5469	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05472 - □ P,M,K,N	0.5472	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05511 - □ P,M,K,N	0.5512	0.5512	2.441	4.213	3.150	5.236	5.236	7.165
	05551 - □ P,M,K,N	0.5551	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05590 - □ P,M,K,N	0.5591	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05625 - □ P,M,K,N	9/16, 0.5626	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05629 - □ P,M,K,N	0.5630	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05669 - □ P,M,K,N	0.5669	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05708 - □ P,M,K,N	0.5709	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05748 - □ P,M,K,N	0.5748	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05779 - □ P,M,K,N	37/64, 0.5780	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05787 - □ P,M,K,N	0.5787	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05826 - □ P,M,K,N	0.5827	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05866 - □ P,M,K,N	0.5866	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05905 - □ P,M,K,N	0.5906	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05937 - □ P,M,K,N	19/32, 0.5937	0.5906	2.559	4.528	3.346	5.630	5.984	8.031
	05944 - □ P,M,K,N	0.5945	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	05984 - □ P,M,K,N	0.5984	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06023 - □ P,M,K,N	0.6024	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06062 - □ P,M,K,N	0.6063	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06094 - □ P,M,K,N	39/64, 0.6094	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06102 - □ P,M,K,N	0.6102	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06141 - □ P,M,K,N	0.6142	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06181 - □ P,M,K,N	0.6181	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06220 - □ P,M,K,N	0.6220	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06248 - □ P,M,K,N	5/8, 0.6248	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06259 - □ P,M,K,N	0.6260	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06299 - □ P,M,K,N	0.6299	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06330 - □ P,M,K,N	0.6331	0.6299	2.677	4.528	3.465	5.630	5.984	8.031
	06338 - □ P,M,K,N	0.6339	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06377 - □ P,M,K,N	0.6378	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06405 - □ P,M,K,N	41/64, 0.6406	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06417 - □ P,M,K,N	0.6417	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06456 - □ P,M,K,N	0.6457	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06496 - □ P,M,K,N	0.6496	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06535 - □ P,M,K,N	0.6535	0.6693	2.874	4.843	3.661	6.024	6.732	8.780

MSDP(H)-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)A	06562 - □ P,M,K,N	21/32, 0.6563	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06574 - □ P,M,K,N	0.6575	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06614 - □ P,M,K,N	0.6614	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06653 - □ P,M,K,N	0.6654	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06692 - □ P,M,K,N	0.6693	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06720 - □ P,M,K,N	43/64, 0.6720	0.6693	2.874	4.843	3.661	6.024	6.732	8.780
	06732 - □ P,M,K,N	0.6732	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06771 - □ P,M,K,N	0.6772	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06811 - □ P,M,K,N	0.6811	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06850 - □ P,M,K,N	0.6850	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06874 - □ P,M,K,N	11/16, 0.6874	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06889 - □ P,M,K,N	0.6890	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06929 - □ P,M,K,N	0.6929	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	06968 - □ P,M,K,N	0.6969	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	07007 - □ P,M,K,N	0.7008	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	07031 - □ P,M,K,N	45/64, 0.7031	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	07047 - □ P,M,K,N	0.7047	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	07086 - □ P,M,K,N	0.7087	0.7087	2.874	4.843	3.858	6.024	6.732	8.780
	07125 - □ P,M,K,N	0.7126	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07165 - □ P,M,K,N	0.7165	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07188 - □ P,M,K,N	23/32. 0.7189	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07204 - □ P,M,K,N	0.7205	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07244 - □ P,M,K,N	0.7244	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07283 - □ P,M,K,N	0.7283	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07322 - □ P,M,K,N	0.7323	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07362 - □ P,M,K,N	0.7362	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07401 - □ P,M,K,N	0.7402	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07440 - □ P,M,K,N	0.7441	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07480 - □ P,M,K,N	0.7480	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07500 - □ P,M,K,N	3/4, 0.7500	0.7480	3.110	5.157	4.055	6.024	7.480	9.606
	07519 - □ P,M,K,N	0.7520	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07543 - □ P,M,K,N	0.7543	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07559 - □ P,M,K,N	0.7559	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07578 - □ P,M,K,N	0.7579	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07598 - □ P,M,K,N	0.7598	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07637 - □ P,M,K,N	0.7638	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07655 - □ P,M,K,N	49/64, 0.7656	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07677 - □ P,M,K,N	0.7677	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07716 - □ P,M,K,N	0.7717	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07755 - □ P,M,K,N	0.7756	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07795 - □ P,M,K,N	0.7795	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07811 - □ P,M,K,N	25/32, 0.7811	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07834 - □ P,M,K,N	0.7835	0.7874	3.110	5.157	4.213	6.024	7.480	9.606
	07874 - □ P,M,K,N	0.7874	0.7874	3.110	5.157	4.213	6.024	7.480	9.606

Optimized tool for hole making of CFRP

MSD Plus CFRP new

Mach Solid Drill Plus for Machining CFRP

- Excellent wear resistance thanks due to the new diamond-coated grade, ND2100
- Reduced burrs when machining CFRP thanks to high rake cutting edges

Code system

MSDP(H) A 01574 – 5 P

Oil hole
None: MSDP
With oil holes: MSDPH

Inch unit

Drill dia.(ØD)
Ø0.1574

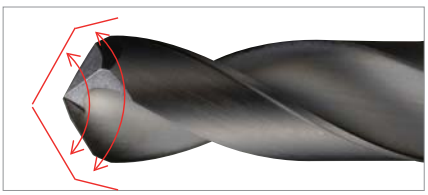
Standard type
Aspect ratio (L/D)
3D, 5D, 7D

Machining area
P: Carbon steel, alloy steel
M: Stainless steel
K: Cast iron
N: Aluminum, Copper alloy

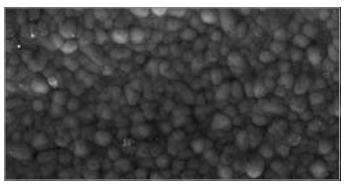
Features

- Reduced thrust around corners thanks to the 2-step point angle
- Reduced burrs when drilling CFRP thanks to high rake cutting edges

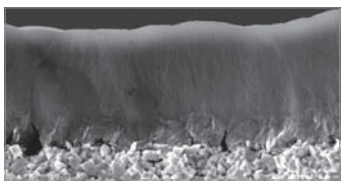




- Diamond Coating specialized in CFRP machining
- Diamond-coated substrate optimized for CFRP cutting



High hardness diamond coating maintains well-cut shapes

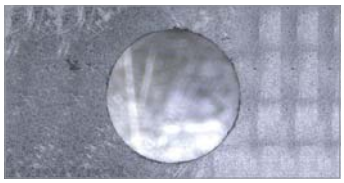


Diamond coating's strong grip to the substrate

- Inhibited burr creation by keeping cutting edges in good shape



Less wear and flaking on the rake surface

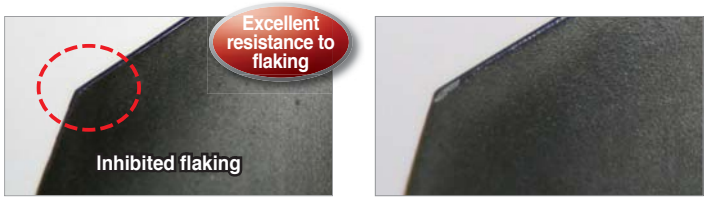


Fewer burrs on workpieces

Performance evaluation

- **Workpiece** CFRP
- **Cutting conditions** vc (sfm) = 328, fn (ipr) = 0.002, ap (inch) = 0.394, Air
- **Cutting length** 720 hole
- **Tools** MSDPA02362-5C

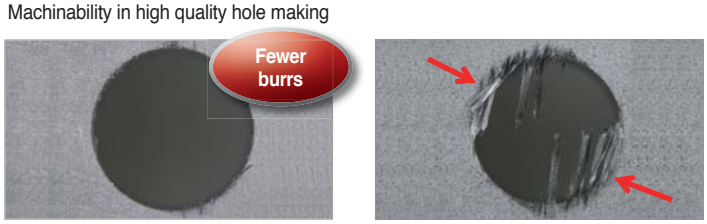
Improved performance quality



MSDP-C Competitor

- **Workpiece** CFRP
- **Cutting conditions** vc (sfm) = 328, fn (ipr) = 0.002, ap (inch) = 0.394, Air
- **Cutting length** 720 hole
- **Tools** MSDPA02362-5C

Machinability in high quality hole making



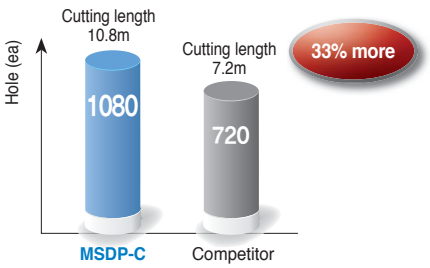
MSDP-C Competitor

Application examples

- **Use** Wing Tail
- **Workpiece** CFRP
- **Cutting conditions** vc (sfm) = 328, fn (ipr) = 0.002 ap (inch) = 0.394, Air
- **Tools** MSDPA02362-5C



■ **Test result**

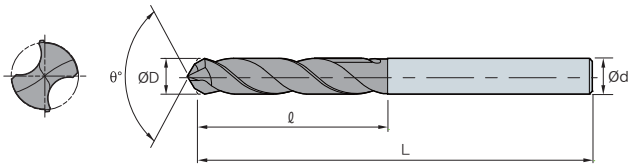


Recommended cutting conditions

Workpiece	Grade	vc (sfm)	Depth of cut = 5D Feed rate (ipr) per drill dia. (inch)		
			Ø0.0984~Ø0.1575	Ø0.1614~Ø0.3150	Ø0.3189~Ø0.4724
CFRP	ND2100	328 (328~492)	0.0012~0.0028	0.0012~0.0028	0.0012~0.0028

MSDP-5C





Specification	C
Grade	ND2100
Tolerance (drill Dia.)	m7
Tolerance (shank Dia.)	h6
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

C CFRP

(inch)

Designation		ØD	Ød	5C	
				ℓ	L
MSDPA	01874-5C	0.187 3/16	0.1874	1.7323	3.2283
	02500-5C	0.25 1/4	0.2500	2.0866	3.5827
	03126-5C	0.313 5/16	0.3126	2.0866	3.5827
	003748-5C	0.375 3/8	0.3748	2.4016	4.0551
	04374-5C	0.437 7/16	0.4374	2.7953	4.6457
	05000-5C	0.5 1/2	0.5000	3.0315	4.8819

Various designations of MSD & MSDH enable to do any drilling

Mach Solid Drill

Code system



Features

- **Optimally designed chip pocket**
  - Wide and deep chip pocket improve chip control to minimizing friction during an operation
- **A curvilinear edge**
  - A curvilinear edge offers excellent wear resistance and shock resistance by dispersing the cutting load
- **3D, 5D, 7D Standardization**
  - For example) diameter Ø10mm and depth 30mm and outer coolant system, Take MSDA100-3P
- **MSD: Solid type & MSDH: Through oil-hole type**
  - Various designations of MSDA & MSDHA enable to do any drilling
- **Low cutting resistance edge**
  - The MSDA & MSDHA low cutting resistance edge guarantees a better surface roughness and chip control while allowing the drill to center itself
- **Rigid neck of drill**
  - The new design of this drill has an increased rigidity at neck. This prevents breakage of neck on the drill

- **Line-up as per workpiece**
  - P: Steel (Carbon steel, Alloy steel)
    General - Carbon steel, Alloy steel, Stainless steel, Cast iron Low cutting resistance edge, Ultra micro grain substrate, K-Black coating
  - K: Cast iron, Die casting, Ductile cast iron
    Coolant system: Through/Outer (MQL)
  - M: Stainless steel, Reduced built-up edge and cutting resistance
    Coolant system: Through/Outer (MQL)
  - N: Aluminum (Carbide drills), Medium & Low speed cutting performance
    Coolant system: Through/Outer (MQL)
  - ND: Non-ferrous metal, High speed, High efficiency performance
    Improved welding resistance due to applied DLC coating
    Coolant system: Through/Outer (MQL)







Features

- **Low cutting resistance edge**
  - Uniformity in cutting edge treatment: Reinforces repeatable quality in every machined part
  - Protecting workpiece: Low cutting resistance edge operates well in medium to finishing machining, workpiece protection and good surface roughness
  - Better chip breaking: Based on our cutting processes studies, our drills assure better chip breaking in high or low speeds

- **Features of TiAlN Coating**
  - Decreasing of micro particle → Chipping free from macro particle
  - Better hardness and toughness → Covering wide cutting speed and feed rate range
  - Special coating layer at most-outer edge → Special TiAlN with better lubrication guarantees welding resistance
  - Pre-treatment before coating process → Higher adhesion by pre-treatment

Specification line-up

Line-up as per aspect ratio (L: Overall length, D: Tool Dia.)



MSDA□□□-7P

MSDA□□□-5P

MSDA□□□-3P

Line-up as per aspect ratio (Mach Drills: Ø0.2188 inch~Ø0.7500 inch)
Various choices as per aspect ratio (3D,5D,7D)

Line-up as per coolant type



MSDA Type



MSDHA Type

Wide choices for coolant type
• For example) Solid type: MSDA,
Through coolant type: MSDHA

Line-up as per workpiece

P	General - Carbon steel, Alloy steel, Stainless steel, Cast iron
M	Stainless steel
K	Cast iron, Aluminum
N	Aluminum, Brass
ND	Non-ferrous metal

Cutting condition formula

$$vc = \frac{\pi x D x n}{12}\ (sfm), \quad fn = \frac{vf}{n}\ (ipr) \quad \left[\ n = \frac{vc x 12}{\pi x D}\ (min^{-1}),\ vf = fn \times n\ (rpm)\ \right]$$

n: Revolution per minute (min^{-1})
vc: Cutting speed (sfm)
vf: Feed per minute (ipm)
fn: Feed per revolution (ipr)
D: Drill Dia. (inch)
π: 3.1416

Recommended cutting condition

Mach Drill: Solid type [MSDA ○○○-□P,M,K]

Workpiece \ Tool dia.		Ø0.008~Ø0.1969		Ø0.2008~Ø0.3150		Ø0.3189~Ø0.3937		Ø0.3976~Ø0.4724		Ø0.4764~Ø0.5512		Ø0.5551~Ø0.7874	
		vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)
Mild steel, Alloy steel, General steel (Under HRC25)	4140	132~231 (181.5)	0.0059 ~0.0098	165~363 (214.5)	0.0079 ~0.0138	165~363 (231)	0.0079 ~0.0138	165~396 (247.5)	0.0098 ~~0.0138	165~396 (247.5)	0.0098 ~~0.0138	198~396 (264)	0.0098 ~0.0157
	1045	132~264 (198)	0.0059 ~0.0098	165~396 (231)	0.0079 ~0.0118	165~369 (247.5)	0.0079 ~0.0118	198~396 (264)	0.0079 ~0.0118	198~396 (264)	0.0098 ~0.0138	231~396 (297)	0.0118 ~0.0157
High alloy steel, High carbon steel (Over HRC25)	D2	49.5~115.5 (99)	0.0031 ~0.0061	66~132 (99)	0.0039 ~0.0079	66~165 (115.5)	0.0039 ~0.0079	66~198 (115.5)	0.0059 ~0.0098	66~198 (132)	0.0059 ~0.0098	99~214.5 (132)	0.0059 ~0.0098
Stainless steel	304	49.5~99 (82.5)	0.0020 ~0.0039	49.5~148.5 (82.5)	0.0039 ~0.0079	49.5~165 (99)	0.0039 ~0.0079	66~198 (115.5)	0.0039 ~0.0079	66~214.5 (115.5)	0.0039 ~0.0079	66~231 (132)	0.0039 ~0.0079
Cast iron	No 20B	132~297 (231)	0.0059 ~0.0118	165~396 (264)	0.0079 ~0.0138	165~396 (264)	0.0079 ~0.0138	198~429 (297)	0.0098 ~0.0138	198~429 (313.5)	0.0098 ~0.0157	198~462 (313.5)	0.0098 ~0.0157
	60-40-18	132~264 (198)	0.0039 ~0.0098	165~363 (247.5)	0.0079 ~0.0138	165~363 (264)	0.0079 ~0.0138	165~429 (264)	0.0098 ~0.0138	165~429 (280.5)	0.0098 ~0.0138	198~429 (297)	0.0098 ~0.0157

Mach Drill: Through oil-hole type [MSDHA ○○○-□P,M,K]

Workpiece \ Tool dia.		vc (sfm)	Ø0.0984~Ø0.1575	Ø0.1614~Ø0.3150	Ø0.3189~Ø0.4724	Ø0.4764~Ø0.6299	Ø0.6339~Ø0.7874
			fn (ipr)	fn (ipr)	fn (ipr)	fn (ipr)	fn (ipr)
Mild steel, Alloy steel, General steel (Under HRC25)	4140	200~460	0.0059~0.0138	0.0059~0.0138	0.0079~0.0138	0.0098~0.0157	0.0118~0.0157
	1045	200~460	0.0059~0.0118	0.0059~0.0118	0.0079~0.0118	0.0098~0.0138	0.0118~0.0157
High alloy steel, High carbon steel (Over HRC25)	D2	130~260	0.0031~0.0079	0.0031~0.0079	0.0039~0.0098	0.0059~0.0098	0.0059~0.0118
Stainless steel	304	80~260	0.0020~0.0079	0.0020~0.0079	0.0039~0.0098	0.0039~0.0098	0.0059~0.0118
Cast iron	No 20B	180~510	0.0059~0.0138	0.0059~0.0138	0.0079~0.0138	0.0098~0.0157	0.0098~0.0157
	60-40-18	180~480	0.0039~0.0138	0.0039~0.0138	0.0079~0.0138	0.0098~0.0138	0.0098~0.0157

Note)1. Decrease cutting speed 30%~40% contrast with recommended condition when machining forged steel
2. Decrease cutting condition considering the overhang of drill, machined rigidity, precision of spindle, clamping and surface of workpiece, etc
3. For longer tool life, Please apply to step feed at every 1.5D
4. Put the drill clamping between edge groove and shank boundary part in order to be located in the suitable position
5. Coolant pressure for through hole type = 3~5kg/cm^3, volume = 2~5l/min

Mach Drills: Through coolant type [MSD(H)A ○○○-□N] cemented carbide

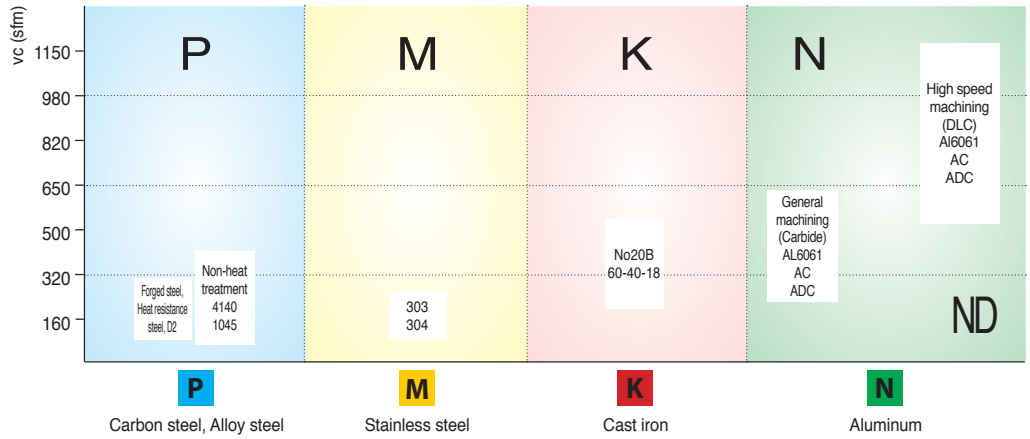
Workpiece \ Tool dia.		Ø0.0984~Ø0.1575		Ø0.2165~Ø0.2765		Ø0.3346~Ø0.3937		Ø0.4528~Ø0.5118	
		vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)
Aluminum	Alloy steel (Al6061)	200~330	0.0079~0.0138	300~330	0.0118~0.0157	330~400	0.0118~0.0157	330~400	0.0118~0.0177
	Die-casting (AC,ADC)	200~330	0.0079~3.5433	330~330	0.0118~0.0157	330~400	0.0118~0.0157	330~400	0.0118~0.0177
Copper alloy (CII00)		200~260	0.0031~0.0059	200~330	0.0039~0.0079	260~330	0.0039~0.0098	260~330	0.0039~0.0098

Mach Drills: Through coolant type [MSDHA ○○○-□ND] DLC coated

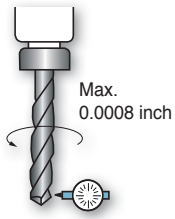
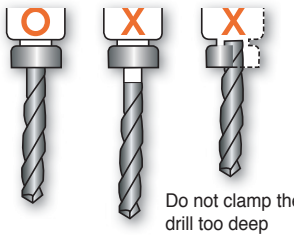
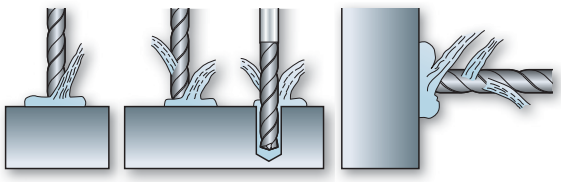
Workpiece \ Tool dia.		Ø0.0984~Ø0.1575		Ø0.2165~Ø0.2765		Ø0.3346~Ø0.3937		Ø0.4528~Ø0.5118	
		vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)	vc (sfm)	fn (ipr)
Aluminum	Alloy steel (Al6061)	260~530	0.0031~0.0118	260~600	0.0047~0.0138	260~600	0.0059~0.0157	260~600	0.0059~0.0177
	Die-casting (AC,ADC)	260~600	0.0031~0.0118	260~660	0.0047~0.0138	260~660	0.0059~0.0157	260~660	0.0059~0.0177
Copper alloy (CII00)		260~530	0.0031~0.0059	260~600	0.0039~0.0079	260~600	0.0039~0.0098	260~600	0.0039~0.0098

Note) Recommended cutting speed is one of the important factors for the drill performance. In case of using further cutting speed or feed rate than recommended conditions to improve the productivity, please apply it after enough tests because it could be occurred some problems like early wear, built-up edge, chipping, fracture, etc

Recommended cutting condition by series

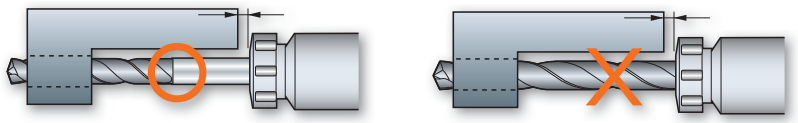


Setting of drills

Outer tolerance	Setting condition	Coolant (External system)
 Max. 0.0008 inch	 Do not clamp the drill too deep	

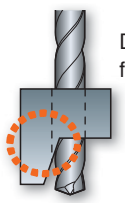
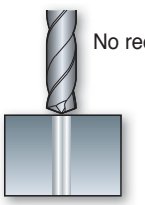
To improve machining method

• **Machining for strength of wheel**

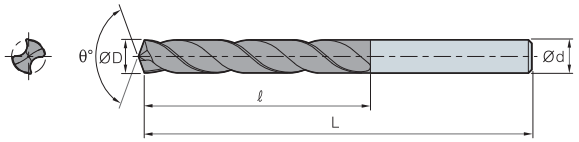


Using short flute length

• **Improvement of drilling**

Piercing stage	Circular surface	Inclined surface	Boring
 Decrease feed 1/2	 First, center drilling with large point angle	 First, facing with endmills	 No recommendation

MSD (P/M/K/N)



Terminology	P	M	K	N
Grade	TiAlN			Cemented carbide
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

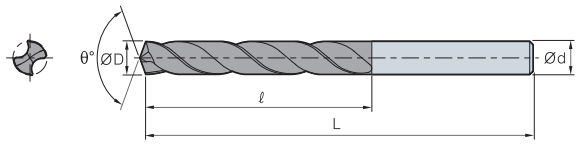
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(inch)

Designation		Diameter (ØD)		Shank dia (Ød)	Flute length (ℓ)	Overall length (L)
MSDA	02188	7/32	0.2188	0.2500	1.69	3.23
	02500	1/4	0.2500	0.2500	1.69	3.23
	02656	17/64	0.2656	0.3125	1.97	3.58
	02813	9/32	0.2813	0.3125	1.97	3.58
	02969	19/64	0.2969	0.3125	1.97	3.58
	03125	5/16	0.3125	0.3125	1.97	3.58
	03281	21/64	0.3281	0.3750	2.36	4.05
	03438	11/32	0.3438	0.3750	2.36	4.05
	03594	23/64	0.3594	0.3750	2.36	4.05
	03750	3/8	0.3750	0.3750	2.36	4.05
	03906	25/64	0.3906	0.4375	2.60	4.37
	04063	13/32	0.4063	0.4375	2.60	4.37
	04219	27/64	0.4219	0.4375	2.60	4.37
	04375	7/16	0.4375	0.4375	2.60	4.37
	04531	29/64	0.4531	0.5000	2.75	4.64
	04688	15/32	0.4688	0.5000	2.75	4.64
	04844	31/64	0.4844	0.5000	2.75	4.64
	05000	1/2	0.5000	0.5000	2.75	4.64
	05625	9/16	0.5625	0.5625	2.99	4.88
	06250	5/8	0.6250	0.6250	3.23	5.23
	06875	11/16	0.6875	0.6875	3.62	5.63
	07500	3/4	0.7500	0.7500	3.74	5.82

※ Order made items: MSDA□ □ □-Material (P,M,K,N) - Flute length - Total length L - Shank diameter S
Ex.1) Workpiece: SM45C(1045)
Machined diameter: Ø0.3906inch, Flute length: 2.16inch, Total length: 4.37inch, Shank diameter: Ø0.4375 → MSDA03906-P × 2.16 - 4.37L × 0.4375S

MSDH (P/M/K/N/ND)



Terminology	P	M	K	N	ND
Grade	TiAlN			Cemented carbide	DLC
Tolerance (drill Dia.)	h7				
Tolerance (shank Dia.)	h6				
Point angle	140°			135°	140°
Twist angle	30°				
Thinning	X type				N type
Coolant	Through				

P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy

(inch)

Designation		Diameter (ØD)		Shank dia (Ød)	Flute length (ℓ)	Overall length (L)
MSDHA	**02188**	7/32	0.2188	0.2500	1.69	3.23
	02500	1/4	0.2500	0.2500	1.69	3.23
	02656	17/64	0.2656	0.3125	1.97	3.58
	02813	9/32	0.2813	0.3125	1.97	3.58
	02969	19/64	0.2969	0.3125	1.97	3.58
	03125	5/16	0.3125	0.3125	1.97	3.58
	03281	21/64	0.3281	0.3750	2.36	4.05
	03438	11/32	0.3438	0.3750	2.36	4.05
	03594	23/64	0.3594	0.3750	2.36	4.05
	03750	3/8	0.3750	0.3750	2.36	4.05
	03906	25/64	0.3906	0.4375	2.60	4.37
	04063	13/32	0.4063	0.4375	2.60	4.37
	04219	27/64	0.4219	0.4375	2.60	4.37
	04375	7/16	0.4375	0.4375	2.60	4.37
	04531	29/64	0.4531	0.5000	2.75	4.64
	04688	15/32	0.4688	0.5000	2.75	4.64
	04844	31/64	0.4844	0.5000	2.75	4.64
	05000	1/2	0.5000	0.5000	2.75	4.64
	05625	9/16	0.5625	0.5625	2.99	4.88
	06250	5/8	0.6250	0.6250	3.23	5.23
	06875	11/16	0.6875	0.6875	3.62	5.63
	07500	3/4	0.7500	0.7500	3.74	5.82

※ Order made items: MSDA□ □ □-Material (P,M,K,N) - Flute length - Total length L - Shank diameter S
Ex.1) Workpiece: SM45C(1045)
Machined diameter: Ø0.3906inch, Flute length: 2.16inch, Total length: 4.37inch, Shank diameter: Ø0.4375 → MSDA03906-P × 2.16 - 4.37L × 0.4375S

The best tool for ramped, curved or flat workpieces

MSFD new

Mach Solid Flat Drill

- High quality hole making capability with 180°-point angle
- Improved anti chipping and welding resistance by edge honing and chamfering
  Minimized creation of burrs compared to general drills

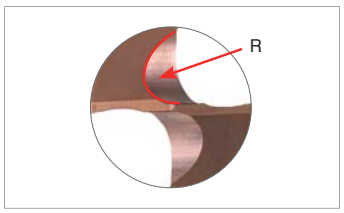
Code system

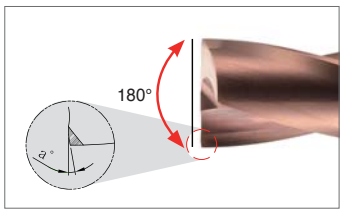
MSFD(H) A – 02362 2P – 3.397L – 0.2362S

Oil hole	Inch unit	Drill dia.(ØD)	Machining area	Overall length	Shank dia.
None: MSFD With oil holes: MSFDH		Ø0.2362	P: General - Carbon steel, alloy steel	3.397L: 0.397inch	0.2362S: Ø0.2362

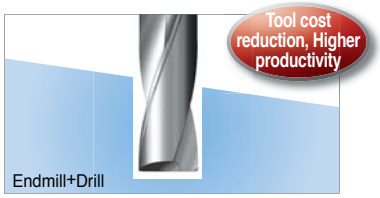
Features

- Excellent straightness with its 180°-point angle when drilling on ramped surface
- Stronger resistance to chipping through corner chamfering
- Widened chip pockets by the use of 'R' shape on the thinning part

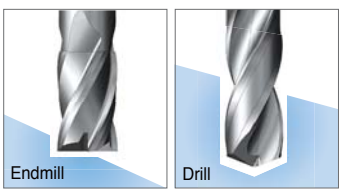




- Multi-functional capability - end milling and drilling using a single MSFD



MSFD



Conventional tools used and their application



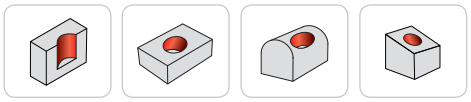
MSFD



Competitor

Wide applications

• A wide range of applications and improved cutting performance



Performance evaluation

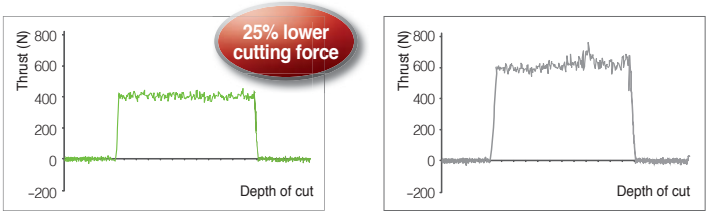
- **Workpiece** SM48C
- **Cutting conditions** vc (sfm) = 262, fn (ipr) = 0.004, ap (inch) = 0.59, wet
- **Cutting length** 600 hole
- **Tools** MSFDA02362-2P



MSFD
Prolongs tool life

Competitor

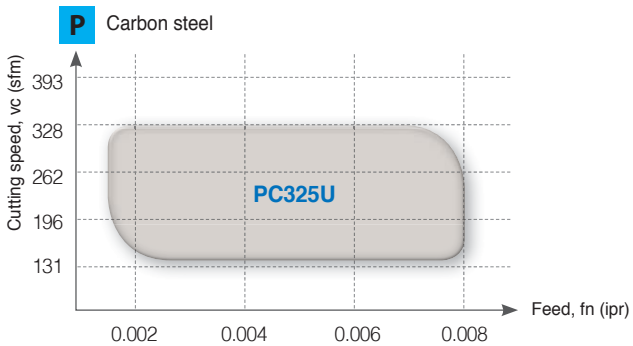
- **Workpiece** SM45C
- **Cutting conditions** vc (sfm) = 229, fn (ipr) = 0.004, ap (inch) = 0.59, wet
- **Cutting length** 600 hole
- **Tools** MSFDA02362-3P



MSFD (Average thrust of 160N)
Stable hole size consistency and better surface finish

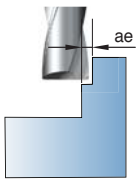
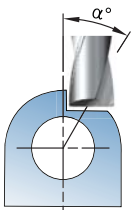
Competitor (Average thrust of 214N)

Application range

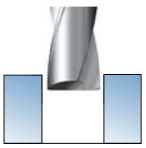
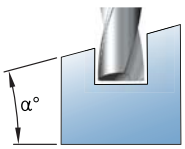




Application methods

Application type	Recommended machining conditions
	• Radial depth of cuts should be less than half the drill radius • In case of increasing depth of cuts, divide the machining process into two passes
	• Use the tool within 30° from the center of the curve • Reduce the feed rate when the tool penetrates the workpiece to the end part

Workpiece (Ø)	Slope angle (α°)	Performance	Applied (fn)
≤ Ø100	≤ 20°	◎	100%
	20°< ~40°	○	80%
	≥ 40°	△	60%

Application type	Recommended machining conditions
	• Reduce the feed rate by half the recommended condition when the tool enters the workpiece • Reduce the feed rate by half the recommended condition when the tool penetrates the workpiece to the end part • Recommended depth of cut is under 2D
	• Recommended slope angle range is under 30° • In case of machining at slope angle over 30°, reduce thefeed rate when the tool enters the workpiece

Slope angle (α°)	Performance	Applied (fn)
≤ 20°	◎	100%
20°< ~40°	○	80%
≥ 40°	△	60%

Recommended cutting conditions

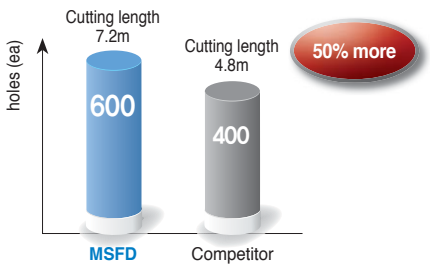
Workpiece			Grade	Cutting speed, vc (sfm)	Feed (Depth of cut = 2D~3D)		
					Feed rate (ipr) per drill dia. (inch)		
ISO		Workpiece materials	Hardness (HB)			Ø0.0984~Ø0.1575	Ø0.1614~Ø0.3150	Ø0.3189~Ø0.4724
P	Carbon steel	Low carbon steel	80~120	PC325U	246 (196~295)	0.0012~0.0039	0.0020~0.0060	0.0040~0.0079
		High carbon steel	over 250	PC325U	246 (196~295)	0.0012~0.0039	0.0020~0.0060	0.0040~0.0079
	Alloy steel	Low alloy steel	140~260	PC325U	213 (164~262)	0.0012~0.0039	0.0020~0.0060	0.0040~0.0079
		High alloy steel	50~260	PC325U	213 (164~262)	0.0012~0.0039	0.0020~0.0060	0.0040~0.0079

Application examples

- **Workpiece** Carbon steel (SM45C)
- **Cutting conditions** vc (sfm) = 262
fn (ipr) = 0.004
ap (inch) = 0.47, wet
- **Tools** MSFDA02362-2P



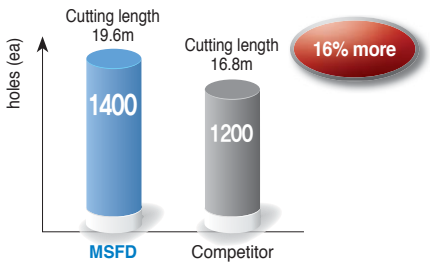
■ **Test result**



- **Workpiece** Alloy steel (SCM440)
- **Cutting conditions** vc (sfm) = 328
fn (ipr) = 0.004
ap (inch) = 0.55, wet
- **Tools** MSFDA02362-3P

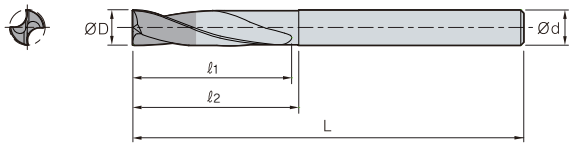


■ **Test result**



MSFD-2P





Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	20°
Thinning	R type
Coolant	External

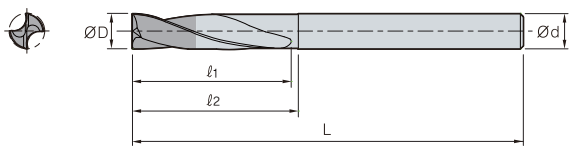
P Steel

(inch)

Designation		ØD	Ød	2P		
				ℓ1	ℓ2	L
MSFDA	025-2P	0.0984	0.1575	0.413	0.453	1.969
	026-2P	0.1024	0.1575	0.430	0.469	1.969
	027-2P	0.1063	0.1575	0.446	0.486	1.969
	028-2P	0.1102	0.1575	0.463	0.502	1.969
	029-2P	0.1142	0.1575	0.480	0.519	1.969
	030-2P	0.1181	0.2362	0.496	0.535	1.969
	031-2P	0.1220	0.2362	0.513	0.552	1.969
	032-2P	0.1260	0.2362	0.529	0.569	1.969
	033-2P	0.1299	0.2362	0.546	0.585	1.969
	034-2P	0.1339	0.2362	0.562	0.602	1.969
	035-2P	0.1378	0.2362	0.579	0.618	1.969
	036-2P	0.1417	0.2362	0.595	0.635	1.969
	037-2P	0.1457	0.2362	0.612	0.651	1.969
	038-2P	0.1496	0.2362	0.628	0.668	1.969
	039-2P	0.1535	0.2362	0.645	0.684	1.969
	040-2P	0.1575	0.2362	0.661	0.701	1.969
	041-2P	0.1614	0.2362	0.678	0.717	2.362
	042-2P	0.1654	0.2362	0.694	0.734	2.362
	043-2P	0.1693	0.2362	0.711	0.750	2.362
	044-2P	0.1732	0.2362	0.728	0.767	2.362
	045-2P	0.1772	0.2362	0.744	0.783	2.362
	046-2P	0.1811	0.2362	0.761	0.800	2.362
	047-2P	0.1850	0.2362	0.777	0.817	2.362
	048-2P	0.1890	0.2362	0.794	0.833	2.362
	049-2P	0.1929	0.2362	0.810	0.850	2.362
	050-2P	0.1969	0.2362	0.827	0.866	2.362
	051-2P	0.2008	0.2362	0.843	0.883	2.362
	052-2P	0.2047	0.2362	0.860	0.899	2.362
	053-2P	0.2087	0.2362	0.876	0.916	2.362
	054-2P	0.2126	0.2362	0.893	0.932	2.362
	055-2P	0.2165	0.2362	0.909	0.949	2.362
	056-2P	0.2205	0.2362	0.926	0.965	2.362
	057-2P	0.2244	0.2362	0.943	0.982	2.362
	058-2P	0.2283	0.2362	0.959	0.998	2.362
	059-2P	0.2323	0.2362	0.976	1.015	2.362
	060-2P	0.2362	0.2362	0.992	1.031	2.362
	061-2P	0.2402	0.3150	1.009	1.048	2.756
	062-2P	0.2441	0.3150	1.025	1.065	2.756
	063-2P	0.2480	0.3150	1.042	1.081	2.756
	064-2P	0.2520	0.3150	1.058	1.098	2.756
	065-2P	0.2559	0.3150	1.075	1.114	2.756
	066-2P	0.2598	0.3150	1.091	1.131	2.756
	067-2P	0.2638	0.3150	1.108	1.147	2.756
	068-2P	0.2677	0.3150	1.124	1.164	2.756
	069-2P	0.2717	0.3150	1.141	1.180	2.756

MSFD-2P





Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	20°
Thinning	R type
Coolant	External

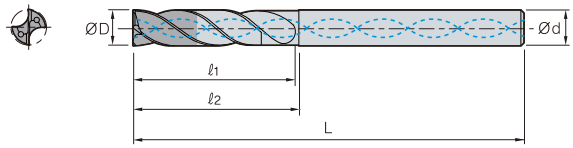
P Steel

(inch)

Designation		ØD	Ød	2P		
				ℓ1	ℓ2	L
MSFDA	070-2P	0.2756	0.3150	1.157	1.197	2.756
	071-2P	0.2795	0.3150	1.174	1.213	2.756
	072-2P	0.2835	0.3150	1.191	1.230	2.756
	073-2P	0.2874	0.3150	1.207	1.246	2.756
	074-2P	0.2913	0.3150	1.224	1.263	2.756
	075-2P	0.2953	0.3150	1.240	1.280	2.756
	076-2P	0.2992	0.3150	1.257	1.296	2.756
	077-2P	0.3031	0.3150	1.273	1.313	2.756
	078-2P	0.3071	0.3150	1.290	1.329	2.756
	079-2P	0.3110	0.3150	1.306	1.346	2.756
	080-2P	0.3150	0.3150	1.323	1.362	2.756
	081-2P	0.3189	0.3937	1.339	1.379	3.150
	082-2P	0.3228	0.3937	1.356	1.395	3.150
	083-2P	0.3268	0.3937	1.372	1.412	3.150
	084-2P	0.3307	0.3937	1.389	1.428	3.150
	085-2P	0.3346	0.3937	1.406	1.445	3.150
	086-2P	0.3386	0.3937	1.422	1.461	3.150
	087-2P	0.3425	0.3937	1.439	1.478	3.150
	088-2P	0.3465	0.3937	1.455	1.494	3.150
	089-2P	0.3504	0.3937	1.472	1.511	3.150
	090-2P	0.3543	0.3937	1.488	1.528	3.150
	091-2P	0.3583	0.3937	1.505	1.544	3.150
	092-2P	0.3622	0.3937	1.521	1.561	3.150
	093-2P	0.3661	0.3937	1.538	1.577	3.150
	094-2P	0.3701	0.3937	1.554	1.594	3.150
	095-2P	0.3740	0.3937	1.571	1.610	3.150
	096-2P	0.3780	0.3937	1.587	1.627	3.150
	097-2P	0.3819	0.3937	1.604	1.643	3.150
	098-2P	0.3858	0.3937	1.620	1.660	3.150
	099-2P	0.3898	0.3937	1.637	1.676	3.150
	100-2P	0.3937	0.3937	1.654	1.693	3.150
	101-2P	0.3976	0.4724	1.670	1.709	3.543
	102-2P	0.4016	0.4724	1.687	1.726	3.543
	103-2P	0.4055	0.4724	1.703	1.743	3.543
	104-2P	0.4094	0.4724	1.720	1.759	3.543
	105-2P	0.4134	0.4724	1.736	1.776	3.543
	106-2P	0.4173	0.4724	1.753	1.792	3.543
	107-2P	0.4213	0.4724	1.769	1.809	3.543
	108-2P	0.4252	0.4724	1.786	1.825	3.543
	109-2P	0.4291	0.4724	1.802	1.842	3.543
	110-2P	0.4331	0.4724	1.819	1.858	3.543
	111-2P	0.4370	0.4724	1.835	1.875	3.543
	112-2P	0.4409	0.4724	1.852	1.891	3.543
	113-2P	0.4449	0.4724	1.869	1.908	3.543
	114-2P	0.4488	0.4724	1.885	1.924	3.543
	115-2P	0.4528	0.4724	1.902	1.941	3.543
	116-2P	0.4567	0.4724	1.918	1.957	3.543
	117-2P	0.4606	0.4724	1.935	1.974	3.543
	118-2P	0.4646	0.4724	1.951	1.991	3.543
	119-2P	0.4685	0.4724	1.968	2.007	3.543
	120-2P	0.4724	0.4724	1.984	2.024	3.543

MSFDH-3P





Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	30°
Thinning	R type
Coolant	Through

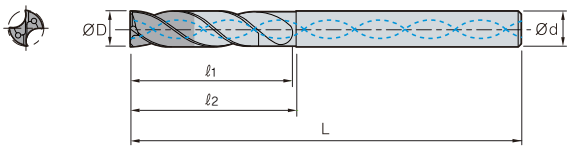
P Steel

(inch)

Designation		ØD	Ød	3P		
				ℓ1	ℓ2	L
MSFDHA	025-3P	0.0984	0.1181	0.669	0.709	2.283
	026-3P	0.1024	0.1181	0.669	0.709	2.283
	027-3P	0.1063	0.1181	0.669	0.709	2.283
	028-3P	0.1102	0.1181	0.669	0.709	2.283
	029-3P	0.1142	0.1181	0.669	0.709	2.283
	030-3P	0.1181	0.2362	0.787	0.827	2.441
	031-3P	0.1220	0.2362	0.787	0.827	2.441
	032-3P	0.1260	0.2362	0.787	0.827	2.441
	033-3P	0.1299	0.2362	0.787	0.827	2.441
	034-3P	0.1339	0.2362	0.787	0.827	2.441
	035-3P	0.1378	0.2362	0.787	0.827	2.441
	036-3P	0.1417	0.2362	0.787	0.827	2.441
	037-3P	0.1457	0.2362	0.787	0.827	2.441
	038-3P	0.1496	0.2362	0.945	0.984	2.598
	039-3P	0.1535	0.2362	0.945	0.984	2.598
	040-3P	0.1575	0.2362	0.945	0.984	2.598
	041-3P	0.1614	0.2362	0.945	0.984	2.598
	042-3P	0.1654	0.2362	0.945	0.984	2.598
	043-3P	0.1693	0.2362	0.945	0.984	2.598
	044-3P	0.1732	0.2362	0.945	0.984	2.598
	045-3P	0.1772	0.2362	0.945	0.984	2.598
	046-3P	0.1811	0.2362	0.945	0.984	2.598
	047-3P	0.1850	0.2362	0.945	0.984	2.598
	048-3P	0.1890	0.2362	1.102	1.142	2.598
	049-3P	0.1929	0.2362	1.102	1.142	2.598
	050-3P	0.1969	0.2362	1.102	1.142	2.598
	051-3P	0.2008	0.2362	1.102	1.142	2.598
	052-3P	0.2047	0.2362	1.102	1.142	2.598
	053-3P	0.2087	0.2362	1.102	1.142	2.598
	054-3P	0.2126	0.2362	1.102	1.142	2.598
	055-3P	0.2165	0.2362	1.102	1.142	2.598
	056-3P	0.2205	0.2362	1.102	1.142	2.598
	057-3P	0.2244	0.2362	1.102	1.142	2.598
	058-3P	0.2283	0.2362	1.102	1.142	2.598
	059-3P	0.2323	0.2362	1.102	1.142	2.598
	060-3P	0.2362	0.2362	1.102	1.142	2.598
	061-3P	0.2402	0.3150	1.339	1.378	3.110
	062-3P	0.2441	0.3150	1.339	1.378	3.110
	063-3P	0.2480	0.3150	1.339	1.378	3.110
	064-3P	0.2520	0.3150	1.339	1.378	3.110
	065-3P	0.2559	0.3150	1.339	1.378	3.110
	066-3P	0.2598	0.3150	1.339	1.378	3.110
	067-3P	0.2638	0.3150	1.339	1.378	3.110
	068-3P	0.2677	0.3150	1.339	1.378	3.110
	069-3P	0.2717	0.3150	1.339	1.378	3.110
	070-3P	0.2756	0.3150	1.339	1.378	3.110
	071-3P	0.2795	0.3150	1.614	1.654	3.110
	072-3P	0.2835	0.3150	1.614	1.654	3.110

MSFDH-3P





Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	30°
Thinning	R type
Coolant	Through

P Steel

(inch)

Designation		ØD	Ød	3P		
				ℓ1	ℓ2	L
MSFDHA	073-3P	0.2874	0.3150	1.614	1.654	3.110
	074-3P	0.2913	0.3150	1.614	1.654	3.110
	075-3P	0.2953	0.3150	1.614	1.654	3.110
	076-3P	0.2992	0.3150	1.614	1.654	3.110
	077-3P	0.3031	0.3150	1.614	1.654	3.110
	078-3P	0.3071	0.3150	1.614	1.654	3.110
	079-3P	0.3110	0.3150	1.614	1.654	3.110
	080-3P	0.3150	0.3150	1.614	1.654	3.110
	081-3P	0.3189	0.3937	1.850	1.890	3.504
	082-3P	0.3228	0.3937	1.850	1.890	3.504
	083-3P	0.3268	0.3937	1.850	1.890	3.504
	084-3P	0.3307	0.3937	1.850	1.890	3.504
	085-3P	0.3346	0.3937	1.850	1.890	3.504
	086-3P	0.3386	0.3937	1.850	1.890	3.504
	087-3P	0.3425	0.3937	1.850	1.890	3.504
	088-3P	0.3465	0.3937	1.850	1.890	3.504
	089-3P	0.3504	0.3937	1.850	1.890	3.504
	090-3P	0.3543	0.3937	1.850	1.890	3.504
	091-3P	0.3583	0.3937	1.850	1.890	3.504
	092-3P	0.3622	0.3937	1.850	1.890	3.504
	093-3P	0.3661	0.3937	1.850	1.890	3.504
	094-3P	0.3701	0.3937	1.850	1.890	3.504
	095-3P	0.3740	0.3937	1.850	1.890	3.504
	096-3P	0.3780	0.3937	1.850	1.890	3.504
	097-3P	0.3819	0.3937	1.850	1.890	3.504
	098-3P	0.3858	0.3937	1.850	1.890	3.504
	099-3P	0.3898	0.3937	1.850	1.890	3.504
	100-3P	0.3937	0.3937	1.850	1.890	3.504
	101-3P	0.3976	0.4724	2.165	2.205	4.016
	102-3P	0.4016	0.4724	2.165	2.205	4.016
	103-3P	0.4055	0.4724	2.165	2.205	4.016
	104-3P	0.4094	0.4724	2.165	2.205	4.016
	105-3P	0.4134	0.4724	2.165	2.205	4.016
	106-3P	0.4173	0.4724	2.165	2.205	4.016
	107-3P	0.4213	0.4724	2.165	2.205	4.016
	108-3P	0.4252	0.4724	2.165	2.205	4.016
	109-3P	0.4291	0.4724	2.165	2.205	4.016
	110-3P	0.4331	0.4724	2.165	2.205	4.016
	111-3P	0.4370	0.4724	2.165	2.205	4.016
	112-3P	0.4409	0.4724	2.165	2.205	4.016
	113-3P	0.4449	0.4724	2.165	2.205	4.016
	114-3P	0.4488	0.4724	2.165	2.205	4.016
	115-3P	0.4528	0.4724	2.165	2.205	4.016
	116-3P	0.4567	0.4724	2.165	2.205	4.016
	117-3P	0.4606	0.4724	2.165	2.205	4.016
	118-3P	0.4646	0.4724	2.165	2.205	4.016
	119-3P	0.4685	0.4724	2.165	2.205	4.016
	120-3P	0.4724	0.4724	2.165	2.205	4.016

High precision results when machining deep holes

MLD Plus new

Mach Long Solid Drill Plus

Code system

MLD	A	02362N	–	10	P
Mach Long Solid Drill Plus (MLD Plus)	Inch unIt	Drill Dia. (ØD)		Standard type	Machining area
		Ø0.2362		Aspect ratio(L/D) 10D, 15D, 20D	P: Carbon steel, alloy steel K: Cast iron N: Aluminum, copper alloy

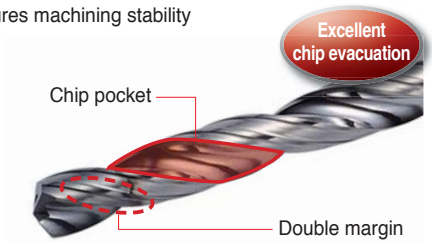
Features

Cutting edge and flute shape

- Straight cutting edge provides better rigidity
- Excellent chip evacuation due to wider chip pocket and improved flute surface roughness
- Double margin secures machining stability

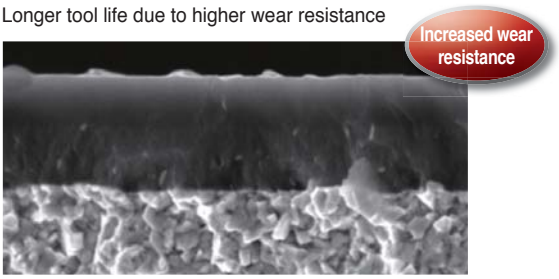


Cutting edge shape



New grade (PC315G)

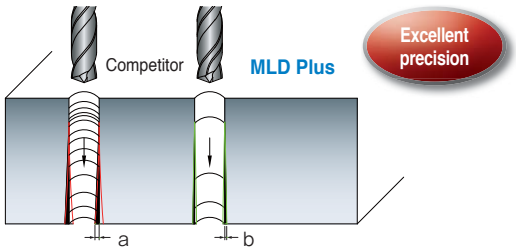
- Ultra-fine substrate and new coating applied
- Lubricative coating layer improves chip evacuation with lower frictional resistance
- Longer tool life due to higher wear resistance



PC315G

Degree of machining precision

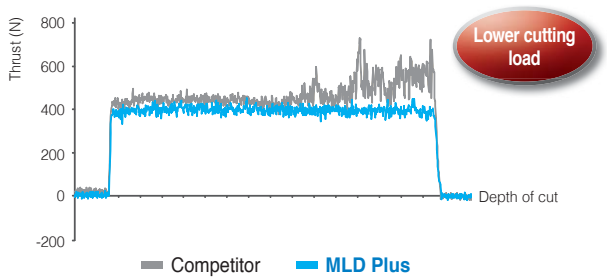
- Improved machining precision
  - Bent holes reduced, Inside hole surface roughness improved
  - Hole size uniformity increased
- Improved point shape
  - Precise location secured



Reduced bent holes compared to competitors (a > b)

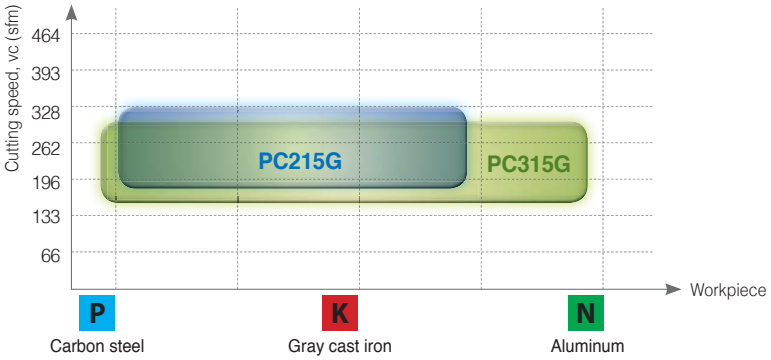
Cutting load

- **Workpiece** 1045
- **Cutting conditions** Drill Dia.(m) = Ø0.2362, vc (sfm) = 295 fn (ipr) = 0.0078, ap (inch) = 2.3622, wet
- **Tools** MLDA02362N-20P



Application area

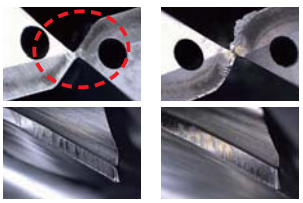
- **PC215G** – Excellent performance when machining cast iron and alloy steel at high speed
- **PC315G** – Universal grade excellent when machining carbon steel, cast iron, etc. at middle to low cutting speed



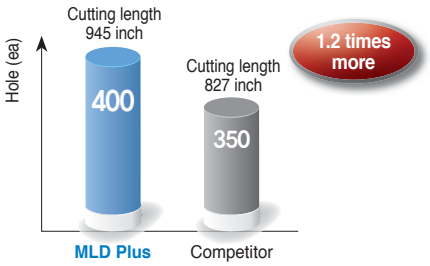
Application examples

- **Use** Part of Automobile
- **Workpiece** 1045
- **Cutting conditions** vc (sfm) = 230, fn (ipr) = 0.0047
  ap (inch) = 2.3622, Through coolant
- **Tools** MLDA01574N-20P (PC315G)





Test result

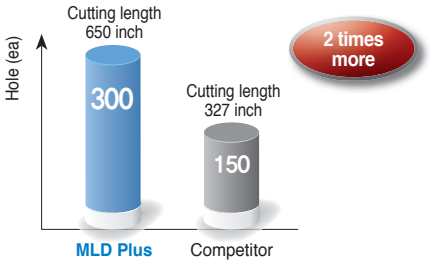


New grade PC315G's coating layer has been applied to improve wear resistance when machining carbon steel materials

- **Use** Part of Automobile
- **Workpiece** 4140 (H)
- **Cutting conditions** vc (sfm) = 230, fn (ipr) = 0.0047
  ap (inch) = 2.1653, Through coolant
- **Tools** MLDA02244N-15P (PC315G)



Test result



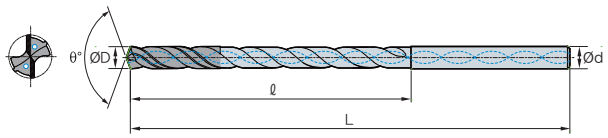
Double margin has been applied to improve stability and machining precision

Recommended cutting condition

Workpiece				Grade	vc (sfm)	Depth of cut = 10D~25D Feed rate (ipr) per drill dia.(inch)		
ISO		Workpiece	HB	Recommended		Ø0.1181~Ø0.1969	Ø0.2008~Ø0.3150	Ø0.3189~Ø0.3937
P	Carbon steel	Low carbon steel	80~120	PC315G	262 (196~295)	0.0039~0.0059	0.0059~0.0078	0.0078~0.0098
		High carbon steel	180~280	PC315G	229 (196~262)	0.0039~0.0059	0.0059~0.0078	0.0078~0.0098
	Alloy steel	Low alloy steel	140~260	PC215G	262 (196~295)	0.0039~0.0059	0.0047~0.0066	0.0059~0.0078
		Low carbon steel	50~260	PC215G	229 (196~262)	0.0031~0.0059	0.0039~0.0059	0.0059~0.0078
K	Cast iron	Gray cast iron	150~230	PC215G	262 (196~328)	0.0039~0.0078	0.0059~0.0078	0.0059~0.0078
		Ductile cast iron	160~260	PC215G	229 (196~262)	0.0039~0.0078	0.0059~0.0078	0.0059~0.0078
N	Aluminum	Aluminum alloy	30~150	FG2	393 (328~492)	0.0047~0.0066	0.0059~0.0078	0.0078~0.0098
	Copper alloy	Copper alloy	150~160	FG2	393 (328~492)	0.0047~0.0066	0.0059~0.0078	0.0078~0.0098

MLD-□□(P/K/N)





Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

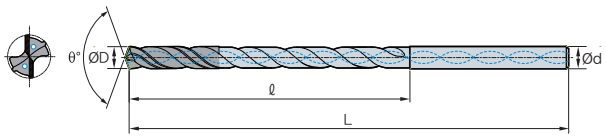
P Steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLDA	01181N-□□P,K,N	0.1181	0.1181	1.5748	3.5433	2.1654	4.1339	2.7559	4.7244	-	-
	01220N-□□P,K,N	0.1220	0.1575	1.7717	3.9370	2.3622	4.9213	3.1496	5.5118	-	-
	01248N-□□P,K,N	1/8, 0.1248	0.1575	1.7717	3.9370	2.3622	4.9213	3.1496	5.5118	-	-
	01259N-□□P,K,N	0.1260	0.1575	1.7717	3.9370	2.3622	4.9213	3.1496	5.5118	-	-
	01279N-□□P,K,N	0.1280	0.1575	1.7717	3.9370	2.3622	4.9213	3.1496	5.5118	-	-
	01299N-□□P,K,N	0.1299	0.1575	1.7717	3.9370	2.3622	4.9213	3.1496	5.5118	-	-
	01338N-□□P,K,N	0.1339	0.1575	1.9685	3.9370	2.5591	4.9213	3.3465	5.5118	-	-
	01377N-□□P,K,N	0.1378	0.1575	1.9685	3.9370	2.5591	4.9213	3.3465	5.5118	-	-
	01405N-□□P,K,N	9/64, 0.1406	0.1575	1.9685	3.9370	2.5591	4.9213	3.3465	5.5118	-	-
	01417N-□□P,K,N	0.1417	0.1575	1.9685	3.9370	2.5591	4.9213	3.3465	5.5118	-	-
	01456N-□□P,K,N	0.1457	0.1575	1.9685	3.9370	2.5591	4.9213	3.3465	5.5118	-	-
	01496N-□□P,K,N	0.1496	0.1575	1.9685	3.9370	2.9528	4.9213	3.5433	5.5118	-	-
	01535N-□□P,K,N	0.1535	0.1575	1.9685	3.9370	2.9528	4.9213	3.5433	5.5118	-	-
	01562N-□□P,K,N	5/32, 0.1563	0.1575	1.9685	3.9370	2.9528	4.9213	3.5433	5.5118	5.3150	7.4803
	01574N-□□P,K,N	0.1575	0.1575	1.9685	3.9370	2.9528	4.9213	3.5433	5.5118	4.5276	6.4961
	01590N-□□P,K,N	0.1591	0.1575	1.9685	3.9370	2.9528	4.9213	3.5433	5.5118	4.5276	6.4961
	01614N-□□P,K,N	0.1614	0.1969	2.1654	4.5276	2.9528	5.5118	3.9370	6.4961	4.7244	7.4803
	01653N-□□P,K,N	0.1654	0.1969	2.1654	4.5276	2.9528	5.5118	3.9370	6.4961	4.7244	7.4803
	01692N-□□P,K,N	0.1693	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01720N-□□P,K,N	11/64, 0.1720	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01732N-□□P,K,N	0.1732	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01771N-□□P,K,N	0.1772	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01811N-□□P,K,N	0.1811	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01830N-□□P,K,N	0.1831	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01850N-□□P,K,N	0.1850	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01874N-□□P,K,N	3/16, 0.1874	0.1969	2.3622	4.5276	3.3465	5.5118	4.3307	6.4961	5.3150	7.4803
	01889N-□□P,K,N	0.1890	0.1969	2.5591	4.5276	3.5433	5.5118	4.5276	6.4961	5.5118	7.4803
	01929N-□□P,K,N	0.1929	0.1969	2.5591	4.5276	3.5433	5.5118	4.5276	6.4961	5.5118	7.4803
	01968N-□□P,K,N	0.1969	0.1969	2.5591	4.5276	3.5433	5.5118	4.5276	6.4961	5.5118	7.4803

MLD-□□(P/K/N)





Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

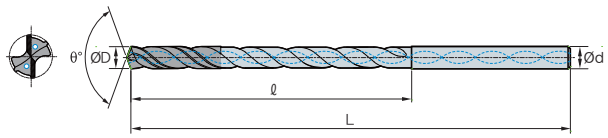
P Steel K Cast iron N Non-ferrous metal

(inch)

Designation		ØD	Ød	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLDA	02007N-□□P,K,N	0.2008	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02011N-□□P,K,N	0.2012	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02031N-□□P,K,N	13/64, 0.2031	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02047N-□□P,K,N	0.2047	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02066N-□□P,K,N	0.2067	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02086N-□□P,K,N	0.2087	0.2362	2.7559	5.0394	3.7402	6.2992	4.7244	7.4803	5.9055	8.6614
	02125N-□□P,K,N	0.2126	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02129N-□□P,K,N	0.2130	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02165N-□□P,K,N	0.2165	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02185N-□□P,K,N	0.2185	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02188N-□□P,K,N	7/32, 0.2189	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02204N-□□P,K,N	0.2205	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02244N-□□P,K,N	0.2244	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02283N-□□P,K,N	0.2283	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02322N-□□P,K,N	0.2323	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02342N-□□P,K,N	15/64, 0.2343	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02362N-□□P,K,N	0.2362	0.2362	3.0709	5.0394	4.3307	6.2992	5.5118	7.4803	6.6929	8.6614
	02401N-□□P,K,N	0.2402	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02440N-□□P,K,N	0.2441	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02480N-□□P,K,N	0.2480	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02500N-□□P,K,N	1/4, 0.2500	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02519N-□□P,K,N	0.2520	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02559N-□□P,K,N	0.2559	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02570N-□□P,K,N	0.2571	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02598N-□□P,K,N	0.2598	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02637N-□□P,K,N	0.2638	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02657N-□□P,K,N	17/64, 0.2657	0.2756	3.4252	5.5118	4.7244	6.8898	6.1024	8.2677	7.4803	9.8425
	02677N-□□P,K,N	0.2677	0.2756	3.5433	5.5118	4.9213	6.8898	6.2992	8.2677	7.8740	9.8425
	02716N-□□P,K,N	0.2717	0.2756	3.5433	5.5118	4.9213	6.8898	6.2992	8.2677	7.8740	9.8425
	02755N-□□P,K,N	0.2756	0.2756	3.5433	5.5118	4.9213	6.8898	6.2992	8.2677	7.8740	9.8425
	02795N-□□P,K,N	0.2795	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02811N-□□P,K,N	9/32, 0.2811	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02834N-□□P,K,N	0.2835	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02874N-□□P,K,N	0.2874	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02913N-□□P,K,N	0.2913	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02952N-□□P,K,N	0.2953	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02968N-□□P,K,N	19/64, 0.2969	0.3150	3.9370	6.1024	5.3150	7.6772	6.6929	9.0551	-	-
	02992N-□□P,K,N	0.2992	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-

MLD-□□(P/K/N)





Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

P Steel K Cast iron N Non-ferrous metal

(inch)

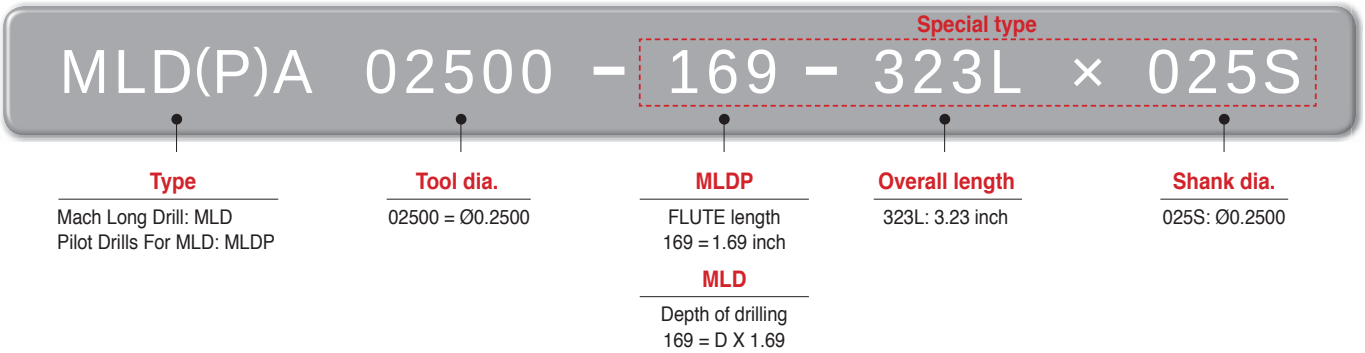
Designation		ØD	Ød	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLDA	03031N-□□P,K,N	0.3031	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-
	03070N-□□P,K,N	0.3071	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-
	03110N-□□P,K,N	0.3110	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-
	03125N-□□P,K,N	5/16, 0.3126	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-
	03149N-□□P,K,N	0.3150	0.3150	4.1339	6.1024	5.7087	7.6772	7.0866	9.0551	-	-
	03188N-□□P,K,N	0.3189	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03228N-□□P,K,N	0.3228	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03267N-□□P,K,N	0.3268	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03279N-□□P,K,N	21/64, 0.3280	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03307N-□□P,K,N	0.3307	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03346N-□□P,K,N	0.3346	0.3543	4.3307	6.4961	6.1024	8.2677	7.6772	10.2362	-	-
	03385N-□□P,K,N	0.3386	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03425N-□□P,K,N	0.3425	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03437N-□□P,K,N	11/32, 0.3437	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03464N-□□P,K,N	0.3465	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03503N-□□P,K,N	0.3504	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03543N-□□P,K,N	0.3543	0.3543	4.5276	6.4961	6.2992	8.2677	8.2677	10.2362	-	-
	03582N-□□P,K,N	0.3583	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03594N-□□P,K,N	23/64, 0.3594	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03622N-□□P,K,N	0.3622	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03641N-□□P,K,N	0.3642	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03661N-□□P,K,N	0.3661	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03677N-□□P,K,N	0.3677	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03700N-□□P,K,N	0.3701	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03740N-□□P,K,N	0.3740	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03748N-□□P,K,N	3/8, 0.3748	0.3937	4.9213	7.4803	6.6929	9.4488	-	-	-	-
	03779N-□□P,K,N	0.3780	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-
	03818N-□□P,K,N	0.3819	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-
	03858N-□□P,K,N	0.3858	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-
	03897N-□□P,K,N	0.3898	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-
	03905N-□□P,K,N	25,64, 0.3906	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-
	03937N-□□P,K,N	0.3937	0.3937	5.1181	7.4803	7.0866	9.4488	-	-	-	-

Stable deep hole drilling with specially designed low cutting resistance

Mach Long Solid Drill

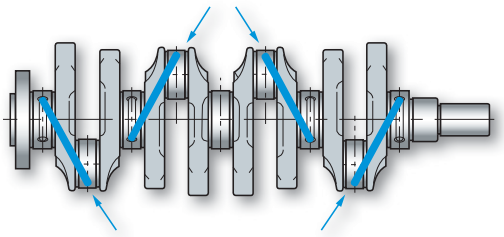
- Over 20D deep hole drilling is possible without step drilling
- The stable hole drilling due to specially designed low cutting resistance
- Special chip pocket has designed for effective chip evacuation
- Optimized design for drill rigidity to prevent the bending of the drill when entering operation
- The lubrication & thermal resistance of coating has been increased by adapting new TiAlN

Code system



Mach long drills-deep hole drilling

- **Mach Long Drills are ideal for.....**
  - Deep and inclined hole drilling of crank shaft
  - Deep hole drilling of cam shaft
  - Deep hole drilling of mold and machinery
    → Deep hole drilling aspect ratio over 15D
- **Advantages of MLD**
  - Shorting cycle time for better productivity
  - Tool guide bush is not required
  - Reduce idle time by prolonged tool life
  - Green coolant solutions (MQL) to protect environment



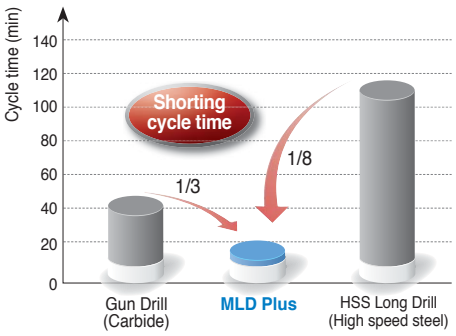
Application example (Oil hole for crank shaft, 20D)

MLD productivity: MLDA02500-20A

Tool	vc (sfm)	fn (ipr)	n (min^{-1})	vf (ipm)	Coolant	Step operation
Gun Drills (Carbide)	328	0.002	4,683	7.362	Through coolant oil	No required
High Speed Steel Long Drills	49	0.004	703	2.756	Outer coolant oil	15mm/9times
Mach Long Drills	262	0.006	3,747	20.669	MQL- Air 0.5MPa, Oil 20cc/h	No required

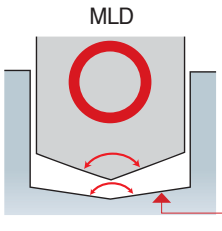
Cycle time

- Decreasing cycle time up to 1/3~1/8 times
- Increasing productivity by process reduction
- It is easy to reduce running cost
- Improving of effective working condition
- Drill guide bush is not required



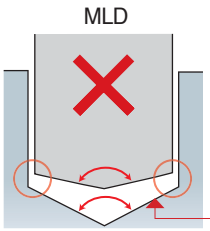
Function of MLD & MLDP

• Relationship of point angle between MLD & MLDP



Point angle of MLD < Point angle of foundation hole
→ Stable machining

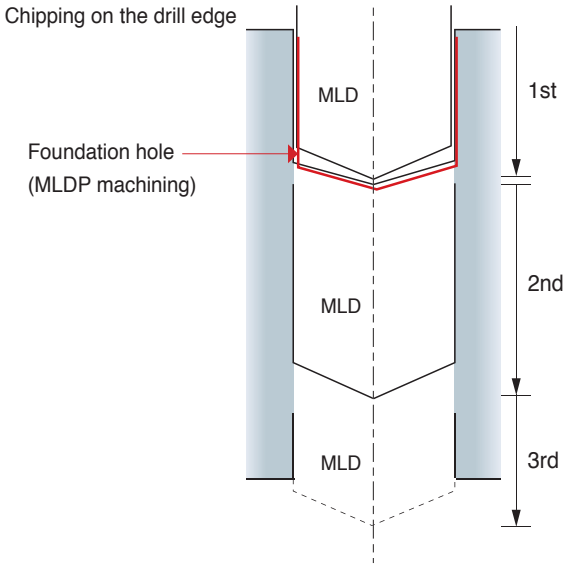
Large point angle of Pilot Drill: Stable condition



Point angle of MLD > Point angle of foundation hole
→ Chipping on the drill edge

Small point angle of Pilot Drill: Unstable condition

• To make the optimal of MLD



1st. Pilot drilling
- vc (sfm) = Normal
- fn (ipr) = Normal

2nd. Deep drilling by MLD
Approach the drill 1mm less than the depth of MLDP drilling
- vc (sfm) = 49
- fn (ipr) = 0.020

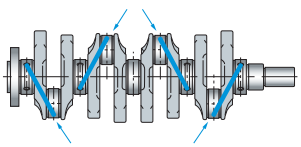
2nd. MLD drilling (Machining stage)
- vc (sfm) = Normal
- fn (ipr) = Normal

3rd. MLD drilling (Piercing stage)
- vc (sfm) = Normal
- fn (ipr) = Normal feed/2

Application example

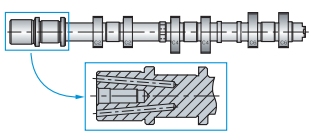
- **Use** Part of Automobile
- **Workpiece** 4140, HB255~330
- **Cutting conditions** vc (sfm) = 230, fn (ipr) = 0.007
  MQL (30cc/hour), Air (MPa) = 0.7
- **Tools** MLDA2362-22A (Ø0.2362 inch, Aspect ratio 18D)
- **Machine** Horizontal milling machine
- **Tool life** 1000 holes



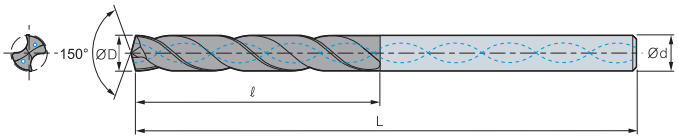


- **Use** Part of Automobile
- **Workpiece** No35B
- **Cutting conditions** vc (sfm) = 207, fn (ipr) = 0.004
  water-soluble cutting fluid (3kg/cm^2, 2ℓ/min)
- **Tools** MLDA01575-25A (Ø0.1575 inch, Aspect ratio 16D)
- **Machine** Rotary milling machine
- **Tool life** 440 holes





MLDP Mach pilot drills with oil hole



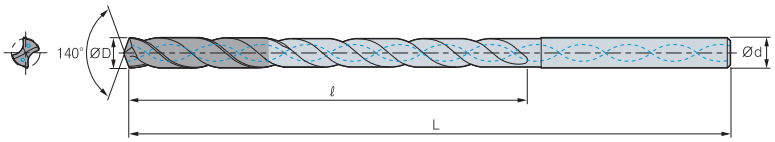
Grade	PC205F/PC325U
Tolerance (drill Dia.)	x6
Tolerance (shank Dia.)	h6
Point angle	150°
Twist angle	30°
Thinning	X type
Coolant	Through

(inch)

Designation		ØD		Ød	ℓ	L
MLDPA	02188	7/32	0.2188	0.2500	1.69	3.23
	02500	1/4	0.2500	0.2500	1.69	3.23
	02656	17/64	0.2656	0.3125	1.97	3.58
	02813	9/32	0.2813	0.3125	1.97	3.58
	02969	19/64	0.2969	0.3125	1.97	3.58
	03125	5/16	0.3125	0.3125	1.97	3.58
	13281	21/64	0.3281	0.3750	2.36	4.05
	03438	11/32	0.3438	0.3750	2.36	4.05
	03594	23/64	0.3594	0.3750	2.36	4.05
	03750	3/8	0.3750	0.3750	2.36	4.05

※ Order made items: MLDPA□□□□ × Flute length - Total length L × Shank diameter S
Ex.1) Machined diameter: Ø0.2500inch, Flute length: 1.69 inch, Total length: 3.23 inch, Shank diameter: 0.2500
MLDPA02500 × 1.69 - 3.23L × 0.25S

MLD Mach long drill



Grade	PC205F
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle	140°
Twist angle	30°
Thinning	X type
Coolant	Through

(inch)

Designation		ØD		Ød	20(ℓ / ØD = 20)		25(ℓ / ØD = 25)	
					ℓ	L	ℓ	L
MLDA	02188-□	7/32	0.2188	0.2500	4.33	6.33	5.47	7.47
	02500-□	1/4	0.2500	0.2500	5.00	7.00	6.26	8.26
	02656-□	17/64	0.2656	0.3125	5.31	7.31	6.65	8.65
	02813-□	9/32	0.2813	0.3125	5.63	7.63	7.05	9.05
	02969-□	19/64	0.2969	0.3125	5.91	7.91	7.44	9.44
	03125-□	5/16	0.3125	0.3125	6.26	8.26	7.83	9.83
	13281-□	21/64	0.3281	0.3750	6.57	8.57	8.19	10.19
	03438-□	11/32	0.3438	0.3750	6.89	8.89	-	-
	03594-□	23/64	0.3594	0.3750	7.20	9.20	-	-
	03750-□	3/8	0.3750	0.3750	7.48	9.48	-	-

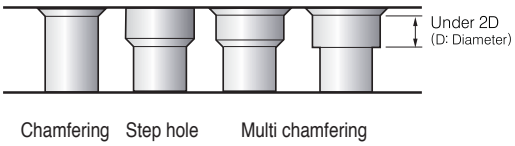
※ Order made items: MLDA□□□□-Aspect ratio
Ex.1) Machined diameter: Ø0.25 inch, Flute length: 5 inch, Total length: 7 inch
MLDA02500-□(Aspect ratio)

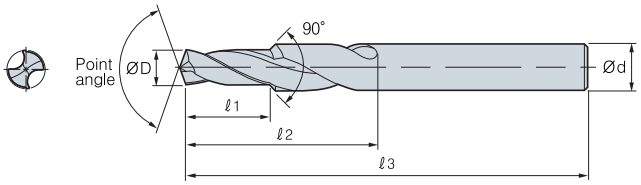
Tolerance code

Drill dia. (ØD)		h6	h7	x6
Over	Under			
-	3	0~-0.006	0~-0.010	+0.020~+0.026
3	6	0~-0.008	0~-0.012	+0.028~+0.036
6	10	0~-0.009	0~-0.015	+0.034~+0.043
10	14	0~-0.011	0~-0.018	+0.040~+0.051
14	18	0~-0.011	0~-0.018	+0.045~+0.056
18	24	0~-0.013	0~-0.021	+0.054~+0.067

Code system for mach step drill

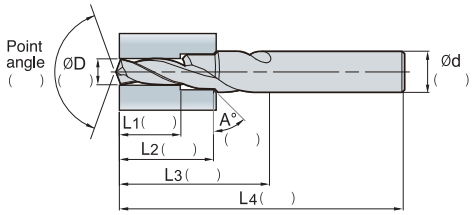
MSD(H)S	Tool Dia.	×	Effective flute length	–	Flute length	–	Overall length (L)	×	Shank Dia. (S)
Solid type: MSDS Oil-hole type: MSDHS	ØD		ℓ_1		ℓ_2		(ℓ_3)L		(Ød)S





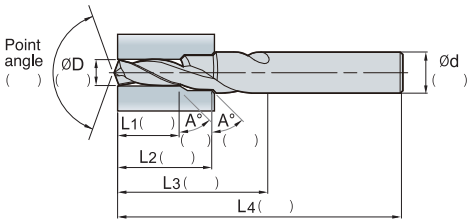
☐ Multi chamfering

(**Coolant**: Through system ☐ External system ☐)



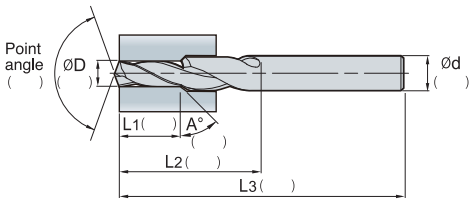
☐ Multi chamfering

(**Coolant**: Through system ☐ External system ☐)



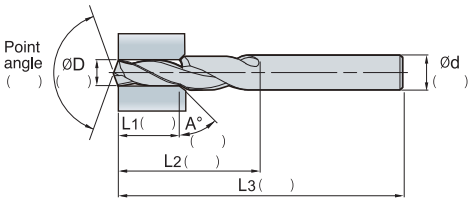
☐ Step hole

(**Coolant**: Through system ☐ External system ☐)



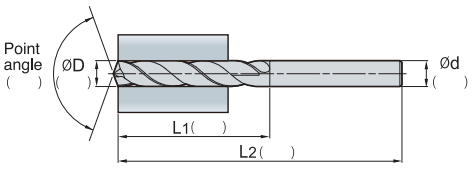
☐ Chamfering

(**Coolant**: Through system ☐ External system ☐)



☐ Drilling

(**Coolant**: Through system ☐ External system ☐)

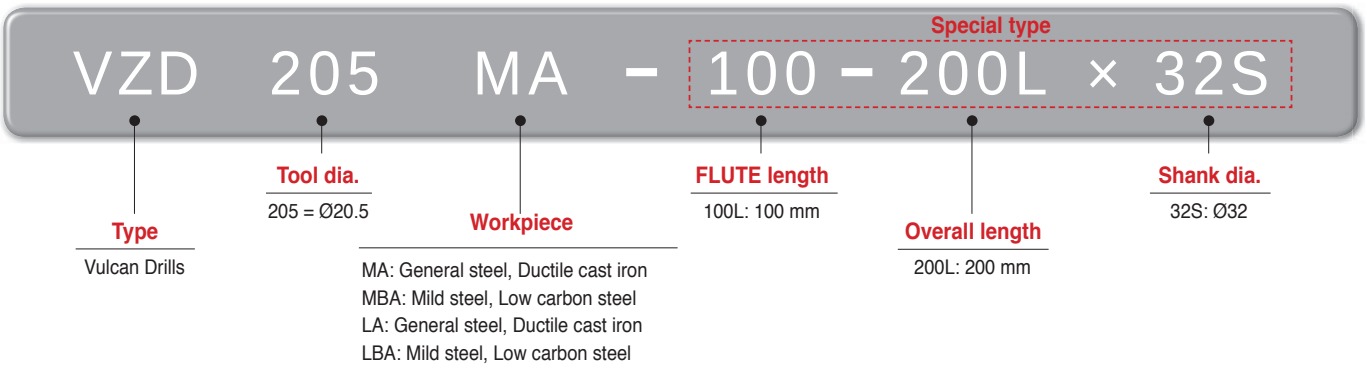


High feed and precision machining with our specially designed point edge

Vulcan Drill

- High feed and precision machining due to specially designed point edge
- Vulcan drills ensure longer tool life under high speed condition because of increased thermal & wear resistance. It also uses a PVD coating with an exclusive substrate to help maintain reduced frictional resistance
- Low cutting resistance by the best design of clearance angle is possible to increase feed
- Smoother chip control due to improved chip breakage
- Rmax: 6~25s, Hole tolerance: IT8 ~ 10
- Strong shock resistance ensures long tool life under the heavy interrupted machining

Code system



Application for vulcan drill

• General steel, Alloy steel, Mild steel, Dice steel, Stainless steel, Cast iron, Ductile cast iron, Non-ferrous metal, etc

Notice

• **Unsuitable drilling**

- Avoid the inclination or unevenness of entering and piercing section of hole as possible
- Reduce the feed 0.1~0.15mm/rev when drilling at inclined and unevenness

• **Clamping of workpiece**

- In case of wide flat panel or rotation by horizontal component, please clamp to be prevented bending of central part of workpiece for high efficiency

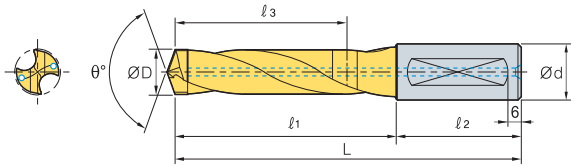
Recommended cutting condition

Form	Workpiece	Hardness	~Ø15		~Ø20		~Ø40	
			vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)
MA LA	Mild steel, General steel, Alloy steel	Under HB250	40~90 (65)	0.15~0.30 (0.20)	40~90 (65)	0.20~0.40 (0.30)	40~90 (70)	0.20~0.45 (0.35)
	General steel, Alloy steel	Under HB320	40~90 (60)	0.10~0.25 (0.20)	40~90 (60)	0.15~0.35 (0.25)	40~90 (65)	0.20~0.40 (0.30)
	Mold steel	HB250	40~70 (50)	0.10~0.25 (0.20)	40~70 (50)	0.15~0.30 (0.25)	40~70 (50)	0.20~0.35 (0.30)
	Stainless steel	HB250	30~50 (45)	0.10~0.20 (0.15)	30~50 (45)	0.15~0.25 (0.20)	30~50 (45)	0.20~0.30 (0.25)
	Ductile cast iron	-	50~100 (70)	0.20~0.35 (0.30)	50~100 (70)	0.20~0.40 (0.35)	50~100 (70)	0.25~0.50 (0.40)
MBA LBA	Mild steel, General steel, Alloy steel	Under HB250	40~90 (75)	0.20~0.40 (0.30)	40~90 (75)	0.20~0.40 (0.30)	40~90 (80)	0.20~0.45 (0.35)
	General steel, Alloy steel	Under HB320	35~80 (55)	0.15~0.30 (0.25)	35~80 (55)	0.15~0.30 (0.25)	40~80 (60)	0.15~0.40 (0.30)

M This is metric size. We can also provide in inch type

Vulcan Drill (VZD) MA, MBA

Type	MA	MBA
Grade	PC230F	
Tolerance (drill Dia.)	h7	
Tolerance (shank Dia.)	h7	
Point angle	140°	150°
Twist angle	25°	20°
Thinning	X type	
Coolant	Through	



(mm)

Designation		ØD	Ød	L	ℓ1	ℓ2	ℓ3
VZD	126~135MA, MBA	12.6~13.5	16	110	62	48	44
	136~145MA, MBA	13.6~14.5	16	115	67	48	48
	146~155MA, MBA	14.6~15.5	20	125	75	50	55
	156~165MA, MBA	15.6~16.5	20	130	80	50	59
	166~175MA, MBA	16.6~17.5	20	135	85	50	63
	176~185MA, MBA	17.6~18.5	20	140	90	50	66
	186~195MA, MBA	18.6~19.5	25	155	99	56	74
	196~205MA, MBA	19.6~20.5	25	155	99	56	73
	206~215MA, MBA	20.6~21.5	25	155	99	56	72
	216~225MA, MBA	21.6~22.5	25	160	104	56	76
	226~235MA, MBA	22.6~23.5	25	160	104	56	74
	236~245MA, MBA	23.6~24.5	32	170	110	60	79
	246~255MA, MBA	24.6~25.5	32	170	110	60	78
	256~265MA, MBA	25.6~26.5	32	175	115	60	82
	266~275MA, MBA	26.6~27.5	32	175	115	60	80
	276~285MA, MBA	27.6~28.5	32	180	120	60	84
	286~295MA, MBA	28.6~29.5	32	185	125	60	88
	296~305MA, MBA	29.6~30.5	32	185	125	60	87
	306~315MA, MBA	30.6~31.5	40	205	135	70	95
	316~325MA, MBA	31.6~32.5	40	210	140	70	98
	326~335MA, MBA	32.6~33.5	40	215	145	70	101
	336~345MA, MBA	33.6~34.5	40	220	150	70	104
	346~355MA, MBA	34.6~35.5	40	225	155	70	107
	356~365MA, MBA	35.6~36.5	40	225	155	70	110
	366~375MA, MBA	36.6~37.5	40	230	160	70	113
	376~385MA, MBA	37.6~38.5	40	235	165	70	116
	386~395MA, MBA	38.6~39.5	40	240	170	70	119
	396~405MA, MBA	39.6~40.5	40	245	175	70	122

※ VZD□□□MA: For General steel, Ductile cast iron
MBA: For Mild steel, Low carbon steel

M This is metric size. We can also provide in inch type

※ Order made items: VZD□□□M□ × Flute length - Total length L

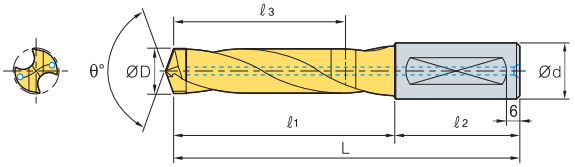
Ex.1) MA Type, Machined diameter: Ø18.6 mm, Flute length: 110 mm, Total length: 200 mm
--- VZD186MA × 110-200L

Ex.2) MA Type, Machined diameter: Ø18.63, Flute length: 110 mm, Total length: 200 mm
--- VZD1863MA × 110-200L

Ex.3) MA Type, Machined diameter: Ø18.6, Standard
--- VZD186MA

Vulcan Drill (VZD) LA, LBA

Type	LA	LBA
Grade	PC230F	
Tolerance (drill Dia.)	h7	
Tolerance (shank Dia.)	h7	
Point angle	140°	150°
Twist angle	25°	20°
Thinning	X type	
Coolant	Through	



(mm)

Designation		ØD	Ød	L	ℓ1	ℓ2	ℓ3
VZD	126~135LA, LBA	12.6~13.5	16	140	92	48	74
	136~145LA, LBA	13.6~14.5	16	145	97	48	78
	146~155LA, LBA	14.6~15.5	20	155	105	50	85
	156~165LA, LBA	15.6~16.5	20	165	115	50	94
	166~175LA, LBA	16.6~17.5	20	170	120	50	98
	176~185LA, LBA	17.6~18.5	20	175	125	50	101
	186~195LA, LBA	18.6~19.5	25	190	134	56	109
	196~205LA, LBA	19.6~20.5	25	195	139	56	113
	206~215LA, LBA	20.6~21.5	25	195	139	56	112
	216~225LA, LBA	21.6~22.5	25	200	144	56	116
	226~235LA, LBA	22.6~23.5	25	210	154	56	124
	236~245LA, LBA	23.6~24.5	32	220	160	60	129
	246~255LA, LBA	24.6~25.5	32	225	165	60	133
	256~265LA, LBA	25.6~26.5	32	230	170	60	137
	266~275LA, LBA	26.6~27.5	32	235	175	60	141
	276~285LA, LBA	27.6~28.5	32	240	180	60	144
	286~295LA, LBA	28.6~29.5	32	245	185	60	148
	296~305LA, LBA	29.6~30.5	32	255	195	60	157
	306~315LA, LBA	30.6~31.5	40	275	205	70	166
	316~325LA, LBA	31.6~32.5	40	280	210	70	172
	326~335LA, LBA	32.6~33.5	40	280	215	70	173
	336~345LA, LBA	33.6~34.5	40	290	220	70	177
	346~355LA, LBA	34.6~35.5	40	295	225	70	181
	356~365LA, LBA	35.6~36.5	40	300	230	70	183
	366~375LA, LBA	36.6~37.5	40	305	235	70	188
	376~385LA, LBA	37.6~38.5	40	315	245	70	193
	386~395LA, LBA	38.6~39.5	40	320	250	70	198
	396~405LA, LBA	39.6~40.5	40	325	255	70	203

※ VZD□□□LA: For General steel, Ductile cast iron
LBA: For Mild steel, Low carbon steel

M This is metric size. We can also provide in inch type

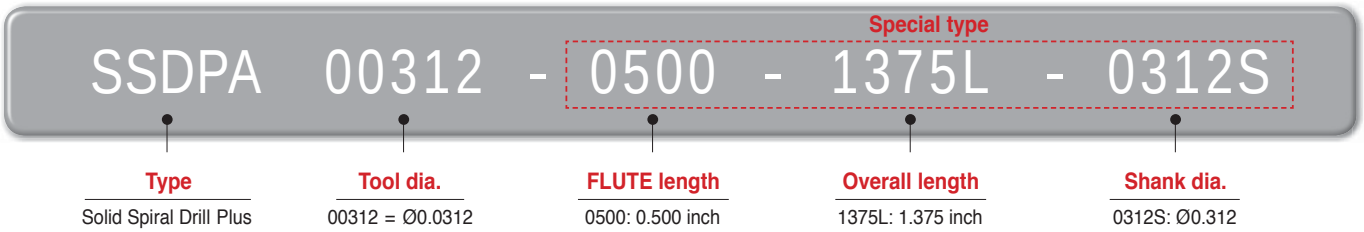
※ Order made items: VZD□□□M□ × Flute length - Total length L
Ex.1) LA Type, Machined diameter: Ø18.6 mm, Flute length: 110 mm, Total length: 200 mm
--- VZD186LA × 110-200L
Ex.2) LA Type, Machined diameter: Ø18.63, Flute length: 110 mm, Total length: 200 mm
--- VZD1863LA × 110-200L
Ex.3) LA Type, Machined diameter: Ø18.6, Standard
--- VZD186LA

High quality solid drill for high performance

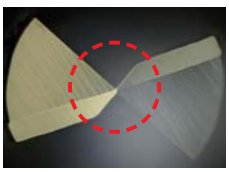
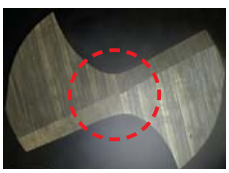
SSD Plus new

- Improved chip control thanks to the new flute design
- Higher quality machining achieved from improved surface finish and forming
- Increased productivity thanks to stable tool life
- A variety of workpiece materials available including mild steel and non-ferrous

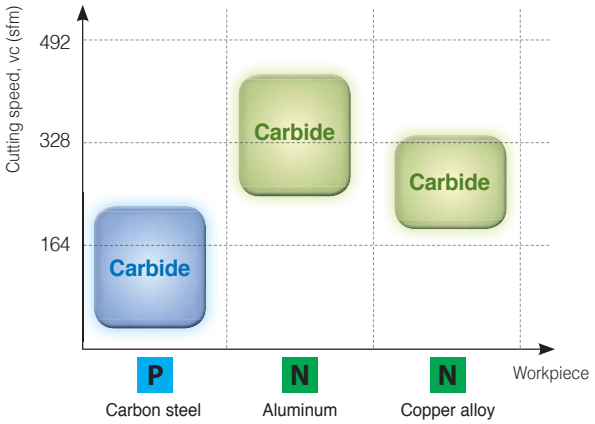
Code system



Features

Division	Shape	Application area
SSD Plus (SSDP)		P, N
existing SSD		N

Application area

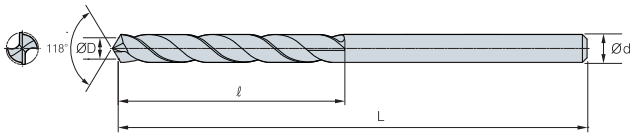


Recommended cutting condition

Workpiece				Grade	vc (sfm)	Depth of cut = 10D~25D Feed rate (mm/rev) per drill dia.(inch)			
ISO		Workpiece	HB			Ø0.0394~Ø0.1575	Ø0.1614~Ø0.3150	Ø0.3189~Ø0.4724	Ø0.4764~Ø0.5906
P	Carbon steel	Low carbon steel	80~120	Carbide	115 (66~213)	0.0079~0.0236	0.0157~0.0315	0.0236~0.0472	0.0394~0.0630
N	Aluminum	Aluminum alloy	30~150		328 (308~394)	0.0181~0.0236	0.0197~0.0315	0.0315~0.0472	0.0472~0.0630
	Copper alloy	Copper alloy	150~160		262 (213~312)	0.0181~0.0236	0.0197~0.0315	0.0315~0.0472	0.0472~0.0630

SSDP





Coating	×
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h7
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

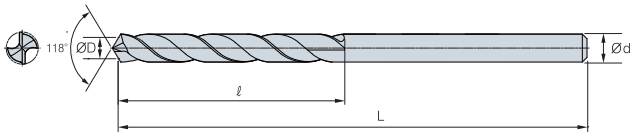
(inch)

Designation		ØD = Ød	ℓ	L
SSDPA	00394	0.0394	0.394	1.260
	00433	0.0433	0.394	1.260
	00472	0.0472	0.394	1.260
	00512	0.0512	0.394	1.260
	00551	0.0551	0.394	1.260
	00591	0.0591	0.512	1.378
	00630	0.0630	0.512	1.378
	00669	0.0669	0.512	1.378
	00709	0.0709	0.512	1.378
	00748	0.0748	0.512	1.378
	00787	0.0787	0.709	1.575
	00827	0.0827	0.709	1.575
	00866	0.0866	0.709	1.575
	00906	0.0906	0.709	1.575
	00945	0.0945	0.709	1.575
	00984	0.0984	0.866	1.772
	01024	0.1024	0.866	1.772
	01063	0.1063	0.866	1.772
	01102	0.1102	0.866	1.772
	01142	0.1142	0.866	1.772
	01181	0.1181	0.984	1.969
	01220	0.1220	0.984	1.969
	01260	0.1260	0.984	1.969
	01299	0.1299	1.102	1.969
	01339	0.1339	1.102	1.969
	01378	0.1378	1.102	1.969
	01417	0.1417	1.181	2.165
	01457	0.1457	1.181	2.165
	01496	0.1496	1.181	2.165
	01535	0.1535	1.181	2.165
	01575	0.1575	1.181	2.165
	01614	0.1614	1.339	2.362
	01654	0.1654	1.339	2.362
	01693	0.1693	1.339	2.362
	01732	0.1732	1.339	2.362
	01772	0.1772	1.339	2.362
	01811	0.1811	1.496	2.559
	01850	0.1850	1.496	2.559

Designation		ØD = Ød	ℓ	L
SSDPA	01890	0.1890	1.496	2.559
	01929	0.1929	1.496	2.559
	01969	0.1969	1.496	2.559
	02008	0.2008	1.496	2.559
	02047	0.2047	1.496	2.559
	02087	0.2087	1.496	2.559
	02126	0.2126	1.496	2.559
	02165	0.2165	1.496	2.559
	02205	0.2205	1.575	2.953
	02244	0.2244	1.575	2.953
	02283	0.2283	1.575	2.953
	02323	0.2323	1.575	2.953
	02362	0.2362	1.575	2.953
	02402	0.2402	1.575	2.953
	02441	0.2441	1.575	2.953
	02480	0.2480	1.575	2.953
	02520	0.2520	1.575	2.953
	02559	0.2559	1.575	2.953
	02598	0.2598	1.811	3.150
	02638	0.2638	1.811	3.150
	02677	0.2677	1.811	3.150
	02717	0.2717	1.811	3.150
	02756	0.2756	1.811	3.150
	02795	0.2795	1.811	3.150
	02835	0.2835	1.811	3.150
	02874	0.2874	1.811	3.150
	02913	0.2913	1.811	3.150
	02953	0.2953	1.811	3.150
	02992	0.2992	1.969	3.346
	03031	0.3031	1.969	3.346
	03071	0.3071	1.969	3.346
	03110	0.3110	1.969	3.346
	03150	0.3150	1.969	3.346
	03189	0.3189	1.969	3.346
	03228	0.3228	1.969	3.346
	03268	0.3268	1.969	3.346
	03307	0.3307	1.969	3.346
	03346	0.3346	1.969	3.346

SSDP





Coating	×
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

(inch)

Designation		ØD = Ød	ℓ	L
SSDPA	03386	0.3386	1.969	3.740
	03425	0.3425	1.969	3.740
	03465	0.3465	1.969	3.740
	03504	0.3504	1.969	3.740
	03543	0.3543	1.969	3.740
	03583	0.3583	1.969	3.740
	03622	0.3622	1.969	3.740
	03661	0.3661	1.969	3.740
	03701	0.3701	1.969	3.740
	03740	0.3740	1.969	3.740
	03780	0.3780	1.969	3.937

Designation		ØD = Ød	ℓ	L
SSDPA	03819	0.3819	1.969	3.937
	03858	0.3858	1.969	3.937
	03898	0.3898	1.969	3.937
	03937	0.3937	1.969	3.937
	04134	0.4134	2.362	4.528
	04331	0.4331	2.362	4.528
	04528	0.4528	2.559	4.724
	04724	0.4724	2.559	4.724
	04921	0.4921	2.559	4.921
	05118	0.5118	2.559	4.921
	05906	0.5906	2.756	5.118

Burnishing Drill

Recommended cutting condition

Workpiece	Cutting speed vc (m/min)	Feed rate (mm/rev) per drill dia. (mm)				
		Ø2.0~Ø3.0	Ø3.5~Ø5.0	Ø5.5~Ø8.0	Ø8.5~Ø12	Ø12.5~Ø18
Aluminum alloy, Copper alloy	30~60	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
Aluminum alloy for die castings	50~80	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
Cast iron (GC) Ductile cast	25~60	0.01~0.04	0.02~0.08	0.05~0.12	0.05~0.20	0.05~0.30
Iron (GCD)	20~50	0.01~0.03	0.02~0.05	0.03~0.08	0.04~0.12	0.05~0.15

M This is metric size. We can also provide in inch type

Burnishing Drill-BDS



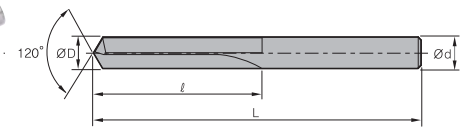


Fig.1

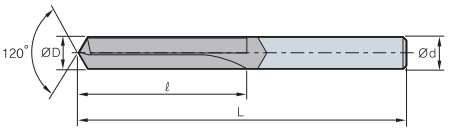


Fig.2

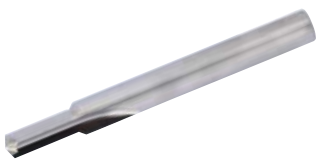
(mm)

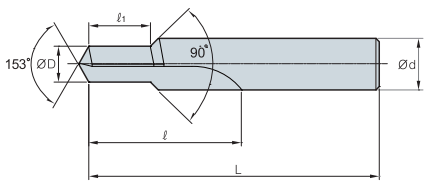
Designation		ØD	Ød	ℓ	L	Fig.
BDS	040S	4.0	4.0	35	80	1
	050S	5.0	5.0	40	85	1
	060S	6.0	6.0	50	95	1
	070S	7.0	7.0	55	100	1
	080S	8.0	8.0	65	110	1
	090S	9.0	9.0	70	120	1
	100S	10.0	10.0	80	130	1
	110S	11.0	11.0	90	140	1
	120B	12.0	12.0	95	150	2
	130B	13.0	16.0	105	160	2
	140B	14.0	16.0	110	170	2
	150B	15.0	16.0	120	185	2
	160B	16.0	16.0	125	190	2

M This is metric size. We can also provide in inch type

Step Burnishing Drill-BDT

For tapping a foundation hole





(mm)

Designation		ØD	Ød	ℓ	ℓ1	L	Tap
BDT	M05080- ℓ 1	4.2	6.0	35	9~15	90	M5XP0.8
	M06100- ℓ 1	5.0	7.0	40	11~18	95	M6XP1.0
	M08125- ℓ 1	6.8	10.0	50	15~24	105	M8XP1.25
	M10125- ℓ 1	8.8	12.0	55	17~30	110	M10XP1.25
	M10150- ℓ 1	8.5	12.0	55	17~30	110	M10XP1.5
	M12125- ℓ 1	10.8	14.0	60	19~36	120	M12XP1.25
	M12150- ℓ 1	10.5	14.0	60	19~36	120	M12XP1.5
	M12175- ℓ 1	10.3	14.0	60	19~36	120	M12XP1.75

M This is metric size. We can also provide in inch type

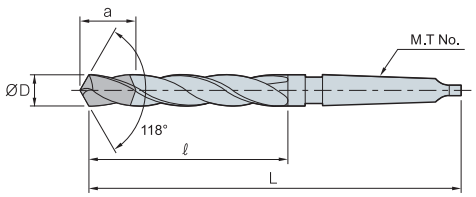
Top Solid Drill

Recommended cutting condition

Diameter	Cutting condition	Ductile cast iron	Gray cast iron	Soft steel
Ø0.030~Ø0.40	vc (sfm)	65~115	65~195	165~490
	fn (ipr)	0.008~0.016	0.008~0.016	0.004~0.008
Ø0.41~Ø0.60	vc (sfm)	100~230	100~260	230~655
	fn (ipr)	0.012~0.016	0.012~0.016	0.004~0.008
Ø0.61~Ø1.00	vc (sfm)	165~295	165~330	330~820
	fn (ipr)	0.012~0.018	0.012~0.020	0.004~0.008

Top Solid Drill-TSDM





(inch)

Designation		ØD	L	ℓ	a	M.T No
TSDMA	0310~0330	0.315~0.335	6.6	3.3	1.0	1
	0340~0350	0.337~0.354	6.8	3.5	1.0	1
	0360~0370	0.358~0.374	6.9	3.6	1.0	1
	0380~0390	0.378~0.394	7.0	3.7	1.0	1
	0400~0410	0.398~0.413	7.2	3.9	1.0	1
	0420~0430	0.417~0.433	7.3	4.0	1.0	1
	0440~0450	0.437~0.453	7.4	4.1	1.0	1
	0460~0470	0.457~0.472	7.6	4.3	1.0	1
	0480~0490	0.476~0.492	7.7	4.4	1.0	1
	0500~0510	0.496~0.512	7.8	4.5	1.0	2
	0520~0530	0.516~0.531	8.0	4.6	1.1	2
	0540~0550	0.535~0.551	8.1	4.8	1.1	2
	0560~0570	0.555~0.571	8.7	4.8	1.1	2
	0580~0590	0.575~0.590	8.9	4.9	1.1	2
	0600~0610	0.594~0.610	9.0	4.9	1.1	2
	0620~0630	0.614~0.630	9.1	5.1	1.1	2
	0640~0650	0.634~0.650	9.1	5.2	1.1	2
	0660~0670	0.654~0.669	9.2	5.3	1.1	2
	0680~0710	0.673~0.709	9.4	5.5	1.1	2
	0720~0750	0.713~0.748	9.6	5.7	1.2	2
	0760~0790	0.752~0.787	9.8	5.9	1.2	2
	0800~0830	0.791~0.827	10.0	6.1	1.2	2
	0840~0870	0.831~0.866	10.2	6.3	1.2	2
	0880~0910	0.870~0.906	10.4	6.5	1.2	2
	0920~0980	0.909~0.984	11.2	6.5	1.3	3

※ Ordrer form: TSDM125

High accuracy hole machining for aluminum alloy

PCD Drill

- High accuracy hole machining for aluminum alloy
- Drilling tolerance: IT7~8 class
- Recommendation with high accuracy and high spindle machine

Code system

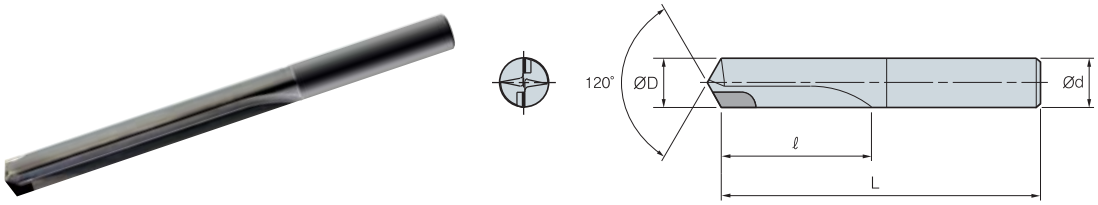
PDDA 04375 S

PCD Drill	Diameter	Type
	04375: Ø0.4375	S: Solid Type B: Brazed Type

Recommended cutting condition

Workpiece	vc (sfm)	fn (ipr)
Aluminum alloy	165~820	D ≤ Ø0.3125: 0.002~0.008 D ≤ Ø0.3125: 0.004~0.016

PDD



(inch)

Designation		ØD	Ød	ℓ	L
PDDA	01875S	0.1875	0.1875	1.5	3.0
	02500S	0.2500	0.2500	1.5	3.5
	03125S	0.3125	0.3750	2.0	4.0
	03750S	0.3750	0.3750	2.0	4.5
	04375S	0.4375	0.5000	2.5	4.5
	05000B	0.5000	0.5000	2.5	5.0

Stable performance and hole quality with our unique cutting edge and guide pad available regrinding

Gun Drill

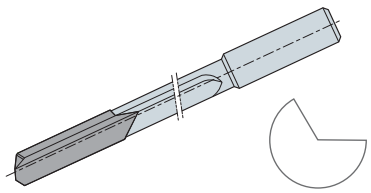
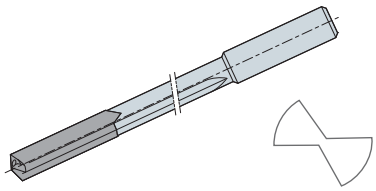
- High efficiency in deep hole machining
- High accuracy (Hole tolerance: IT9, surface finish: Ra0.1~3.0S)
- Stable Quality due to unique cutting edge and guide pad available regrinding
- Used drill can recycle as change part of carbide
- Depending on request, the drills can change geometry of cutting edge and drive specification
- For ordering, please check length of drill

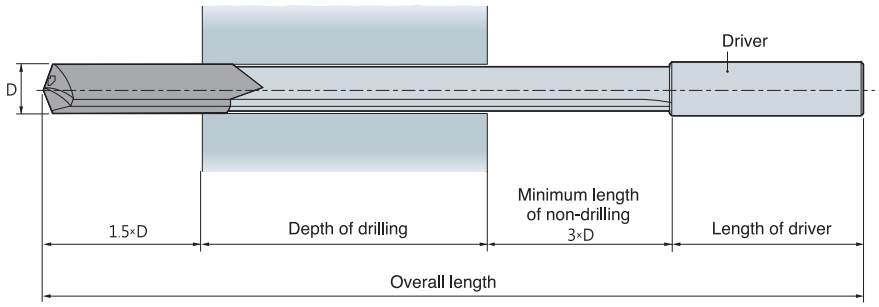
Code system

KGD SA 0.250 – 0600 / D30

KORLOY Gun Drill	Lib type	Drill dia.	Length of drill	Drive no.
	S: Single T: Twin	Ø0.250	60.0 inch	D30

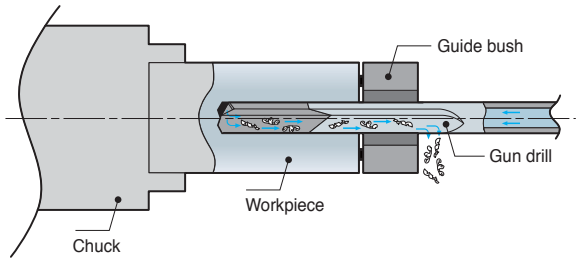
Features

	Single lip type	Twin lip type
Shape		
Drill Dia.	Ø0.079~Ø1.299	Ø0.236~Ø1.043
Depth of drilling	≥ 78.74 inch	≥ 39.37 inch
Tolerance	IT9	IT10
Surface finish	Ra 0.1~3.0 μm	Ra 1.0~4.0 μm
Application	For all kinds of workpiece machining	• Workpieces with good chip evacuation • Machining of at higher feed than single lip type's



- Refer to the code system and the above drawing when ordering
- Refer to the page 68 for the size of a driver
- The overall length can be chosen by order

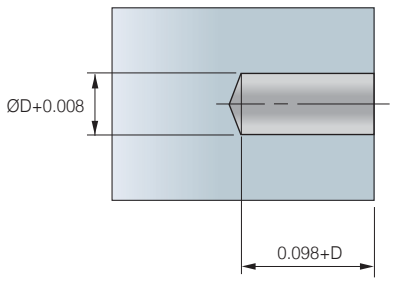
Application of Gun Drill on exclusive machine



• The guide bush is necessary for centering before gun-drilling

Application of Gun Drill on machining center

1 Machining of a pilot hole

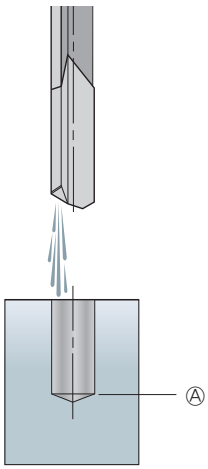


1. A pilot hole is necessary in machining on a machining center instead of a guide bush
2. The diameter of the pilot hole should be 0.004~0.008 (H7) larger bigger than one of the Gun Drill diameter and the depth of drilling should be about 0.098×D
3. Use Mach Drill (MSD) for machining of a pilot hole



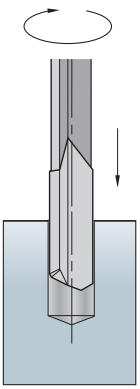
MSD

2 Moving the Gun Drill to the pilot hole



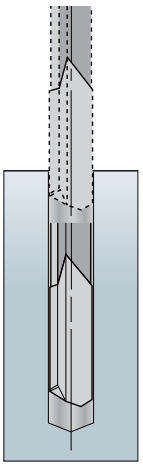
1. The Gun Drill should not drill before entering the pilot hole
2. Coolant is necessary for gun drilling

3 Start Gun Drilling



1. Rotate the spindle
2. Machine with drilling to vertical axis

4 After Gun Drilling



1. Return the drill
2. Stop drilling and supplying coolant
3. Remove the Gun Drill

Recommended cutting condition

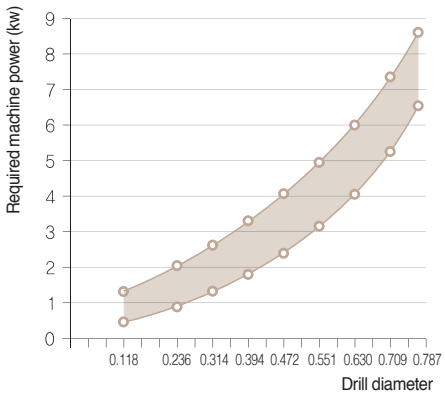
Workpiece	Hardness (HB)	Cutting speed vc (sfm)	Feed rate (ipr) per drill dia.(inch)					
			~Ø0.156	Ø0.157~Ø0.235	Ø0.236~Ø0.412	Ø0.413~Ø0.550	Ø0.551~Ø0.944	Ø0.551~Ø0.944
Carbon steel Alloy steel	~150	330~490	0.0002~0.0006	0.0004~0.0010	0.0006~0.0014	0.0008~0.0020	0.0012~0.0028	0.0016~0.0031
	150~250	260~395	0.0002~0.0004	0.0006~0.0008	0.0006~0.0012	0.0008~0.0016	0.0012~0.0024	0.0012~0.0024
	250~350	165~330	0.0002~0.0004	0.0002~0.0004	0.0004~0.0008	0.0006~0.0012	0.0008~0.0016	0.0008~0.0016
	350~	~100	-	0.0002~0.0004	0.0002~0.0004	0.0004~0.0008	0.0008~0.0014	0.0008~0.0014
Stainless steel	~250	165~260	0.0002~0.0006	0.0004~0.0008	0.0004~0.0008	0.0004~0.0012	0.0008~0.0014	0.0008~0.0016
	250~350	130~165	-	0.0002~0.0006	0.0004~0.0006	0.0004~0.0008	0.0004~0.0008	0.0004~0.0008
Cast iron	~220	260~330	0.0004~0.0005	0.0008~0.0016	0.0012~0.0020	0.0016~0.0031	0.0031~0.0047	0.0004~0.0059
	220~	130~260	0.0002~0.0004	0.0002~0.0006	0.0004~0.0008	0.0006~0.0012	0.0008~0.0020	0.0010~0.0028
Aluminum alloy	-	590~820	0.0004~0.0008	0.0008~0.0016	0.0012~0.0024	0.0016~0.0031	0.0039~0.0071	0.0059~0.0079
Light alloy	-	395~655	0.0002~0.0004	0.0004~0.0008	0.0008~0.0010	0.0008~0.0012	0.0001~0.0016	0.0016~0.0024

Technical information

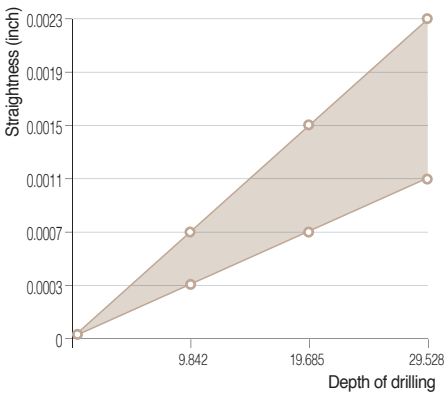
The factors below determine the straightness of hole

• Drill diameter and depth of drilling • Cutting condition and kind of application • Kind of workpiece and machine • Drill bush

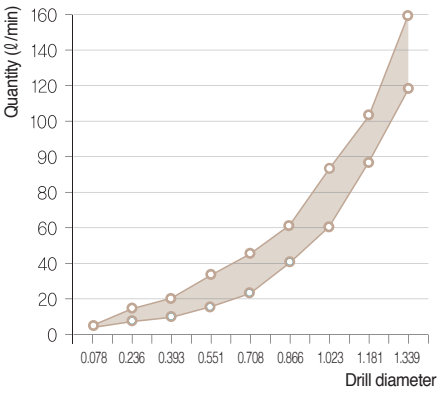
Required machine power



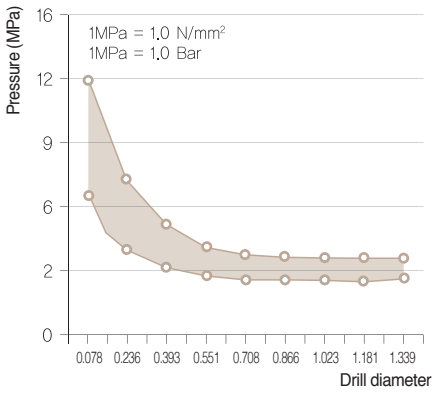
Straightness



Quantity of coolant



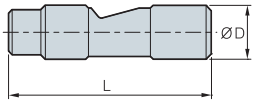
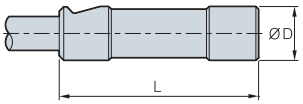
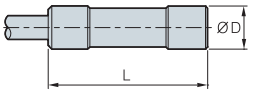
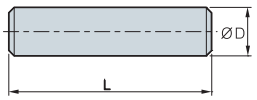
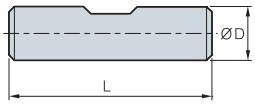
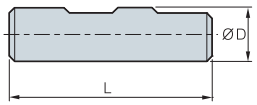
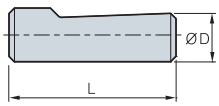
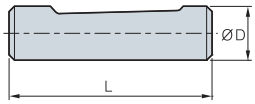
Pressure of coolant



The above graph shows general information and it is changeable depending on kind of tool, workpieces, and cutting conditions etc

- **Pressure and quantity of coolant** - High pressure of coolant ensures excellent chip evacuation and cooling the cutting edge
- **Use a filter for removing impurities** - The diameter of a filter should be less than 20㎛. Impurities could make bad flow of coolant, wear on a tool, and high load on the cooling pump
- **Temperature of coolant** - Proper temperature of coolant: 20°C~22°C/Do not use coolant at 50°C above

Driver standard

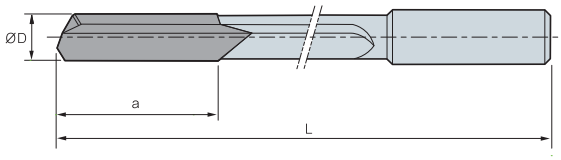
Type	Shape	No.	ØD×L		Carbide type	
			ØD×L	Thread	Tipped	Solid
Central clamping surface 15°		D01	0.394 × 1.57		●	●
		D02	0.630 × 1.77		●	
		D03	0.750 × 2.75		●	
		D04	0.984 × 2.76		●	
		D05	1.000 × 2.75		●	
Frontal clamping surface 15°		D06	0.630 × 1.97		●	
Central clamping tapered		D07	0.500 × 1.50		●	●
		D08	0.630 × 2.76			
		D09	0.750 × 2.75		●	
		D10	0.787 × 2.76			
Cylindrical DIN1835A DIN6535HA		D11	0.157 × 1.10		●	●
		D12	0.236 × 1.42		●	●
		D13	0.394 × 1.57		●	●
		D14	0.630 × 1.89		●	●
		D15	0.787 × 1.97		●	
		D16	0.984 × 2.20		●	
Weldon DIN1835B		D17	0.394 × 1.57		●	●
		D18	0.472 × 1.77		●	●
		D19	0.630 × 1.89		●	●
		D20	0.787 × 1.97		●	●
Weldon DIN6535HB		D21	0.984 × 2.20		●	
		D22	1.260 × 2.36		●	
		D23	1.575 × 2.76			
Whistle Notch DIN1835E		D24	0.394 × 1.57		●	●
		D25	0.472 × 1.77		●	●
		D26	0.630 × 1.89		●	●
		D27	0.787 × 1.97		●	●
		D28	0.984 × 2.20		●	
		D29	1.260 × 2.36		●	
Whistle notch DIN6535HE		D30	0.394 × 1.57		●	●
		D31	0.472 × 1.77		●	●
		D32	0.630 × 1.89		●	●
		D33	0.787 × 1.97		●	●

※ Special types are available for quotation with shape and size information

Gun Drill-KGDS

Single Lip type

Designation description	
O.OO	Diameter
□□□□	Length
D□□	Driver code no.



(inch)

Designation		ØD	a
KGDSA	O.OO-□□□□/D□□	0.079~0.097	0.7
	O.OO-□□□□/D□□	0.098~0.117	0.7
	O.OO-□□□□/D□□	0.118~0.137	0.8
	O.OO-□□□□/D□□	0.138~0.156	0.8
	O.OO-□□□□/D□□	0.157~0.176	0.9
	O.OO-□□□□/D□□	0.177~0.196	0.9
	O.OO-□□□□/D□□	0.197~0.216	0.9
	O.OO-□□□□/D□□	0.127~0.235	1.0
	O.OO-□□□□/D□□	0.236~0.255	1.1
	O.OO-□□□□/D□□	0.256~0.275	1.1
	O.OO-□□□□/D□□	0.276~0.294	1.1
	O.OO-□□□□/D□□	0.295~0.314	1.2
	O.OO-□□□□/D□□	0.315~0.334	1.2
	O.OO-□□□□/D□□	0.335~0.353	1.2
	O.OO-□□□□/D□□	0.354~0.373	1.2
	O.OO-□□□□/D□□	0.374~0.383	1.2
	O.OO-□□□□/D□□	0.384~0.412	1.2
	O.OO-□□□□/D□□	0.413~0.432	1.3
	O.OO-□□□□/D□□	0.433~0.452	1.4
	O.OO-□□□□/D□□	0.453~0.471	1.4
	O.OO-□□□□/D□□	0.472~0.491	1.5
	O.OO-□□□□/D□□	0.492~0.511	1.5
	O.OO-□□□□/D□□	0.512~0.550	1.5
	O.OO-□□□□/D□□	0.551~0.590	1.5
	O.OO-□□□□/D□□	0.591~0.599	1.5
	O.OO-□□□□/D□□	0.630~0.668	1.5
	O.OO-□□□□/D□□	0.669~0.708	1.6
	O.OO-□□□□/D□□	0.709~0.747	1.6
	O.OO-□□□□/D□□	0.748~0.786	1.6
	O.OO-□□□□/D□□	0.787~0.826	1.7
	O.OO-□□□□/D□□	0.827~0.865	1.8
	O.OO-□□□□/D□□	0.866~0.905	1.9
	O.OO-□□□□/D□□	0.906~0.944	2.0
	O.OO-□□□□/D□□	0.945~0.983	2.1
	O.OO-□□□□/D□□	0.984~1.023	2.1
	O.OO-□□□□/D□□	1.024~1.062	2.1
	O.OO-□□□□/D□□	1.063~1.101	2.1
	O.OO-□□□□/D□□	1.102~1.141	2.1
	O.OO-□□□□/D□□	1.142~1.180	2.2
	O.OO-□□□□/D□□	1.181~1.219	2.3
	O.OO-□□□□/D□□	1.220~1.259	2.4
	O.OO-□□□□/D□□	1.260~1.299	2.4

※ When ordering, please mark the overall length and driver number (or drawing)

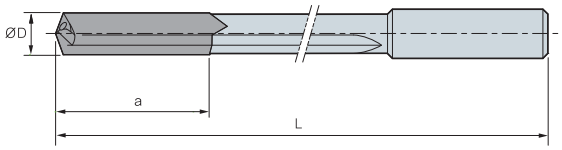
Available overall length

Designation	Drill Dia.	Overall length				
		9.84 inch	19.69 inch	39.37 inch	59.06 inch	78.74 inch
KGDS	0.079~0.117	○	○			
	0.118~0.137	○	○	○		
	0.138~1.299	○	○	○	○	○

Gun Drill-KGDT

Twin Lip type

Designation description	
O.OO	Diameter
□□□□	Length
D□□	Driver code no.



(inch)

Designation		ØD	a
KGDTA	O.OO-□□□□/D□□	0.236~0.255	1.4
	O.OO-□□□□/D□□	0.256~0.275	1.4
	O.OO-□□□□/D□□	0.276~0.294	1.5
	O.OO-□□□□/D□□	0.295~0.314	1.5
	O.OO-□□□□/D□□	0.315~0.334	1.5
	O.OO-□□□□/D□□	0.335~0.353	1.5
	O.OO-□□□□/D□□	0.354~0.373	1.6
	O.OO-□□□□/D□□	0.374~0.393	1.6
	O.OO-□□□□/D□□	0.394~0.412	1.6
	O.OO-□□□□/D□□	0.413~0.432	1.6
	O.OO-□□□□/D□□	0.433~0.452	1.8
	O.OO-□□□□/D□□	0.453~0.471	1.8
	O.OO-□□□□/D□□	0.472~0.491	1.8
	O.OO-□□□□/D□□	0.492~0.511	1.9
	O.OO-□□□□/D□□	0.512~0.550	1.9
	O.OO-□□□□/D□□	0.551~0.590	1.9
	O.OO-□□□□/D□□	0.591~0.629	1.9
	O.OO-□□□□/D□□	0.630~0.668	2.0
	O.OO-□□□□/D□□	0.669~0.708	2.0
	O.OO-□□□□/D□□	0.709~0.747	2.0
	O.OO-□□□□/D□□	0.748~0.786	2.0
	O.OO-□□□□/D□□	0.787~0.826	2.2
	O.OO-□□□□/D□□	0.827~0.865	2.2
	O.OO-□□□□/D□□	0.866~0.905	2.2
	O.OO-□□□□/D□□	0.906~0.944	2.4
	O.OO-□□□□/D□□	0.945~0.983	2.4
	O.OO-□□□□/D□□	0.984~1.023	2.6
	O.OO-□□□□/D□□	1.024~1.043	2.6

※ When ordering, please mark the overall length and driver number (or drawing)

Available overall length

Designation	Drill Dia.	Overall length				
		9.84 inch	19.69 inch	39.37 inch	59.06 inch	78.74 inch
KGDT	0.236~1.043	○	○	○		

Mass production and High performance

Indexable Reamer

- Suitable for mass production and high performance
- Using PCD or coated insert for high speed machining
- Excellent high accuracy and adjustable machining hole
- Using accuracy chucking system (Hydraulic, rotating type arbor)
- Using inner coolant type machine to evacuate chips
- Using suitable holder and insert
- As insert setting, using setting fixture (KIRSD-210)

Code system

IR TA 0625 – 0750 60 – 16

Type	Application	Reamer dia.	Shank Dia.	length	Insert size
Indexable Reamer	T: Throughout hole machining B: Blind hole machining	0625: Ø0.625	0750: Ø0.750	60: 6.0	15: 15.0×3.0 16: 16.0×3.5 17: 17.0×4.5 22: 22.0×6.5

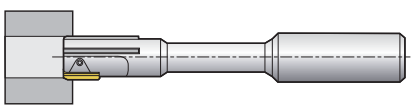
Insert code system

RI 15 – B 06

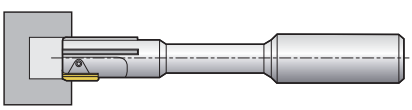
Type	Insert size	Insert reed type	Angle of C/B
Reamer Insert	15: 15.0×3.0 16: 16.0×3.5 17: 17.0×4.5 22: 22.0×6.5	A: Excellent surface finish, low cutting condition B: General surface finish, high cutting condition C: Aluminum and copper alloy D: Blind hole, low feed	00: 0°, Cast iron 06: 6°, General steel 12: 12°, Stainless, Al

Application

Throughout hole machining (IRT type)



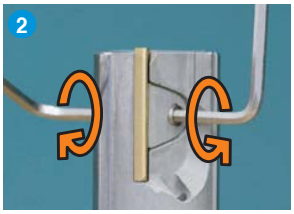
Stuffed hole machining (IRB type)



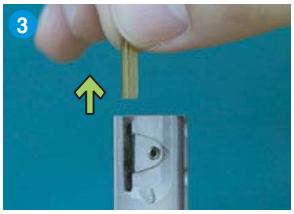
How to set an insert



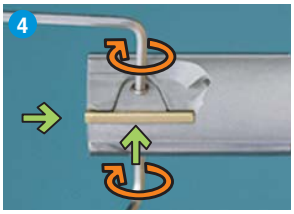
1. Screw the wedge screw counter clockwise with the exclusive wrench



2. Screw the clamp screw
   ① Top side: counter clockwise
   ② Lower side: clockwise



3. Remove the insert and clean the pocket



4. Put the insert up to the edge stopper and clamp the insert
   ① Top side: clockwise
   ② Lower side: counterclockwise

Exclusive fixture

- Designation: KIRSD-210
- Maximum diameter of reamer: Ø2.36×8.27 inch
- The fixture is also available for setting special reamer and mono tool
- Special reamers (out of maximum setting range) are available quotation



How to set an insert with fixture



1. Adjust the gauge to '0'



2. Rotate the reamer for the insert to touch the gauge



3. Set the back taper and adjust the insert height with screw the wedge screw
   ① Top side of insert: +0.0059~ +0.0078 inch
   ② Bottom side of insert: +0.0019~ +0.0039 inch
   ③ Back taper: 0.0039~0.0059 inch

Back taper

- Ensures low cutting load and excellent surface finish with good chip evacuation
- Inaccurate back taper could cause unstable machining with wear of insert
- The size of back taper of insert down side should be less to 0.0039~0.0059 inch than one of insert upper side

Insert setting with a micrometer





- Lathe with both centers or bench center are also available

Notice: The setting with a micrometer is not recommended due to chipping on the cutting edge

Recommended cutting condition

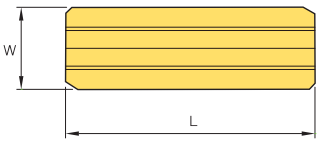
Workpiece	Insert type		Feed rate (ipr) per drill dia. (inch)	Cutting speed vc (sfm)		
	Rake angle	Lead type		Coated	Uncoated	Cermet
Carbon steel General steel	6	A	0.004~0.016	197~262	131~197	361~525
		B	0.004~0.012	262~394	197~262	
		D	0.002~0.008			
Mild steel Alloy steel	6	A	0.004~0.016	131~197	66~131	361~525
		B	0.004~0.012	262~394	197~262	
		D	0.002~0.008			
High alloy steel Tool steel	6	A	0.004~0.016	66~197	66~131	66~197
		B	0.004~0.012	131~262	131~197	131~262
		D	0.002~0.008			
Stainless steel	12	A	0.004~0.012	131~197	66~131	131~197
		B	0.004~0.008	197~262	66~131	197~262
		D	0.002~0.008			
Cast iron	0.6	A	0.004~0.012	197~328	131~197	-
		B	0.004~0.010	262~394	197~262	
		D	0.002~0.008			
Alloyed aluminum	12	B	0.004~0.012	-	525~626	-
		C	0.006~0.012		492~820	
		D	0.002~0.008		361~656	
Alloyed copper	0	B	0.004~0.008	-	262~328	-
		D	0.002~0.008			
Non-ferrous alloy	0	B	0.004~0.012	-	33~230	-

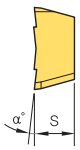
Parts

Reamer size	Clamp 	Wedge 	Clamp Screw 	Wedge Screw  (NYLOK)	Clamp Wrench 	Wedge Wrench 
0.375	CV15	AW2430	DHA0308	HS0306	HW15L	HW15L
0.500~0.625	CV16	AW2435				
0.750~1.000	CV17	AW3240	DHA0409	HS0406	HW20L	HW20L
1.125~1.250	CV22	AW3260				

Indexable Reamer Insert





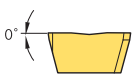
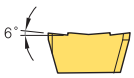
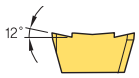


(inch)

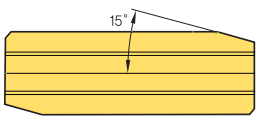
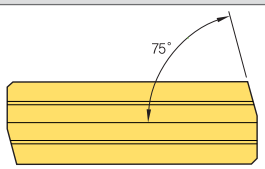
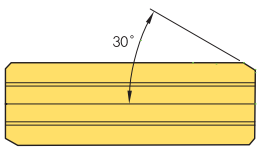
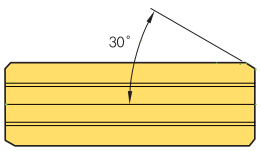
Designation		Grade			Dimensions			Reed type	Rake angle (α°)
		K10 (Uncoated)	BPK110 (TiAlN)	BPK210 (TiN)	L	W	S		
RI	15-A06			○	0.591	0.118	0.059	A	6˚
	15-A12	○			0.591	0.118	0.059	A	12˚
	15-B06		○	○	0.591	0.118	0.059	B	6˚
	15-B12		○		0.591	0.118	0.059	B	12˚
	16-A06			○	0.630	0.138	0.059	A	6˚
	16-A12	○			0.630	0.138	0.059	A	12˚
	16-B06		○	○	0.630	0.138	0.059	B	6˚
	16-B12		○		0.630	0.138	0.059	B	12˚
	17-A06			○	0.669	0.177	0.079	A	6˚
	17-A12	○			0.669	0.177	0.079	A	12˚
	17-B06		○	○	0.669	0.177	0.079	B	6˚
	17-B12		○		0.669	0.177	0.079	B	12˚
	22-A06			○	0.866	0.256	0.118	A	6˚
	22-A12	○			0.866	0.256	0.118	A	12˚
	22-B06		○	○	0.866	0.256	0.118	B	6˚
	22-B12		○		0.866	0.256	0.118	B	12˚

※ ○This is recommended grade as for insert type

Angle of chip breaker

Division	00	06	12
Shape			
Application	For cast iron machining	For general machining	For stainless and aluminum machining

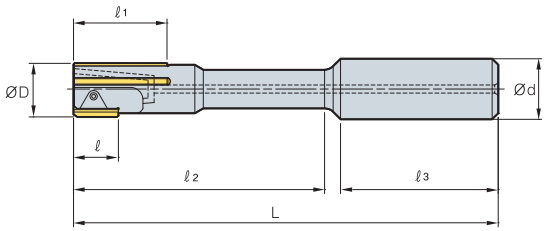
Insert lead type

Type	Shape	Working condition	Type	Shape	Working condition
A		For excellent surface, low cutting condition	C		For aluminum and copper alloy machining
B		For general application, high cutting condition	D		For blind hole machining, low feed

Indexable Reamer-IRT

Throughout hole





(inch)

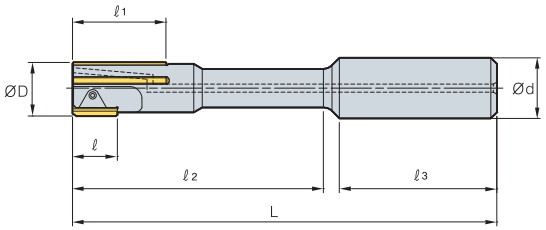
	Designation	ØD	ℓ	ℓ1	ℓ2	ℓ3	L	Ød	Insert
IRTA	0375-062550-15	0.375	0.591	1.2	3.0	1.8	5.0	0.625	RI 15
	0500-062553-16	0.500	0.630	1.2	3.3	1.8	5.5	0.625	RI 16
	0625-075061-16	0.625	0.630	1.2	4.0	4.0	6.0	0.750	RI 16
	0750-075061-17	0.750	0.669	1.2	4.0	4.0	6.0	0.750	RI 17
	0875-100065-17	0.875	0.669	1.2	4.3	4.3	6.5	1.000	RI 17
	1000-100065-17	1.000	0.669	1.2	4.3	4.3	6.5	1.000	RI 17
	1125-125065-22	1.125	0.816	1.2	4.3	4.3	6.5	1.250	RI 22
	1250-125065-22	1.250	0.816	1.2	4.3	4.3	6.5	1.250	RI 22

Applicable inserts **G88**

Indexable Reamer-IRB

Stuffed hole





(inch)

	Designation	ØD	ℓ	ℓ1	ℓ2	ℓ3	L	Ød	Insert
IRBA	0375-062550-15	0.375	0.591	1.2	3.0	1.8	5.0	0.625	RI 15
	0500-062553-16	0.500	0.630	1.2	3.3	1.8	5.5	0.625	RI 16
	0625-075061-16	0.625	0.630	1.2	4.0	4.0	6.0	0.750	RI 16
	0750-075061-17	0.750	0.669	1.2	4.0	4.0	6.0	0.750	RI 17
	0875-100065-17	0.875	0.669	1.2	4.3	4.3	6.5	1.000	RI 17
	1000-100065-17	1.000	0.669	1.2	4.3	4.3	6.5	1.000	RI 17
	1125-125065-22	1.125	0.816	1.2	4.3	4.3	6.5	1.250	RI 22
	1250-125065-22	1.250	0.816	1.2	4.3	4.3	6.5	1.250	RI 22

Applicable inserts **G88**

Chucking/Machine Reamer

Recommended cutting condition

(mm)

Workpiece	Hardness (HB)	Cutting condition	Diameter		
			~Ø9	Ø10~25	Ø26~60
Steel	~100kg/mm^2	vc (m/min)	8~12	8~12	8~12
		fn (mm/rev)	0.15~0.25	0.20~0.40	0.30~0.50
	100~140kg/mm^2	vc (m/min)	5~10	5~10	5~10
		fn (mm/rev)	0.10~0.20	0.15~0.25	0.20~0.40
Cast iron	HB~220	vc (m/min)	6~12	6~12	8~15
		fn (mm/rev)	0.15~0.30	0.30~0.50	0.40~0.80
	HB 220~	vc (m/min)	5~10	5~10	8~12
		fn (mm/rev)	0.10~0.20	0.20~0.35	0.30~0.50
Brass	HB 50~120	vc (m/min)	8~12	10~15	10~15
		fn (mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
Bronze	HB 60~100	vc (m/min)	8~12	10~15	10~15
		fn (mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
Alloyed aluminum	HB 90~120	vc (m/min)	15~25	15~25	20~30
		fn (mm/rev)	0.15~0.25	0.25~0.40	0.40~0.70
Synthetic resins	-	vc (m/min)	15~30	20~35	30~40
		fn (mm/rev)	0.15~0.25	0.25~0.40	0.40~0.50

M This is metric size. We can also provide in inch type

Chucking Reamer-SCRS



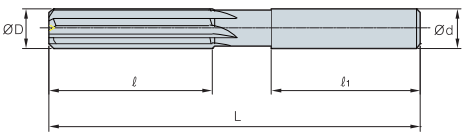


Fig.1

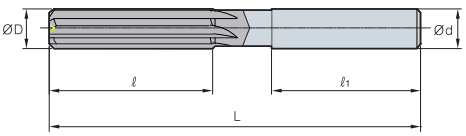


Fig.2

(mm)

Designation		No. of flute	ØD	Ød	ℓ	ℓ1	L	Fig.
SCRS	050S	4	5.0	6.0	20	40	100	1
	060S	4	6.0	6.0	20	40	115	1
	070S	4	7.0	8.0	20	40	125	1
	080S	4	8.0	8.0	20	40	135	1
	090S	4	9.0	10.0	20	45	140	1
	100B	4	10.0	10.0	25	50	145	2
	110B	4	11.0	12.0	25	50	150	2
	120B	4	12.0	12.0	25	50	160	2
	130B	4	13.0	16.0	25	50	165	2
	140B	6	14.0	16.0	25	50	170	2
	150B	6	15.0	16.0	30	50	180	2
	160B	6	16.0	16.0	30	50	190	2
	180B	6	18.0	20.0	30	55	210	2
	200B	6	20.0	20.0	40	60	230	2

M This is metric size. We can also provide in inch type

Chucking Reamer-SCRH



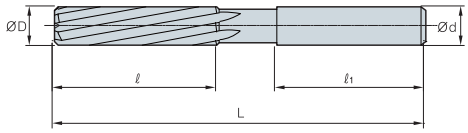


Fig.1

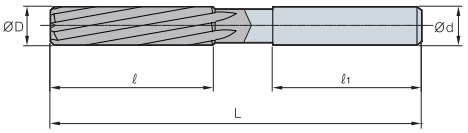


Fig.2

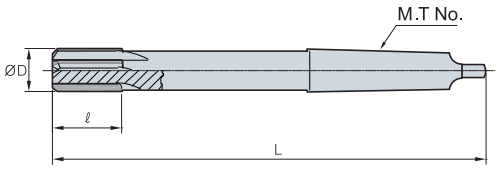
(mm)

Designation		No. of flute	ØD	Ød	ℓ	ℓ1	L	Fig.
SCRS	050S	4	5.0	6.0	20	40	100	1
	060S	4	6.0	6.0	20	40	115	1
	070S	4	7.0	8.0	20	40	125	1
	080S	4	8.0	8.0	20	40	135	1
	090S	4	9.0	10.0	20	45	140	1
	100B	4	10.0	10.0	25	50	145	2
	110B	4	11.0	12.0	25	50	150	2
	120B	4	12.0	12.0	25	50	160	2
	130B	4	13.0	16.0	25	50	165	2
	140B	6	14.0	16.0	25	50	170	2
	150B	6	15.0	16.0	30	50	180	2
	160B	6	16.0	16.0	30	50	190	2
	180B	6	18.0	20.0	30	55	210	2
	200B	6	20.0	20.0	40	60	230	2

M This is metric size. We can also provide in inch type

Chucking Reamer-TCRS





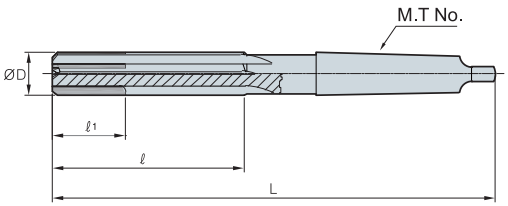
(mm)

Designation		No. of flute	ØD	ℓ	L	M.T No.
TCRS	070	4	7.0	20	150	1
	080	4	8.0	20	150	1
	090	4	9.0	20	160	1
	100	4	10.0	25	160	1
	110	4	11.0	25	170	1
	120	4	12.0	25	170	1
	130	4	13.0	25	180	1
	140	6	14.0	25	190	1
	150	6	15.0	30	200	2
	160	6	16.0	30	200	2
	180	6	18.0	30	220	2
	200	6	20.0	40	230	2
	250	6	25.0	40	260	3
	280	8	28.0	40	270	3
	300	8	30.0	50	290	3

M This is metric size. We can also provide in inch type

Chucking Reamer-TMRS





(mm)

Designation		No. of flute	ØD	ℓ	ℓ1	L	M.T No.
TMRS	070	4	7.0	60	60	150	1
	080	4	8.0	70	70	150	1
	090	4	9.0	70	70	160	1
	100	4	10.0	75	75	170	1
	110	4	11.0	75	75	170	1
	120	4	12.0	80	40	180	1
	130	4	13.0	85	40	190	1
	140	6	14.0	90	45	210	1
	150	6	15.0	90	45	215	2
	160	6	16.0	100	50	220	2
	180	6	18.0	105	50	225	2
	200	6	20.0	120	50	240	2
	250	6	25.0	130	50	270	3
	280	8	28.0	140	50	280	3
	300	8	30.0	150	50	290	3

M This is metric size. We can also provide in inch type

PCD Reamer

Code system

PDRA 2 03750

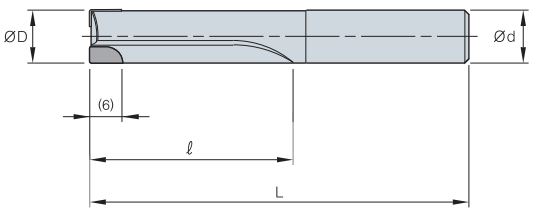
Type	No. of flute	Diameter
PCD Reamer	2: 2flute	03750: Ø0.3750

Recommended cutting condition (For high speed and high precision machining)

Workpiece	vc (sfm)	fn (ipr)
Aluminum alloy	165~820	0.002~0.008

PCD Reamer-PDR





(inch)

Designation		No. of flute	ØD	Ød	ℓ	L
PDRA	202187	2	0.2187	0.2500	1.5	3.0
	202500	2	0.2500	0.2500	1.5	3.0
	203125	2	0.3125	0.3750	1.5	3.0
	203750	2	0.3750	0.3750	1.5	3.5
	205000	2	0.5000	0.5000	2.0	4.0
	205625	2	0.5625	0.6250	2.0	4.0
	406250	4	0.6250	0.6250	2.0	4.0
	406875	4	0.6875	0.7500	2.5	4.5
	407500	4	0.7500	0.7500	2.5	4.5

H

BRAZED TOOLS



Technical Information for Brazed Tools

H02 KORLOY Ultra-Fine Grades: F-Series
H03 Corrosion & Magnetism Proof Grade: IN-Series

General Cutting Tools

H04 Cemented Carbide, Cermet Blank
H05 Square Blank
H07 Round bar Blank
H07 Ring Blank
H08 Helix Blank
H09 Square Bits
H10 Auto Tool Bits
H11 Chuck Jaw

Mining & Construction Tools

H12 Cemented Carbide Blank for Taper Bits
H13 Cemented Carbide Blank for Cross Bits
H13 Taper Bits
H13 Boring Crown Blank
H13 Bits for Construction

Rotating Brazing Tools

H14 Rotating Brazing Tool
H15 Special Rotating Brazing Tools Order Form

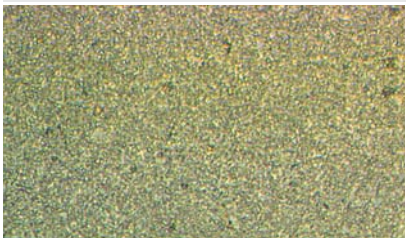
KORLOY ultra-fine grades "F-Series"

Features

In general, when we compare cemented carbide to high speed steel, cemented carbide has higher hardness but is more brittle than high speed steel. To neutralize the difference, KORLOY has developed an ultra fine cemented carbide grade "F-Series"± (WC size under 0.5㎛). It provides improved toughness and plastic deformation resistance against cemented carbide having coarse grain sizes. The main coverage for ultra fine cemented carbide is endmilling of difficult-to-cut materials like high temp alloys

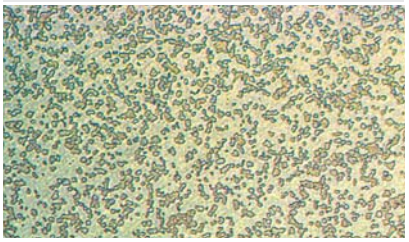
● Micro structure of "F-Series"

FA1



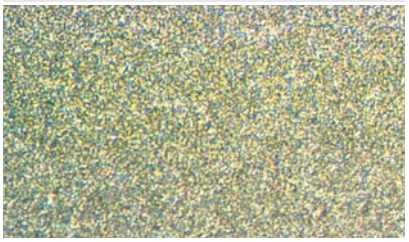
Since it is a grade focused on toughness, it is possible to make endmill, side cutter, gun drill, reamer etc. It has superior quality on toughness and anti built-up edge properties

FCC



It has been modified from FA1 to increase thermal shock resistance, thus FCC has proper properties to machine stainless steel and hard to machine materials at medium to high speed milling

FS1



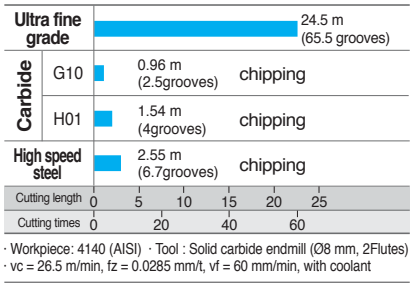
As a ultra fine grade having high hardness and superior toughness at the same time, it is the 1st recommended grade of KORLOY to make sharp cutting edge to cut difficult-to-cut material

Cutting performance

● Special features

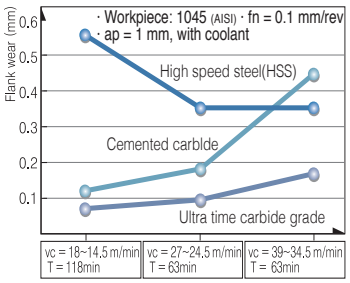
Grade	Characteristics			ISO classification	Wear resistance	Toughness
	Specific Gravity	Hardness (HRA)	TRS (kgf/mm²)			
FS1	14.4	92.4	250	Z10	⊙	○
FCC	12.6	91.5	250	Z10	⊙	○
FA1	14.1	91.2	300	Z20	○	⊙
FG2	14.3	92.7	350	Z10	⊙	○

● Chipping resistance



· Workpiece: 4140 (AISI) · Tool : Solid carbide endmill (Ø8 mm, 2Flutes)
· vc = 26.5 m/min, fz = 0.0285 mm/t, vf = 60 mm/min, with coolant

● Wear resistance

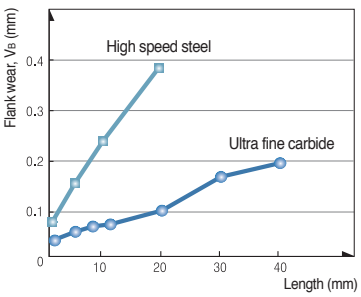


AISI: American Iron and Steel Institute

Guide of grade selection

Workpiece	Non-ferrous metal Steel, Cast iron
1st Recommended grade	FS1, FG2, FCC, FA1
Application tool	Drill, Endmill

- **Workpiece:** SM55C (HRC20)
- **Helix angle:** 30°
- **Tool**: Ø10 mm, 2 Flutes (SSE2100)
- **RPM** = 1,100 min^{-1}
- **Cutting speed** = 35 m/mim
- **Axial depth** = 12 mm
- **Feed** = 0.1 mm/t
- **Radial depth** = 1 mm
- Downward cutting, Without coolant



M This is metric size. We can also provide in inch type

KORLOY corrosion & magnetism proof grades, "IN-Series"

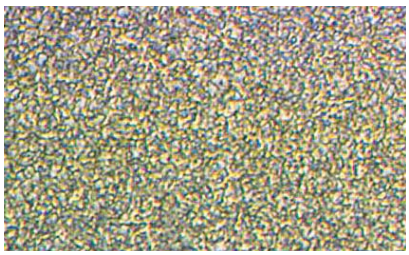
Features

- Outstanding corrosion resistance: several hundred times better performance than general carbide grade (Test have been performed at 30% NHO3, comparing KORLOY G5 and IN-Series)
- Excellent hardness & toughness: Over (H_RA) 85 hardness, Over (TRS) 200 toughness
- Several grades: 3 different kind of grades for specific application, respectively

Grade	Specific gravity (g/cm^3)	Hardness (H_RA)	TRS (kgf/mm^2)	Magnetic saturation ($Gauss \cdot cm^3/g$)	Use
IN10	14.4	91.5	230	0	Mechanical Seal, Sliter Knife Anti-corrosive alloy, Magnetism proof alloy
IN20	14.5	91.0	230	90	Mechanical Seal, Sliter Knife Anti-corrosive alloy
IN40	13.5	85.5	230	0	Mold for magnetic powder Anticorrosive-Magnetism proof alloy

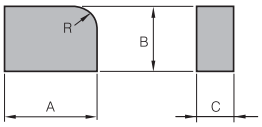
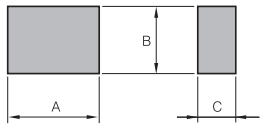
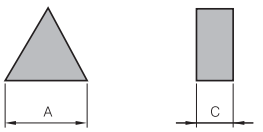
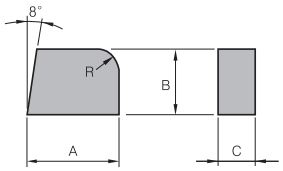
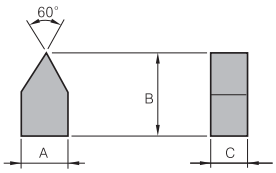
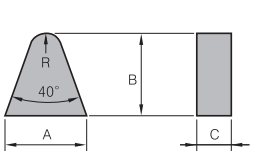
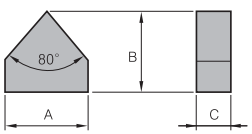
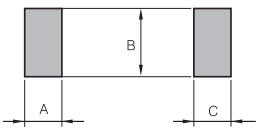
M This is metric size. We can also provide in inch type

Micro structure of "IN-Series"



Use

For anti-corrosive	For magnetism proof
• Parts for plant of corrosion-high pressure • Parts for sea water pump • Die/punch in high temperature • Mechanical seal	• Tape sliter • Mold for magnetic powder • Parts for VTR

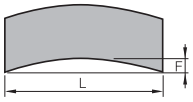
Inserts	Designation	A	B	C	R	Uncoated							Cermet	Available blank
						ST10	ST20	GR35	U20	H01	H05	G10	CN2000	
	01- 0	10	6	3	4									
	1	13	9	3	5									
	2	16	11	4	5		●							31 Type
	3	19	13	5	5		●							32 Type
	4	22	15	6	8									45 Type
	5	25	17	7	8									46 Type
	6	30	20	8	8									
	02- 0	10	6	3	-		●		●	●		●		
	1	13	9	3	-		●		●	●		●		
	2	16	11	4	-		●		●	●		●		
	3	19	13	5	-	●	●		●	●		●		41 Type
	4	22	15	6	-		●		●	●		●		42 Type
	5	25	17	7	-		●			●		●		
	6	30	20	8	-		●							
	03- 0	10	-	3	-									
	1	12	-	3	-									
	2	15	-	4	-									37 Type
	3	18	-	5	-									38 Type
	4	24	-	6	-									47 Type
	5	24	-	7	-									48 Type
	6	28	-	8	-									
	04- 0	10	6	3	4									
	1	13	9	3	5		●							
	2	16	11	4	5									
	3	19	13	5	5		●							33 Type
	4	22	15	6	8									34 Type
	5	25	17	7	8									
	6	30	20	8	8									
	05- 1	5	8	3	-		●		●					
	2	6	10	4	-		●		●					
	3	7	12	5	-		●		●					49 Type
	4	9	16	6	-		●							50 Type
	5	10	18	7	-									51 Type
	6	11	20	8	-									52 Type
	06- 0	10	10	3	2		●		●	●				
	1	13	13	3	2.5		●		●	●		●		
	2	16	16	4	3	●	●		●	●		●		
	3	19	19	5	4		●	●	●	●		●		36 Type
	4	22	22	6	4	●	●		●	●		●		39 Type
	5	25	25	7	5		●		●	●		●		40 Type
	6	30	30	8	6									
	07- 0	10	10	3	-									
	1	13	13	3	-									
	2	16	16	4	-									
	3	19	19	5	-									
	4	25	20	6	-									35 Type
	5	25	22	7	-									
	6	30	25	8	-									
	08- 1	3	8	3	-		●		●					
	3	4	13	4	-	●	●		●	●		●		
	4	5	15	5	-	●	●		●	●		●		
	5	6	17	6	-	●	●		●			●		43 Type
	6	8	20	8	-		●							

M This is metric size. We can also provide in inch type

RB



■ Bending tolerance



L		F-max
Standard	Tolerance	
~30	+1.0 - 0	0.15
31~50	+1.5 - 0	0.25
51~100	+3.0 - 0	0.30

※ Code system RB 15 04 □
Length Width Thickness

(mm)

Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	303□	3	3									
	304□	3	4									
	305□	3	5									
	306□	3	6									
	307□	3	7									
	308□	3	8									
	309□	3	9									
	310□	3	10									
RB	403□	4	3									
	404□	4	4									
	405□	4	5									
	406□	4	6									
	407□	4	7									
	408□	4	8									
	409□	4	9									
	410□	4	10									
RB	503□	5	3									
	504□	5	4									
	505□	5	5									
	506□	5	6									
	507□	5	7									
	508□	5	8									
	509□	5	9									
	510□	5	10									
RB	603□	6	3									
	604□	6	4									
	605□	6	5									
	606□	6	6									
	607□	6	7									
	608□	6	8									
	609□	6	9									
	610□	6	10									
RB	703□	7	3									
	704□	7	4									
	705□	7	5									

(mm)

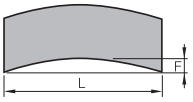
Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	706□	7	6									
	707□	7	7									
	708□	7	8									
	709□	7	9									
	710□	7	10									
RB	803□	8	3									
	804□	8	4									
	805□	8	5									
	806□	8	6									
	807□	8	7									
	808□	8	8									
	809□	8	9									
	810□	8	10									
RB	903□	9	3									
	904□	9	4									
	905□	9	5									
	906□	9	6									
	907□	9	7									
	908□	9	8									
	909□	9	9									
	910□	9	10									
RB	1003□	10	3									
	1004□	10	4									
	1005□	10	5									
	1006□	10	6									
	1007□	10	7									
	1008□	10	8									
	1009□	10	9									
	1010□	10	10									
RB	1504□	15	4									
	1505□	15	5									
RB	2003□	20	3									
	2004□	20	4									
	2005□	20	5									
	2006□	20	6									

M This is metric size. We can also provide in inch type

RB



■ Bending tolerance



L		F-max
Standard	Tolerance	
~30	+1.0 - 0	0.15
31~50	+1.5 - 0	0.25
51~100	+3.0 - 0	0.30

※ Code system RB 15 04 □

Length Width Thickness

(mm)

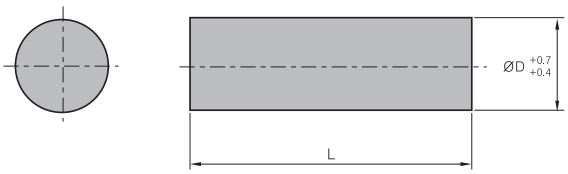
Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	2007□	20	7									
	2008□	20	8									
	2009□	20	9									
	2010□	20	10									
RB	3003□	30	3									
	3004□	30	4									
	3005□	30	5									
	3006□	30	6									
	3007□	30	7									
	3008□	30	8									
	3009□	30	9									
	3010□	30	10									
RB	4003□	40	3									
	4004□	40	4									
	4005□	40	5									
	4006□	40	6									
	4007□	40	7									
	4008□	40	8									
	4009□	40	9									
	4010□	40	10									
RB	5003□	50	3									
	5004□	50	4									
	5005□	50	5									
	5006□	50	6									
	5007□	50	7									
	5008□	50	8									
	5009□	50	9									
	5010□	50	10									
RB	6003□	60	3									
	6004□	60	4									
	6005□	60	5									
	6006□	60	6									
	6007□	60	7									
	6008□	60	8									
	6009□	60	9									

(mm)

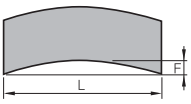
Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	6010□	60	10									
RB	7003□	70	3									
	7004□	70	4									
	7005□	70	5									
	7006□	70	6									
	7007□	70	7									
	7008□	70	8									
	7009□	70	9									
	7010□	70	10									
RB	8003□	80	3									
	8004□	80	4									
	8005□	80	5									
	8006□	80	6									
	8007□	80	7									
	8008□	80	8									
	8009□	80	9									
	8010□	80	10									
RB	9003□	90	3									
	9004□	90	4									
	9005□	90	5									
	9006□	90	6									
	9007□	90	7									
	9008□	90	8									
	9009□	90	9									
	9010□	90	10									
RB	10003□	100	3									
	10004□	100	4									
	10005□	100	5									
	10006□	100	6									
	10007□	100	7									
	10008□	100	8									
	10009□	100	9									
	10010□	100	10									

M This is metric size. We can also provide in inch type

SR Round bars blank



■ Bending tolerance



L		F-max
Standard	Tolerance	
~30	+1.5 - 0	0.10
31~40	+1.5 - 0	0.15
41~50	+1.5 - 0	0.20
51~100	+2.5 - 0	0.25

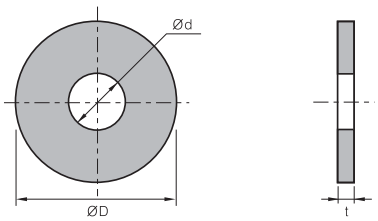
※ Code system SR 03 □
Diamerer Length

(mm)

Designation		ØD	T = □								Grades	
			30	40	50	60	70	80	90	100	ST20	G10
SR	03□	3										
	04□	4										
	05□	5										
	06□	6										
	07□	7										
	08□	8										
	09□	9										
	10□	10										
	11□	11										
	12□	12										

M This is metric size. We can also provide in inch type

RT Ring blank

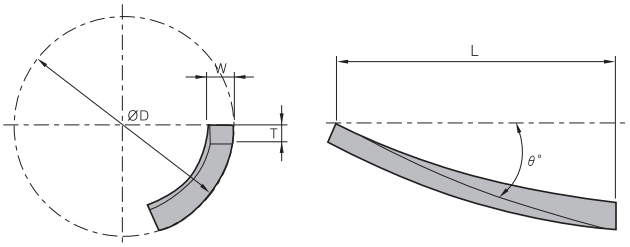


(mm)

Designation	ØD	Ød	t
ØD×Ød×t	Ø7.2~Ø200	Ø2.7~Ø150	0.8~10

M This is metric size. We can also provide in inch type

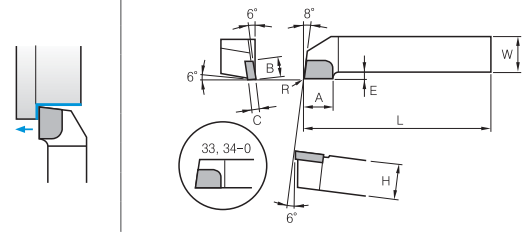
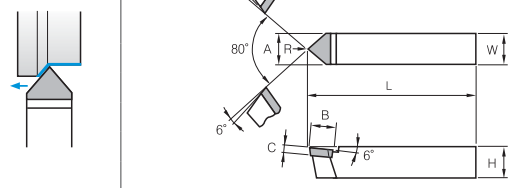
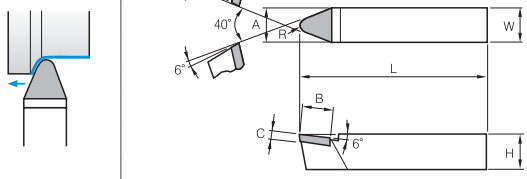
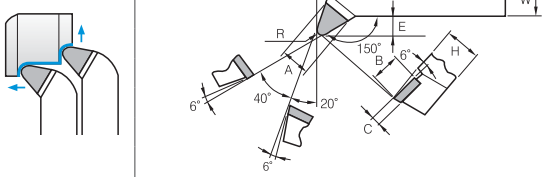
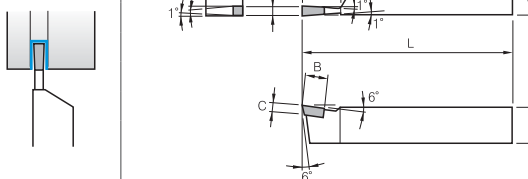
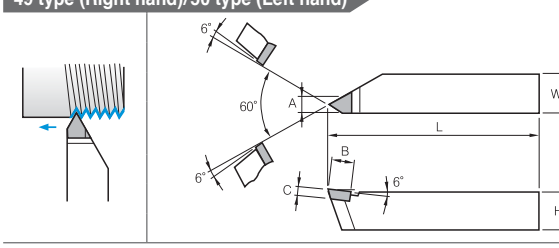
ST Helix blank



(mm)

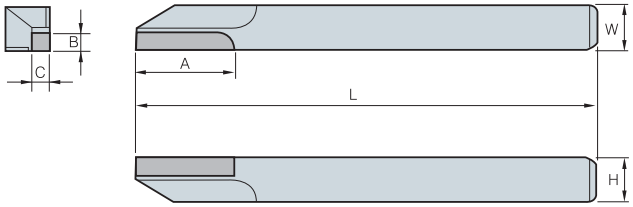
Designation		Available endmill (ØD)	L	T	W	θ°
ST	14	Ø13, 14	30	2.3	4.0	23° 44′
	15	Ø15	30	2.3	4.0	25° 13′
	18	Ø18	32	2.3	4.5	25° 13′
	20	Ø20	32	2.8	5.5	24° 09′
	24	Ø23, 24	37	2.8	5.5	25° 13′
	26	Ø26, 27	37	3.3	6.5	24° 24′
	30	Ø29, 30, 31	42	3.8	7.0	25° 13′
	32	Ø32, 33	47	3.8	7.0	26° 41′
	35	Ø34, 35, 36	52	3.8	7.0	24° 36′
	38	Ø37, 38	57	3.8	7.0	23° 51′
	40	Ø39, 40, 41, 42	62	4.3	7.5	24° 57′
	45	Ø43, 44, 45, 46, 47	67	4.3	7.5	25° 13′
	50	Ø48, 49, 50	67	4.3	7.5	24° 09′

M This is metric size. We can also provide in inch type

Feed direction	Figure	Designation	A	B	C	(R)	W	H	L	E	F	Available blank
33 type (Right hand)/34 type (Left hand)		33, 34 - 0	10	6	3	0.3	10	10	80	0		04-0
		1	13	9	3	0.5	13	13	100	4		04-1
		2	16	11	4	0.5	16	16	120	4		04-2
		3	19	13	5	0.5	19	19	140	5		04-3
		4	22	15	6	1	25	25	160	5		04-4
		5	25	17	7	1	25	30	180	5		04-5
		6	30	20	8	1	35	35	200	6		04-6
35 type		35 - 0	10	10	3	0.3	10	10	80			07-0
		1	13	13	3	0.5	13	13	100			07-1
		2	16	16	4	0.5	16	16	120			07-2
		3	18	19	5	0.5	19	19	140			07-3
		4	25	20	6	1	25	25	160			07-4
		5	25	22	7	1	25	30	180			07-5
		6	30	25	8	1	30	35	200			07-6
36 type		36 - 0	10	10	3	2	10	10	80			06-0
		1	13	13	3	2.5	13	13	100			06-1
		2	16	16	4	3	16	16	120			06-2
		3	18	18	5	4	19	19	140			06-3
		4	22	22	6	4	25	25	160			06-4
		5	25	25	7	5	25	30	180			06-5
		6	30	30	8	6	30	35	200			06-6
39 type (Right hand)/40 type (Left hand)		39, 40 - 0	10	10	3	2	10	10	80	5		06-0
		1	13	13	3	2.5	13	13	100	7		06-1
		2	16	16	4	3	16	16	120	10		06-2
		3	19	19	5	4	19	19	140	12		06-3
		4	22	22	6	4	25	25	160	13		06-4
		5	25	25	7	5	25	30	180	15		06-5
		6	30	30	8	6	30	35	200	16		06-6
43 type		43 - 1	3	8	3		10	16	100		13	08-1
		2	3	8	3		13	19	120		16	08-1
		3	4	13	4		16	22	140		20	08-3
		4	5	15	5		18	25	160		25	08-4
		5	6	17	6		22	32	180		30	08-5
		6	8	20	8		25	38	200		40	08-6
49 type (Right hand)/50 type (Left hand)		49, 50 - 1	5	8	3		13	13	100			05-1
		2	6	10	4		16	16	120			05-2
		3	7	12	5		19	19	140			05-3
		4	9	16	6		25	25	160			05-4

M This is metric size. We can also provide in inch type

PBX100



(mm)

Designation		A	B	C	W	H	L
PBX -	105	20	2.0	2.0	5	5	125
	106	20	2.5	2.5	6	6	140
	107	20	3.0	3.0	7	7	150
	108	20	3.0	3.0	8	8	150
	109	20	3.5	3.5	9	9	150
	110	20	4.0	4.0	10	10	150
	112	20	4.0	4.0	12	12	150
	116	20	4.0	4.0	16	16	150

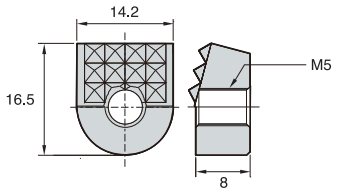
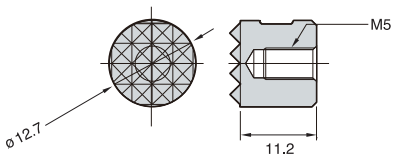
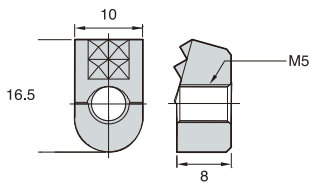
M This is metric size. We can also provide in inch type

Chuck Jaw new

Features

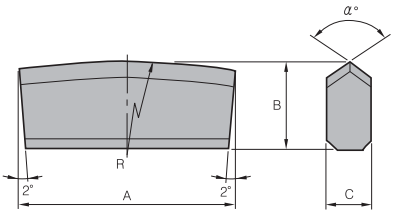
- Chuck Jaw strongly clamps rough workpiece in turning and milling (including MCT)
- Can chuck any types of workpiece

Stock information

Designation	Geometry	Dimension
CJ 04		
CJ 12		
CJ 21		
CJ 22		
CJ 23		
CJ 31		
CJ 32		
CJ 41		
CJ 42		

M This is metric size. We can also provide in inch type

For taper bits 1000 type

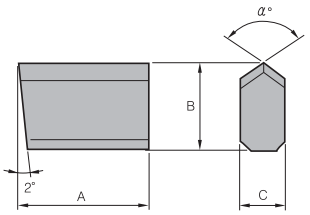


(mm)

Designation		A	B	C	α°	R
1000 -	124	24	10	6	100	80
	126	26	10	6	100	80
	128	28	10	6	100	80
	130	30	10	6	100	80
	132	32	10	6	100	80
	232	32	10	6	100	80
	234	34	12	8	110	120
	236	36	12	8	110	120
	238	38	12	8	110	120
	240	40	12	8	110	120
	242	42	12	8	110	120
	332	32	14	8	110	120
	334	34	14	8	110	120
	336	36	14	8	110	120
	338	38	14	8	110	120
	340	40	14	8	110	120
	342	42	14	8	110	120
	434	34	15	10	110	120
	436	36	15	10	110	120
	438	38	15	10	110	120
	440	40	15	10	110	120
	442	42	15	10	110	120
	444	44	15	10	110	120
	446	46	15	10	110	120
	534	34	18	10	110	120
	536	36	18	10	110	120
	538	38	18	10	110	120
	540	40	18	10	110	120
	542	42	18	10	110	120
	544	44	18	10	110	120
	546	46	18	10	110	120

M This is metric size. We can also provide in inch type

For cross bits 2000 type



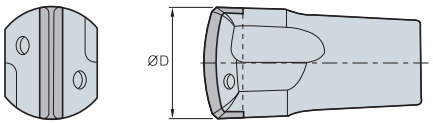
(mm)

Designation		A	B	C	α°	R
2000 -	110	10	10	6	100	
	111	11	10	6	100	
	112	12	10	6	100	
	113	13	10	6	100	
	114	14	10	6	100	
	115	15	12	6	100	
	210	10	12	6	100	
	211	11	12	6	100	
	212	12	12	6	100	
	213	13	12	6	100	
	214	14	12	6	100	
	215	15	14	8	100	
	312	12	14	8	100	
	313	13	14	8	100	
	314	14	14	8	100	
	315	15	14	8	100	
	316	16	14	8	100	
	317	17	14	8	100	
	318	18	14	8	100	

When ordering special items, Please point out the designation, grades, quantity. Available for tailor made

M This is metric size. We can also provide in inch type

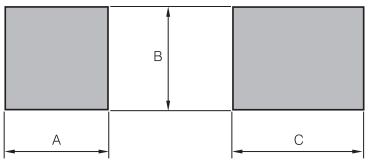
TB For taper bits



(mm)

Designation		ØD
TB	20	20
	32	32
	34	34
	36	36
	38	38
	39	39
	40	40

BT Boring crown blank

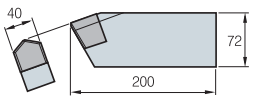


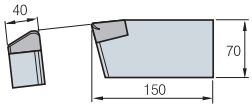
(mm)

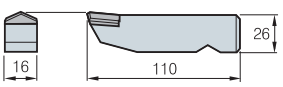
Designation		A	B	C
BT	1	5	5	8
	2	6	6	9
	3	8	8	10
	4	7	10	15

M This is metric size. We can also provide in inch type

Bits for construction

Configuration	Dimensions
Earth auger bits	

Configuration	Dimensions
Casing bits	

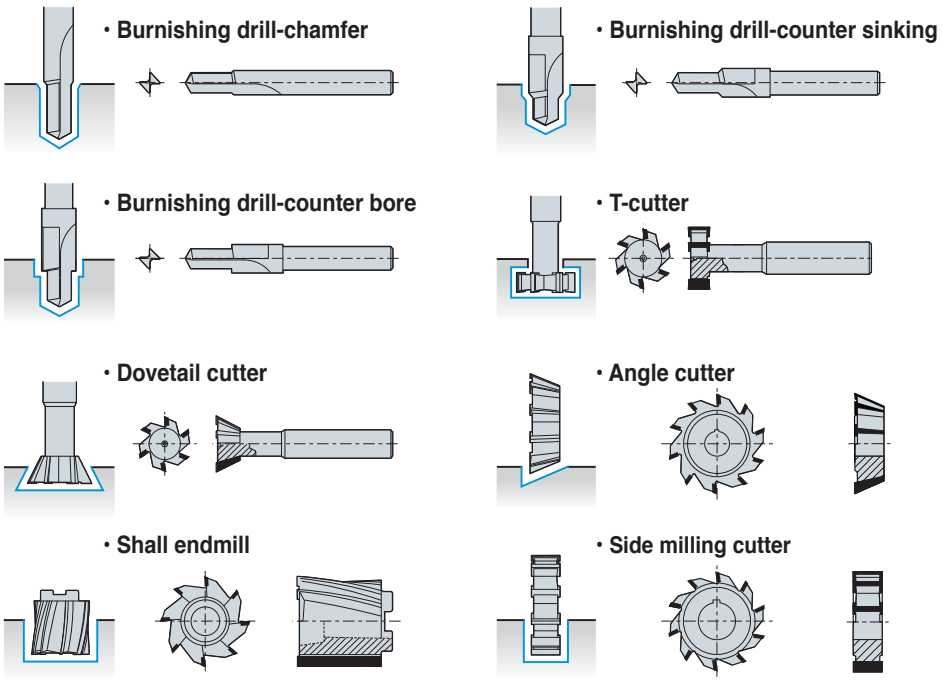
Configuration	Dimensions
Rod bits	

M This is metric size. We can also provide in inch type

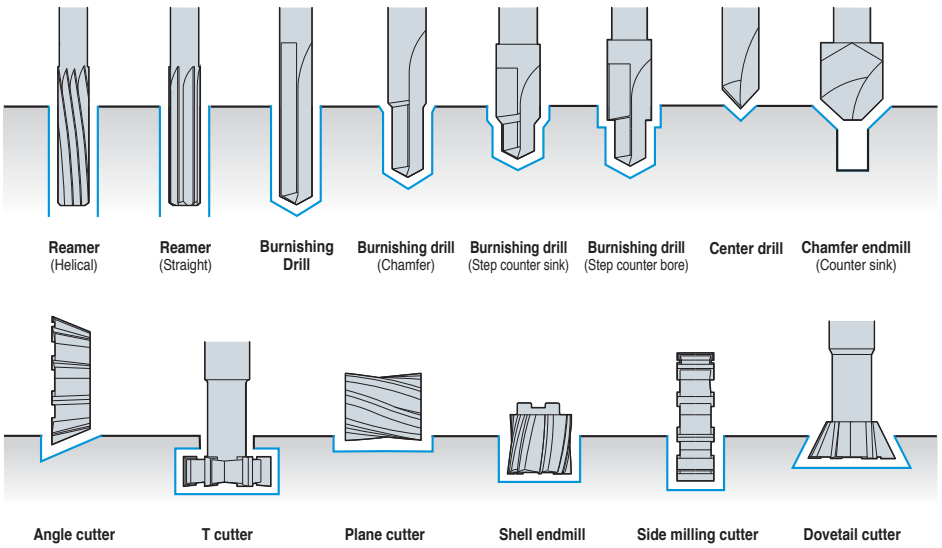
Features

- For various applications
- Precise accuracy. Easy to order for special types
- Suitable for small tools. Short delivery time
- Reasonable tool cost. Reusable after sharpening

Cutting process type

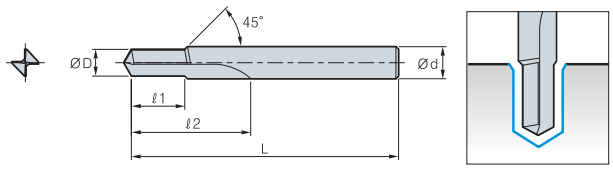


Cutting processes and type



M This is metric size. We can also provide in inch type

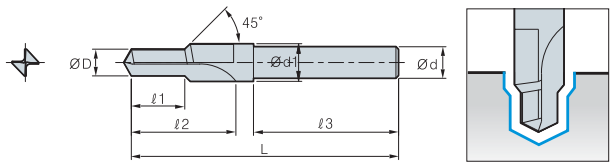
Burnishing Drill-Chamfer



(mm)

Designation	ØD	ℓ1	ℓ2	L	Ød
BDC					

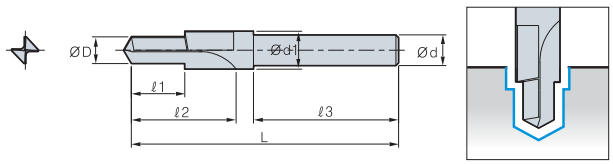
Burnishing Drill-Step



(mm)

Designation	ØD	Ød1	ℓ1	ℓ2	ℓ3	L	Ød
BDS							

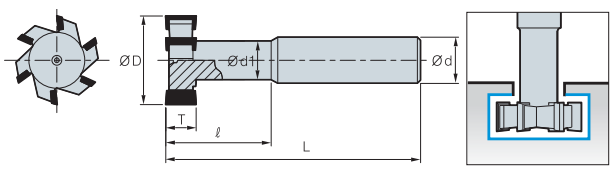
Burnishing Drill-Counter Bore



(mm)

Designation	ØD	Ød2	ℓ1	ℓ2	ℓ3	L	Ød
BDCB							

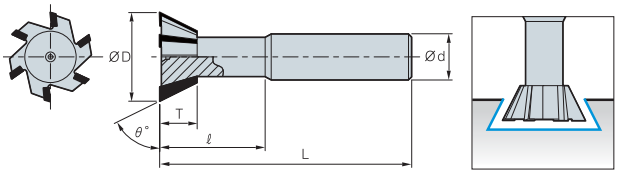
T-Cutter



(mm)

Designation	ØD	Ød1	T	ℓ	L	Ød	No. of flute
TC							

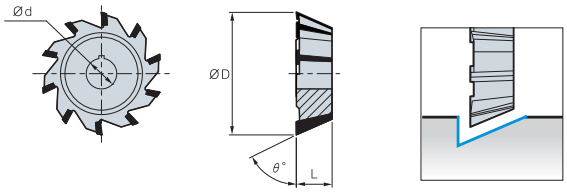
Dovetail Cutter



(mm)

Designation	ØD	ℓ	θ°	ℓ1	L	Ød	No. of flute
DC							

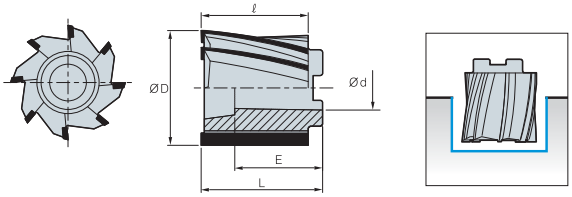
Angle Cutter



(mm)

Designation	ØD	θ°	Ød	L	No. of flute
AC					

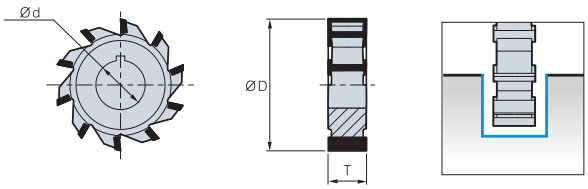
Shall Endmill



(mm)

Designation	ØD	Ød	ℓ	E	L	No. of flute
SEM						

Side Milling Cutter



(mm)

Designation	ØD	Ød	T	No. of flute
SMC				

M This is metric size. We can also provide in inch type

TOOLING SYSTEM



Tooling System

I 02 DBT Series
I 03 HSK Tooling System
I 04 Balancing System
I 05 Tooling System Index
I 06 DHE Series
I 10 DSC Series
I 17 CPM Series
I 19 NPM Series
I 21 DCS/DC/TC
I 22 Collet Chuck Series
I 24 SDC Series
I 29 GSK Series
I 31 DSK Series
I 34 GERC
I 37 DST Series
I 39 NPU
I 40 DTN Series
I 42 TCA Tap Adaptor
I 43 TER Tap Collet
I 44 Side Lock Arbor Series
I 46 Face Mill Arbor Series
I 49 Angular Head Series
I 57 FBH/B Series
I 61 TBC/FBC Series
I 64 FBB
I 65 DBC
I 66 KMB
I 67 SMB
I 68 SMH
I 69 Modular System
I 70 Modular Arbor
I 72 EXT Bar
I 73 RDC Bar
I 74 DAMPING PRO
I 79 Others



For high speed machining

DBT Series

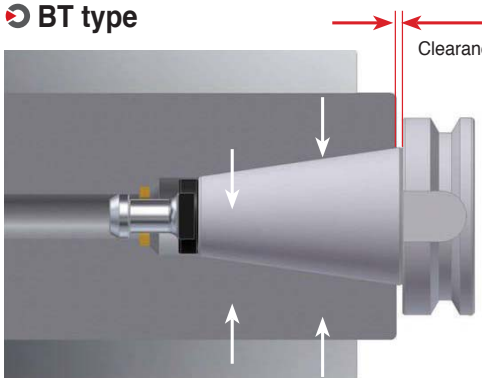
2 face constrained system of taper and shank face for excellent surface roughness and high quality finish in heavy cutting at high speed



Features of 2 face constrained system

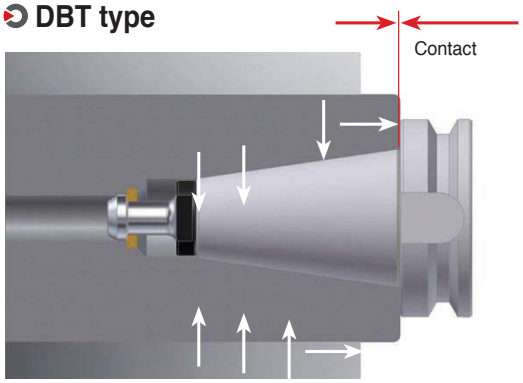
- Stable machining can be possible at high speed
- Improvement of tool-life for machine spindle and cutting tool
- Prevention for corrosion of taper porsion of both machine spindle and tool holder by heavy duty machining vibration
- Guarantee for the most suitable machining and high accuracy

BT type



The clearance between spindle and face of shank

DBT type

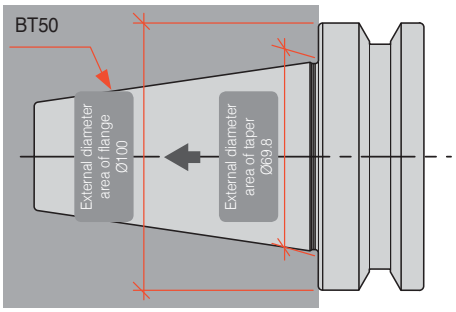


Perfect contact of both faces Better precision/less vibration

Higher stability and precision

Stability and precision increase due to the close contact between taper face and wide external diameter of flange at DBT shank than at BT shank

Shank	Taper		Flange
BT30	Ø31.7	→	Ø46
BT40	Ø44.4	→	Ø63
BT50	Ø69.8	→	Ø100



Difference between taper face contact and flange contact at its external diameter

Various models

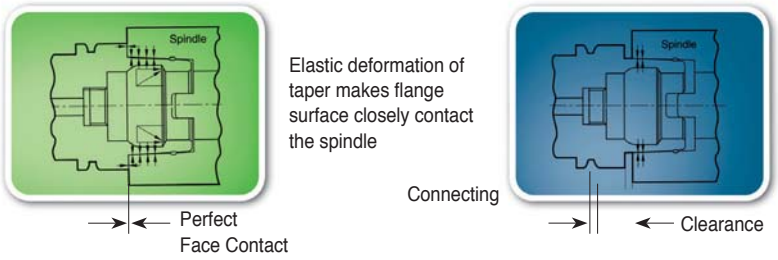
Tapping	Milling		Face milling	Angular head
				
BT-DST	BT-NPM	BT-DHE	BT-FMA	BT-KAG

M This is metric size. We can also provide in inch type

HSK Tooling System

Features of HSK 2 face constrained toolholder

The 7/24 taper shank for multi-purpose has been pointed out that its performance is inappropriate in terms of repeatability, joint stiffness and high speed machining. Drawbacks of 7/24 taper shank had been eliminated by using new two face contact

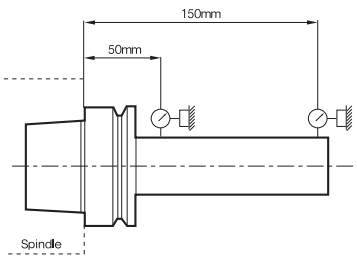


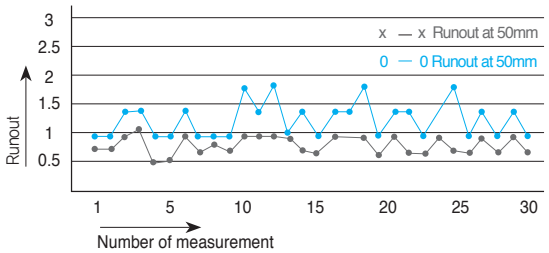


HSK shank -Perfect 2-surface constrained system

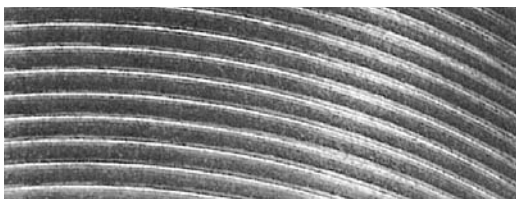
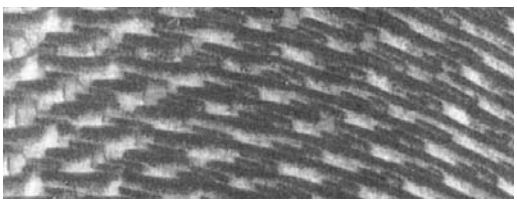
Excellent repeatability-run out accuracy

As taper of holder will deform elastically following the profile of the spindle shape, there is no eccentricity between the spindle and the other. Also, due to perfect face contact between flange surface of the holder and spindle face, bending strength of the holder is very high, which makes radial and axial and accuracy very high





High rigidity against bending load

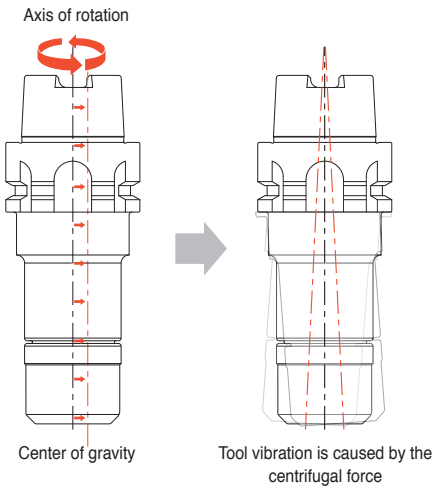
HSK 63	BT 40
	

M This is metric size. We can also provide in inch type

Balancing System

Imbalance

- **Cause of imbalance**
  Imbalance occurs due to the asymmetry of tool geometries and spindle run-out
- **Difficulties of imbalance**
  Shorter tool life, inferior surface roughness and noise are caused by vibration during rotation and damage on spindle bearing
- **Need for balancing**
  Balancing is needed to prevent unbalance for better surface roughness, precision and tool life

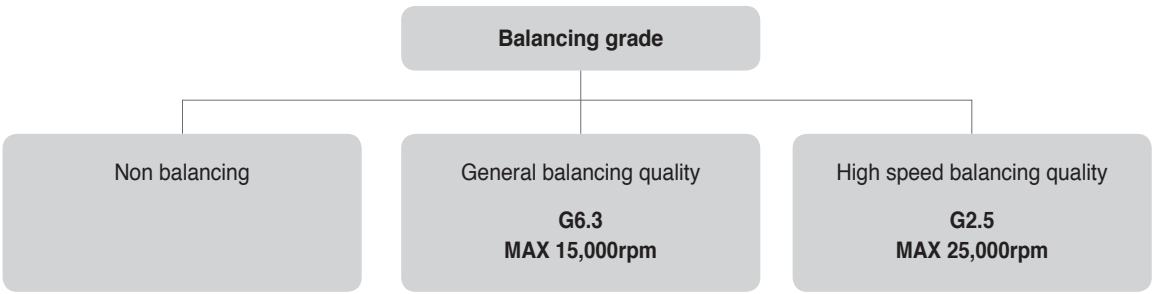


※ A case that the tool's center of gravity deviates from the rotation axis

The most optimal accuracy at high speed

- Without bending from rotation of an unbalanced load, High accuracy and rigidity are maintained
- Excellent Balance (≤ G1.0 or 0.5 g·mm/kg)
- Tool life, surface finish, dimension of accuracy and productivity can be realized at high speed

Balancing grade standard



Various balancing quality available



Hydraulic Expansion Chuck	Shrinking Chuck	Champion Milling Chuck	Milling Chuck
DHE  I 7	DSC  I 11	CPM  I 18	NPM  I 20
Collet Chuck	**Collet Chuck**	**High Speed Synchro Slim Chuck**	**Collet Chuck**
SDC  I 24	SDC/S  I 28	GSK  I 29	DSK  I 32
High Speed Synchro Tapping Chuck	**Drill Chuck**	**Tap Chuck**	**Side Lock Arbor**
DST  I 38	NPU  I 39	DTN  I 41	SLA  I 44
Face Mill Arbor	**Angular Head Series**	**Angular Head Series**	**Angular Head Series**
FMA, FMC  I 46	MAH  I 51	HRAG  I 52	KHU  I 53
Angular Head Series	**Angular Head Series**	**Angular Head Series**	**Boring Tool**
KAG  I 54	KAH  I 55	KAC  I 56	FBH/B  I 58
Boring Tool	**Boring Tool**	**Boring Tool**	**Boring Tool**
TBC, FBC  I 63	DBC  I 65	KMB  I 66	SMB  I 67
Boring Tool	**Modular System Arbors**	**Modular System Extention Bar**	**Modular System Reducer Bar**
SMH  I 68	MD  I 70	EXT  I 72	RDC  I 73
DAMPING PRO			
FMA/FMC  I 76			

Hydraulic expansion chuck

DHE Series



- Ideal for mold making and machining automobile components & precise parts due to high precision machining
- Improved surface roughness due to vibration proof by hydraulic chamber
- Reduced replacement time and tiredness of worker with the use of T wrench for removal
- Applicable shank diameter: Ø3-32

Code system

BT40 - DHE 20 - 140

BT40	DHE	20	140
Spindle	Hydraulic expansion chuck	Max. Chucking dia.	Length

Features

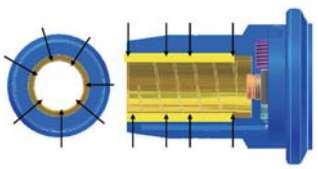
High accuracy provides long tool life due to reduced wear and hydraulic room enhances a surface roughness by lessening vibrations

- RUN OUT: under 5 ㎛
- L = 3 x ØD
- Shank: Tolerance of ØD: h6



Internal sealing structure (Durability)

- Internal sealing system protects the chuck against dust, cutting oil, lubricant and chips getting into it
  - Maintaining clamping force and accuracy for a long time



With simple t-wrench,very easy to change a tool

- Clamping structure for easy operation (Convenience)
  - Decrease of worker's fatigue
  - Improving machine capacity



Shank	Grade	Max.rpm
BT50, SK50, HSK100A	G6.3	10,000
BT40, SK40, HSK63A		15,000
BT30, HSK50A, SK30		20,000
HSK40A	-	25,000



Stable clamping

The clearance between holder and tool is fixed by hydraulic pressure



M This is metric size. We can also provide in inch type

BT-DHE

MAS403-BT



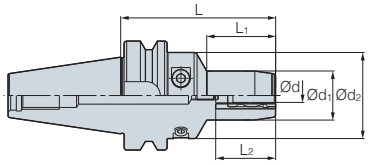


Fig. 1

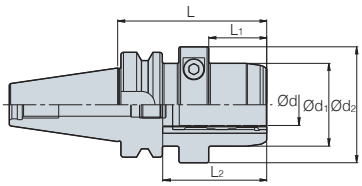


Fig. 2

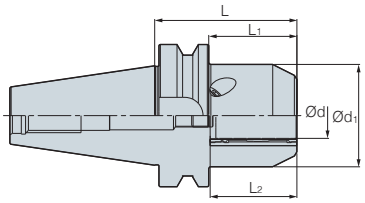


Fig. 3

(mm)

Designation			Ød	L	Ød1	Ød2	L1	L2	Adjust screw	Fig.	kg
BT30 -	DHE 6 -	65	6	65	29	45	33	30~39.8	M5	1	0.7
	DHE 8 -	65	8	65	31	45	33	30~39.8	M5	1	0.7
	DHE 10 -	65	10	65	32	45	34	35~44.8	M5	1	0.7
	DHE 12 -	65	12	65	35	45	34	41~50.8	M5	1	0.7
	DHE 14 -	90	14	90	36	45	40	43~52.8	M5	1	0.9
	DHE 16 -	90	16	90	40	45	45	46~55.8	M5	1	1.0
	DHE 18 -	90	18	90	42	45	40	49~58.8	M5	1	1.0
	DHE 20 -	90	20	90	44	45	45	49~58.8	M5	1	1.1
BT40 -	DHE 6 -	90	6	90	29	50	40	30~39.8	M5	1	1.4
		140	6	140	29	50	40	30~39.8	M5	1	2.2
	DHE 8 -	90	8	90	31	50	40	30~39.8	M5	1	1.4
		140	8	140	31	50	40	30~39.8	M5	1	2.2
	DHE 10 -	90	10	90	33	50	40	35~44.8	M5	1	1.5
		140	10	140	33	50	40	35~44.8	M5	1	2.2
	DHE 12 -	90	12	90	35	50	40	41~50.8	M10	1	1.5
		140	12	140	35	50	40	41~50.8	M10	1	2.3
	DHE 14 -	90	14	90	36	50	40	43~52.8	M10	1	1.5
		140	14	140	36	50	40	43~52.8	M10	1	2.3
	DHE 16 -	90	16	90	40	50	45	46~55.8	M10	1	1.5
		140	16	140	40	50	45	46~55.8	M10	1	2.3
	DHE 18 -	90	18	90	42	50	45	49~58.8	M10	1	1.5
		140	18	140	42	50	45	49~58.8	M10	1	2.3
	DHE 20 -	90	20	90	44	50	47	49~58.8	M10	1	1.5
		140	20	140	44	50	47	49~58.8	M10	1	2.3
	DHE 25 -	90	25	90	50	70	35	58~67.8	M16	2	1.9
	DHE 32 -	90	32	90	63	80	35	58~67.8	M16	2	2.0
BT50 -	DHE 6 -	90	6	90	29	50	34	30~39.8	M5	1	3.9
		140	6	140	29	50	40	30~39.8	M5	1	4.5
	DHE 8 -	90	8	90	31	50	34	30~39.8	M5	1	3.9
		140	8	140	31	50	40	30~39.8	M5	1	4.5
	DHE 10 -	90	10	90	33	50	34	35~44.8	M5	1	3.9
		140	10	140	33	50	34	35~44.8	M5	1	4.5
	DHE 12 -	90	12	90	35	50	34	41~50.8	M10	1	4.0
		140	12	140	35	50	34	41~50.8	M10	1	4.6
	DHE 14 -	90	14	90	36	50	34	43~52.8	M10	1	4.0
		140	14	140	36	50	34	43~52.8	M10	1	4.6
	DHE 16 -	90	16	90	40	50	34	46~55.8	M10	1	4.1
		140	16	140	40	50	34	46~55.8	M10	1	4.7
	DHE 18 -	90	18	90	42	50	40	49~58.8	M10	1	4.1
		140	18	140	42	50	45	19~58.8	M10	1	4.7
	DHE 20 -	90	20	90	44	50	34	49~58.8	M10	1	4.2
		140	20	140	44	50	47	49~58.8	M10	1	4.7
	DHE 25 -	90	25	90	66	-	52	58~67.8	M16	3	4.7
	DHE 32 -	90	32	90	72	-	52	58~67.8	M16	3	4.8

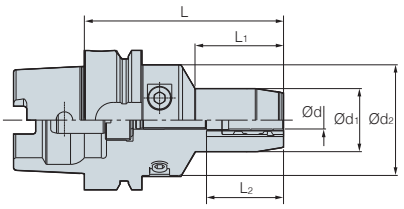
Spare Part I9 Collet I8~9

• L_2 : Insertion depth of tool (Min.~max.) • Through coolant system available

M This is metric size. We can also provide in inch type

HSK-DHE





(mm)

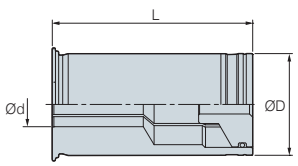
Designation			Ød	L	Ød1	Ød2	L1	L2	Adjust Screw	kg
HSK63A -	DHE 6 -	75	6	75	29	50	34	30~39.8	M5	1.0
	DHE 8 -	75	8	75	31	50	34	30~39.8	M5	1.0
	DHE 10 -	85	10	85	33	50	40	35~44.8	M5	1.2
	DHE 12 -	90	12	90	35	50	40	41~50.8	M5	1.2
	DHE 16 -	95	16	95	40	50	45	46~55.8	M10	1.3
	DHE 20 -	100	20	100	44	50	50	49~58.8	M10	1.4
		150	20	150	44	50	50	49~58.8	M10	2.0
HSK100A -	DHE 20 -	105	20	105	44	50	50	49~58.8	M10	2.8
	DHE 25 -	115	25	115	50	63	62	58~67.8	M16	3.3
	DHE 32 -	115	32	115	63	75	62	58~67.8	M16	3.8

• L_2 : Insertion depth of tool (Min.~max.) • Through coolant system is optional

M This is metric size. We can also provide in inch type

DHC Collet (General type)





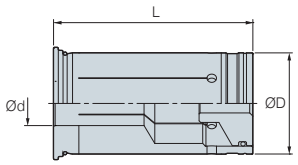
(mm)

Designation	ØD	Ød	L
DHC12 - 3, 4, 5, 6, 8	12	3, 4, 5, 6, 8	47
DHC20 - 3, 4, 5 , 6, 8, 10, 12, 14, 16	20	3, 4, 5, 6, 8, 10, 12, 14, 16	52
DHC32 - 6, 8, 10, 12, 14, 16, 18, 20, 25	32	6, 8, 10, 12, 14, 16, 18, 20, 25	63

M This is metric size. We can also provide in inch type

DHC Collet (Accuracy type)





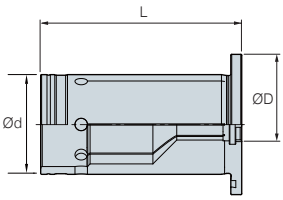
(mm)

Designation	ØD	Ød	L
DHC12 - 3(P), 4(P), 5(P), 6(P), 8(P)	12	3, 4, 5, 6, 8	47
DHC20 - 3(P), 4(P), 5(P), 6(P), 8(P), 10(P), 12(P), 14(P), 16(P)	20	3, 4, 5, 6, 8, 10, 12, 14, 16	52
DHC32 - 6(P), 8(P), 10(P), 12(P), 14(P), 16(P), 18(P), 20(P), 25(P)	32	6, 8, 10, 12, 14, 16, 18, 20, 25	63

M This is metric size. We can also provide in inch type

DHJ Collet (Jet coolant)





(mm)

Designation	ØD	Ød	L
DHJ20 - 6, 8, 10, 12, 14, 16	20	6, 8, 10, 12, 14, 16	50

M This is metric size. We can also provide in inch type

Parts

Spare Parts					
Chuck		**Clamp screw**	**Wrench**	**Chuck**	**Adjust screw**
Type				**Type**	
BT30/SK30/HSK50	DHE 6, 8, 10, 12	DHE-M8 (C)	DHETW-4	DHE 6, 8, 10	DHE-M5 (ADJ)
	DHE 14, 16, 18, 20	DHE-M10 (C)	DHETW-5		
BT40/BT50/SK40/SK50 HSK63A/HSK100A	DHE 6, 8, 10, 12, 14, 16, 18, 20	DHE-M10 (C)	DHETW-5	DHE 12, 14, 16, 18, 20	DHE-M10 (ADJ)
	DHE 25, 32	DHE-M12 (C)	DHETW-6	DHE 25, 32	DHE-M16 (ADJ)

Shrinking chuck

DSC

- Use of specially heat-treated steel
- High precision machining and clamping
- Increased precision and longer tool life due to minimized overhang when machining deep grooves
- Applicable shank diameter: Ø3-32



Code System

BT50 - DSC 6 - S - 165 - S

Shank type	Holder type	Tool Dia.	Type	Length	Special
BT, HSK, SK, ST, CS, CM	DSC: Shrinking chuck SLK: 2piece holder Collet		S: Silm M: Middle NON: General		S: Curve type NON: General

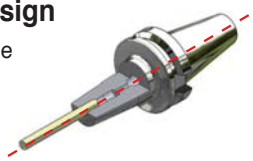
Mono curve type

- Integral DSC with excellent precision and balancing
- Long but stable holder design

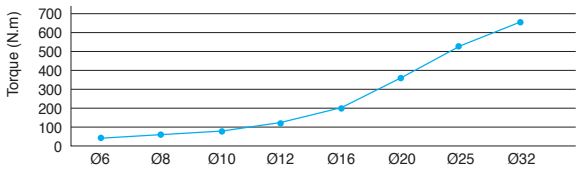


Symmetric design

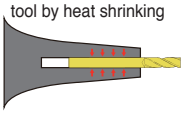
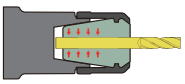
- High clamping force



High clamping force

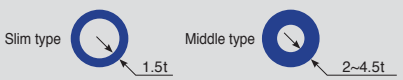


- 30% stronger Clamping Force
- Run-Out (≤ 0.003 mm)
- Higher Power transmission Clamping Force by Inner-Size

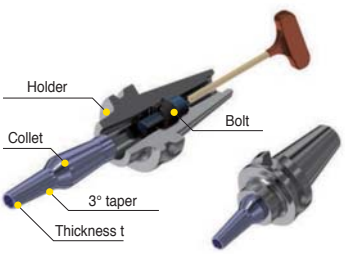
Shrinking chuck	Collet chuck
Fix the clearance between holder and tool by heat shrinking	Fix the tool by elasticity of collet
	
Thermal expansion ▶ Thermal shrinking	Elastic deformation
Highly strong clamping	Strong clamping

Mono type

Figure	Accuracy
	 Run-out 3 ㎛



2-pieces type

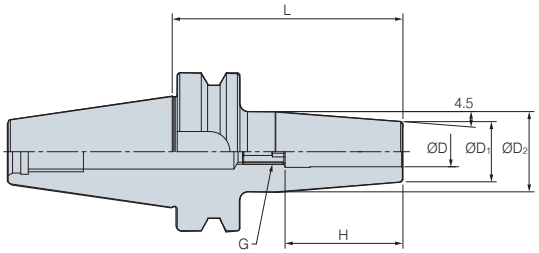
Figure	Accuracy
	 Run-out 5 ㎛



M This is metric size. We can also provide in inch type

BT-DSC





(mm)

Designation			ØD	L	ØD1	ØD2	H	G	kg	MAX RPM
BT30 -	DSC3 -	60	3	60	11	18.5	82	-	0.6	25,000
	DSC4 -	60	4	60	13	20.5	82	-	0.6	25,000
BT40 -	DSC6 -	90	6	90	21	27	36	M5	1.2	20,000
		120	6	120	21	27	36	M5	1.2	20,000
		160	6	160	21	27	36	M5	1.4	20,000
	DSC8 -	90	8	90	21	27	36	M5	1.2	20,000
		120	8	120	21	27	36	M5	1.2	20,000
		160	8	160	21	27	36	M5	1.4	20,000
	DSC10 -	90	10	90	24	32	42	M8	1.2	20,000
		120	10	120	24	32	42	M8	1.2	20,000
		160	10	160	24	32	42	M8	1.6	20,000
	DSC12 -	90	12	90	24	32	47	M8	1.2	20,000
		120	12	120	24	32	47	M8	1.2	20,000
		160	12	160	24	32	47	M8	1.6	20,000
	DSC16 -	90	16	90	27	34	50	M12	1.3	20,000
		120	16	120	27	34	50	M12	1.3	20,000
		160	16	160	27	34	50	M12	1.7	20,000
	DSC20 -	90	20	90	33	42	52	M12	1.3	20,000
		120	20	120	33	42	52	M12	1.5	20,000
		160	20	160	33	42	52	M12	2.1	20,000

Adjust screw I 16

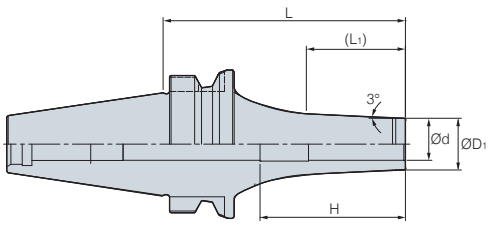
• Through coolant system available

M This is metric size. We can also provide in inch type

BT-DSC/M

Mono Curve type





(mm)

Designation			ØD	L	L1	ØD1	ØC1	H	G	kg	MAX RPM
BT30 -	DSC3M -	75S	3	75	29.8	8	25	97	-	0.6	25,000
	DSC4M -	75S	4	75	31.8	10	25	97	-	0.6	25,000
	DSC6M -	75S	6	75	28.9	12	30	97	-	0.6	25,000
	DSC8M -	75S	8	75	28.9	14	32	97	-	0.6	25,000
	DSC10M -	75S	10	75	30.66	16	32	45	-	0.6	25,000

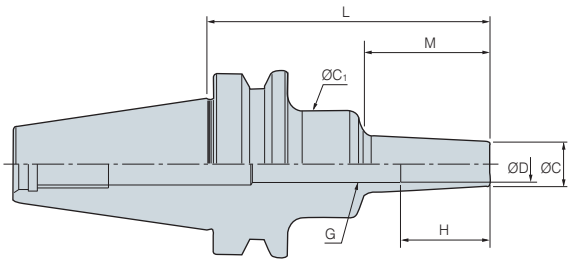
• Not able to use the adjust screw • Through coolant system available

M This is metric size. We can also provide in inch type

BT-DSC/M

Mono type





(mm)

Designation		ØD	L	ØD1	ØC1	M	H	kg
BT40 -	DSC6M - 95	6	95	10	26	42	18	1.2
	120	6	120	10	26	67	18	1.2
	160	6	160	10	36	97	18	1.5
	DSC8M - 95	8	95	13	36	42	24	1.2
	120	8	120	13	36	67	24	1.2
	160	8	160	13	36	97	24	1.5
	DSC10M - 95	10	95	16	36	42	30	1.2
	120	10	120	16	36	67	30	1.2
	160	10	160	16	36	97	30	1.5
	DSC12M - 95	12	95	19	36	42	30	1.2
	120	12	120	19	36	67	30	1.2
	160	12	160	19	36	97	30	1.5
	DSC16M - 95	16	95	24	50	42	32	1.2
	120	16	120	24	50	67	32	1.2
	160	16	160	24	50	97	32	1.5
	DSC20M - 95	20	95	29	50	42	40	1.2
	120	20	120	29	50	67	40	1.2
	160	20	160	29	50	97	40	1.5
BT50 -	DSC6M - 110	6	110	10	26	42	18	3.5
	160	6	160	10	36	97	18	4
	DSC8M - 110	8	110	13	36	42	24	3.5
	160	8	160	13	36	97	24	4
	DSC10M - 110	10	110	16	36	42	30	3.5
	160	10	160	16	36	97	30	4
	DSC12M - 110	12	110	19	36	42	30	3.5
	160	12	160	19	50	97	30	4
	DSC16M - 110	16	110	24	50	42	32	3.5
	160	16	160	24	50	97	32	4
	DSC20M - 110	20	110	29	50	42	40	3.5
	160	20	160	29	50	97	40	4

Adjust screw I 16

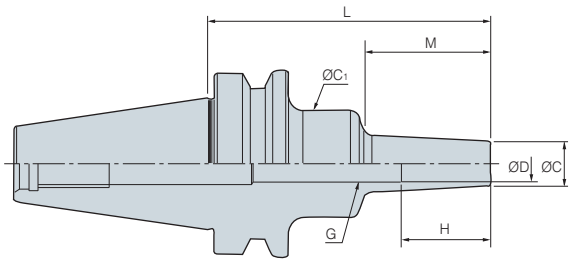
• Through coolant system available

M This is metric size. We can also provide in inch type

BT-DSC/S

Mono Slim type





(mm)

Designation			ØD	L	ØD1	ØC1	M	H
BT30 -	DSC6S -	60	6	60	9	20	22	18
		80	6	80	9	20	42	18
		120	6	120	9	25	67	18
BT40 -	DSC6S -	95	6	95	9	26	42	18
		120	6	120	9	26	67	18
		160	6	160	9	36	97	18
	DSC8S -	95	8	95	11	36	42	24
		120	8	120	11	36	67	24
		160	8	160	11	36	97	24
	DSC10S -	95	10	95	13	36	42	30
		120	10	120	13	36	67	30
		160	10	160	13	36	97	30
	DSC12S -	95	12	95	15	36	42	30
		120	12	120	15	36	67	30
		160	12	160	15	36	97	30
BT50 -	DSC6S -	110	6	110	9	26	42	18
		160	6	160	9	36	97	18
	DSC8S -	110	8	110	11	36	42	24
		160	8	160	11	36	97	24
	DSC10S -	110	10	110	13	36	42	30
		160	10	160	13	36	97	30
	DSC12S -	110	12	110	15	36	42	30
		160	12	160	15	36	97	30

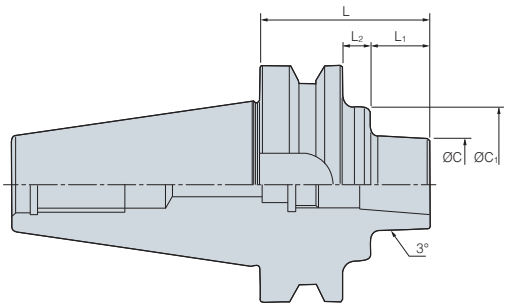
• Not able to use the adjust screw • Through coolant system available

M This is metric size. We can also provide in inch type

BT-SLK

2-pieces type





(mm)

Designation			L	ØC	L_1	L_2	$ØC_1$
BT30 -	SLK12 -	35	35	38	13	-	-
BT40 -	SLK12 -	45	45	38	18	-	-
		45F	45	41	18	-	-
		75	75	38	48	-	-
		75F	75	41	48	-	-
		135F	135	41	108	-	-
BT50 -	SLK12 -	75	75	38	25	12	65
		75F	75	41	25	12	65
		105F	105	41	55	12	65
		135F	135	41	85	12	65
		225	225	38	150	37	65
		315	315	38	150	127	90

Adjust screw I 16

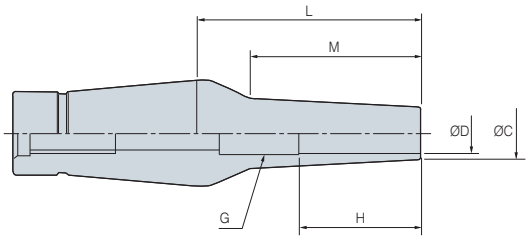
• Through coolant system available • PULL STUD BOLT is needed for BT30-SLK12-35

M This is metric size. We can also provide in inch type

CS/CM

2-pieces type





(mm)

Designation			ØD	ØC	L	M	H
CS12 -	6 -	36	6	9	35	22	18
		55	6	9	55	42	18
		80	6	9	80	67	18
		110	6	9	110	97	18
	8 -	35	8	11	35	22	24
		55	8	11	55	42	24
		80	8	11	80	67	24
		110	8	11	110	97	24
	10 -	35	10	13	35	22	30
		55	10	13	55	42	30
		80	10	13	80	67	30
		110	10	13	110	97	30
	12 -	35	12	15	35	22	30
		55	12	15	55	42	30
		80	12	15	80	67	30
		110	12	15	110	97	30

• Not able to use the adjust screw • Through coolant system available

M This is metric size. We can also provide in inch type

(mm)

Designation			ØD	ØC	L	M	H
CM12 -	6 -	35	6	12	35	22	18
		55	6	12	55	42	18
		80	6	12	80	67	18
	8 -	35	8	14	35	22	24
		55	8	14	55	42	24
		80	8	14	80	67	24
	10 -	35	10	16	35	22	30
		55	10	16	55	42	30
		80	10	16	80	67	30
	12 -	35	12	20	35	22	30
		55	12	20	55	42	30
		80	12	20	80	67	30

Adjust screw I 16

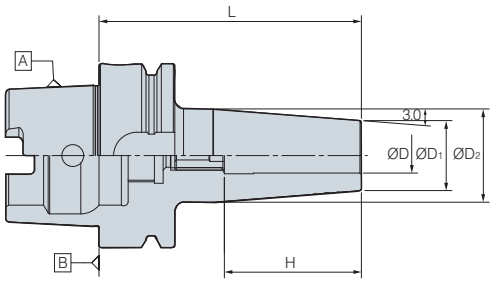
• Through coolant system available

M This is metric size. We can also provide in inch type

HSK-DSC/M

Mono type





(mm)

Designation		ØD	L	ØD1	ØC1	M	H
HSK63A -	DSC6M - 95	6	95	10	26	42	18
	DSC8M - 95	8	95	13	36	42	24
	DSC10M - 120	10	120	16	36	67	30
	DSC12M - 120	12	120	19	36	67	30
	DSC16M - 120	16	120	24	50	67	32

• Not able to use the adjust screw • Through coolant system is optional

M This is metric size. We can also provide in inch type

Parts

Spare parts											
Type		DSC6	DSC8	DSC10	DSC12	DSC14	DSC16	DSC18	DSC20	DSC25	DSC32
Adjust screw		M520C		M820C		M1230C					

Champion milling chuck

CPM

- Improved tool life by blocking dust and lubricant leaking with perfect sealing structure on O-ring and Nut
- Available through coolant system with CTC set
- Length regulator is inserted in CPM, user can adjust length conveniently



Code system

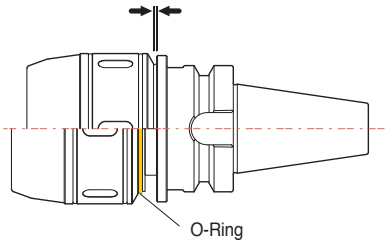
BT40 - CPM 32 - 105

BT40	CPM	32	105
Spindle	Champion milling chuck	Max. chucking dia.	Length

Prevention of grease leak and dust proof

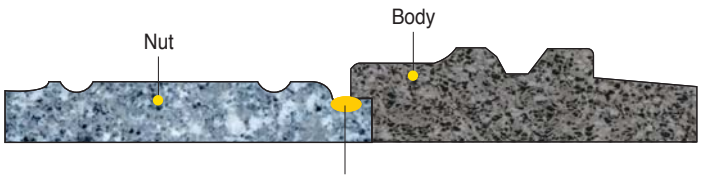
CPM has O-Ring on nuts to absorb cutting vibration for stable operation and prevents inflow of debris

Face contact for stable machining and dust proof

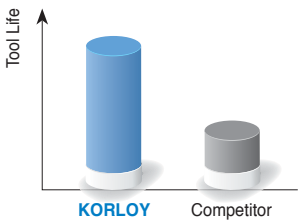


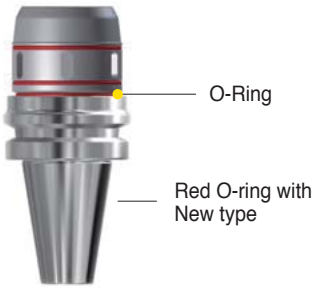
Correlation of oil leaking and tool life

Obvious increase of tool life after applying dust proof system

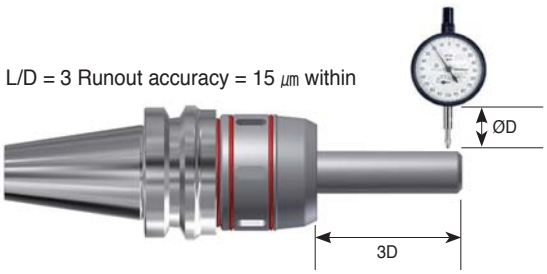


O-Ring: Blocking lubricant leakage and dust entry → **Enhanced tool life**





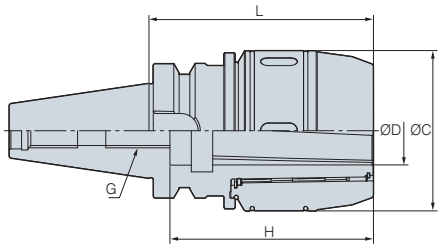
L/D = 3 Runout accuracy = 15 ㎛ within



M This is metric size. We can also provide in inch type

BT-CPM





(mm)

Designation			ØD	L	ØC	H	G	Collet	kg
BT30 -	CPM20 -	80	20	80	54	80	M16	DC20, DSC20	1.1
BT40 -	CPM20 -	90	20	90	54	80	M16	DC20, DSC20	2.3
	CPM32 -	90	32	90	75	85	M16	DC32, DCS32	2.8
		105	32	105	75	95	M16	DC32, DCS32	2.9
BT50 -	CPM32 -	105	32	105	75	95	M24	DC32, DCS32	5.0
		135	32	135	75	95	M24	DC32, DCS32	5.8
		165	32	165	75	95	M24	DC32, DCS32	6.8

• Order-made sets available • Through coolant system is optional

M This is metric size. We can also provide in inch type

New power milling chuck

NPM

- Strong clamping over 500kgf·m (on NPM42 basis)
- DUST BLOCK functions for blocking foreign substance
- Jet coolant available
- High precision within 15㎛ at L/D = 3
- Applicable shank diameter: D6-42

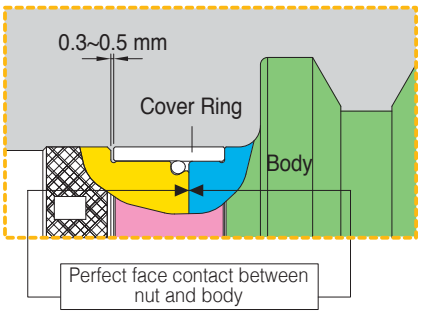


Code system

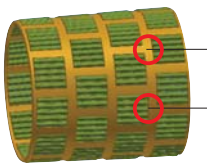
BT40 - NPM 32 - 110

Spindle	New power milling chuck	Max. chucking dia.	Length

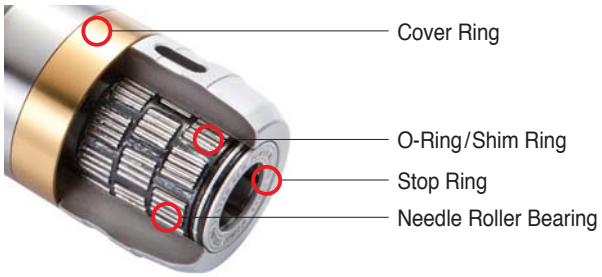
Improvement of durability by preventing minute dust, chips and coolant



• Adopted Stop Ring on Head parts
- Preventing minute dust by Shim&O-Ring



- Specially designed Steel Bearing for prevention of damage
- Strong Clamping by spreading the force



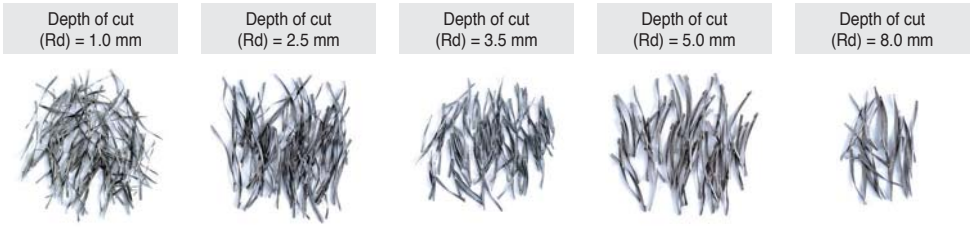
Needle Roller Bearing

Stable machining from heavy to fine

Perfect face contact and Powerful clamping force strengthen both Cutting force and Absorbtion of vibration



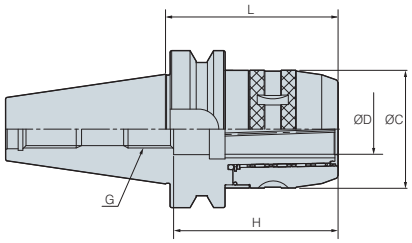
Possible machining from heavy milling to fine finishing



M This is metric size. We can also provide in inch type

BT-NPM





(mm)

Designation			ØD	L	ØC	H	G	Collet	kg
BT30 -	NPM20 -	85	20	85	54	85	M16	DC20, DSC20	1.1
BT40 -		85	20	85	54	85	M16	DC20, DSC20	2.3
		100	20	100	54	85	M16	DC20, DSC20	2.3
	NPM25 -	85	25	85	61	85	M16	DC25, DSC25	2.5
	NPM32 -	90	32	90	75	87	M16	DC32, DCS32	2.8
		110	32	110	75	95	M16	DC32, DCS32	2.9
		135	32	135	75	95	M16	DC32, DCS32	3.5
BT50 -	NPM20 -	95	20	95	54	85	M24	DC20, DSC20	4.3
		125	20	125	54	85	M24	DC20, DSC20	4.8
		165	20	165	54	85	M24	DC20, DSC20	5.3
	NPM32 -	110	32	110	75	105	M24	DC32, DCS32	5.0
		135	32	135	75	105	M24	DC32, DCS32	5.8
		165	32	165	75	105	M24	DC32, DCS32	6.8
	NPM42 -	110	42	110	90	125	M24	DC42, DCS42	5.4
		135	42	135	90	125	M24	DC42, DCS42	6.6
		165	42	165	90	125	M24	DC42, DCS42	8.0

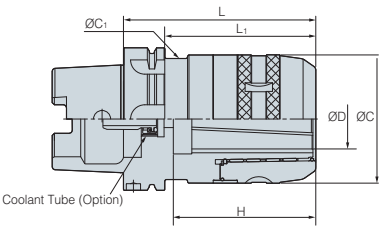
Applicable collet **I 21**

- Through coolant system available is optional
- In case of L ≤ 90, chucks with over 90mm are recommended for medium cutting by short cap

M This is metric size. We can also provide in inch type

HSK-NPM





(mm)

Designation			ØD	L	L_1	ØC	Collet	kg
HSK63A -	NPM20 -	100	20	95	54	75	DC20, DSC20	1.1
	NPM32 -	120	42	135	90	90	DC42, DCS42	6.6
HSK100A -	NPM32 -	130	42	165	90	90	DC42, DCS42	8.0

Applicable collet **I 21**

- Through coolant system is optional

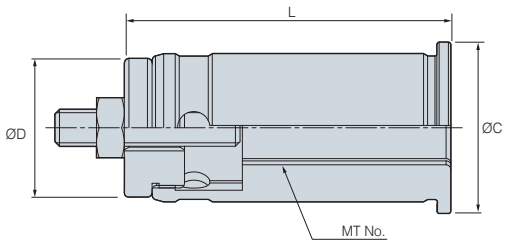
M This is metric size. We can also provide in inch type

Parts

Division	Spare parts		
	Option		
	Collet	Spanner	Through coolant system
Type			
NPM20	DC20, DCS20	57-60	CTC20-20
NPM32	DC32, DCS32	75-79	CTC32-32
NPM42	DC42, DCS42	92-96	CTC42-42

DCS Straight Collet





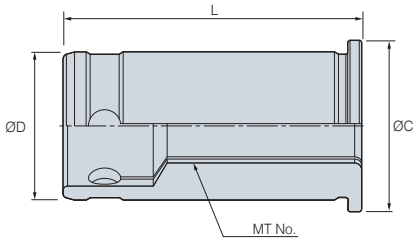
(mm)

Designation	ØD	Ød	ØC	L	kg
DCS20 - 6, 8, 10, 12, 16	20	6, 8, 10, 12, 16	26	55	0.2
DCS25 - 6, 8, 10, 12, 16, 20	25	6, 8, 10, 12, 16, 20	29	66.5	0.3
DCS32 - 6, 8, 10, 12, 14, 16, 19, 20, 25	32	6, 8, 10, 12, 14, 16, 19, 20, 25	38	70	0.4
DCS42 - 6, 8, 10, 12, 16, 20, 25, 32	42	6, 8, 10, 12, 16, 20, 25, 32	48	75	0.7

M This is metric size. We can also provide in inch type

DC Straight Collet





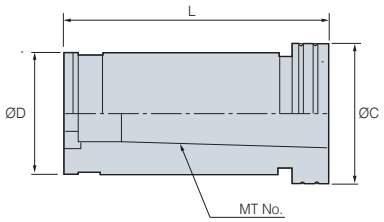
(mm)

Designation	ØD	Ød	ØC	L	kg
DC20 - 6, 8, 10, 12, 14, 16	20	6, 8, 10, 12, 14, 16	26	55	0.2
DC25 - 6, 8, 10, 12, 16, 20	25	6, 8, 10, 12, 16, 20	29	61.5	0.3
DC32 - 6, 8, 10, 12, 14, 16, 19, 20, 25	32	6, 8, 10, 12, 14, 16, 19, 20, 25	38	70	0.4
DC42 - 6, 8, 10, 12, 16, 20, 25, 32	42	6, 8, 10, 12, 16, 20, 25, 32	48	75	0.7

M This is metric size. We can also provide in inch type

TC Taper Collet





(mm)

Designation	MT No.	ØD	ØC	L
TC20 - 1	MT1	20	26	60
TC20 - 2	MT2	20	26	72
TC25 - 1	MT1	25	32	60
TC25 - 2	MT2	25	32	72
TC32 - 1	MT1	32	38	60
TC32 - 2	MT2	32	38	72

M This is metric size. We can also provide in inch type

(mm)

Designation	MT No.	ØD	ØC	L
TC32 - 3	MT3	32	38	90
TC42 - 1	MT1	42	48	60
TC42 - 2	MT2	42	48	72
TC42 - 3	MT3	42	48	90
TC42 - 4	MT4	42	48	112.5

M This is metric size. We can also provide in inch type

Collet Chuck Series

- High Accuracy and Powerful clamping force
- Convenient tool change
- Various models
- Chucking Diameter Ø1.0~Ø26.0mm



Collet Chuck Series

Collet chuck	High speed collet chuck	High speed slim collet chuck
		
SDC/P - Max. Chucking dia.: Ø26.0 mm - For use of drilling, Reaming, Endmilling and tapping etc	DSK - Max. Chucking dia.: Ø25.0 mm - Balanced G6.3 - Max. Revolution: 15,000 rpm	GSK - Max. Chucking dia.: Ø25.0 mm - Balanced G2.5 - Max. Revolution: 25,000 rpm

High Precision Collet

- Accuracy type: 5 ㎛ (GER-B)
- High accuracy type: 2 ㎛ (GER-HP)
- Through Coolant type



- Accuracy type
- High accuracy type



- Through Coolant type



M This is metric size. We can also provide in inch type

Collet chuck

SDC/P

- ER collet chuck, standard type for general machining
- Applicable shank diameter: Ø1.0~26.0

First-class nut (SWISS Made)



Easy clamping of collets



Special hardening treatment



For SDC/P
(General machining)



High speed collet chuck

DSK

- Available for machining at max.15,000RPM and balancing of G6.3
- Minimized tool vibration during operation by using collet 8°
- Swiss made high precision nut enhances stability
- Applicable shank diameter: Ø1.8~25



Standard type & Precision type	Designation	Arbor	Max chucking	Run-out
	HC6-Ød	10.5	6.0	Standard type 5µm Precision type 3µm
	HC10-Ød	15.5	10.0	
	HC13-Ød	20.1	13.0	
	HC16-Ød	24.6	16.0	
	HC20-Ød	29.1	20.0	
	HC25-Ød	35.6	25.0	

8° HC collet

Minimized tool vibration during operation

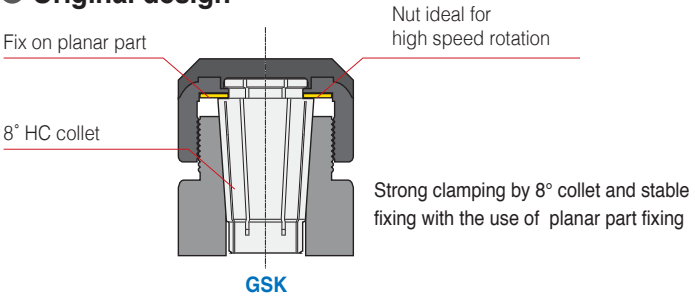
Great speed slim collet chuck

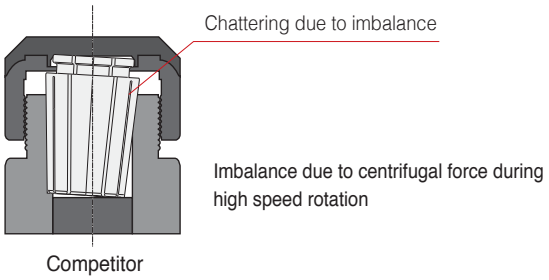
GSK

- Available for machining at max.25,000RPM and balancing of G6.3
- Increased productivity due to high speed machining
- Minimized tool vibration during operation by using collet 8°
- Swiss made high precision nut enhances stability by pressing collet uniformly
- Applicable shank diameter: Ø1.8~25



Original design





M This is metric size. We can also provide in inch type

BT-SDC/P



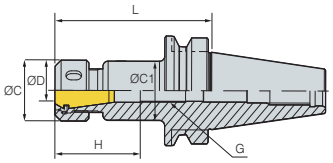


Fig. 1

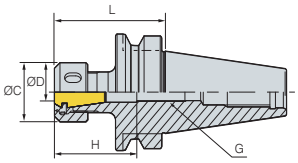


Fig. 2

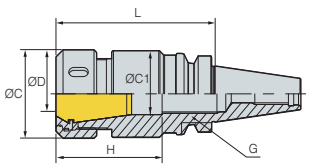


Fig. 3

(mm)

Designation			ØD	L	H	Collet/Step	G	ØC	ØC1	Fig.
BT30 -	SDC7P -	70	1.0~7.0	70	33	GERC11/0.5	M7	18	17	1
		100	1.0~7.0	100	33	GERC11/0.5	M7	18	17	1
	SDC10P -	50	1.0~10.0	50	44.5	GERC16/1.0	M10	32	-	2
		70	1.0~10.0	70	44.5	GERC16/1.0	M10	32	31	1
		100	1.0~10.0	100	44.5	GERC16/1.0	M10	32	31	1
	SDC13P -	50	1.0~13.0	50	49	GERC20/1.0	M7	35	-	2
		70	1.0~13.0	70	49	GERC20/1.0	M13	35	34	1
		100	1.0~13.0	100	49	GERC20/1.0	M13	35	34	1
	SDC16P -	50	1.0~16.0	50	50	GERC25/1.0	M7	42	-	2
		70	1.0~16.0	70	50	GERC25/1.0	M18	42	41	1
		100	1.0~16.0	100	50	GERC25/1.0	M18	42	41	1
	SDC20P -	60	1.0~20.0	60	60	GERC32/1.0	M7	50	-	2
		90	1.0~20.0	90	60	GERC32/1.0	M22	50	49	3
		120	1.0~20.0	120	60	GERC32/1.0	M22	50	49	3
BT40 -	SDC7P -	70	1.0~7.0	70	33	GERC11/0.5	M7	18	17	1
		90	1.0~7.0	90	33	GERC11/0.5	M7	18	17	1
		130	1.0~7.0	130	33	GERC11/0.5	M7	18	17	1
	SDC10P -	70	1.0~10.0	70	44.5	GERC16/1.0	M10	32	31	1
		90	1.0~10.0	90	44.5	GERC16/1.0	M10	32	31	1
		130	1.0~10.0	130	44.5	GERC16/1.0	M10	32	31	1
	SDC13P -	70	1.0~13.0	70	49	GERC20/1.0	M13	35	34	1
		90	1.0~13.0	90	49	GERC20/1.0	M13	35	34	1
		130	1.0~13.0	130	49	GERC20/1.0	M13	35	34	1
		150	1.0~13.0	150	49	GERC20/1.0	M13	35	34	1
	SDC16P -	70	1.0~16.0	70	50	GERC25/1.0	M18	42	41	1
		90	1.0~16.0	90	50	GERC25/1.0	M18	42	41	1
		130	1.0~16.0	130	50	GERC25/1.0	M18	42	41	1
	SDC20P -	70	1.0~20.0	70	60	GERC32/1.0	M22	50	-	2
		90	1.0~20.0	90	60	GERC32/1.0	M22	50	49	1
		130	1.0~20.0	130	60	GERC32/1.0	M22	50	49	1
		150	1.0~20.0	150	60	GERC32/1.0	M22	50	49	1
	SDC26P -	90	3.0~26.0	90	71	GERC40/1.0	M28	63	62	1

Spare Part I 26

- Through coolant system is optional
- Collets in the right size are recommended for oil hole type

M This is metric size. We can also provide in inch type

BT-SDC/P



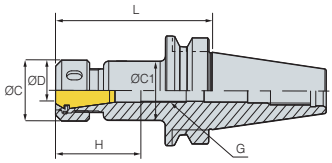


Fig. 1

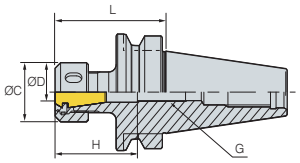


Fig. 2

(mm)

Designation		ØD	L	H	Collet/Step	G	ØC	ØC1	Fig.
BT50 -	SDC10P - 100	1.0~10.0	100	44.5	GERC16/1.0	M10	32	31	1
	120	1.0~10.0	120	44.5	GERC16/1.0	M10	32	31	1
	160	1.0~10.0	160	44.5	GERC16/1.0	M10	32	31	1
	SDC13P - 100	1.0~13.0	100	49	GERC20/1.0	M13	35	34	1
	130	1.0~13.0	130	49	GERC20/1.0	M13	35	34	1
	160	1.0~13.0	160	49	GERC20/1.0	M13	35	34	1
	180	1.0~13.0	180	49	GERC20/1.0	M13	35	34	1
	SDC16P - 100	1.0~16.0	100	50	GERC25/1.0	M18	42	41	1
	160	1.0~16.0	160	50	GERC25/1.0	M18	42	41	1
	SDC20P - 70	1.0~20.0	70	60	GERC32/1.0	M22	50	-	2
	100	1.0~20.0	100	60	GERC32/1.0	M22	50	49	1
	130	1.0~20.0	130	60	GERC32/1.0	M22	50	49	1
	160	1.0~20.0	160	60	GERC32/1.0	M22	50	49	1
	180	1.0~20.0	180	60	GERC32/1.0	M22	50	49	1
	SDC26P - 160	3.0~26.0	160	71	GERC40/1.0	M28	63	62	1

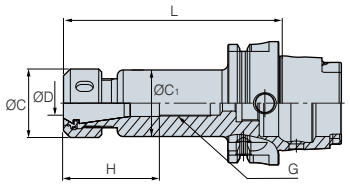
Spare Part I 26

- Through coolant system is optional
- Collets in the right size are recommended for oil hole type

M This is metric size. We can also provide in inch type

HSK-SDC/P





(mm)

Designation		ØD	L	H	Collet/Step	G	ØC	ØC1
HSK63A -	SDC10P - 100	1.0~10.0	100	44.5	GER16/1.0	M10	32	31
	SDC13P - 100	1.0~13.0	100	49	GER20/1.0	M7	35	34
	SDC16P - 100	1.0~16.0	100	50	GER25/1.0	M7	42	41
	SDC20P - 110	1.0~20.0	110	60	GER32/1.0	M7	50	49
HSK100A -	SDC16P - 110	1.0~16.0	110	50	GER25/1.0	M13	42	41
	SDC20P - 120	2.0~20.0	120	60	GER32/1.0	M10	50	49

Spare Part 126

- Through coolant system is optional
- Collets in the right size are recommended for oil hole type

M This is metric size. We can also provide in inch type

Parts

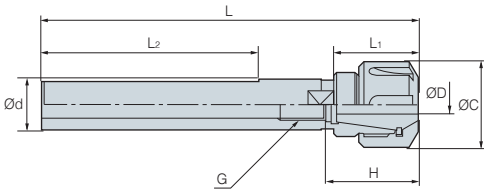
Division	Spare parts			
	Basic		Option	
	Sleeve bearing nut	Adjust screw	Spanner	Collet
Type				
SDC7	RN11	BN0716F	20-22	GER/ER 11-ØD
SDC10	RN16	BN1025F	32-35	GER/ER 16-ØD
SDC13	RN20	BN1325F	35-38	GER/ER 20-ØD
SDC16	RN25	BN1830F	42-46	GER/ER 25-ØD
SDC20	RN32	BN2230F	48-52	GER/ER 32-ØD
SDC26	RN40	BN2838F	62-65	GER/ER 40-ØD

- NOTES : In case of the RU20 nut, order a 35-38 spanner. In case of the R20 nut, a S-30 spanner

S-SDC







(mm)

	Designation		ØD	Ød	ØC	L	L_1	L_2	H	Collet / Step	G	kg
S16 -	**SDC7 -**	**120M**	1.0~7.0	16	19	120	-	-	33	GER11/0.5	M7	0.2
		120T	1.0~7.0	16	19	120	-	73	33	GER11/0.5	M7	0.2
	SDC10 -	**150T**	1.0~10.0	16	28	150	46.5	83	34.5	GER16/1.0	M10	0.2
S20 -	**SDC10 -**	**150M**	1.0~10.0	20	28	150	26.5	-	34.5	GER16/1.0	M10	0.3
		150T	1.0~10.0	20	28	150	26.5	83	34.5	GER16/1.0	M10	0.3
	SDC13 -	**150M**	1.0~13.0	20	35	150	50	-	49	GER20/1.0	M13	0.3
		150T	1.0~13.0	20	35	150	50	83	49	GER20/1.0	M13	0.3
S25 -	**SDC10 -**	**150M**	1.0~10.0	25	28	150	-	-	34.5	GER16/1.0	M10	0.5
		150T	1.0~10.0	25	28	150	-	83	34.5	GER16/1.0	M10	0.5
	SDC13 -	**150M**	1.0~13.0	25	35	150	-	-	49	GER20/1.0	M13	0.5
		150T	1.0~13.0	25	35	150	-	83	49	GER20/1.0	M13	0.5
S32 -	**SDC13 -**	**150M**	1.0~13.0	32	35	150	-	-	49	GER20/1.0	M13	0.7
		150T	1.0~13.0	32	35	150	-	83	49	GER20/1.0	M13	0.7
	SDC20 -	**165M**	2.0~20.0	32	50	165	-	-	60	GER32/1.0	M22	0.7
		165T	2.0~20.0	32	50	165	-	83	60	GER32/1.0	M22	0.7

Spare Part I 28

• Through coolant system is optional

M This is metric size. We can also provide in inch type

S-SDC/S



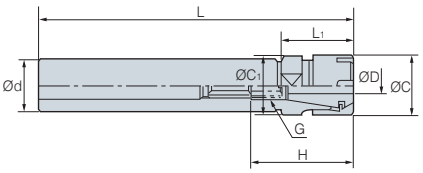


Fig. 1

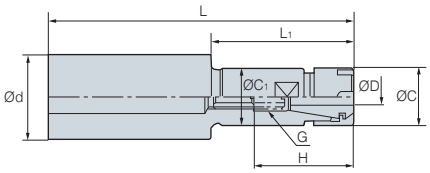


Fig. 2

(mm)

Designation			ØD	Ød	ØC	L	L_1	H	Collet/Step	G	kg
S16 -	SDC7S -	100M	1.0~7.0	16	16	100	-	33	GER11/0.5	M7	0.2
		150M	1.0~7.0	16	16	150	-	33	GER11/0.5	M7	0.2
	SDC10S -	100M	1.0~10.0	16	22	100	50	44.5	GER16/1.0	M10	0.3
		150M	1.0~10.0	16	22	150	50	44.5	GER16/1.0	M10	0.3
S20 -	SDC7S -	100M	1.0~7.0	20	16	100	30	35	GER11/0.5	M7	0.3
		150M	1.0~7.0	20	16	150	80	35	GER11/0.5	M7	0.3
	SDC10S -	100M	1.0~10.0	20	22	100	50	44.5	GER16/1.0	M10	0.3
		150M	1.0~10.0	20	22	150	50	44.5	GER16/1.0	M10	0.3
		200M	1.0~10.0	20	22	200	50	44.5	GER16/1.0	M10	0.4
	SDC13S -	100M	1.0~13.0	20	28	100	50	49	GER20/1.0	M13	0.3
		150M	1.0~13.0	20	28	150	50	49	GER20/1.0	M13	0.3
S25 -	SDC7S -	100M	1.0~7.0	25	16	100	30	33	GER11/0.5	M7	0.4
		150M	1.0~7.0	25	16	150	80	33	GER11/0.5	M7	0.4
	SDC10S -	100M	1.0~10.0	25	22	100	30	44.5	GER16/1.0	M10	0.4
		150M	1.0~10.0	25	22	150	80	44.5	GER16/1.0	M10	0.4
	SDC13S -	100M	1.0~13.0	25	28	100	-	49	GER20/1.0	M13	0.5
		150M	1.0~13.0	25	28	150	-	49	GER20/1.0	M13	0.5
	SDC16S -	100M	1.0~16.0	25	35	100	50	50	GER25/1.0	M18	0.5
		150M	1.0~16.0	25	35	150	50	50	GER25/1.0	M18	0.5
		200M	1.0~16.0	25	35	200	50	50	GER25/1.0	M18	0.7
S32 -	SDC16S -	120M	1.0~16.0	32	35	120	-	50	GER25/1.0	M18	1
		150M	1.0~16.0	32	35	150	-	50	GER25/1.0	M18	1

• Through coolant system is optional

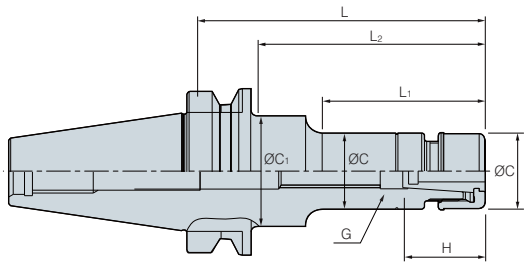
M This is metric size. We can also provide in inch type

Parts

Division	Spare parts			
	Basic		Option	
	Nut	Adjust screw	Spanner	(G)ER collet
Type				
SDC7S	R11M	BN0716F	M11M	(G)ER 11-ØD
SDC10S	R16M	BN1025F	M16M	(G)ER 16-ØD
SDC13S	R20M	BN1325F	M20M	(G)ER 20-ØD
SDC16S	R25M	BN1830F	M25M	(G)ER 25-ØD

BT-GSK





(mm)

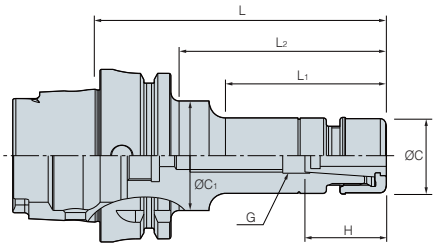
Designation			ØD	L	L1	L2	H	Collet / Step	G	ØC	ØC1	kg	MAX RPM
BT30 -	GSK6 -	60	1.0~6.0	60	33	33	35	HC6/0.5	M8	19.5	19.5	0.7	25,000
		90	1.0~6.0	90	56	65	35	HC6/0.5	M8	19.5	32	0.8	25,000
	GSK10 -	60	2.0~10.0	60	35	35	50	HC10/0.5	M12	27	27	0.9	25,000
		90	2.0~10.0	90	65	65	50	HC10/0.5	M12	27	27	1.0	25,000
	GSK13 -	60	3.0~13.0	60	36	36	43	HC13/1.0	M12	35	35	0.6	25,000
	GSK16 -	60	3.0~16.0	60	37	37	60	HC16/0.5	M12	40	40	1.1	25,000
		90	3.0~16.0	90	67	67	60	HC16/0.5	M18	40	40	1.2	25,000
	GSK25 -	90	16.0~25.0	90	67.5	67.5	63.5	HC25/0.5	M12	55	55	1.1	25,000
BT40 -	GSK6 -	90	1.0~6.0	90	51	61	35	HC6/0.5	M8	19.5	32	1.1	20,000
		120	1.0~6.0	120	60	90	35	HC6/0.5	M8	19.5	32	1.4	20,000
		150	1.0~6.0	150	60	120	35	HC6/0.5	M8	19.5	25	1.5	20,000
	GSK10 -	90	2.0~6.0	90	48	60	50	HC10/0.5	M12	27	40	1.2	20,000
		120	2.0~6.0	120	73	90	50	HC10/0.5	M12	27	40	1.4	20,000
		150	2.0~6.0	150	73	118	50	HC10/0.5	M12	27	34.5	1.6	20,000
	GSK13 -	90	3.0~13.0	90	59	59	43	HC13/1.0	M15	35	35	1.4	20,000
	GSK16 -	90	3.0~16.0	90	58	58	60	HC16/0.5	M18	40	40	1.5	20,000
		120	3.0~16.0	120	88	88	60	HC16/0.5	M18	40	40	1.7	20,000
		150	3.0~16.0	150	118	118	60	HC16/0.5	M18	40	40	1.9	20,000
	GSK20 -	90	4.0~20.0	90	60	60	70	HC20/0.5	M22	48	48	1.6	20,000
		120	4.0~20.0	120	90	90	70	HC20/0.5	M22	48	48	2.0	20,000
	GSK25-	90	16.0~25.0	90	61	61	75	HC25/0.5	M28	55	55	1.8	20,000
		120	16.0~25.0	120	91	91	85	HC25/0.5	M28	55	55	2.0	20,000
BT50 -	GSK6 -	105	1.0~6.0	105	55	64	35	HC6/0.5	M8	19.5	32	3.8	15,000
		135	1.0~6.0	135	60	92	35	HC6/0.5	M8	19.5	32	3.9	15,000
		165	1.0~6.0	165	60	114	35	HC6/0.5	M8	19.5	32	4.0	15,000
	GSK10 -	105	2.0~10.0	105	57	57	50	HC10/0.5	M12	27	27	3.8	15,000
		135	2.0~10.0	135	70	92	50	HC10/0.5	M12	27	32	4.0	15,000
		165	2.0~10.0	165	75	114	50	HC10/0.5	M12	27	36	4.2	15,000
	GSK13 -	135	3.0~13.0	135	92	92	43	HC13/1.0	M15	35	35	4.2	15,000
	GSK16 -	105	3.0~16.0	105	62	62	60	HC16/0.5	M18	40	40	4.1	15,000
		135	3.0~16.0	135	92	92	60	HC16/0.5	M18	40	40	4.3	15,000
		165	3.0~16.0	165	40	122	60	HC16/0.5	M18	40	50	4.5	15,000
	GSK20 -	105	4.0~20.0	105	62	62	70	HC20/0.5	M22	48	-	4.3	15,000
		135	4.0~20.0	135	92	92	70	HC20/0.5	M22	48	-	4.6	15,000
		165	4.0~20.0	165	122	122	70	HC20/0.5	M22	48	-	5.0	15,000
	GSK25 -	105	16.0~25.0	105	62	62	85	HC25/0.5	M28	55	55	4.8	15,000
		135	16.0~25.0	135	92	92	85	HC25/0.5	M28	55	55	5.2	15,000
		165	16.0~25.0	165	122	122	85	HC25/0.5	M28	55	55	5.6	15,000

Spare Part I 30

M This is metric size. We can also provide in inch type

HSK-GSK





(mm)

Designation			ØD	L_1	L_2	H	Collet/Step	G	ØC	$ØC_1$	MAX RPM
HSK63A -	GSK6 -	100	1.0~6.0	51	61	35	HC6/0.5	M8	19.5	32	20,000
	GSK10 -	105	2.0~6.0	73	118	50	HC10/0.5	M12	27	34.5	20,000
	GSK16 -	120	3.0~16.0	58	58	60	HC16/0.5	M18	40	40	20,000
	GSK20 -	120	4.0~20.0	60	60	70	HC20/0.5	M22	48	48	20,000
HSK100A -	GSK6 -	120	1.0~6.0	55	64	35	HC6/0.5	M8	19.5	32	15,000
	GSK10 -	120	2.0~10.0	57	57	50	HC10/0.5	M12	27	27	15,000
	GSK16 -	140	3.0~16.0	62	62	60	HC16/0.5	M18	40	40	15,000
	GSK25 -	155	16.0~25.0	62	62	85	HC25/0.5	M28	55	55	15,000

M This is metric size. We can also provide in inch type

Parts

Division	Spare parts		
	Basic		
	Nut	Adjust screw	Extractor
Type			
GSK6	GN6	M820C	GSK-6CE
GSK10	GN10	M1230C	GSK-10CE
GSK13	GN13	BN1530F	GSK-13CE
GSK16	GN16	BN1830F	GSK-16CE
GSK20	GN20	BN2230F	GSK-20CE
GSK25	GN25	BN2838F	GSK-25CE

Spanner (Option)



Designation
GSK6
GSK10
GSK13
GSK16
GSK20
GSK25

Slim type collet chuck

DSK

- Balancing G6.3 available for machining at max.15,000RPM
- Minimized tool vibration during operation by using collet 8°
- Swiss made high precision nut enhances stability
- Applicable shank diameter: Ø1.8~25



Code system

BT30 - DSK 10 - 90

- BT30: Spindle
- DSK: High speed slim collet chuck
- 10: Max. clamping dia.
- 90: Length

First-class nut (SWISS made)

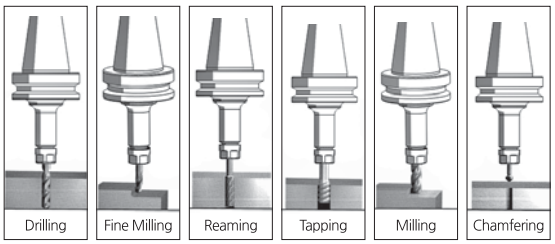


Easy clamping of collet

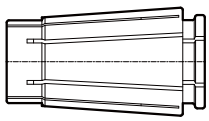


Special hardening treatment

Multifunctional applications



Collet

Standard type & Precision type	Designation	Diameter	Max chucking	Run-out
	HC6-Ød	10.5	6.0	Standard type 5μm Precision type 3μm
	HC10-Ød	15.5	10.0	
	HC13-Ød	20.1	13.0	
	HC16-Ød	24.6	16.0	
	HC20-Ød	29.1	20.0	
	HC25-Ød	35.6	25.0	

8° HC collet

Minimized tool vibration during operation

Spanner (Option)

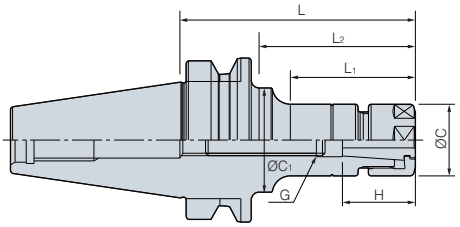
	Designation	Chuck
 Spanner	DSS-6	DSK-6
	DSS-10	DSK-10
	DSS-16	DSK-16
	DSS-20	DSK-20
	DSS-25	DSK-25

	Designation	Chuck
 Collet Extractor	DSS-6	DSK-6
	DSS-10	DSK-10
	DSS-16	DSK-16
	DSS-20	DSK-20
	DSS-25	DSK-25

M This is metric size. We can also provide in inch type

BT-DSK





(mm)

Designation			ØD	L	L_1	L_2	H	Collet / Step	G	ØC	$ØC_1$	kg	MAX RPM
BT30 -	**DSK6 -**	**60**	1.0~6.0	60	33	33	35	HC6/0.5	M8	19.5	19.5	0.7	15,000
		90	1.0~6.0	90	56	65	35	HC6/0.5	M8	19.5	32	0.8	15,000
	DSK10-	**60**	2.0~10.0	60	35	35	50	HC10/0.5	M12	27.5	27.5	0.9	15,000
		90	2.0~10.0	90	65	65	50	HC10/0.5	M12	27.5	27.5	1.0	15,000
	DSK13 -	**60**	3.0~13.0	60	36	36	43	HC13/0.5	M12	33	33	0.6	15,000
	DSK16 -	**60**	3.0~16.0	60	37	37	60	HC16/0.5	M12	40	40	1.1	15,000
		90	3.0~16.0	90	67	67	60	HC16/0.5	M18	40	40	1.2	15,000
	DSK25 -	**90**	16.0~25.0	90	67.5	67.5	63.5	HC25/0.5	M12	55	55	1.1	15,000
BT40 -	**DSK6 -**	**90**	1.0~6.0	90	51	61	35	HC6/0.5	M8	19.5	32	1.1	10,000
		120	1.0~6.0	120	60	90	35	HC6/0.5	M8	19.5	32	1.4	10,000
		150	1.0~6.0	150	60	120	35	HC6/0.5	M8	19.5	25	1.5	10,000
	DSK10 -	**90**	2.0~6.0	90	48	60	50	HC10/0.5	M12	27.5	40	1.2	10,000
		120	2.0~6.0	120	73	90	50	HC10/0.5	M12	27.5	40	1.4	10,000
		150	2.0~6.0	150	73	118	50	HC10/0.5	M12	27.5	34.5	1.6	10,000
	DSK13 -	**90**	3.0~13.0	90	59	59	43	HC13/1.0	M15	33	33	1.4	10,000
	DSK16 -	**90**	3.0~16.0	90	58	58	60	HC16/0.5	M18	40	40	1.5	10,000
		120	3.0~16.0	120	88	88	60	HC16/0.5	M18	40	40	1.7	10,000
		150	3.0~16.0	150	118	118	60	HC16/0.5	M18	40	40	1.9	10,000
	DSK20 -	**90**	4.0~20.0	90	60	60	70	HC20/0.5	M22	46.5	48.5	1.6	10,000
		120	4.0~20.0	120	90	90	70	HC20/0.5	M22	46.5	48.5	2.0	10,000
	DSK25 -	**90**	16.0~25.0	90	61	61	75	HC25/0.5	M28	55	55	1.8	10,000
		120	16.0~25.0	120	91	91	85	HC25/0.5	M28	55	55	2.0	10,000

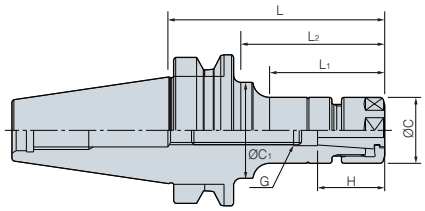
Spare Part I33

- Through coolant system is optional
- Coolant collets are recommended when using the coolant system

M This is metric size. We can also provide in inch type

BT-DSK





(mm)

Designation			ØD	L	L_1	L_2	H	Collet / Step	G	ØC	$ØC_1$	kg	MAX RPM
BT50 -	DSK6 -	105	1.0~6.0	105	55	64	35	HC6/0.5	M8	19.5	32	3.8	8,000
		135	1.0~6.0	135	60	92	35	HC6/0.5	M8	19.5	32	3.9	8,000
		165	1.0~6.0	165	60	114	35	HC6/0.5	M8	19.5	32	4.0	8,000
	DSK10 -	105	2.0~10.0	105	57	57	50	HC10/0.5	M12	27.5	27.5	3.8	8,000
		135	2.0~10.0	135	70	92	50	HC10/0.5	M12	27.5	32	4.0	8,000
		165	2.0~10.0	165	75	114	50	HC10/0.5	M12	27.5	36	4.2	8,000
	DSK13 -	135	3.0~13.0	135	92	92	43	HC13/1.0	M15	33	33	4.2	8,000
	DSK16 -	105	3.0~16.0	105	62	62	60	HC16/0.5	M18	40	40	4.1	8,000
		135	3.0~16.0	135	92	92	60	HC16/0.5	M18	40	40	4.3	8,000
		165	3.0~16.0	165	40	122	60	HC16/0.5	M18	40	50	4.5	8,000
	DSK20 -	105	4.0~20.0	105	62	62	70	HC20/0.5	M22	48.5	-	4.3	8,000
		135	4.0~20.0	135	92	92	70	HC20/0.5	M22	48.5	-	4.6	8,000
		165	4.0~20.0	165	122	122	70	HC20/0.5	M22	48.5	-	5.0	8,000
	DSK25 -	105	16.0~25.0	105	62	62	85	HC25/0.5	M28	55	55	4.8	8,000
		135	16.0~25.0	135	92	92	85	HC25/0.5	M28	55	55	5.2	8,000
		165	16.0~25.0	165	122	122	85	HC25/0.5	M28	55	55	5.6	8,000

• Through coolant system is optional
• Coolant collets are recommended when using the coolant system

M This is metric size. We can also provide in inch type

Parts

Division	Spare parts		
	Option		
	Nut	Adjust screw	Spanner
Type			
DSK6	DN6	BN0825F	DSS-6
DSK10	DN10	BN1225F	DSS10
DSK16	DN16	BN1830F	DSS16
DSK20	DN20	BN2230F	DSS20
DSK25	DN25	BN2838F	DSS25

GER Collet_GER

GERC new

- Corrosion resistant collet to micro unit
- High tech coating for long lasting precision
- Longer tool life and higher productivity



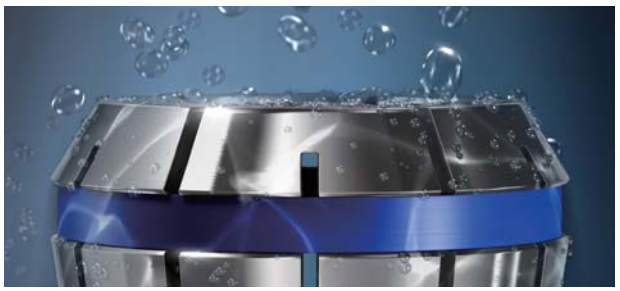
Code system

GERC - 16 6.0 - HP

- GERC: Spindle GER Collet
- 16: Clamping range
- 6.0: HP: Precision / Non: General
- HP: HP: Precision / Non: General

Special coating technology

Unlike GERC collets, Conventional non-coated collets have the following features:
Non-coated collets are affected by corrosion due to high humidity, cutting fluid, cleaner, salt, gas and many other factors, which in result deteriorates whole quality of machining



When a collet gets rusty, the tool life is shortened and precision considerably decreases. To prevent this problem, surface treatment by micro unit was applied to GERC collets for effective protection and long lasting precision



GERC Competitor

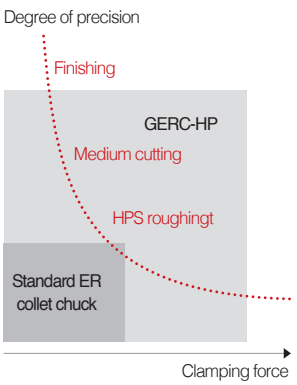
Two samples of collets after 4 months of use:
Left: GERC collet, Right: Non-coated

GERC-HP

A precision type collet chuck is expensive than standard one, but still it has more advantages in long term cost and efficiency. Using GERC-HP can minimize pricy reworking due to smaller tolerance with maximum precision

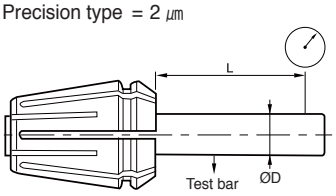


Precision type collet 2 ㎛



Precision (L/D = 3)

Standard type = 5 ㎛
Precision type = 2 ㎛

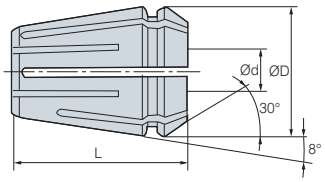


M This is metric size. We can also provide in inch type

GERC Collet

Accuracy type/High Accuracy type





(mm)

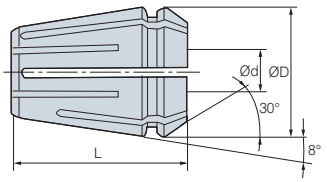
Designation	ER size	ØD	L	Ød (Max.)	Distance (mm)	Tolerance	
						Standard type	Precision type (HP)
GER11 - Ød(HP)	11	11.5	18.0	7.0	0.5	5 μm	2 μm
GER16 - Ød(HP)	16	17.0	27.5	10.0	1.0		
GER20 - Ød(HP)	20	21.0	31.5	13.0	1.0		
GER25 - Ød(HP)	25	26.0	34.0	16.0	1.0		
GER32 - Ød(HP)	32	33.0	40.0	20.0	1.0		
GER40 - Ød(HP)	40	41.0	46.0	26.0	1.0		

M This is metric size. We can also provide in inch type

ER Collet

Trough coolant type





(mm)

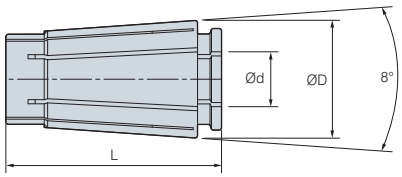
Designation	ER size	ØD	L	Ød (Max.)	Min. pi of water proof type	Distance (mm)	Tolerance
ER11 - Ød	11	11.5	18.0	7.0	-	0.5	10 μm
ER16 - Ød(C)	16	17.0	27.5	10.0	4.0	1.0	
ER20 - Ød(C)	20	21.0	31.5	13.0	6.0	1.0	
ER25 - Ød(C)	25	26.0	34.0	16.0	6.0	1.0	
ER32 - Ød(C)	32	33.0	40.0	20.0	8.0	1.0	
ER40 - Ød(C)	40	41.0	46.0	26.0	10.0	1.0	

M This is metric size. We can also provide in inch type

HC Slim Collet

General & Accuracy type





(mm)

Designation	ØD	L	Ød (Max.)	Distance (mm)	Tolerance	
					Standard type	Precision type (HP)
HC6 - Ød(P)	10.5	25.0	6.0	1.0	5 μm	3 μm
HC10 - Ød(P)	15.6	30.5	10.0	1.0		
HC13 - Ød(P)	20.1	39.0	13.0	1.0		
HC16 - Ød(P)	24.6	45.0	16.0	1.0		
HC20 - Ød(P)	29.2	54.3	20.0	1.0		
HC25 - Ød(P)	35.7	57.0	25.0	1.0		

M This is metric size. We can also provide in inch type

GERC Collet

Accuracy type



(mm)

Designation	Ød	Distance	Collet amount	Tolerance
GERC11 1.0-7.0mm/0.5mm	1.0-7.0	0.5	13pcs	5 ㎛
GERC16 1.0-10.0mm/1.0mm	1.0-10.0	1.0	10pcs	5 ㎛
GERC20 2.0-13.0mm/1.0mm	2.0-13.0	1.0	12pcs	5 ㎛
GERC25 2.0-16.0mm/1.0mm	2.0-16.0	1.0	15pcs	5 ㎛
GERC32 3.0-20.0mm/1.0mm	3.0-20.0	1.0	18pcs	5 ㎛
GERC40 4.0-26.0mm/1.0mm	4.0-26.0	1.0	23pcs	5 ㎛

M This is metric size. We can also provide in inch type

ER Collet

General type



(mm)

Designation	Ød	Distance	Collet amount	Tolerance
ER11(SET)	1.5-7.0	0.5	12pcs	10 ㎛
ER16(SET)	2.0-10.0	1.0	10pcs	10 ㎛
ER20(SET)	2.0-13.0	1.0	12pcs	10 ㎛
ER25(SET)	2.0-16.0	1.0	15pcs	10 ㎛
ER32(SET)	3.0-20.0	1.0	18pcs	10 ㎛
ER40(SET)	6.0-26.0	1.0	21pcs	15 ㎛

M This is metric size. We can also provide in inch type

High speed synchro tapping chuck

DST new

- Tapping chuck for high speed machining
- Specially designed structure for absorbing thrust load and preventing damage on the tap
- Through coolant system available
- Applicable range: M1-M22



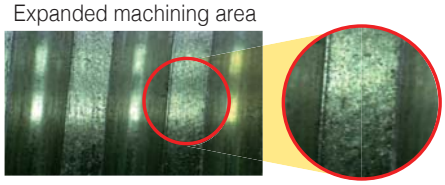
Code system

BT40 - DST 20 - 100

- BT40 — Spindle
- DST — Tapping holder
- 20 — Max. Chucking dia.
- 100 — Length

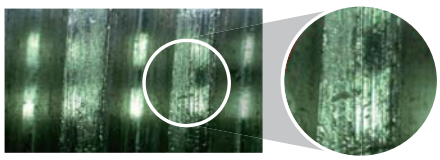
Excellent performance, precise machining

Expanded machining area

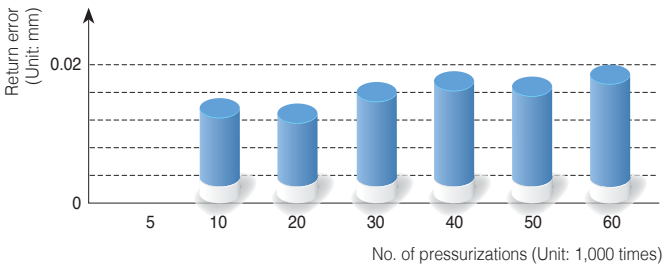


DST22
(vc = 100 m/min)

Excellent cutting face



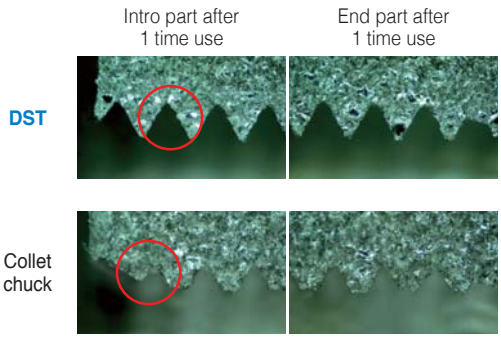
Conventional one

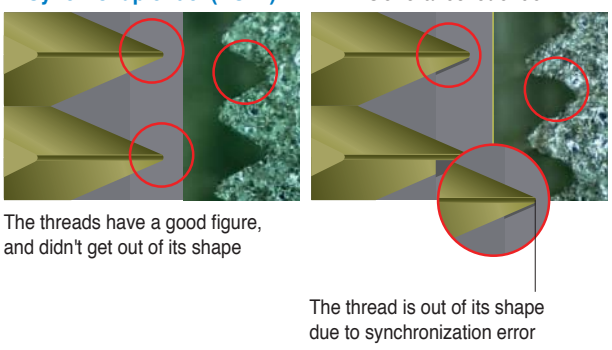




Exclusive collet for tapping
- At tapping work use of TER collet
- DST3: Use of ER11 collet

Comparison of thread figures

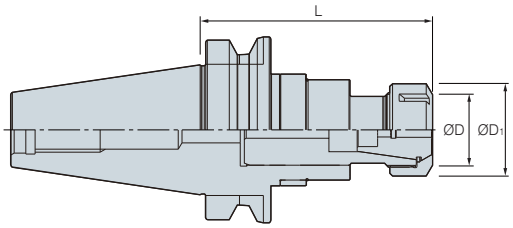




M This is metric size. We can also provide in inch type

BT-DST





(mm)

Designation			ØD	ØD1	L	Collet	Tapping range	F-	F+
BT30 -	DST3 -	70	26	19	70	ER11	M1~M3	0.5	0.5
	DST10 -	95	40.4	28	95	TER16	M3~M10	0.5	0.5
BT40 -	DST10 -	100	40.4	28	100	TER16	M3~M10	0.5	0.5
	DST22 -	110	60	49.5	110	TER32	M6~M22	0.7	0.7
BT50 -	DST10 -	110	60	49.5	110	TER16	M3~M10	0.5	0.5
	DST22 -	130	60	49.5	125	TER32	M6~M22	0.7	0.7

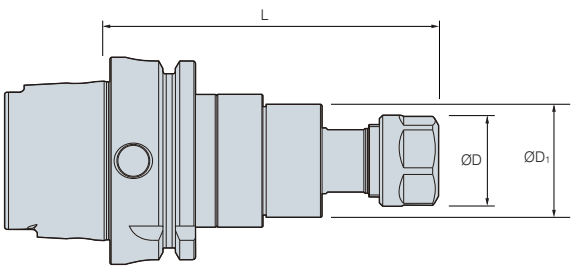
Applicable collet I35, I43

• Through coolant system is optional

M This is metric size. We can also provide in inch type

HSK-DST





(mm)

Designation			ØD	ØD1	L	Collet	Tapping range	F-	F+
HSK63A -	DST10 -	100	40.4	28	100	TER16	M3~M10	0.5	0.5
	DST22 -	130	60	49.5	130	TER32	M6~M22	0.7	0.7

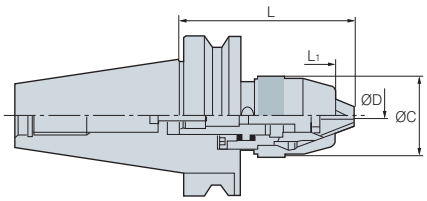
Applicable collet I43

• Through coolant system is optional

M This is metric size. We can also provide in inch type

BT-NPU





(mm)

Designation			ØD (Clamping range)	ØC	L	L_1	kg
BT30 -	NPU8 -	97	0~8	38	97	8.5	0.8
	NPU13 -	125	1~13	50	125	12.5	1.5
BT40 -	NPU8 -	87	0~8	38	87	8.5	1.3
	NPU13 -	105	1~13	50	105	12.5	1.7
	NPU1a3 -	130	1~13	50	130	12.5	2.0
BT50 -	NPU13 -	115	1~13	50	115	12.5	4.4
	NPU13 -	130	1~13	50	130	12.5	4.6
	NPU13 -	190	1~13	50	190	12.5	5.4

• Through coolant system not available

M This is metric size. We can also provide in inch type

Parts

Division	Spare parts		
	Basic		Option
	Chuck	Bolt	Spanner
Type			
NPU08	NPU08	BX0820	NPU0836
NPU13	NPU13	BX0825	NPU1348

Tapping holder

DTN

- Compact design and slim type
- Improvement of tapping force
- Tapping range M3 ~ M38



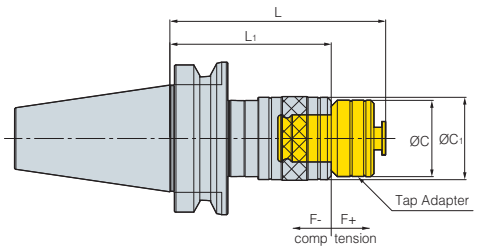
Code system

BT40 - DTN 22 - 130

Spindle	Tapping holder	Max. chucking dia.	Length

Easy exchange of TCA (Tap adaptor)

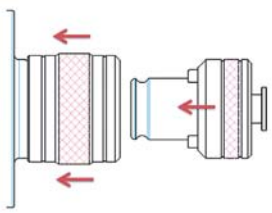
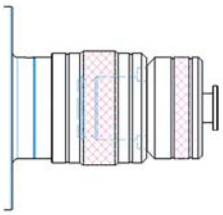
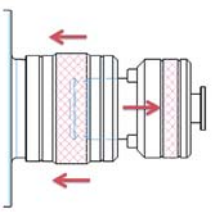
Convenient one-touch exchange type for high precision and longer tool life
Contraction of length is possible by axial floating way



Improved cutting result



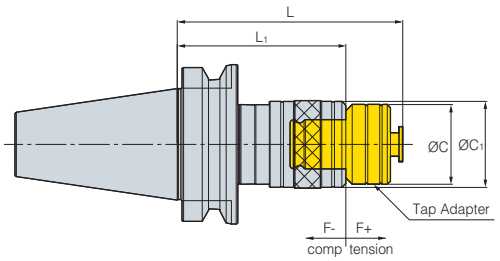
How to clamp TCA and a tap holder

Before installation	After installation	Disassembly
		
1. Insert TCA pushing the cover of tap holder 2. Clamp the TCA in the Key groove and firmly	1. The cover of tap holder is placed correctly	1. Seaparate the TCA pushing the cover of tap holder

M This is metric size. We can also provide in inch type

BT-DTN





(mm)

Designation			Tapping range	L	L_1	ØC	$ØC_1$	Adaptor	F-	F+	kg
BT30 -	DTN12 -	85	M3~M12	85	60	32	39	TCA1-M	4	10	0.7
BT40 -	DTN12 -	90	M3~M12	90	65	32	39	TCA1-M	4	10	1.2
		120	M3~M12	120	95	32	39	TCA1-M	4	10	1.4
	DTN22 -	130	M8~M22	130	96	50	56	TCA2-M	12.5	12.5	1.7
		160	M8~M22	160	126	50	56	TCA2-M	12.5	12.5	2.1
BT50 -	DTN12 -	100	M3~M12	100	75	32	39	TCA1-M	4	10	3.7
		130	M3~M12	130	105	32	39	TCA1-M	4	10	3.9
	DTN22 -	140	M8~M22	140	104	50	56	TCA2-M	12.5	12.5	4.2
		170	M8~M22	170	134	50	56	TCA2-M	12.5	12.5	4.7
	DTN38 -	185	M16~M38	185	140	72	81	TCA3-M	20	20	5.7
		215	M16~M38	215	170	72	81	TCA3-M	20	20	6.6

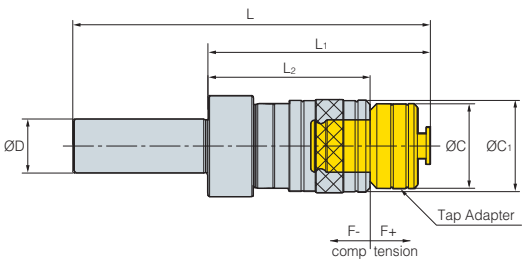
Tap Adapter (TCA) I 42

• Through coolant system not available • Tap adaptor is optional

M This is metric size. We can also provide in inch type

S-DTN





(mm)

Designation			Tapping range	ØD	L	L_1	L_2	ØD	ØD	F-	F+	Adaptor
S32 -	DTN12 -	90	M3-M12	32	170	90	65	32	39	4	10	TCA1
S32 -	DTN22 -	130	M8-M24	32	210	130	96	50	56	12.5	12.5	TCA2

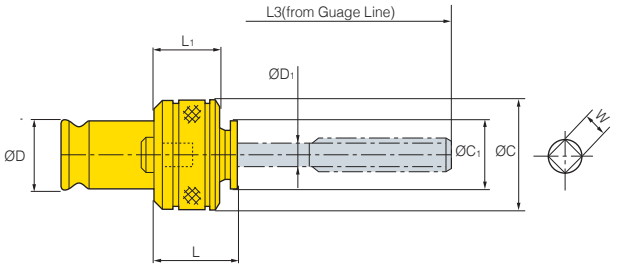
Tap Adapter (TCA) I 42

• Through coolant system not available • Tap adaptor is optional

M This is metric size. We can also provide in inch type

TCA Tap Adaptor





(mm)

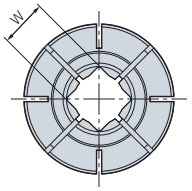
Designation		ØD	ØC	L	L1	kg
TCA1 -	M3	4	3.2	24	22	0.2
	M4	5	4	24	22	0.2
	M5	5.5	4.5	24	22	0.2
	M6, 1/4U	6	4.5	24	22	0.2
	M8	6.2	5	25	22	0.2
	M10, 3/8U	7	5.5	25	22	0.2
	M11	8	6	39	22	0.2
	M12	8.5	6.5	26	22	0.2
TCA2 -	M8	6.2	5	38	28	0.6
TCS2 -	M10	7	5.5	38	28	0.6
TCA2 -	M12	8.5	6.5	39	28	0.6
	M14, 3/4U	10.5	8	41	28	0.6
	P1/4	11	9	31	28	0.6
TCS2 -	M16	12.5	10	43	28	0.6
TCA2 -	M18, P3/8	14	11	44	28	0.6
	M20	15	12	45	28	0.6
	M22	17	13	46	28	0.6
	P1/2	18	14	36	28	0.6
	M24	19	15	46	28	1.8
TCA3 -	M16	12.5	10	35	37	1.8
	M18	14	11	37	37	1.8
	M20	15	12	37	37	1.8
	M22	17	13	38	37	1.8
	M24	19	15	44	37	1.8
	M27, 1U	20	15	62	37	1.8
	M30, P3/4	23	17	62	37	1.8
	M33	25	19	66	37	1.8
	M36, M38	28	21	68	37	1.8

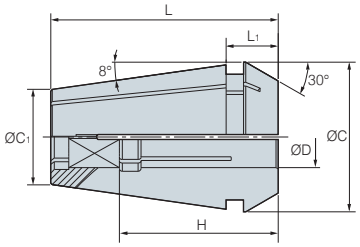
• DIN standard products can be ordered • Through coolant system not available

M This is metric size. We can also provide in inch type

TER Tap Collet







(mm)

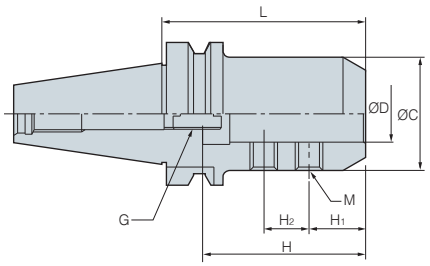
Designation		Tapping Range	ØD	W	ØC	ØC1	L	L1	H
TER16 -	**4x3.2**	M3	4	3.2	16.74	10.1	27.5	6.3	18
	5x4	M4	5	4	16.74	10.1	27.5	6.3	18
	5.5x4.5	M5	5.5	4.5	16.74	10.1	27.5	6.3	18
	6x4.5	M6,U1/4	6	4.5	16.74	10.1	27.5	6.3	18
	6.2x5	M7, M8	6.2	5	16.74	10.1	27.5	6.3	18
	7x5.5	M9, M10, U3/8	7	5.5	16.74	10.1	27.5	6.3	18
TER20 -	**5x4**	M4	5	4	20.74	13.2	31.5	7.2	18
	5.5x4.5	M5	5.5	4.5	20.74	13.2	31.5	7.2	18
	6x4.5	M6,U1/4	6	4.5	20.74	13.2	31.5	7.2	18
	6.2x5	M7, M8	6.2	5	20.74	13.2	31.5	7.2	18
	7x5.5	M9, M10, U3/8	7	5.5	20.74	13.2	31.5	7.2	18
	8x6	M11, U7/16, P1/8	8	6	20.74	-	-	-	-
	8.5x6.5	M12	8.5	6.5	20.74	13.2	31.5	7.2	22
TER25 -	**5x4**	M4	5	4	25.74	17.6	34	7.5	18
	5.5x4.5	M5	5.5	4.5	25.74	17.6	34	7.5	18
	6x4.5	M6	6	4.5	25.74	17.6	34	7.5	18
	6.2x5	M7, M8	6.2	5	25.74	17.6	34	7.5	18
	7x5.5	M9, M10, U3/8	7	5.5	25.74	17.6	34	7.5	18
	8.5x6.5	M12	8.5	6.5	25.74	17.6	34	7.5	22
TER32 -	**6x4.5**	M6,U1/4	6	4.5	32.74	23.1	40	8.2	18
	6.2x5	M7, M8	6.2	5	32.74	23.1	40	8.2	18
	7x5.5	M9, M10, U3/8	7	5.5	32.74	23.1	40	8.2	18
	8X6	M11, U7/16, P1/8	8	6	32.74	23.1	40	8.2	22
	8.5x6.5	M12	8.5	6.5	32.74	23.1	40	8.2	22
	10.5x8	M14, U9/16	10.5	8	32.74	23.1	40	8.2	25
	12.5x10	M16	12.5	10	32.74	23.1	40	8.2	25
	14x11	M18, P3/8	14	11	32.74	23.1	40	8.2	25
	15x12	M20	15	12	32.74	23.1	40	8.2	25
	17x13	M22, U7/8	17	13	32.74	23.1	40	8.2	25
	11x9	P1/4	11	9	32.74	23.1	40	8.2	25
	12x9	U5/8	12	9	32.74	23.1	40	8.2	25
	9x7	U1/2	9	7	32.74	23.1	40	8.2	22

• Water proof tapping is possible with the use of RTJW and nuts (limited to the right sizes)

M This is metric size. We can also provide in inch type

BT-SLA





(mm)

Designation			ØD	L	ØC	H	H_1	H_2	M	G	kg
BT30 -	SLA16 -	90	16	90	40	70	25	20	M10	M12	1.1
	SLA20 -	90	20	90	50	70	25	20	M12	M12	1.2
	SLA25 -	90	25	90	50	70	25	20	M12	M12	1.2
BT40 -	SLA16 -	90	16	90	40	70	25	20	M10	M12	1.5
	SLA20 -	90	20	90	50	70	25	20	M12	M12	1.8
	SLA25 -	90	25	90	50	70	25	20	M12	M12	2.0
	SLA32 -	90	32	90	60	80	25	25	M14	M12	2.2
		105	32	105	60	80	25	25	M14	M12	2.4
	SLA40 -	105	40	105	80	80	25	25	M16	M12	2.4
BT50 -	SLA16 -	90	16	90	40	70	25	20	M10	M12	4.2
	SLA20 -	105	20	105	50	70	25	20	M12	M12	4.4
	SLA25 -	105	25	105	50	70	25	20	M12	M12	4.4
		135	25	135	50	70	25	20	M12	M12	4.7
	SLA32 -	105	32	105	60	80	25	25	M14	M12	4.8
		135	32	135	60	80	25	25	M14	M12	5.4
		165	32	165	60	80	25	25	M14	M12	6.2
	SLA40 -	105	40	105	90	80	25	25	M16	M12	5.2
		150	40	150	90	80	25	25	M16	M12	5.8
	SLA42 -	105	42	105	90	80	25	25	M16	M12	5.8

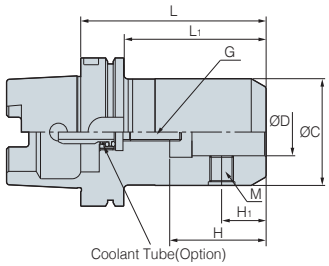
Spare Part I 45

• Through coolant system is optional

M This is metric size. We can also provide in inch type

HSK-SLA





(mm)

Designation			ØD	L	ØC	H	H1	M	G	kg
HSK63A -	SLA20 -	100	20	100	52	51	25	M16	M12	2.0
	SLA25 -	105	25	105	65	59	25	M18	M12	2.7
	SLA32 -	105	32	105	72	63	30	M20	M12	2.9
HSK100A -	SLA20 -	105	20	105	52	51	25	M16	M12	3.9
	SLA25 -	110	25	110	65	59	25	M18	M12	4.0
	SLA32 -	125	32	125	72	63	30	M20	M12	4.3

• Through coolant system is optional

M This is metric size. We can also provide in inch type

Parts

Division	Spare parts				
	Basic			Option	
	Set screw		Adjust screw	Wrench	
Type					
	DBT/BT type	HSK/SK type		DBT/BT type	HSK/SK type
SLA16	BTF1010	BTF1414-1.5	M1230C	LW-5	LW-6
SLA19	BTF1212-1.5	BTF1616-1.5		LW-6	LW-8
SLA20					
SLA25		BTF1818-1.5			
SLA32	BTF1414-1.5	BTF2020-1.5		LW-6	LW-10
SLA40	BTF1624-1.5			LW-8	
SLA42					

BT-FMA



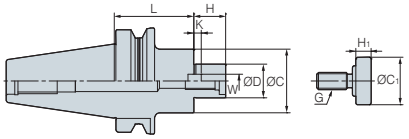


Fig. 1

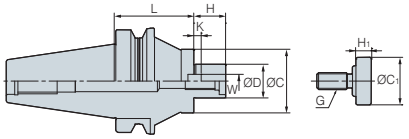


Fig. 2

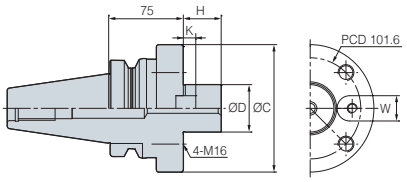


Fig. 3

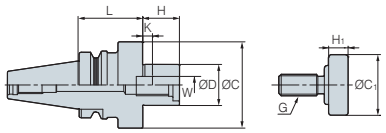


Fig. 4

(mm)

Designation			Cutter dia.	ØD	L	ØC	H	W	K	G	kg	Fig.
BT30 -	FMA25.4 -	45	80	25.4	45	50	22	9.5	5	M12	1.2	4
BT40 -	FMA25.4 -	45	80	25.4	45	50	22	9.5	5	M12	1.4	1
	FMA25.4 -	90	80	25.4	90	50	22	9.5	5	M12	3.1	1
	FMA31.75 -	45	100	31.75	45	60	30	12.7	7	M16	1.6	1
	FMA31.75 -	90	100	31.75	90	60	30	12.7	7	M16	3.0	1
	FMA38.1 -	60	125	38.1	60	80	34	15.87	9	M20	2.9	4
BT50 -	FMA25.4 -	45	80	25.4	45	50	22	9.5	5	M12	3.8	1
	FMA25.4 -	90	80	25.4	90	50	22	9.5	5	M12	4.5	1
	FMA25.4 -	150	80	25.4	150	50	22	9.5	5	M12	5.5	2
	FMA31.75 -	45	100	31.75	45	60	30	12.7	7	M16	4.6	1
	FMA31.75 -	75	100	31.75	75	60	30	12.7	7	M16	5.2	1
	FMA31.75 -	105	100	31.75	105	60	30	12.7	7	M16	6.0	2
	FMA38.1 -	45	125	38.1	45	80	34	15.87	9	M20	4.3	1
	FMA38.1 -	75	125	38.1	75	80	34	15.87	9	M20	5.5	1
	FMA50.8 -	45	160	50.8	45	100	36	19.05	10	M24	4.8	1
	FMA50.8 -	75	160	50.8	75	100	36	19.05	10	M24	6.8	1
	FMA47.625 -	75	200	47.625	75	128	38	25.4	12.5	-	7.5	3

• Through coolant system is optional • The weight above exclude the face cutter

M This is metric size. We can also provide in inch type

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Key bolt	Wrench bolt	Wrench
Type					
FMA22	K8.0	MBA-M10	BX0310	-	LW-8
FMA22.225	K8.0	MBA-M10	BX0310	-	LW-8
FMA25.4	K9.5	MBA-M12	BX0412	BX1230	LW-10
FMA31.75	K12.7	MBA-M16	BX0516	-	LW-14
FMA38.1	K15.87	MBA-M20	BX0616	-	LW-17
FMA50.8	K19.05	MBA-M24	BX0820	-	LW-19
FMA47.625	K25.4	-	BX1020	BX1645	-
S-FMA25.4	-	-	-	-	LW-10
S-FMA31.75	-	-	-	-	LW-14

BT-FMC



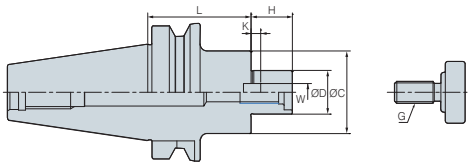


Fig. 1

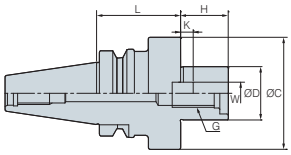


Fig. 2

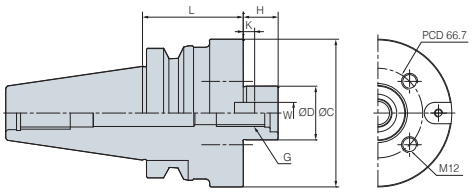


Fig. 3

(mm)

	Designation		Cutter dia.	ØD	L	ØC	H	W	K	G	kg	Fig.
BT30 -	FMC16 -	45	40	16	45	38	17	8	5.0	M8	0.7	1
	FMC22 -	45	50/63	22	45	48	19	10	5.6	M10	0.8	2
	FMC27 -	50	80	27	50	60	21	12	6.3	M12	1.2	2
BT40 -	FMC16 -	60	40	16	60	38	17	8	5.0	M8	1.2	1
	FMC22 -	45	50/63	22	45	48	19	10	5.6	M10	1.2	1
	FMC22 -	90	50/63	22	90	48	19	10	5.6	M10	1.2	1
	FMC27 -	60	80	27	60	60	21	12	6.3	M12	1.8	2
	FMC27 -	90	80	27	90	60	21	12	6.3	M12	3.2	2
	FMC32 -	60	100	32	60	78	24	14	7.0	M16	2.3	2
	FMC40 -	50	125/160	40	50	89	27	15.87	8.0	M20	3.3	3
BT50 -	FMC16 -	60	40	16	60	38	17	8	5.0	M8	3.9	1
	FMC22 -	60	50/63	22	60	48	19	10	5.6	M10	4.1	1
	FMC27 -	40	80	27	40	60	21	12	6.3	M12	4.1	1
	FMC27 -	90	80	27	90	60	21	12	6.3	M12	5.5	1
	FMC27 -	150	80	27	150	60	21	12	6.3	M12	6.1	1
	FMC32 -	45	100	32	45	78	24	14	7.0	M16	4.2	1
	FMC32 -	75	100	32	75	78	24	14	7.0	M16	4.2	1
	FMC32 -	105	100	32	105	78	24	14	7.0	M16	4.2	1
	FMC40 -	50	125/160	40	50	89	27	15.87	8.0	M20	4.6	3

• Through coolant system is optional • The weight above exclude the face cutter

M This is metric size. We can also provide in inch type

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Key bolt	Wrench bolt	Wrench
Type					
FMC 16	K8.0	-	BX0310	BX0830	LW-6
FMC 22	K10.0	-	BX0412	BX1030	LW-8
FMC 25.4	K9.5	-	BX0516	BX1230	LW-10
FMC 27	K12.0	MBA-M12	BX0616	-	LW-10
FMC 32	K14.0	MBA-M16	BX0616	-	LW-14
FMC38.1	K15.87	MBA-M16	BX0616	-	LW-14
FMC40	K15.87	MBA-M20	BX0616	-	LW-17

HSK-FMC



Fig. 1

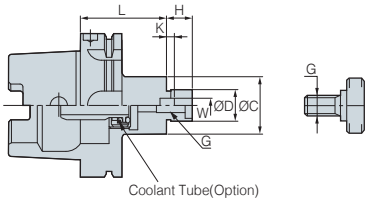


Fig. 2

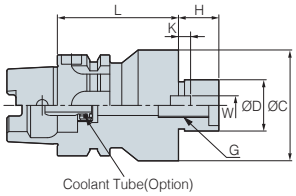
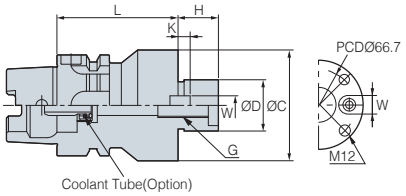


Fig. 3



(mm)

Designation		Cuttter dia.	ØD	L	ØC	H	W	K	G	kg	Fig.
HSK50A -	FMC16 - 40	40	16	40	38	17	8	5	M8	0.8	1
	FMC22 - 50	50/63	22	50	48	19	10	5.6	M10	0.9	1
HSK63A -	FMC16 - 50	40	16	50	38	17	8	5.0	M8	1.1	1
	FMC22 - 50	50/63	22	50	48	19	10	5.6	M10	1.2	1
	FMC27 - 60	80	27	60	60	21	12	6.3	M12	1.4	1
	FMC32 - 60	100	32	60	78	24	14	7.0	M16	1.8	2
	FMC40 - 60	125/160	40	60	89	27	15.87	8.0	M20	2	3

• Through coolant system is optional • The weight above exclude the face cutter

M This is metric size. We can also provide in inch type

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Key bolt	Wrench bolt	Wrench
Type					
FMC 16	K8.0	-	BX0310	BX0830	LW-6
FMC 22	K10.0	-	BX0412	BX1030	LW-8
FMC 25.4	K9.5	-	BX0516	BX1230	LW-10
FMC 27	K12.0	MBA-M12	BX0616	-	LW-10
FMC 32	K14.0	MBA-M16	BX0616	-	LW-14
FMC38.1	K15.87	MBA-M16	BX0616	-	LW-14
FMC40	K15.87	MBA-M20	BX0616	-	LW-17

Available for various angles

ANGULAR HEAD



Features

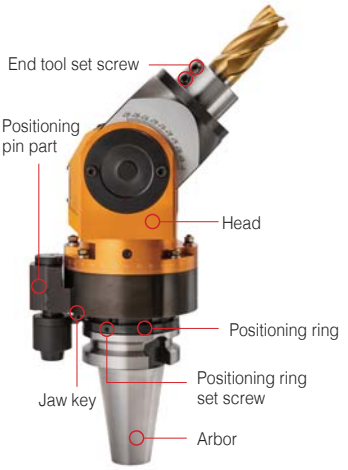
- Doubled effect by one equipment / Available for various angles
- Lighter aluminum body

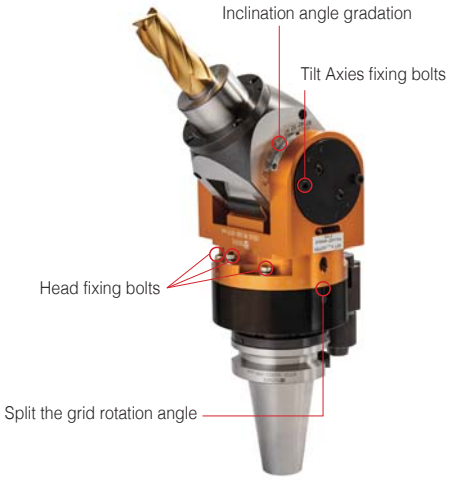
Code system

BT50 - KHU 10 - 195

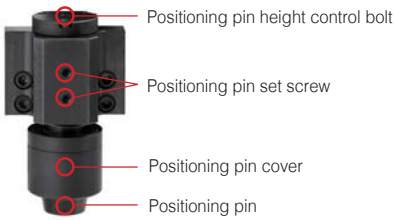
Spindle	Tapping holder	Max. chucking dia.	Length

Name of angular head parts

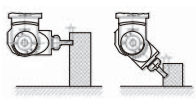
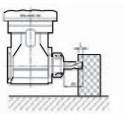
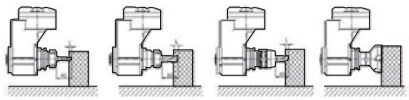




Positioning pin details



Various applications

			
0~90-degree rotating (MAH, KHU)	Fixed 90-degree type (KAH)	Fixed 45-degree type (KAC)	Attachment type (HRAG, KAG)

Components



M This is metric size. We can also provide in inch type

MAH

Universal type MAH (Reinforced series)

- Reinforced type Better performance by improving existing universal Angular head
  - Stability on large mold machining
  - Use 32mm Ball Endmill
  - Reinforced from KHU type



HRAG

Attachment type HRAG (Reinforced type)

- HRAG: The reinforced bracket enhanced durability upto 200%
  - Stablility on face milling machining
  - Reinforced stiffness from KAG type

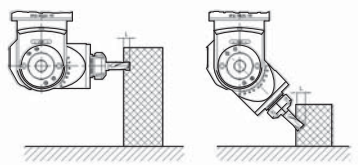


KHU

Universal type KHU

- Free angle adjusting up to 90°
  - HSK and SK type are order made





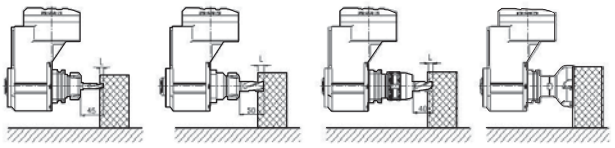
BT50-KHU20-195

KAG

Attachment type KAG

- Free 360° angle adjusting from side to side
  - Possible to use various tools of BT40 and BT30
  - HSK and SK type are order made





BT40-SDC20-60 (Ø12 E/M)

NT40-SDC20-60 (Ø20 E/M)

BT40-NPM20-85 (Ø20 E/M)

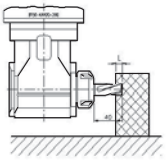
BT40-FMA25.4-45 (Ø80 Shoulder Mill)

KAH

Modular type KHU (90° type)

- Fixed 90° type angular head
  - In case of using a tap collet, please contact us in advance
  - HSK and SK type are order made





BT50-KAH20-200

KAC

Modular type KAC (45° type)

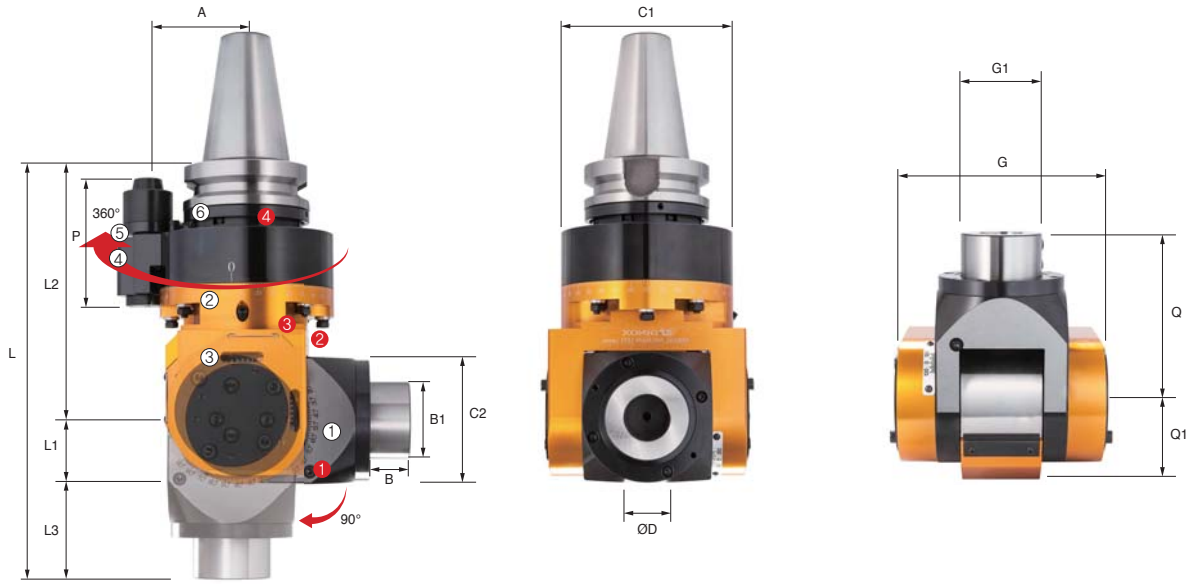
- Fixed 45° type angular head
  - HSK and SK type are order made



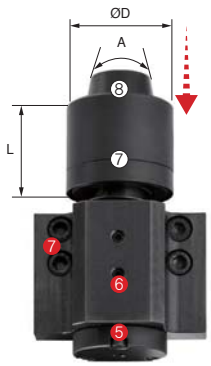
M This is metric size. We can also provide in inch type

MHA for mold (0°~90°)_Reinforced type

BT-MAH



Positioning pin



Shank size	L	A	ØD
BT50	56.5	30°	Ø40

NO	Name
①	Inclination angle gradation (Axial positioning in 0°~90°)
②	Rotating angle graduation (Free radius position in 360°)
③	Head
④	Positioning pin part
⑤	Jaw key
⑥	Positioning ring
⑦	Positioning pin cover
⑧	Positioning pin

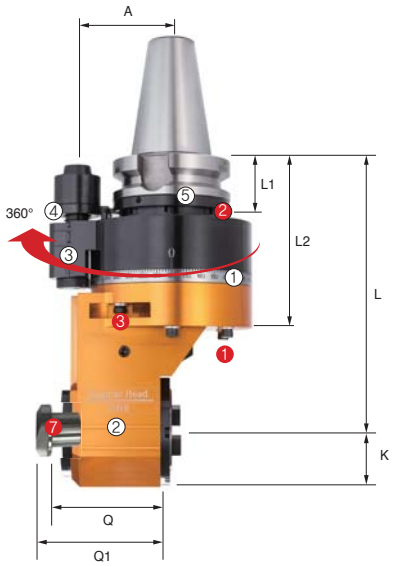
NO	Part name	Designation
❶	Inclination angle gradation screw	BT1216
❷	Head fixed bolts	BT0645
❸	Rotating angle graduation screw	BT0640
❹	Positioning ring set screw	MSST5-12
❺	Positioning pin height control bolt	BT0516
❻	Positioning pin set screw	BT0512
❼	Body position block set screw	BX0516

Designation	ØD	L	L1	L2	L3	C	C1	G	C2	Q	Q1	B	B1	P	A	MAX RPM	Install tool	kg
BT50-MAH32-200	32	200	47	78	325	136	95	154	95	125	63	31	60	95	80	3,000	SIDE LOCK	19

M This is metric size. We can also provide in inch type

HRAG (90° fixed)_Reinforced type

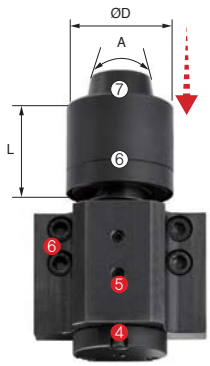
BT-HRAG







Positioning pin



Shank size	L	A	ØD
BT50	56.5	30°	Ø40

NO	Name
①	Rotating angle graduation (Free radius position in 360°)
②	Head
③	Positioning pin part
④	Jaw key
⑤	Positioning ring
⑥	Positioning pin cover
⑦	Positioning pin

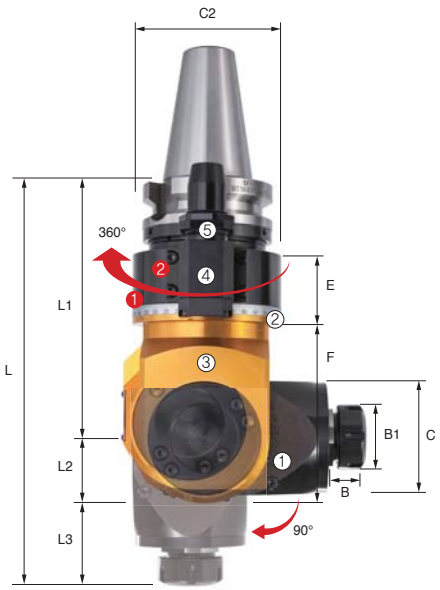
NO	Part name	Designation
1	Head fixed bolts	BX0660
2	Positioning ring set screw	MSST5-12
3	Rotating angle graduation screw	BT0648
4	Positioning pin height control bolt	BT0516
5	Positioning pin set screw	BT0512
6	Body position block set screw	BX0516
7	BT/NT Bolt	

Designation	L	L1	L2	L3	L4	Q	Q1	A	G	G1	MAX RPM	Tool shank	kg
BT50-HRAG40-230	230	56.5	145	46.5	276.5	89	101	80	93	136	3000	BT/NT40	15.75

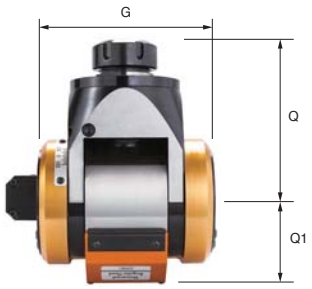
M This is metric size. We can also provide in inch type

KHU (0°~90°)_Collet type

BT-KHU







Positioning pin



Shank size	L	L1	A	ØD
BT40	Max: 32 Min: 26	10	20°	Ø19.6
BT50	Max: 35 Min: 29	15		Ø28

NO	Name
①	Inclination angle gradation (Axial positioning in 0°~90°)
②	Rotating angle graduation (Free radius position in 360°)
③	Head
④	Positioning pin part
⑤	Jaw key
⑥	Height control wrench hole

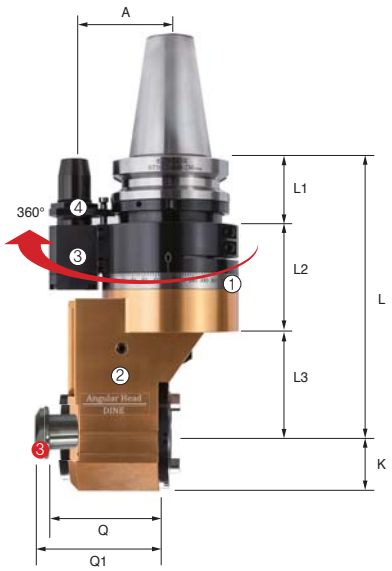
NO	Part name	Designation
❶	Bracket angle fixing bolt	BX0630
❷	Position block fixing bolt	BX0512
❸	Set screw	BT0404
❹	Fixing bolts	BXS0630

Designation	ØD	ØD1	L	L1	L2	L3	B	B1	E	F	C	A	G	Q	Q1	Torque rate (IN: OUT)	Direction of rotation (IN: OUT)	MAX RPM	Collet	kg
BT40-KHU10-160	1.0~10.0	58	160	33	54	247	22	28	51	98	96	65	90	87	40	1: 2	CW: CW	6,000	GER16	6.4
BT50-KHU10-180	1.0~10.0	58	180	33	54	267	22	28	53	103	114	80	90	87	40	1: 2	CW: CW	6,000	GER16	10.5
BT50-KHU20-195	2.0~20.0	84	195	47	73	315	29	50	53	132	114	80	124	120	63	1: 1	CW: CW	3,000	GER32	15.8

M This is metric size. We can also provide in inch type

KAG (90° fixed type)

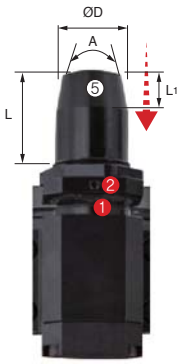
BT-KAG







Positioning pin



Shank size	L	L1	A	ØD
BT40	Max: 32 Min: 26	10	20°	Ø19.6
BT50	Max: 35 Min: 29	15		Ø28

NO	Name
①	Rotating angle graduation (Free radius position in 360°)
②	Head
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

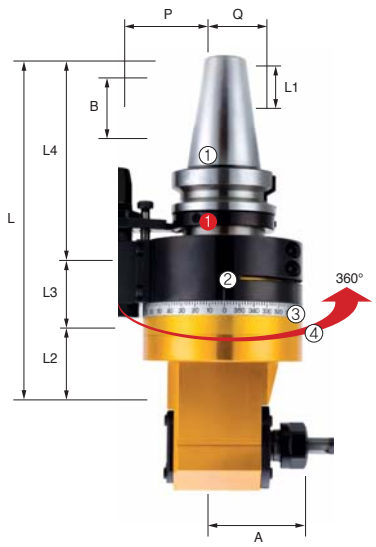
NO	Part name	Designation
1	Set screw	BT0404
2	Fixing bolts	BXS0630
3	BT / NT Bolt	

Designation	L1	L2	L3	L4	L5	L6	Q	Q1	A	C	G	Torque rate (IN: OUT)	Direction of rotation (IN: OUT)	MAX RPM	Holder shank	kg
BT40-KAG30-195	44	86	65	37.5	195	232.5	66	70	65	96	75	1: 1	CW: CW	4,000	BT30/NT30	6.4
BT50-KAG40-230	57	88	85	46.5	230	276.5	89	94	80	114	93	1: 1	CW: CW	3,000	BT40/NT40	15.8

M This is metric size. We can also provide in inch type

HRAG (90° fixed)_Collet type

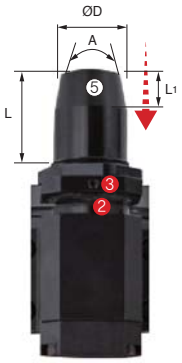
BT-KAH







Positioning pin



Shank size	L	L1	A	ØD
BT40	Max: 32 Min: 26	10	20°	Ø19.6
BT50	Max: 35 Min: 29	15		Ø28

NO	Name
①	Head
②	Rotating angle graduation (Free radius position in 360°)
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

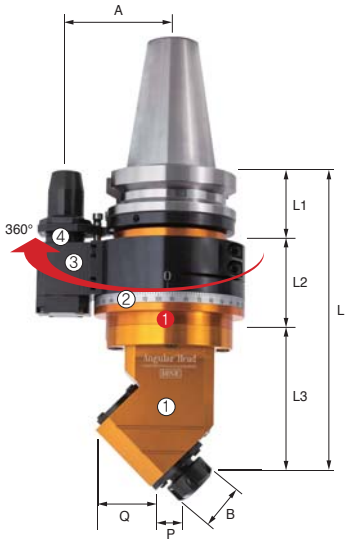
NO	Part name	Designation
1	Head fixing bolts	BX0618
2	Set screw	BT0404
3	Fixing bolts	BXS0630

Designation	ØD	L	L1	L2	L3	L4	B	A	P	Q	G	G1	Torque rate (IN: OUT)	MAX RPM	Collet	kg
BT40-KAH7-170	1.0~7.0	170	20	44	71	55	19	65	37	24.5	40	96	1: 1	5,000	GER11	4.6
BT40-KAH10-195	1.0~10.0	195	25	44	71	80	28	65	46	32	58	96	1: 1	5,000	GER16	5.8
BT40-KAH13-165	1.0~13.0	165	28	44	71	50	35	65	53	35	60	96	1: 1	5,000	GER20	5.7
BT40-KAH20-180	2.0~20.0	180	38	44	71	65	50	65	71	49	76	96	1: 1	3,500	GER32	6.7
BT50-KAH07-220	1.0~7.0	220	20	57	54	109	19	80	37	24.5	40	96	1: 1	5,000	GER11	9.8
BT50-KAH10-215	1.0~10.0	215	25	57	54	104	28	80	46	32	58	96	1: 1	5,000	GER16	10.7
BT50-KAH10-260	1.0~10.0	260	25	57	54	149	28	80	46	32	58	96	1: 1	5,000	GER16	11.0
BT50-KAH13-260	1.0~13.0	260	28	57	54	149	35	80	53	35	60	96	1: 1	5,000	GER20	11.2
BT50-KAH20-200	2.0~20.0	200	38	57	54	89	50	80	71	49	76	96	1: 1	3,500	GER32	11.6
BT50-KAH20-240	2.0~20.0	240	38	57	54	129	50	80	71	49	76	96	1: 1	3,500	GER32	12.4

M This is metric size. We can also provide in inch type

KAC (45° fixed)_Collet type

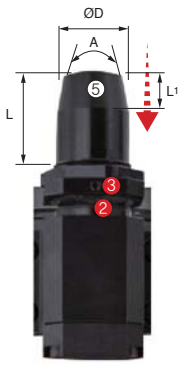
BT-KAC







Positioning pin



Shank size	L	L1	A	ØD
BT40	Max: 32 Min: 26	10	20°	Ø19.6
BT50	Max: 35 Min: 29	15		Ø28

NO	Name
①	Head
②	Rotating angle graduation (Free radius position in 360°)
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

NO	Part name	Designation
❶	Head fixing bolts	BX0618
❷	Set screw	BT0404
❸	Fixing bolts	BXS0630

Designation	ØD	L	L1	L2	L3	B	G	G1	P	Q	A	MAX RPM	Collet	kg
BT40-KAC10-220	1.0~10.0	220	44	71	105	28	60	96	25	54	65	5,000	GER16	5.3
BT40-KAC13-220	1.0~13.0	220	44	71	105	28	60	96	25	54	65	5,000	GER20	5.5
BT40-KAC20-230	2.0~20.0	230	44	71	115	50	72	96	30	60	65	3,500	GER32	6.8
BT50-KAC10-240	1.0~10.0	240	57	54	129	28	60	96	25	54	80	5,000	GER16	10.2
BT50-KAC13-240	1.0~13.0	240	57	54	129	28	60	96	25	54	80	5,000	GER20	10.4
BT50-KAC20-250	2.0~20.0	250	57	54	139	50	72	96	30	60	80	3,500	GER32	11.7

M This is metric size. We can also provide in inch type

FBH back boring & balanced type

FBH/B

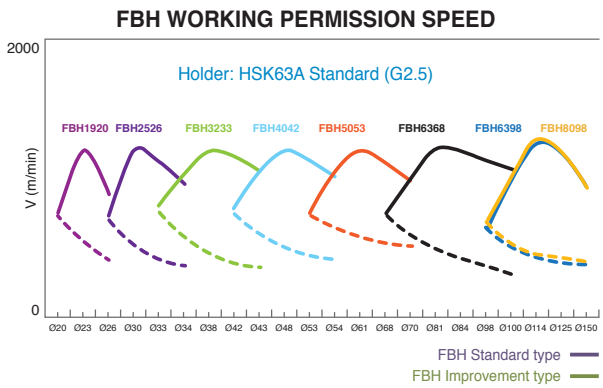
- High speed boring and back boring capability
- High precision balancing: G2.5, Head: G6.3
- Min. adjustment range: 2 ㎛



Code system

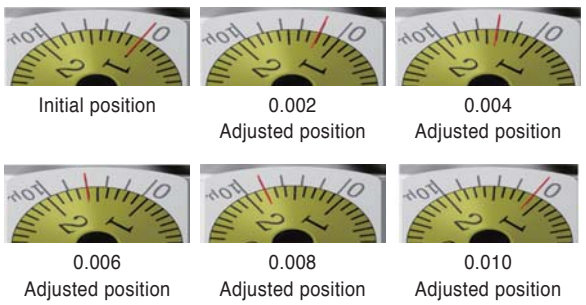
FBH	32	-	33	B
Fine boring head	MD		Min. Boring dia.	Balance type

Working permission speed



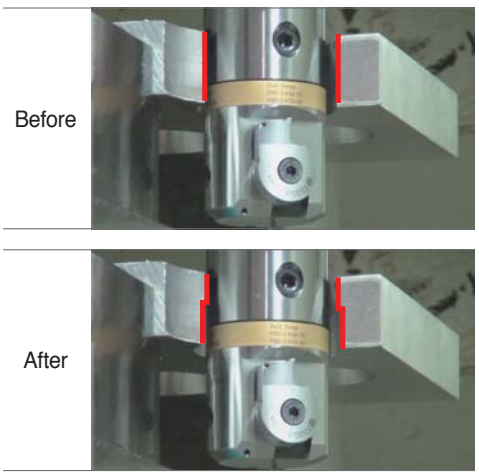
Boring range adjustment method

2㎛ Boring range



Initial position	0.002 Adjusted position	0.004 Adjusted position
0.006 Adjusted position	0.008 Adjusted position	0.010 Adjusted position

Back boring



Adjusting machining direction available



By forward machining

By reverse machining

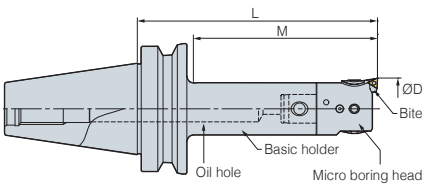
Easy change of machining direction
only by adjusting the bite

M This is metric size. We can also provide in inch type

BT-FBH/B

Micro Boring Balance type





(mm)

Designation					Boring range ØD		L	Max. Boring depth	kg
Head	Bite	Body (Basic holder)			Min	Max			
FBH1920B	FBB20N-□-□□	BT30 -	MD19F -	70R	20 (24)	26 (30)	103	60	0.5
FBH2526B	FBB26N-□-□□		MD25F -	90R	26 (32)	34 (40)	127	80	0.7
FBH3233B	FBB33N-□-□□		MD32F -	80R	33 (40)	43 (50)	121	80	0.8
FBH4042B	FBB42N-□-□□		MD40F -	80R	42 (50)	54 (62)	127	96	1.1
FBH5053B	FBB53N-□-□□		MD50F -	70	53 (65)	70 (82)	127	97	1.7
FBH1920B	FBB20N-□-□□	BT40 -	MD19F -	70R	20 (24)	26 (30)	103	45	1.9
FBH2526B	FBB26N-□-□□		MD25F -	95R	26 (32)	34 (40)	133	59	2
FBH3233B	FBB33N-□-□□		MD32F -	100R	33 (40)	43 (50)	141	77	2.5
FBH4042B	FBB42N-□-□□		MD40F -	115R	42 (50)	54 (62)	162	107	3.1
FBH5053B	FBB53N-□-□□		MD50F -	105	53 (65)	70 (82)	162	135	3.5
FBH6368B	FBB68N-□-□□		MD63F -	110	68 (90)	100 (122)	181	154	6.3
FBH6398B	FBB68N-□-□□		MD63F -	135	98 (120)	150 (172)	206	179	7.1
FBH8098B	FBB68N-□-□□		MD80F -	100	98 (120)	150 (172)	171	144	8.3
FBH1920B	FBB20N-□-□□	BT50 -	MD19F -	85	20 (24)	26 (30)	118	80	5.2
FBH2526B	FBB26N-□-□□		MD25F -	105R	26 (32)	34 (40)	142	59	5.8
FBH3233B	FBB33N-□-□□		MD32F -	110R	33 (40)	43 (50)	151	77	6
FBH4042B	FBB42N-□-□□		MD40F -	195R	42 (50)	54 (62)	242	130	6.3
FBH5053B	FBB53N-□-□□		MD50F -	225R	53 (65)	70 (82)	282	182	6.6
FBH6368B	FBB68N-□-□□		MD63F -	230R	68 (90)	100 (122)	301	220	7.2
FBH6398B	FBB68N-□-□□		MD63F -	195R	98 (120)	150 (172)	266	191	8.5
FBH8098B	FBB68N-□-□□		MD80F -	175	98 (120)	150 (172)	246	208	12.8

Spare Part I60

• Through coolant system available

M This is metric size. We can also provide in inch type

• FBB bites are divided into two sorts Normal type: FBB□□N, Scalable type: FBB□□N-1
There are also the other options for your insert type: FBB□□N-□-C09 or T11
FBB□□N, FBB□□N-1: TPGT, TPGW0802□□L
FBB□□N-□-C: CCMT,CCGT0602□□L
FBB□□N-□-C09: CCMT,CCGT09T3□□L
FBB□□N-□-T11: TPGT1103□□L

FBH

FBH1920B

New Type

Micro Boring Head

(mm)

Designation		Boring range ØD		L	Scale ring 1rev. adjustable range	MD No.	kg
		Min	Max				
FBH -	1920B	20	26 (30)	33	Ø0.4 mm	MD1911	0.06
	2526B	26	34 (40)	37	Ø0.4 mm	MD2514	0.12
	3233B	33	43 (50)	41	Ø0.5 mm	MD3218	0.24
	4042B	42	54 (62)	47	Ø0.5 mm	MD4022	0.41
	5053B	53	70 (82)	57	Ø0.6 mm	MD5028	0.8
	6368B	68	100 (122)	71	Ø0.8 mm	MD6336	1.7
	6398B	98	150 (172)	71	Ø0.8 mm	MD6336	2.35

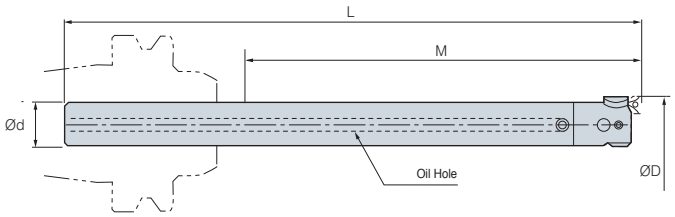
• Stock of basic holders, heads and bites are separately managed
• ( ): Max. boring diameter of extension type

M This is metric size. We can also provide in inch type

S-FBH/B

Small Micro Boring





(mm)

Designation			Shank dia ød	Boring range ØD		L	M	Designation			kg
				Min	Max			Basic shank	Boring head	Bite	
S19W -	FBH20B -	120	19	20	26	190	120	S19W-MD19F-157	FBH1920B	FBB20N	0.6
		140	19	20	26	210	140	S19W-MD19F-177	FBH1920B	FBB20N	0.7
		160	19	20	26	230	160	S19W-MD19F-197	FBH1920B	FBB20N	0.8
S25W -	FBH26B -	150	25	26	34	235	150	S25W-MD25F-197.5	FBH2526B	FBB26N	1.4
		175	25	26	34	260	175	S25W-MD25F-222.5	FBH2526B	FBB26N	1.6
		200	25	26	34	285	200	S25W-MD25F-247.5	FBH2526B	FBB26N	2
S32W -	FBH33B -	180	32	33	43	280	180	S32W-MD32F-239	FBH3233B	FBB33N	2.8
		240	32	33	43	340	240	S32W-MD32F-299	FBH3233B	FBB33N	3.5
S19 -	FBH20B -	40	19	20	26	110	40	S19-MD19F-77	FBH1920B	FBB20N	0.1
		80	19	20	26	150	80	S19-MD19F-117	FBH1920B	FBB20N	0.2
S25 -	FBH26B -	50	25	26	34	135	50	S25-MD25F-97.5	FBH2526B	FBB26N	0.4
		100	25	26	34	185	100	S25-MD25F-147.5	FBH2526B	FBB26N	0.6
S32 -	FBH33B -	90	32	33	43	190	90	S32-MD32F-149	FBH3233B	FBB33N	1.1
		120	32	33	43	220	120	S32-MD32F-179	FBH3233B	FBB33N	1.2

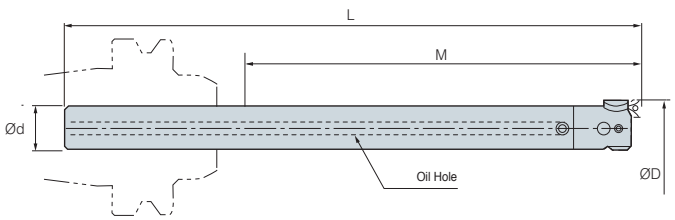
• Through coolant system available

M This is metric size. We can also provide in inch type

S-FBH

Mini Small Micro Boring





(mm)

Designation			Shank dia ød	Boring range ØD		L	M	Designation			kg
				Min	Max			Basic shank	Boring head	Bite	
S14W	FBH15	85	14	15	18	155	85	S14W-M6-123	FBH15	FBB15-C	0.2
	FBH15	110	14	15	18	180	110	S14W-M6-148	FBH15	FBB15-C	0.3
S16W	FBH18	95	16	18	22	165	95	S16W-M8-128	FBH18	FBB15-C	0.3
	FBH18	125	16	18	22	195	120	S16W-M8-158	FBH18	FBB15-C	0.4
S14	FBH15	40	14	15	18	110	40	S14-M6-78	FBH15	FBB15-C	0.1
S16	FBH18	45	16	18	22	115	45	S16-M8-78	FBH18	FBB15-C	0.1

• Through coolant system available

M This is metric size. We can also provide in inch type

Parts

Spare parts		
Type (FBH)	Lock screw	Clamp screw
FBH1920B	BTF0404	BXC0304
FBH2526B	BTF0505	BXC0405
FBH3233B	BTF0606	BXC0506
FBH4042B	BTF0808	BXC0610
FBH5053B	BTF0812	BXC0610
FBH6368B	BTF1016	BXC0810
FBH6398B	BTF1012	BXC0810
FBH8098B	BTF1014	BXC0810

FBB Bite (New type)

Designation	Boring range	Insert	Insert screw	Clamp bolt
FBB15C	Ø15~Ø18 mm Ø18~Ø22 mm	CCET0301-□□L	FTNA01633	BFTX02506N
FBB20N	Ø20~Ø26 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0304
FBB20N-C		CCET0401□□L	BFTX0204N	
FBB20N-1	Ø24~Ø30 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB20N-1-C		CCET0401□□L	BFTX0204N	
FBB26N	Ø26~Ø34 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0405
FBB26N-C		CCET0401□□L	BFTX0204N	
FBB26N-1	Ø32~Ø40 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB26N-1-C		CCET0401□□L	BFTX0204N	
FBB33N	Ø33~Ø43 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0506
FBB33N-C		CCMT0602□□/CCGT0602□□	BFTX02506N	
FBB33N-1	Ø41~Ø50 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB33N-1-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB42N	Ø42~Ø54 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0610
FBB42N-		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB42N-11		TPGT1103□□L	BFTX0307A	
FBB42N-1	Ø50~Ø62 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB42N-1-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB42N-1-T11		TPGT1103□□L	BFTX0307A	
FBB53N	Ø53~Ø70 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB53N-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB53N-11		TPGT1103□□L	BFTX0307A	
FBB53N-1	Ø65~Ø82 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB53N-1-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB53N-1-C09		CCMT09T3□□/CCGT09T3□□L	BFTX0409N	
FBB53N-1-T11		TPGT1103□□L	BFTX0307A	
FBB68N	Ø68~Ø100 mm Ø98~Ø150 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0810
FBB68N-C		CCMT09T3□□/CCGT09T3□□L	BFTX0409N	
FBB68N-11		TPGT1103□□L	BFTX0307A	
FBB68N-1	Ø90~Ø122 mm Ø120~Ø172 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB68N-1-C09		CCMT09T3□□/CCGT09T3□□L	BFTX0409N	
FBB68N-1-T11		TPGT1103□□L	BFTX0307A	

M This is metric size. We can also provide in inch type

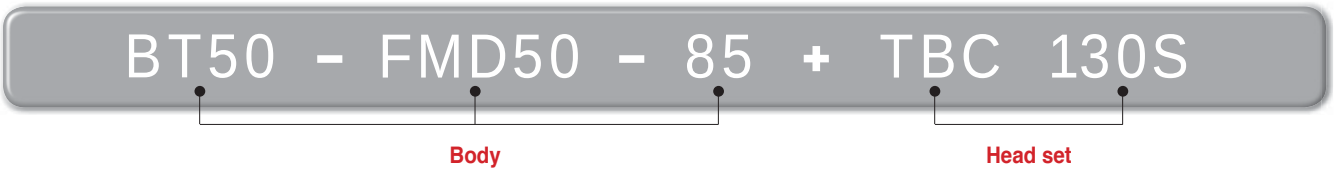
Balance cut tool for Rough boring

TBC

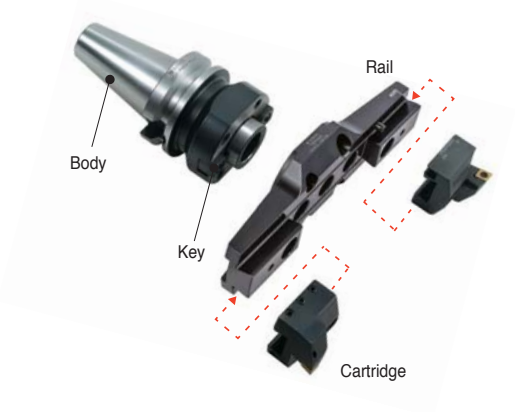
- Wide boring range for big diameters: Ø130~Ø540 mm
- Stable structure against for cutting load - Assembly by dove-tail structure
- Interconvert with FBC
  - Common boring head and rail adopted, different cartridge
- Light-weight (5%~20% reduced)
- Various cartridge approach angle: 15°, 45°



Code system

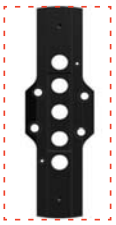


TBC boring tool structure & features





Cartridge: BCC1348
Incert: CCMT1204□□
CNMG1204□□



Less weight and more margin for chip evacuation



Enhanced strength and weight

TBC boring tool cutting condition

Workpiece	Grade (HRC)	Cutting condition		
		Tip (Grade)	Cutting speed (m/min)	Feed per revolution f (mm/rev)
ALL	ADC12	"N"Material	"N"Material	0.1
Mild steel	SS41 (HB160)	P Material	P Material	0.1
Steel	S45C (H250)	P Material	P Material	0.1
Stainless steel	SUS304	M Material	M Material	0.1
Cast-iron	FC25 (HB250)	K Material	K Material	0.1

Boring range

Grade	Dia (Ø)		Body	Head set	Insert
	min	max			
TBC130	130	180	FMD50	TBC130S	CCMT1204□□
TBC175	175	225	FMD50	TBC175S	CCMT1204□□
TBC220	220	270	FMD50	TBC220S	CCMT1204□□
TBC265	265	315	FMD50	TBC265S	CCMT1204□□
TBC310	310	390	FMD50	TBC310S	CCMT1204□□
TBC385	385	465	FMD50	TBC385S	CCMT1204□□
TBC460	460	540	FMD50	TBC460S	CCMT1204□□

M This is metric size. We can also provide in inch type

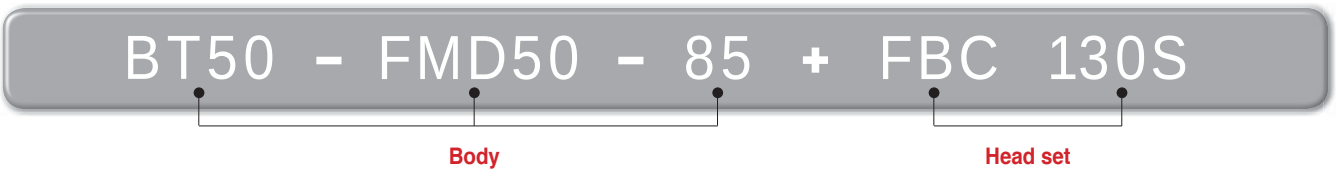
Balance cut tool for Fine boring

FBC

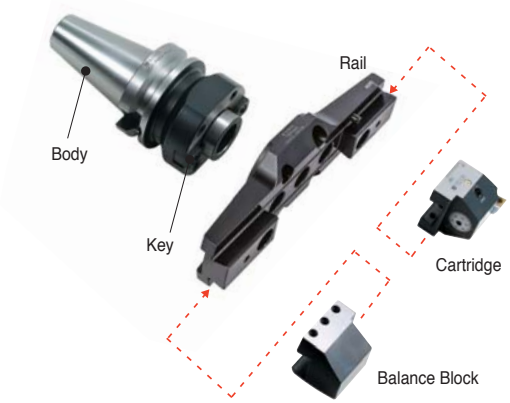
- Wide boring range for big diameters: Ø130 ~ Ø540 mm
- Interconvert with TBC
  - Common boring head and rail adopted, different cartridge [micro cartridge+balancing block]
- Various Insert according to bite
  - Applicable insert: CCMT09T3/1204, TPMT1103 (Cermet, cBN, PCD)



Code system



FBC boring tool structure & features





Cartridge
FCC130



Balance Block
FCB130



Incert
CCGT09T3□□
CCMT1204□□
TPGT1103□□

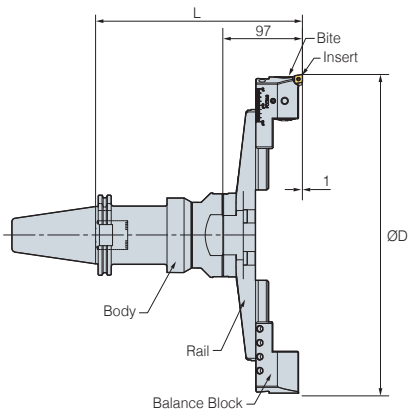
FBC boring tool cutting condition

Grade	Dia (Ø)		Head set	Insert
	min	max		
FBC130	130	180	FBC130S (TBR130+FCC130+FCB130)	FBB130-C09 (CCMT09T3□□, CCGT09T3□□) FBB130-C12 (CCMT1204□□) FBB130-T11 (TPMT1103□□,TPGT1103□□L)
FBC175	175	225	FBC175S (TBR175+FCC130+FCB130)	
FBC220	220	270	FBC220S (TBR220+FCC130+FCB130)	
FBC265	265	315	FBC265S (TBR265+FCC130+FCB130)	
FBC310	310	390	FBC310S (TBR310+FCC310+FCB310)	
FBC385	385	465	FBC385S (TBR385+FCC310+FCB310)	
FBC460	460	540	FBC460S (TBR460+FCC310+FCB310)	

M This is metric size. We can also provide in inch type

TBC, FBC





(mm)

Designation											Boring range	
Body				Rough boring (TBC)			Finish boring (FBC)					
			kg	TBC HEAD SET (Rail+Cartridge)	L	kg	FBC HEAD SET (Rail+Cartridge+Balance block)	L	kg		Min	Max
BT50 -	FMD50 -	85	5.9	TBC130S (TBR130+BCC1348)	175	3.5	FBC130S (TBR130+FCC130+FCB130)	182	3.8		130	180
		155	7.9	TBC130S (TBR130+BCC1348)	245	3.5	FBC130S (TBR130+FCC130+FCB130)	252	3.8		130	180
		205	9.7	TBC130S (TBR130+BCC1348)	295	3.5	FBC130S (TBR130+FCC130+FCB130)	302	3.8		130	180
		255	10.4	TBC130S (TBR130+BCC1348)	345	3.5	FBC130S (TBR130+FCC130+FCB130)	352	3.8		130	180
		85	5.9	TBC175S (TBR175+BCC1348)	175	3.9	FBC175S (TBR175+FCC130+FCB130)	182	4.1		175	225
		155	7.9	TBC175S (TBR175+BCC1348)	245	3.9	FBC175S (TBR175+FCC130+FCB130)	252	4.1		175	225
		205	9.7	TBC175S (TBR175+BCC1348)	295	3.9	FBC175S (TBR175+FCC130+FCB130)	302	4.1		175	225
		255	10.4	TBC175S (TBR175+BCC1348)	345	3.9	FBC175S (TBR175+FCC130+FCB130)	352	4.1		175	225
		85	5.9	TBC220S (TBR220+BCC1348)	175	4.3	FBC220S (TBR220+FCC130+FCB130)	182	4.5		220	270
		155	7.9	TBC220S (TBR220+BCC1348)	245	4.3	FBC220S (TBR220+FCC130+FCB130)	252	4.5		220	270
		205	9.7	TBC220S (TBR220+BCC1348)	295	4.3	FBC220S (TBR220+FCC130+FCB130)	302	4.5		220	270
		255	10.4	TBC220S (TBR220+BCC1348)	345	4.3	FBC220S (TBR220+FCC130+FCB130)	352	4.5		220	270
		85	5.9	TBC265S (TBR265+BCC1348)	175	4.5	FBC265S (TBR265+FCC130+FCB130)	182	4.6		265	315
		155	7.9	TBC265S (TBR265+BCC1348)	245	4.5	FBC265S (TBR265+FCC130+FCB130)	252	4.6		265	315
		205	9.7	TBC265S (TBR265+BCC1348)	295	4.5	FBC265S (TBR265+FCC130+FCB130)	302	4.6		265	315
		255	10.4	TBC265S (TBR265+BCC1348)	345	4.5	FBC265S (TBR265+FCC310+FCB310)	352	4.6		265	315
		85	5.9	TBC310S (TBR310+BCC1354)	175	5.5	FBC310S (TBR310+FCC310+FCB310)	182	5.5		310	390
		155	7.9	TBC310S (TBR310+BCC1354)	245	5.5	FBC310S (TBR310+FCC310+FCB310)	252	5.5		310	390
		205	9.7	TBC310S (TBR310+BCC1354)	295	5.5	FBC310S (TBR310+FCC310+FCB310)	302	5.5		310	390
		255	10.4	TBC310S (TBR310+BCC1354)	345	5.5	FBC310S (TBR310+FCC310+FCB310)	352	5.5		310	390
		85	5.9	TBC385S (TBR385+BCC1354)	175	5.8	FBC385S (TBR385+FCC310+FCB310)	182	5.8		385	465
		155	7.9	TBC385S (TBR385+BCC1354)	245	5.8	FBC385S (TBR385+FCC310+FCB310)	252	5.8		385	465
		205	9.7	TBC385S (TBR385+BCC1354)	295	5.8	FBC385S (TBR385+FCC310+FCB310)	302	5.8		385	465
		255	10.4	TBC385S (TBR385+BCC1354)	345	5.8	FBC385S (TBR385+FCC310+FCB310)	352	5.8		385	465
		85	5.9	TBC460S (TBR460+BCC1354)	175	12.8	FBC460S (TBR460+FCC310+FCB310)	182	12.8		460	540
		155	7.9	TBC460S (TBR460+BCC1354)	245	12.8	FBC460S (TBR460+FCC310+FCB310)	252	12.8		460	540
		205	9.7	TBC460S (TBR460+BCC1354)	295	12.8	FBC460S (TBR460+FCC310+FCB310)	302	12.8		460	540
		255	10.4	TBC460S (TBR460+BCC1354)	345	12.8	FBC460S (TBR460+FCC310+FCB310)	352	12.8		460	540

• Bites for FBC are sold separately

M This is metric size. We can also provide in inch type

FBB Bite (For FBC)



(mm)

Designation		Insert
FBB130 -	C09	CCMT09T3□□, CCGT09T3□□
	C12	CCMT1204□□
	T11	TPMT1103□□, TPGT1103□□

• TBC and DBC cartridges with tip angle of 15°/45° can be purchased by order (45° basis)

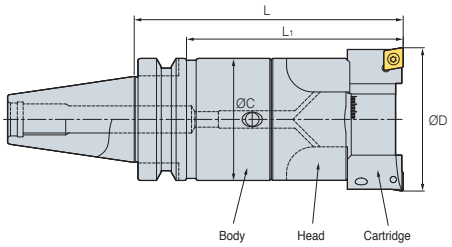
M This is metric size. We can also provide in inch type

Parts

Division	Spare parts								
	Basic								
	Rail	Cartridge	Cartridge	Clamp bolt	Clamp bolt	Balance block	Wrench	Clamp screw	Torx wrench
Type									
TBC130S	TBR130	BCC1348	-	BX0820	BT0645	-	LW-3	BFTX0511N	TW20
TBC175S	TBR175								
TBC220S	TBR220								
TBC265S	TBR265								
TBC310S	TBR310	BCC1354 (BCN1354)			BT0660				
TBC385S	TBR385								
TBC460S	TBR460								
FBC130S	TBR130	-	FCC130		BT0645	FCB130	LW-3	-	-
FBC175S	TBR175								
FBC220S	TBR220								
FBC265S	TBR265								
FBC310S	TBR310		FCC310		BT0660	FCB310			
FBC385S	TBR385								
FBC460S	TBR460								

BT-DBC





(mm)

Designation				Boring range ØD		L	Max. Boring depth
Micro boring head	kg	Body (Basic holder)	kg	Min	Max		
DBC2528S	0.3	BT30-MD25F-90R	0.4	28	35	140	93
DBC3235S	0.4	BT30-MD32F-80R	0.4	35	46	145	114
DBC4046S	0.6	BT30-MD40F-80R	0.5	46	58	150	119
DBC5058S	1.1	BT30-MD50F-70	0.8	58	74	150	128
DBC2528S	0.3	BT40-MD25F-105R	1.9	28	35	165	100
DBC3235S	0.4	BT40-MD32F-115R	2.4	35	46	180	110
DBC4046S	0.6	BT40-MD40F-110R	2.7	46	58	180	130
DBC5058S	1.1	BT40-MD50F-100R	2.7	58	74	180	130
DBC6374S	2.0	BT40-MD63F-90	3.6	74	94	180	150
DBC8094S	3.5	BT40-MD80F-100	4.8	94	120	200	173
DBC2528S	0.3	BT50-MD25F-120R	4.7	28	35	180	100
DBC3235S	0.4	BT50-MD32F-235R	5.3	35	46	300	180
DBC4046S	0.6	BT50-MD40F-230R	5.6	46	58	300	250
DBC5058S	1.1	BT50-MD50F-250R	6.5	58	74	330	280
DBC6374S	2.0	BT50-MD63F-240R	8.4	74	94	330	280
DBC8094S	3.5	BT50-MD80F-175	9.5	94	120	275	225
DBC120S	5.3	BT50-MD80F-175	9.5	120	175	275	235

M This is metric size. We can also provide in inch type

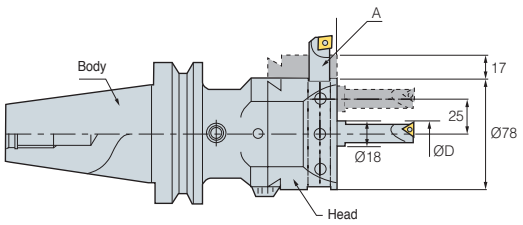
Parts

Division	Spare parts								
	Basic								
	Head	Spring pin	Wrench bolt	Wrench	Cartridge	Set screw	Wrench	Clamp screw	Torx wrench
Type									
DBC2528S	DBC2528	SP0308	BX0415	LW-3	BCC28	BT0306	LW-1.5	FTKA02565	TRX7
DBC3235S	DBC3235	SP0410	BX0515	LW-4	BCC35	BT0308			
DBC4046S	DBC4046	SP0516	BX0620	LW-5	BCC46	BT0410	LW-2	FTNA0408	TRX15
DBC5058S	DBC5058	SP0616			BCC58	BT0412			
DBC6374S	DBC6374	SP1018	BX0830	LW-6	BCC74	BT0516	LW-2.5	BFTX0511N	TRX20
DBC8094S	DBC8094	SP1020	BX1035	LW-8	BCC94	BT0620	LW-3		
DBC120S	DBC120N	SP1020	BX0830	LW-6.0	BCC120	BT0830	LW-4.0	BFTX0511N	TRX20

BT-KMB

Micro Boring





1DIV = Ø0.02mm

(mm)

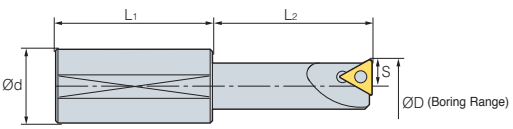
Designation			Head (Modular)	Boring bite	L	L_1	kg
BT40 -	MD63F -	64	KMB6336	BB18-□(S)	141	64	5.5
BT50 -	MD63F -	75	KMB6336	BB18-□(S)	152	75	7.0

Boring head	Bite	MD NO.	L	kg
KMB6336	BB18-□(S)	BT□□-MD63F	77	2.2

• Through coolant system is optional

M This is metric size. We can also provide in inch type

Boring bite: BBtype (For KMB)



(mm)

Designation		Boring range (Center)		Boring range (Side)		S	L_1	L_2	Insert	Insert Screw
		Min	Max	Min	Max					
BB	18-7(S)	7	40	43	91	3.5	30	30	TBGT0601□□L	BFTX0204A
	18-9(S)	9	42	45	93	4.5	30	40	TPGT0802□□L	BFTX0204A
	18-11(S)	11	44	47	95	5.5	30	45	TPGT1103□□L	BFTX0307A
	18-13(S)	13	46	49	97	6.5	40	45	TPGT1103□□L	BFTX0307A
	18-15(S)	15	48	51	99	7.5	40	50	TPGT1103□□L	BFTX0307A
	18-17(S)	17	50	53	101	8.5	40	50	TPGT1103□□L	BFTX0307A

M This is metric size. We can also provide in inch type

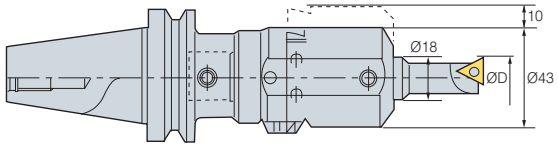
Parts

Division	Spare parts				
	Basic			Option	
	Boring head	Taper screw	Wrench	Boring bite	Basic holder
Type					
KMB	KMB6336	BTT1620F	LW-8	BB18	MD63F

BT-SMB

Small Micro Boring Bar





1DIV = Ø0.02mm

(mm)

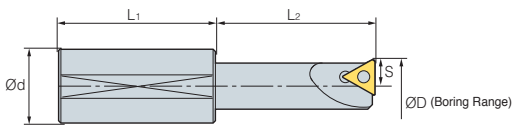
Designation	Head (Modular)	Boring bite	L	L_1	kg
BT40 - MD40F - 60	SMB4022	BB18-O(S)	122.5	60	2.8
BT50 - MD40F - 60	SMB4022	BB18-O(S)	122.5	60	5.4

Boring head	Bite	MD NO.	L	kg
SMB4022	BB18-O(S)	BTOO-MD40T	62.5	0.6

• Through coolant system not available

M This is metric size. We can also provide in inch type

Boring bite: BBtype (For SMB)



(mm)

Designation		Boring range Min	Boring range Max	S	L_1	L_2	Insert	Insert screw
BB	18-7(S)	7	27	3.5	30	30	TBGT0601□□L	BFTX0204A
	18-9(S)	9	29	4.5	30	40	TPGT0802□□L	BFTX0204A
	18-11(S)	11	31	5.5	30	45	TPGT1103□□L	BFTX0307A
	18-13(S)	13	33	6.5	40	45	TPGT1103□□L	BFTX0307A
	18-15(S)	15	35	7.5	40	50	TPGT1103□□L	BFTX0307A
	18-17(S)	17	37	8.5	40	50	TPGT1103□□L	BFTX0307A

M This is metric size. We can also provide in inch type

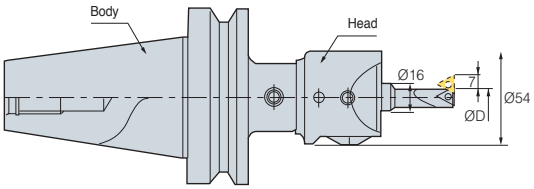
Parts

Division	Spare parts				
	Basic			Option	
	Boring head	Taper screw	Wrench	Boring bite	Basic holder
Type					
SMB	SMB4022	BTT1013F	LW-5	BB18	MD40F

BT-SMH

Small Micro Boring Bar (For High Precision)





(mm)

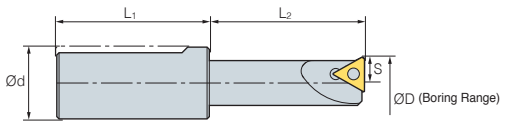
Designation	Head (Modular)	Boring bite	L	L_1	kg
BT40 - MD40F - 60	SMH4022	BB16-O(S)	109	60	3.0
BT50 - MD40F - 60	SMH4022	BB16-O(S)	109	60	6.0

Boring head	Bite	MD NO.	L	kg
SMH4022	BB18-O(S)	BTOO-MD40F	49	2.7

• Through coolant system not available

M This is metric size. We can also provide in inch type

Boring bite: BBtype (For SMH)



(mm)

Designation		Boring range ØD Min	Boring range ØD Max	S	L_1	L_2	Insert	Insert screw	Wrench
BB	**16-5(S)**	5.5	19	2.75	34	20	WBGT0601□□L	BFTX0203A	TRX06
	16-7(S)	7	21	3.5	34	30	TBGT0601□□L	BFTX0204A	TRX06
	16-9(S)	9	23	4.5	34	40	TPGT0802□□L	BFTX0204A	TRX06
	16-11(S)	11	25	5.5	34	45	TPGT1103□□L	BFTX0307A	TRX10
	16-15(S)	15	29	7.5	34	50	TPGT1604□□L	BFTX0307A	TRX10
	16-19(S)	19	33	9.5	34	60	TPGT1103□□L	BFTX0410A	TRX15

M This is metric size. We can also provide in inch type

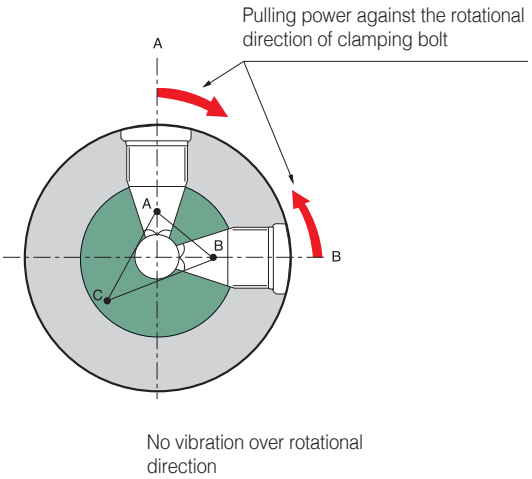
Parts

Division	Spare parts				
	Basic			Option	
	Boring head	Taper screw	Wrench	Boring bite	Basic holder
Type					
SMH	SMH4022	BTT1013F	LW-5	BB16	MD40F

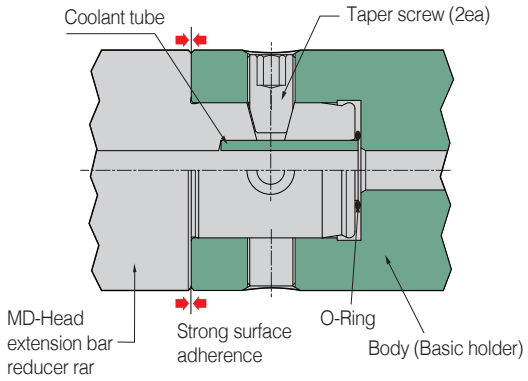
Versatile tooling system that can flexibly react to FMS

Modular System Series

- Versatile tooling system conforming to FMS specification
- Flexible combination of tool units according to conditions of subject
- Joining with a specially designed screw provides high accuracy (error less than 5μm) and ease of detach for one step setting
- Cutting edge of boring system aligned with the groove of drive key
- Corresponding accuracy and stiffness compared to uni-body type



No vibration over rotational direction





M This is metric size. We can also provide in inch type

BT-MD



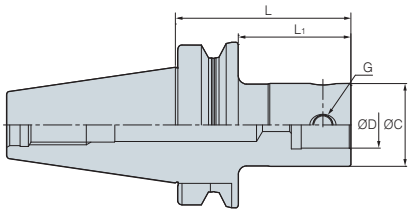


Fig. 1

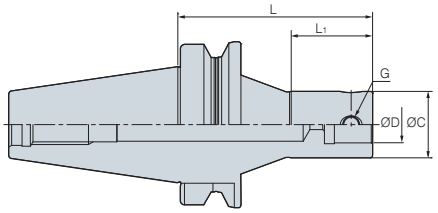


Fig. 2

(mm)

Designation		ØC	ØD	L	L_1	G	kg	Fig.
BT30 -	MD19F - 70	19	11	70	45	M5	0.4	1
	MD25F - 90	25	14	90	63	M6	0.3	1
	MD32F - 80	32	18	80	55	M8	0.4	1
	MD40F - 45	40	22	45	22	M8	0.4	1
	MD40F - 60	40	22	60	36	M10	0.5	1
	MD40F - 80	40	22	80	56	M10	0.5	1
	MD50F- 70	50	28	70	48	M12	0.8	3
BT40 -	MD19F- 70	19	11	70	40	M5	1.8	1
	MD25F- 95	25	14	95	63	M6	1.9	1
	MD25F- 105R	25	14	105	40	M6	1.9	2
	MD32F- 100	32	18	100	70	M8	2.3	1
	MD32F- 115R	32	18	115	45	M8	2.4	2
	MD40F- 60	40	22	60	31	M10	2.7	1
	MD40F- 110R	40	22	110	60	M10	2.7	2
	MD40F- 115	40	22	115	83	M10	2.7	1
	MD50F- 105	50	28	105	73	M12	2.7	1
	MD63F- 64	63	36	64	37	M16	3.3	1
	MD63F- 110	63	36	110	83	M16	3.6	1
	MD63F- 135	63	36	135	108	M16	4.6	1
	MD80F- 100	80	45	100	73	M16	4.8	3
BT50 -	MD19F- 85	19	11	85	44	M5	4.3	1
	MD25F- 105	25	14	105	62	M6	4.5	1
	MD25F- 120R	25	14	120	40	M6	4.7	2
	MD32F- 110	32	18	110	67	M8	5.1	1
	MD32F- 115R	32	18	115	45	M8	5.1	2
	MD32F- 235R	32	18	235	115	M8	5.3	2
	MD40F- 60	40	22	60	22	M10	5.0	1
	MD40F- 195	40	22	195	152	M10	5.4	1
	MD40F- 230R	40	22	230	180	M10	5.6	2
	MD50F- 125	50	28	125	82	M12	6.0	1
	MD50F- 225	50	28	225	182	M12	6.4	1
	MD50F- 250R	50	28	250	81	M12	6.5	2
	MD63F- 75	63	36	75	35	M16	6.0	1
	MD63F- 130	63	36	130	87	M16	6.8	1
	MD63F- 195	63	36	195	152	M16	8.0	1
	MD63F- 230	63	36	230	187	M16	8.4	1
	MD80F- 75	80	45	75	36	M16	9.1	1
	MD80F- 110	80	45	110	69	M16	9.4	1
	MD80F- 175	80	45	175	134	M16	9.5	1
	MD90F- 75	90	45	75	34	M16	9.3	1
	MD90F- 145	90	45	145	104	M16	9.9	1
	MD90F- 195	90	45	195	154	M16	10.2	1

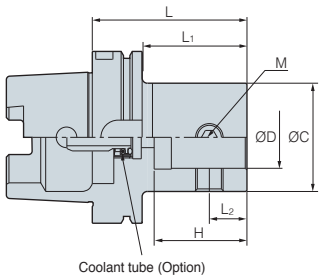
Spare Part I71

• Through coolant system available • Order made body available

M This is metric size. We can also provide in inch type

HSK-MD





(mm)

Designation		ØC	ØD	L	L1	L2	H	M
HSK 63A -	MD19F - 60	19	11	60	34	6.5	15.5	M5
	MD25F - 60	25	14	60	31	8	18.5	M6
	MD32F - 65	32	18	65	31	11	23.5	M8
	MD40F - 70	40	22	70	41	13	29	M10
	MD50F - 85	50	28	85	58	17	36	M12
	MD63F - 95	63	36	95	69	22	54	M16

• Through coolant system available

M This is metric size. We can also provide in inch type

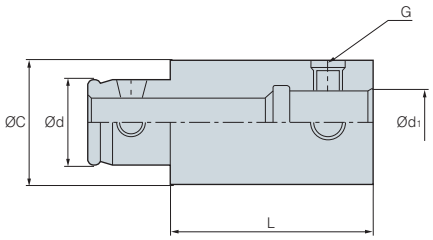
Parts

Division	Spare parts	
	Basic	Option
	Taper screw	Wrench
Type		
MD19F	BTT0506F	LW-2.5
MD25F	BTT0608F	LW-3
MD32F	BTT0810F	LW-4
MD40F	BTT1013F	LW-5
MD50F	BTT1215F	LW-6
MD63F	BTT1620F	LW-8
MD80F	BTT1626F	LW-8
MD90F	BTT1631F	LW-8

EXT

Extension Bar





(mm)

Designation		ØC	Ød	L	Ød1	G
EXT -	1930F	19	11	30	11	M5
	1950F	19	11	50	11	M5
	2530F	25	14	30	14	M6
	2550F	25	14	50	14	M6
	3235F	32	18	35	18	M8
	3260F	32	18	60	18	M8
	4040F	40	22	40	22	M10
	4090F	40	22	90	22	M12
	5050F	50	28	50	28	M12
	50100F	50	28	100	28	M12
	6360F	63	36	60	36	M16
	63120F	63	36	120	36	M16
	8070F	80	45	70	45	M16
	80120F	80	45	120	45	M16
	9080F	90	45	80	45	M16
	90130F	90	45	130	45	M16

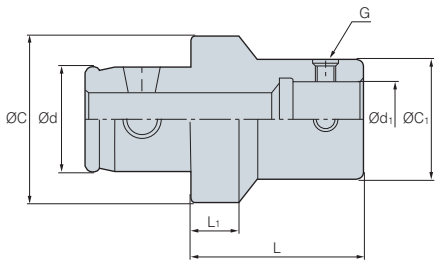
• Through coolant system available

M This is metric size. We can also provide in inch type

RDC

Reducer Bar





(mm)

Designation		Ød	ØC1	Ød1	ØC	L	L1	G
RDC -	3225F	18	25	14	32	30	9	M6
	4025F	22	25	14	40	30	9	M6
	4032F	22	32	18	40	30	9	M8
	5025F	28	25	14	50	30	9	M6
	5032F	28	32	18	50	30	9	M8
	5040F	28	40	22	50	40	10	M10
	6325F	36	25	14	63	30	9	M6
	6332F	36	32	18	63	30	9	M8
	6340F	36	40	22	63	40	10	M10
	6350F	36	50	28	63	45	10	M12
	8032F	45	32	18	80	30	9	M6
	8040F	45	40	22	80	40	10	M10
	8050F	45	50	28	80	45	10	M12
	8063F	45	63	36	80	50	13	M16

• Through coolant system available

M This is metric size. We can also provide in inch type

Parts

Division	Spare parts		
	Basic		Option
	Taper screw	Spring pin	Wrench
Type			
MD19F	BTT0506F	-	LW-2.5
MD25F	BTT0608F	SP0308	LW-3
MD32F	BTT0810F	SP0410	LW-4
MD40F	BTT1013F	SP0516	LW-5
MD50F	BTT1215F	SP0616	LW-6
MD63F	BTT1620F	SP0818	LW-8
MD80F	BTT1626F	SP1020	LW-8
MD90F	BTT1631F	SP1020	LW-8

DAMPING PRO
Anti-Vibration Tool

KORLOY Anti-Vibration tool

KORLOY DAMPING PRO

- The application of a special design provides an excellent Anti-Vibration effect and is optimized for Overhang work
- Capable to elevate Feed comparing to standard arbor with stable machining
- Longer tool life and noise decrease
- Provides a solution for Mold, Deep Cavity machining, and Heavy-duty work

Code system

KDP - CAT50 - FMA25.4 - 260

- **KDP** — KORLOY DAMPING PRO
- **CAT50** — Arbor taper
  - CAT type
  - BT type
  - HSK type
- **FMA25.4** — **FMA:** JIS B4113 Face milling; **FMB:** T-MAX Face milling/Shoulder Cutter; **FMC:** T-MAX Face milling/Shoulder Cutter
- **260** — Length of gauge line

Features



- Anti-Vibration: Exclusively designed Anti-Vibration structure
- Material: Special alloy steel
- Anti-Vibration body: Application of high density damper
- Overhang: Capable for 2D~5D
- Coolant: Inner coolant is capable

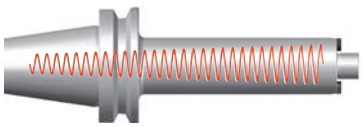


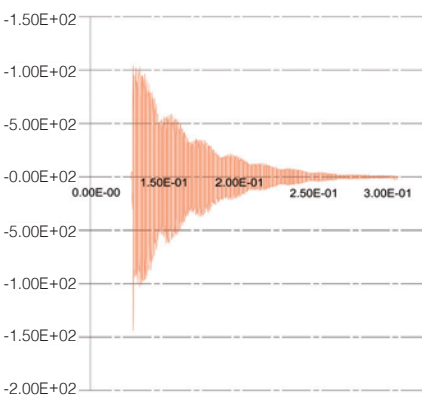
BT type HSK type SK type

Various types and sizes are applicable

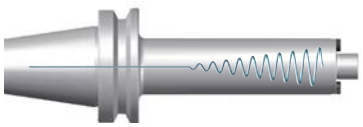
Comparison of vibration damping time

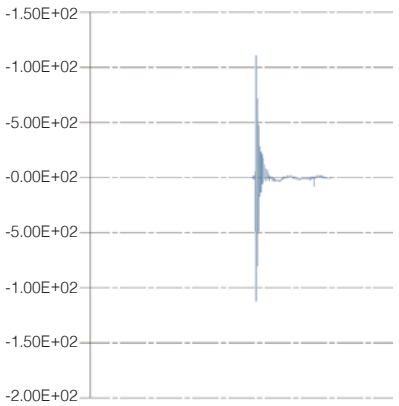
Standard arbor	KORLOY DAMPIG PRO





Longer Vibration damping time/
Chattering is caused while Overhang work

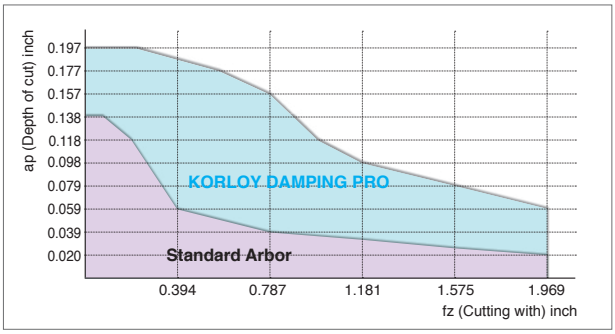




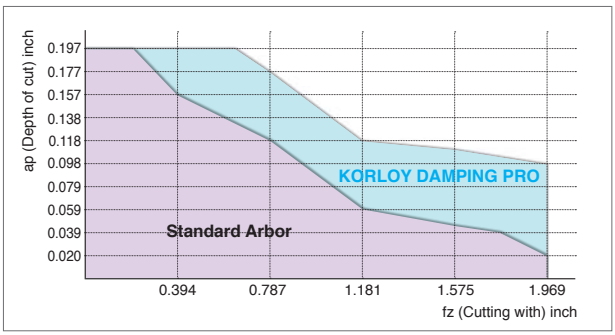
Short Vibration damping time/
Performance is 2~3 times better than standard arbor

Performance evaluation

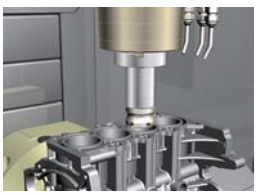
- **Cutting condition:** fz (ipt) = 0.004
  vc (sfm) = 328
- **Cutter:** AMC4063HS 6flute
- **Arbor:** BT50-FMC22-210 (Standard arbor)
  KDP-BT50-FMC22-210 (Damping pro)



- **Cutting condition:** fz (ipt) = 0.004
  vc (sfm) = 328
- **Cutter:** FMRC3063HRD-H 6flute
- **Arbor:** BT50-FMC22-210 (Standard arbor)
  KDP-BT50-FMC22-210 (Damping pro)



Application examples

Mold machining	Side milling cutter machining	Facing for long depth	Deep-hole Boring machining
			
Better productivity than general arbor	Excellent performance in the deep grooving	Better productivity and surface roughness than general arbor	Better surface roughness and machinability than general arbor

Side milling cutter machining example

- Faulty occurrence on size and surface roughness by the vibration, when use the general arbor
- **Using DAMPING PRO, good size and surface roughness**



■ **General arbor**
Cutting condition:
vc (sfm) = 164
fz (ipt) = 0.039
ae (inch) = 0.787

■ **DAMPING PRO**
Cutting condition:
vc (sfm) = 328
fz (ipt) = 0.039
ae (inch) = 0.787

Big size Crankshaft machining example

- General arbor: ap = 0.079 inch
- KORLOY DAMPING PRO: ap = 0.157 inch available
- **2 times better productivity**



■ **General arbor**
Cutting condition:
vc (sfm) = 328
fz (ipt) = 0.045
ap (inch) = 0.079

■ **DAMPING PRO**
Cutting condition:
vc (sfm) = 328
fz (ipt) = 0.045
ap (inch) = 0.157

BT-FMA

ANSI/ASMEB5.50-1985



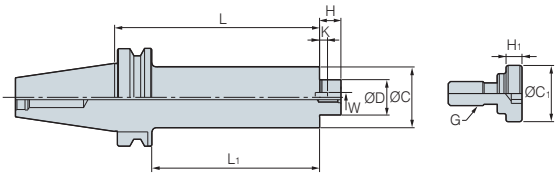


Fig. 1

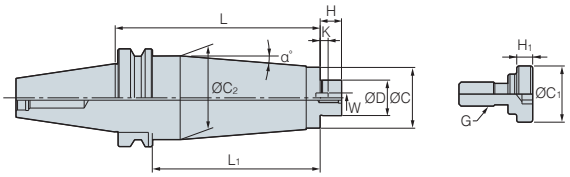


Fig. 2

(inch)

Designation		Cutter dia.	ØD	L	L_1	ØC	$ØC_2$	H	G	lbs	Fig.	α°
KDP-BT40 -	FMA1-8	3	1	8	6.937	2.25	-	0.69	1/2-20UNF	11.95	1	-
	FMA1-10	3	1	10	8.937	2.25	-	0.69	1/2-20UNF	14.33	2	-
KDP-BT50 -	FMA1-8	3	1	8	6.504	2.25	3	0.69	1/2-20UNF	21.23	2	4
	FMA1-10	3	1	10	8.504	2.25	3	0.69	1/2-20UNF	26.01	2	3
	FMA1.25-8	4	1.25	8	6.771	3	3.3	0.75	5/8-18UNF	28.00	2	1
	FMA1.25-10	4	1.25	10	8.504	3	3.3	0.75	5/8-18UNF	31.31	2	1

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Wrench bolt	Wrench bolt	Wrench
Type					
FMA25.4	K9.5(B)	MBA-M12	BX0412	BX1225	LW-10
FMA31.75	K12.7(D)	MBA-M16	BX0515	-	LW-14

CAT-FMA

ANSI/ASMEB5.50-1985



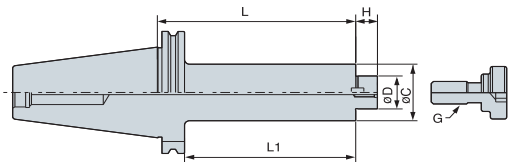


Fig. 1

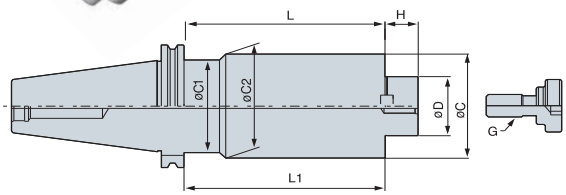


Fig. 2

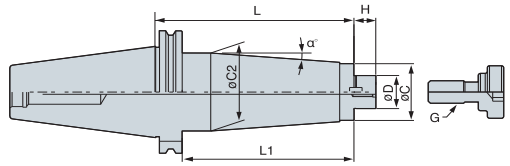


Fig. 3

(inch)

Designation		Cutter dia.	ØD	L	L_1	ØC	$ØC_1$	$ØC_2$	H	G	lbs	Fig.	α°
KDP-CAT40-	FMA0.75-8	2.5	0.75	8	7.25	1.75	-	-	0.69	3/8-24UNF	7.50	1	-
	FMA1-8	3	1	8	7.25	2.25	-	-	0.69	1/2-20UNF	10.54	2	-
KDP-CAT50-	FMA1-8	3	1	8	7.25	2.25	-	2.759	0.69	1/2-20UNF	18.30	3	2
	FMA1-10	3	1	10	9.25	2.25	-	2.759	0.69	1/2-20UNF	21.65	3	1
	FMA1.25-8	4	1.25	8	7.25	3	-	2.759	0.75	5/8-18UNF	20.72	3	1
	FMA1.25-10	4	1.25	10	9.25	3	-	2.759	0.75	5/8-18UNF	24.03	3	1

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Wrench bolt	Wrench bolt	Wrench
Type					

HSK-FMA



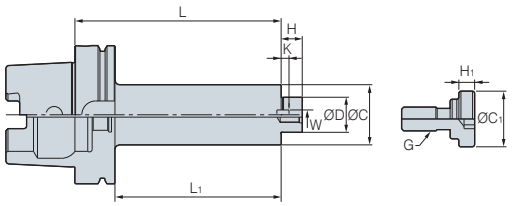


Fig. 1

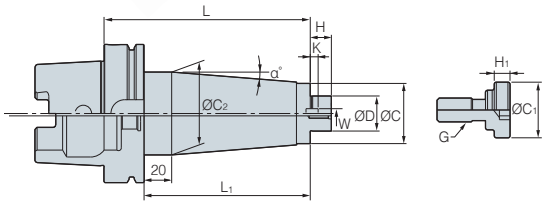


Fig. 2

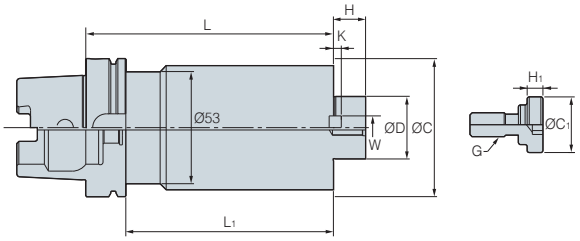


Fig. 3

(inch)

Designation		Cutter dia.	ØD	L	L_1	ØC	$ØC_1$	$ØC_2$	H	G	lbs	Fig.	α°
KDP-HSK63 -	FMA1-8	3	1	8	6.976	2.25	2.08	-	0.69	1/2-20UNF	10.80	1	0.1
	FMA1-10	3	1	10	5.791	2.25	2.08	-	0.69	1/2-20UNF	12.99	1	0.1
KDP-HSK100 -	FMA1-8	3	1	8	6.858	2.25	-	3	0.69	1/2-20UNF	18.34	2	3
	FMA1-10	3	1	10	8.858	2.25	-	3	0.69	1/2-20UNF	22.05	2	2
	FMA1.25-8	4	1.25	8	6.858	3	-	3.3	0.75	5/8-18UNF	24.87	2	1
	FMA1.25-10	4	1.25	10	8.858	3	-	3.3	0.75	5/8-18UNF	29.94	2	1

• Key and screw are clamped • Wrench is separately sold

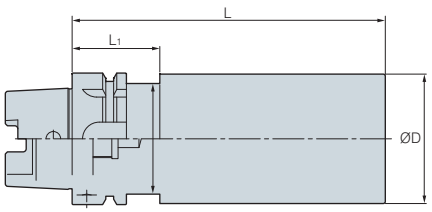
Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Wrench bolt	Wrench bolt	Wrench
Type					
FMA25.4	K9.5(B)	MBA-M12	BX0412	BX1230	LW-10
FMA31.75	K12.7(D)	MBA-M16	BX0515	-	LW-14

BLK

Blank Tool





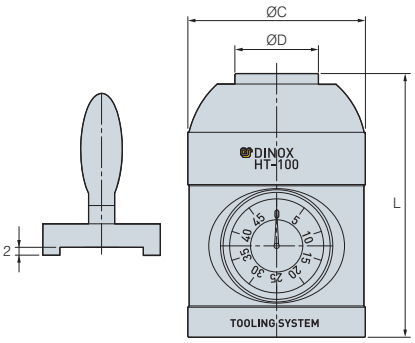
(mm)

Designation		Ød	ØC	L	L1
HSK40A -	BLK42 - 180	42	34	180	35
HSK50A -	BLK52 - 200	52	42	200	42
HSK63A -	BLK63 - 150	63	52	150	42
	BLK63 - 250	63	52	250	42
	BLK82 - 200	82	52	200	42
HSK100A -	BLK102 - 150	102	85	150	45
	BLK102 - 250	102	85	250	45
	BLK126 - 200	126	85	200	45
BT30 -	BLK48 - 180	48	44	180	30
BT40 -	BLK63 - 150	63	61	150	35
	BLK63 - 250	63	61	250	35
	BLK82 - 200	82	61	200	35
BT50 -	BLK102 - 150	102	98	150	48
	BLK102 - 250	102	98	250	48
	BLK126 - 200	126	98	200	48

M This is metric size. We can also provide in inch type

HT





(mm)

Designation	ØD	ØC	L
HT-100	32	68	100

- Good for setting the Tool length at CNC machine
- No inturferance between height Touch setter and Tool makes safe work
- Location Accuracy: ±0.003 mm

M This is metric size. We can also provide in inch type

SC Spindle Cleaner



(mm)

Designation		Taper	N.W.	G.W.
SC -	BT30	BT30	0.06kg	0.08kg
	BT40	BT40	0.07kg	0.1kg
	BT50	BT50	0.16kg	0.2kg
	HSK50	HSK50	0.08kg	0.12kg
	HSK63	HSK63	0.1kg	0.13kg
	HSK100	HSK100	0.5kg	0.7kg

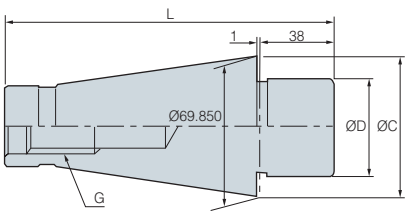
M This is metric size. We can also provide in inch type

Features

• Cleaning ships of taper wipe is made of lambskin
It can clean inside slide of spindles to prevention of static electricity and to extend spindles and tapers durable life

KCP





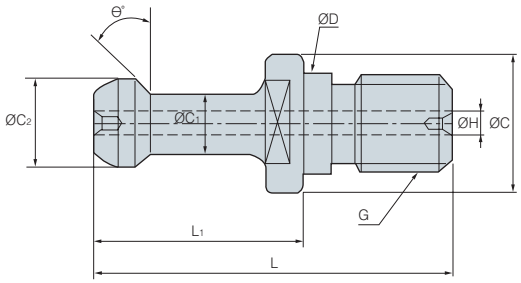
(mm)

Designation		Taper	Cutter dia.	ØD	ØC	L	G
NTN 50 -	KCP47.625	NT50	200(8″)	47.625	69.55	164.00	U1”-8(M24)
	KCP60	NT50	200(8″)	60	69.55	164.00	M24

M This is metric size. We can also provide in inch type

Pull Stud Bolt





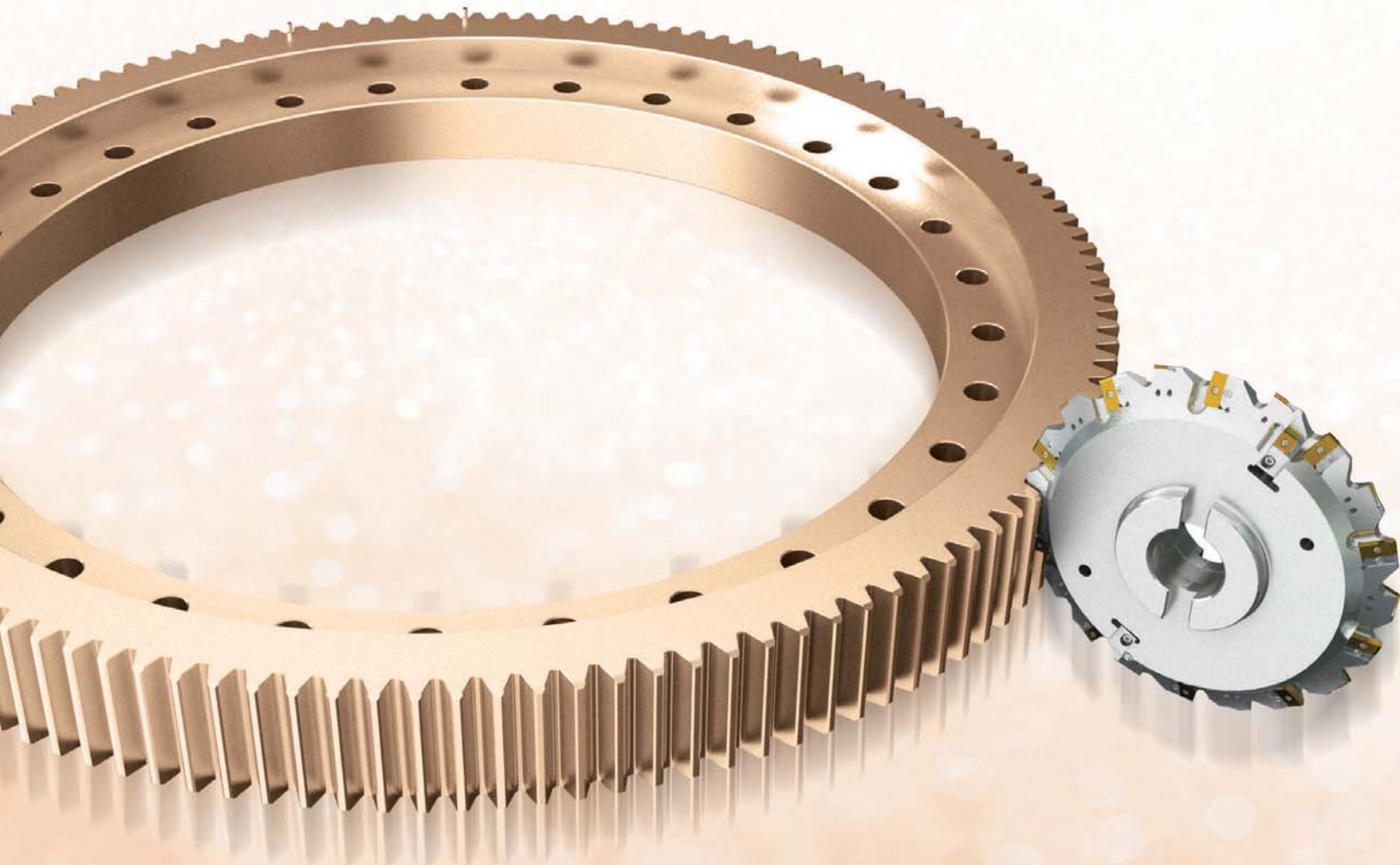
(mm)

Designation	ØD	ØC	ØC1	ØC2	L1	L	θ	G	ØH
P20T-1	8.5	12	6	8.5	17.5	31.5	15°	M8	
P30T-1	12.5	16.5	7	11	23	43	45°	M12	
P30T-1(Ø2.5)	12.5	16.5	7	11	23	43	45°	M12	Ø2.5
P30T-2	12.5	16.5	7	11	23	43	30°	M12	
P30T-2(Ø2.5)	12.5	16.5	7	11	23	43	30°	M12	Ø2.5
P40T-1	17	23	10	15	35	60	45°	M16	
P40T-1(3)	17	23	10	15	35	60	45°	M16	Ø3
P40T-2	17	23	10	15	35	60	30°	M16	
PS40-3F	17	23	10	15	35	60	0°	M16	
PS-G51	17	22	12.45	18.8	19.11	44.11	45°	M16	Ø7
DIN69872-A40	17	23	14	19	26	54	15°	M16	Ø7
DIN69872-B40	17	23	14	19	26	54	15°	M16	
JISB6339-A40(PS-806)	17	23	14	19	29	54	15°	M16	Ø7
JISB6339-B40(PS-805)	17	23	14	19	29	54	15°	M16	
P50T-1	25	38	17	23	45	85	45°	M24	
P50T-1(7)	25	38	17	23	45	85	45°	M24	Ø7
P50T-2	25	38	17	23	45	85	30°	M24	
PS50-1F	25	38	17	23	45	85	0°	M24	
PS50-1FH	25	38	17	23	45	85	0°	M24	Ø8
PS-G41	25	37	20.83	28.96	25.2	65.2	45°	M24	Ø10
DIN69872-A50	25	36	21	28	34	74	15°	M24	Ø11.5
P50T-1HS	25	38	17	23	45	85	45°	M24	Ø5.7

M This is metric size. We can also provide in inch type

J

TOOLING EXAMPLES

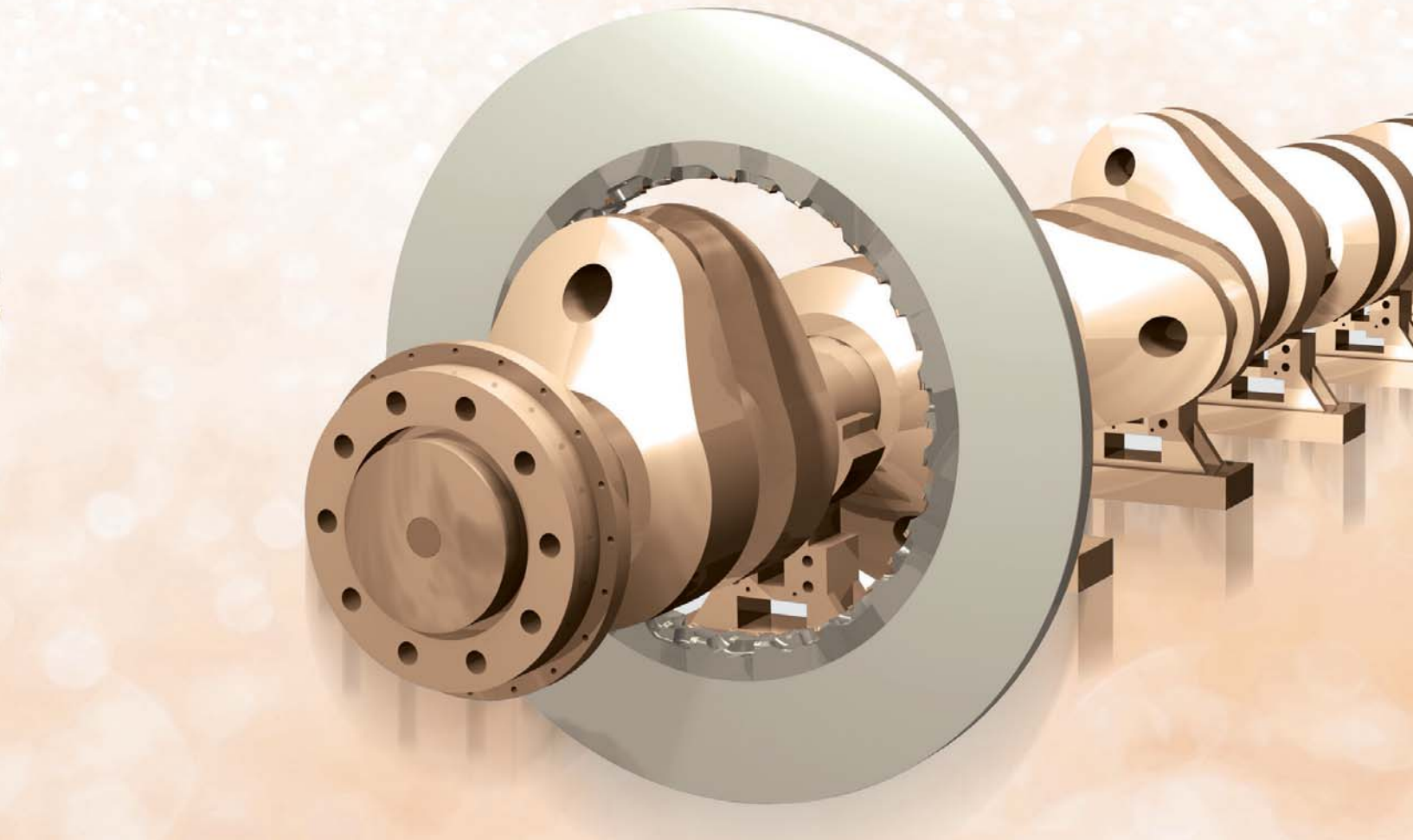


Industrial Tooling Example

J02 Gear Machining Solution
J04 Ship Building Industrial Solution
J07 Role Machining Solution
J08 Railway Industrial Solution
J10 Pipe Industrial Solution
J12 Bearing working Solution
J13 Development Industrial Solution
J14 Aviation Industrial Solution
J18 Slitter Knife

Automobile Tooling Examples

J19 Crankshaft
J20 Knuckle
J22 Brake
J24 Connecting Rod
J26 Block
J28 Head



Gear machining (External Gear)

Cutter for roughing



- Cutter diameter: Ø11.8
- The Number of Edges: 60
- Available for high speed working through ontrolled V-style edges to reduce cutting force

Cutter for medium

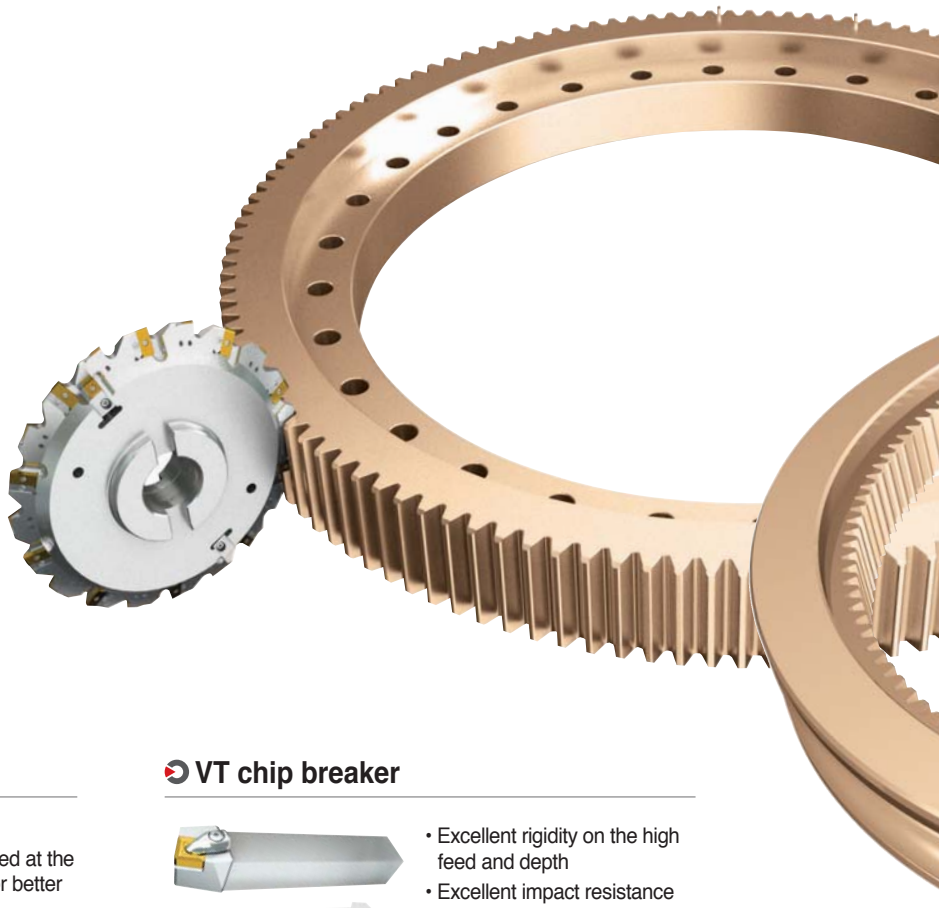


- Cutter diameter: Ø11
- The Number of Edges: 48
- Available for high efficiency and long life and high productivity through Korloy's own insert shape
- Made R part of gear by proper designed 'R'-shape of insert

Cutter for finishing: M20



- Cutter diameter: Ø15.7
- The Number of Edges: 20
- Gear cutter for medium is realized on the 4 grade of precision. (KS, JS)
- Chamfering system available for machining efficiency



Hob cutter



- Cutter diameter: Ø13.7
- The Number of Edges: 100
- Indexable hob for roughing worked by generating cutting action
- Available for customized producing by user

King Drill



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade: PC3500, PC5300

VT chip breaker



- Excellent rigidity on the high feed and depth
- Excellent impact resistance and long life based on stable structure and outstanding rigidity
- Type of SNMM/CNMM

TPDB



High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

VH chip breaker



- Innovative improved chip breaking on the medium working
- Provided good performance on the flange and continuous working
- Type of SNMM/CNMM

Gear machining (Internal Gear)

Cutter for roughing



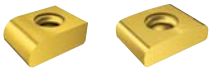
- Cutter diameter: Ø22
- The Number of Edges: 140
- Available for all module gear working is caused by edges designed stair shape

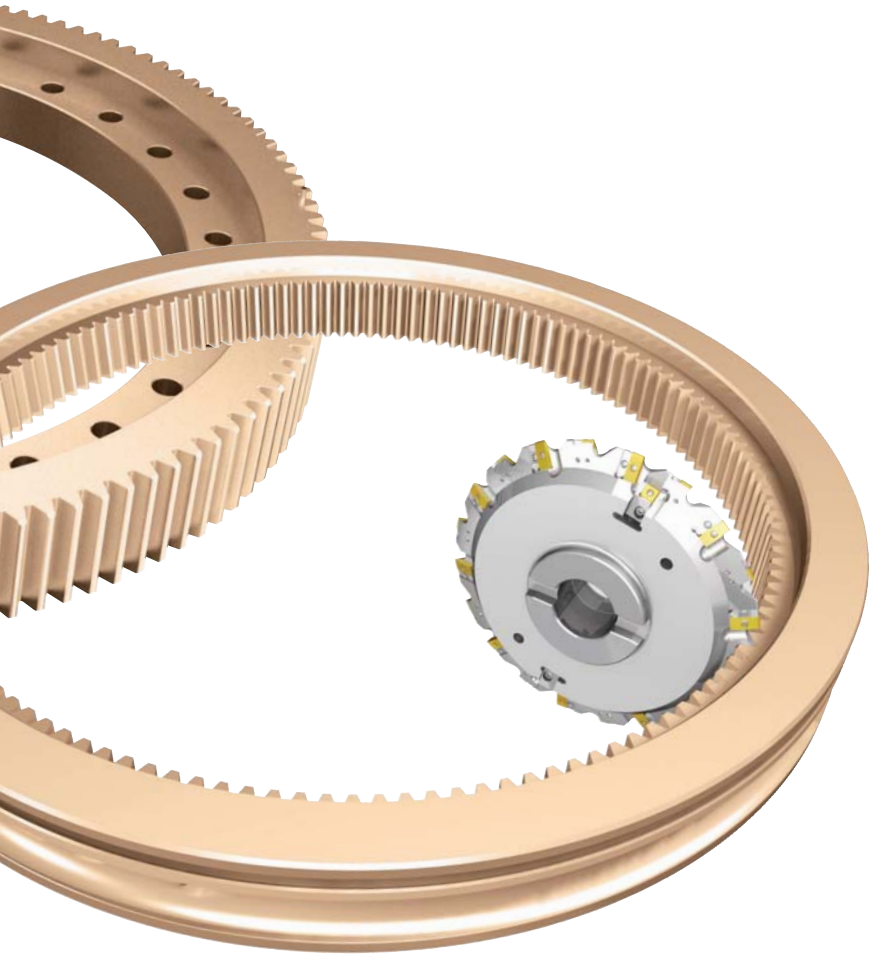


Cutter for medium



- Cutter diameter: Ø15.7
- The Number of Edges: 48
- Available for making involute curve shape of internal gear



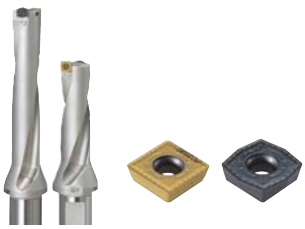


Cutter for finishing



- Cutter diameter: Ø15.7
- The Number of Edges: 20
- Cutter for finishing available for 4 grades accuracy of internal gear
- Available for chamfering on the same time and unnecessariness of extra working

King Drill



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life
- Grade: PC3500, PC5300

TPDB



High precision and high efficiency indexable drill

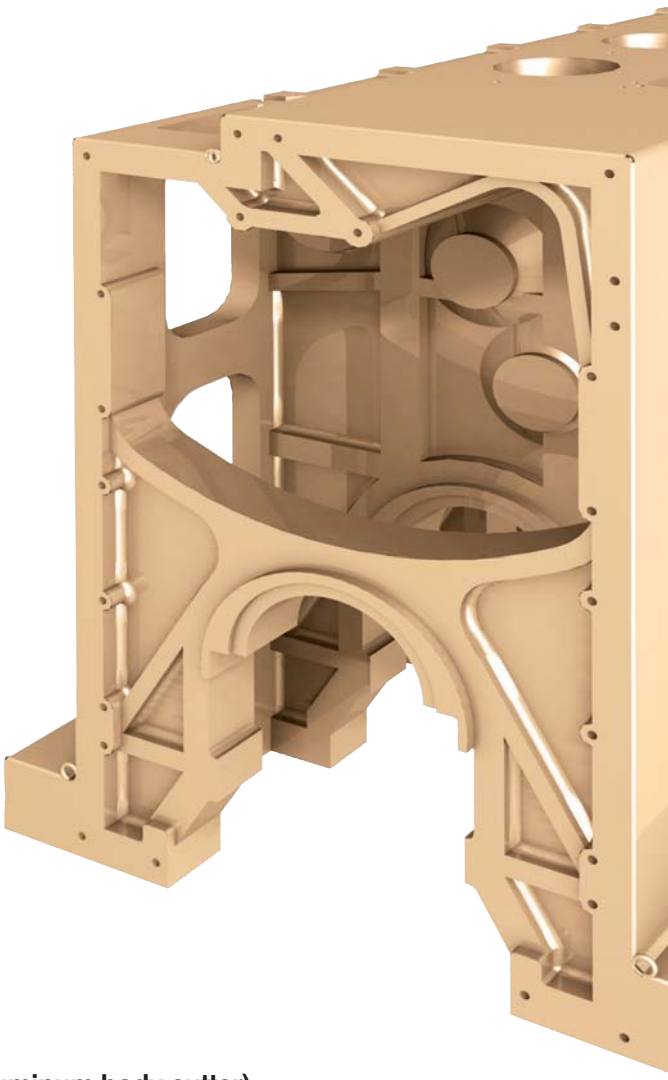
- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

Ship building (Engine block)

Roughing cutter for cylinder block



- Cutter diameter: Ø7.87
- Applicable insert: SNCF1507ANN-MF
- Economical concepts: 8 edge available insert, high feed available tool
- KORLOY exclusive latch clamping system provides quick change of insert



TPDB



High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

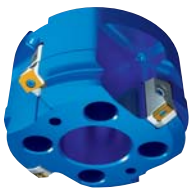
King Drill



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life
- Grade: PC3500, PC5300

Cylinder block cam shaft boring cutter (Aluminum body cutter)



- Cutter diameter: Ø10.6
- Applicable insert: LNE434/SDKX1506
- Right-hand rotational aluminum cutter body, easy to handle, makes high precision boring

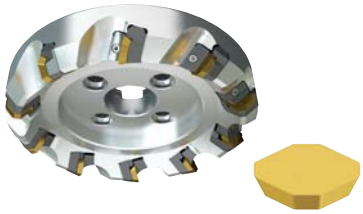


Cylinder block roughing and medium (Both)



- Cutter diameter: Ø9.8
- Applicable insert: LNE434/LNCS1907-R3.0-WC
- Designs available for roughing and medium applications
- Available high efficiency working to chose LNE 434 insert for roughing and high reliability grade
- Good surface working through LNCS1907-R3.0-WC Wiper shape for medium

High rake-angle applied cylinder block roughing cutter



- Cutter diameter: Ø9.8
- Applicable insert: SECN2606AFN
- High rake angle cutter suitable for the machining applications that have the tendency to create chatter

Adjustable medium machining cutter



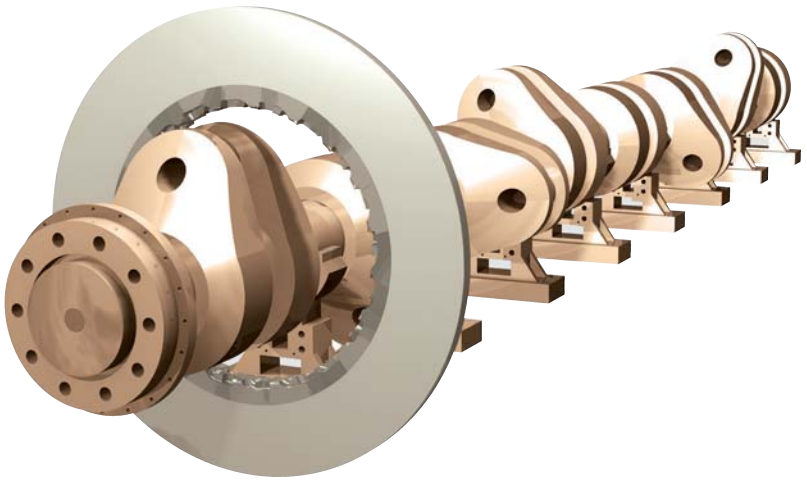
- Cutter diameter: Ø9.8
- Applicable insert: LNCS1907-C1.5-WC
- Cutting edge height adjustable device provides excellent surface finish

Cylinder block bearing cap seat machining cutter



- Cutter diameter: Ø9.8
- Applicable insert: RDKT2006M0
- Several sizes of inserts are prepared to meet the radius requirement of work-piece
- Rigid inserts for high efficiency machining

Ship building (Crank shaft/Propeller)

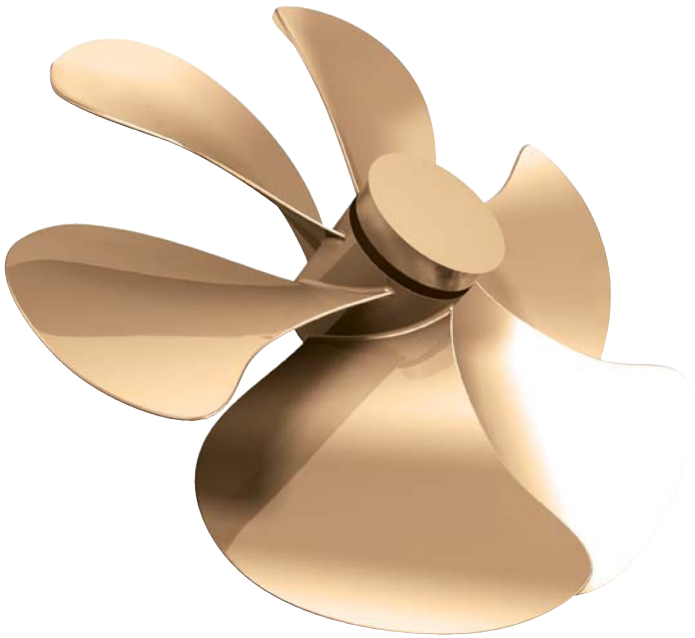




KORLOY exclusive screw-on type internal pin miller

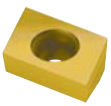


- Cutter diameter: Over Ø78.7
- Weight: 1.5 tons
- Pin miller for crank shaft of medium size ship engine
- Special segment assembly system developed by KORLOY makes it easy to handle and provides excellent cutting performance with good chip forming



Periphery side of propeller machining tool

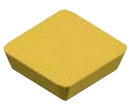




- Cutter diameter: Ø5.9
- Applicable insert: CDEW170708R
- Positive relief angle applied to get smooth cutting without chatter

Top face of propeller machining tool





- Cutter diameter: Ø9.8
- Applicable insert: SECN1904EER
- Double layer insert array provides big depth of cut



Role machining (Body/Shape/Parting-off)

Role machining (Body/shape/parting-off)


Competitor


NC6315

- Good chip evacuation even in deep grooving
- High hardness coating grade that has excellent wear resistance prevents damage from cutting load (Photo shows edge damage after machining same time under same conditions)

Application case

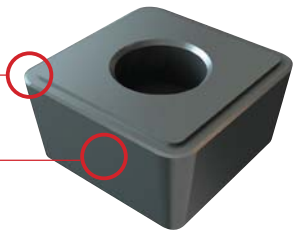

Competitor


NC6315

- Equipped with wide chip breaker enough to prevent crater wear
- Better chip control from the beginning of the machining, together with high hardness coating grade provides 3 times longer tool life than conventional tool (especially at finishing)

The combination of high hardness coating grade (NC6315) and chip breaker shows better performance

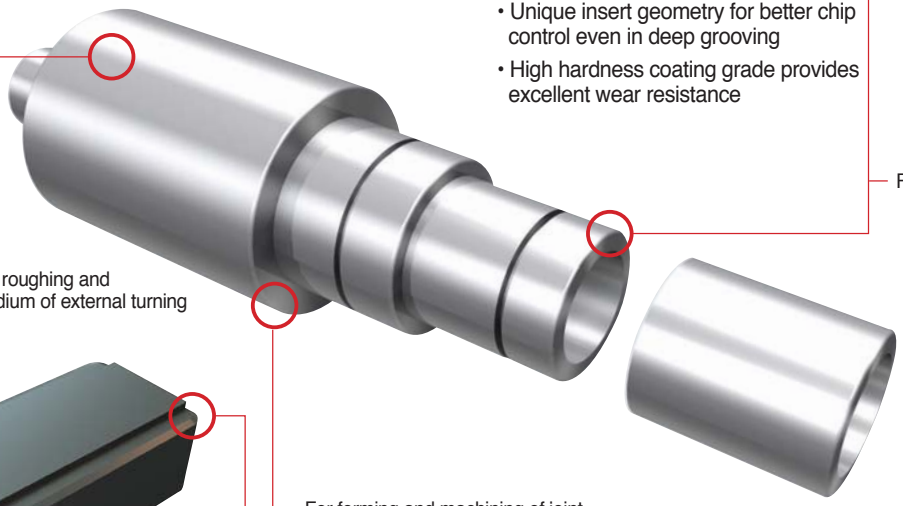
Closer chip breaker to the cutting edge provides better chip control even in deep grooving



Parting-off roll

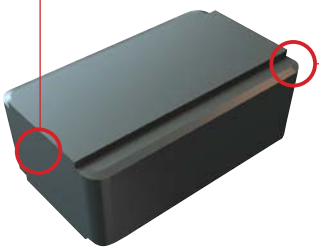
- Unique insert geometry for better chip control even in deep grooving
- High hardness coating grade provides excellent wear resistance

For parting-off



For roughing and medium of external turning

For forming and machining of joint





External turning of roll

- Match of high hardness coating grade (NC6315) with chip breaker provides longer tool life with smooth chip control
- Various cutting edge designs are applicable according to workpiece materials and cutting conditions

Forming and grooving of roll

- Special chip breaker focus on suitable chip forming (engineered chip breaker width and depth)
- Strong cutting edge treatment prevents un-expected fracture of insert

Railway Industry (Rail)

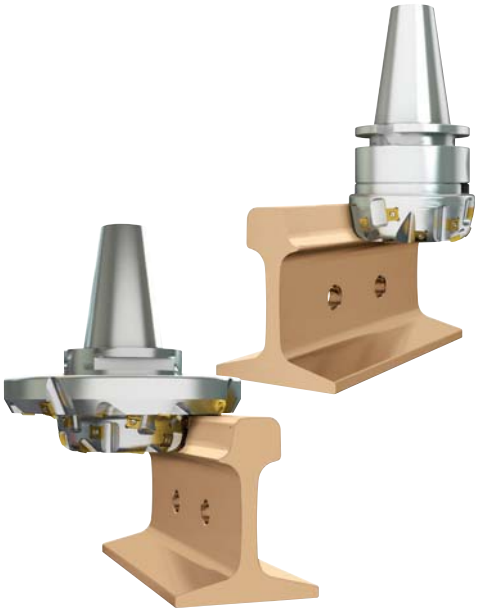
Cutter for turnout's joint plates





- Cutter diameter: Ø6.3
- The Number of Edges: 54
- Special customizing is available upon customer's requests



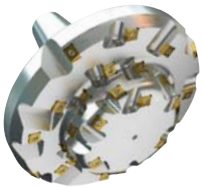


Cutter for upper parts of rails





- Cutter diameter: Ø6.3
- The Number of Edges: 16
- Precise forming of rail way is possible





- Cutter diameter: Ø11.8
- The Number of Edges: 33
- One body design of cutter and arbor provides high rigidity



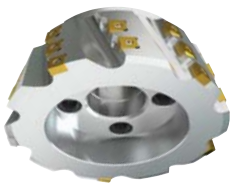
Cutter for upper tapers of rails



- Cutter diameter: Ø7.8
- The Number of Edges: 24
- Economical 8 edge available insert
- Special customizing is available insert
- Special customer's requests upon customer's requests



Cutter for upper flanks of rails



- Cutter diameter: Ø9.4
- The Number of Edges: 25



Cutter for rail repair





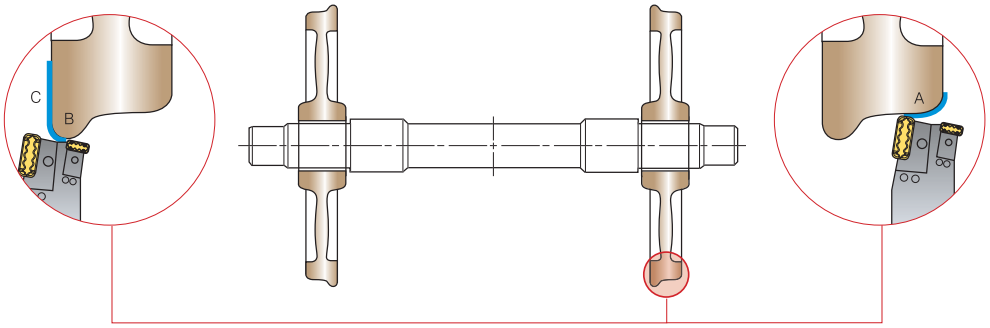
- Cutter diameter: Ø23.6
- The Number of Edges: 198
- Milling applicable on the rail of part requested repairing

Rail Industry (Wheel)



The type of LNUX for the working of wheel (Repair)

- Material: SSW2. Ø36.2~39.3
- Cutting conditions: vc = 255 sfm (13~18min-1), fn = 0.039 ipr, ap = 0.018~0.157 inch
- Insert: LNUX301940-TM Grade: NC3215
- Result: good chip evacuation, stable structure and long life tool life



LNUX301940-TF



- For light cutting, it generates a low load with good chips

LNUX301940-TM

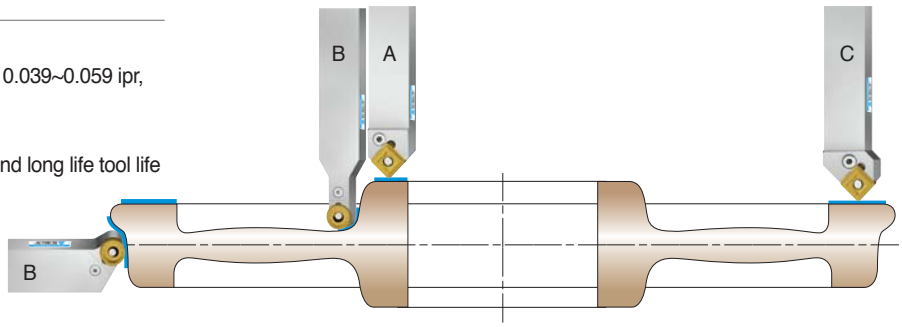


- Comprehensive design for general use, strong cutting edge with good chip forming (First recommendation)

Working procedure	A	B	C
Insert	LNUX301940-TF/TM	LNUX191940-25/22	
Grade	NC3215	NC3215	
Cutting condition	Decrease the speed on deep part of A	Increase the speed to get good chip evacuation	

RCMX insert for rail way wheel

- Material: SSW2. Ø33
- Cutting conditions: vc = 180.4~328.08 sfm, fn = 0.039~0.059 ipr, ap = 0.039~0.059 inch
- Insert: RCMX3209M0-SL Grade: NC3215
- Result: good chip evacuation, stable structure and long life tool life



VT chip breaker



- Strong cutting edge for high feed and deep cutting depth
- Tough design of chip breaker provides excellent impact resistance
- SNMM type

SL chip breaker



- Comprehensive chip breaker covers wide application range
- Proper chip control with long tool life

B chip breaker



- Comprehensive roughing design having strong edge strength with long tool life

SB chip breaker

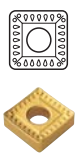


- Better chip control at low depth of cut machining

TM chip breaker



- Medium-finishing chip breaker, proper surface finish, superior wear resistance

Working procedure	A	B	C
Applicable insert			
Holder	PSDNN5050-U25	PRDCN5050-U32 PRGCN5050-U32	PSSNR5050-S25
Insert	SNMM856-GH	RCMX3209MO-SL	SNMM856-VT
Grade	NC3215	NC3215	NC3215

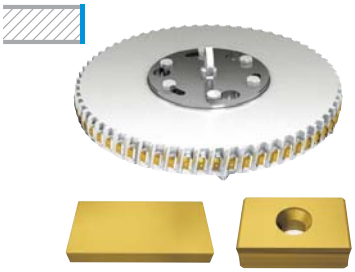
Pipe Industry (Edge milling)

" X " shape machining

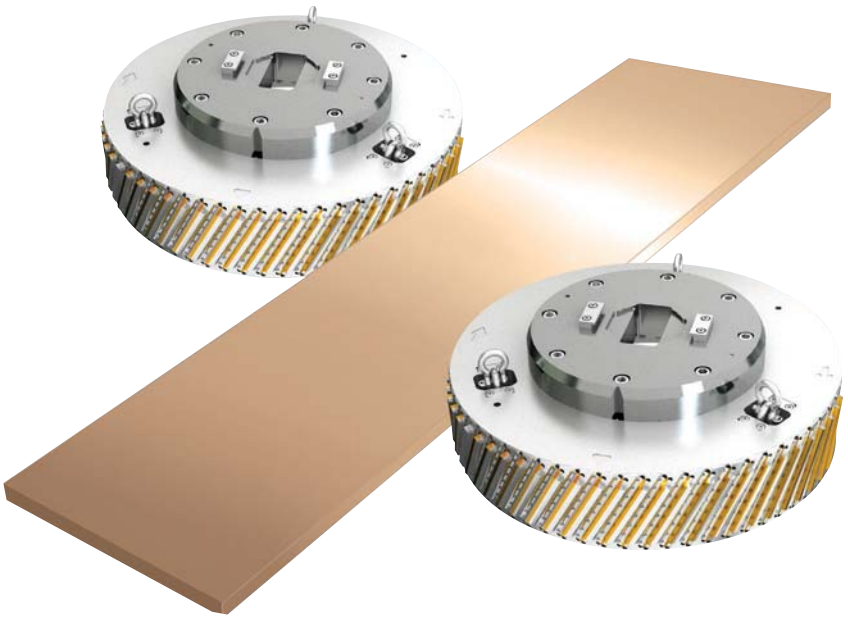


- A cutter to make the "X" shape on the both side-end of steel plate, to do bevel-end welding
- Locator wedge type clamping system applied for the cutter provides long durability of cutter as well as strong clamping power
- Grade: NC5340

" I " shape machining



- A machining to make "I" shape on the both side-end of steel plate, to do bevel-end or plane-end welding
- Variety of inserts (with chip breaker or without chip breaker) are available according to your cutting conditions
- Grade: NC5340



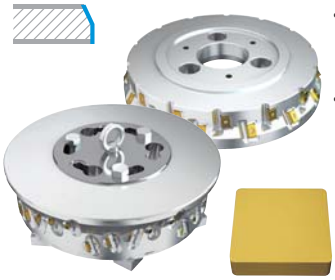


A-1 ····▶ A-2 ····▶ A-3



B-1 ····▶ B-2 ····▶ B-3

" Y " shape machining



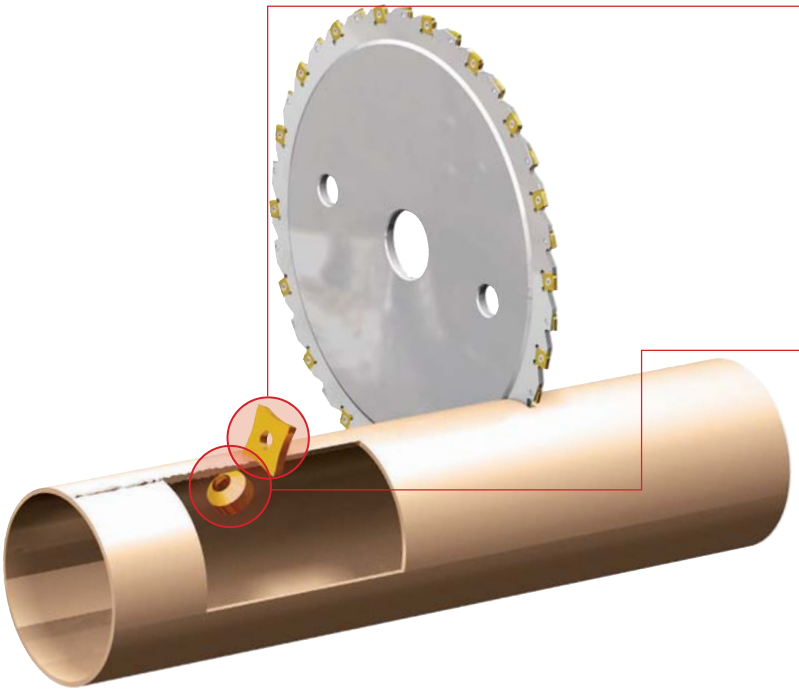
- A machining to make "Y" shape on the both side-end of steel plate, to do bevel-end welding
- Wide chip pocket on cutter provides long durability of it by reducing contact of chip with cutter body

Special machining

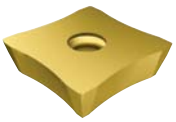


- Special design of cutter as per side-end shape of steel plant upon customer's request is available

Pipe Industry (Bead removal/Parting-off/Chamfering)



Bead removal insert: external

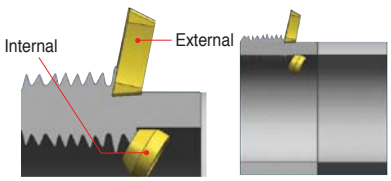


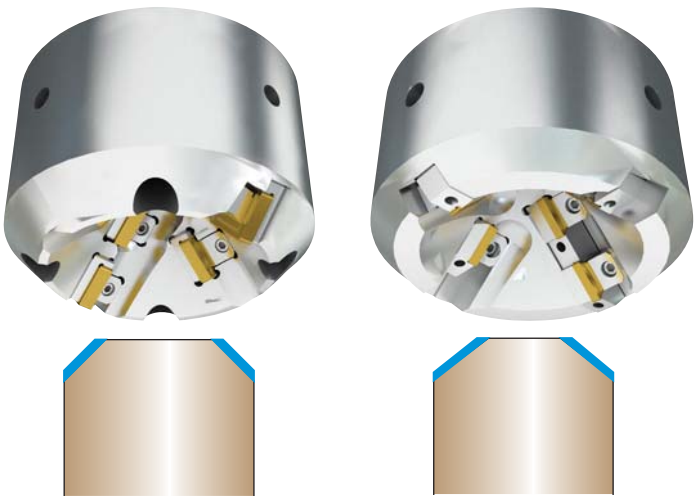
- Tool removing protruded part of melted welding material at outside of pipe
- Economical tool by using square insert, utilizing 4 cutting edges
- Grade: NC3030

Bead removal insert: internal



- Tool removing protruded part of melted welding material at inside of pipe
- Grade: NC5330

Working method	Application range	Applicable inserts	Cutter
	For external bead removal	SDMX80-R□□/SEGW54-R□□ SNMG150708-R□□/SNMN1207(SNU452)-□□R SNMN1507(SNU552)-□□R/SOET1906-254 SEGX2509-R□□	Customizing
	For internal bead removal	AR□□(AC)/SF□□R-□□	



Chamfer tool



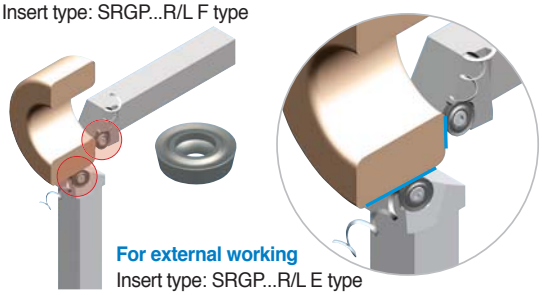


- Chamfering tool machining cut-off face of pipe
- Special chamfering angle design is possible upon customer's request
- Cost effective concept: Triangle and Square double sided insert provides 6~8 effective cutting edges
- Grade: NCM325, PC3500

Bearing

For external and facingworking

For facing
Insert type: SRGP...R/L F type

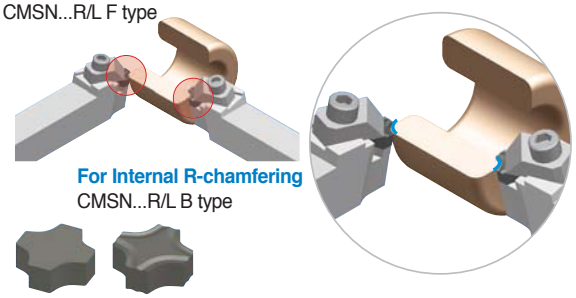


For external working
Insert type: SRGP...R/L E type

- Applicable on the internal, external and facing working

For internal and external r-chamfering

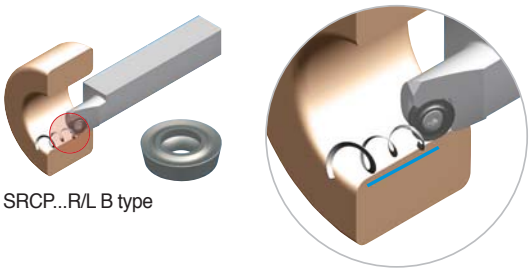
For R-chamfering
CMSN...R/L F type



For Internal R-chamfering
CMSN...R/L B type

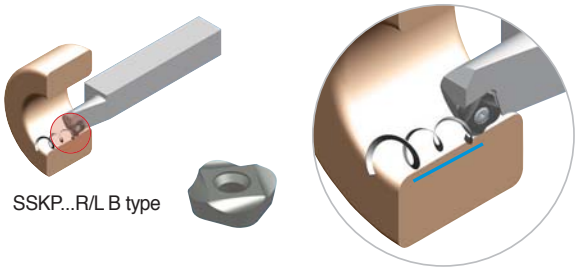
- Applicable 8 corner of insert
- R-shape is realized to internal and external part of corner

For internal working



SRCP...R/L B type

- Applicable over Ø0.472



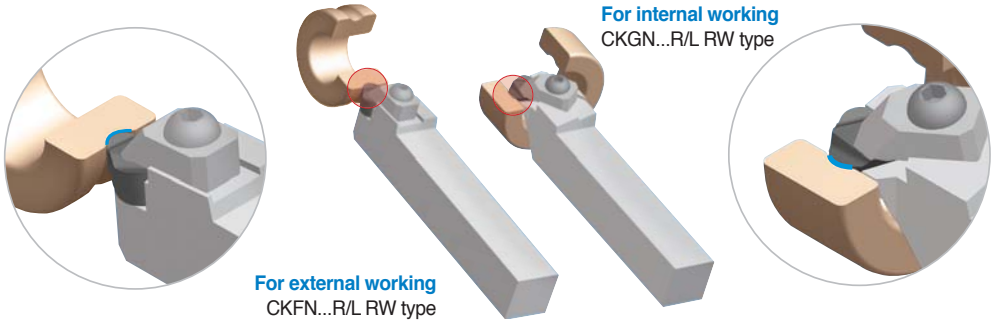
SSKP...R/L B type

- Applicable over Ø0.453 with 4-corner insert for internal and low working

For ray-way

- For Ray-way on internal and external bearing
- Applicable 3 corner insert
- Able to customize





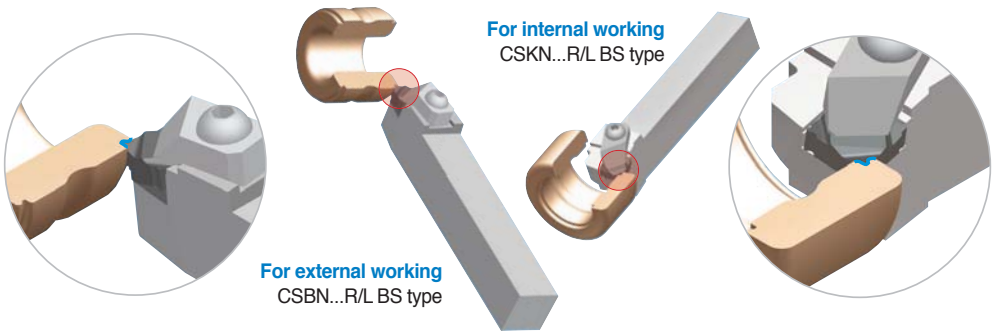
For internal working
CKGN...R/L RW type

For external working
CKFN...R/L RW type

For shield way

- For shield working on internal and external bearing
- Applicable 4 corner insert
- Able to customize





For internal working
CSKN...R/L BS type

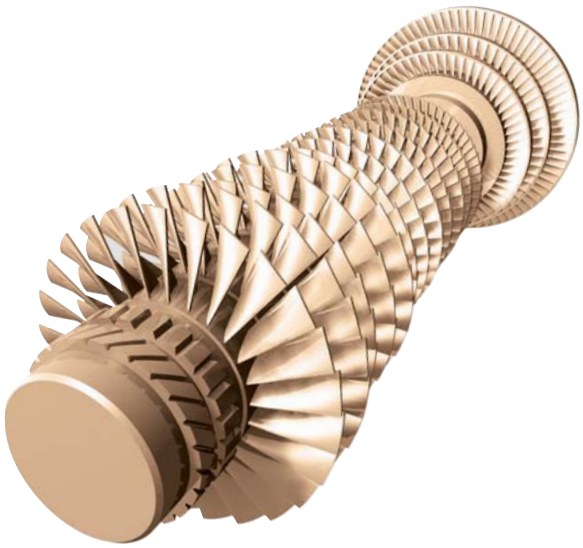
For external working
CSBN...R/L BS type

Power Generation (Wind Power Generation Shaft/Tower Flange)

VH chip breaker



- Good chip control in heavy machining
- Excellent performance for flange machining
- Suitable for continuous cutting conditions
- SNMM/CNMM type



RCMX type



- High quality machining
- Rigid insert ensures good surface finish and long tool life
- RCMX type



Vulcan Drills (VZD)



- Rigid body for high feed and precision machining
- Better chip evacuation from improved chip breaker
- Applicable for the drilling under poor cutting conditions

King Drill



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life
- Grade: PC3500, PC5300

VT chip breaker



- Strong cutting edge for high feed and deep cutting depth
- Though design of chip breaker provides excellent impact resistance
- SNMM/CNMM type



TM (Thread milling)





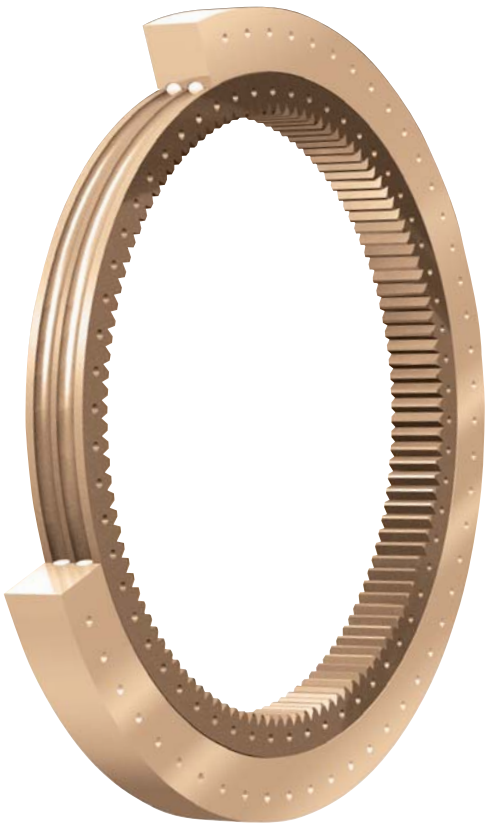
- Thread milling indexable tools
- Various type of holder (standard, long, taper) and inserts
- Screw diameter: Ø0.354~Ø1.811 inch

H Endmill



Endmill for high hardened steel machining at high speeds

- New grade (PC303S, PC310U) - Ultra fine substrate and AlTiSiN coating guarantee excellent wear resistance
- Special edge treatment - Special cutting edge design was applied for less chipping and longer tool life



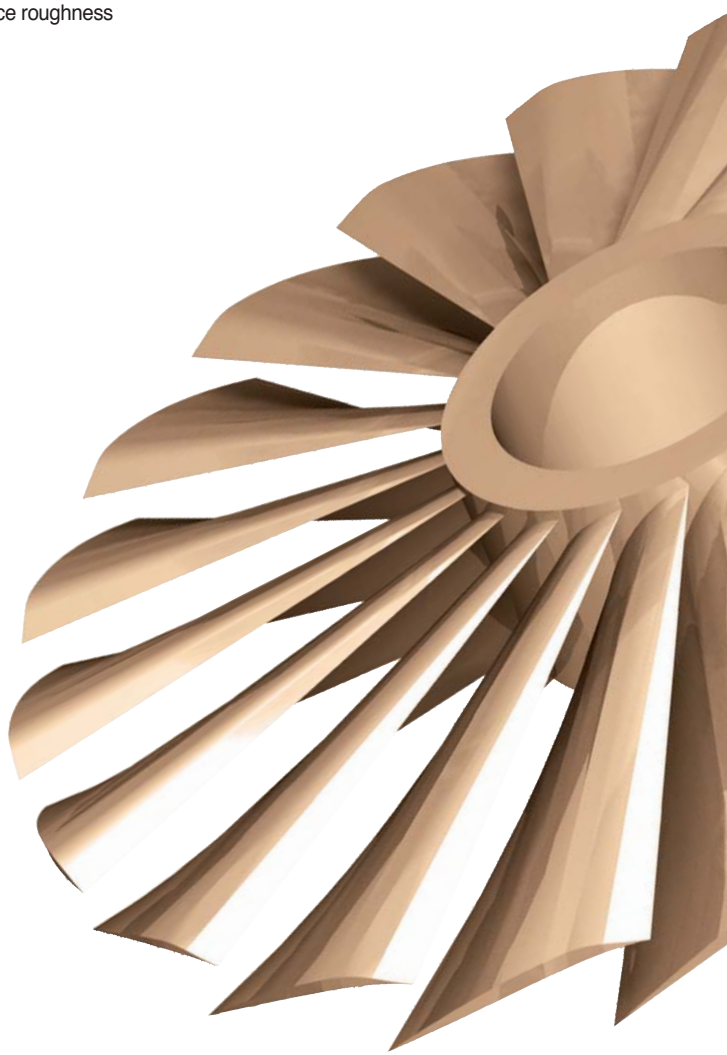
Aviation Industry (Engine/Turbine)

TPDB

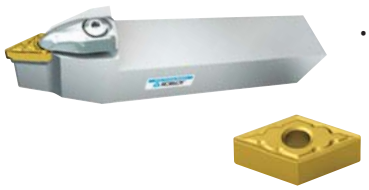


High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness



ISO turning



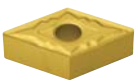
- Available to customize whole and special items for complicated and various shape

Boring Bar



Internal turning

- ISO standard boring bar for internal machining



Rich Mill



- Increased number of edges and excellent tool life due to 8 corner edges
- Smooth cutting with low cutting load due to the unique geometry & high rake angle of cutting edge, this combination provides excellent tool life



MSD



Long tool life with protecting material

- Good chip control with proper chip-pocket
- Decrease the chipping and increase the cutting ability due to applicable streamlined shape insert
- Increase impact resistance and lubrication due to apply PVD K Black coating on the sub-micron material

Laser Mill



Multi-functional indexable end-mill

- Extremely hard grade provides long tool life
- Easy and simple clamping of insert by using single screw
- Excellent quality for fine finishing due to its precise tolerance



H Endmill



Endmill for high hardened steel machining at high speeds

- New grade (PC303S, PC310U) - Ultra fine substrate and AlTiSiN coating guarantee excellent wear resistance
- Special edge treatment - Special cutting edge design was applied for less chipping and longer tool life

Aviation Industry (Landing Gear/Accessory)

HRMDouble



High efficient and cost effective tool utilizing a double sided insert

- Cost effective tool by using double sided insert with a total of 6 cutting edges
- Smooth cutting utilizing a high rake angle sharp cutting edge insert



MGT



For grooving, turning, profiling, cut-off

- Multi functional grooving tool can over variety of machining with multifunctional grooving tool and the chip breaker with excellent cutting perfomance and the ability to expand grooves



Pro-X Mill





High-speed aluminum milling tool

- Unique mounting system of insert provides tight clamping of insert
- Mirror surface and high rake angle of insert provides excellent machined surface by reduced cutting load and edge build-up
- Grade: H01

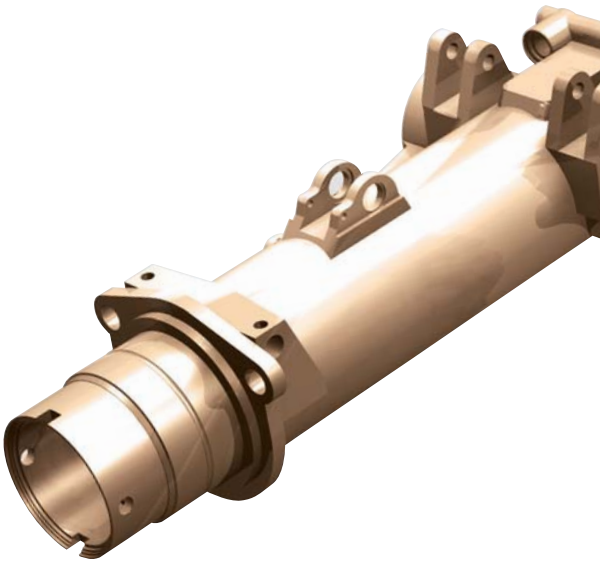


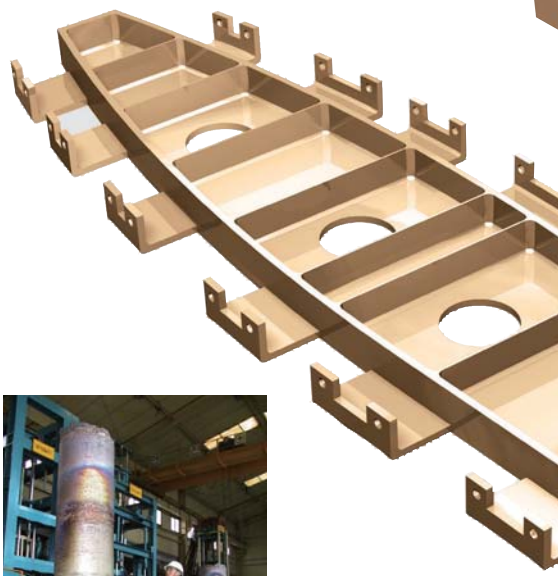
SSEA



Solid carbide end-mill for aluminum machining

- Advanced geometry of end-mill refrains build-up-edge
- Superior surface machined
- DLC coated end-mills available

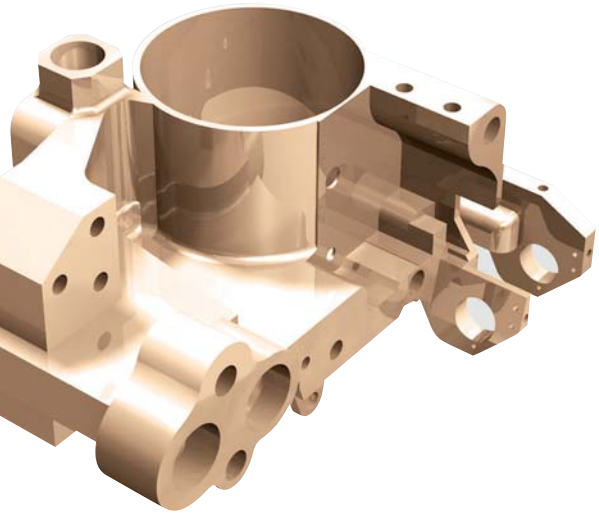


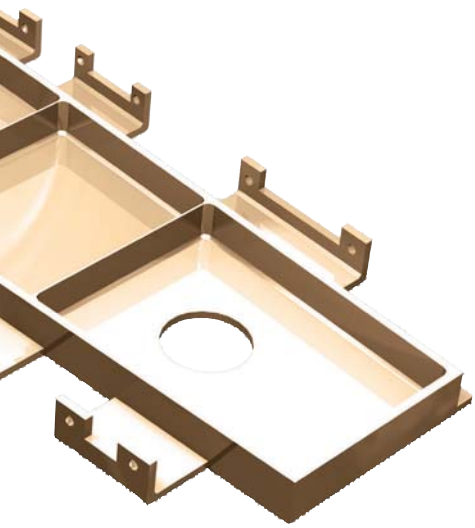




Titanium
Picture provided: KPC Inc





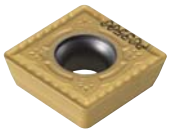


King Drill



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life
- Grade: PC3500, PC5300







MLD (Mach Long Drill)

- Direct drilling without separate operation (step drilling) over 20xD
- Wider flute space along with drill provides effective chip control
- Special design for rigid body provides smooth drilling without bending of drill

Alpha Mill





Multi functional milling tool

- Vast coverage of milling operation due to its variety of cutters and inserts
- 3 dimensional chip breaker design provides smooth cutting



Brazed Endmill



- Apply High Spiral Angle (over 40 degrees) able to get good sharpness
- Available high speed milling due to reduce the working temperature
- Expected long tool life by applying hardened carbide material.
- Economical welded tool due to available 2 or 3 times re-grinding

Slitter Knife



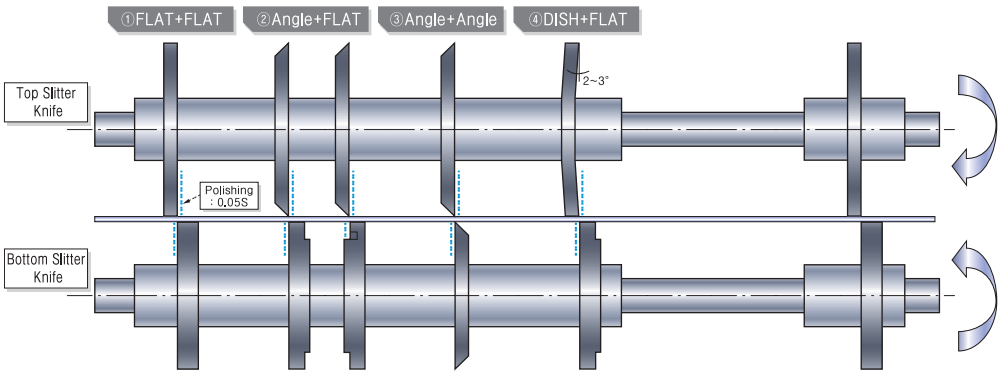
Application

- For video tape/For audio tape
- For mangetic tape/For brass plate, mobile battery

Tool selection

- Top slitter knife: Thickness: ±0.00039~0.00078 inch
- Bottom slitter knife: Thickness: ±0.00004 inch / Flatness: under 0.00002 inch
  Polishing surface roughness: under 0.05 S

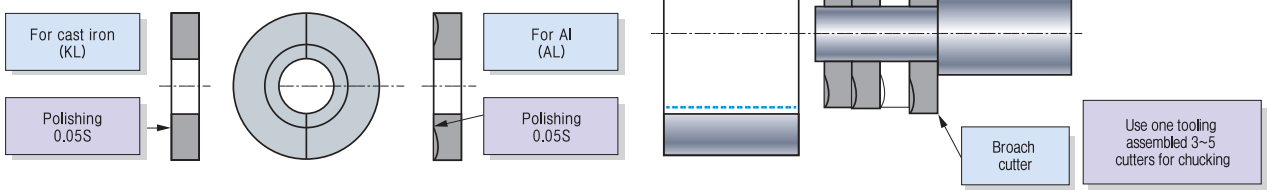
Machining example



Broach cutter

Application

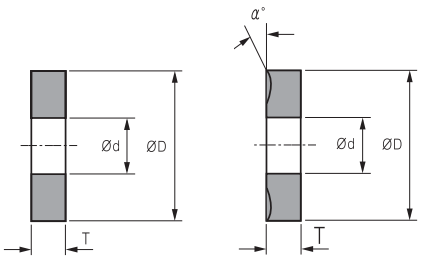
- Broach cutters apply to inner machining of metal bearing which is used for automobile crank shaft



Order

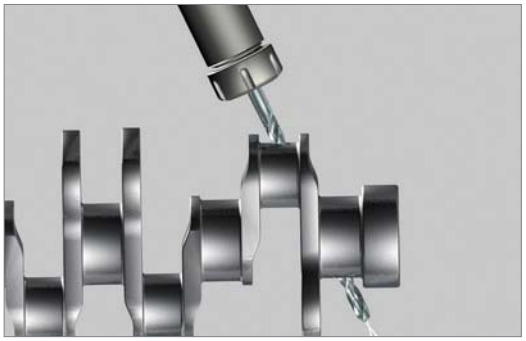
- Designation for cast iron: KL Ød×Ød×T
- Designation for Aluminium: AL Ød×Ød×T
  : AL Ød×Ød×T×α°

(If there is no mentioned any angle, α = 30°)



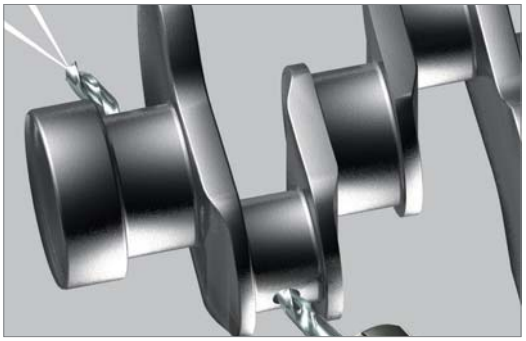
Automobile engine tooling example (Crank Shaft)

Oil Bore - Mach Long Drill (MLD)



Taper Spline Structure
(Rigidity has been enhanced due to increased contact area)

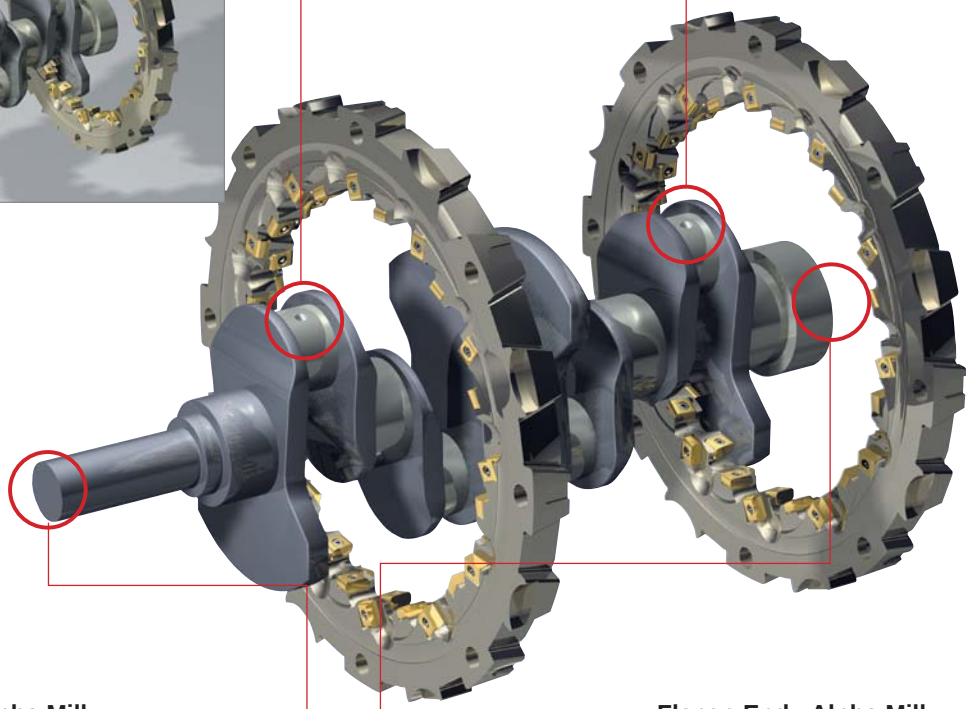
Oil Bore - Mach Long Drill (MLD)



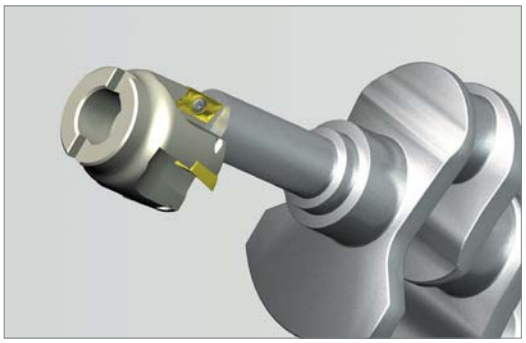
- Machining wihout step feed operation for deep hole drilling like 20D
- Optimal performance with MQL System

Pin & Journal - Crankshaft Cutter (Internal/External)

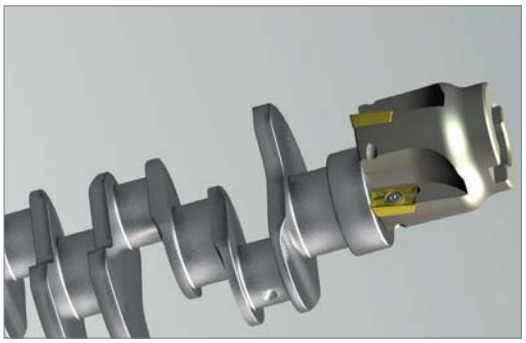




Post End - Alpha Mill



Flange End - Alpha Mill



Automobile tooling example (Knuckle)

Micro Boring bar

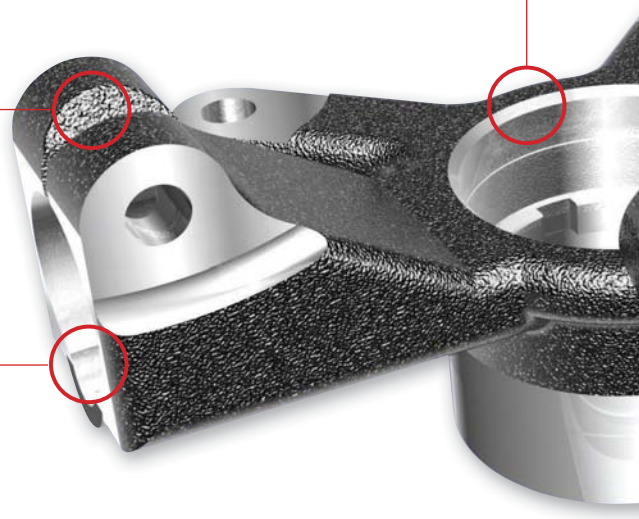


Mach Drill



Micro Boring bar





Indexable Side Cutter (SPB)



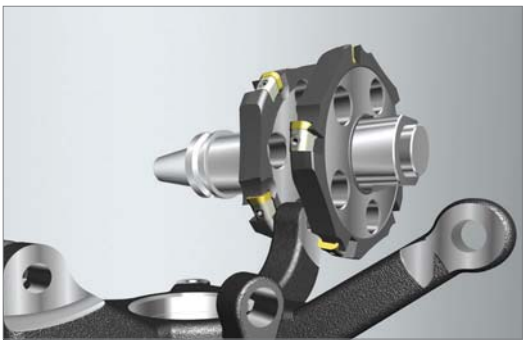
Future Mill (FMP)

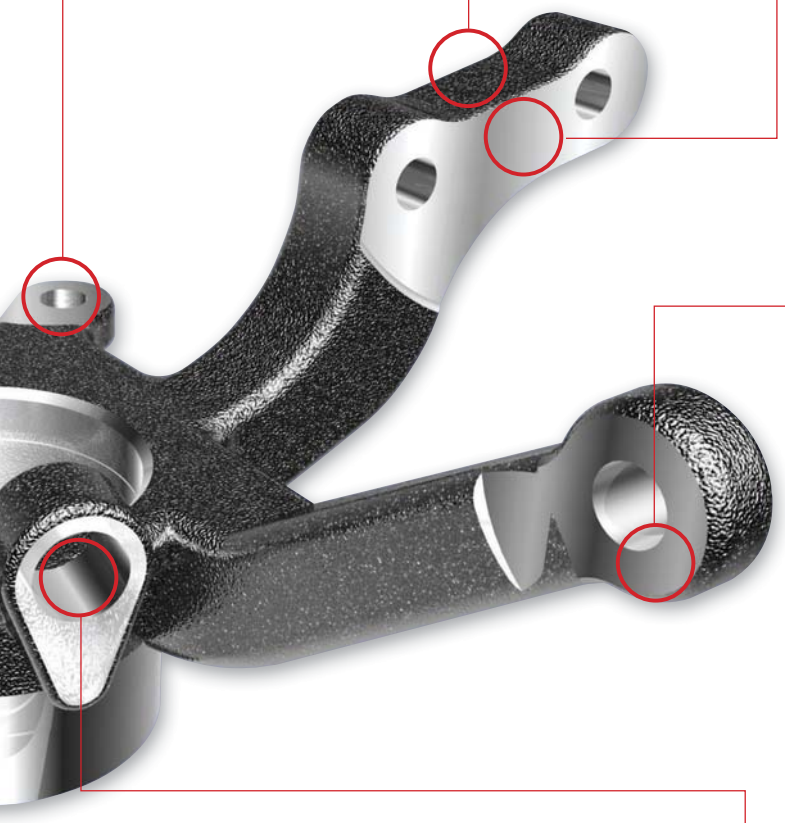


Indexable Side Cutter (Tangential type)



Indexable Side Cutter (Radial type)





Future Mill (FMP)



Step Drill



Drill (King Drill)



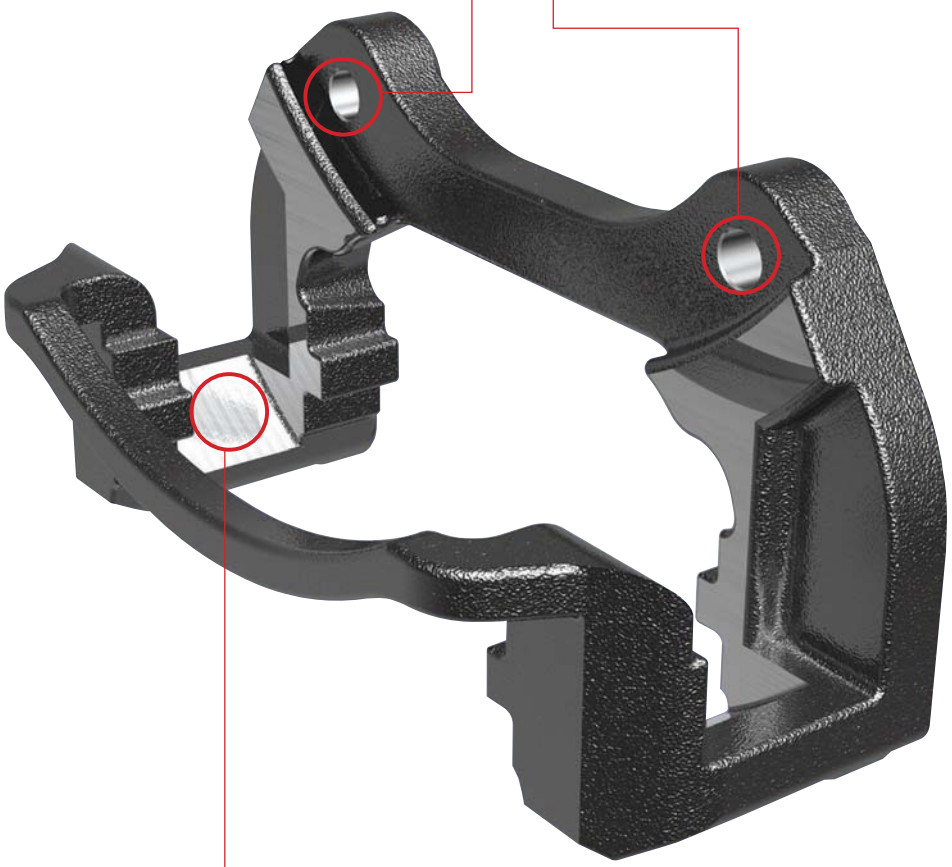
Automobile break tooling example (Carrier)

Drill



Drill



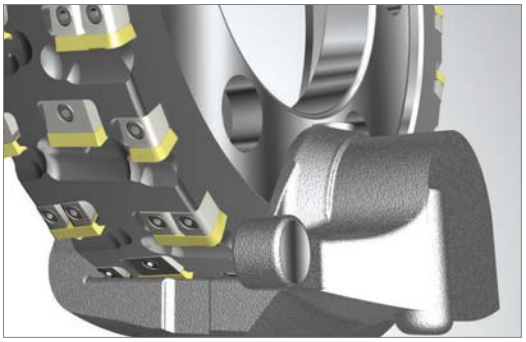


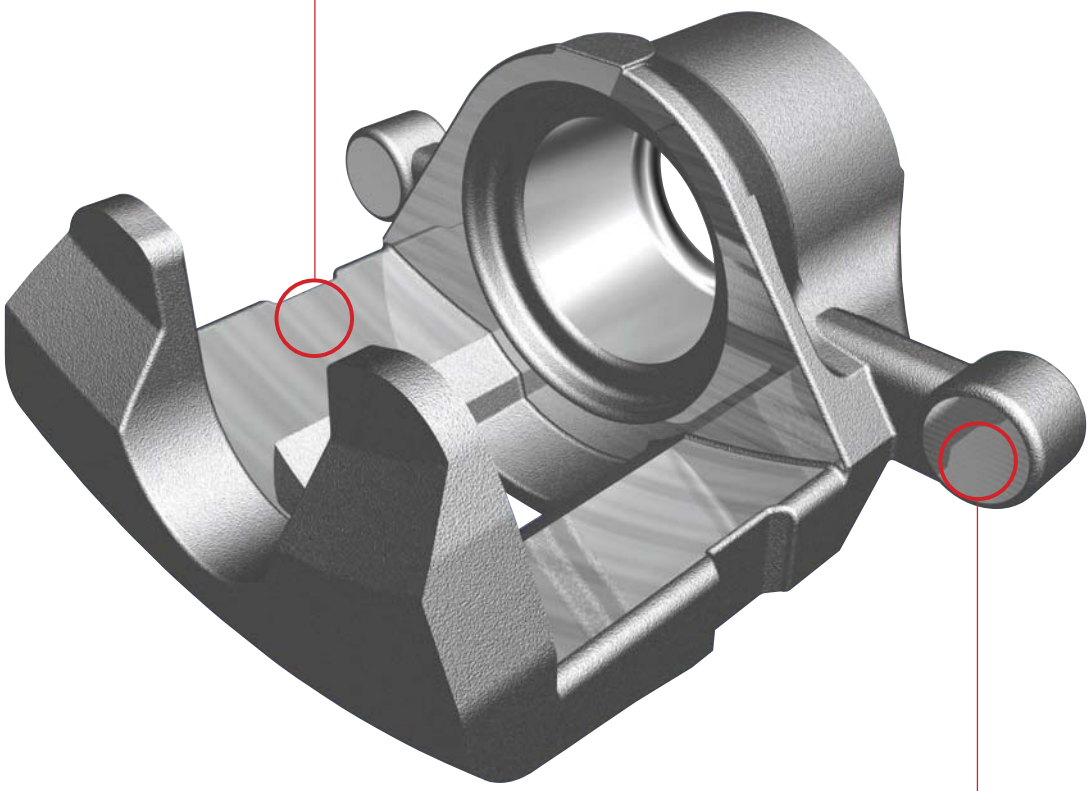
Side Cutter



Automobile break tooling example (Housing)

Side Cutter





Side Cutter



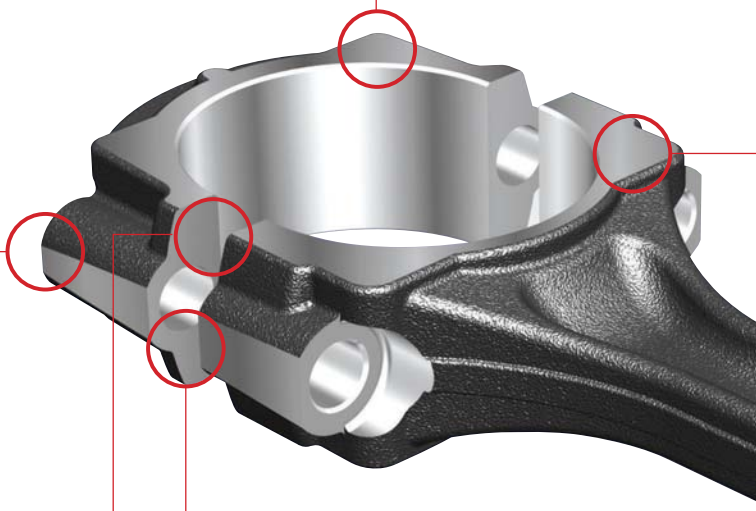
Automobile tooling example (Connecting Rod)

Drill



Rich Mill (RM4)





Side Cutter



Side Cutter



Rich Mill (RM4)



Rich Mill (RM8)

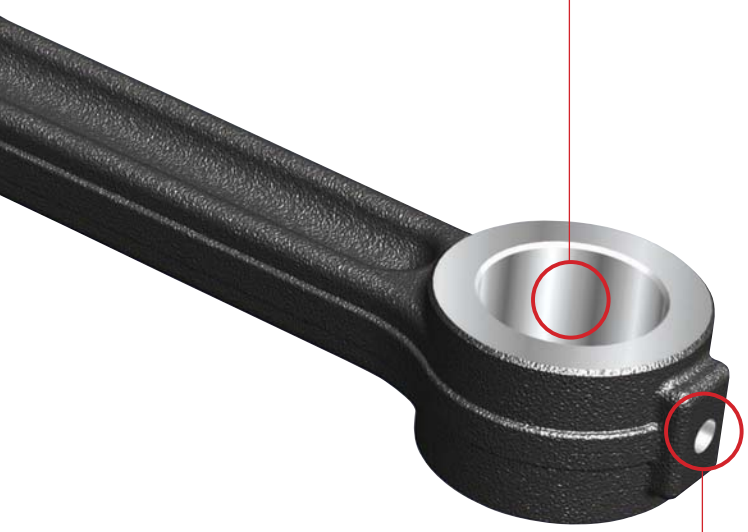


Drill (King Drill)



Step Drill



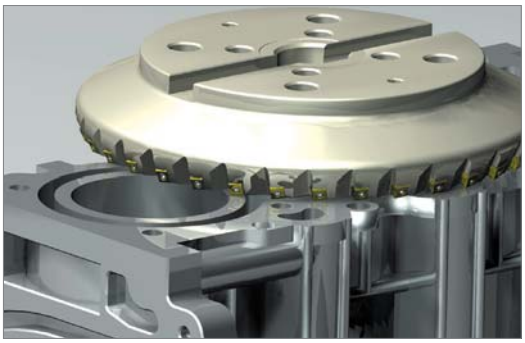


Drill



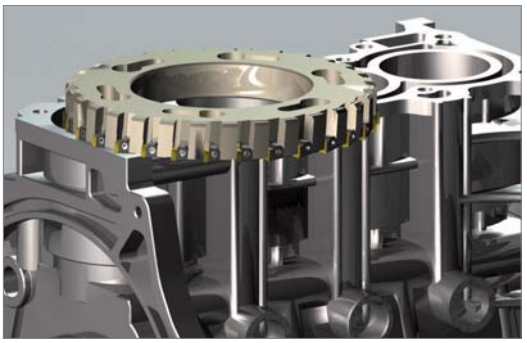
Automobile engine tooling example (Block)

Top Face (Roughing)



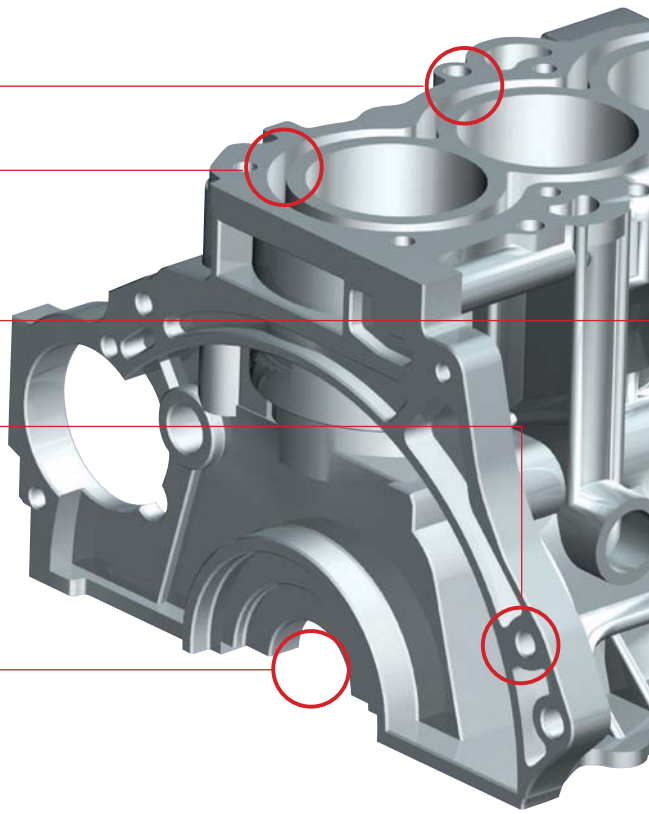
• Applied 8 corner edges of insert

Top Face (Finishing) - High feed Cutter



Bosses - Alpha Mill

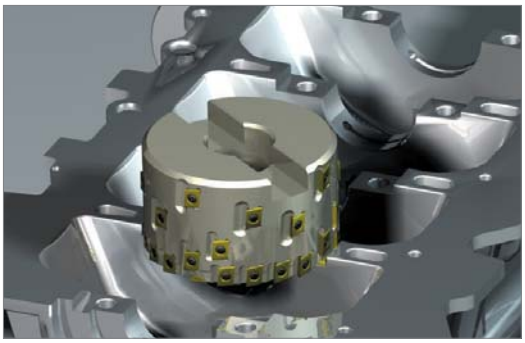




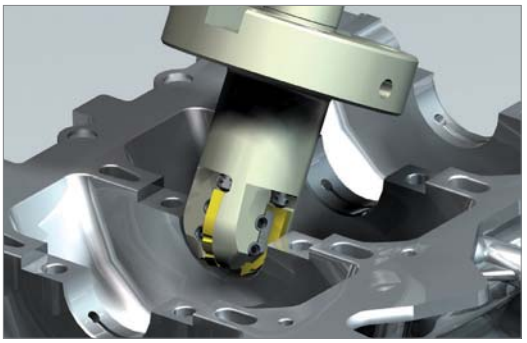
Line Boring Bar Reamer



Bearing Cap Seat - Form Cutter

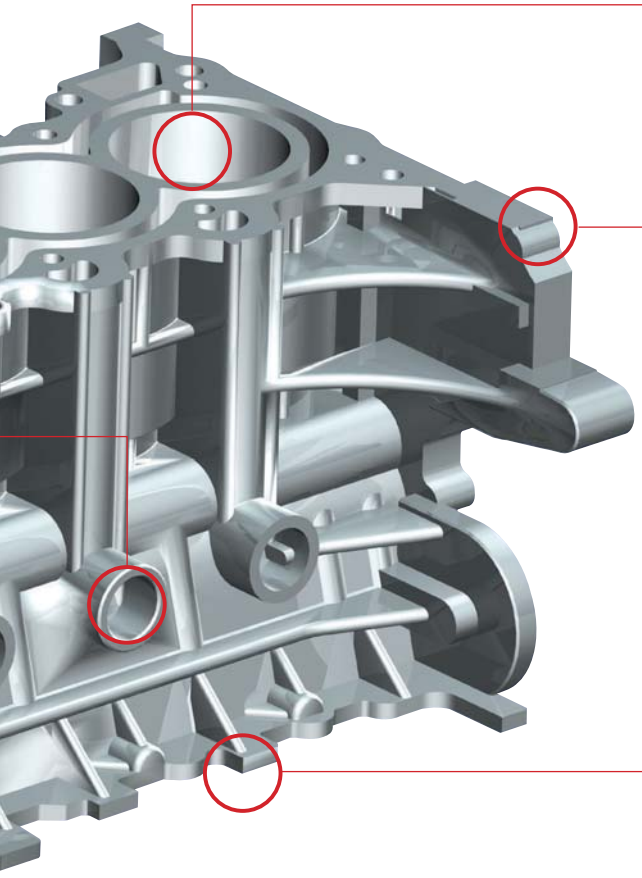


Crank Bore (Crankshaft Bearing Bore) - Form Cutter



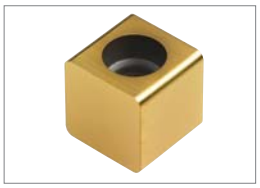
Cylinder Bore (Roughing) - Boring Cutter

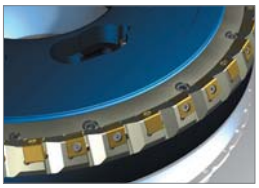




Front & Rear Face - Cube Couple Mill

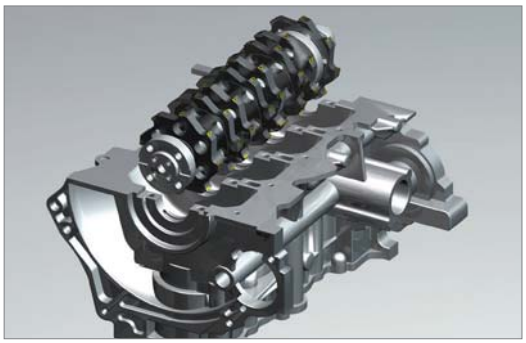




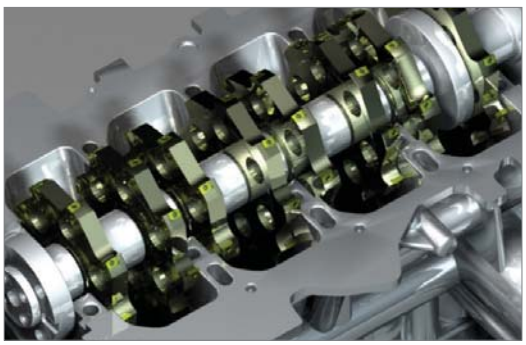


- High feed cutter made of aluminum
- Due to light weight, it s easy to handle & effective to prevent accident

Cheek Faces - Gang Cutter

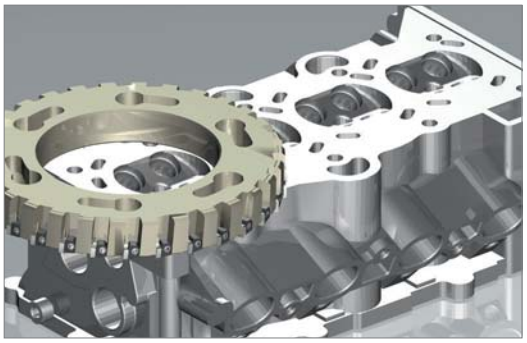


Cheek Faces - Gang Cutter



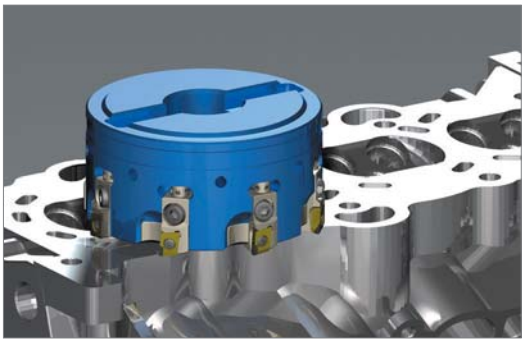
Automobile engine tooling example (Head)

Top Face (Roughing & Finishing) - High Feed Cutter



• Carbide insert, PCD insert

Top Face (Roughing & Finishing) - Aero Mill



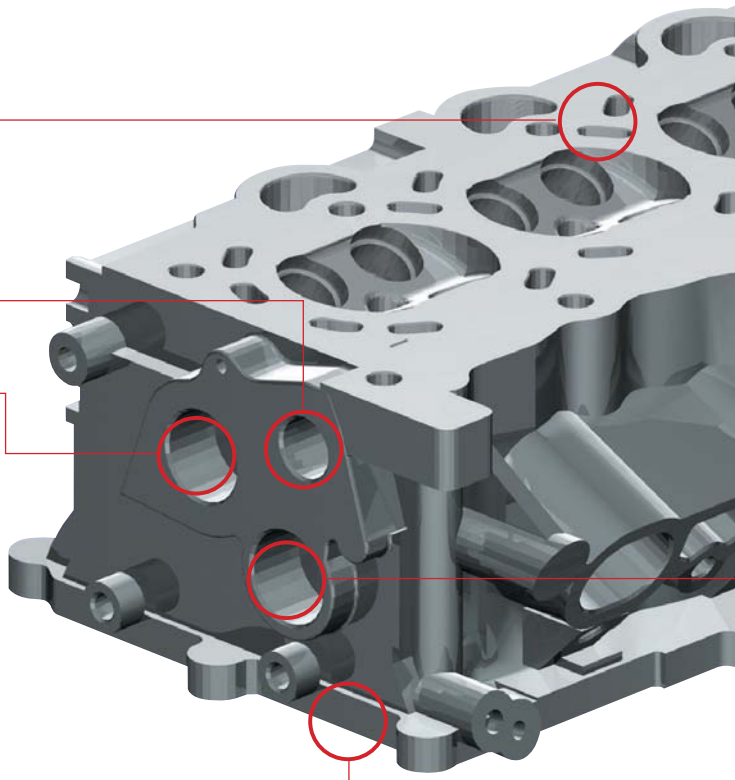
• Due to the light weight of aluminum body that about 50% of steel body, excellent cutting performance with high speed machining can be achieved

Step Burnishing Reamer

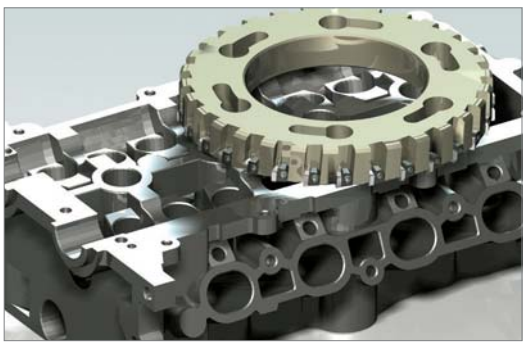


Straight Reamer



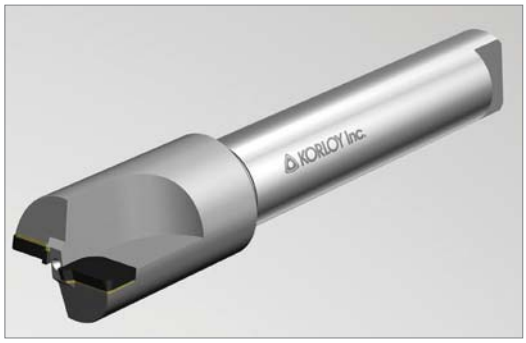


Bottom Face (Roughing & Finishing) - High feed Cutter

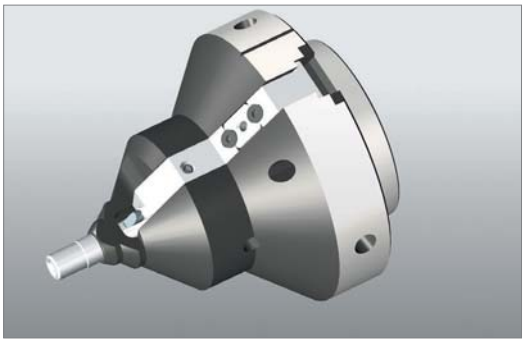


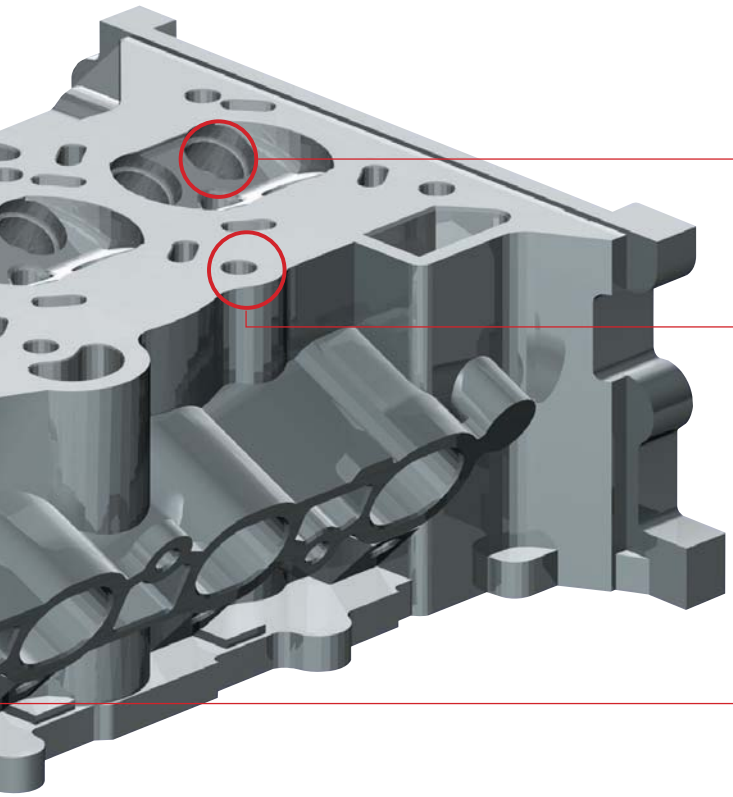
• Carbide insert, PCD insert

Counter Bore Tool

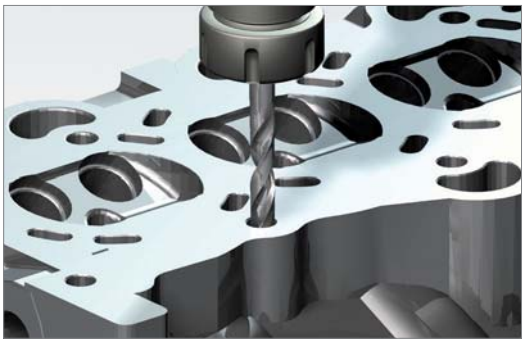


Valve Seat - Apolo Cutter (Special Boring Holder)

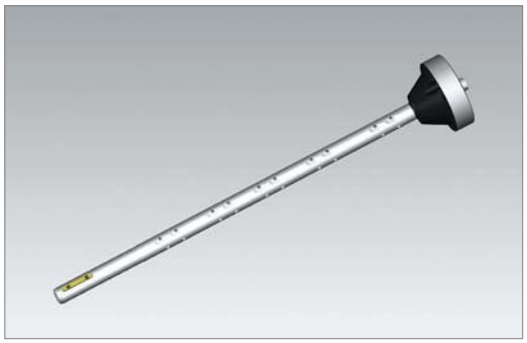




Top Face (Drilling) - Mach Drill



Cam Shaft Bearing Seat - Line Boring Bar



• Stable machining at high speed without chattering

Cam Journal Bore - High Speed Reamer



• Available for high speed machining
• Excellent surface finish & roundness



Parts

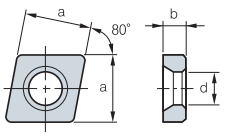
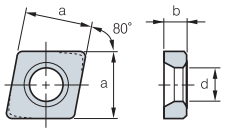
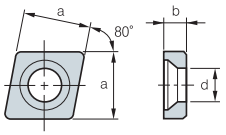
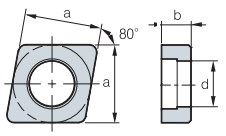
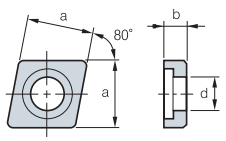
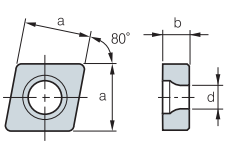
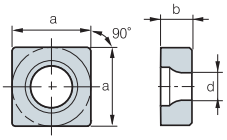
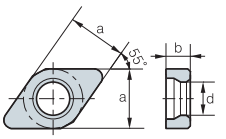
K02 Shim
K03 Cartridge
K03 Chip Breaker
K03 Chip Cover
K03 Clamp
K04 Coolant Bolt
K04 Wrench Bolt
K04 Lever

Parts

K05 Locator
K05 Nut
K05 Pin
K05 Screw
K06 Shim Pin
K07 Spring
K07 Wrench
K07 Stop Ring
K07 Washer
K07 Stopper
K07 Nozzle

PARTS K

Shim

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	SC32	0.335	0.125		0.193	
	SC32N	0.335	0.125		0.192	
	SC42	0.492	0.125		0.272	
	SC42N	0.457	0.125		0.256	
	SC53	0.618	0.187		0.311	
	SC53N	0.575	0.187		0.319	
	SC63	0.742	0.187		0.394	
	SC63N	0.701	0.187		0.378	
	SC83	0.961	0.187		0.504	
	SC84N	0.953	0.250		0.512	
	SC42B	0.492	0.125		0.272	
	SC42CC	0.492	0.125		0.138	
	SC32D	0.365	0.125		0.255	
	SC43D	0.490	0.187		0.289	
	SC53D	0.615	0.187		0.380	
	SC63D	0.740	0.187		0.443	
	SC84D	0.987	0.250		0.585	
	SC42S	0.453	0.125		0.252	
	SC32S	0.327	0.125		0.213	
	SC63V	0.722	0.187		0.217	
	SC83V	0.996	0.187		0.258	
	SC84V	0.996	0.250		0.250	
	SC32V	0.359	0.125		0.134	
	SC42V	0.496	0.125		0.177	
	SC44V	0.496	0.250		0.177	
	SC54V	0.620	0.250		0.217	
	SS32V	0.359	0.125		0.134	
	SS42V	0.496	0.125		0.177	
	SS54V	0.620	0.250		0.217	
	SS64V	0.744	0.250		0.217	
	SD317	0.368	0.106		0.205	
	SD32N	0.335	0.125		0.192	
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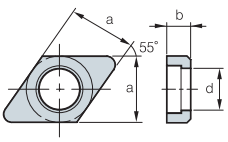
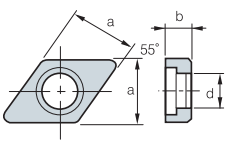
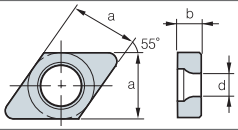
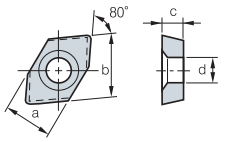
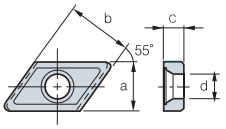
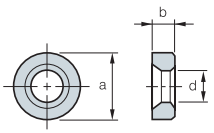
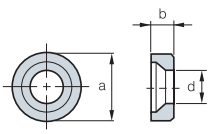
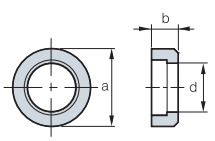
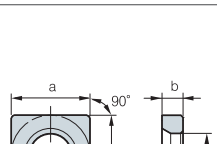
	SD42N	0.457	0.125		0.256	
	SD43N	0.457	0.187		0.256	
	SD32D	0.362	0.125		0.228	
	SD43D	0.490	0.187		0.289	
	SD32S	0.335	0.125		0.213	
	SD42S	0.453	0.125		0.252	
	SD32V	0.359	0.125		0.134	
	SD43V	0.496	0.187		0.177	
	SD44V	0.496	0.250		0.177	

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	SES33C	0.358	0.472	0.187	0.138	
	SK33C	0.367	0.579	0.189	0.138	
	SK33CL	0.367	0.579	0.189	0.138	
	SR10	0.331	0.125		0.185	
	SR12	0.394	0.125		0.185	
	SR16	0.533	0.187		0.272	
	SR20	0.673	0.191		0.311	
	SR25	0.866	0.250		0.378	
	SR32	1.094	0.250		0.512	
	SR42CC	0.495	0.125		0.138	
	SR10S	0.346	0.125		0.213	
	SR12S	0.415	0.125		0.213	
	SS32	0.335	0.125		0.193	
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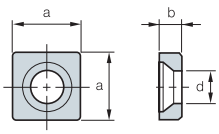
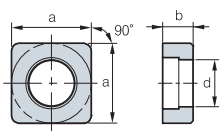
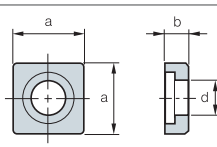
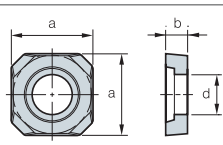
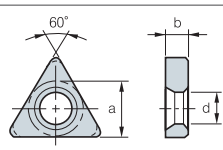
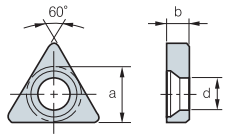
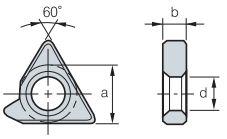
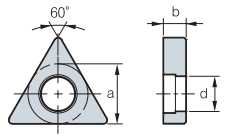
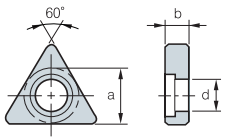
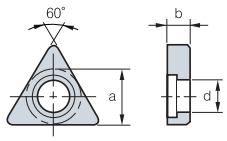
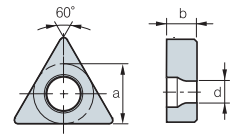
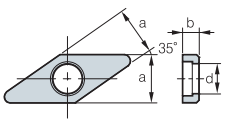
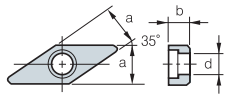
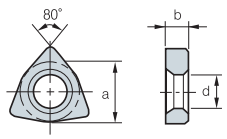
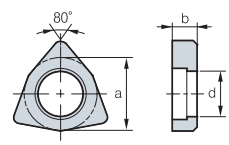
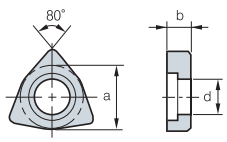
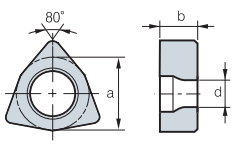
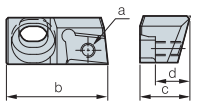
	SS42B	0.492	0.125		0.272	
	SS42N	0.457	0.125		0.256	
	SS53	0.618	0.187		0.311	
	SS53N	0.575	0.187		0.319	
	SS63	0.742	0.187		0.394	
	SS63N	0.701	0.187		0.378	
	SS84	0.961	0.250		0.504	
	SS84N	0.953	0.250		0.512	
	SS42CC	0.492	0.125		0.138	
	SS32CC	0.366	0.125		0.138	
	SS32D	0.365	0.125		0.227	
	SS43D	0.490	0.187		0.289	
	SS53D	0.615	0.187		0.380	
	SS63D	0.740	0.187		0.443	
	SS84D	0.990	0.250		0.568	
	SS32S	0.327	0.125		0.213	
	SS42S	0.453	0.125		0.252	
	SS42SAF	0.441	0.118		0.217	
	ST317	0.368	0.106		0.197	
	ST317B	0.368	0.106		0.197	
	ST317N	0.335	0.106		0.192	
	ST42	0.492	0.125		0.272	
	ST42N	0.457	0.125		0.256	
	ST53	0.618	0.187		0.311	

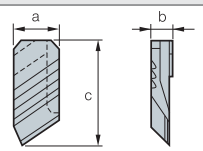
Shim

Geometry	Designation	Dimensions a	b	c	d	angle
	ST32CC	0.368	0.125		0.138	
	ST32C1	0.359	0.125		0.195	
	ST42C1	0.484	0.125		0.195	
	ST32D	0.368	0.125		0.227	
	ST43D	0.493	0.187		0.289	
	ST53D	0.618	0.187		0.380	
	ST63D	0.743	0.187		0.443	
	ST32M	0.343	0.125		0.185	
	ST43M	0.492	0.187		0.248	
	ST32S	0.335	0.125		0.213	
	ST32V	0.359	0.243		0.134	
	ST44V	0.496	0.250		0.177	
	SV32D	0.362	0.125		0.228	
	SV43D	0.484	0.187		0.289	
	SV32D2	0.362	0.125		0.228	
	SV32S	0.331	0.125		0.213	
	SW317	0.368	0.106		0.197	
	SW317N	0.335	0.106		0.192	
	SW42	0.492	0.125		0.272	
	SW42N	0.457	0.125		0.256	
	SW32D	0.364	0.125		0.228	
	SW43D	0.490	0.187		0.289	
	SW53D	0.615	0.187		0.380	
	SW63D	0.740	0.187		0.443	
	SW84D	0.980	0.250		0.568	
	SW43M	0.492	0.187		0.244	
	SW32M	0.335	0.125		0.205	
	SW32V	0.359	0.125		0.134	
	SW44V	0.496	0.250		0.177	
	SW54V	0.620	0.187		0.217	

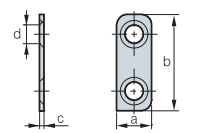
Cartridge

Geometry	Designation	Dimensions a	b	c	d	angle
	LAPDR-AJ	M4x0.7	1.181	0.591	0.394	

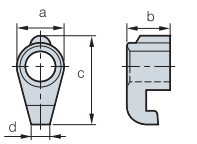
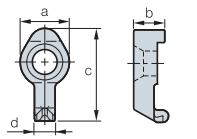
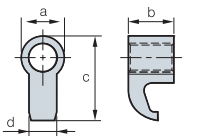
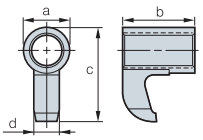
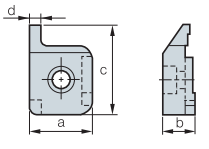
Chip breaker

Geometry	Designation	Dimensions a	b	c	d	angle
	CB20	0.335	0.134	0.787		

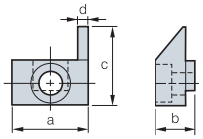
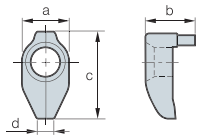
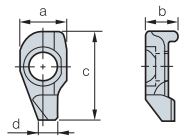
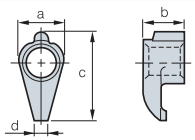
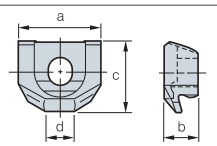
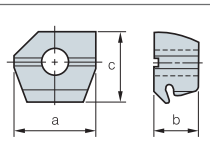
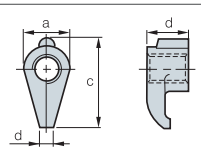
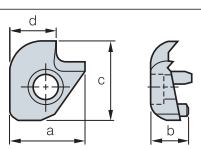
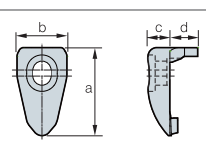
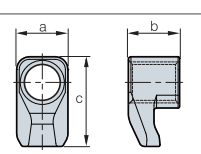
Chip cover

Geometry	Designation	Dimensions a	b	c	d	angle
	CFMP3R14R1-A	0.413	0.787	0.039	(Ø0.169)	
	CFMP3R-A	0.315	0.709	0.039	(Ø0.169)	
	CFMP4R-A	0.315	0.866	0.039	(Ø0.169)	

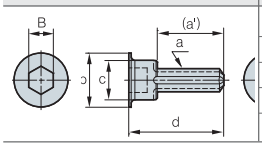
Clamp

Geometry	Designation	Dimensions a	b	c	d	angle
	CA05R	0.350	0.217	0.693	0.130	
	CA06R	0.472	0.283	0.811	0.209	
	CH5R3	0.309	0.283	0.583	0.122	
	CH6R4	0.473	0.354	0.944	0.148	
	CBH4.5R1	0.315	0.226	0.697	0.157	
	CBH4.5R2	0.374	0.252	0.709	0.157	
	CBH5R1	0.394	0.307	0.839	0.197	
	CBH6R1	0.472	0.366	1.024	0.236	
	CDH6N	0.374	0.394	0.732	0.240	
	CDH7N	0.311	0.449	0.579	0.185	
	CDH8N	0.429	0.665	0.882	0.240	
	CDH8N1	0.429	0.665	0.752	0.240	
	CDH8N2	0.429	0.665	1.000	0.240	
	CDH8N3	0.492	0.780	1.000	0.362	
	CDS8N	0.425	0.669	0.874	0.197	
	CGH5R1	0.768	0.374	1.134	0.098	
	CGH5R2	0.807	0.374	1.134	0.138	
	CGH5R3	0.886	0.374	1.134	0.217	

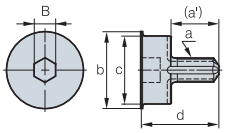
Clamp

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	CGH6R1	0.878	0.469	0.913	0.098	
	CGH6R2	0.913	0.469	0.913	0.134	
	CGH6R3	0.945	0.469	0.913	0.165	
	CHH3.5R1	0.295	0.264	0.512	0.096	
	CHH4.5R1	0.311	0.309	0.555	0.100	
	CHH5.5R1	0.386	0.394	0.646	0.157	
	CH4R1	0.291	0.197	0.555	0.122	
	CH5R1	0.394	0.260	0.795	0.177	
	CH5R2	0.270	0.276	0.543	0.079	
	CH6R2	0.348	0.343	0.650	0.079	
	CH6R3	0.465	0.394	0.906	0.165	
	CMH5R1	0.728	0.311	0.630	0.246	
	CMH6R2	0.787	0.433	0.689	0.543	
	CMH6R6	0.728	0.311	0.630	0.246	
	CMH6R1	0.945	0.335	0.650	0.326	
	CMH6R3	0.787	0.433	0.689		
	CMH6L3	0.787	0.433	0.689		
	CS5R1	0.268	0.276	0.571	0.079	
	CS6R1	0.346	0.335	0.713	0.106	
	CS8R1	0.465	0.394	0.906	0.165	
	CTH6L1	0.925	0.472	1.000	0.565	
	CTH6R1	0.925	0.472	1.000	0.565	
	CTH6R2	0.857	0.508	1.229	0.682	
	CVH3	0.827	0.433	0.228	0.303	
	CVH3V	1.142	0.551	0.276	0.315	
	CVH4	1.004	0.571	0.236	0.276	
	CVH5	1.181	0.669	0.295	0.374	
	CVH6	1.319	0.728	0.315	0.394	
	CXH8N	0.398	0.394	0.689		

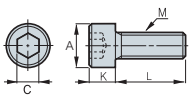
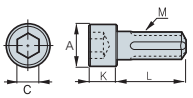
Coolant bolt

Geometry	Designation	Dimensions					
		a	b	c	d	B (T)	á
	CBA063-3IN/MM	M10	Ø0.984	Ø0.630	1.457	0.315	(1.063)
	CBA063-4IN/MM	M10	Ø0.984	Ø0.630	1.673	0.315	(1.063)
	CBA080-IN/MM	M12	Ø1.102	Ø0.709	1.791	0.394	(1.260)
	CBP063-IN/MM	M10	Ø0.866	Ø0.630	1.520	0.315	(1.063)
	CBP080-IN/MM	M12	Ø0.984	Ø0.709	1.913	0.394	(1.260)

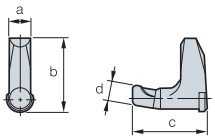
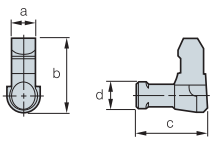
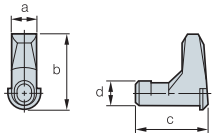
Coolant bolt

Geometry	Designation	Dimensions					
		a	b	c	d	B (T)	á
	CBA100-IN/MM	M16	Ø2.126	Ø1.693	1.850	0.551	(1.260)
	CBA100-IN-25.4	M12	Ø1.732	Ø1.417	1.634	0.394	(0.984)
	CBA125-IN	M20	Ø2.559	Ø2.126	2.205	0.669	(1.496)
	CBA125-IN-25.4	M12	Ø1.732	Ø1.417	1.713	0.394	(0.984)
	CBA125-MM	M20	Ø2.559	Ø2.126	2.244	0.669	(1.378)
	CBA160-IN	M24	Ø3.268	Ø2.874	2.205	0.748	(1.496)
	CBA160-MM	M20	Ø3.268	Ø2.874	2.087	0.669	(1.339)
	CBP100-IN	M16	Ø1.969	Ø1.693	1.913	0.551	(1.260)
	CBP100-IN-25.4	M12	Ø1.732	Ø1.417	1.831	0.394	(0.984)
	CBP100-MM-1	M16	Ø1.969	Ø1.693	1.913	0.551	(1.417)
	CBP125-IN	M20	Ø2.559	Ø2.126	2.205	0.669	(1.496)
	CBP125-IN-25.4	M12	Ø1.732	Ø1.417	2.165	0.394	(0.984)
	CBP125-MM	M20	Ø2.559	Ø2.126	2.244	0.669	(1.378)
	CBP125-MM-1	M20	Ø2.402	Ø2.126	2.583	0.551	(1.299)
	CBP160-IN	M24	Ø3.268	Ø2.874	2.205	0.748	(1.496)
	CBP160-MM	M20	Ø3.268	Ø2.874	2.087	0.669	(1.339)

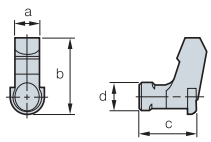
Wrench bolt

Geometry	Designation	Dimensions				
		A	C	K	L	M
	SB0825	0.512	0.236	0.315	0.984	M08 x 1.25
	SB1025	0.630	0.315	0.394	0.984	M10 x 1.50
	SB1035	0.630	0.315	0.394	1.378	M10 x 1.50
	SB1230	0.709	0.394	0.472	1.181	M12 x 1.75
	SB1630	0.945	0.551	0.630	1.181	M16 x 2.0
	SB1645	0.945	0.551	0.630	1.772	M6 x 2.0
	SB2040	1.181	0.669	0.787	1.575	M20 x 2.5
	CB1025	0.512	0.236	0.315	0.984	M08x1.25
	CB1025	0.630	0.315	0.394	0.984	M10x1.50
	CB1035	0.630	0.315	0.394	1.378	M10x1.50
	CB1230	0.709	0.394	0.472	1.181	M12x1.75
	CB1245	0.709	0.394	0.472	1.772	M12x1.75
	CB1630	0.945	0.551	0.630	1.181	M16x2.0
	CB1645	0.945	0.551	0.630	1.772	M16x2.0
	CB2040	1.181	0.669	0.787	1.575	M20x2.5

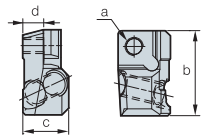
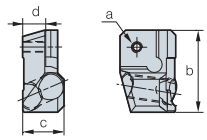
Lever

Geometry	Designation	Dimensions			
		a	b	c	d
	LR10	0.134	0.425	0.461	0.118
	LR12	0.146	0.531	0.528	0.138
	LR16	0.187	0.736	0.720	0.169
	LR20	0.232	0.807	0.736	0.219
	LR25	0.289	0.955	0.933	0.244
	LR32	0.333	1.169	1.061	0.311
	LV2	0.102	0.305	0.236	0.083
	LV3B	0.122	0.394	0.374	0.146
	LV4B	0.185	0.573	0.614	0.185
	LV4BN	0.185	0.630	0.587	0.184
	LV3	0.146	0.394	0.472	0.142
	LV3N	0.148	0.394	0.472	0.140
	LV3AN	0.148	0.476	0.449	0.183
	LV3C	0.122	0.394	0.309	0.142
	LV3CN	0.126	0.394	0.307	0.142
	LV3D	0.122	0.461	0.374	0.142
	LV3DN	0.126	0.459	0.374	0.140
	LV4	0.185	0.573	0.551	0.185
	LV4N	0.185	0.530	0.520	0.184
	LV5	0.236	0.673	0.669	0.236
	LV5N	0.236	0.646	0.672	0.234
	LV5AN	0.236	0.741	0.681	0.234
	LV6N	0.295	0.807	0.827	0.299
	LV8N	0.339	1.004	1.000	0.339

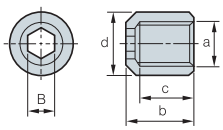
Lever

Geometry	Designation	Dimensions			
		a	b	c	d
	LV4A	0.181	0.521	0.392	0.185
	LV4AN	0.185	0.524	0.394	0.184

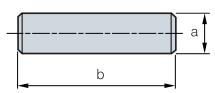
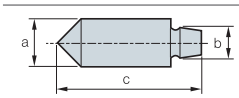
Locator

Geometry	Designation	Dimensions			
		a	b	c	d
	LFMP3R-A	M3.5	0.736	0.398	0.181
	LFMP4R1-A	M4.5	0.957	0.543	0.244
	LFMP4R-A	M4.5	1.035	0.543	0.244
	LFMA3R-A	M3	0.728	0.374	0.189
	LFMA4R-A	M3.5	1.024	0.516	0.287

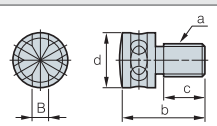
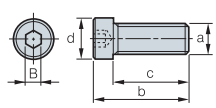
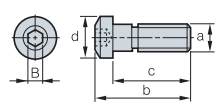
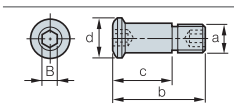
Nut

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	N0407	M4 X 0.7	0.295	0.236	0.276	0.118	
	N0508	M5 X 0.8	0.327	0.260	0.276	0.118	

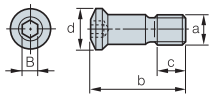
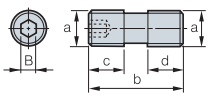
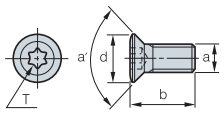
Pin

Geometry	Designation	Dimensions		
		a	b	c
	PN0308	0.118	0.315	
	PN0310	0.118	0.394	
	PN0312	0.118	0.472	
	PN0314	0.118	0.551	
	PN0515	0.189	0.130	0.571

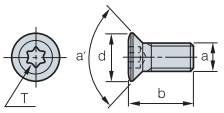
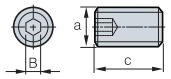
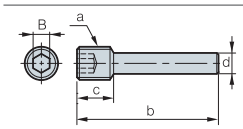
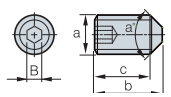
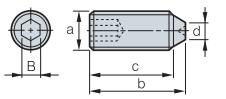
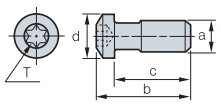
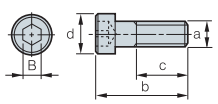
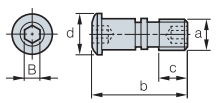
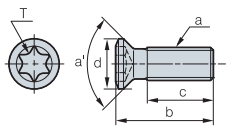
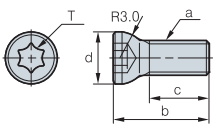
Screw

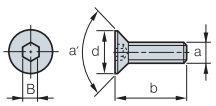
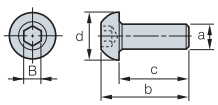
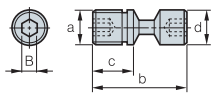
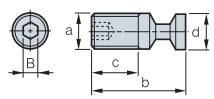
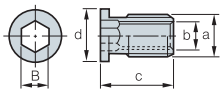
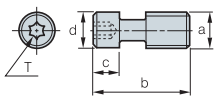
Geometry	Designation	Dimensions				
		a	b	c	d	B(T)
	AZ0508F	M5 X 0.5	0.512	0.315	0.354	Ø0.079
	AZ0514	M5 X 0.8	0.551	0.276	0.354	Ø0.098
	BHA0510	M5 X 0.8	0.591	0.394	0.335	0.157
	BHA0512	M5 X 0.8	0.669	0.472	0.335	0.157
	BHA0612	M6 X 1.0	0.709	0.472	0.394	0.197
	BHA0614	M6 X 1.0	0.787	0.551	0.394	0.197
	BHA0616	M6 X 1.0	0.866	0.630	0.394	0.197
	BHA0619-NYLOK	M6 X 1.0	0.984	0.748	0.394	0.197
	CHX0407	M4 X 0.7	0.374	0.290	0.224	0.098
	CHX0415	M4 X 0.7	0.689	0.591	0.213	0.098
	CHX0510	M5 X 0.8	0.516	0.398	0.303	0.118
	CHX0518	M5 X 0.8	0.846	0.709	0.315	0.118
	CHX0622	M6 X 1.0	1.043	0.866	0.394	0.157
	CHX0513	M5 X 0.8	0.512	0.315	0.252	0.098
	CHX0616	M6 x 1.0	0.638	0.398	0.335	0.118
	CHX0617L	M6 x 1.0(Left)	0.677	0.398	0.335	0.118
	CHX0621	M6 X 1.0	0.827	0.398	0.335	0.118

Screw

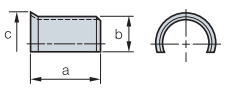
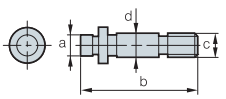
Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	CHX0625	1/4-20UNC	0.976	0.433	0.394	0.157	
	CTX03510	M3.5 X 0.6	0.394	0.185	0.209	0.591	
	CTX04513	M4.5 X 0.75	0.516	0.272	0.268	0.787	
	CTX04513H	M4.5 X 0.75	0.516	0.283	0.268	0.787	
	CTX0515	M5 X 0.8	0.591	0.315	0.276	0.787	
	CTX0517	M5 X 0.8	0.689	0.394	0.276	0.787	
	CTX0621	M6 X 1.0	0.835	0.488	0.354	0.984	
	DHA0514	M5 X 0.8	0.551	0.197	0.276	0.098	
	DHA0617	M6 x 1.0	0.669	0.276	0.295	0.118	
	DHA0620	M6 x 1.0	0.787	0.315	0.315	0.118	
	DHA0624	M6 x 1.0	0.945	0.472	0.335	0.118	
	DHA0815	M8 X 1.25	0.610	0.246	0.246	0.157	
	DHA0818F	M8 X 1.0	0.709	0.335	0.217	0.157	
	DHA0820	M8 X 1.25	0.787	0.315	0.354	0.157	
	DHA0821F	M8 X 1.0	0.827	0.335	0.335	0.157	
	DHA0825	M8 X 1.25	0.984	0.394	0.354	0.157	
	DHA0830	M8 X 1.25	1.181	0.453	0.453	0.157	
	ETGA0520CBM	M5 X 0.8	0.787		0.256	0.787	43°
	ETGD0825	M8 X 1.25	0.992		0.437	1.575	40°
	ETKA0523	M5 X 0.8	0.906		0.299	0.787	43°
	ETKA0625	M6 X 1.0	1.004		0.346	0.787	43°
	ETKD0516	M5 X 0.8	0.646		0.268	0.787	40°
	ETKD0620	M6 X 1.0	0.787		0.327	1.181	40°
	ETNA02506	M2.5 X 0.45	0.224		0.134	0.276	43°
	ETNA0408	M4 X 0.7	0.315		0.201	0.591	43°
	ETNA0412	M4 X 0.7	0.472		0.201	0.591	43°
	ETNA0511	M5 X 0.8	0.433		0.252	0.787	43°
	ETND02506F	M2.5 X 0.35	0.246		0.122	0.276	40°
	ETND0307F	M3 X 0.35	0.307		0.146	0.315	40°
	ETND03509	M3.5 X 0.6	0.378		0.185	0.394	40°
	FTGA03507	M3.5 X 0.6	0.276		0.209	0.591	60°
	FTGA03508	M3.5 X 0.6	0.315		0.209	0.591	60°
	FTGA03510	M3.5 X 0.6	0.394		0.209	0.591	60°
	FTGA03512	M3.5 X 0.6	0.472		0.197	0.591	60°
	FTGA0411F	M4 X 0.5	0.433		0.276	0.591	60°
	FTGA0417CBM	M4 X 0.7	0.669		0.217	0.591	62°
	FTGA0510-P	M5 X 0.8	0.394		0.276	0.787	63°
	FTGA0512-P	M5 X 0.8	0.472		0.276	0.787	63°
	FTGA0513	M5 X 0.8	0.520		0.276	0.787	61°
	FTGA0513-P	M5 X 0.8	0.512		0.276	0.787	63°
	FTGA0517	M5 X 0.8	0.669		0.295	0.787	61°
	FTGA0621	M6 X 1.0	0.846		0.354	0.787	61°
	FTGA0826	M8 X 1.25	1.024		0.457	0.984	61°
	FTKA02206	M2.2 X 0.45	0.217		0.118	0.236	60°
	FTKA02206S	M2.2 X 0.45	0.220		0.120	0.276	60°
	FTKA02555	M2.5 X 0.45	0.217		0.138	0.276	60°
	FTKA02565	M2.5 X 0.45	0.256		0.138	0.276	60°
	FTKA02565S	M2.5 X 0.45	0.256		0.150	0.315	60°
	FTKA0307	M3 X 0.5	0.283		0.165	0.354	60°
	FTKA03508	M3.5 X 0.6	0.331		0.217	0.591	60°
	FTKA03510	M3.5 X 0.6	0.409		0.217	0.591	60°
	FTKA03511A	M3.5 X 0.6	0.433		0.205	0.591	60°
	FTKA0408	M4 X 0.7	0.331		0.217	0.591	60°
	FTKA0410	M4 X 0.7	0.394		0.217	0.591	60°
	FTKA0411K	M4 X 0.7	0.433		0.268	0.591	60°
	FTKA0412B	M4 X 0.7	0.492		0.217	0.591	60°
	FTKA0413	M4 X 0.7	0.512		0.217	0.591	60°
	FTNA01633	M1.6 X 0.35	0.130		0.102	0.236	60°
	FTNA0203	M2 X 0.4	0.118		0.106	0.236	60°
	FTNA02033	M2 X 0.4	0.130		0.106	0.236	60°
	FTNA0204	M2 X 0.4	0.169		0.106	0.236	60°
	FTNA02205	M2.2 X 0.45	0.177		0.118	0.236	60°
	FTNA0238	M2 X 0.4	0.150		0.118	0.236	60°
	FTNA0305	M3 X 0.5	0.205		0.165	0.354	60°
	FTNA0306	M3 X 0.5	0.244		0.165	0.354	60°
	FTNA0307	M3 X 0.5	0.283		0.165	0.354	60°
	FTNA0408	M4 X 0.7	0.335		0.217	0.591	60°
	FTNA0411	M4 X 0.7	0.433		0.217	0.591	60°
	FTNA0511	M5 X 0.8	0.276	0.433	0.264	0.787	63°
	FTNA0513	M5 X 0.8	0.512		0.276	0.787	60°
	FTNA0516	M5 X 0.8	0.630		0.276	0.787	60°

Screw

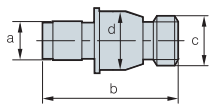
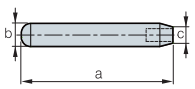
Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	FTNB0411	M4 X 0.7	0.425		0.224	0.591	60°
	FTNC04509	M4.5 X 0.75	0.374		0.268	0.787	55°
	FTNC04511	M4.5 X 0.75	0.453		0.268	0.787	55°
	KHA0508	M5 X 0.8	0.315			0.098	
	KHA0510	M5 X 0.8	0.394			0.098	
	KHA0610	M6 X 1.0	0.394			0.118	
	KHA0612	M6 X 1.0	0.472			0.118	
	KHA0812	M8 X 1.25	0.472			0.157	
	KHA0815	M8 X 1.25	0.591			0.157	
	KHA1015	M10 X 1.5	0.591			0.197	
	KHA1020	M10 X 1.5	0.787			0.197	
	KHB0417	M4 X 0.7	0.677	0.177	0.098	0.079	
	KHB0406	M4 X 0.7	0.236	0.165	0.118	0.079	
	KHC0510	M5 X 0.8	0.394	0.319		0.098	90°
	KHC0610	M6 X 1.0	0.394	0.307		0.118	90°
	KHC0812	M8 X 1.25	0.472	0.354		0.157	90°
	KHC1016	M10 X 1.5	0.630	0.484		0.197	90°
	KHC1020	M10 X 1.5	0.787	0.642		0.197	90°
	KHD0510	M5 X 0.8	0.394	0.354	0.118	0.098	
	KHD0610	M6 X 1.0	0.394	0.394	0.157	0.118	
	KHD0810	M8 X 1.25	0.394	0.394	0.295	0.157	
	LTX0512	M5 X 0.8	0.594	0.472	0.287	0.787	
	LTX0514	M5 X 0.8	0.673	0.551	0.287	0.787	
	MHA0512	M5 X 0.8	0.669	0.425	0.315	0.157	
	MHB0310	M3 X 0.5	0.528	0.315	0.217	0.098	
	MHB0410	M4 X 0.7	0.551	0.315	0.276	0.118	
	MHB1055	M10 X 1.5	2.559	1.969	0.630	0.315	
	MHB1260	M12 X 1.75	2.835	2.165	0.709	0.394	
	MHB1680	M16 X 2.0	3.780	2.953	0.945	0.551	
	MHX0523	M5 X 0.8	0.925	0.382	0.394	0.098	
	MHX0626	M6 X 1.0	1.016	0.394	0.433	0.118	
	MHX0630	M6 X 1.0	1.181	0.492	0.413	0.157	
	PTKA02508	M2.5 X 0.45	0.315	0.197	0.150	0.315	92°
	PTKA03510	M3.5 X 0.6	0.394	0.197	0.197	0.591	92°
	PTKA0407	M4 X 0.7	0.276	0.181	0.217	0.591	86°
	PTKA0407F	M4 X 0.5	0.287	0.150	0.256	0.591	91°
	PTKA0408	M4 X 0.7	0.315	0.220	0.217	0.591	86°
	PTKA0408F	M4 X 0.5	0.327	0.224	0.256	0.591	91°
	PTKA0409F	M4 X 0.5	0.366	0.264	0.256	0.591	91°
	PTKA0410F	M4 X 0.5	0.406	0.303	0.256	0.591	91°
	PTKA0411F	M4 X 0.5	0.445	0.343	0.256	0.591	91°
	PTKA0412	M4 X 0.7	0.472	0.295	0.232	0.591	92°
	PTKA0412F	M4 X 0.5	0.484	0.382	0.256	0.591	91°
	PTKA0413F	M4 X 0.5	0.524	0.421	0.256	0.591	91°
	PTKA0512	M5 X 0.8	0.472	0.276	0.272	0.787	92°
	PTMA03508	M3.5 X 0.6	0.315	0.209	0.236	0.354	90°
	PTMA0403F	M4 X 0.5	0.130	0.067	0.256	0.591	91°
	PTMA0404F	M4 X 0.5	0.169	0.106	0.256	0.591	91°
	PTMA0405F	M4 X 0.5	0.209	0.146	0.256	0.591	91°
	PTMA0406F	M4 X 0.5	0.248	0.185	0.256	0.591	91°
	PTMA0411	M4 X 0.7	0.433	0.335	0.260	0.591	90°
	PTKA0411-R3	M4 X 0.7	0.433	0.272	0.236	0.591	

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	FHGA0618	M6 X 1.0	0.709		0.335	0.157	61°
	PXMA0306	M3 X 0.5	0.232		0.224	0.079	90°
	SHX0310	M3 X 0.5	0.394		0.232	0.079	91°
	RHA0510	M5 X 0.8		0.394		0.157	
	RHA0613	M6 X 1.0	0.642	0.512	0.413	0.157	
	RHA0620	M6 X 1.0	0.945	0.787	0.413	0.157	
	VHX0509B	M5 X 0.8	0.354	0.163	0.197	0.079	
	VHX0512B	M5 X 0.8	0.472	0.256	0.197	0.079	
	VHX0512BN	M5 X 0.8	0.472	0.258	0.197	0.079	
	VHX0514	M5 X 0.8	0.571	0.325	0.197	0.079	
	VHX0613N	M6 X 1.0	0.528	0.295	0.233	0.098	
	VHX0617	M6 X 1.0	0.669	0.394	0.236	0.098	
	VHX0617N	M6 X 1.0	0.659	0.328	0.232	0.098	
	VHX0621	M6 X 1.0	0.827	0.551	0.236	0.098	
	VHX0817N	M8 X 1.0	0.671	0.314	0.311	0.118	
	VHX0820N	M8 X 1.0	0.815	0.314	0.311	0.118	
	VHX0820AN	M8 X 1.0	0.807	0.408	0.311	0.118	
	VHX0821	M8 X 1.0	0.827	0.394	0.315	0.118	
	VHX0821N	M8 X 1.0	0.835	0.381	0.311	0.118	
	VHX0823N	M8 X 1.0	0.925	0.408	0.311	0.118	
	VHX0825	M8 X 1.0	0.984	0.472	0.315	0.118	
	VHX1027N	M10 X 1.0	1.071	0.567	0.386	0.197	
	VHX1236N	M12 X 1.0	1.417	0.720	0.465	0.197	
	VHX0613A	M6 X 1.0	0.528	0.358	0.236	0.098	
	SHXN0509F	M5 X 0.5	M3.5 X 0.6	0.341	0.248	0.138	
	SHXN0610F	M6 X0.75	M4 X 0.5	0.394	0.307	0.157	
	SHXN0712F	M7 X0.75	M5 X 0.8	0.472	0.335	0.197	
	WTX0813	M8 X 1.25	0.677	0.193	0.335	0.984	
	WTX0817	M8 X 1.25	0.866	0.193	0.335	0.984	

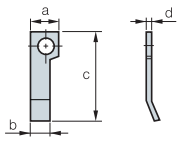
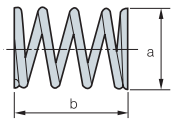
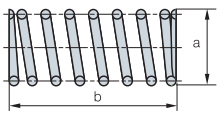
Shim pin

Geometry	Designation	Dimensions			
		a	b	c	d
	SP3	0.217	0.138	0.232	
	SP3N	0.270	0.130	0.219	
	SP3N-1	0.209	0.130	0.219	
	SP4	0.276	0.157	0.299	
	SP4N	0.228	0.171	0.291	
	SP5	0.335	0.177	0.346	
	SP5N	0.335	0.224	0.354	
	SP6N	0.437	0.236	0.433	
	SP8N	0.472	0.394	0.604	
	SP2M	0.197	0.551	M5x0.8	0.236
	SP3M	0.138	0.768	M4x0.7	0.157
	SP3M-1	0.138	0.650	M4x0.7	0.157
	SP4M	0.197	0.748	M5x0.8	0.236

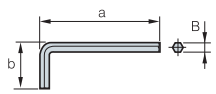
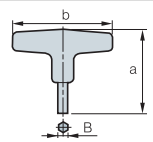
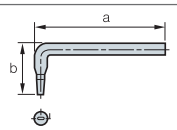
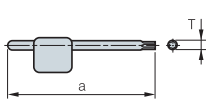
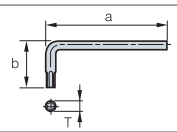
Shim pin

Geometry	Designation	Dimensions			
		a	b	c	d
	SP3D	0.146	0.516	UNF10-32	0.220
	SP3D2	0.142	0.472	UNF10-32	0.217
	SP3DS	0.146	0.454	UNF10-32	0.220
	SP4D	0.196	0.677	UNF1/4 28	0.280
	SP4DL	0.197	0.673	UNF1/4 28	0.276
	SP4DS	0.196	0.522	UNF1/4 28	0.000
	SP5D	0.244	0.862	UNF5/16-24	0.372
	SP6D	0.305	0.862	UNF3/8-24	0.434
	SP8D	0.355	1.167	UNF7/16-20	0.559
	LSPS3	2.362	0.323	0.219	
	LSPS4	2.559	0.394	0.276	
	LSPS5	2.717	0.449	0.348	
	LSPS6	2.717	0.512	0.433	
	LSPS8	2.874	0.650	0.598	

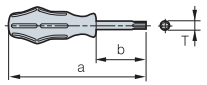
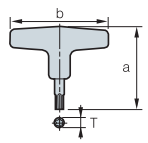
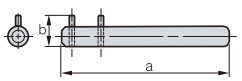
Spring

Geometry	Designation	Dimensions			
		a	b	c	d
	SR2	0.157	0.110	0.496	0.016
	SPR0315	0.118	0.591		
	SPR0415	0.157	0.591		
	SR3	0.362	0.492		
	SR4	0.157	0.433		
	SPR0714	0.276	0.551		
	SPR0510	0.197	0.394		
	SPR0714	0.276	0.551		
	SPR0811	0.315	0.433		

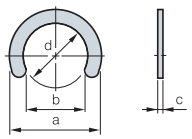
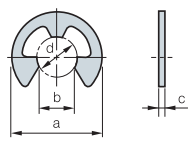
Wrench

Geometry	Designation	Dimensions		
		a	b	B(T)
	HW20L	2.047	0.709	0.079
	HW25L	2.303	0.807	0.098
	HW30L	2.598	0.906	0.118
	HW35L	2.835	0.984	0.138
	HW40L	2.913	1.142	0.157
	HW50L	3.346	1.299	0.197
	HW40	3.228	3.150	0.157
	HW50	3.780	3.543	0.197
	SW50L	2.756	1.083	
	TW06P	2.480		0.236
	TW07P	2.480		0.276
	TW08P	2.795		0.315
	TW09P	2.953		0.354
	TW10P	3.071		0.394
	TW15P	3.228		0.591
	TW20P	3.386		0.787
	TW15L	2.362	0.827	0.591
	TW20L	2.362	0.827	0.787

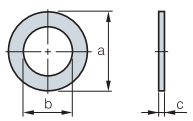
Wrench

Geometry	Designation	Dimensions		
		a	b	B(T)
	TW07S	5.512	2.362	0.276
	TW08S	5.906	2.992	0.315
	TW09S	6.496	2.756	0.354
	TW15S	7.480	3.543	0.591
	TW20S	7.677	3.583	0.787
	TW20	2.953	3.150	0.787
	TW25	2.913	3.150	0.984
	SW15S	5.906	0.512	

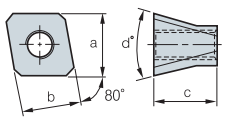
Stop ring

Geometry	Designation	Dimensions			
		a	b	c	d
	CR03	0.189	0.102	0.016	0.118
	CR04	0.260	0.142	0.016	0.157
	CR05	0.299	0.181	0.016	0.197
	ER03	0.276	0.102	0.024	0.118
	ER04	0.354	0.138	0.024	0.157
	ER05	0.039	0.169	0.024	0.197

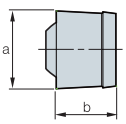
Washer

Geometry	Designation	Dimensions		
		a	b	c
	WA3	0.133	0.268	0.02~0.039
	WA4	0.394	0.209	0.02~0.039

Stopper

Geometry	Designation	Dimensions			
		a	b	c	d°
	STP5	0.433	0.402	0.433	30°

Nozzle

Geometry	Designation	Dimensions			
		a	b	c	d°
	CN0605	0.433	0.402	0.433	30°

L

TECHNICAL INFORMATION



General Information I

L02 Workpiece material grades
L06 Steel, Non-ferrous metal symbol list
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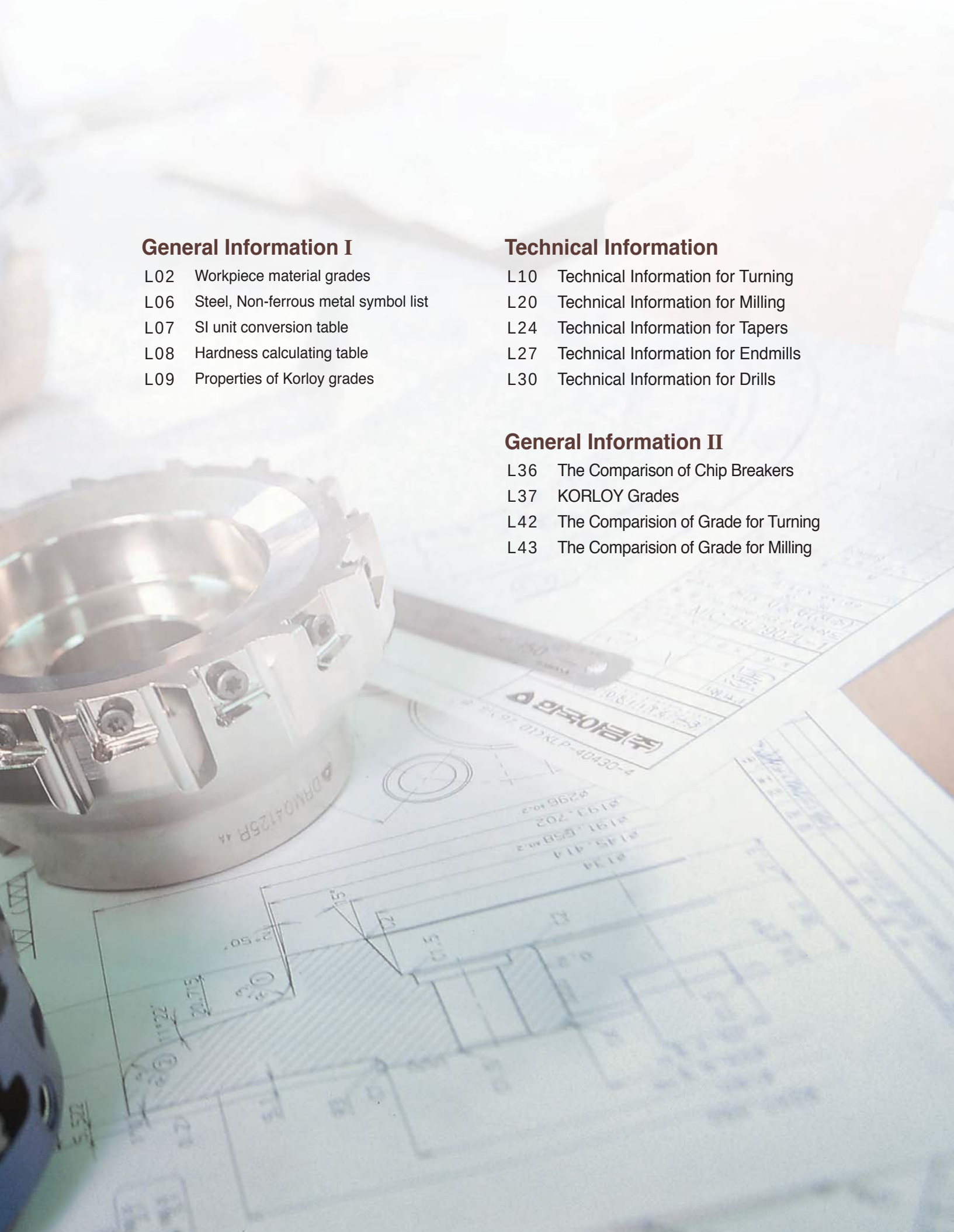
L08 Hardness calculating table
L09 Properties of Korloy grades

Technical Information

L10 Technical Information for Turning
L20 Technical Information for Milling
L24 Technical Information for Tapers
L27 Technical Information for Endmills
L30 Technical Information for Drills

General Information II

L36 The Comparison of Chip Breakers
L37 KORLOY Grades
L42 The Comparision of Grade for Turning
L43 The Comparision of Grade for Milling



Carbon steel and alloy steel for structural use

Type		U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
		AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Carbon steel		1010	SM10C	C10	S10C	040A10 045A10 045M10	C10E C10R	XC10	-
		1015	SM15C	C15E4 C15M2	S15C	055M15	C15E C15R	-	-
		1020	SM20C	-	S20C	070M20 C22, C22E C22R	C22 C22E C22R	C22 C22E C22R	-
		1025	SM25C	C25 C25E4 C25M2	S25C	C25 C25E C25R	C25 C25E C25R	C25 C25E C25R	-
		1030	SM30C	C30 C30E4 C30M2	S30C	080A30 080M30 CC30 C30E C30R	C30 C30E C30R	C30 C30E C30R	30Г
		1035	SM35C	C35 C35E4 C35M2	S35C	C35 C35E C35R	C35 C35E C35R	C35 C35E C35R	35Г
		1039 1040	SM40C	C40 C40E4 C40M2	S40C	080M40 C40 C40E C40R	C40 C40E C40R	C40 C40E C40R	40Г
		1042 1043	SM43C	-	S43C	080A42	-	-	40Г
		1045 1046	SM45C	C45 C45E4 C45M2	S45C	C45 C45E C45R	C45 C45E C45R	C45 C45E C45R	45Г
		-	SM48C	-	S48C	080A47	-	-	45Г
		1049	SM50C	C50 C50E4 C50M2	S50C	080M50 C50 C50E C50R	C50 C50E C50R	C50 C50E C50R	50Г
		1050 1053	SM53C	-	S53C	-	-	-	50Г
		1055	SM55C	C55 C55E4 C55M2	S55C	070M55 C55 C55E C55R	C55 C55E C55R	C55 C55E C55R	-
		1059 1060	SM58C	C60 C60E4 C60M2	S58C	C60 C60E C60R	C60 C60E C60R	C60 C60E C60R	60Г
Alloy steel	Nickel chromium steel	- - - - -	SNC236 SNC415(H) SNC631(H) SNC815(H) SNC836	- - - 15NiCr13 -	SNC236 SNC415(H) SNC631(H) SNC815(H) SNC836	- - - 655M13(655H13) -	- - - 15NiCr13 -	- - - - -	40XH - 30XH3A - -
	Nickel chromium molybdenum steel	8615 8617(H) 8620(H) 8622(H)	SNCM220	20NiCrMo2 20NiCrMoS2	SNCM220	805A20 805M20 805A22 805M22	20NiCrMo2 20NiCrMoS2	20NCD2	-
		8637 8640	SNCM240	41CrNiMo2 41CrNiMoS2	SNCM240	-	-	-	-
		- 4320(H) - 4340 - - - - -	SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- - - - - - - - -	SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- - - - - - - - -	- - - - - - - - -	- - - - - - - - -	- 20XH2M(20XHM) - - - - - - -
	Chromium steel	-	SCr415(H)	-	SCr415(H)	-	17Cr3 17CrS3	-	15X 15XA
		5120(H)	SCr420(H)	20Cr4(H) 20CrS4	SCr420(H)	-	-	-	20X
		5130(H) 5132(H)	SCr430(H)	34Cr4 34CrS4	SCr430(H)	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	30X
		5135(H)	SCr435(H)	34Cr4 34CrS4 37Cr4 37CrS4	SCr435(H)	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	35X
		5140(H)	SCr440(H)	37Cr4 37CrS4 41Cr4 41CrS4	SCr440(H)	530M40 41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	40X
			SCr445(H)		SCr445(H)				45X

• The above Alloy steel can supplied by domestic manufacturing

Type		U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
		AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Alloy steel	Chromium molybdenum steel	-	SCM415(H)	-	SCM415(H)	-	-	-	-
		-	SCM418(H)	18CrMo4 18CrMoS4	SCM418(H)	-	18CrMo4 18CrMoS4	-	20XM
		-	SCM420(H)	-	SCM420(H)	708M20(708H20)	-	-	20XM
		4130	SCM430	-	SCM430	-	-	-	30XM 30XMA
		-	SCM432	-	SCM432	-		-	-
		(4135H) 4137(H)	SCM435(H)	34CrMo4 34CrMoS4	SCM435(H)	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	35XM
		4140(H) 4142(H)	SCM440(H)	42CrMo4 42CrMoS4	SCM440(H)	708M70 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	-
		4145(H) 4147(H)	SCM445(H)	-	SCM445(H)	-	-	-	-
	Manganese steel and Manganese chromium steel	1522(H) 1534 1541(H) 1541(H) - -	SMn420(H) SMn433(H) SMn438(H) SMn443(H) SMnC420(H) SMnC443(H)	22Mn6(H) - 36Mn6(H) 42Mn6(H) - -	SMn420(H) SMn433(H) SMn438(H) SMn443(H) SMnC420(H) SMnC443(H)	150M19 150M36 150M36 - - -	- - - - -	- - - - -	- 30Г2 35Г2 35Г2 40Г2 40Г2 45Г2 - -
	Aluminum chromium molybdenum steel	-	SACM645	41CrAlMo74	SACM645	-	-	-	-

• The above Alloy steel can supplied by domestic manufacturing

Tool steel

Type	U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
	AISI SAE	KS	ISO	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
High speed steel	T1 T4 T5 T15 M2 M3-1 M3-2 M4 M 35 M36 - M7 M42	SKH2 SKH3 SKH4 SKH10 SKH51 SKH52 SKH53 SKH54 SKH55 SKH56 SKH57 SKH58 SKH59	HS18-0-1 - - - HS6-5-2 HS6-6-2 HS6-5-3 HS6-5-4 HS6-5-2-5 - HS10-4-3-10 HS2-9-2 HS2-9-1-8	SKH2 SKH3 SKH4 SKH10 SKH51 SKH52 SKH53 SKH54 SKH55 SKH56 SKH57 SKH58 SKH59	 BM 2 BM 35 	 S6/5/2 S6/5/2/5 S2/9/2 	 Z 85 WDCV 6-5-2-5 	
Alloy tool steel	F2 - - - L6 - - - - W2-9 1/ W2-8 1-2 - - - - - D3 D2 A2 - H21 H11 H13 H12 H10 H19 - L6	STS11 STS2 STS21 STS5 STS51 STS7 STS8 STS4 STS41 STS43 STS44 STS3 STS31 STS93 STS94 STS95 STD1 STD11 STD12 STD4 STD5 STD6 STD61 STD62 STD7 STD8 STF3 STF4	- - - - - - - - - 105V - - 105WCr1 - - - 210Cr12 - 100CrMoV5 - X30WCrV9-3 X37CrMoV5-1 X40CrMoV5-1 X35CrWMoV5 32CrMoV12-28 - - 55NiCrMoV7	SKS11 SKS2 SKS21 SKS5 SKS51 SKS7 SKS8 SKS4 SKS41 SKS43 SKS44 SKS3 SKS31 SKS93 SKS94 SKS95 SKD1 SKD11 SKD12 SKD4 SKD5 SKD6 SKD61 SKD62 SKD7 SKD8 SKT3 SKT4	 BD3 BA2 BH21 BH13 	 105WCr6 X210Cr12 X100CrMoV5 1 X30WCrV9 3 X40CrMoV5 1 55NiCrMoV6	 105WC13 Z200C12 Z100CDV5 Z30WCV9 Z40CDV5 55NCDV7	

• The above Alloy steel can supplied by domestic manufacturing

Type	U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
	AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Free cutting carbon steel	1110	SUM11	-	SUM11				
	1109	SUM12	-	SUM12				
	1212	SUM21	9S20	SUM21				
	1213	SUM22	11SMn28	SUM22	230M07	9SMn28	S250	
	12L13	SUM22L	11SMnPb28	SUM22L		9SMnPb28	S250Pb	
	1215	SUM23	-	SUM23	240M07	9SMn36	S 300	
	-	SUM23L	-	SUM23L				
	12L14	SUM24L	11SMnPb28	SUM24L		9SMnPb36	S300Pb	
	-	SUM25	12SMn35	SUM25				
	1117	SUM31	-	SUM31				
	-	SUM31L	-	SUM31L				
	-	SUM32	-	SUM32				
	1137	SUM41	-	SUM41				
	1141	SUM42	-	SUM42				
	1144	SUM43	44SMn28	SUM43				
High carbon chromiom	-	STB1	-	SUJ1				
	52100	STB2	B1	SUJ2	534A99	100Cr6	100Cr6	
	ASTM A 485 Grade 1	STB3	B2	SUJ3				
	-	STB4	-	SUJ4				
	-	STB5	-	SUJ5				

• The above Special speed steel can supplied by domestic manufacturing

Stainless steel

Type		U.S.A		Korea	ISO	Japan	Great Britain	Germany	France	Russia
		UNS	AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Stainless steel	Austenitic	S20100	201	STS201	X12CrMnNiN17-7-5	SUS201	284S16	X12CrNi17-7	Z12CMN17-07Az	12X17•9AH4
		S20200	202	STS202	X12CrMnNiN18-9-5	SUS202	301S21	X2CrNiN18-7		07X16H6
		S30100	301	STS301	X10CrNi18-8	SUS301		X12CrNi17-7	Z11CN17-08	
				STS301L	X2CrNiN18-7	SUS301L				
				STS301J1		SUS301J1	302S25			12X18H9
		S30200	302	STS302		SUS302		X10CrNiS18-9	Z12CN18-09	
		S30215	302B	STS302B	X12CrNiSi18-9-3	SUS302B	303S21			
		S30300	303	STS303	X10CrNiS18-9	SUS303	303S41		Z8CNF18-09	12X18H10E
		S30323	303Se	STS303Se		SUS303Se		X5CrNi18-10		
				STS303Cu		SUS303Cu	304S31			08X18H10
		S30400	304	STS304	X5CrNi18-9	SUS304		X2CrNi19-11	Z7CN18-09	
					X2CrNi18-9		304S11			03X18H11
		S30403	304L	STS304L	X2CrNi19-11	SUS304L		X2CrNiN18-10	Z3CN19-11	
		S30451	304N	STS304N1	X5CrNiN18-8	SUS304N1			Z6CN19-09Az	
		S30453	304LN	STS304LN	X2CrNiN18-8	SUS304LN		X5CrNi18-12	Z3CN18-10Az	
				STS304J1		SUS304J1	305S19			06X18H11
		S30500	305	STS305	X6CrNi18-12	SUS305			Z8CN18-12	
		S30908	309S	STS309S		SUS309S	310S31	X5CrNiMo27-12-2	Z10CN24-13	10X23H18
		S31008	310S	STS310S	X6CrNi25-20	SUS310S	316S31	X5CrNiMo27-13-3	Z8CN25-20	
		S31600	316	STS316	X5CrNiMo17-12-2	SUS316		X2CrNiMo17-13-2	Z7CND17-12-02	
					X3CrNiMo17-12-3		316S11	X2CrNiMo17-14-3	Z6CND18-12-03	03X17H14M3
		S31603	316L	STS316L	X2CrNiMo17-12-2	SUS316L			Z3CND17-12-02	
					X2CrNiMo17-12-3				Z3CND17-12-03	
					X2CrNiMo18-14-3					
		S31651	316N	STS316N		SUS316N	317S16	X6CrNiTi18-10		
		S31700	317	STS317		SUS317	321S31	X6CrNiNb18-10		08X18H10T
		S32100	321	STS321	X6CrNiTi18-10	SUS321	347S31		Z6CNT18-10	08X18H12
		S34700	347	STS347	X6CrNiNb18-10	SUS347		X6CrAl13	Z6CNNb18-10	
		S38400	384	STS384	X3NiCr18-16	SUS384	405S17		Z6CN18-16	
	Ferritic	S40500	405	STS405	X6CrAl13	SUS405			Z8CA12	
				STS410L		SUS410L		X6Cr17	Z3C14	
		S42900	429	STS429		SUS429	430S17	X7CrS18		12X17
		S43000	430	STS430	X6Cr17	SUS430		X6CrMo17-1	Z8C17	
		S43020	430F	STS430F	X7CrS17	SUS430F	434S17		Z8CF17	
		S43400	434	STS434	X6CrMo17-1	SUS434			Z8CD17-01	
		S44400	444	STS444	X2CrMoTi18-2	SUS444			Z3CDT18-02	
		S44627		STSXM27		SUSXM27		X10Cr13	Z1CD26-01	
	Martensitic	S40300	403	STS403		SUS403	410S21			
		S41000	410	STS410	X12Cr13	SUS410	416S21	X20Cr13	Z13C13	
		S41600	416	STS416	X12CrS13	SUS416	420S29	X20CrNi17-2	Z11CF13	20X13
		S42000	420	STS420J1	X20Cr13	SUS420J1	431S29		Z20C13	20X17H2
		S43100	431	STS431	X19CrNi16-2	SUS431			Z15CN16-02	
		S44002	440A	STS440A	X70CrMo15	SUS440A		X7CrNiAl17-7	Z70C15	
	Precipitation hardening type	S17400	S17400	STS630	X5CrNiCuNb16-4	SUS630			Z6CNU17-04	09X17H7IO
		S17700	S17700	STS631	X7CrNiAl17-7	SUS631			Z9CNA17-07	
				STS631J1		SUS631J1				

• The above Stainless steel can supplied by domestic manufacturing

Casting or forging steel

Type		U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
		AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Casting Iron	Grey iron casting	No 20 B No 25 B No 30 B No 35 B No 45 B No 50 B No 55 B	GC100 GC150 GC200 GC250 GC300 GC350	100,150, 200, 250, 300, 350	FC100 FC150 FC200 FC250 FC300 FC350	 Grade 150 Grade 220 Grade 260 Grade 300 Grade 350 Grade 400	GG 10 GG 15 GG 20 GG 25 GG 30 GG 35 GG 40	Ft 10 D Ft 15 D Ft 20 D Ft 25 D Ft 30 D Ft 35 D Ft 40 D	-
	Spheroidal graphite iron casting	60-40-18 80-55-06 100-70-03	GCD400 GCD500 GCD600 GCD700	700-2, 600-3, 500-7, 450-10, 400-15, 400-18, 350-22	FCD400 FCD500 FCD600 FCD700	SNG 420/12 SNG 370/17 SNG 500/7 SNG 600/3 SNG 700/2	GGG 40 GGG 40.3 GGG 50 GGG 60 GGG 70	FCS 400-12 FGS 370-17 FGS 500-7 FGS 600-3 FGS 700-2	B
	Austempered Spheroidal graphite iron casting	-	FCAD	-	FCAD	EN-GJS-	EN-GJS-	EN-GJS-	-
	Austenitic iron casting	Type 1, 2, Type D-2, D-3A Class 1, 2	FCA- FCDA-	L-, S-	FCA- FCDA-	F1, F2, S2W, S5S	GGL-, GGG-	L-, S-	-

Non-ferrous alloy

Type		U.S.A	Korea	ISO	Japan	Great Britain	Germany	France	Russia
		AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Aluminum alloy	Aluminum alloy ingots for casting	204.0 - 319.0 - - - 356.0 A356.0 355.0 242.0 514.0 - - - - -	AC1B AC2A AC2B AC3A AC4A AC4B AC4C AC4CH AC4D AC5A AC7A AC8A AC8B AC8C AC9A AC9B	Al-Cu4MgTi - - - - - Al-Si7Mg(Fe) Al-Si7Mg Al-Si5Cu1Mg Al-Cu4Ni2Mg2 - - - - - -	AC1B AC2A AC2B AC3A AC4A AC4B AC4C AC4CH AC4D AC5A AC7A AC8A AC8B AC8C AC9A AC9B	- - - LM-6 - - LM-25 - LM-16 - LM-5 LM-13 LM-26 - LM-29 -	- - - - G(GK)-AlSi9Cu3 - G(GK)-AlSi7MG - - G(GK)-AlMg5 - - - - - GD-AlSi12 (Cu)	A-U5GT - - - - - A-S7G - - A-U4NT - A-S12UNG A-S10UG A-S10UG - A-S18UNG	
	Aluminum alloy die casting	A413.0 A360.0 518.0 - A380.0 A380.0 383.0 383.0 B390.0	ALDC1 ALDC2 ALDC3 ALDC4 ALDC7 ALDC7Z ALDC8 ALDC8Z ALDC9	Al-Si12CuFe - - - Al-Si8Cu3Fe Al-Si8Cu3Fe - - -	ADC1 ADC3 ADC5 ADC6 ADC10 ADC10Z ADC12 ADC12Z ADC14	LM20 - - - - LM24 LM2 LM2 LM30	GD-AlSi10Mg GD-AlMg9 - GD-AlSi9Cu3 GD-AlSi9Cu3 - - - EN AW-5052	A-S13 A-S9G A-G6 A-G3T - - - - -	
	Aluminum alloy extruded shapes	5052 5454 5083 5086 6061 6063 - - 7075	A5052S A5454S A5083S A5086S A6061S A6063S A7003S A7N01S A7075S	- - AlMg4.5Mn0.7 - AlMg1SiCu AlMg0.7Si - - AlZn5.5MgCu	A5052S A5454S A5083S A5086S A6061S A6063S A7003S A7N01S A7075S	EN AW-5052 EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075	EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075 -	EN AW-5052 EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075	

Heat resistant steel

Type		U.S.A		Korea	ISO	Japan	Great Britain	Germany	France	Russia
		UNS	AISI SAE	KS	ISO	JIS	BS BS/EN	DIN DIN/EN	NF NF/EN	ГОСТ
Heat resistant steel	Austenitic	 S63008 S63017 S30900 S31000 N08330 S66286	 309 310 N08330	STR31 STR35 STR36 STR37 STR38 STR309 STR310 STR330 STR660 STR661		SUH31 SUH35 SUH36 SUH37 SUH38 SUH309 SUH310 SUH330 SUH660 SUH661	331S42 349S52 349S54 381S34 309S24 310S24 	 X53CrMnNi21-9 CrNi2520 CrAl1205	Z35CNWS14-14 Z52CMN21-09-Az Z55CMN21-09-Az Z15CN24-13 Z15CN25-20 Z12NCS35-16 Z6NCTV25-20	
	Ferritic	R30155 S40900 	 409	STR21 STR409 STR409L STR446	 X6CrTi12 X2CrTi12 	SUH21 SUH409 SUH409L SUH446	 409S19 	X6CrTi12 X45CrSi9-3	 Z6CT12 Z3CT12 Z12C25	
	Martensitic	S44600 S65007 S42200	 446 	STR1 STR3 STR4 STR11 STR600 STR616		SUH1 SUH3 SUH4 SUH11 SUH600 SUH616	401S45 443S65 	 	Z45CS9 Z40CSD10 Z80CSN20-02	

• The above Heat resistant steel can supplied by domestic manufacturing

Steel, Non-ferrous metal symbol list

Comparison of workpiece material standards

Group		Standard term	Code
Structural Steel		Rolled Steel for Welded Suructure	SWS
		Rerolled Steel	SBR
		Rolled Steel for General Structure	SB
		Light Gauge Steel for General Structure	SBC
		Hot- rolled Steel Plate, Sheet/ Strip for Automobile Structural Use	SAPH
Steel Plate		Cold-rolled Steel Sheet/Strip	SBC
		Hot-rolled Soft Steel Sheet/Strip	SHP
Steel Pipe		Carbon Steel Pipe for Ordinary Piping	SPP
		Carbon Steel Pipe for Boiler and Heat Exchanger	STH
		Seamless Steel Pipe for High Pressure Gas Cylinder	STHG
		Carbon Steel Pipe for General Structural Use	SPS
		Carbon Steel Pipe for Machine Structural Use	STST
		Alloy Steel Pipe for Structural Use	STA
		Stainless Steel Pipe for Machine and Structural Use	STS-TK
		Carbon Steel Square Pipe for General Structural Use	SPSR
		Alloy Steel Pipe	SPA
		Carbon Steel Pipe for Pressure Service	SPPS
		Carbon Steel Pipe for High Temperature Service	SPSR
		Carbon Steel Pipe for High Pressure Service	SPPH
		Stainless Steel Pipe	STSxT
Iron and Steel		Carbon Steel for Machine Structural Use	SMxxC, SMxxCK
		Aluminum Chromium Molybdenum Steel	SACM
		Chromium Molybdenum Steel	SCM
		Chromium Steel	SCr
		Nickel Chromium Steel	SNC
		Nickel Chromium Molybdenum Steel	SNCM
		Manganese Steel and manganese Chromium Steel for Machine Structural Use	SMn, SMnC
Special steel	Tool steel	Carbon Tool Steel	STC
		Hollow Drill Steel	SKC
		Alloy Tool Steel	STS, STD, STF
		High Speed Tool Steel	SKH
	Stainless steel	Stainless Steel Bar	STS
	Heat resisting steel	Heat Resisting Steel	STR
		Heat Resisting Steel Bar	STR
		Heat Resisting Steel Sheet	STR
	Free cutting carbon steel		SUM
	Special steel		STB
	Spring steel		SPS

Group	Standard term	Code
Forged steel	Carbon Steel Forging	SF
	Chromium Molybdenum Steel Forging	SFCM
	Nickel Chromium Molybdenum Steel Forging	SFNCM
Cast iron	Gray Cast iron	GC
	Spheroidal Graphite Cast iron	GCD
	Blackheart Malleable Cast iron	BMC
	Whiteheat Malleable Cast iron	WMC
	Pearlitic Malleable Cast iron	PMC
Cast steel	Carbon Cast Steel	SC
	High Tensile Strength Carbon Cast Steel & Low Alloy Cast Steel	HSC
	Stainless Cast Steel	SSC
	Heat Resisting Cast Steel	HRSC
	High Manganese Cast Steel	HMnSC
	Cast Steel for High Temperature and High Pressure Service	SCPH
Casting	Brass Casting	BsC
	High Strength Brass Casting	HBsC
	Bronze Casting	BrC
	Phosphoric Bronze Casting	PCB
	Aluminum Bronze Casting	AlBC
	Aluminum Alloy Casting	ACxA
	Magnesium Alloy Casting	MgC
	Zinc Alloy Die Casting	ZnDC
	Aluminum Alloy Die Casting	Aℓ DC
	Magnesium Alloy Die Casting	MgDC
	White Metal	WM
	Aluminum Alloy Casting for Bearing	AM
	Brass Alloy Casting for Bearing	KM

SI unit conversion table

Major SI unit conversion table

Force

N	kgf	dyn
1	1.01972×10^{-1}	1×10^{-5}
9.80665	1	9.80665×10^{5}
1×10^{-5}	1.01972×10^{-6}	1

Stress

Pa or N/m²	MPa or N/mm²	kgf/mm²	kgf/cm²	kgf/m²
1	1×10^{-6}	1.01972×10^{-7}	1.01972×10^{-5}	1.01972×10^{-1}
1×10^{6}	1	1.01972×10^{-1}	1.01972×10	1.01972×10^{5}
9.80665×10^{6}	9.80665	1	1×10^{2}	1×10^{6}
9.80665×10^{4}	9.80665×10^{-2}	1×10^{-2}	1	1×10^{4}
9.80665	9.80665×10^{-6}	1×10^{-6}	1×10^{-4}	1

Pressure

Pa	kPa	MPa	bar	kgf/cm²
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	1.01972×10^{-5}
1×10^{3}	1	1×10^{-3}	1×10^{-2}	1.01972×10^{-2}
1×10^{6}	1×10^{3}	1	1×10	1.01972×10
1×10^{5}	1×10^{2}	1×10^{-1}	1	1.01972
9.80665×10^{4}	9.80665×10	9.80665×10^{-2}	9.80665×10^{-1}	1

Work, Energy, Calorie

J	kW·h	kgf·m	kcal
1	2.77778×10^{-7}	1.01972×10^{-1}	2.38889×10^{-4}
3.60000×10^{6}	1	3.67098×10^{5}	8.60000×10^{2}
9.80665	2.72407×10^{-6}	1	2.34270×10^{-3}
4.18605×10^{3}	1.16279×10^{-3}	4.26858×10^{2}	1

Power

W	kW	kgf·m/s	PS	kcal/h
1	1×10^{-3}	1.01972×10^{-1}	1.35962×10^{-3}	0.860
1×10^{3}	1	1.01972×10^{2}	1.359 62	8.60000×10^{2}
9.81 65	9.80665×10^{-3}	1	1.33333×10^{-2}	8.433 71
7.355×10^{2}	7.355×10^{-1}	7.5×10	1	6.32529×10^{2}
1.16279	1.16279×10^{-3}	1.18572×10^{-1}	1.58095×10^{-3}	1

Specific heat

J/(kg·K)	kcal/(kg·℃) cal/(g·℃)
1	2.38889×10^{-4}
4.18605×10^{3}	1

Thermal conductivity

W/(m·k)	kcal/(h·m·℃)
1	8.6000×10^{-1}
1.16279	1

Revolution per minute

min⁻¹	s⁻¹	r.p.m.
1	0.0167	1
60	1	60

Hardness calculating table

Work piece hardness calculating table

Vickers 50kgf HV	Brinell 3000kgf HB		Rockwell				Shore	Tensile strength (approximate value)
	Standard ball 10㎜	Cemented carbide ball 10㎜	A scale 60kgf Diamond particle HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf Diamond particle HRC	D scale 100kgf Diamond particle HRD	HS	MPa (1)
940	-	-	85.6	-	68.0	76.9	97	-
920	-	-	85.3	-	67.5	76.5	96	-
900	-	-	85.0	-	67.0	76.1	95	-
880	-	(767)	84.7	-	66.4	75.7	93	-
860	-	(757)	84.4	-	65.9	75.3	92	-
840	-	(745)	84.1	-	65.3	74.8	91	-
820	-	(733)	83.8	-	64.7	74.3	90	-
800	-	(722)	83.4	-	64.0	74.8	88	-
780	-	(710)	83.0	-	63.3	73.3	87	-
760	-	(698)	82.6	-	62.5	72.6	86	-
740	-	(684)	82.2	-	61.8	72.1	84	-
720	-	(670)	81.8	-	61.0	71.5	83	-
700	-	(656)	81.3	-	60.1	70.8	81	-
690	-	(647)	81.1	-	59.7	70.5	-	-
680	-	(638)	80.8	-	59.2	70.1	80	-
670	-	630	80.6	-	58.8	69.8	-	-
660	-	620	80.3	-	58.3	69.4	79	-
650	-	611	80.0	-	57.8	69.0	-	-
640	-	601	79.8	-	57.3	68.7	77	-
630	-	591	79.5	-	56.8	68.3	-	-
620	-	582	79.2	-	56.3	67.9	75	-
610	-	573	78.9	-	55.7	67.5	-	-
600	-	564	78.6	-	55.2	67.0	74	-
590	-	554	78.4	-	54.7	66.7	-	2055
580	-	545	78.0	-	54.1	66.2	72	2020
570	-	535	77.8	-	53.6	65.8	-	1985
560	-	525	77.4	-	53.0	65.4	71	1950
550	(505)	517	77.0	-	52.3	64.8	-	1905
540	(496)	507	76.7	-	51.7	64.4	69	1860
530	(488)	497	76.4	-	51.1	63.9	-	1825
520	(480)	488	76.1	-	50.5	63.5	67	1795
510	(473)	479	75.7	-	49.8	62.9	-	1750
500	(465)	471	75.3	-	49.1	62.2	66	1705
490	(456)	460	74.9	-	48.4	61.6	-	1660
480	488	452	74.5	-	47.7	61.3	64	1620
470	441	442	74.1	-	46.9	60.7	-	1570
460	433	433	73.6	-	46.1	60.1	62	1530
450	425	425	73.3	-	45.3	59.4	-	1495
440	415	415	72.8	-	44.5	58.8	59	1460
430	405	405	72.3	-	43.6	58.2	-	1410
420	397	397	71.8	-	42.7	57.5	57	1370
410	388	388	71.4	-	41.8	56.8	-	1330
100	379	379	70.8	-	40.8	56.0	55	1290
390	369	369	70.3	-	39.8	55.2	-	1240
380	360	360	69.8	(100.0)	38.8	54.4	52	1205
370	350	350	69.2	-	39.9	53.6	-	1170
360	341	341	68.7	(109.0)	36.6	52.8	50	1130
350	331	331	68.1	-	35.5	51.9	-	1095
340	322	322	67.6	(108.0)	34.4	51.1	47	1070
330	313	313	67.0	-	33.3	50.2	-	1035

Vickers 50kgf HV	Brinell 3000kgf HB		Rockwell				Shore	Tensile strength (approximate value)
	Standard ball 10㎜	Cemented carbide ball 10㎜	A scale 60kgf Diamond particle HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf Diamond particle HRC	D scale 100kgf Diamond particle HRD	HS	MPa (1)
320	303	303	66.4	(107.0)	32.2	49.4	45	1005
310	294	294	65.8	-	31.0	48.4	-	980
300	284	284	65.2	(105.5)	29.8	47.5	42	950
295	280	280	64.8	-	29.2	47.1	-	935
290	275	275	64.5	(104.5)	28.5	46.5	41	915
285	270	270	64.2	-	27.8	46.0	-	905
280	265	265	63.8	(103.5)	27.1	45.3	40	890
275	261	261	63.5	-	26.4	44.9	-	875
270	256	256	63.1	(102.0)	25.6	44.3	38	855
265	252	252	62.7	-	24.8	43.7	-	840
260	247	247	62.4	(101.0)	24.0	43.1	37	825
255	243	243	62.0	-	23.1	42.2	-	805
250	238	238	61.6	99.5	22.2	41.7	36	795
245	233	233	61.2	-	21.3	41.1	-	780
240	228	228	60.7	98.1	20.3	40.3	34	765
230	219	219	-	96.7	(18.0)	-	33	730
220	209	209	-	95.0	(15.7)	-	32	695
210	200	200	-	93.4	(13.4)	-	30	670
200	190	190	-	91.5	(11.0)	-	29	635
190	181	181	-	89.5	(8.5)	-	28	605
180	171	171	-	87.1	(6.0)	-	26	580
170	162	162	-	85.0	(3.0)	-	25	545
160	152	152	-	81.7	(0.0)	-	24	515
150	143	143	-	78.7	-	-	22	490
140	133	133	-	75.0	-	-	21	455
130	124	124	-	71.2	-	-	20	425
120	114	114	-	66.7	-	-	-	390
110	105	105	-	62.3	-	-	-	-
100	95	95	-	56.2	-	-	-	-
95	90	90	-	52.0	-	-	-	-
90	86	86	-	48.0	-	-	-	-
85	81	81	-	41.0	-	-	-	-

Note) 1. 1MPa = 1N/㎟
2. The number In the blank is not generally used ranges

Properties of KORLOY grades

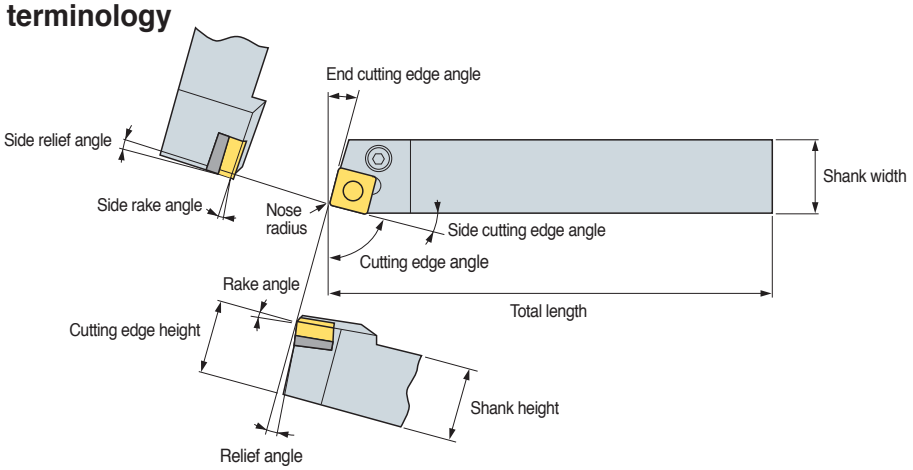
Physical properties of KORLOY grades

Application	ISO Classification symbol		KORLOY grades	Specific gravity (g/㎤)	Hardness (HRA)	TRS (kgf/㎟)	Compressive strength (㎏/㎟)	Young's modulus (10^3㎏f/㎟)	Thermal expansion coefficient (10^{-6}/°C)	Thermal conductivity (cal/㎝sec°C)
Grades for cutting tools	P	P01	**ST05**	10.6	92.7	140	440	-	-	-
		P10	**ST10**	10.0	92.1	175	460	48	6.2	25
		P20	**ST20**	11.8	91.9	200	480	56	5.2	42
		P30	**ST30A**	12.2	91.3	230	500	53	5.2	-
	M	M10	**U10**	12.9	92.4	170	500	47	-	-
		M20	**U20**	13.1	91.1	210	500	-	-	88
		M30	**ST30A**	12.2	91.3	230	500	53	5.2	-
		M40	**A40**	13.3	89.2	270	440	-	-	-
	K	K01	**H02**	14.8	93.2	185	-	61	4.4	105
		K10	**H01**	13.0	92.9	210	570	66	4.7	109
		K20	**G10**	14.7	90.9	250	500	63	-	105
Ultra fine grain alloy	Z	Z10	**FA1**	14.1	91.4	290	-	58	5.7	-
		Z20	**FCC**	12.5	91.3	235	-	-	-	-
Grade for tungsten carbide wear parts	V	V1	**D1**	15.0	92.3	205	520	-	-	-
		V2	**D2**	14.8	90.9	250	150	-	-	-
		V3	**D3**	14.6	89.7	310	410	-	-	-
		V4	**G5**	14.3	89.0	320	380	-	-	-
		V5	**G6**	14.0	87.7	350	330	-	-	-
Grade for mining and civil engineering tools	E	E1	**GR10**	14.8	90.9	220	-	-	-	-
		E2	**GR20**	14.8	90.3	240	-	-	-	-
		E3	**GR30**	14.8	89.0	270	-	-	-	-
		E4	**GR35**	14.8	88.2	270	-	-	-	-
		E5	**GR50**	14.5	87.0	300	-	-	-	-

The physical properties of element

Element	Specific gravity (g/㎤)	Hardness (Hv)	Young's modulus ($\times10^3$㎏f/㎟)	Thermal conductivity (cal/㎝·sec·°C)	Thermal expansion coefficient ($\times10^{-6}$/°C)	Melting point (°C)
WC	15.60	2,150	70	0.30	5.1	5,252
TiC	4.94	3,200	45	0.04	7.6	5,792
TaC	14.50	1,800	29	0.05	6.6	6,872
NbC	8.20	2,050	35	0.04	6.8	6,332
TiN	5.43	2,000	26	0.07	9.2	5,342
Al_2O_3	3.98	3,000	42	0.07	8.5	3,722
cBN	3.48	4,500	71	3.10	4.7	-
Diamond	3.52	9,000	99	5.00	3.1	-
Co	8.90	-	10~18	0.165	12.3	2,723
Ni	8.90	-	20	0.22	13.3	2,651

Insert shape and terminology

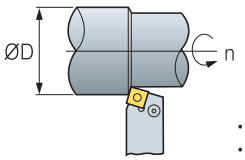


Relating angles between tool and workpiece

Cutting edge inclination	Terminology	Function	Effect
Rake angle	Side rake angle Rake angle	• Cutting force, Cutting heat, The effects of chip control on tool life	• (+): Excellent machine-ability(reducing cutting force, weakening cutting edge strength) • (+): When machining excellent machine-ability or thin workpiece • (-): When strong cutting edge is needed at interrupted condition or mill scale
Relief angle	Relief angle Side relief angle	• Only cutting edge contact with cutting face	• (-): Cutting edge is strong but has short tool life to make bad influence on flank wear
Cutting edge angle	Cutting edge angle	• Affects chip control and cutting force direction	• (+): Improved chip control because chip thickness is big
	Side cutting edge angle	• Affects chip control and cutting force direction	• (+): Strong cutting edge due to distributed cutting force but chip control is bad by thin chip thickness • (-): Improved chip performance
	End cutting edge angle	• Prevent friction between cutting edge and cutting face	• (-): Cutting edge is strong but has short tool life to make bad influence on flank wear

Calculation formulas for machining

Cutting speed



$$vc = \frac{\pi \times D \times n}{12} \text{ (sfm)}$$

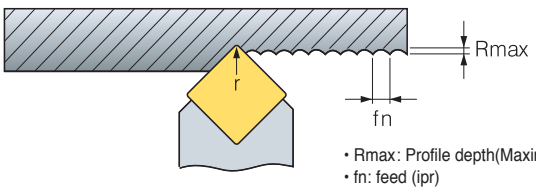
- vc: Cutting speed (sfm)
- D: Diameter (inch)
- n: Revolution per minute (min^{-1})
- π: Circular constant (3.14)

Feed

$$fn = \frac{vf}{n} \text{ (ipr)}$$

- fn: Feed per revolution (ipr)
- vf: Table feed (msfm)
- n: Revolution per minute (min^{-1})

Surface finish



- Rmax: Profile depth(Maximum height roughness) (μ)
- fn: feed (ipr)
- r : nose radius

- Theoretical surface roughness

$$Rmax = \frac{fn^2}{8r} 1000(\mu m)$$

- Practical surface roughness

Steel: Rmax × (1.5~3)
Cast iron: Rmax × (3~5)

Power requirement

$$P_{HP} = \frac{kc \times W \times ap \times fn}{4500 \times \eta}$$

$$P_{KW} = \frac{kc \times W \times ap \times fn}{6120 \times \eta}$$

- P_{KW}: Power requirement [kW]
- P_{HP}: Power requirement (horse power) [HP]
- vc: Cutting speed [sfm]
- ap: Depth of cut [inch]
- fn: Feed per revolution [ipr]
- kc: Specific cutting resistance [kg/mm²]
- η: Machine efficiency rate (0.7~0.8)

Rough Kc	
Mild steel	190
Medium carbon steel	210
High carbon steel	240
Low alloy steel	190
High alloy steel	245
Cast iron	93
Malleable cast iron	120
Bronze, Brass	70

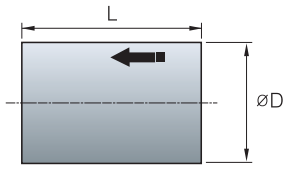
Material removal rate

$$Q\ (cm^3/min) = vc \times ap \times fn$$

- Q: Material removal rate [cm^3/min]
- ap: Depth of cut [sfm]
- vc: Cutting speed [inch]
- fn: Feed per revolution [ipr]

● Machining time

External face machining 1



Constant revolution per minute

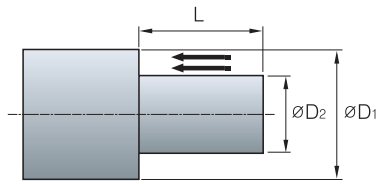
$$T = \frac{60 \times L}{fn \times n}$$

Constant cutting speed

$$T = \frac{60 \times \pi \times L \times D}{1000 \times fn \times vc}$$

T: Machining time [sec]
L: Cutting length [inch]
fn: Feed per revolution [ipr]
n: Revolution per minute [inch]
D: Diameter of workpiece [inch]
vc: Cutting speed [sfm]

External face machining 2



Constant revolution per minute

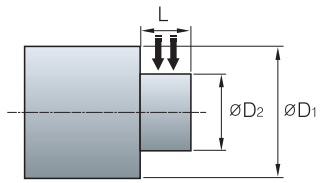
$$T = \frac{60 \times L}{fn \times n} \times N$$

Constant cutting speed

$$T = \frac{60 \times \pi \times L \times (D_1 + D_2)}{2 \times 1000 \times fn \times vc} \times N$$

T: Machining time [sec]
L: Cutting length [inch]
fn: Feed per revolution [ipr]
n: Revolution per minute [min]
D1: Maximum diameter of workpiece [inch]
D2: Minimum diameter of workpiece [inch]
vc: Cutting speed [sfm]
N: The number of pass = (D1-D2)/d/2

Facing



Constant revolution per minute

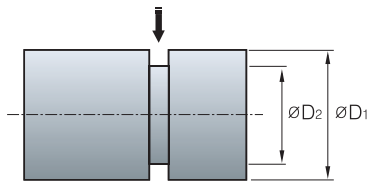
$$T = \frac{60 \times (D_1 - D_2)}{2 \times fn \times n} \times N$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times fn \times vc} \times N$$

T: Machining time [sec]
T1: Machining time before the maximum rpm[sec]
L: Width of machining [inch]
fn: Feed per revolution [ipr]
n: Revolution per minute [min^{-1}]
D1: Maximum diameter of workpiece [inch]
D2: Minimum diameter of workpiece [inch]
vc: Cutting speed [sfm]
N: The number of pass = (D1-D2)/d/2

Grooving



Constant revolution per minute

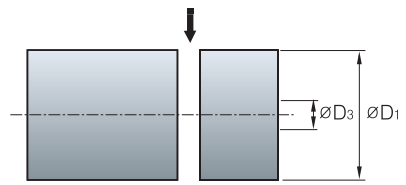
$$T = \frac{60 \times (D_1 - D_2)}{2 \times fn \times n}$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times fn \times vc}$$

T: Machining time [sec]
T1: Machining time before the maximum rpm[sec]
L: Width of machining [inch]
fn: Feed per revolution [ipr]
n: Revolution per minute [min^{-1}]
D1: Maximum diameter of workpiece [inch]
D2: Minimum diameter of workpiece [inch]
vc: Cutting speed [sfm]

Parting



Constant revolution per minute

$$T = \frac{60 \times D_1}{2 \times fn \times n}$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_3)\ (D_1 - D_3)}{4000 \times fn \times vc}$$

$$T_3 = T_1 + \frac{60 \times D_3}{2 \times fn \times n_{max}}$$

T: Machining time [sec]
T1: Machining time before the maximum rpm[sec]
T3: Machining time till maximum RPM[sec]
fn: Feed per revolution [ipr]
n: Revolution per minute [min^{-1}]
nmax: Maximum revolution per minute [min^{-1}]
D1: Maximum diameter of workpiece [inch]
D3: Maximum diameter at maximum RPM [inch]
vc: Cutting speed [sfm]

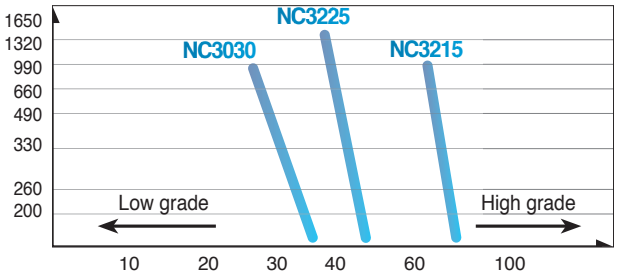
The affects of cutting condition

- The most desirable machining means short machining time, long tool life and good precision
  This is the reason that proper cutting condition for each tools should be selected according to material's properties, hardness, shapes, the efficiency of machine

Cutting speed

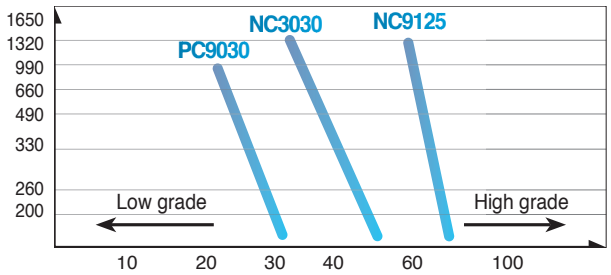
- **Workpiece:** S45C (180HB)
- **Tool life criterion:** V_B = 0.008 inch
- **Depth of cut:** 0.060 inch
- **Feed:** 0.012 ipr
- **Holder:** PCLNR16-3D
- **Insert:** CNMG431, Dry cutting

(The tool life feature of P grade)



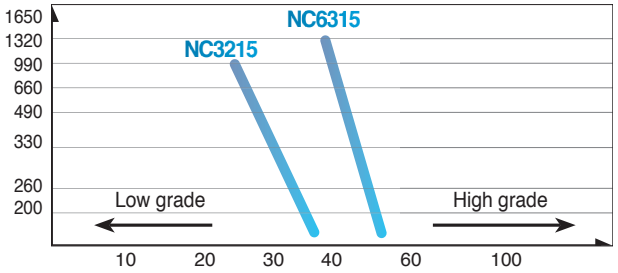
- **Workpiece:** STS304 (200HB)
- **Tool life criterion:** V_B = 0.008 inch
- **Depth of cut:** 0.060 inch
- **Feed:** 0.012 ipr
- **Holder:** PCLNR16-3D
- **Insert:** CNMG431, Dry cutting

(The tool life feature of M grade)



- **Workpiece:** GC300 (180HB)
- **Tool life criterion:** V_B = 0.008 inch
- **Depth of cut:** 0.060 inch
- **Feed:** 0.012 ipr
- **Holder:** PCLNR16-3D
- **Insert:** CNMG431, Dry cutting

(The tool life feature of K grade)



Cutting Speed's effects

- When the cutting speed increases up to 20% in an application, the tool life respectively decreases down 50%
  Although inversely, if the cutting speed increases up to 50% the tool life decreases 20%. On the other hand if cutting speed is too low (66~131 sfm) Tool life shortens due to vibration

Feed

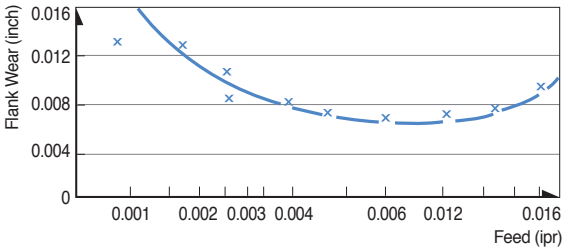
- The feed rate in turning means the progressed interval of a distance in a work piece within 1 revolution
  The feed rate in a milling application means the table feed divided by number of teeth of cutter (feed rate per tooth)

The effects of feed

- When the feed rate decreases the flank wear is increased. When the feed rate is too low, the tool life shortens radically
- When the feed rate increases, the flank wear increases due to high temperatures, however the feed rates effects tool life less than the cutting speed. And higher feed rates improve machining efficiency

(Relationship between feed and flank wear in steel turning)

- **Workpiece:** SNCN431
- **Grade:** ST20
- **Cutting speed:** 200 sfm
- **Depth of cut:** 0.039 inch
- **Cutting time:** 10 min

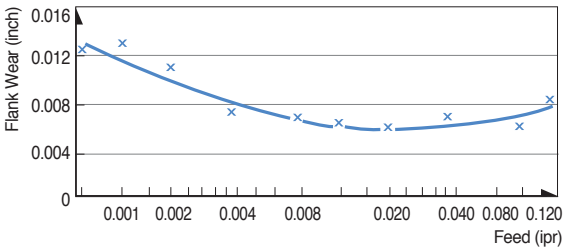


Depth of cut

- Determined by the required allowances in machining a material and the capacity the machine can tolerate
  There are cutting limits according to the different shapes and sizes of the insert

(Relationship between depth of cut and flank wear in steel turning)

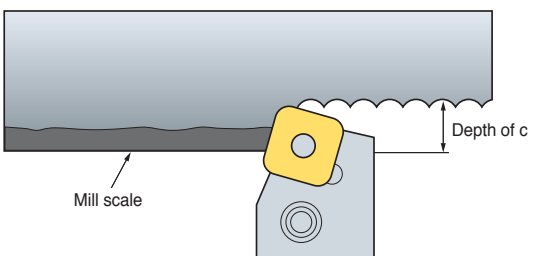
- **Workpiece:** SNCN431
- **Grade:** ST20
- **Cutting speed:** 200 sfm
- **Feed:** 0.2 ipr
- **Cutting time:** 10 min



The effect of a depth of cut

- The depth of cut does not have a big influence on tool life
- When the depth of cut is small the work piece is not cut but rather rubbed. In these cases, machine off the work hardened parts that decrease tool life
- When machining a cast skin or milling scale smaller depth of cuts usually cause chipping and abnormal wear because of hard impurities in the surface of the work piece

(Surface parts including mill scale Roughing)



Relief angle

• Relief angle avoids the friction between workpiece and relief face and makes cutting edge move along workpiece easily

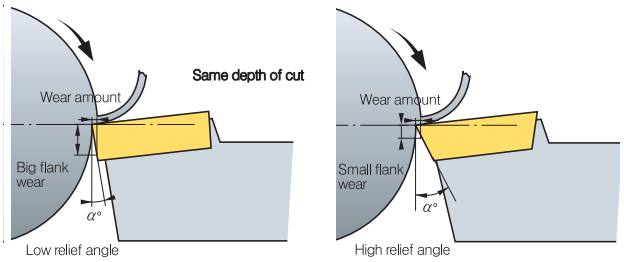
● Relationship between various relief angle and flank wear

Affects

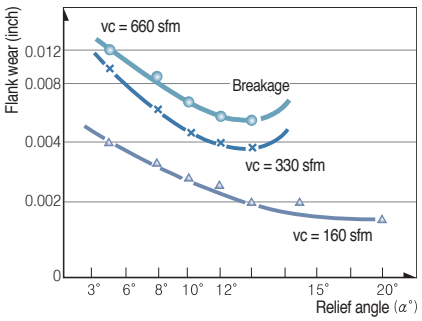
1. If relief angle is big Flank wear decreases
2. If relief angle is big Cutting edge strength weakens
3. If relief angle is small Chattering occurs

Selection system

1. Hard workpiece/When strong cutting edge is needed
   - Low relief angle
2. Soft workpiece/Workpiece turning to work hardening easily
   - High relief angle



• **Workpiece:** 4320 (H)
• **Grade:** P20
• **Depth of cut:** 0.04 inch
• **Feed:** 0.013 ipr
• **Cutting time:** 20 min



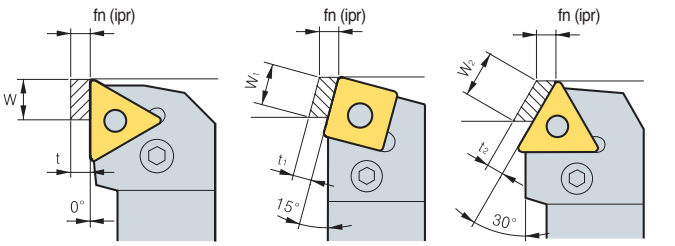
Side cutting edge angle

• Side cutting edge angle has big influence on chip flow and cutting force therefore proper Side cutting edge angle is very important

● Side cutting edge angle and chip thickness

• As side cutting edge angle is getting bigger chips are getting thinner and wider (refer to left picture)
• At the same feed and depth of cut with approach angle 0˚ Chip thickness is the same as feed (t = fn) and chip width is equal to depth of cut (W=ap)

$t_1 = 0.97t$, $W_1 = 1.04W$
$t_2 = 0.87t$, $W_2 = 1.15W$



① Approach angle 0˚　② Approach angle 15˚　③ Approach angle 30˚

● Side cutting edge angle and 3 cutting forces

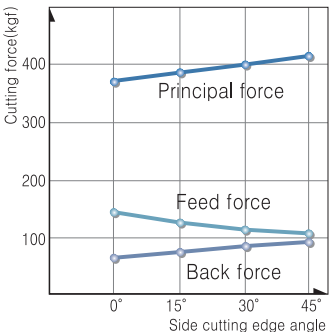
Affects

1. Big side cutting edge angle with the same feed makes chip attaching length longer and chip thickness thinner. So that cutting forces scatter to long cutting edge therefore tool life gets longer
2. Big side cutting edge angle for machining long bars can cause bending

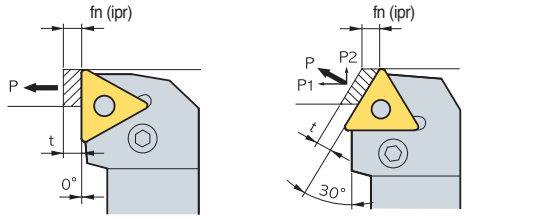
Selection system

1. Deep depth of cut finishing/Long thin workpiece/Low machine rigidity
   - Side cutting edge angle
2. Hard and high calorific power workpiece/Roughing big workpiece/ High machine rigidity - Side cutting edge angle

• **Workpiece :** 4140
• **Grade:** TNGA433
• **vc:** 330 sfm
• **ap:** 0.16 inch
• **fn:** 0.018 ipr



● Side cutting edge angle and cutting load

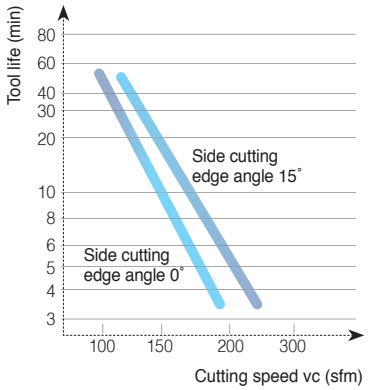


① "Force P is loaded." ② "Force P is scattered to P1, P2."

As approach angle gets bigger Back force gets bigger and feed force gets smaller

● Side cutting edge angle and tool life

- **Workpiece:** 4130
- **Grade:** P20
- **Depth of cut:** 0.12 inch
- **Feed:** 0.008 ipr



● Side cutting edge angle and cutting performance

Specification	Low ← Approach angle → High
Wear rate	High ⇢ Low
Workpiece	Easy to cut material ⇢ Difficult to cut material
Machining power	Small ⇢ Big
Chatter	Hard to occur ⇢ Easy to occur
How to machine	Finishing ⇢ Roughing
Workpiece rigidity	Long thin workpiece ⇢ Thick workpiece
Machine rigidity	In case of low rigidity ⇢ In case of high rigidity

End cutting edge angle

- It affects machined surface to prevent interference between surface of workpiece and insert

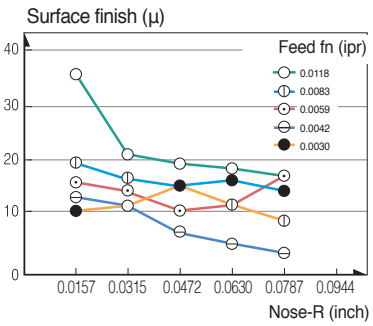
Affects

1. If end cutting edge angle reduces cutting edge get stronger but cutting heat generated by machining increases
2. Small end cutting edge angle can cause chattering due to the increases cutting force

Nose-R

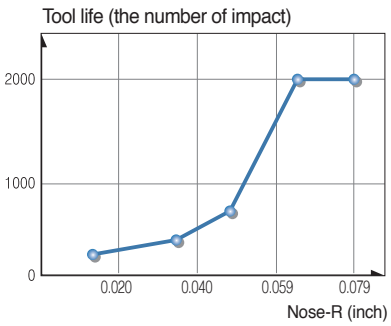
- Nose-R affects not only surface roughness but strength of cutting edge
- In general, It's desirable that Nose-R is 2~3 times bigger than feed

● Nose R and surface finish



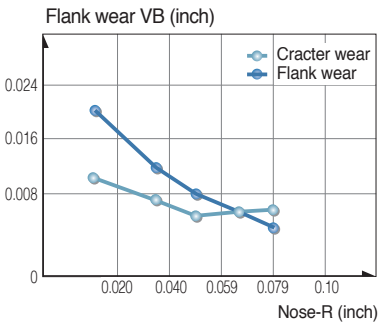
- **Workpiece:** 4340, HB200
- **Grade:** P20
- **vc:** 400 sfm
- **ap:** 0.020 inch

● Nose R and tool life



- **Workpiece:** 4140, HB280
- **Grade:** P10
- **vc:** 330 sfm, **ap:** 0.02 inch
- **fn:** 0.012 ipr

● Nose R and wear of tool

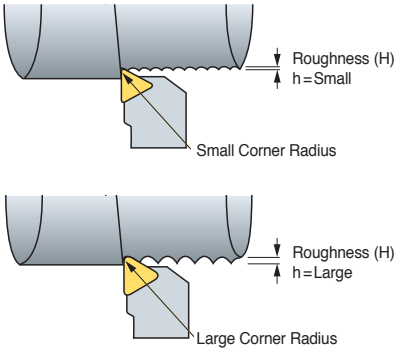


- **Workpiece:** 4340, HB200
- **Grade:** P10
- **vc:** 460 sfm, **ap:** 0.08 inch
- **fn:** 0.008 ipr, **T:** 10 min

Nose-R

Affects

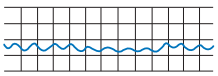
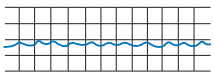
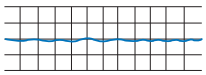
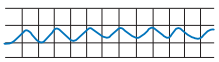
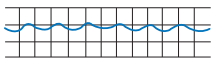
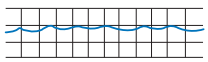
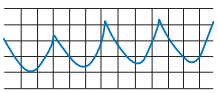
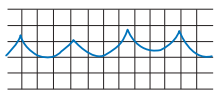
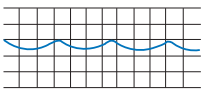
1. Big Nose-R improves surface finish
2. Big Nose-R improves cutting edge strength
3. Big Nose-R reduces flank wear and crater wear
4. Too big Nose-R causes chattering due to increased cutting force



Selection system

1. For finishing with small depth of cut/long and thin workpiece/ When machine power is low - Small Nose-R
2. For applications that need strong cutting edge such as intermittent and machining mill scale/For roughing of big workpiece/When the machine power is strong eough - Big Nose-R

● Relationship between nose radius, feed and various surface roughness

Feed (ipr) \ Nose R	0.4	0.8	1.2
0.006			
0.010			
0.018			

Cutting edge shape and the affects

● Rake angle (α)

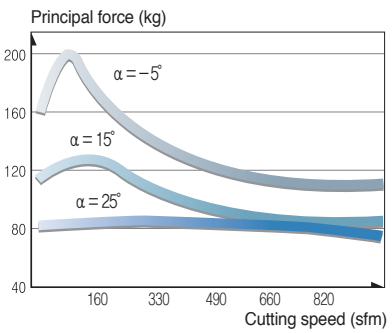
Rake angle has big influence on cutting force, chip flow and tool life

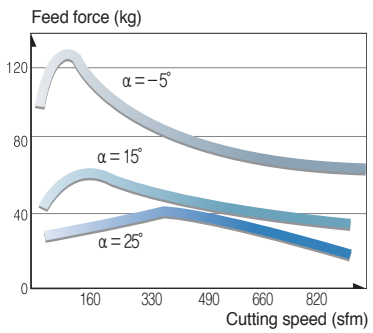
Affects

1. High rake angle results in good suface finish
2. As the rake angle increases by 1° Machining power decreases by 1%.
3. High rake angle weakens cutting edge

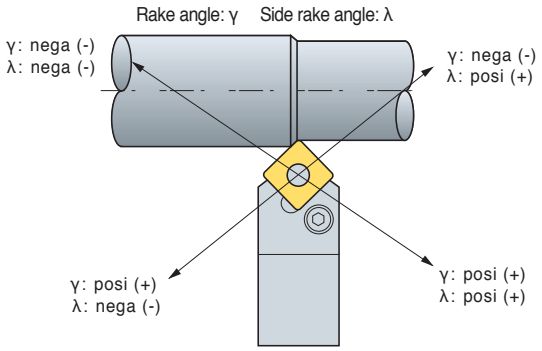
Selection system

1. For hard workpiece/For applications that need strong cutting edge such as interrupted and machining mill scale - Low rake angle
2. For soft workpiece/Easy to cut material/When the rigidity of machine power and workpiece is low - High rake angle

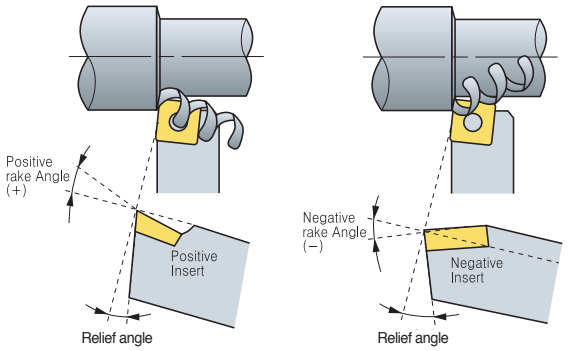




● Rake angle and the direction of chip flow



In order to prevent machined surface from damages Avoid nega, posi combination. γ: nega (-) λ: posi (+)



Selecting proper tools

• Nowadays, It's very difficult to select the best tools in complicating tooling system and various cutting conditions However, It can be simplified by classifying basic factors below

● Selection of inserts and tool holder

Listed below is the basic factors and choose B according to A

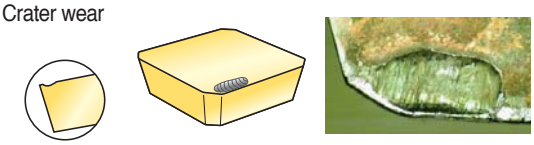
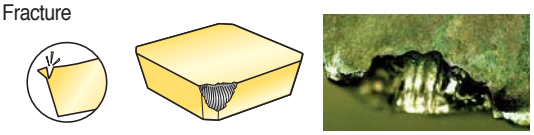
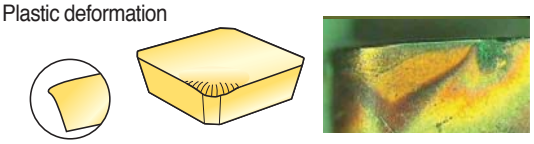
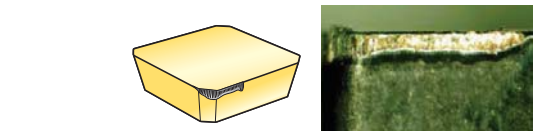
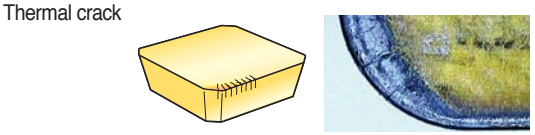
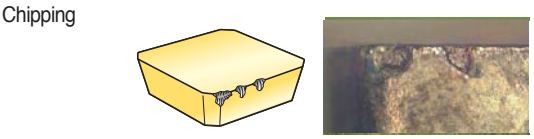
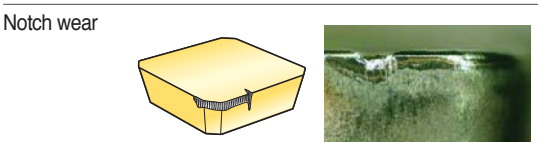
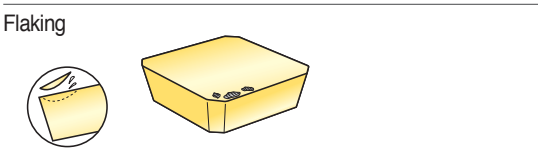
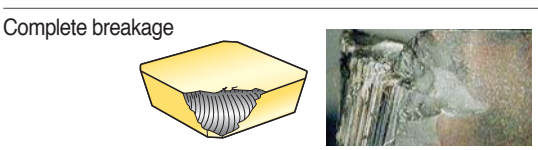
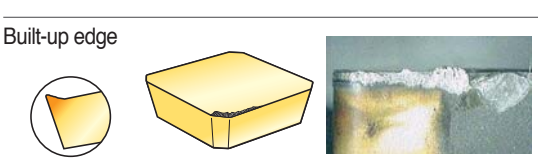
A : Basic factors

· Workpiece material
· Workpiece shape
· Workpiece size
· Hardness of workpiece
· Surface roughness of workpiece (before machining)
· Surface finish required
· Type of lathe machine
· Condition of lathe machine (rigidity, power etc)
· Horse power of machine
· Clamping method of workpiece

B : Selection system

① Select as big approach angle as possible
② Select as big shank as possible
③ Select as strong cutting edge of insert as possible
④ Select as big nose radius as possible
⑤ In finishing, Select the insert using many corners
⑥ Select as small insert as possible
⑦ Cutting speed should be determined carefully according to cutting conditions
⑧ Select as deep depth of cut as possible
⑨ Select as fast feed as possible
⑩ Cutting condition should be determined within chip breaker application ranges

Trouble shooting

Tool failure	Cause	Solution
Crater wear 	• Improper grade • Excessive cutting condition	• Choose harder grade • Decrease cutting condition
Fracture 	• Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder	• Choose tougher grade • Decrease feed • Apply to large honed or chamfered edge • Choose bigger size holder
Plastic deformation 	• Improper grade • Excessive cutting condition • High cutting temperature	• Choose harder grade • Decrease cutting condition • Choose grade wich heat conductivity are big
Wear on nose radius (Flank wear) 	• When the hardness of workpiece is too high compare with tool • When machinig surface hardened workpiece • Improper grade • Excessive cutting speed • Too small relief angle • Too low feed	• Choose harder grade • Decrease cutting speed • Choose lager relief angle • Increase feed
Thermal crack 	• Expansion and shrinking by cutting temperature • Improper grade (*Specially milling operation)	• Apply to dry cutting (In case of wet cutting, use enough coolant) • Choose tougher grade
Chipping 	• Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder	• Choose tougher grade • Decrease feed • Apply to large honing or chamfer edge • Choose bigger size holder
Notch wear 	• Surface hardened workpiece • Friction due to bad chip geometry (Generate vibration)	• Choose harder grade • Improve chip control form large rake angle
Flaking 	• Deposition on cutting edge • Bad chip control	• Improve cutting performance fromd large rake angle • Apply to chip pocket with big size
Complete breakage 	• Unusable condition due to wear off the most parts of cutting edge by progress of wear	• Reduce the feed rate. • Reduce the depth of cut. • Select a tougher grade. • Select a stronger chipbreaker. • Select a thicker insert.
Built-up edge 	• Slow cutting speed • Sticky materials	• Increase cutting speed. • Use more positive rake geometry. • Use tougher grade

Types of tool failure and trouble shooting

Troubles	Causes	Solution																		
		Cutting conditions				Selecting insert grade				Tool shape							Machine clamping			
		Cutting speed	Feed	Depth of cut	Coolant	Select harder grade	Select tougher grade	Select better heat-impact resistance grade	Select better adhesion resistance grade	Chip breaker valuation	Rake angle	Nose radius	Side cutting edge angle	Cutting edge strength Honing	Improving insert precision M class → G class	Improving holder rigidity	Clamping workpiece	Holder overhang	Machine vibration
Poor precision Unstable machining size	Insert precision is variable														●				
	Workpiece, Separation of tool									●	⬆	⬇				●	●	●	●
Cutting edge back thrust is big It's necessary to adjust because machining precision changes during operation.	Flank wear increase					●						⬆							
	Cutting condition is improper	⬇	⬆			●													
Poor surface roughness for finishing Criterion of tool life	Weakened cutting force by increasing wear of tool	⬇			Wet cutting				●	●	⬆	⬆		⬇	●				
	Cutting edge chipping		⬇	⬇			●			●		⬆		⬆			●	●	●
	Adhesion, built-up edge	⬆	⬆		Wet cutting				●	●	⬆			⬇	●				
	Improper cutting conditions	⬆	⬇	⬇	Wet cutting														
	Improper tool and shape of cutting edge									●		⬆		⬇	●				
	Vibration, chattering	⬇	⬇	⬇	Wet cutting		●			●	⬆	⬇		⬇		●	●	●	●
Cutting heat generation Poor machining precision and short tool life by cutting heat	Improper cutting conditions	⬇	⬇	⬇		●													
	Improper tool and shape of cutting edge									●	⬆			⬇					
Burr, chipping, nap steel, aluminum (burr)	Improper cutting conditions	⬇	⬆		Wet cutting	●													
	Wear on the tool, improper shape of cutting edge								◉	●	⬆	⬇		⬇					
Cast iron (Weak chipping)	Improper cutting conditions		⬇	⬇		●													
	Wear on the tool, improper shape of cutting edge									●	⬆	⬆		⬇		●	●	●	●
Soft steel (nap)	Improper cutting conditions	⬆	⬍		Wet cutting	●													
	Wear on the tool, improper shape of cutting edge								◉	●	⬆			⬇					

⬆: Increase ⬇: Decrease ●: use ◉: Correct use

Tool life criterion

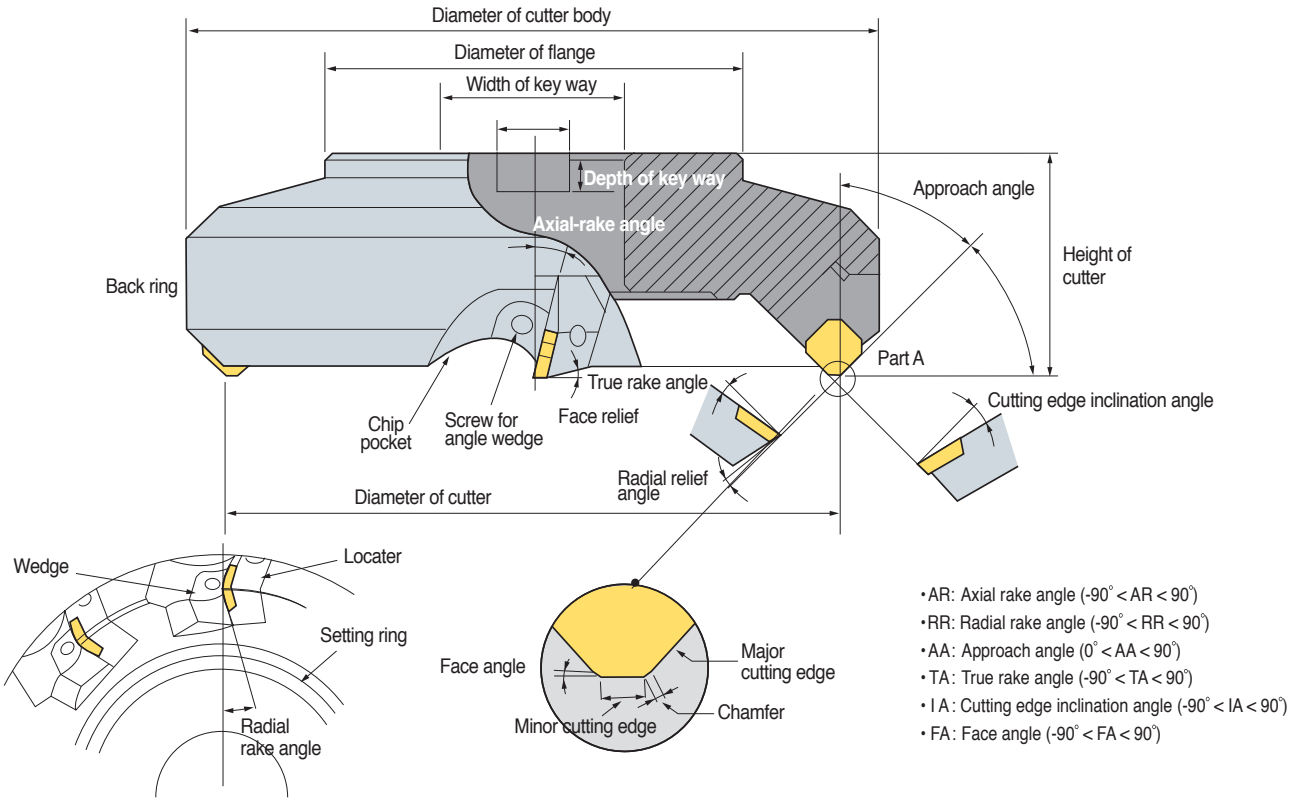
● KS B0813

Flank wear width	0.008 inch	Precision light cutting , Finishing in nonferrous alloy
	0.016 inch	Machining special steel
	0.028 inch	General cutting in cast iron, steel etc
	0.040~0.050 inch	General cutting in cast iron, steel etc
Depth of crater wear	In general 0.002~0.004 inch	

● ISO (B8688)

Tool life criterion	Application
Complete breakage	Machining special steel
Flank wear width V_B = 0.012 inch	Even flank wear of cemented carbides, Ceramic tool
V_B max = 0.020 inch	Uneven flank wear
Crater wear width KT = 0.06+0.3 fmm (f: mm/ipr)	Cemented carbides tool
Criterion by surface roughness 1, 1.6, 2.5, 4, 6.3, 10㎛Ra	When surface roughness is important

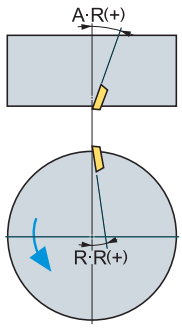
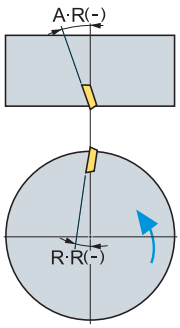
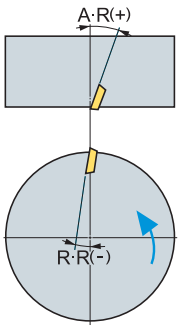
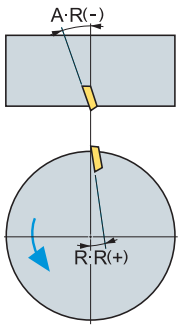
Milling cutter shape and designation



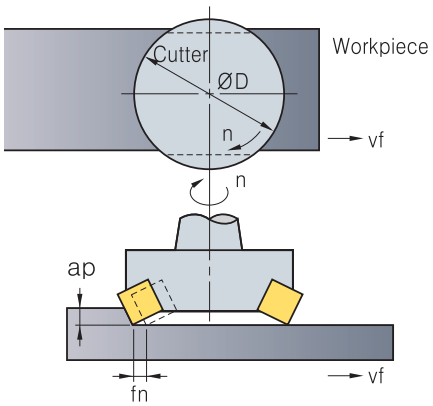
● The terminology and functions of cutting edge angle

No.	Tool failure	Symbol	Function	Effects
1	Axial rake angle	A.R	Chip flow direction, Adhesion	Positive: Excellent cutting, built-up edge prevented
2	Radial rake angle	R.R	Affecting on thrust	Negative: Excellent chip control
3	Approach angle	A.A	Chip thickness, Determines flow direction	(+): Chip thickness become thinner, cutting force could be reduced
4	True rake angle	T.A	Effective rake angle	(+): Better cutting. Preventing adhesion, Weakening cutting edge strength (–): Cutting edge strength increases, easy to adhere
5	Cutting edge inclination angle	I.A	Determines chip flow direction	(+): Good chip flow, cutting force could decreases, Comer edge strength weakens
6	Relief angle	F.A	Controlling cutting edge strenght, tool life and chattering	Surface roughness increases as F.A gets close to 0 degree

Features by combination of rake angle

	Double positive angle	Double negative angle	Posi - Negative angle	Nega - Positive angle
Division				
Use	• General machining of steel, cast iron, stainless steel • Machining soft steel that brings about built-up edge easily • Machining material having tendency to poor surface roughness	• Under interrupted cutting condition • Roughing of cast iron and steel	• Machining difficult to cut material • Roughing with deep depth of cut and wide width of cut in steel and cast iron	• Chip flows to center of cutter body
Advantages	• As for tough workpiece material It prevents built-up edge to improve surface roughness • Low cutting load and better machinability	• Strong cutting edge • Roughing of workpiece that has bad surface condition containing sand, mill scale • Double sided inserts can be applied (Economical) • Good chip control	• Good chip flow and machinability. • Suitable for machining of difficult-to-cut material • Un-even partition clamping prevents chattering	-
Disadvantages	• Weak cutting edge strength • Only single sided inserts are available (No economical) • Machine and cutter need enough power and rigidity	• Machine and cutter need enough power and rigidity	• Only single sided inserts are available (No economical)	• Since the chips flows toward the center of cutter. Chips scratch on machined surface • Bad chip flow • No economical

Major cutting formulas



Cutting speed

$$vc = \frac{\pi \cdot D \cdot n}{1000} \text{ (sfm)}$$

- vc: Cutting speed (sfm)
- D: Diameter of tool (inch)
- n: Revolution per minute (min^{-1})
- π: Circular constant (3.14)

Feed

$$fz = \frac{vf}{z \cdot n} \text{ (ipt)}$$

- fz: Feed per tooth (ipt)
- vf: Feed per minute (ipm)
- n: Revolution per minute (min^{-1})
- z: Number of tooth

Chip removal amount

$$Q = \frac{Lxvfxap}{1000} \text{ (cm^3/min)}$$

- Q: Chip removal amount (cm^3/min)
- L: Width of cut (inch)
- vf: Table feed (ipm)
- ap: Depth of cut (inch)

Power requirement

$$P_{kw} = \frac{Q \times kc}{60 \times 102 \times \eta} \qquad P_{hp} = \frac{P_{kw}}{0.75} \text{ (hp)}$$

- Pc: Power requirement (kW)
- H: Horse power requirement (hp) (mm/min)
- Q: Chip removal amount (cm^3/min)
- kc: Specific cutting resistance (kgf/mm^3)
- η: Machine efficiency rate (0.7~0.8)

Machining time

$$T = \frac{60 \times Lt}{vf} \text{ (sec)}$$

- T: Machining time (sec)
- Lt: Total length of table feed (inch) (= Lw+D+2R)
- Lw: The length of workpiece (inch)
- D: The diameter of cutter body (inch)
- vf: Table feed (ipm)
- R: Relief length (inch)

True rake angle/Cutting edge inclination angle

True rake angle: $\tan(T) = \tan(R) \times \cos(AA) + \tan(A) \times \sin(C)$

Cutting edge inclination angle: $\tan(I) = \tan(A) \times \cos(AA) - \tan(R) \times \sin(C)$

Values of specific cutting resistance

Workpiece	Tensile strength (kg/mm²) and hardness	Specific cutting resistance according to various feed kc(MPa)				
		0.004 (ipt)	0.008 (ipt)	0.012 (ipt)	0.016 (ipt)	0.024 (ipt)
Soft steel	52	220	195	182	170	158
Medium carbon steel	62	198	180	173	160	157
High carbon steel	72	252	220	204	185	174
Tool steel	67	198	180	173	170	160
Tool steel	77	203	180	175	170	158
Chrome manganese steel	77	230	200	188	175	166
Chrome manganese steel	63	275	230	206	180	178
Chrome molybdenum steel	73	254	225	214	200	180
Chrome molybdenum steel	60	218	200	186	180	167
Nickel Chrome molybdenum steel	94	200	180	168	160	150
Nickel Chrome molybdenum steel	HB352	210	190	176	170	153
Cast steel	52	280	250	232	220	204
Hardened cast iron	HRC46	300	270	250	240	220
Meehanite cast iron	36	218	200	175	160	147
Gray cast iron	HB200	175	140	124	105	97
Brass	50	115	95	80	70	63
Light alloy (Al - Mg)	16	58	48	40	35	32
Light alloy (Al - Si)	20	70	60	52	45	39

Chip removal amount (cm³/min) per rated horse power

Workpiece \ Rated horse power		5Hp	10Hp	20Hp	30Hp	40Hp	50Hp
Steel	Soft	32	75	163	295	425	570
	Medium	26	55	127	212	310	425
	hard	18	41	93	163	228	310
Cast iron	Soft	52	116	260	455	670	880
	Medium	32	75	163	295	425	570
	hard	26	55	127	212	310	425
Bronze Brass	Soft	77	163	390	670	980	1,280
	Medium	54	118	275	490	700	910
	hard	26	55	127	245	325	425
Aluminum		90	195	440	780	1,110	1,500

Selection of MILL-MAX diameter (D)

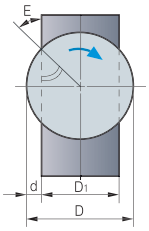
Selection by machine rigidity

Machine horse power (PS)	10~15	15~20	Over 20
Proper cutter body specification (inch)	Ø3.15~Ø3.94	Ø4.92~Ø6.30	Ø6.30~Ø7.87

Selection by machine rigidity

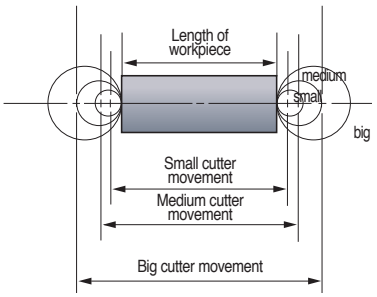
Workpiece	E	δ
Steel	+20°~-10°	3 : 2
Cast iron	Under +50°	5 : 4
Light alloy	Under +40°	5 : 3

D: External diameter of cutter body
D1: Width of workpiece
d: Projected part of cutter body
E: Engage angle
δ: Ratio of cutter body and width of workpiece (D: D1)



Selection by machining time

The bigger size cutter the longer machining time

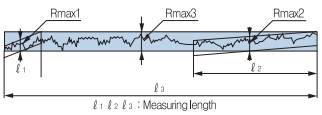
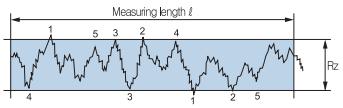
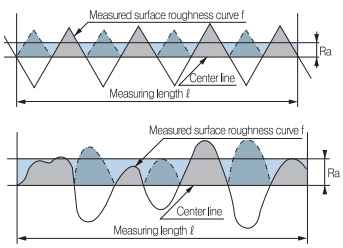


Selection by number of tooth

Workpiece	Steel	Cast iron	Light alloy
Number of tooth	D× (1~1.5)	D× (1~4)	D×1+α

ex) D = ø100 ⇒ 4" x(1~1.5) = 4~6 D is the size of cutter body converted into inch size

Classification of surface roughness

Type	Symbol	How to calculate	Measured value
Maximum height	Rmax	• The distance between the top of profile peak line and the bottom of profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve (Expressed by unit: μ) • Exclude extraordinary values (too small or big) that look like grooves or mountains	
+10 point mean roughness	Rz	• Sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute value of the highest profile peaks and the depths of five deepest profile valleys measured in the vertical magnification is expressed by micro meter (μ)	
Arithmetic mean roughness	Ra	• Sampling only the reference length from the roughness curve in the direction of mean line , taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and is expressed by micro meter (μ) • Generally, Read measured value by Ra measurer	

Finish mark		▽▽▽▽	▽▽▽	▽▽	▽	~
Surface roughness	Rmax	0.8s	6.3s	25s	100s	Unspecified
	Rz	0.8z	6.3z	25z	100z	
	Ra	0.2a	1.6a	6.3a	25a	

Trouble shooting for milling

Trouble	Causes	Solutions										
		Cutting conditions				Tool shape					Insert grade	
		Cutting speed	Depth of cut	Feed	Coolant	Rake angle	Relief angle	Approach angle	Chattering at cutting edge	Nose radius	Toughness	Hardness
Flank wear	• Improper insert grade • Improper cutting conditions • Chattering	⬇		⬆			⬆	⬇		⬆		⬆
Crater wear	• Improper cutting conditions • Improper insert grade	⬇	⬇	⬇	●	⬆	⬆			⬇		⬆
Chipping	• Lack of insert toughness • Excessive feed • Excessive cutting load			⬇		⬇	⬇	⬇		⬆	⬆	
Built-up edge	• Improper cutting conditions • Improper cutting edge shape • Improper insert grade	⬆	⬇			⬆				⬇		
Chattering	• Improper cutting conditions • Lack of number of cutting teeth • Improper cutting edge shape • Bad chip flow • Unstable workpiece clamping		⬇	⬇	●	⬆		⬆	⬇	⬇		
Poor surface finish	• Built-up edge • Improper cutting conditions • Chattering • Bad chip flow	⬆	⬇	⬇	●	⬆			⬇	⬆		
Thermal crack	• Improper cutting conditions • Improper insert grade	⬇	⬇	⬇	◉	⬆				⬆	⬆	
Fracture	• Improper insert grade • Excessive cutting load • Bad chip flow • Chattering • Excessive overhang		⬇	⬇	●						⬆	

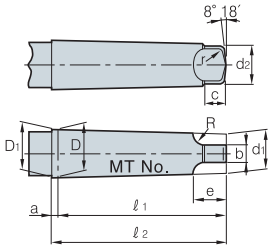
⬆: Increase ⬇: Decrease ●: use ◉: Correct use

General formulas for milling

● Machine efficiency rate (η)

Power transmission mode	Efficiency rate (E)	Reference
Principal axis direct connection driving	0.90	
Belt driving	0.85	Double connection: 0.85 × 0.85 ≒ 0.70
Starting driving	0.75	
Oil pressure driving	0.60~0.90	

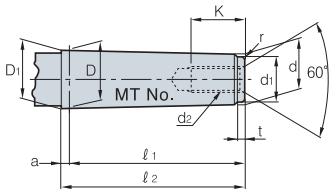
Morse taper (Tang type)



(mm)

MT No.	Taper	Taper angle(α)	D	a	D1	d1	ℓ1	ℓ2	d2	b	c	e	R	r
0	1/19.212	1°29′27″	9.045	3.0	9.201	6.104	56.5	59.5	6.0	3.9	6.5	10.5	4	1.0
1	1/20.047	1°25′43″	12.065	3.5	12.240	8.972	62.0	65.5	8.7	5.2	8.5	13.5	5	1.2
2	1/20.020	1°25′50″	17.780	5.0	18.030	14.034	75.0	80.0	13.5	6.3	10.0	16.0	6	1.6
3	1/19.922	1°26′16″	23.825	5.0	24.076	19.107	94.0	99.0	18.5	7.9	13.0	20.0	7	2.0
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.164	117.5	124.0	24.5	11.9	16.0	24.0	8	2.5
5	1/19.002	1°30′26″	44.399	6.5	4.741	36.531	149.5	156.0	35.7	15.9	19.0	29.0	10	3.0
6	1/19.180	1°29′36″	63.348	8.0	63.765	52.399	210.0	218.0	51.0	19.0	27.0	40.0	13	4.0
7	1/19.231	1°29′22″	83.058	10.0	83.578	68.186	286.0	296.0	66.8	28.6	35.0	54.0	19	5.0

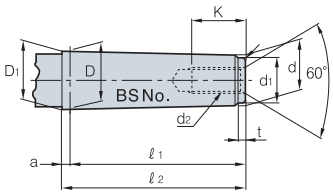
Morse taper (Screw type)



(mm)

MT No.	Taper	Taper angle(α)	D	a	D1	d	ℓ1	ℓ2	d1	d2	k	t	r
0	1/19.212	1°29′27″	9.045	3.0	9.201	6.442	50.0	53	6.0	-		4	0.2
1	1/20.047	1°25′43″	12.065	3.5	12.230	9.396	53.5	57	9.0	M6	16	5	0.2
2	1/20.020	1°25′50″	17.780	5.0	18.030	14.583	64.0	69	14.0	M10	24	5	0.2
3	1/19.922	1°26′16″	23.825	5.0	24.076	19.759	81.0	86	19.0	M12	28	7	0.6
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.943	102.5	109	25.0	M16	32	9	1.0
5	1/19.002	1°30′26″	44.399	6.5	4.741	37.584	129.5	136	35.7	M20	40	9	2.5
6	1/19.180	1°29′36″	63.348	8.0	63.765	53.859	182.0	190	51.0	M24	50	12	4.0
7	1/19.231	1°29′22″	83.058	10.0	83.578	70.058	250.0	260	65.0	M33	80	18.5	5.0

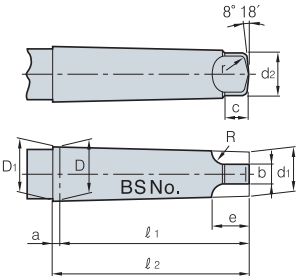
Brown sharp taper (Screw type)



(mm)

B&S No.	D	a	D1	d	d1	ℓ1	ℓ2	t	r	d2	K
4	10.221	2.4	10.321	8.890	8.0	31.0	34.2	2	0.2	-	-
5	13.286	2.4	13.386	11.430	10.0	44.4	46.8	3	0.2	-	-
6	15.229	2.4	15.330	12.700	11.0	60.0	62.7	3	0.2	M 8(1/4)	20
7	18.424	2.4	18.524	15.240	14.0	76.2	78.6	4	0.2	M10(3/8)	24
8	22.828	3.2	22.962	19.090	17.0	90.5	93.7	4	0.6	M12(1/2)	28
9	27.104	3.2	27.238	22.863	21.0	101.6	104.8	4	0.6	M12(1/2)	28
10	32.749	3.2	32.887	26.534	24.0	144.5	147.7	5	1.0	M16(5/8)	32
11	38.905	3.2	39.039	31.749	29.0	171.4	174.6	5	1.0	M16(5/8)	32
12	45.641	3.2	45.774	38.103	35.0	181.0	184.2	6	2.5	M20(3/4)	40
13	52.654	3.2	52.787	44.451	41.0	196.8	200.0	6	3.0	M20(3/4)	40
14	59.533	3.2	59.666	50.800	47.0	209.6	212.8	7	4.0	M24(1)	40
15	66.408	3.2	66.541	57.150	53.0	222.2	225.4	7	4.0	M24(1)	50
16	73.292	3.2	73.425	63.500	59.0	35.0	238.2	8	5.0	M30(11/8)	60

Brown sharp taper (Tang type)

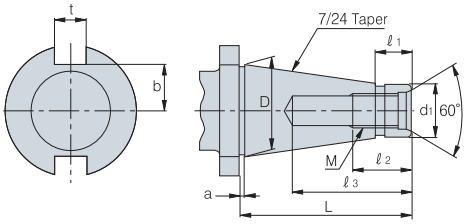


(mm)

B&S No.	D	a	D1	d1	d2	ℓ1	ℓ2	b	c	e	R	r
4	10.221	2.4	10.321	8.458	8.1	42.1	44.5	5.5	8.7	14.4	7.9	1.3
5	13.286	2.4	13.386	10.962	10.7	55.6	58.0	6.3	9.5	16.2	7.9	1.5
6	15.229	2.4	15.330	12.167	11.7	73.0	75.4	7.1	11.1	18.0	7.9	1.5
7	18.424	2.4	18.524	14.675	14.2	89.7	92.1	7.9	11.9	20.3	9.5	1.8
8	22.828	3.2	22.962	18.453.	18.0	104.8	108.0	8.7	12.7	22.0	9.5	2.0
9	27.104	3.2	27.238	22.200	21.8	117.5	120.7	9.5	14.3	25.4	11.1	2.5
10	32.749	3.2	32.887	25.751	25.7	162.7	165.9	11.1	16.7	28.1	11.1	2.8
11	38.905	3.2	39.039	30.985	30.7	189.7	192.9	11.1	16.7	30.0	12.7	3.3
12	45.641	3.2	45.774	37.246	37.1	201.6	204.8	12.7	190	32.5	12.7	3.8
13	52.654	3.2	52.787	43.589	43.4	217.5	220.7	12.7	19.0	35.7	15.9	4.3
14	59.533	3.2	59.666	49.841	49.8	232.6	235.8	14.2	21.4	41.2	19.0	4.8
15	66.408	3.2	66.541	56.186	56.1	245.3	248.5	14.2	21.4	44.4	22.2	5.3
16	73.292	3.2	73.425	62.441	62.2	260.4	263.6	15.8	23.8	50.0	25.4	5.8

M This is metric size. We can also provide in inch type

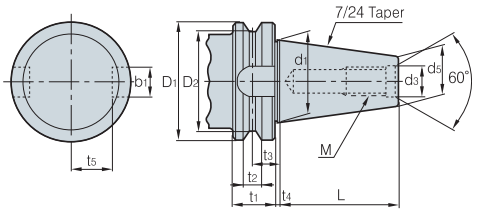
Standard taper of american milling machine



(mm)

NT No.	Dimensions	D	D1	L	ℓ1	M	ℓ2	ℓ3	a	t	b
30	1 1/4	31.750	17.40 -0.29 -0.36	70	20	UNC 1/2″	24	50	1.6	15.9	6.0
40	1 3/4	44.450	25.32 -0.30 -0.384	95	25	UNC 5/8″	30	60	1.6	15.9	22.5
50	2 3/4	69.850	39.60 -0.31 -0.41	130	25	UNC 1″	45	90	3.2	25.4	35.0
60	4 1/4	107.950	60.20 -0.34 -0.46	210	45	UNC 1 1/4″	56	110	3.2	25.4	60.0

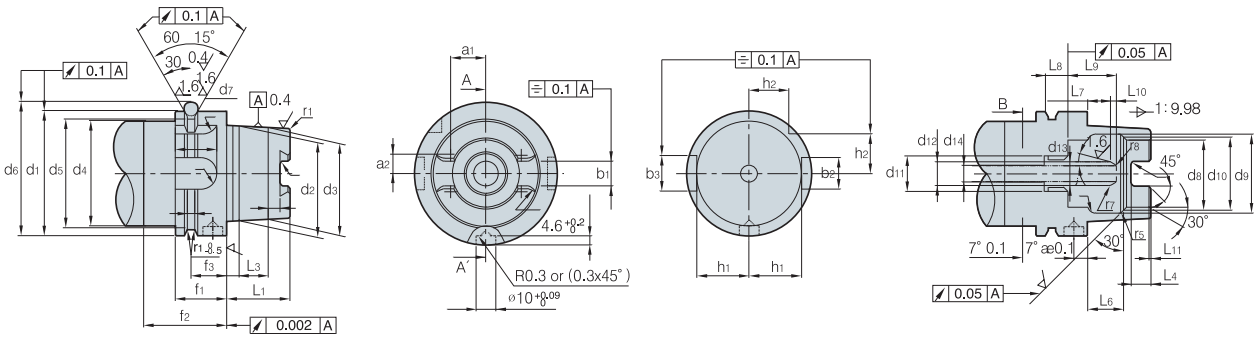
Bottle grip taper



(mm)

BT No.	D1	D2	t1	t2	t3	t4	d1	d3	L	M	b1	t5	d5
35	53	43	22	10	14.6	2	38.1	13	56.5	M12×1.75	16.1	19.6	21.62
40	63	52	25	10	16.6	2	44.45	17	65.4	M16×2	16.1	22.6	25.3
45	85	73	30	12	21.2	3	57.15	21	82.8	M20×25	19.3	29.1	33.1
50	100	85	35	15	23.2	3	69.85	25	101.8	M24×3	25.7	35.4	40.1
60	155	135	45	20	28.2	3	107.95	31	161.8	M30×3.5	25.7	60.1	60.7

HSK shank (DIN 69893)



(mm)

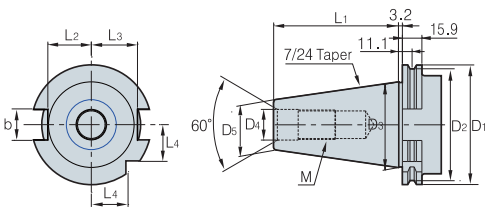
HSK No.	b1	b2	b3	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	a1	a2
50	10.54	12	14	50	38	36.90	42	43	59.30	7	26	32	29	M16X1	10	6.8	6.8	13.997	7.648
63	12.50	16	14	63	48	46.53	53	55	72.30	7	34	40	37	M18X1	12	8.0	8.4	17.862	9.250
100	20.00	20	14	100	75	72,80	85	92	109.75	7	53	63	58	M24X1.5	16	12.0	12.0	27.329	15.000

(mm)

HSK No.	f1	f2	f3	f4	b1	b2	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	r1	r2	r3	r4	r5	r6	r7	r8
50	26	42	18	3.75	2.0	15.5	25	5.0	11.0	7.5	4.5	14.13	10.0	10	23.0	3	1	19	1	1.5	2.38	6	0.5	1.0	2	6
63	26	42	18	3.75	28.5	20.0	32	6.3	14.7	10.0	6.0	18.13	10.0	12	24.5	3	1	21	1.2	1.5	3.00	8	0.6	1.5	3	8
100	29	45	20	3.75	44.0	31.5	50	10.0	24.0	15.0	10.0	28.56	12.5	16	28.0	3	1.5	24	2	2.0	3.00	12	1.0	1.5	3	10

M This is metric size. We can also provide in inch type

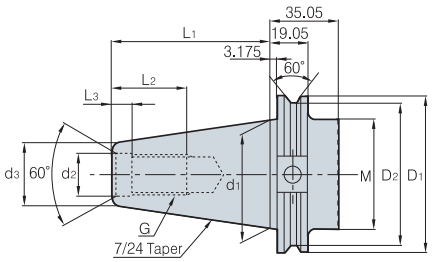
DIN 69871



(mm)

Shank No	D1	D2	D3	D4	D5	L1	L2	L3	L	b	M
30	50.0	44.3	31.75	13	17.8	47.8	16.4	19.0	33.5	16.0	M12×1.75
40	63.5	56.2	44.45	17	24.5	68.4	22.8	25.0	42.5	16.1	M16×2
45	82.5	57.2	57.15	21	33.0	82.7	29.1	31.3	52.5	19.3	M20×2.5
50	97.5	91.2	68.85	25	40.1	101.7	35.5	37.7	61.5	25.7	M24×3

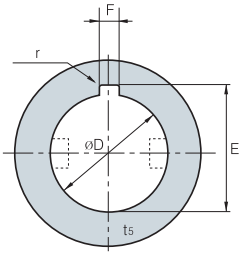
CAT shank



(mm)

Shank No	D1	D2	M	d1	d2	d3	L1	L2	L3	G
CAT40	63.5	56.36	M16×2	44.45	16.28	21.84	68.25	28.45	4.78	5/8-11
CAT45	82.55	75.41	M20×25	57.15	19.46	27.69	82.55	38.1	4.78	3/4-10
CAT50	98.43	91.29	M24×3	69.85	26.19	35.05	101.6	44.45	6.35	1-8

Standard of milling cutter hole (KSB3203)

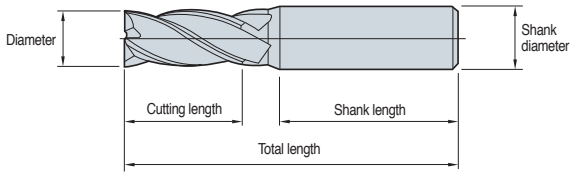


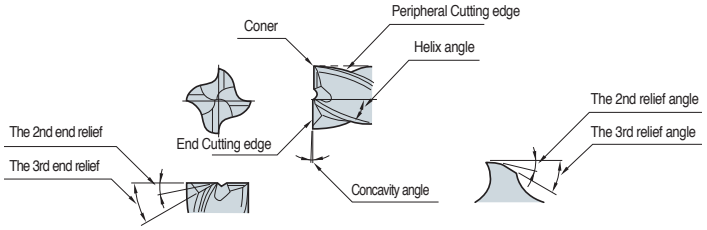
● **Type B**

Diameter	øDH7	E	F	r
1/2	12.70 +0.018 0	14.17 +0.25 0	2.38 +0.31 +0.13	0.5
5/8	15.875 +0.018 0	17.74 +0.25 0	3.18 +0.31 +0.13	0.8
3/4	19.050 +0.021 0	20.89 +0.25 0	3.18 +0.31 +0.13	0.8
7/8	22.225 +0.021 0	24.07 +0.25 0	3.18 +0.31 +0.13	0.8
1	25.40 +0.021 0	28.04 +0.25 0	6.35 +0.31 +0.13	1.2
1 1/4	31.750 +0.025 0	35.18 +0.25 0	7.94 +0.32 +0.14	1.6
1 1/2	38.10 +0.025 0	42.32 +0.25 0	9.53 +0.89 +0.25	1.6
1 3/4	44.450 +0.025 0	49.48 +0.25 0	11.11 +0.89 +0.25	1.6
2	50.80 +0.03 0	55.83 +0.25 0	12.7 +0.89 +0.25	1.6
2 1/2	63.50 +0.03 0	69.42 +0.25 0	15.81 +0.89 +0.25	1.6
3	76.20 +0.03 0	82.93 +0.25 0	19.05 +0.89 +0.25	2.4
3 1/2	88.90 +0.035 0	98.81 +0.25 0	22.23 +0.89 +0.25	2.4
4	101.60 +0.035 0	111.51 +0.25 0	25.4 +0.89 +0.25	2.4
4 1/2	114.30 +0.035 0	125.81 +0.25 0	25.58 +0.89 +0.25	3.2
5	127.0 +0.04 0	140.08 +0.25 0	31.75 +0.89 +0.25	3.2

M This is metric size. We can also provide in inch type

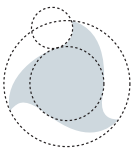
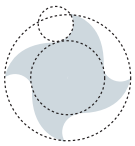
Endmill's shape and names





The comparison according to number of flute

● Features of number of flute

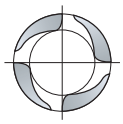
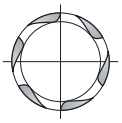
Ø10mm	2 flutes	3 flutes	4 flutes
Shape			
Cross section	44mm²	46mm²	48mm²
Ratio	56%	58%	61%
Advantages	Good chip flow	Good chip flow	High rigidity
Disadvantages	Weak rigidity	Difficult to measure external diameter	Bad chip flow
Usages	Side facing, Grooving	Side facing, Grooving	Side cutting
	Multi-functional	Medium, finishing	Finishing

● Affection of number of flute

Specification	Major features	2 flutes	4 flutes
Tool rigidity	Torsional rigidity	○	◎
	Bending rigidity	○	◎
Surface finish	Surface roughness	○	◎
	Machining precision	○	◎
Chip control	Chip clogging	◎	○
	Chip evacuation	◎	○
Grooving	Chip evacuation	◎	○
	Grooving	◎	○
Side facing	Surface finish	○	◎
	Vibration	◎	○

◎: Excellent ○: Good

The differences between general endmills and high speed endmills

General endmills		High speed endmills	
Cross section shape	Features	Cross section shape	Features
	- Applied for Low speed, High depth of cut, Low feed - Low hardness workpiece(general steel, cast iron)		- Applied for high speed, low depth of cut, high feed - Useful for hardened workpiece such as die steel

Calculations of cutting condition

● Calculations of Cutting speed

$$vc = \frac{\pi \times D \times n}{12} \qquad n = \frac{12 \times vc}{\pi \times D}$$

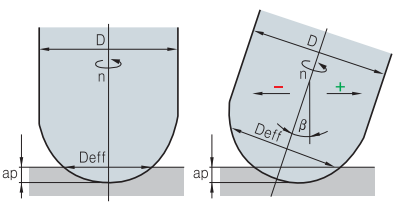
● Calculations of feed speed

$vf = n \times fn$ or $n \times fz \times z$

$$fn = \frac{vf}{n} \qquad fz = \frac{fn}{z} \text{ or } \frac{vf}{n \times z}$$

vc: Cutting speed (sfm)
π: Circular constant (3.141592)
D: Endmill diameter (inch)
n: Revolution per minute (min^{-1})
vf: Feed speed (ipm)
fn: Feed per revolution (ipr)
fz: Feed per flute (ipt)
z: Number of flute

Ball endmills cutting speed calculation formulas

Revolution per minute	$n = \frac{vc \times 12}{D \times \pi}$
Cutting speed	$vc = \frac{D \times \pi \times n}{12}$
Feed per tooth	$fz = \frac{vf}{z \times n}$
Feed per revolution	$fn = fz \times z$
Feed speed	$vf = fz \times z \times n$
Chip removal rate	$Q = ae \times ap \times vf$
Effective diameter of Ball Endmill	$D_{eff} = 2 \times \sqrt{D \times ap - ap^2}$ Calculation Table
	$D_{eff} = D \times \sin\left[\beta \pm \arccos\left(\frac{D-2ap}{D}\right)\right]$

The affection of flute length

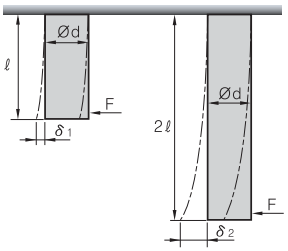
● Expression of aspect ratio

- Aspect ratio
- ℓ/d
- Ex) 3D, 15D, 22D

● Deformation rate according to length

- Deformation rate is reaction force against external force
- Proportional to the cube of length
- Set flute length and overall length as short as possible
- The more flute the better rigidity
- When flute width rate is narrower drill's rigidity is higher

$$\delta = \frac{P\ell^3}{3EI}$$



δ = Deformation volume **ℓ** = Length of cut

P = Cutting force **E** = Elasticity coefficient

I = Inertia moment ($I = \frac{\pi d^4}{64}$)

- ℓ : 2ℓ
- δ1: δ1 = 8δ1 = δ2

Spindle revolution conversion table (RPM) - external diameter

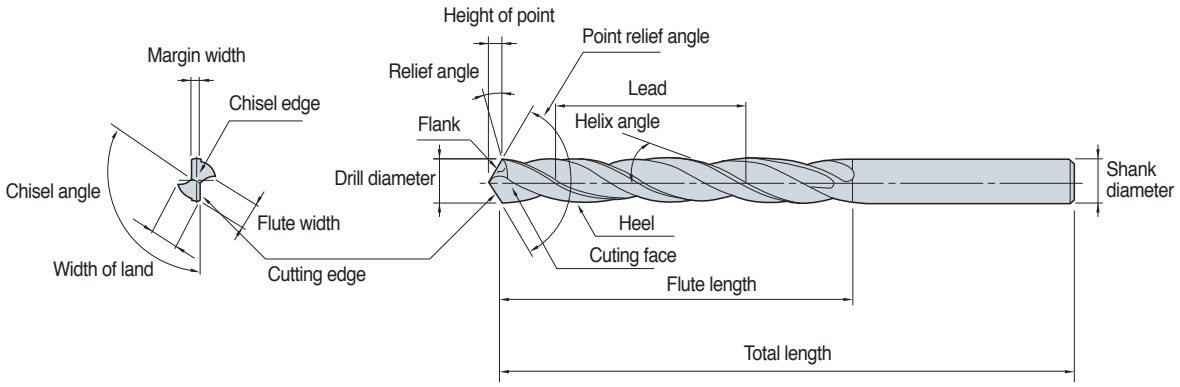
vc / External	Cutting speed (vc, sfm)															
	20	30	130	160	190	230	260	300	330	400	460	490	590	660	820	990
0.008	31,831	47,746	63,662	79,577	95,493	111,408	127,324	143,239	159,155	190,986	222,817	238,720	286,479	318,310	397,887	477,465
0.012	21,221	31,831	42,441	53,052	63,662	74,272	84,883	95,493	106,103	127,324	148,545	159,155	190,986	212,207	265,258	318,310
0.016	15,915	23,873	31,831	39,789	47,746	55,704	63,662	71,620	79,577	95,493	111,408	119,366	143,239	159,155	198,944	238,732
0.020	12,732	19,099	25,465	31,831	38,197	44,563	50,930	57,296	63,662	76,394	89,127	95,493	114,592	127,324	159,155	190,986
0.024	10,610	15,915	21,221	26,526	31,831	37,136	42,441	47,746	53,052	63,662	74,272	79,577	95,493	106,103	132,629	159,155
0028	9,095	13,642	18,189	22,736	27,284	31,831	36,378	40,926	45,473	54,567	63,662	68,209	81,851	90,946	113,682	136,419
0.032	7,958	11,937	15,915	19,894	23,873	27,852	31,831	35,810	39,789	47,746	55,704	59,683	71,620	79,577	99,472	119,366
0.036	7,074	10,610	14,147	17,684	21,221	24,757	28,294	31,831	35,368	42,441	49,515	53,052	63,662	70,736	88,419	106,103
0.040	6,366	9,549	12,732	15,915	19,009	22,282	25,465	28,648	31,831	38,197	44,563	47,746	57,296	63,662	79,577	95,793
0.059	4,244	6,366	8,488	10,610	12,732	14,854	16,977	19,099	21,221	25,465	29,709	31,831	38,197	42,441	53,052	63,662
0.079	3,183	4,775	6,366	7,958	9,549	11,141	12,732	14,324	15,915	19,099	22,282	23,873	28,648	31,831	39,789	47,746
0.098	2,546	3,820	5,093	6,366	7,639	8,913	10,186	11,459	12,732	15,279	17,825	19,099	22,918	25,465	31,831	38,197
0.118	2,122	3,183	4,244	5,305	6,366	7,427	8,488	9,549	10,610	12,732	14,854	15,915	19,099	21,221	26,526	31,831
0.138	1,819	2,728	3,638	4,547	5,457	6,366	7,276	8,185	9,095	10,913	12,732	13,642	16,370	18,189	22,736	27,284
0.158	1,592	2,387	3,183	3,979	4,775	5,570	6,366	7,162	7,958	9,549	11,141	11,937	14,324	15,915	19,894	23,873
0.177	1,415	2,122	2,829	3,537	4,244	4,951	5,659	6,366	7,074	8,488	9,903	10,610	12,732	14,147	17,684	21,221
0.197	1,273	1,910	2,546	3,183	3,820	4,456	5,093	5,730	6,366	7,639	8,913	9,549	11,459	12,732	15,915	19,099
0.217	1,157	1,736	2,315	2,894	3,472	4,051	4,630	5,209	5,787	6,945	8,102	8,681	10,417	11,575	14,469	17,362
0.236	1,061	1,592	2,122	2,653	3,183	3,714	4,244	4,775	5,305	6,366	7,427	7,958	9,549	10,610	13,263	15,915
0.256	979	1,469	1,959	2,449	2,938	3,428	3,918	4,407	4,897	5,876	6,856	7,346	8,815	9,794	12,243	14,691
0.276	909	1,364	1,819	2,274	2,728	3,183	3,638	4,093	4,547	5,457	6,366	6,821	8,185	9,095	11,368	13,642
0.295	849	1,273	1,698	2,122	2,546	2,971	3,395	3,820	4,244	5,093	5,942	6,366	7,639	8,488	10,610	12,732
0.315	796	1,194	1,592	1,989	2,387	2,785	3,183	3,581	3,979	4,775	5,570	5,968	7,162	7,958	9,947	11,937
0.335	749	1,123	1,498	1,872	2,247	2,621	2,996	3,370	3,745	4,494	5,243	5,617	6,741	7,490	9,362	11,234
0.354	707	1,061	1,415	1,768	2,122	2,476	2,829	3,183	3,537	4,244	4,951	5,305	6,366	7,074	8,842	10,610
0.374	670	1,005	1,340	1,675	2,010	2,345	2,681	3,016	3,351	4,021	4,691	5,026	6,031	6,701	9,377	10,052
0.394	637	955	1,273	1,592	1,910	2,228	2,546	2,865	3,183	3,820	4,456	4,775	5,730	6,366	7,958	9,549
0.433	579	868	1,157	1,447	1,736	2,026	2,315	2,604	2,894	3,472	4,051	4,341	5,209	5,787	7,234	8,681
0.472	531	796	1,061	1,326	1,592	1,857	2,122	2,387	2,653	3,183	3,714	3,979	4,775	5,305	6,631	7,958
0.512	490	735	979	1,224	1,469	1,714	1,959	2,204	2,449	2,938	3,428	3,673	4,407	4,897	6,121	7,346
0.551	455	682	909	1,137	1,364	1,592	1,819	2,046	2,274	2,728	3,183	3,410	4,093	4,547	5,684	6,821
0.591	424	637	849	1,061	1,273	1,485	1,698	1,910	2,122	2,546	2,971	3,183	3,820	4,244	5,305	6,366
0.630	398	597	796	995	1,194	1,393	1,592	1,790	1,989	2,387	2,785	2,984	3,581	3,979	4,974	5,968
0.669	374	562	749	969	1,123	1,311	1,498	1,685	1,872	2,247	2,621	2,809	3,370	3,745	4,681	5,617
0.709	354	531	707	884	1,061	1,238	1,415	1,592	1,768	2,122	2,476	2,653	3,183	3,537	4,421	5,305
0.748	335	503	670	838	1,005	1,173	1,340	1,508	1,675	2,010	2,345	2,513	3,016	3,351	4,188	5,026
0.787	318	477	637	796	955	1,114	1,273	1,432	1,592	1,910	2,228	2,387	2,865	3,183	3,979	4,775
0.827	303	455	606	758	909	1,061	1,213	1,364	1,516	1,819	2,122	2,274	2,728	3,032	9,789	4,547
0.866	289	434	579	723	868	1,013	1,157	1,302	1,447	1,736	2,026	2,170	2,604	2,894	3,617	4,341
0.906	277	415	554	692	830	969	1,107	1,246	1,384	1,661	1,938	2,076	2,491	2,768	3,460	4,152
0.945	265	398	531	663	796	928	1,061	1,194	1,326	1,592	1,857	1,989	2,387	2,653	3,316	3,979
0.984	255	382	509	637	764	891	1,019	1,146	1,273	1,528	1,783	1,910	2,292	2,546	3,183	3,820

Tool failure and trouble shooting

Trouble		Causes	Solutions																	
			Cutting condition					Tool shape						Grade		etc				
			Cutting speed	Feed	Depth of cut	Coolant	Up cut·down cut	Relief angle	Lead angle	Length of flute	Number of flute	Honing	Chip pocket	Toughness	Hardness	Machine rigidity	Machine vibration	Workpiece fixing	Overhang
Damage at cutting edge	**Excessive periphery cutting edge**	Improper cutting condition	⬇	⬆		◉											⬆		
	Chipping	Improper cutting condition Generating built up edge Weak tool rigidity Improper grade		⬇			⬇	⬇				◉		⬆			⬇	⬆	⬇
	Fracture during operation	Improper cutting conditions Excessive cutting load Excessive overhang		⬇	⬇					⬇			⬆			⬆		⬆	⬇
Poor surface finish		Generating built-up edge	⬆	⬆		◉			⬆			◉							
		Chattering	⬇				⬇			⬇						⬆	⬇	⬆	⬇
		Poor straightness		⬇	⬇		⬆		⬆	⬇									⬇
Poor machining precision (Machined size, perpendicularity)		Improper cutting conditions Improper tool shape	⬆	⬇			⬇			⬇	⬆					⬆	⬇		⬇
Bad chip evacuation		Excessive cutting volume Improper chip pocket Improper cutting conditions		⬇	⬇						⬇		⬆						

⬆ : Increase ⬇: Decrease ●: use ◉: Correct use

The shape of drills and the names



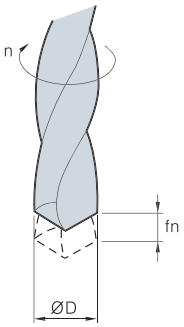
Shape and the feature of cutting

Helix angle	Plays rake angle of cutting edge's role. If helix angle increases Cutting force decreases. On the other hand If helix angle is too big Drill rigidity decreases Poor machinability ◀ low - Helix angle - high ▶ Smooth chip evacuation Hard workpiece (hardened steel) ◀ low - Helix angle - high ▶ Soft material (aluminum etc)
Length of flute	The path of both chip evacuation and cooling lubricant Too big length of flute weakens drill rigidity and too small length of flute worsens chip evacuation to breakage
Point angle	Point angle has big influence on cutting performance. It mainly depends on workpiece. In case of standard drills Point angle is generally 118 thrust resistance decrease ◀ low - Point angle - high ▶ thrust resistance increase Torque increase, Burr on exit increase ◀ low - Point angle - high ▶ Torque decrease, Burr on exit decrease Soft material (aluminum etc) ◀ low - Point angle - high ▶ Hard workpiece (hardened steel)
Margin	While machining Margin is the part of contact between workpiece and drill's external. It prevents bending and plays guide's role It depends on drill size Cutting force decrease ◀ small - Margin - big ▶ Cutting force increase Poor guide ◀ small - Margin - big ▶ Good guide
Web thickness	Web is the part of center of drill and drill's rigidity depends on the web. Drill needs cutting edge, chisel edge, at the tip of drill because drill makes a hole at the beginning of drilling . When web thickness is big Thinning is needed to reduce cutting force Cutting force decrease ◀ small - Web thickness - big ▶ Cutting force increase Rigidity decrease ◀ small - Web thickness - big ▶ Rigidity increase Good chip evacuation ◀ small - Web thickness - big ▶ Bad chip evacuation Soft material (aluminum etc) ◀ small - Web thickness - big ▶ Hard workpiece (hardened steel)
Back taper	Drill diameter size is getting smaller from point to shank in order to avoid the friction between drill periphery and workpiece. The decrease of diameter divided by flute length 100mm generally becomes 0.0015~0.0394 inch. As for high performance drills and drills for hole shrinkage workpiece during operation have big back taper
Thinning	In general drills Thrust effects on chisel over 50%. Chisel edge length depends on web thickness and chisel angle. But if web is thin Drill rigidity weaken. Therefore without web thickness change Thinning makes chisel edge short or gives rake angle. In other words, Thinning makes rake angle at chisel and improves chip evacuation and decrease thrust

Types of	Edge shape	Feature	Korloy's drills
X type		Good centering High central thickness Crank shaft	Mach solid drill (MSD) Vulcan drill (VZD)
S type		For wide use For general Easy regrinding	Solid drill (SSD)

Major cutting formulas

Cutting speed	Feed	Helix angle	Machining time
$vc = \frac{\pi \cdot D \cdot n}{1000}$ (sfm)	$fn = \frac{vf}{n}$ (ipr)	$\delta = \tan^{-1}\left(\frac{\pi D}{L}\right)$	$tc = \frac{ld}{n \cdot fn}$ (min)
• vc: Cutting speed (sfm) • D: Drill diameter (inch) • n: Revolution per minute (min^{-1}) • π: Circular constant (3.14)	• fn: Feed per revolution (ipr) • vf: Feed per minute (ipm) • n: Revolution per minute (min^{-1})	• δ: Helix angle • D: Drill diameter (inch) • L: Lead (inch) • π: Circular constant (3.14)	• tc: Machining time (min) • n: Revolution per minute (min^{-1}) • ld: Drilling time (inch) • fn: Feed (ipr)



Cutting torque and thrust (calculation formulas)

$Md = KD^2 \times (0.0631 + 1.686 \times fn)$ (kg·cm)

$T = 57.95KDfn^{0.85}$ (kg)

• Md: Cutting torque (kg·cm)
• T: Cutting thrust (kg)
• D: Drill diameter (inch)
• fn: Feed per revolution (ipr)
• K: Material coefficient

Workpiece material (SAE/AISI)		Tensile strength (kgf)	Hardness (HB)	Material coefficient K
Cast iron	Cast iron (Gray)	21	177	1.00
	Cast iron	28	198	1.39
	Cast iron (Ductile)	35	224	1.88
General steel	1020(carbon steel C 0.2%)	55	160	2.22
	1112(C 0.12, S 0.2%)	62	183	1.42
	1335(Mn 1.75%)	63	197	1.45
Nickel Chrome steel	3115 (Ni 1.25, Cr 0.6, Mn 0.5)	53	163	1.56
	3120 (Ni 1.25, Cr 0.6, Mn 0.7)	69	174	2.02
	3140	88	241	2.32
Chrome molybdenum steel	4115 (Cr 0.5, Mo 0.11, Mn 0.8)	63	167	1.62
	4130 (Cr 0.95, Mo 0.2, Mn 0.5)	77	229	2.10
	4140 (Cr 0.95, Mo 0.2, Mn 0.85)	94	269	2.41
Nickel molybdenum steel	4615 (Ni 1.8, Mo 0.25, Mn 0.5)	75	212	2.12
	4820 (Ni 3.5, Mo 0.25, Mn 0.6)	140	390	3.44
Chrome steel	5150 (Cr 0.8, Mn 0.8)	95	277	2.46
Chrome vanadium steel	6115 (Cr 0.6, Mn 0.6, V 0.12)	58	174	2.08
	6120 (Cr 0.8, Mn 0.8, V 0.1)	80	255	2.22

Cutting torque and thrust (empirical formula)

$Md = K_1 d^2 \cdot fn^m$

$T = K_2 d \cdot fn^n$

• Md: Cutting torque (kg·cm)
• T: Thrust (kg)
• fn: Feed (ipr)
• d: Drill diameter (inch)
• K_1, K_2, m, n: Experimental Data Characteristic value

Workpiece	K_1	m	K_2	n
Soft steel	5.9	1.00	125.0	0.88
Rolled steel	3.5	1.00	55.0	0.88
7-3 brass	2.5	0.94	44.4	0.87
Aluminum	1.5	0.90	33.3	0.78
Zinc	1.4	0.88	27.0	0.74
Gun metal	2.0	0.94	21.6	0.75
Galvanized iron	0.3	0.57	6.4	0.55

Tool failures and solutions

Trouble		Causes	Solutions																	
			Cutting condition					Tool shape						Grade		etc				
			Cutting speed	Feed	Step feed	Initial feed	Coolant	Relief angle	Point angle	Thinning angle	Honing	Flute width rate	Thinning	Toughness	Hardness	Machine rigidity	Machine vibration	Guide bush	Clamping workpiece
Chipping		• Too sharp cutting edge (too big relief angle) (thinning edge is too sharp)						⬇		⬇	⬆			⬆					
		• Excessive cutting speed	⬇				●												
		• Built-up edge					●	⬇		⬇	⬆			⬆					
		• Vibration and chattering	⬇													⬆	⬇		●
Wear		• Excessive cutting speed (Abnormal wear at margin)	⬇				●												
		• Insufficient cutting speed (Abnormal wear at center)	⬆				●												
Chip		• Long chip	⬆	⬆			●				⬇								
		• Over lap	⬆	⬆															
		• Chip burning	⬆				●												
Hole precision burr, poor surface finish		• Tool clamping precision				⬇			⬇		⬇					⬆	⬇		●
		• Excessive feed, sharp point angle		⬇					⬆		⬇								
		• Excessive cutting speed (Considered tool grade)	⬆				●	⬇	◉						⬆				
Fracture	Breakage on contact	• Poor surface finish			●	⬇												●	
		• Insufficient machine rigidity														⬆			●
		• Improper cutting condition	⬆	⬇															
	Breakage at hole bottom	• Crooked hole	⬆						⬆				●				⬇	●	
		• Chip clogging		⬇	●							⬆							

⬆: Increase ⬇: Decrease ●: use ◉: Correct use

Hole size for threading

● Metric coarse screw threads

Specification	Hole diameter
M1 X 0.25	0.75
M1.1 X 0.25	0.85
M1.2 X 0.25	0.95
M1.4 X 0.3	1.1
M1.6 X 0.35	1.25
M1.7 X 0.35	1.35
M1.8 X 0.35	1.45
M2 X 0.4	1.6
M2.2 X 0.45	1.75
M2.3 X 0.4	1.9
M2.5 X 0.45	2.1
M2.6 X 0.45	2.2
M3 X 0.6	2.4
M3 X 0.5	2.5
M3.5 X 0.6	2.9
M4 X 0.75	3.25
M4 X 0.7	3.3
M4.5 X 0.75	3.8
M5 X 0.9	4.1
M5 X 0.8	4.2
M5.5 X 0.9	4.6
M6 X 1	5
M7 X 1	6
M8 X 1.25	6.8
M9 X 1.25	7.8
M10 X 1.5	8.5
M11 X 1.5	9.5
M12 X 1.75	10.3
M14 X 2	12
M16 X 2	14
M18 X 2.5	15.5
M20 X 2.5	17.5
M22 X 2.5	19.5
M24 X 3	21
M27 X 3	24
M30 X 3.5	26.5
M33 X 3.5	29.5
M36 X 4	32
M39 X 4	35
M42 X 4.5	37.5
M45 X 4.5	40.5
M48 X 5	43

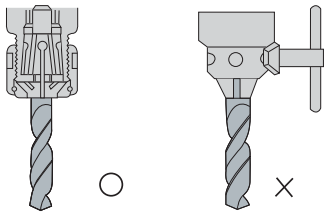
● Metric coarse screw threads

Specification	Hole diameter
M2.5 X 0.35	2.2
M3 X 0.35	2.7
M3.5 X 0.35	3.2
M4 X 0.5	3.5
M4.5 X 0.5	4
M5 X 0.5	4.5
M5.5 X 0.5	5
M6 X 0.75	5.3
M7 X 0.75	6.3
M8 X 1	7
M8 X 0.75	7.3
M9 X 1	8
M9 X 0.75	8.3
M10 X 1.25	8.8
M10 X 1	9
M10 X 0.75	9.3
M11 X 1	10
M11 X 0.75	10.3
M12 X 1.5	10.5
M12 X 1.25	10.8
M12 X 1	11
M14 X 1.5	12.5
M14 X 1	13
M15 X 1.5	13.5
M15 X 1	14
M16 X 1.5	14.5
M16 X 1	15
M17 X 1.5	15.5
M17 X 1	16
M18 X 2	16
M18 X 1.5	16.5
M18 X 1	17
M20 X 2	18
M20 X 1.5	18.5
M20 X 1	19
M22 X 2	20
M22 X 1.5	20.5
M22 X 1	21
M24 X 2	22
M24 X 1.5	22.5
M24 X 1	23
M25 X 2	23
M25 X 1.5	23.5
M25 X 1	24
M26 X 1.5	24.5
M27 X 2	25

Cautions

● Selection of drill chuck

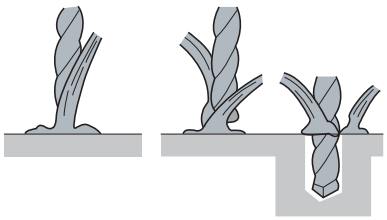
• Collect chuck is favorable Because it has strong grip power
(General drill-chuck and Keyless chuck don't have enough grip power.)



• Collect chuck • General drill-chuck

● Coolant supply

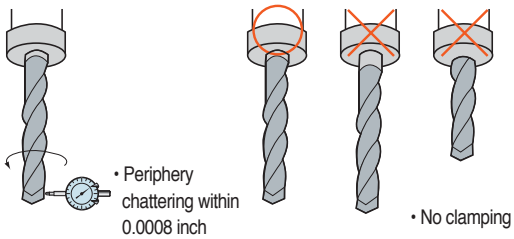
• Supply enough coolant around hole entrance
• Standard cutting oil pressure: 3~5 kg/㎠, Flux: 2~5 l/min



• Supply much coolant at hole entrance

● Mounting drill

• When mounting drill Periphery chattering should be within 0.0008 inch
• Flute should not be clamped

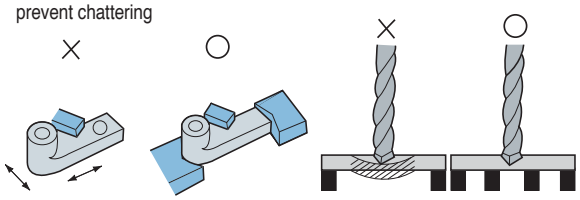


• Periphery chattering within 0.0008 inch

• No clamping flute

● How to clamp workpiece

• At high performance drilling High thrust, torque and horizontal cutting force work at the same time so that workpiece should be clamped strongly to prevent chattering



• Uniformed and strong clamping is needed (Right and left, up and down)

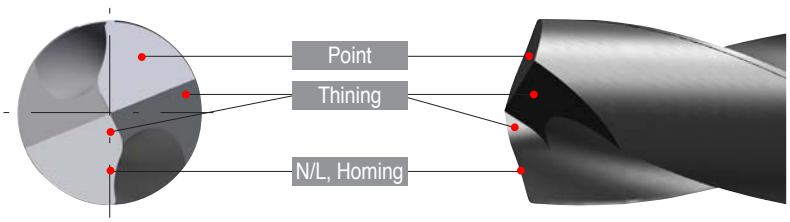
• Strong clamping is needed because bending causes chipping

Notice

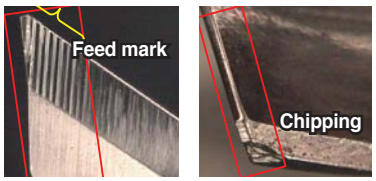
1) For better drill's life, small damage and wear are favorable to be regrinding
2) Damage and wear size should be within 0.06 inch for regrinding
3) If drill has crack, regrinding is impossible
4) Ordering for regrinding is acceptable or purchase regrinding machine

Regrinding procedures

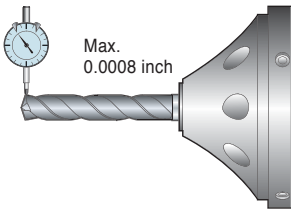
● Regrinding mathod (Mach Drill)



1) Preparation Determination of regrinding areas
- Check the cutting edge for damage and wear If large fracture is found, remove it by rough grinding



2) Grinding operation Drills setting
- Drill is clamped to collet chuck Chattering is kept within 0.0008 inch

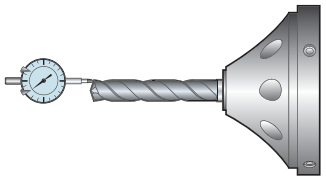


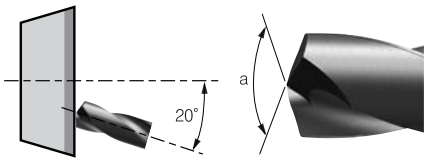
3) Grinding operation-Grinding point

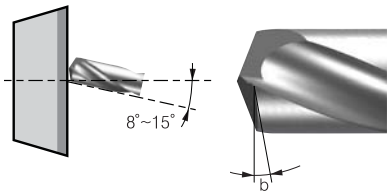
- Check damage and wear at the point and remove it completely
- The difference of the lip height is kept within 0.0008 inch

Point angle (a): 140°

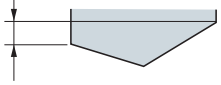
Point relief angle (b)t: 8°~15°







The difference of the lip height Max. 0.0008 inch



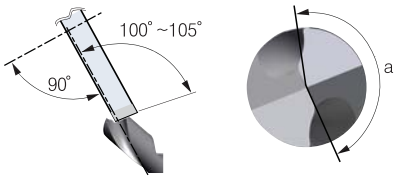
4) Grinding operation-Thinning grinding

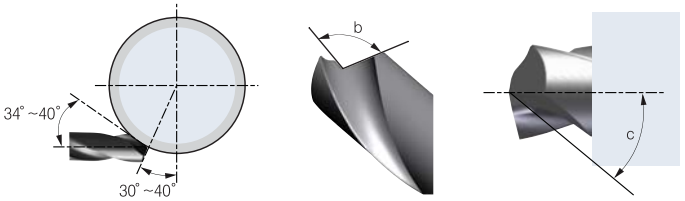
- Considering N/L width Cutting edge length from the center of drill axis should be 0.0012~0.0032 inch for balancing

- Set the wheel to tilt drill axis by 34°~40°.

Thinning angle (a)°: 155°~160° Thining open angle (b): 100°~105°

Thinning relief angle (c): 34°~40°

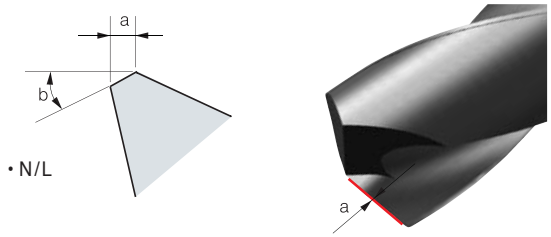




5) Grinding-N/L grinding and honing

- Using diamond chisel Grinds the width flat along point cutting edge
- After negaland operation Finishes with brush or handstone

N/L width (a): 0.0020~0.0063 inch /N/L angle (b): 24°~26°



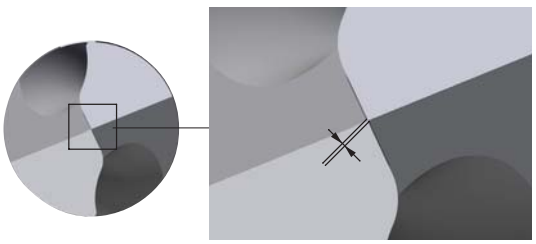
● TIP

· Making point

- Without center drill, the point width should be below 0.004 inch

· Recommended grinding condition

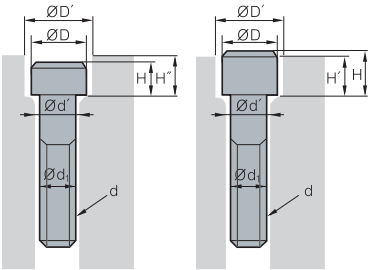
- Diamond wheel: 240~400 mesh
- Diamond chisel: 400~600 mesh
- Diamond hand stone: 800~1500 mesh



Hexagonal socket bolt (clamping screw) size

● Counter boring and size of bolt hole for hexagonal socket bolt

ISO (d)	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
Ød1	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
Ød′	3.4	4.5	5.5	6.5	8.5	11	14	16	18	20	22	24	26	30	33
ØD	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
ØD′	5	8	9.5	11	14	17.5	20	23	26	29	32	35	39	43	48
H	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
H′	2.7	3.6	4.6	5.5	7.4	9.2	11.0	12.8	14.5	16.5	18.5	20.5	22.5	25	28
H″	3.3	4.4	5.4	6.5	8.6	10.8	13.0	15.2	17.5	19.5	21.5	23.5	25.5	29	32



The comparison of chip breakers

※2017.11-Ver.01

APPLICATION				KORLOY	KYOCERA	TAEGUTEC	SUMITOMO	SANDVIK	KENNAMETAL	ISCAR	WLATER	MITSUBISHI	SECO	TUNGALLOY
NEGATIVE	P	Application	Ultra-Finishing	-	DP (G-class)	-	FA	PMC	FF (G-class)	SF	-	PK (G-class), FY	FF1	TF
				VL	GP	FA	FL, FB	QF	UF	PF	NF3	FH, FS, SY	FF2	NS, ZF
			Finishing	VF	PP	FG	LU, FE	PF, XF	FN	NF, SM	NF4	FP		NM, NS, SS
				VB	-	SF	SU	61	K	F3P	FP5	LP, SH, SA	MF2	TS, TSF
			Medium to finishing	VQ, VC	HQ, CQ	MC	SE	HM	LF, CT	TF	NS6	C (Cermet)		AS
				LP	PQ, CJ	FC	SX	PMC	-	-	MP3	MV	MF5	ZM, AM
			Medium machining	VM	HK, GS, HS, PS	MP, MT	GU (UG)	QM, SM	MP, MN	PP, TF	NM4, NP5	MA, MH	M3, M5	TQ, TM
				MP	PG	PC	GE, UX	PM, XM	-	M3P	MP5	MP	-	DM, None C/B
			Roughing	B25				-	RP, MR	GN	-	GM, None C/B	M5	TH
				HR, GR	PT, GT, HT, PH	RT	MU, ME, MX	PR, WR	RN, None C/B	R3P	RP5, NM9	GH, RP	MR5, MR6, MR7	THS
			Heavy duty machining	GH	PX	HB, RH, RX	HG, MP	PR, XMR	RH	NR, HT	RP7, NR4, NRF	HZ	R4, R5	CH
				VH	-	HZ, EH	HP	QR	RM	HR	NRR, NR8	HX	R6, R7, R8, PR6	THS, TRS
				VT	-	HT, HY, HD	HU, HW, HF	HR	MM	T3P	-	HV	PR9, R56, R57, R68	65, TUS
		Low carbon steel	Soft steel	VL	XF, XP, XP-T	SF	FL	LC	-	-	-	FY	-	-
				-	XQ, XS	-	-	-	-	-	-	SY	-	-
		High feed	Wiper	VW	WP, WF	WS	LUW, SEW	WF, WL	FW	WF	NF	SW	FF2, MF2	AFW, FW
				LW	WQ, WE	WT	GUW	WM, WMX	MW	WG	NM	MW	MF5, M3	ASW, SW
				-	-	-	-	WR	RW	-	-	-	R4, R7	-
		Application	Shaft (long bar)	SH	CJ, ST	FS, VF, FX	HM	K	-	-	-	ES	UX	P, S
				KNUX-	KNMX-	KNUX-	-	KNUX-71	-	-	-	KNMX-19	-	KNMX
	M	Stainless steel	Finishing	VP2, MP	MQ, GU, SK	EA, SF	SU, EF	MF, XF	FP, FF	SF, VL, F3M	NF4, FM5	SH, LM	FF1, MF1	SS, SF, SA
			Medium cutting	HS, MM	HU, TK, MS	MP, EM	EX, EG, GU	MM,XM,QM,MMC	MP, UP, MS	PP, TF, M3M	NM4, NR4	MS, GM, MM	MF3, MF4	SM
			Roughing	GS, RM	MU	ET	MU, HM, EM	MR, XMR, MRR	RP, P	MR, R3M	RM5, NRS	MA, ES	MF5, M5	S, SH
	K	Cast iron	Finishing	MP	None C/B, C, KQ	MT	UZ	KF, PMC, XF	T-20, FN	TF	NM, MK5	LK, MA	M4	CF
			Medium cutting	B25, MK	ZS, KG	RT, KT	UX, GZ	KM, XM	UN, RP	GN	NM5, RK5	MK, GK, None C/B	M5	CM, None C/B
			Roughing	-MA, RK	-MA, GC, KH	-MA	-MA	KR, XMR, KRR	MR, S-20, -MA	-MA, NR	-MA, RK7	RK, -MA	MR7	CH
	S	HRSA	Ultra-finishing	VP1	MQ, SK	EA	EF	SF, SGF	FS (G-class) LF (G-class)	SF, PF	NF4	FJ(G-class)	M1	SF
			Finishing	VP2	TK	ML	UP, EG	23.SR, XF, SMC	UP	PP	NFT	LS	MF1	HMM
			Medium cutting	VP3	MS	EM	EX	SM, SMR, XM	MS, GP, P, UN	TF	NMS, NMT	MS	MF4, MR3	HRF
			Roughing	VP4	MU	ET	MU	XMR	RP	MR	NRS, NRT	RS, GJ	MR4	HRM
	N	Aluminium alloy		HA	AH	ML	AX	23	GP, MS	NF, PP	FN2, PF2, MN2, PM2	MJ	MF1	P
POSITIVE	P M K	Application	Finishing	VL	XP, PP	FA, FX	FC	PF, XF	11	PF	FP4	SMG (G-class), FV	FF1	01
				VF	GP	-	FB, LU (FP,FK)	UF	UF	F3P	FK6	SV, FP	F1	PSF, PF
			Medium cutting	HMP	XQ	FG	LB, NF	PM, XM	LF, FP	14	MP4,FM2,FM4,MK4	LP	MF2	PSS
				MP	HQ, GK	PC, FM	SU, SC	UM, PMC	MP, T-20	SM	FP6,MM4,FM6,RK4	MV	F2, M3	PS
			Roughing	C25	None C/B	MT	MU	PR, UR, XR	MF, GM, -C	19	RP4, RM4, RK6	None C/B, MP	M5	PM
			Wiper	-	WP	-	LUW	WL, WF	FW	WF	PM	SW	-	-
				-	-	WT	SDW	WM, WMX	MW	WG	-	MW	-	-
	M S	Stainless steel For HRSA	Finishing	VP1	CF, GF, GQ	FG	FC, FM	MF, MM, MMC	11, UF, LF	PF	FM4, NM4	FJ (G-class), FM, LM	F1, MF2	PSF, PSS
			Medium to finish cutting	VL	MQ, MF	SA	LB, SI	MR, XR, SMC	MF	SM, M3M	RM4	MM, None C/B	M3, M5	PS, PM
	K	Cast iron	Medium cutting	MP	HQ	PC	MU	KF, KM	LF	17	FK6	MK	M3	CM
			Roughing	C25	GK	MT	None C/B	KR	MF, UF	19	MK4, RK6	None C/B, -MW	M5	None C/B
	N	Aluminium alloy		AK, AR	AH	FL	AW, AG, AY	AL	HP, LF	AS, AF	PM2	AZ, FS	AL	AL
High precision bar turning (tolerance class G&E)				KF, KM	FSF, USF, J, A3	GF, FF, GW	FY, FX, FZ	K, F, UM	GH	LF, RF, XL	-	F, SR, SS, SM	UX	JS, J10, JRP, JPP

KORLOY grades

Cat.	ISO	Grade	Range	Workpiece application	Turning	Milling	Facing	Grooving	Threading	Parting	Index drill	Solid drill	Endmill	Coating layer
CVD	P	NC3215 (new)	P10~P15	For high speed turning of general steel and forged steel	●									TiN / Al_2O_3 / MT-TiCN
		NC3225 (new)	P20~P25	For universal turning of general steel and forged steel	●		●	●		●				TiN / Al_2O_3 / MT-TiCN
		NC3120	P20~P25	For medium turning of steel	●		●	●		●				Al_2O_3 / TiC / MT-TiCN
		NC3030	P25~P35	For medium to rough turning of steel	●			●		●				TiN / Al_2O_3 / TiC / MT-TiCN
		NC5330	P30~P35	For multi-purpose machining of mild steel and forged steel	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NC500H	P25~P35	For heavy turning of steel	●					●				TiN / Al_2O_3 / MT-TiCN
		NC5340 (new)	P30~P35	For high/medium low speed milling of turning		●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NCM325	P30~P40	For high speed turning of steel		●			●		●			TiN / Al_2O_3 / MT-TiCN
		NC5350 (new)	P35~P45	For medium low/ low speed milling of steel		●								TiN / Al_2O_3 / MT-TiCN
		NCM335	P35~P45	For rough and interrupted milling of steel and high speed milling of cast iron		●								TiN / Al_2O_3 / MT-TiCN
	K	NC6315 (new)	K10~K15	For turning applications of gray and ductile cast iron	●		●	●		●				Al_2O_3 / MT-TiCN
		NC5330	K15~K25	For multi-purpose machining of cast iron at high speed	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
	M	NC9115 (new)	M10~M20	For turning applications of ferritic and martensitic stainless steel	●									TiN / Al_2O_3 / MT-TiCN
		NC9125 (new)	M20~M30	For stainless steel turning	●									TiN / Al_2O_3 / MT-TiCN
		NC9135 (new)	M30~M40	For interrupted machining of stainless steel	●									TiN / Al_2O_3 / MT-TiCN
		NC5330	M25~M35	For multi-purpose machining of STS	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NCM325	M25~M35	For high speed milling of STS		●				●	●			TiN / Al_2O_3 / MT-TiCN
		NCM335	M30~M40	For rough and interrupted milling of STS		●								TiN / Al_2O_3 / MT-TiCN
	S	NC9125 (new)	S15~S25	For roughing heat resistant alloy	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NC9135 (new)	S20~S30	For continuous cutting of heat resistant alloy	●									TiN / Al_2O_3 / MT-TiCN
PVD	P	PC230	P15~P30	For finish and medium turning of steel		●			●		●			TiAlN
		PC3500	P25~P35	For medium and rough milling of steel (1st recommended)		●	●	●	●		●			TiN / TiAlN
		PC3600	P20~P30	For universal milling of steel		●								★New TiAlN film (High hardness/ Oxidation resistance)
		PC3545	P35~P45	For medium/rough milling of steel at high interruption		●								TiN / TiAlN

KORLOY grades

Cat.	ISO	Grade	Range	Workpiece application	Turning	Milling	Facing	Grooving	Threading	Parting	Index drill	Solid drill	Endmill	Coating layer
PVD		PC5300	P30~P40	For medium/rough milling of steel	●	●	●	●	●	●	●			★New TiAlN film (High hardness/ Oxidation resistance)
		PC5335 new	P30~P40	For medium/rough milling of steel	●	●					●			★TiAlCrN film (Lubricative)
		PC5400 new	P35~P45	For medium/rough milling of steel	●	●		●			●			★TiAlCrN film (Lubricative)
		PC2005 new	P01~P10	For milling of high hardness heat-treated steel		●								TiMeN TiAlN
		PC2010 new	P05~P15	For milling of pre hardened steel and press mold steel		●								TiMeN TiAlN
		PC2015 new	P10~P20	For milling of carbon steel and mold making		●								AlCrN
		PC2505 new	P01~P10	For milling high hardened steel (heat-treated steel)		●								★New TiAlN film (High hardness/ Oxidation resistance)
		PC2510 new	P05~P15	For milling pre hardened steel and pressed die steel		●								★New TiAlN film (High hardness/ Oxidation resistance)
		PC210F	P10~P20	For high speed milling of general steel and alloy steel (Laser Mill)		●								★New TiAlN film (High hardness/ Oxidation resistance)
		PC3030T	P20~P30	For steel threading					●					TiAlN
		PC203F	P05~P15	For high speed end milling of steel (H-max)									●	★New TiAlN film (High hardness/ Oxidation resistance)
		PC220	P20~P35	For universal end milling of steel (I-max)									●	★New TiAlN film (High hardness)
		PC303S new	P05~P15	For end milling of high hardness steel and press mold steel									●	TiMeN TiAlN
		PC310U new	P10~P20	For end milling of high hardness steel and press mold steel									●	TiMeN TiAlN
		PC315E new	P20~P35	For end milling of carbon steel and pre hardened steel									●	AlCrN
		PC320 new	P20~P35	For medium/rough end milling									●	TiAlN
		PC205F	P15~P30	For general drilling Solid drill								●		★New TiAlN film (High hardness/ Oxidation resistance)
		PC215G new	P15~P30	For general drilling Solid drill								●		TiAlN
		PC230F new	P25~P35	For general drilling Solid drill								●		TiAlN
		PC325U new	P20~P35	For general drilling Solid drill								●		TiAlCrN
		PC315G new	P15~P30	For general drilling Solid drill								●		TiAlCrN
	K	PC8110	K05~K15	For finish turning and milling of cast iron	●	●		●						★New TiAlN film (High hardness/ Oxidation resistance)
		PC6510	K05~K15	For high speed milling of cast iron		●			●		●			TiN TiAlN
		PC5300	K20~K30	For medium-rough turning and milling of cast iron	●	●	●	●	●	●	●			★New TiAlN film (High hardness/ Oxidation resistance)
		PC5335 new	K20~K30	For medium-rough turning and milling of cast iron	●	●					●			★TiAlCrN film (Lubricative)

KORLOY grades

Cat.	ISO	Grade	Range	Workpiece application	Turning	Milling	Facing	Grooving	Threading	Parting	Index drill	Solid drill	Endmill	Coating layer
PVD		new PC5400	K25~K35	For medium-rough turning and milling of cast iron	●	●			●		●			★TiAlCrN film (Lubricative)
		PC215K	K15~K30	For medium-rough milling of cast iron		●	●	●	●					★New TiAlN film (High hardness/ Oxidation resistance)
		new PC2005	K01~K10	For finish milling of cast iron		●								TiMeN TiAlN
		new PC2015	K10~K20	For universal milling of cast iron		●								AlCrN
		PC203F	K05~K15	For high speed end milling of cast iron (H-max)									●	★New TiAlN film (High hardness/ Oxidation resistance)
		PC220	K20~K35	For high speed end milling of cast iron (H-max)									●	★New TiAlN film (High hardness/ Oxidation resistance)
		new PC303S	K05~K15	For finish end milling of cast iron									●	TiMeN TiAlN
		new PC310U	K10~K20	For medium/rough end milling of cast iron									●	TiMeN TiAlN
		new PC315E	K20~K35	For universal end milling of cast iron									●	AlCrN
		new PC320	K20~K35	For universal end milling of cast iron									●	TiAlN
		new PC215G	K15~K30	For general drilling Solid drill								●		TiAlN
		new PC325U	K20~K35	For general drilling Solid drill								●		TiAlCrN
		new PC315G	K15~K30	For general drilling Solid drill								●		TiAlCrN
	M	PC8110	M10~M20	For medium to finish turning of STS	●			●		●				★New TiAlN film (High hardness/ Oxidation resistance)
		PC9030	M25~M35	For medium to rough turning of STS at interruption	●		●	●		●				TiAlN
		PC5300	M20~M30	For medium to rough turning and milling of STS	●	●	●	●	●	●	●			★New TiAlN film (High hardness/ Oxidation resistance)
		new PC5335	M25~M35	For medium to rough turning and milling of STS	●	●					●			★TiAlCrN film (Lubricative)
		PC9530	M25~M35	For medium to rough milling of STS at interruption		●					●			TiAlN
		new PC5400	M30~M40	For medium to rough turning and milling of STS	●	●			●		●			★TiAlCrN film (Lubricative)
		PC3545	M30~M40	For rough and highly interrupted milling of STS		●								TiN TiAlN
		PC3030T	M20~M30	For STS threading					●					TiAlN
		new PC2015	M10~M20	For universal milling of STS		●								AlCrN
		new PC8105	M05~M15	For finish turning of STS	●			●						TiAlN
		new PC8115	M15~M25	For medium to rough turning of STS	●			●						TiAlN
		new PC303S	M05~M15	For universal end milling of cast iron									●	TiMeN TiAlN

KORLOY grades

Cat.	ISO	Grade	Range	Workpiece application	Turning	Milling	Facing	Grooving	Threading	Parting	Index drill	Solid drill	Endmill	Coating layer
PVD	M	PC310U (new)	M10~M20	For universal end milling of cast iron									●	TiMeN / TiAlN
		PC320S	M20~M35	For general endmilling of stainless steel (STS)									●	TiMeN / TiAlN
		PC315E (new)	M20~M30	For universal end milling of cast iron									●	
		PC205F	P20~P35	For general drilling Solid drill								●		★New TiAlN film (High hardness/ Oxidation resistance)
		PC215G (new)	M15~M25	For general drilling Solid drill								●		TiAlN
		PC325U (new)	M20~M30	For general drilling Solid drill								●		TiAlCrN
		PC315G (new)	M15~M25	For general drilling Solid drill								●		TiAlCrN
	S	PC8105 (new)	S01~S10	For finish turning of heat-resistant alloy	●			●						TiAlN
		PC8110	S05~S15	For medium to finish turning of heat-resistant alloy steel	●			●		●				★New TiAlN film (High hardness/ Oxidation resistance)
		PC8115 (new)	S10~S20	For medium to rough turning of heat-resistant alloy	●			●						TiAlN
		PC5300	S15~S25	For medium to rough turning and milling of heat-resistant alloy steel	●	●	●	●	●	●	●		●	★New TiAlN film (High hardness/ Oxidation resistance)
		PC5335 (new)	S20~S30	For medium to rough turning and milling of heat-resistant alloy steel	●	●					●			★TiAlCrN film (Lubricative)
		PC5400 (new)	S25~S35	For medium to rough turning and milling of heat-resistant alloy steel	●	●			●		●			★TiAlCrN film (Lubricative)
		PC3545	S25~S35	For rough and highly interrupted milling of heat-resistant alloy steel		●								TiN / TiAlN
		PC2015 (new)	S10~S20	For universal milling of heat-resistant alloy		●								AlCrN
		PC210	S15~S25	General E/M Cutting for Heat resistant Alloy Steel									●	★New TiAlN film (High hardness/ Oxidation resistance)
		PC320S	S15~S25	General E/M Cutting for Heat resistant Alloy Steel									●	TiMeN / TiAlN
		PC325E (new)	S25~S35	For universal end milling of heat-resistant alloy									●	AlCrN
		PC205F	S15~S25	For universal end milling of heat-resistant alloy								●		★New TiAlN film (High hardness/ Oxidation resistance)
Uncoated	P	ST30A	P25~P35	For general steel machining	●		●		●	●				
	K	H01	K10~K15	For finishing cast iron and non ferrous metal(aluminum, etc.)	●	●		●			●		●	
		H05	K10~K15	For finishing cast iron	●	●					●			
		G10	K15~K20	For medium cutting of cast iron	●	●		●						
	N	H01	N10~N20	For finishing cast iron and non ferrous metal(aluminum, etc.)	●	●		●			●		●	
		H05	N15~N25	For medium cutting of cast iron and non ferrous metal(aluminum, etc.)	●	●							●	
Cermet	P	CC1500 (new)	P01~P10	For light cutting of steel at high speed (Optimized for precise boring)	●		●	●	●	●				★TiAlCrN film (Lubricative)
		CC2500 (new)	P10~P20	For light cutting of steel at medium to high speeds	●		●	●	●	●				★TiAlCrN film (Lubricative)

KORLOY grades

Cat.	ISO	Grade	Range	Workpiece application	Turning	Milling	Facing	Grooving	Threading	Parting	Index drill	Solid drill	Endmill	Coating layer
Cermet	P	CN1500 (new)	P05~P15	For continuous cutting at high speeds	●		●	●	●	●				
		CN2000	P10~P20	For medium to rough turning and milling of steel	●		●	●		●				
		CN2500 (new)	P15~P25	For highly interrupted machining at high feed	●		●	●						
		CN30	P20~P30	For rough milling of steel		●								
	K	CN1500 (new)	K05~K10	For high speed finishing of cast iron	●		●	●						
		CN2500 (new)	K10~K20	For high speed and interrupted machining of cast iron	●		●	●						
cBN	H	KB410	H01~H10	For high speed and continuous cutting of heat-treated steel	●									
		KB420	H05~H15	For highly efficient machining of heat-treated steel	●									
		KB425	H15~H25	For high speed and interrupted cutting of heat-treated steel	●									
		KB320	H15~H25	For continuous and interrupted cutting of heat-treated steel	●									
		KB335	H25~H35	For highly interrupted cutting of heat-treated steel	●									
		DNC100 (new)	H01~H10	For high speed and continuous cutting of heat-treated steel	●									★New TiAlN film (High hardness)
		DNC250	H05~H15	For high speed and continuous or low interrupted cutting of heat-treated steel	●									TiN / TiAlN
		DNC350	H15~H25	For medium to high interrupted cutting of heat-treated steel	●									★New TiAlN film (High hardness)
		DNC400 (new)	H25~H35	For medium interrupted and continuous cutting of heat-treated steel	●									TiN / TiAlN
	K	KB350	K01~K10	For finishing of high hardness cast	●									
		KB370	K05~K15	For high speed machining of cast iron	●	●								
PCD	N	DP90	N01~N10	For machining cemented carbide, ceramics, high Si-aluminum alloy, stone and rock	●									
		DP150	N05~N15	For machining high Si-aluminum alloy, copper alloy, rubber, wood and carbon	●									
		DP200	N10~N20	For precise machining of plastic, wood and aluminum	●									
DLC	N	PD1000	N01~N20	For turning of non ferrous metal (aluminum, etc.)	●									DLC
		PD2000	N01~N20	For milling of non ferrous metal (aluminum, etc.)		●								DLC
		PD3000	N01~N20	For end milling of non ferrous metal (aluminum, etc.)									●	DLC
Diamond coated	N	ND1000	N01~N20	For turning of non ferrous metal (graphite, aluminum, copper)	●									Dia Coating
		ND2000	N01~N20	For milling of non ferrous metal (graphite, aluminum, copper)		●								Dia Coating
		ND3000 (new)	N01~N05	For end milling of non ferrous metal (graphite, aluminum, copper)	●	●					●	●	●	Dia Coating
		ND2100 (new)	N05~N10	For hole making and endmilling of composite materials							●	●	●	Dia Coating

The comparison of grade for turning

WC

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	ST10 ST20 MA2 ST30 ST30A	ST10P ST20E A30 ST40E	PW30	IC50M IC54	S1P SM30 S30T S6	TTX TTM TTR	K45 KM K420	TX10S TX20 TX30 TX40	STi10T STi20T UTi20T	SRN5 WS20B EX35 EX40 EX45	S1F VC6 VC5 VC56		P10 P20 P30 P40		
	M	U2	U10E U2 A30 A40			H13A H10F	AT10 AT15 TTR	K2885 K2S	TU10 TU20 TU40	UTi20T	WAM10B EX35	VC27 VC28		M10 M20 M40		
	K	H01 H05 G10E	H1 G10E	KW10H	IC4 IC20 IC28	H1P H10F	THM THR	K68 K8735	TH03 TH10 KS20	HTi10T HTi20T	WH05 W10 WH20	VC3 VC2 VC1		K10 K20 K20M K30		

CVD coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	NC3215★ NC3225★ NC3120 NC3030 NC5330	AC805P AC810P AC700G AC900G AC820P AC2000 AC8025P AC830P	CA5505 CA510 CA515 VP5115 CA5515 CA525 VP5125 CA5525 CR9025 CA5535 CA530	IC8150 IC8250 IC8350	GC4305 GC4205 GC4315 GC4215 GC4325 GC4225 GC4235	TP0500 TP0501 TP1500 TP1501 TGP25 TP2500 TP2501 TGP35 TP3501 TP3500 TGP45	KCP05 KCP05B KCP10 KCP10B KCP25 KCP25B KCP30 KCP30B KCP40 KCP40B	T9105 T9115 T9125 T9135	UE6105 UE6110 MY5015 MC6025 UE6020 UE6035 UH6400	HG8010 HG8025 GM8035	VP5515 VP5525 VP5535	WPP10S WKP13S WPP20S WKP23S WPP30S WKP33S	TT8105 TT8110 LC215P TT8115 TT8120 LC225P TT8125 TT5100 TT8135 TT7100	CP5	JC110V JC215V JC325V JC450
	M	NC9115★ NC9125★ NC9025 NC9135★	AC610M AC630M AC6030M	CA6515 CA6525	IC6015	GC2015 GC2025	TM2000 TM4000	KCM15 KCM15M KCM25 KCM25B KCM35 KCM35B	T6120 T6130	MC7015 MC7025 US7020 US735	GM25 GX30	VP8515 VP8525	WAM10 WMP20S WAM20 WAM30	TT9215 TT9225 TT9235		
	K	NC6205 NC6210 NC6315★	AC405K AC415K AC420K	CA4505 CA4010 CA4515 CA4115 CA4120	IC5005 IC5015	GC3205 GC3210 GC3215 GC3225	TK1001 TK2001 TGK1500	KCK05 KCK05B KCK15 KCK15B KCK20 KCK20B	T5105 T5115 T5125	MC5005 UC5105 MC5015 UC5115	HG3505 HG3515	VP1505 VP1510 VP1515	WKK10S WKK20S WAK30	TT7005 TT7310 TT7015 TT6300	CP2 CP5	JC105V JC110V JC215V

PVD coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	PC8105★ PC8110 PC230 PC5300 PC8115★		PR1005 PR915 PR1115 PR930 PR1025 PR630 PR660	IC507 IC808 IC830 IC908 IC3028 IC330	GC1025 GC4125	CP200 CP250 CP500	KU10T KU25T	AH710 GH730 AH330 AH740 AH120 GH330	VP15TF VP20MF	IP2000 IP3000	VC907 VC927 VC905	WTA43 WTA41	TT5030		JC5003 JC5015
	M	PC8105★ PC8110 PC8115★ PC5300★ PC9030 PC5400★	AC510U EH510Z AC520U EH520Z AC530U	PR915 PR930 PR1125 PR630 PR660	IC808 IC907 IC3028 IC830 IC330	GC1005 GC1105 GC1020 GC1025 GC4125 GC2035	CP200 CP250 CP500	KC5010 KC5510 KC5025 KC5525	AH330 GH330 AH120 GH730 AH140 AH630 AH645	MP9005 VP10RT VP15TF VP20MF MP7035	IP50S IP100S	VC929 VC927 VC902 VC901 VC905	WSM10S WSM20S WSM30S WSM40S	TT5030 TT8020	ZM3 QM3 VM1 TAS	JC5003 JC5015
	K	PC5300	EH510Z EH520Z		IC5100 IC810 IC220 IC908 IC228		CP200 CP250 CP500		AH110 GH110 AH120		CY110H	VC929 VC903 VC927 VC902 VC901 VC907		TT5030		
	S	PC8105 PC8110 PC8115★ PC5300 PC5400★	AC510U AC520U	PR915 PR660 PR1325	IC808 IC907 IC3028 IC328	GC1105 GC1025 GC2035	TS2000 CP500 TS2500	KC5010 KC5025	AH110 AH120	VP05RT VP10RT VP15TF MP7035			WSM10 WSM20 WSM30	TT5030		

CERMET

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	CC1500★ CN1500★ CC2500★ CN2000 CN2500★	T110A T2000Z★ T1500A T3000Z★	PV30★ TN30 PV7020★ TN60 TN620 TN6020 TN90 PV90★	IC20N IC520N IC30N IC530N	CT5015 CT525 GC1525★	CM C15M TP1020 TP1030★	HT2 KT125 HT5 KT175 KT195M	NS520 GT530★ NS530 NS9530 GT9530★ NS540 NS730	NX2525 NX3035 UP35N★ AP25N★ NX335 MP3025★	CH350 CZ25★ CH530 CH550 CH570	VC83	WTA43★ WTA41★	PV3010★ CT3000	T3N T15 N20 C30 N40	LN10 CX50 CX75 CX90 CX99
	M															
	K	CN1500★ CN2500★	T110A							NX2525				CT3000	T15	LN10 CX75

★ : PVD Coating cermet ★ : New Grade

The comparison of grade for milling

CVD coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Milling	P	NC5330 NC5340★ NCM325 NC5350★ NCM335	ACP100		IC5400	GC4210 GC4220 GC4230	MP1500 MP2500 MM4500	KCPM20 KCMP30 KC927M	T3130	FH7020 F7030		SM245	WKP25S WKP35S	TT8515 TT7800		
	M	NC5330 NC5340★ NCM325 NC5350★ NCM335	ACP400			GC2040	MP2500 MM4500		T3130	F7030						
	K	NC5330 NC5340★ NC5350★	ACK200		IC5100	GC3330 GC3040	MK1500 MK2000 MK3000	KC907M KCK15 KC914M KCPK30 KC917M KC924M	T1115 T1015	MC5020			WAK15 WKK25 WKP25S WKP35S	TT7515 TT6800		

PVD coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Milling	P	PC2005★ PC2010★ PC2015★ PC2505★ PC2510★ PC3600 PC3500 PC210F★ PC5300 PC5400★	ACZ310 ACP200 ACZ330 ACP300 ACZ350	PR730 PR830 PR630 PR660	IC903 IC908 IC950 IC1008 IC928	P20A GC1010 GC1025 GC1030 GC1030	MP3000 F25M F30M F40M T60M	KC522M KUC20M KC525M KUC30M KC935M KC7140 KC720	GH330 AH120 AH3135	AP20M GP20M MP6120 VP15TF UP20M MP6130 VP30RT	ATH80D PCA08M ACS05E PCA12M PC20M JX1005 TB6005 JX1020 CY9020 TB6045 CY250 PTH30E JP4160 JM4160 PTH40H	VC935	WKP25 WKP35 WKP45	TT2510 TT7070 TT7080 TT7030 TT8020	QM3 ZM3	DH102 JC5003 JC5015 JC5030 JC5040
	M	PC210F★ PC5300 PC9530 PC5400★	ACM100 ACP200 ACM300 ACP300 ACZ350	PR730 PR1025 PR630 PR660 PR1535 PR660	IC903 IC900 IC250 IC928 IC328	GC1125 GC1025 GC2030 GC1030	F25M F30M F40M	KC5510 KC7020 KC522M KC725M KC735M KC7030 KC722	AH120 AH140 AH3135	MP7130 MP7140	JX1020 CY9020 JX1015 TB6020 CY250 JX1045 TB6045 JX1060 TB6060	VC928 VC902 VC901	WQM35 WSM35S WSP45 WSM45S	TT9030 TT9080 TT8020	QM3 ZM3	JC5003 JC5015 JC5030 JC5040
	K	PC8110★ PC6510 PC5300		PR510 PR905	DT7150 IC900 IC910 IC950 IC350		MK2050	KC510M KC915M KC520M	AH120	VP10MF VP15TF VP20RT		VC903 VC928 VC902 VC901		TT6290 TT6030 TT6060		JC5003 JC5015
	S	PC5300 PC5400★	AC520U	PR620 PR660 PR1535	IC328 IC408	GC1025 GC1040 S40T	F40M MS2050	KC510M KCU30M		VP15TF VP30RT MP9130	ACS05E		WSM35S WSM45S	TT9030 TT8020 TT8080		

CERMET

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Milling	P	CN2000 CN30	T250A	TN100M TC60M	IC30N			KT195M	NS540 NS740	NX2525 NX4545	CH550 CH570			CT3000 CT7000	C50	
	M		T250A			CT530										
	K									NX2525						

★ : PVD Coating cermet ★ : New Grade

M

OLD-FASHIONED PRODUCT INFORMATION



Old-fashioned product information

M02 Grade
M02 External Holder
M03 Fine Tool
M03 Threading Tool
M03 Mill-Max
M04 Cen-Mill
M04 Jip Drill
M04 LPD/SPD/NPD

Grade

ISO material code		Old grade	New grade
Coating grade	P	NC310	NC3010
		NC320, NC3020, NC3120	NC3220
		NC330	NC3030
	M	PC3530, PC3525, PC3535, PC3500	PC3600
	K	NC305K, NC6105	NC6205
		NC6110	NC6205, NC6210
	S	PC8010	PC8110
	P, M, K, S	PC8520, PC215K	PC5300
		PC225F	PC205F
Cermet		CN1000	CN1500
		CT10, CN200	CN2000

- Korloy always study and develops cutting-edge technology tools and grades which covers higher speed and feed conditions
- Korloy guarantees better performance and wide stock-management range for the new grade

External holder

Designation	Insert	Old parts name						New holder	Page
		Lever	Screw	Shim	Shim pin	Wrench	Shim pin wrench		
PCBNR□□□□-□19	CN□□1906	LV6	VHX1027	SC63	SP6	HW40L	-	PCBNR□□□□-□19N	**B153**
PCBNR□□□□-□25	CN□□2509	LV8	VHX1236	SC83	SP8	HW50L	-	PCBNR□□□□-□25N	
PCLNR□□□□-□19	CN□□1906	LV6	VHX1027	SC63	SP6	HW40L	-	PCLNR□□□□-□19N	**B154**
PCLNR□□□□-□25	CN□□2509	LV8	VHX1236	SC83	SP8	HW50L	-	PCLNR□□□□-□25N	
PSBNR□□□□-□19	SN□□1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSBNR□□□□-□19N	**B157**
PSBNR□□□□-□25	SN□□2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSBNR□□□□-□25N	
PSDNN□□□□-□19	SN□□1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSDNN□□□□-□19N	**B157**
PSDNN□□□□-□25	SN□□2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSDNN□□□□-□25N	
PSKNR□□□□-□19	SN□□1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSKNR□□□□-□19N	**B158**
PSKNR□□□□-□25	SN□□2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSKNR□□□□-□25N	
PSSNR□□□□-□19	SN□□1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSSNR□□□□-□19N	**B158**
PSSNR□□□□-□25	SN□□2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSSNR□□□□-□25N	

- Old parts are not interchangeable with new type holder part
- Good performance and convenient use of New type holder gives customer best quality of service

Designation	Insert	Old parts name				New holder	Page
		Wedge clamp	Screw	Washer	Others		
WTENN□□-3□ (Old Type: MTEEN)	TN□□33□	CMH5R1	MHX0523	WA4	Same as before	WTEEN□□□□-□16	**B161**
WTJNR□□-3□ (Old Type: MTJNR)	TN□□33□	CMH5R1	MHX0523	WA4	Same as before	WTJNR□□□□-□16	**B161**
WTXNR□□-3□ (Old Type: MTXNR)	TN□□33□	CMH5R1	MHX0523	WA4	Same as before	WTXNR□□□□-□16	**B161**

- Old parts are not interchangeable with new type holder part
- Good performance and convenient use of New type holder gives customer best quality of service

Fine tool

Designation	Insert		Old parts name		New holder	Page
			Screw	Wrench		
FTIH	FTIHA31	FTG08, FTT08, FTF08	PTKA02508	TW08P	NFTIHA	C56
	FTIHA43	FTG11, FTT11, FTF11	PTKA03510	TW15P		
	FTIHA55	FTG14, FTT14, FTF14	PTKA0412	TW15P		
	FTIHA63	FTG16, FTT16, FTF16	PTKA0512	TW20P		

- Old inserts and parts are not interchangeable with new fine tool
- Good performance and convenient use of new fine tool gives customer best quality of service

Threading tool

Designation	Insert		Old parts name						New holder	Page
			Clamp	Clamp screw	Shim	Screw	C-ring	Wrench		
ETH	~ETH3**R	ECTR3***	CH5R3	CHX0513	ST32C1	SHX0310	CR04	HW20L,HW25L	ER(L)H-□	D31
	~ETH4**R	ECTR4***	CH6R4	CHX0621	ST42C1	SHX0310	CR05	HW20L,HW30L		
ITH	~ITH2**R	ICTR2***	CH5R3	CHX0513	ST32C1	FTKA02565	CR04	TW07P	IR(L)H-□	D32
	~ITH3**R	ICTR3***	CH5R3	CHX0513	ST32C1	SHX0310	CR04	TW15P,HW20L,HW25L		
	~ITH4**R	ICTR4***	CH6R4	CHX0621	ST42C1	SHX0310	CR05	HW20L,HW30L		

- Old inserts and parts are not interchangeable with threading holders
- Good performance and convenient use of new fine tool gives customer best quality of service

Mill-Max

Designation	Insert	Old parts name					New holder	Page
		Locator	Wedge	Wedge screw	Locator screw	Wrench		
ADA(ADM)4000	SD□□1203	LAS4R/L	WASR/L	WTX0817	LTX0512	TW25	ADNA(ADNM)4000	E42
ADA(ADM)5000	SD□□1504	LAS5R/L	WASR/L	WTX0817	LTX0512	TW25	ADNA(ADNM)5000+	E43
ADNA(ADNM)5000	SD□□1504	LADN5R/L	WEPN5R/L	DHA0821F	LTX0514	HW40		E43
EPA(EPM)4000	SP□□1203	LES4R/L LES4R1/L1 (Ø80 ~ Ø100)	WESR/L	WTX0817 WTX0813 (Ø80 ~ Ø100)	LTX0512	TW25	EPNA(EPNM)4000	E48
EPA(EPM)5000	SP□□1504	LES5R/L LES5R1/L1 (Ø80 ~ Ø100)	WESR/L	WTX0817 WTX0813 (Ø80 ~ Ø100)	LTX0512	TW25	EPNA(EPNM)5000+	E49
EPNA(EPNM)5000	SP□□1504	LEPN5R/L LEPN5R1/L1 (Ø80 ~ Ø100)	WEPN5R/L	DHA0821F DHA0817F (Ø80 ~ Ø100)	LTX0514	HW40		E49
PPA(PPM)4000	TP□□2204	LPT4R/L LPT4R1/L1 (Ø80 ~ Ø100)	WESR/L	WTX0817 WTX0813 (Ø80 ~ Ø100)	LTX0512	TW25	PPNA(PPNM)4000	E51

- Parts are not interchangeable with new mill-max cutters
- Good performance and convenient use of new mill-max gives customer best quality of service

Cen-Mill

Designation	Insert		Old parts name		New product	Page
			Screw	Wrench		
HEA	Ø1	MCMT080308EN ZCMT080308ER	FTNA0307	TW09P	AMSA□□□□M	E164~E166
	Ø1.25, Ø1.5, Ø2.0	MCMT09T308EN ZCMT09T308ER	FTNA0408	TW15P		
LE (LEA)	LOCX1205ZZ		FTNB0411	TW15P	AMCA□□□□M	E151~E153
SEA	Ø1	MPMT090308	FTNA0408	TW15L	AMSA□□□□MH	E167~E168
	Ø1.25, Ø1.5	MPMT120408	FTNA0513	TW20L		
TM	MIT100 MET150, 200, 300, 400		FTNA0408 FTNA0513 (TM950)	TW15L TW20L (TM950)	TMS(I)	D49
PM	EDCW1604ZDF/TR		FTNA0513	TW20L	RM4Z	E105~E106
CEA (Code changed)	SPG(M)N1203□□				CE45-□□□□R-S125 (New code)	E315~E317

- Old inserts and parts are not interchangeable with new milling product
- New product : Alpha mill which has unique alpha-curve edge guarantees wide range machining and good performance
- Good performance and convenient use of new milling tool gives customer best quality of service

Jip Drill

Designation	Insert		Old parts name		New product	Page
			Screw	Wrench		
JDA	~JD200	WCMT030208-C20	FTNA02565	TW07P	K□DA (KING-DRILL)	G12~G26
	~JD250	WCMT040208-C20				
	~JD300	WCMT050308-C20	FTNA0307	TW09P		
	~JD410	WCMT06T308-C20	FTGA03508			
	~JD580	WCMT080408-C20	FTNA0408	TW15P		

- Old inserts and parts are not interchangeable with new indexable drill
- Good performance and convenient use of new indexable drill gives customer best quality of service

LPD/SPD/NPD

Designation	Insert		Old parts name		New product	Page
			Screw	Wrench		
LPD	~LPD135	LPMT040203-DF	FTNA0204	TW06P	K□DA (KING-DRILL)	G12~G26
SPD	~SPD155	SPM(E)T050203-DM, DF, DS, DA	FTNA0204	TW06P		
	~SPD195	SPM(E)T060204-DM, DS, DR, DA	FTKA02206S	TW07S		
	~SPD225	SPM(E)T070204-DM, DS, DR, DA	FTKA02565	TW07S		
NPD	~NPD245	NPM(E)T222408-DM, DS, DR, DA	FTKA02565	TW07S		
	~NPD285	NPM(E)T252808-DM, DS, DR, DA	FTKA0307	TW09S		
	~NPD325	NPM(E)T293208-DM, DS, DR, DA	FTKA0307	TW09S		
	~NPD405	NPM(E)T334008-DM, DS, DR, DA	FTKA03508	TW15S		
	~NPD505	NPM(E)T415008-DM, DS, DR, DA	FTKA0410	TW15S		
	~NPD605	NPM(E)T516012-DM, DS, DR, DA	FTNC04511	TW20S		

- Old inserts and parts are not interchangeable with new indexable drill
- Good performance and convenient use of new indexable drill gives customer best quality of service





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DSK	Tooling System (BT-DSK)	**I 32~33**
DSKNR/L	Holder (Double clamp system)	**B150**
DSKNR/L	Boring Bar (Double clamp system)	**B185**
DSSNR/L	Holder (Double clamp system)	**B150**
DST	Tooling System (DST series)	**I 38~39**
DTFNR/L	Holder (Double clamp system)	**B151**
DTFNR/L	Boring Bar (Double clamp system)	**B186**
DTGNR/L	Holder (Double clamp system)	**B151**
DTN	Tooling System (DTN series)	**I 41**
DVJNR/L	Holder (Double clamp system)	**B151**
DVVNN	Holder (Double clamp system)	**B152**
DWLNR/L	Holder (Double clamp system)	**B152**
DWLNR/L	Boring Bar (Double clamp system)	**B186**

E

EFA4000	Mill-max	**E46**
EH	Multi functional (Parting off Tools)	**C60**
EL(Extreme Line Casing)	Thread Insert	**D30**
EM06H9M	R+ Endmill (Roughing endmill)	**F75**
EM09CA	R+ Endmill (Roughing endmill with finishing capability)	**F70**
EM11CA	R+ Endmill (Roughing endmill for wave form of Al)	**F70**
EM11PM	R+ Endmill (Roughing endmill)	**F73**
EM16PM	R+ Endmill (Roughing endmill for fine pitches)	**F73**
EM17PM	R+ Endmill (Roughing endmill for fine pitches)	**F74**
EM36CA	R+ Endmill (Long type roughing endmill for fine pitches)	**F71**
EM37CA	R+ Endmill (Roughing endmill for fine pitches)	**F71**

E

EM38CA	R+ Endmill (Standard roughing endmill)	**F72**
EM43CA	R+ Endmill (Standard roughing endmill for fine pitches)	**F72**
ENA4000	Mill-Max	**E47**
EPA4000	Mill-Max	**M03**
EPA5000	Mill-Max	**M03**
EPNA4000	Mill-Max	**E48**
EPNA5000	Mill-Max	**M03**
EPNA5000+	Mill Max Plus	**E49**
ER	Tooling System (ER Collet)	**I 35**
ER(L)	Thread Insert	**D10~30**
ER(L)H	Thread External Holder (Screw on System)	**D31**
ER(L)H-C	Thread External Holder (Clamp on System)	**D31**
ERM	Thread Insert	**D10~13**
ESB	Multi functional Insert (Parting off Tools)	**C60**
EXT	Tooling System (Extension Bar)	**I 72**

F

FBB	Tooling System (FBB Bite)	**I 64**
FBC	Tooling System (FBC)	**I 63**
FBH	Tooling System (FBH series)	**I 58~60**
FGD	MGT Insert	**C26**
FGHH	MGT Holder (Face Grooving)	**C34**
FGM	MGT Insert	**C26**
FGVH	MGT Holder (Face Grooving)	**C35**
FMA	Tooling System (FMA series)	**I 46**
FMACA3000	Future Mill	**E187**
FMACA3000-A	Future Mill (Aluminum body)	**E189**
FMACA4000	Future Mill	**E188**
FMACA4000-A	Future Mill (Aluminum body)	**E190**
FMASA3000	Future Mill	**E191**
FMASA4000	Future Mill	**E192**
FMC	Tooling System (FMC series)	**I 47~48**
FME4000	F Endmill (Standard)	**F26**
FMLE4000	F Endmill (Long)	**F26**
FMM	MGT Insert	**C26**
FMPCA3000	Future Mill	**E193**
FMPCA3000-A	Future Mill (Aluminum body)	**E195**
FMPCA4000	Future Mill	**E194**
FMPCA4000-A	Future Mill (Aluminum body)	**E196**
FMPSA3000	Future Mill	**E197**
FMPSA4000	Future Mill	**E198**
FMRCA3000	Future Mill	**E199**
FMRCA3000	Future Mill_P-Positive	**E213**

F

FMRCA4000	Future Mill	E200
FMRCA4000	Future Mill_P-Positive	E214
FMRCA5000	Future Mill	E201
FMRCA5000	Future Mill_P-Positive	E215
FMRCA6000	Future Mill	E202
FMRCA6000	Future Mill_P-Positive	E216
FMRMA1000	Future Mill	E209
FMRMA1500	Future Mill	E209
FMRMA2000	Future Mill	E210
FMRMA2500	Future Mill	E210
FMRMA2500	Future Mill_P-Positive	E221
FMRMA3000	Future Mill	E211
FMRMA3000	Future Mill_P-Positive	E222
FMRMA4000	Future Mill	E212
FMRMA4000	Future Mill_P-Positive	E223
FMRMA5000	Future Mill	E212
FMRMA5000	Future Mill_P-Positive	E224
FMRSA1000	Future Mill	E203
FMRSA1500	Future Mill	E203
FMRSA2000	Future Mill	E204
FMRSA2500	Future Mill	E204
FMRSA2500	Future Mill_P-Positive	E217
FMRSA3000	Future Mill	E205
FMRSA3000	Future Mill_P-Positive	E218
FMRSA4000	Future Mill	E206
FMRSA4000	Future Mill_P-Positive	E219
FMRSA5000	Future Mill	E207
FMRSA5000	Future Mill_P-Positive	E220
FMRSA6000	Future Mill	E208
FMRSA6000	Future Mill_P-Positive	E220

G

GBEA	GBE (Single edge type)	E276
GBEA-M	GBE (Multi edge type)	E277
GBEMA	GBE (Modular type)	E278
GERC	Tooling System (GERC Collet)	I 35
GFIK	Multi functional holder (Grooving Tools)	C59
GFIP	Multi functional holder (Grooving Tools)	C58
GFT	Multi functional holder (Grooving Tools)	C58
GH	Multi functional holder (Grooving Tools)	C59
GO	Multi functional Insert (Grooving Tools)	C59
GR	Multi functional Insert (Grooving Tools)	C59
GS	Multi functional Insert (Grooving Tools)	C59

G

GSK	Tooling System (GSK series)	I 29~30
GW	Multi functional Insert (Grooving Tools)	C58

H

HC	Tooling System (HC slim collet)	I 35
HEA	Cen-Mill	M04
HECN	Milling Insert (High feed Cutter)	E07
HFMMA	HFM modular	E232
HFMSA1000	HFM shank	E230
HPEN	Milling Insert (High feed Cutter)	E07
HPEN-WC	Milling Insert (High feed Cutter)	E07
HRAG	Tooling System (Angular Head Series)	I 52
HRMCA13	HRM	E249
HRMCA15	HRM	E250
HRMDCA09	HRMDouble	E238
HRMDCA13	HRMDouble	E239
HRMDCA16	HRMDouble	E240
HRMDMA 06	HRMDouble	E246
HRMDMA 09	HRMDouble	E247
HRMDMA 13	HRMDouble	E248
HRMDSA06	HRMDouble	E241
HRMDSA09	HRMDouble	E242
HRMDSA13	HRMDouble	E244
HRMMA08	HRM	E254
HRMMA10	HRM	E255
HRMMA13	HRM	E255
HRMSA 08	HRM	E251
HRMSA 10	HRM	E251
HRMSA 13	HRM	E252
HRMSA 15	HRM	E253
HSK-FMA	Tooling System (Damping pro)	I 78
HSK-FMC	Tooling System (Damping pro)	I 79
HT	Tooling System (Other)	I 81
HSK100A	HSKTooling System (Modular)	E195
HSK100A AM3000	HSKTooling System (Multi edge)	E192
HSK100A AM4000	HSKTooling System (Multi edge)	E193
HSK63A	HSKTooling System (Modular)	E195
HSK63A AM1000	HSKTooling System (Multi edge)	E189
HSK63A AM1000HS	HSKTooling System (Single edge)	E178
HSK63A AM1500	HSKTooling System (Multi edge)	E190
HSK63A AM1500HS	HSKTooling System (Single edge)	E179
HSK63A AM2000	HSKTooling System (Multi edge)	E191
HSK63A AM2000HS	HSKTooling System (Single edge)	E180

H

HSK63A AM3000HS	HSKTooling System (Single edge)	E181
HSK63A AM4000HS	HSKTooling System (Single edge)	E182
HSK63A/100A PAX5000	Pro-L Mill	E336
HSK-FMA	Tooling System (Damping pro)	I 78
HSK-FMC	Tooling System (Damping pro)	I 79
HT	Tooling System (Other)	I 81

I

IG	Multi functional Insert (Grooving Tools)	C57
IGH	Multi functional holder (Grooving Tools)	C57
IPBE2000	I+ Endmill (Ball type)	F37
IPBE4000	I+ Endmill (Ball type)	F39
IPFE2000	I+ Endmill (Flat type)	F33
IPFE4000	I+ Endmill (Flat type)	F35
IPLBE2000	I+ Endmill (Long Ball type)	F38
IPLFE2000	I+ Endmill (Long Flat type)	F34
IPLFE4000	I+ Endmill (Long Flat type)	F36
IPLRE2000	I+ Endmill (Long Radius type)	F42
IPLRE4000	I+ Endmill (Long Radius type)	F44
IPRE2000	I+ Endmill (Radius type)	F40
IPRE4000	I+ Endmill (Radius type)	F43
IR(L)	Thread Insert	D10~30
IR(L)H	Thread Internal Holder (Screw on System)	D32
IR(L)H-C	Thread Internal Holder (Clamp on System)	D32
IRBA	Indexable Reamer (Stuffed hole)	G89
IRM	Thread Insert	D10~11
IRTA	Indexable Reamer (Throughout hole)	G89

J

JDA	Jip drill	M04

K

K2DA	KING DRILL (for through coolant system with a lathe)-2D	G12
K2DA	KING DRILL (for large diameter drilling)-2D	G17
K3DA	KING DRILL (for through coolant system with a lathe)-3D	G13
K3DA	KING DRILL (for large diameter drilling)-3D	G17
K4DA	KING DRILL (for through coolant system with a lathe)-4D	G14
K4DA	KING DRILL (for large diameter drilling)-4D	G17
K5DA	KING DRILL (for through coolant system with a lathe)-5D	G15
KAC	Tooling System (Angular Head Series)	I 56
KAG	Tooling System (Angular Head Series)	I 54

K

KAH	Tooling System (Angular Head Series)	I 55
KCP	Tooling System (Others)	I 82
KEL-ANN	Milling insert (Storm Mill)	E10
KEL-MF	Milling insert (Gear cutter)	E10
KEL-QNN	Milling insert (Storm Mill)	E10
KGDSA	Gun Dril (Single Lip type)	G83
KGDTA	Gun Dril (Twin Lip type)	G84
KGEHR/L	Multi functional (KGT Holder)	C14
KGEHR/L-D00A	Multi functional (KGT Holder)	C16
KGEHR/L-DOOA	Auto tools (KGT type)	B122
KGEHR/L-T00	Multi functional (KGT Holder)	C16
KGEUR/L	Multi functional (KGT Holder)	C18
KGEVR/L-T00	Multi functional (KGT Holder)	C17
KGFHR/L	Multi functional (KGT Holder)	C20
KGFVR/L	Multi functional (KGT Holder)	C19
KGGN-A	Multi functional Insert (KGT series)	C13
KGGN-B	Multi functional Insert (KGT series)	C13
KGGN-R	Multi functional Insert (KGT series)	C13
KGIUR/L	Multi functional (KGT Holder)	C21
KGIVR/L	Multi functional (KGT Holder)	C22
KGMI-T	Multi functional Insert (KGT series)	C12
KGML-LP	Auto tools Insert (KGT type)	B122
KGML-LP	Multi functional Insert (KGT series)	C13
KGML-RP	Auto tools Insert (KGT type)	B122
KGML-RP	Multi functional Insert (KGT series)	C13
KGMN-C	Auto tools Insert (KGT type)	B122
KGMN-L	Auto tools Insert (KGT type)	B122
KGMN-L	Multi functional Insert (KGT series)	C12
KGMN-R	Auto tools Insert (KGT type)	B122
KGMN-R	Multi functional Insert (KGT series)	C12
KGMN-T	Auto tools Insert (KGT type)	B122
KGMN-T	Multi functional Insert (KGT series)	C12
KGMR-LP	Auto tools Insert (KGT type)	B122
KGMR-LP	Multi functional Insert (KGT series)	C12
KGMR-RP	Auto tools Insert (KGT type)	B122
KGMR-RP	Multi functional Insert (KGT series)	C12
KGTB	KGT Blade for Parting off	C23
KHU	Tooling System (Angular Head Series)	I 53
KMB	Tooling System (KMB)	I 66
KNUX-11	Turning Insert_Negative (Clamp on System)	B40
KNUX-12	Turning Insert_Negative (Clamp on System)	B40
KRGN-A	Multi functional Insert (KGT series)	C13
KRMN-C	Multi functional Insert (KGT series)	C12
KMB	Tooling System (KMB)	I 66

K

KM-DCLNR/L	KM Tooling System	**B219**
KNUX-11	Turning Insert_Negative (Clamp on System)	**B40**
KNUX-12	Turning Insert_Negative (Clamp on System)	**B40**
KRGN-A	Multi functional Insert (KGT)	**C13**
KRMN-C	Multi functional Insert (KGT)	**C12**

L

LBEA031/037/050/062	Laser Mill (Steel Shank-Ball, Taper type)	**E271**
LBEA031-C/037-C/050-C/062-C	Laser Mill (Carbide Shank-Ball, Straight type)	**E270**
LBEA050/062/075/100/125	Laser Mill (Carbide Shank-Ball, Straight type)	**E271**
LBEA075/100/125	Laser Mill (Steel Shank-Ball, Taper type)	**E271**
LBEA075-C/100-C/125-C	Laser Mill (Carbide Shank-Ball, Straight type)	**E270**
LBEA-C/037-C/050-C/062-C	Laser Mill (Carbide Shank-Corner R Straight type)	**E272**
LBEA-C075-C/100-C/125-C	Laser Mill (Carbide Shank-Corner R Straight type)	**E272**
LBEA-MHD	Laser Mill (Modular type)	**E274**
LBH	Milling Insert (Laser Mill)	**E08**
LBH-KF	Milling Insert (Laser Mill)	**E08**
LBH-KH	Milling Insert (Laser Mill)	**E08**
LBS	Milling Insert (Laser Mill)	**E08**
LCF	Milling Insert (Laser Mill)	**E09**
LDET	Milling Insert (Pro-L Mill)	**E09**
LE(LEA)	Cen-mill	**M04**
LFH	Milling Insert (Laser Mill)	**E09**
LNCS	Milling Insert (Rich Mill)	**E10**
LNE	Milling Insert (Gear cutter)	**E10**
LNEX-MA	Milling Insert (Rich Mill)	**E11**
LNEX-MF	Milling Insert (Rich Mill)	**E10**
LNEX-MM	Milling Insert (Rich Mill)	**E11**
LNKT	Milling Insert (TP2P)	**E10**
LNMX-MF	Milling Insert (Rich Mill)	**E10**
LNMX-MM	Milling Insert (Rich Mill)	**E11**
LPD	LPD	**M04**
LPEW	Milling Insert (HFM)	**E12**
LPMT-MF	Milling Insert (HFM)	**E11**
LPMW	Milling Insert (HFM)	**E12**
LR	Milling Insert (Laser Mill)	**E09**
LREA037/050	Laser Mill (Steel Shank-Corner R Taper type)	**E273**
LREA050/062/075/100/125	Laser Mill (Steel Shank, Corner R Straight type)	**E273**
LRH	Milling Insert (Laser Mill)	**E09**
LXET-MA	Milling Insert (Pro-L Mill)	**E12**
LXET-ML	Milling Insert (Pro-L Mill)	**E12**

M

MAH	Tooling System (Angular Head Series)	**I 51**
MAPDA000HR/L-Z0	Aero Mill-Mini	**E136**
MAPDSA000HR/L-Z0	Aero Mill-Mini	**E135**
MATA	Modular Adaptor (Steel Shank)	**E308**
MATA-C	Modular Adaptor (Carbide Shank)	**E309**
MBBR	Auto tools (MSB Tools_Back Boring)	**B127**
MBCR	Auto tools (MSB Tools_Copying)	**B126**
MBFR	Auto tools ((MSB Tools_Chamfering)	**B127**
MBR	Auto tools ((MSB Tools_Boring)	**B126**
MCER/L	Multi functional (MGT Cartridge)	**C38**
MCFR/L	Multi functional (MGT Cartridge)	**C38**
MCHR/L	Multi functional (MGT Holder)	**C37**
MCKNR/L	Holder (Multi Lock System)	**B165**
MCLNR/L	Holder (Multi Lock System)	**B165**
MCLNR/L	Boring Bar (Multi Lock System)	**B192**
MCMNN	Holder (Multi Lock System)	**B165**
MCRNR/L	Holder (Multi Lock System)	**B166**
MCVR/L	Multi functional (MGT Holder)	**C37**
MD	Tooling System (Modular System)	**I 70~71**
MDJNR/L	Holder (Multi Lock System)	**B166**
MDNNN	Holder (Multi Lock System)	**B166**
MDQNR/L	Holder (Multi Lock System)	**B167**
MDUNR/L	Boring Bar (Multi Lock System)	**B192**
MFMN	Multi functional Insert (MGT Cartridge, MGT)	**C26**
MGEHR/L	Auto tools (MGT type)	**B123**
MGEHR/L	Multi functional (MGT Holder)	**C28**
MGEHR/L	Multi functional (MGT for Aluminum Wheel)	**C41**
MGEHR/L-15	Multi functional (MGT for Aluminum Wheel)	**C41**
MGEUR/L	Multi functional (MGT Holder)	**C29**
MGEVR/L	Multi functional (MGT Holder)	**C30**
MGEXR/L	Multi functional (MGT for Aluminum Wheel)	**C42**
MGFHR/L	Multi functional (MGT Holder)	**C33**
MGFR	Auto tools (MSB Tools_Face Grooving)	**B129**
MGFVR/L	Multi functional (MGT Holder)	**C33**
MGGN-A	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGGN-M	Multi functional Insert (MGT Cartridge, MGT)	**C26**
MGIUR/L	Multi functional (MGT Holder)	**C31**
MGIUR/L-MR	Multi functional (MGT for Aluminum Wheel)	**C41**
MGIUR/L-MV	Multi functional (MGT for Aluminum Wheel)	**C42**
MGIVR/L	Multi functional (MGT Holder)	**C32**
MGIXR/L-MR	Multi functional (MGT for Aluminum Wheel)	**C42**
MGMN	Auto tools Insert (MGT type)	**B123**
MGMN	Auto tools Insert (MGT type)	**B123**
MGMN-G	Multi functional Insert (MGT Cartridge, MGT)	**C26**

M

MGMN-L	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGMN-M	Multi functional Insert (MGT Cartridge, MGT)	**C26**
MGMN-R	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGMN-T	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGMR/L-PS	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGMR/L-PT	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGR	Auto tools (MSB Tools_Square Grooving)	**B128**
MGRR	Auto tools (MSB Tools_Round Grooving)	**B129**
MLDA	Mach long Solid Drill Plus	**G63~65**
MLDA	Mach long Solid Drill	**G68**
MLDPA	Mach long Solid Drill(Pilot Drills with oil hole for MLD)	**G68**
MPMT	Milling Insert	**E13**
MRGN-A	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MRGN-A	Multi functional (MGT for Aluminum Wheel)	**C40**
MRMN-M	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MSBNR/L	Holder (Multi Lock System)	**B167**
MSDA	Mach Solid Drill	**G52**
MSDHA	Mach Solid Drill (Oil hole type)	**G53**
MSDNN	Holder (Multi Lock System)	**B167**
MSDP(H)A	Mach Solid Drill Plus	**G40~44**
MSDPA	Mach Solid Drill Plus	**G39**
MSDPA-5C	Mach Solid Drill Plus CFRP	**G47**
MSFDA-2P	Mach Solid flat Drill	**G57~58**
MSFDHA-3P	Mach Solid flat Drill	**G59~60**
MSKNR/L	Holder (Multi Lock System)	**B168**
MSKNR/L	Boring Bar (Multi Lock System)	**B192**
MSRNR/L	Holder (Multi Lock System)	**B168**
MSSNR/L	Holder (Multi Lock System)	**B169**
MT	Multi functional (Multi Turn)	**B133**
MTENN	Holder (Multi Lock System)	**B169**
MTFNR/L	Holder (Multi Lock System)	**B169**
MTFNR/L	Boring Bar (Multi Lock System)	**B193**
MTGNR/L	Holder (Multi Lock System)	**B170**
MTJNR/L	Holder (Multi Lock System)	**B170**
MTR	Auto tools (MSB Tools_Threading)	**B130**
MVGN	Multi functional Insert (MGT for Aluminum Wheel)	**C40**
MVJNR/L	Holder (Multi Lock System)	**B170**
MVQNR/L	Holder (Multi Lock System)	**B171**
MVUNR/L	Boring Bar (Multi Lock System)	**B193**
MVVNN	Holder (Multi Lock System)	**B171**
MWLNR/L	Holder (Multi Lock System)	**B171**
MWLNR/L	Boring Bar (Multi Lock System)	**B193**

N

NFTFR/L	Multi functional Insert (New Fine Tools)	**C56**
NFTGR/L	Multi functional Insert (New Fine Tools)	**C55**
NFTIH	Multi functional (New Fine Tools Holder)	**C56**
NFTTR/L	Multi functional Insert (New Fine Tools)	**C55**
NPD	NPD	**M04**
NPM	Tooling System (NPM series)	**I 20**
NU-CCGW	cBN Insert_Negative/Positive (Multi-Corner Type)	**B95**
NU-CNGA	cBN Insert_Negative (Multi-Corner Type)	**B94**
NU-CNMA	cBN Insert_Negative (One-Use Type)	**B94**
NU-DCGW	cBN Insert_Positive (Multi-Corner Type)	**B95**
NU-DNGA	cBN Insert_Negative (Multi-Corner Type)	**B94**
NU-SNGA	cBN Insert_Negative/Positive (Multi-Corner Type)	**B94**
NU-TCGW	cBN Insert_Positive (One-Use Type)	**B95**
NU-TNGA	cBN Insert_Negative/Positive (Multi-Corner Type)	**B94**
NU-TPGB	cBN Insert_Positive (Multi-Corner Type)	**B96**
NU-TPGN	cBN Insert_Positive (Multi-Corner Type)	**B96**
NU-TPGW	cBN Insert_Positive (Multi-Corner Type)	**B96**
NU-VBGW	cBN Insert_Positive (Multi-Corner Type)	**B96**
NU-VCGW	cBN Insert_Positive (Multi-Corner Type)	**B96**
NU-VNGA	cBN Insert_Negative/Positive (Multi-Corner Type)	**B94**

O

OFCN	Milling Insert (Double Mill)	**E13**
OFCW	Milling Insert (Double Mill)	**E13**
OFKR-MA	Milling Insert (Double Mill)	**E13**
OFKR-MF	Milling Insert (Double Mill)	**E13**
OFKR-MM	Milling Insert (Double Mill)	**E13**
OFKT-MA	Milling Insert (Double Mill)	**E13**
OFKT-MF	Milling Insert (Double Mill)	**E13**
OFKT-MM	Milling Insert (Double Mill)	**E14**
ONHX-MA	Milling Insert (Rich Mill)	**E14**
ONHX-MF	Milling Insert (Rich Mill)	**E14**
ONHX-ML	Milling Insert (Rich Mill)	**E14**
ONHX-MM	Milling Insert (Rich Mill)	**E14**
ONHX-W	Milling Insert (Rich Mill)	**E14**
ONMX-MF	Milling Insert (Rich Mill)	**E14**
ONMX-MM	Milling Insert (Rich Mill)	**E14**

P

PACA4000	Pro-A Mill	**E295**
PALCA	Pro-L Mill	**E303**
PALSA(Multi Edge)	Pro-L Mill	**E306**

P

PALSA(Single Edge)	Pro-L Mill	**E304**
PAMA2000	Pro-A Mill	**E297**
PASA2000	Pro-A Mill	**E296**
PASA4000	Pro-A Mill	**E296**
PAXCA5000	Pro-X Mill	**E298**
PAXCA6000	Pro-X Mill	**E299**
PAXMA5000	Pro-X Mill	**E302**
PAXSA5000	Pro-X Mill	**E300**
PAXSA6000	Pro-X Mill	**E301**
PBACA5000	Power Buster	**E61**
PBE2000	H Endmill (Ball type)	**F12**
PBPCA6000	Power Buster	**E63**
PBX100	Brazed Tools (Auto Tool Bits)	**H10**
PBZCA5000	Power Buster	**E62**
PCBNR/L	Holder (Save Turn)	**B102**
PCBNR/L	Holder (Lever Lock System)	**B153**
PCKNR/L	Holder (Lever Lock System)	**B153**
PCLNR/L	Holder (Save Turn)	**B102**
PCLNR/L	Boring Bar (Save Turn)	**B105**
PCLNR/L	Holder (Lever Lock System)	**B154**
PCLNR/L	Boring Bar (Lever Lock System)	**B187**
PDDA	PCD Drill	**G78**
PDEA1000	PCD Endmill (Flat type)	**F101**
PDEA2000	PCD Endmill (Flat type)	**F101**
PDFA	PCD Face Cutter	**E137**
PDJNR/L	Holder (Save Turn)	**B102**
PDJNR/L	Holder (Lever Lock System)	**B154**
PDNNR/L	Holder (Save Turn)	**B103**
PDNNR/L	Holder (Lever Lock System)	**B155**
PDQNR/L	Holder (Save Turn)	**B103**
PDRA	PCD Reamer	**G93**
PDSNR/L	Boring Bar (Lever Lock System)	**B187**
PDUNR/L	Boring Bar (Save Turn)	**B105**
PDUNR/L	Boring Bar (Lever Lock System)	**B188**
PDZNR/L	Boring Bar (Save Turn)	**B106**
PES4A000	Turbo Mill	**E54**
PESA2000	Turbo Mill	**E54**
PESA3000	Turbo Mill	**E54**
PFA4000	Mill-Max	**E50**
PH	Multi functional (Parting off Tools)	**C60**
PM	Cen-mill	**M04**
PNEJ	Side Cutter	**E15**
PNEJ-C	Side Cutter	**E15**
PNHA4000	High feed Cutter	**E332**

P

PNHA5000	High feed Cutter	**E332**
POB	Multi functional Insert (Parting off Tools)	**C60**
PPA4000	Mill-Max	**M03**
PPHA4000	High feed Cutter	**E333**
PPNA4000	Mill-Max	**E51**
PRDCN	Holder (Lever Lock System)	**B156**
PRE4000	H Endmill (Radius type)	**F13**
PRGCR/L	Holder (Lever Lock System)	**B156**
PSBNR/L	Holder (Save Turn)	**B103**
PSBNR/L	Holder (Lever Lock System)	**B157**
PSDNN	Holder (Save Turn)	**B104**
PSDNN	Holder (Lever Lock System)	**B157**
PSKNR/L	Holder (Save Turn)	**B104**
PSKNR/L	Boring Bar (Save Turn)	**B106**
PSKNR/L	Holder (Lever Lock System)	**B158**
PSKNR/L	Boring Bar (Lever Lock System)	**B189**
PSSNR/L	Holder (Save Turn)	**B104**
PSSNR/L	Holder (Lever Lock System)	**B158**
PTFNR/L	Holder (Lever Lock System)	**B159**
PTFNR/L	Boring Bar (Lever Lock System)	**B189**
PTGNR/L	Holder (Lever Lock System)	**B159**
PTTNR/L	Holder (Lever Lock System)	**B160**
Pull Stud Bolt	Tooling System (Others)	**I 83**
PWLNR/L	Holder (Save Turn)	**B105**
PWLNR/L	Boring Bar (Save Turn)	**B106**
PWLNR/L	Holder (Lever Lock System)	**B160**
PWLNR/L	Boring Bar (Lever Lock System)	**B190**
PXLSA	Pro-XL Mill	**E307**
PSSNR/L	Holder (Save Turn)	**B104**
PT	Tap (Point Tap)	**D70**
PTFNR/L	Boring Bar (Lever Lock System)	**B189**
PTFNR/L	Holder (Lever Lock System)	**B159**
PTGNR/L	Holder (Lever Lock System)	**B159**
PTTNR/L	Holder (Lever Lock System)	**B160**
Pull Stud Bolt	Tooling System (Others)	**I 83**
PWLNR/L	Boring Bar (Lever Lock System)	**B190**
PWLNR/L	Holder (Lever Lock System)	**B160**
PWLNR/L	Holder (Save Turn)	**B105**
PWLNR/L	Holder (Save Turn)	**B106**
PXL(S)	Pro-L Mill	**E341**

Q

QCGT	Multi functional Insert (Multi Turn)	B133
QCMT	Multi functional Insert (Multi Turn)	B133

R

RAFCBA	Side Milling Cutter (Radial type-Full side cutter)	E314
RAFCPA	Side Milling Cutter (Radial type-Full side cutter)	E314
RAHCBA	Side Milling Cutter (Radial type-Half side cutter)	E315
RAHCPA	Side Milling Cutter (Radial type-Half side cutter)	E315
RB	Brazed Tools (Square Blank)	H05
RC	Milling Insert (BFE)	E15
RCGT-AK	Aluminum Insert_Positive (Screw on System)	B89
RCGT-AR	Aluminum Insert_Positive (Screw on System)	B89
RCMT-VM	Turning Insert_Positive (Screw on System)	B70
RCMX1	Turning Insert_Positive (Screw on System)	B70
RDC	Tooling System (Reducer Bar)	I 73
RDCT-MA	Milling Insert (Future Mill)	E15
RDHW	Milling Insert (Future Mill)	E15
RDKT-MF	Milling Insert (Future Mill)	E15
RDKT-ML	Milling Insert (Future Mill)	E16
RDKT-MM	Milling Insert (Future Mill)	E16
RDKW	Milling Insert (Future Mill)	E16
REKR-MM	Milling Insert (Double Mill)	E16
RI	Drill (Indexable Reamer Insert)	G88
RM16ACA6000	Rich Mill	E126
RM16ACA8000	Rich Mill	E127
RM3PCA3000	Rich Mill	E85
RM3PCA4000	Rich Mill	E86
RM3PCA5000	Rich Mill	E87
RM3PMA3000	Rich Mill	E90
RM3PMA4000	Rich Mill	E90
RM3PSA3000	Rich Mill	E88
RM3PSA4000	Rich Mill	E89
RM4PCA3000	Rich Mill	E91
RM4PCA4000	Rich Mill	E92
RM4PFCBA3000	Rich Mill	E93
RM4PFCBA4000	Rich Mill	E94
RM4PFCPA3000	Rich Mill	E97
RM4PFCPA4000	Rich Mill	E98
RM4PHCBA3000	Rich Mill	E95
RM4PHCBA4000	Rich Mill	E96
RM4PHCPA3000	Rich Mill	E99
RM4PHCPA4000	Rich Mill	E100
RM4PMA3000	Rich Mill	E103
RM4PSA3000	Rich Mill	E101
RM4PSA4000	Rich Mill	E102
RM4ZCA3000	Rich Mill	E104
RM4ZCA4000	Rich Mill	E104
RM4ZMA3000	Rich Mill	E105
RM4ZSA3000	Rich Mill	E105
RM6PCA-WN04	Rich Mill	E106
RM6PCA-WN08	Rich Mill	E107
RM6PMA	Rich Mill	E110
RM6PSA-WN04	Rich Mill	E108
RM6PSA-WN08	Rich Mill	E109
RM8ACA4000	Rich Mill	E111
RM8ACA5000	Rich Mill	E113
RM8ECA4000	Rich Mill	E115
RM8ECA5000	Rich Mill	E117
RM8QCA4000	Rich Mill	E119
RMH8ACA4000	Rich Mill	E112
RMH8ACA5000	Rich Mill	E114
RMH8ECA4000	Rich Mill	E116
RMH8ECA5000	Rich Mill	E118
RMH8QCA4000	Rich Mill	E120
RMT8AA4000	Rich Mill	E121
RMT8AA5000	Rich Mill	E122
RMT8EA4000	Rich Mill	E123
RMT8EA5000	Rich Mill	E124
RMT8QA4000	Rich Mill	E125
RNMG-B25	Turning Insert_Negative	B40
RPCT-MA	Milling Insert (Future Mill P-Positive)	E16
RPET-ML	Milling Insert (Future Mill P-Positive)	E16
RPMT-MF	Milling Insert (Future Mill P-Positive)	E16
RPMT-MM	Milling Insert (Future Mill P-Positive)	E16
RPMW	Milling Insert (Future Mill P-Positive)	E16
RT	Brazed Tools (Ring blank)	H07

S

SAGE(Metric Buttress)	Thread Insert	D29
SBBR/L	Auto Tools Insert (Blade type)	B116
SBCR/L	Auto Tools Insert (Blade type)	B117
SBCR/L	Auto Tools Insert (Multi functional type)	B119
SBGR/L	Auto Tools Insert (Blade type)	B116
SBHR/L	Holder (Auto Tools_Blade type)	B116
SBHR/L-X	Holder (Auto Tools_Blade type)	B116
SBR/L	Auto Tools Insert (Multi functional type)	B119

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SBTR/L	Auto Tools Insert (Blade type)	B116
SC	Tooling System (Others)	I 82
SCACR/L	Holder (Auto Tools_ISO type)	B109
SCACR/L	Holder (Screw on System)	B172
SCGT-AK	Aluminum Insert_Positive (Screw on System)	B90
SCGT-AR	Aluminum Insert_Positive (Screw on System)	B90
SCLCR/L	Holder (Auto Tools_ISO type)	B109
SCLCR/L	Holder (Screw on System)	B172
SCLCR/L	Boring Bar (Screw on System)	B194
SCLCR/L	Compact Mini	B204
SCLPR/L	Boring Bar (Screw on System)	B195
SCMT	PCD Insert_Negative/Positive	B98
SCMT-C25	Turning Insert_Positive (Screw on System)	B71
SCMT-HMP	Turning Insert_Positive (Screw on System)	B71
SCMT-MP	Turning Insert_Positive (Screw on System)	B71
SCMT-VF	Turning Insert_Positive (Screw on System)	B70
SCMT-VL	Turning Insert_Positive (Screw on System)	B71
SCRH	Drill (Chucking Reamer)	G91
SCRS	Drill (Chucking Reamer)	G91
SDACR/L	Holder (Screw on System)	B172
SDC	Tooling System (SDC series)	I 24~28
SDCN	Milling Insert (Mill-max, High feed Cutter)	E17
SDET-MA	Milling Insert (Future Mill)	E17
SDET-MF	Milling Insert (Future Mill)	E17
SDET-MM	Milling Insert (Future Mill)	E17
SDJCR/L	Holder (Auto Tools-ISO Type)	B109
SDJCR/L	Holder (Screw on System)	B173
SDKN-CM	Milling Insert (Mill-Max)	E17
SDKN-MU	Milling Insert (Mill-Max)	E18
SDKN-SU	Milling Insert (Mill-Max, Turbo Mill)	E18
SDKR-MX	Milling Insert (Mill-Max, Turbo Mill)	E18
SDMT-MM	Milling Insert (Tank Mill, GBE)	E18
SDNCN	Holder (Auto Tools-ISO Type)	B110
SDNCN	Holder (Screw on System)	B173
SDQCR/L	Boring Bar (Screw on System)	B196
SDUCR/L	Boring Bar (Screw on System)	B197
SDXT-MA	Milling Insert (Future Mill)	E18
SDXT-MF	Milling Insert (Future Mill)	E18
SDXT-MM	Milling Insert (Future Mill)	E18
SDZCR/L	Boring Bar (Screw on System)	B198
SEA	Cen-mill	M04
SECA	Milling Insert	E18
SECN	Milling Insert (Mill-Max)	E19
SEET-MA	Milling Insert (Future Mill)	E19

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SEET-MF	Milling Insert (Future Mill)	E19
SEET-MM	Milling Insert (Future Mill)	E19
SEEW	Milling Insert (Future Mill)	E19
SEEW-W	Milling Insert (Future Mill)	E19
SEKN-SU	Milling Insert (Mill-Max)	E19
SEKR-MF1	Milling Insert (Mill-Max)	E19
SEKR-MX	Milling Insert (Mill-Max)	E20
SEMN	Milling Insert	E20
SEXT-MF	Milling Insert (Future Mill)	E20
SEXT-MM	Milling Insert (Future Mill)	E20
SEXT-MR	Milling Insert (Future Mill)	E20
SFCN	Milling Insert (Mill-Max)	E20
SGBR/L	Auto Tools Insert (Multi functional type)	B120
SGR/L	Auto Tools Insert (Multi functional type)	B120
SK-FMC	Tooling System (SMB)	I 80
SL	Sleeve	B130
SLA	Tooling System (SLA series)	I 44~45
SMB	Tooling System (SMB)	I 67
SMBBA	Multi functional(Saw-man_Block)	C52
SMH	Tooling System (SMH)	I 68
SNCF-MF	Milling Insert (Rich Mill)	E20
SNCF-MM	Milling Insert (Rich Mill)	E21
SNCN	Milling Insert (Mill Max)	E21
SNEF	Milling Insert (High feed Cutter)	E21
SNEU-MF	Milling Insert (Shave Mill)	E21
SNEU-TBW	Milling Insert (Shave Mill)	E22
SNEU-WMF	Milling Insert (Shave Mill)	E22
SNEW	Milling Insert (Aero Mill)	E22
SNEW-NAF	Milling Insert (Aero Mill-Mini)	E22
SNEW-NAW	Milling Insert (Aero Mill-Mini)	E22
SNEW-XAF	Milling Insert (Aero Mill-Mini)	E23
SNEW-XAW	Milling Insert (Aero Mill-Mini)	E23
SNEX	Milling Insert (Cube Mill)	E22
SNEX-CU1	Milling Insert (Cube Mill)	E22
SNEX-MA	Milling Insert (Rich Mill)	E22
SNEX-MF	Milling Insert (Rich Mill)	E23
SNEX-ML	Milling Insert (Rich Mill)	E22
SNEX-MM	Milling Insert (Rich Mill)	E23
SNEX-W	Milling Insert (Rich Mill)	E24
SNGA	Turning Insert_Negative (Multi Lock/Lever Lock System)	B41
SNGG	Turning Insert_Negative (Multi Lock/Lever Lock System)	B41
SNGG-VP3	Turning Insert_Negative (Multi Lock/Lever Lock System)	B41
SNGN	Turning Insert_Negative (Lever Lock System/Ceramic Holder)	B42
SNGX	Turning Insert_Negative (Multi Lock/Lever Lock System)	B42

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SNHT-WX	Milling Insert (Wind Mill)	**E23**
SNKN	Milling Insert (Mill-Max)	**E23**
SNMA	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B42**
SNMA	cBN Insert_Negative(Regrinding)	**B97**
SNMF-MF	Milling Insert (Rich Mill)	**E20**
SNMF-MM	Milling Insert (Rich Mill)	**E21**
SNMG-B25	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B45**
SNMG-GR	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B46**
SNMG-HA	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-LP	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-MK	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B44**
SNMG-MM	Turning Insert (Save Turn)	**B101**
SNMG-MM	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B44**
SNMG-MP	Turning Insert (Save Turn)	**B101**
SNMG-MP	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B45**
SNMG-RK	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B46**
SNMG-RM	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B46**
SNMG-VB	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-VC	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-VF	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-VL	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-VM	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B45**
SNMG-VP2	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-VP3	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B45**
SNMG-VP4	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B46**
SNMG-VQ	Turning Insert (Save Turn)	**B101**
SNMG-VQ	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B44**
SNMG-VR	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B47**
SNMM-GH	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B47**
SNMM-GR	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B47**
SNMM-VH	Turning Insert_Negative (Lever Lock System)	**B47**
SNMM-VT	Turning Insert_Negative (Lever Lock System)	**B47**
SNMN	Turning Insert_Negative (Ceramic Holder)	**B48**
SNMX	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B48**
SNMX-MF	Milling Insert (Rich Mill)	**E23**
SNMX-MM	Milling Insert (Rich Mill)	**E23**
SNUN	Turning Insert_Negative (Ceramic Holder)	**B48**
SP	Multi functional Insert (Bearing Solution)	**B140**
SP	Multi functional Insert (Saw-man)	**C51**
SPBA	Multi functional (Saw-man_Blades)	**C52**
SPBA	Side cutter	**E317**
SPBA-S	Multi functional (Saw-man_Blades)	**C52**
SPB-S	Multi functional (Bearing Solution)	**B140**
SPCN	Milling Insert (Mill-Max)	**E24**

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SPD	SPD	**M04**
SPEN-WC	Milling Insert (High feed Cutter)	**E24**
SPET-ND	Drill Insert	**G04**
SPEX	Milling Insert	**E24**
SPFE4000	S+ Endmill (Flat type)	**F64**
SPFN	Milling Insert(Side cutter)	**E25**
SPGA	Turning Insert_Positive	**B72**
SPGN	Turning Insert_Positive	**B72**
SPGN	PCD Insert_Negative/Positive	**B99**
SPGR-F	Turning Insert_Positive (Clamp on System)	**B72**
SPGR-M	Turning Insert_Positive (Clamp on System)	**B73**
SPGT	Turning Insert_Positive (Screw on System)	**B73**
SPGW	PCD Insert_Negative/Positive	**B98**
SPHA	Multi functional (Saw-man_Holder)	**C53**
SPHA-S	Multi functional (Saw-man_Holder)	**C53**
SPKN-MU	Milling Insert (Mill-Max)	**E25**
SPKN-SU	Milling Insert (Mill-Max)	**E25**
SPKR-MX	Milling Insert (Mill-Max)	**E25**
SPLFE4000	S+ Endmill (Long flat type)	**F64**
SPMN	Milling Insert (Chamfer tools)	**E25**
SPMR-F	Turning Insert_Positive (Clamp on System)	**B73**
SPMR-M	Turning Insert_Positive (Clamp on System)	**B73**
SPMT	Milling Insert (Tank Mill, GBE, BT Tooling System)	**E25**
SPMT-KC	Milling Insert (Chamfer tools)	**E25**
SPMT-LD	Drill Insert	**G04**
SPMT-MM	Milling Insert (Tank Mill, GBE)	**E25**
SPMT-PD	Drill Insert (KING DRILL)	**G04**
SPMT-VF	Turning Insert_Positive (Clamp on System)	**B73**
SPPA	Side cutter	**E316**
SPSA	Side cutter	**E318**
SPUN	Turning Insert_Positive	**B73**
SR	Brazed Tools (Round bars blank)	**H07**
SRCPR/L…B	Bearing Solution	**B136**
SRDCN	Holder (Screw on System)	**B173**
SRGCR/L	Holder (Screw on System)	**B174**
SRGPR/L…E	Bearing Solution	**B136**
SRGPR/L…F	Bearing Solution	**B136**
SSBCR/L	Holder (Screw on System)	**B174**
SSBEAA2000	Solid Endmills for Aluminum (Ball type)	**F78**
SSDCN	Holder (Screw on System)	**B174**
SSDPA	Carbide Drill (SSDP)	**G74~75**
SSEAA2000	Solid Endmills for Aluminum (Flat type)	**F77**
SSEAA3000	Solid Endmills for Aluminum (Flat type)	**F77**
SSKCR/L	Holder (Screw on System)	**B175**

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SSKCR/L	Boring Bar (Screw on System)	B198
SSKCR/L	Cartridge (Screw on System)	B211
SSKPR/L	Boring Bar (Screw on System)	B198
SSKPR/L...B	Bearing Solution	B137
SSSCR/L	Holder (Screw on System)	B175
SSSCR/L	Cartridge (Screw on System)	B211
ST	Brazed Tools (Helix blank)	H08
STACR/L	Holder (Auto Tools-ISO Type)	B110
STACR/L	Holder (Screw on System)	B175
STFCR/L	Holder (Screw on System)	B176
STFCR/L	Boring Bar (Screw on System)	B199
STFCR/L	Cartridge (Screw on System)	B212
STFPR/L	Boring Bar (Screw on System)	B200
STGCR/L	Holder (Screw on System)	B176
STLBR/L	Compact Mini	B204
STMD2L	Solid Threading Endmills (ISO Metric / UN)	D59~60
STMD3T	Solid Threading Endmills (ISO Metric / UN)	D57~58
STMHC	Solid Threading Endmills (ISO Metric)	D51~54
STMHCC	Solid Threading Endmills (ISO Metric)	D55
STMHCD	Solid Threading Endmills (ISO Metric)	D56
STMHCR	Solid Threading Endmills (ISO Metric)	D55
STR/L	Auto Tools Insert (FGT type)	B120
STTCR/L	Holder (Screw on System)	B176
STTCR/L	Cartridge (Screw on System)	B212
STUBR/L	Compact Mini	B204
STUPR/L	Compact Mini	B205
STWCR/L	Cartridge (Screw on System)	B213
STWPR/L	Boring Bar (Screw on System)	B201
SVABR/L	Holder (Screw on System)	B177
SVACR/L	Holder (Auto Tools-ISO Type)	B110
SVAPR/L	Holder (Auto Tools-ISO Type)	B111
SVHBR/L	Holder (Screw on System)	B177
SVJBR/L	Holder (Auto Tools-ISO Type)	B111
SVJBR/L	Holder (Screw on System)	B177
SVJCR/L	Holder (Auto Tools-ISO Type)	B111
SVJCR/L	Holder (Screw on System)	B178
SVJCR/L	Boring Bar (Screw on System)	B201
SVJPR/L	Holder (Auto Tools-ISO Type)	B112
SVMA4000	Shave Mill	E334
SVQBR/L	Boring Bar (Screw on System)	B201
SVQCR/L	Boring Bar (Screw on System)	B202
SVUA6000	Shave Mill Ultra	E335
SVUA6000-B	Shave Mill Ultra	E336
SVUBR/L	Boring Bar (Screw on System)	B202

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SVUCR/L	Boring Bar (Screw on System)	B202
SVVBN	Holder (Screw on System)	B178
SVVCN	Holder (Screw on System)	B178
SVVPN	Holder (Auto Tools-ISO Type)	B112
SWLCR/L	Boring Bar (Screw on System)	B203
SWUBR/L	Compact Mini	B206
SXGNR/L	Holder (Auto Tools-FGT Type)	B119
SVVBN	Holder (Screw on System)	B178
SVVBN	HSK Tooling System	B212
SVVCN	Holder (Screw on System)	B178
SVVPN	Holder (Auto Tools-ISO Type)	B112
SWLCR/L	Boring Bar (Screw on System)	B203
SWUBR/L	Compact Mini	B206
SXGNR/L	Holder (Auto Tools-FGT Type)	B119

T

TAFCBA	Side Milling Cutter (Tangential type-Full side cutter)	E312
TAFCPA	Side Milling Cutter (Tangential type-Full side cutter)	E312
TAHCBA	Side Milling Cutter (Tangential type-Half side cutter)	E313
TAHCPA	Side Milling Cutter (Tangential type-Half side cutter)	E313
TB	Multi functional Insert (Grooving Tools)	C46~49
TB	Brazed Tools (Taper bits)	H13
TBC	Tooling System (TBC)	I 63
TBGT	Turning Insert_Positive (Compact Mini)	B74
TBGW	PCD Insert_Negative/Positive	B99
TBH	Multi functional (Grooving Tools)	C50
TB-M	Multi functional Insert (Grooving Tools)	C46~49
TBMT-VL	Turning Insert_Positive (Screw on System)	B74
TC	Tooling System	I 21
TCA	TCA (Tap adaptor)	I 42
TCGT-AK	Aluminum Insert_Positive (Screw on System)	B91
TCGT-AR	Aluminum Insert_Positive (Screw on System)	B91
TCGT-KF	Turning Insert_Positive (Screw on System)	B75
TCGT-VP1	Turning Insert_Positive (Screw on System)	B75
TCMT	PCD Insert_Negative/Positive	B99
TCMT-C25	Turning Insert_Positive (Screw on System)	B76
TCMT-HMP	Turning Insert_Positive (Screw on System)	B75
TCMT-MP	Turning Insert_Positive (Screw on System)	B76
TCMT-VF	Turning Insert_Positive (Screw on System)	B75
TCMT-VL	Turning Insert_Positive (Screw on System)	B75
TCMT-VP1	Turning Insert_Positive (Screw on System)	B75
T-CNMA	cBN Insert_Negative(Regrinding)	B97
TCRS	Drill (Chucking Reamer)	G92

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T-DCGW	cBN Insert_Positive(Regrinding)	**B97**
TEC(E)N	Milling Insert (Turbo Mill)	**E26**
TEEN	Milling Insert (Turbo Mill)	**E26**
TER	TER (Tap Collet)	**I 43**
TFCN	Milling Insert (Mill-Max)	**E26**
TFEA	T-Cutter	**E287**
THEA	Tank Mill	**E281**
TM	Thread Milling Inserts (ISO Metric)	**D44~49**
TM	Cen-mill	**M04**
TMRS	Drill (Machine Reamer)	**G92**
TNGA	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B49**
TNGG	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B49**
TNGG-SC	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B49**
TNGG-VP3	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B49**
TNGN	Turning Insert_Negative (Ceramic Holder)	**B50**
TNMA	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B50**
TNMA	cBN Insert_Negative(Regrinding)	**B97**
TNMG-B25	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B53**
TNMG-GR	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B54**
TNMG-HA	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B51**
TNMG-LP	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B51**
TNMG-LW	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B53**
TNMG-MK	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B52**
TNMG-MM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B52**
TNMG-MP	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B53**
TNMG-RK	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B54**
TNMG-RM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B54**
TNMG-VB	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B50**
TNMG-VC	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B52**
TNMG-VF	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B51**
TNMG-VL	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B51**
TNMG-VM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B53**
TNMG-VP2	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B52**
TNMG-VP3	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B53**
TNMG-VP4	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B54**
TNMG-VQ	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B52**
TNMG-VR	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B54**
TNMG-VW	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B51**
TNMM-GH	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B55**
TNMM-GR	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B55**
TNMN	Turning Insert_Negative (Ceramic Holder)	**B55**
TNMX	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B55**
TNMX	PCD Insert_Negative/Positive	**B98**
TNMX	Milling Insert (Power Buster)	**E26**

T

TNMX-SH	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B55**
TOEH	Turning Insert_Positive	**B76**
TP2PCA	TP2P	**E259**
TP2PSA	TP2P	**E260**
TPCN	Milling Insert (Mill-max, Side cutter)	**E26**
TPD	Drill Insert (TPDC)	**G21**
TPD	Drill Insert (TPDB)	**G27**
TPDBA-3D	Drill (TPDB)	**G28**
TPDBA-5D	Drill (TPDB)	**G29**
TPDBA-8D	Drill (TPDB)	**G30**
TPDCA-3D	Drill (TPDC)	**G22**
TPDCA-5D	Drill (TPDC)	**G22**
TPDCA-8D	Drill (TPDC)	**G22-23**
TPGB	cBN Insert_Positive(Regrinding)	**B97**
TPGB	PCD Insert_Negative/Positive	**B99**
TPGH	Turning Insert_Positive	**B77**
TPGN	Turning Insert_Positive	**B77**
TPGN	PCD Insert_Negative/Positive	**B99**
TPGR-F	Turning Insert_Positive (Clamp on System)	**B77**
TPGR-M	Turning Insert_Positive (Clamp on System)	**B77**
TPGT	Turning Insert_Positive (Screw on System)	**B78**
TPGT	PCD Insert_Negative/Positive	**B99**
TPGW	PCD Insert_Negative/Positive	**B99**
TPGX	PCD Insert_Positive	**B78**
TPKN-MU	Milling Insert (Mill-Max)	**E27**
TPKN-SU	Milling Insert (Mill-Max)	**E27**
TPKR-MX	Milling Insert (Mill-Max)	**E27**
TPMR-F	Turning Insert_Positive (Clamp on System)	**B78**
TPMR-M	Turning Insert_Positive (Clamp on System)	**B78**
TPMT-MP	Turning Insert_Positive (Screw on System)	**B79**
TPMT-VF	Turning Insert_Positive (Screw on System)	**B79**
TPMT-VL	Turning Insert_Positive (Screw on System)	**B79**
TPUN	Turning Insert_Positive	**B79**
TSDMA	Top Solid drill	**G77**
T-VNMA	cBN Insert_Negative(Regrinding)	**B97**
TWX-KC	Milling Insert (Multi functional Chamfer Tool)	**E27**

U

UNJ (Unified Constant Thread)	Thread Insert	**D26**

V

VBGT	Turning Insert_Positive (Screw on System)	**B80**
VBGT-AK	Aluminum Insert_Positive (Screw on System)	**B92**
VBGT-AR	Aluminum Insert_Positive (Screw on System)	**B92**
VBGT-KF	Turning Insert_Positive (Screw on System)	**B80**
VBGT-KM	Turning Insert_Positive (Screw on System)	**B80**
VBGT-VP1	Turning Insert_Positive (Screw on System)	**B80**
VBMT	Turning Insert_Positive (Screw on System)	**B81**
VBMT	PCD Insert_Negative/Positive	**B99**
VBMT-HMP	Turning Insert_Positive (Screw on System)	**B81**
VBMT-MP	Turning Insert_Positive (Screw on System)	**B81**
VBMT-VB	Turning Insert_Positive (Screw on System)	**B80**
VBMT-VF	Turning Insert_Positive (Screw on System)	**B80**
VBMT-VL	Turning Insert_Positive (Screw on System)	**B81**
VBMT-VP1	Turning Insert_Positive (Screw on System)	**B81**
VBMW	cBN Insert_Positive(Regrinding)	**B97**
VCET-KF	Auto Tools Insert (ISO type)	**B114**
VCET-KF	Auto Tools Insert (ISO type)	**B82, 114**
VCET-KM	Auto Tools Insert (ISO type)	**B114**
VCET-KM	Auto Tools Insert (ISO type)	**B82, 114**
VCGT-AK	Aluminum Insert_Positive (Screw on System)	**B93**
VCGT-AR	Aluminum Insert_Positive (Screw on System)	**B93**
VCGT-KF	Turning Insert_Positive (Screw on System)	**B82**
VCGT-KM	Turning Insert_Positive (Screw on System)	**B82**
VCGT-VP1	Auto Tools Insert (ISO type)	**B114**
VCGT-VP1	Auto Tools Insert (ISO type)	**B82, 114**
VCGX-VP1	Auto Tools Insert (ISO type)	**B114**
VCGX-VP1	Auto Tools Insert (ISO type)	**B83, 114**
VCKT-MA	Milling Insert (Pro-A Mill)	**E27**
VCMT	PCD Insert_Negative/Positive	**B99**
VCMT-HMP	Turning Insert_Positive (Screw on System)	**B83**
VCMT-MP	Turning Insert_Positive (Screw on System)	**B83**
VCMT-VF	Turning Insert_Positive (Screw on System)	**B83**
VCMT-VL	Turning Insert_Positive (Screw on System)	**B83**
VCMT-VP1	Turning Insert_Positive (Screw on System)	**B83**
VDKT-MA	Milling Insert (Pro-A Mill)	**E27**
VETR	Thread Insert (Vertical Type)	**D33**
VFE4000	V-Endmill (Flat type)	**F16**
VNGG-HA	Turning Insert_Negative (Multi Lock System)	**B56**
VNGG-VP3	Turning Insert_Negative (Multi Lock System)	**B56**
VNMA	cBN Insert_Negative (Regrinding)	**B97**
VNMG-HA	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-LP	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-MK	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-MM	Turning Insert_Negative (Multi Lock System)	**B57**

V

VNMG-MP	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-RM	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-VB	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-VC	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-VF	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-VL	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-VM	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-VP3	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-VQ	Turning Insert_Negative (Multi Lock System)	**B57**
VNMX	PCD Insert_Negative/Positive	**B98**
VPET-KF	Auto Tools Insert (ISO type)	**B114**
VPET-KF	Auto Tools Insert (ISO type)	**B84, 114**
VPET-KM	Auto Tools Insert (ISO type)	**B114**
VPET-KM	Auto Tools Insert (ISO type)	**B84, 114**
VPGT-VP1	Auto Tools Insert (ISO type)	**B114**
VPGT-VP1	Turning Insert_Positive (Screw on System)	**B84**
VPGT-VP1	Auto Tools Insert (ISO type)	**B84, 114**
VTH	Vertical Type Holder	**D33**
VZD-LA, LBA	Vulcan Drill	**G72**
VZD-MA, MBA	Vulcan Drill	**G71**

W

WBGT	Turning Insert_Positive (Compact Mini)	**B85**
WCMT-C20N	Drill Insert (WPDC)	**G04**
WCMT-C21N	Drill Insert (WPDC)	**G05**
WDKT-MH	Milling Insert (HRM)	**E27**
WFSBA	Wind Mill (Boss type)	**E321**
WFSPA	Wind Mill (Plane type)	**E322**
WNGG-VP3	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B58**
WNGX-MA	Milling Insert (HRMDouble)	**E28**
WNGX-ML	Milling Insert (HRMDouble)	**E28**
WNGX-MM	Milling Insert (HRMDouble)	**E28**
WNMA	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B58**
WNMG-B25	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B60**
WNMG-GR	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B60**
WNMG-HA	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B58**
WNMG-LP	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B59**
WNMG-LW	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B60**
WNMG-MK	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B59**
WNMG-MM	Turning Insert (Save Turn)	**B101**
WNMG-MM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B59**
WNMG-MP	Turning Insert (Save Turn)	**B101**
WNMG-MP	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B60**

W

WNMG-RK	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B61**
WNMG-RM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B61**
WNMG-VB	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B58**
WNMG-VC	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B59**
WNMG-VF	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B58**
WNMG-VL	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B58**
WNMG-VM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B60**
WNMG-VP2	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B59**
WNMG-VP3	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B60**
WNMG-VP4	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B61**
WNMG-VQ	Turning Insert (Save Turn)	**B101**
WNMG-VQ	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B59**
WNMG-VR	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B61**
WNMG-VW	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B58**
WNMM-B25	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B61**
WNMX-MF	Milling Insert (HRMDouble)	**E28**
WNMX-ML	Milling Insert (HRMDouble)	**E28**
WNMX-MM	Milling Insert (HRMDouble)	**E28**
WNMX-SH	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B61**
WPDCA-5D	Drill (WPDC Standard type)	**G35**
WPDCA-5D	Drill (WPDC Dual insert cartridge)	**G36**
WPDCA-5D	Drill (WPDC Single insert catridge)	**G36**
WPDCA-6.5D	Drill (WPDC Standard type)	**G35**
WPDCA-6.5D	Drill (WPDC Dual insert cartridge)	**G36**
WPDCA-6.5D	Drill (WPDC Single insert catridge)	**G36**
WPDCA-8D	Drill (WPDC Standard type)	**G35**
WPDCA-8D	Drill (WPDC Dual insert cartridge)	**G36**
WPDCA-8D	Drill (WPDC Single insert catridge)	**G36**
WSA	Side cutter	**E318**
WTENN	Holder (Wedge Clamp System)	**B161**
WTJNR/L	Holder (Wedge Clamp System)	**B161**
WTXNR/L	Holder (Wedge Clamp System)	**B161**
WWLNR/L	Holder (Wedge Clamp System)	**B162**

X

XCET-KC	Milling Insert (Chamfer Tool)	**E29**
XEKT-MA	Milling Insert (Pro-x Mill)	**E29**
XEKT-ML	Milling Insert (Pro-x Mill)	**E29**
XNCT-MA	Milling Insert (Rich Mill)	**E29**
XNKT-ML	Milling Insert (Rich Mill)	**E30**
XNKT-MM	Milling Insert (Rich Mill)	**E30**
XOET-ND	Drill Insert	**G05**
XOMT-LD	Drill Insert	**G05**

X

XOMT-PD	Drill Insert	**G05**
XOMT-RD	Drill Insert	**G05**

Z

ZBE2000	Z Endmill (Ball type)	**F23**
ZDMT-R-MM	Milling Insert (BRE)	**E30**
ZFE2000	Z Endmill (Flat type)	**F20**
ZFE4000	Z Endmill (Flat type)	**F21**
ZPBE2000	Z+ Endmill (Ball type)	**F56**
ZPBE4000	Z+ Endmill (Ball type)	**F57**
ZPET-MM	Milling Insert (GBE)	**E31**
ZPFE2000	Z+ Endmill (Flat type)	**F48**
ZPFE3000	Z+ Endmill (Flat type)	**F55**
ZPFE4000	Z+ Endmill (Flat type)	**F51**
ZPFE6000	Z+ Endmill (Flat type)	**F55**
ZPLBE2000	Z+ Endmill (Long Ball type)	**F57**
ZPLFE2000	Z+ Endmill (Long Flat type)	**F49**
ZPLFE2000	Z+ Endmill (Long Flute type)	**F50**
ZPLFE4000	Z+ Endmill (Long Flat type)	**F53**
ZPLFE4000	Z+ Endmill (Long Flute type)	**F54**
ZPLRE2000	Z+ Endmill (Long Radius type)	**F59**
ZPLRE4000	Z+ Endmill (Long Radius type)	**F61**
ZPMT-MM	Milling Insert (BT Tooling System, Tank Mill)	**E31**
ZPMT-R-MM	Milling Insert (BRE)	**E31**
ZPMT-R-MR	Milling Insert (BRE)	**E31**
ZPRE2000	Z+ Endmill (Radius type)	**F58**
ZPRE4000	Z+ Endmill (Radius type)	**F60**
ZPSFE2000	Z+ Endmill (Short Flat type)	**F49**
ZPSFE4000	Z+ Endmill (Short Flat type)	**F52**
ZSBE200	Endmill (Brazed Endmill Ball type)	**F108**
ZSE200	Endmill (Brazed Endmill Flat type)	**F104**
ZSE300	Endmill (Brazed Endmill Flat type)	**F104**
ZSE400	Endmill (Brazed Endmill Flat type)	**F105**
ZSE600	Endmill (Brazed Endmill Flat type)	**F105**
ZSEA200	Endmill (Brazed Endmill Flat type)	**F106**
ZSEL200	Endmill (Brazed Endmill Flat type)	**F107**
ZSEL400	Endmill (Brazed Endmill Flat type)	**F107**
ZSEXL200	Endmill (Brazed Endmill Flat type)	**F107**
ZSFE2000	Z Endmill (Short Flat type)	**F22**
ZSFE4000	Z Endmill (Short Flat type)	**F22**

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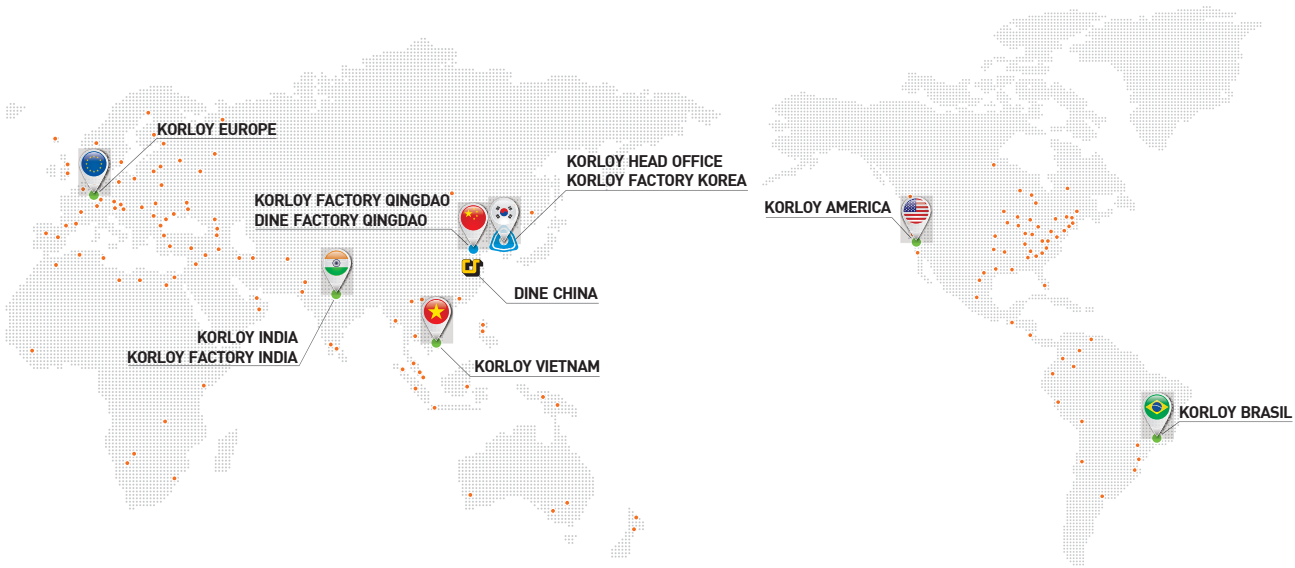

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