

KORLOY'S NEW  
&  
STEADY SELLING  
PRODUCTS

# KORLOY *Highlight Product*

  
**EMO**  
HANNOVER  
18-23/09/2023

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Korloy New &  
Steady Selling Products



# NC3200 Turning Inserts

NC3205, NC3215, NC3225, NC3235

## CVD insert series for Steel Turning

- Applied the New CVD coating increasing productivity and stable tool life
- Applied optimal substrate in cutting range (P05, P15, P25, P35)



### ( Features )

#### • New CVD coating and substrate increasing stability



##### CVD coating with increased wear resistance and chipping resistance

- Ensured stable tool life due to increased wear resistance, chipping resistance and heat resistance

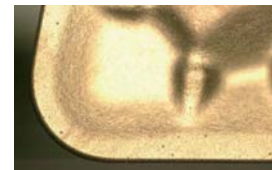
##### High toughness and heat resistance substrate

- Exclusive substrate per each grade increasing tool life

#### • Highly lubricative coating with fine surface finish application



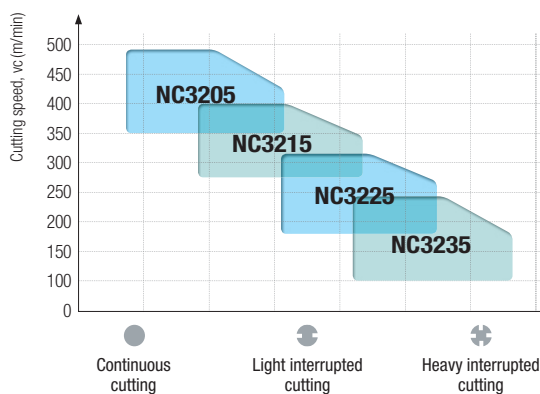
[ NC3205, NC3235 ]



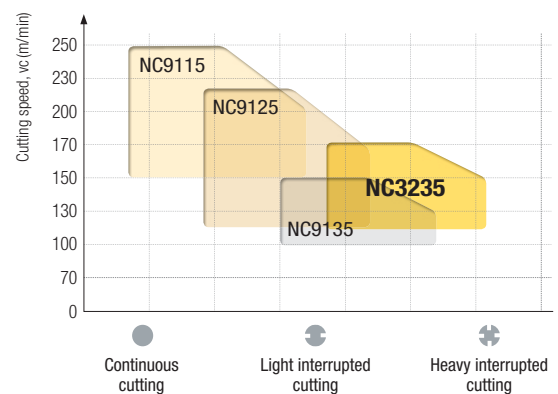
[ Existing grade ]

### ( Application range )

#### P Steel



#### M Stainless steel



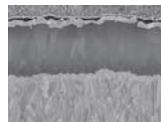
#### NC3205

- High cutting performance in high speed and continuous cutting
- Good wear resistance



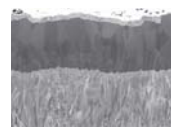
#### NC3215

- High cutting performance in medium to high speed and light interrupted cutting
- Good wear resistance and heat resistance



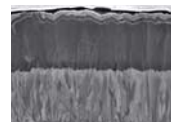
#### NC3225

- High cutting performance in medium speed and medium interrupted cutting
- 1<sup>st</sup> recommended grade



#### NC3235

- High cutting performance in medium to low speed and heavy interrupted cutting
- Good chipping resistance and fracture resistance



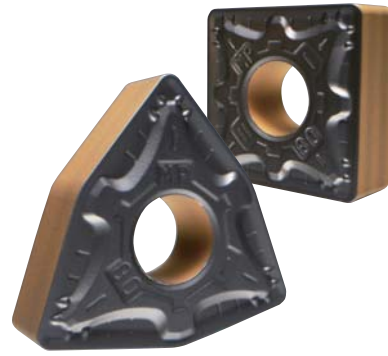




# NC5320

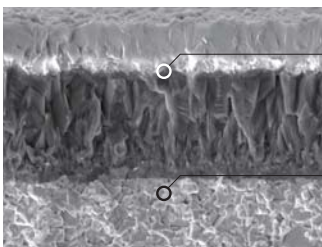
## Universal insert for Steel and Cast iron cutting

- Applying exclusive substrate for Steel and Cast iron and New CVD coating with great wear resistance
- Applying New CVD coating technology with better BUE resistance and chipping resistance than existing grades



### { Features }

- **New CVD coating with increased wear resistance and chipping resistance**



Applying  $\alpha$ -phase alumina coating,  
optimal structured universal CVD coating



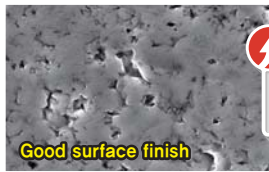
**Increased  
chip resistance**

Optimal substrate for Steel and  
Cast iron cutting with good wear resistance



**Increased  
wear resistance**

- **Increased surface finish due to applying New CVD coating**

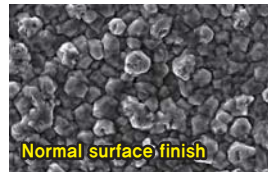


[ NC5320 ]



**Increased  
BUE resistance and  
chipping resistance**

**Good surface finish**

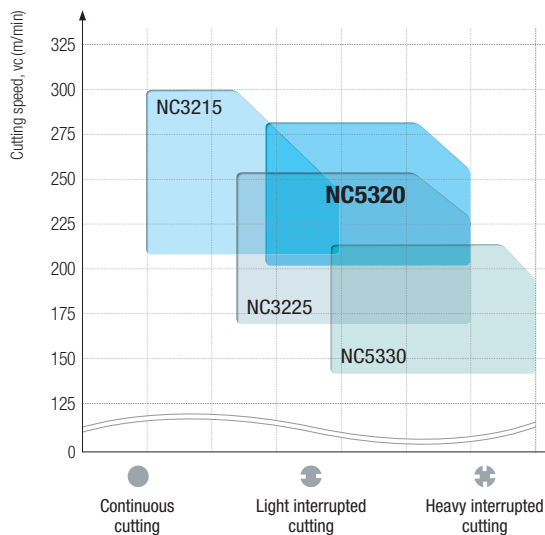


[ Existing grade ]

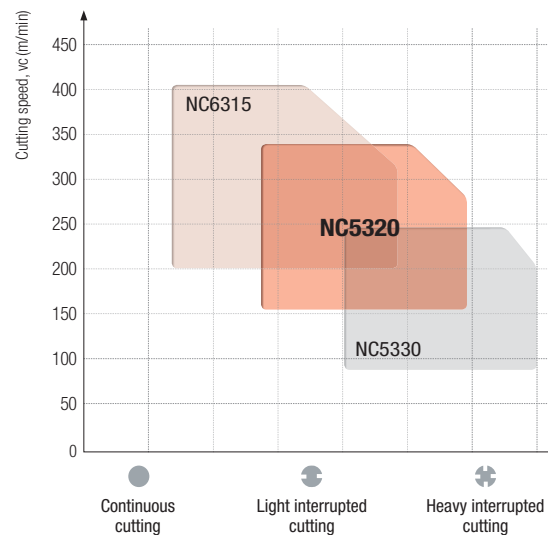
**Normal surface finish**

### { Application range }

#### **P** Steel



#### **K** Cast iron





# UNC805/UNC840 UPC810/UPC840

High performance Ultra Coating grade series  
for machining of HRSA

- Enhanced substrate in order to minimize thermal crack resistance at high temperature and prevent unexpected tool breakage
- Increased chip removal volume thanks to **Ultra Coating** technology with high hardness and lubrication
- Minimized built-up edge due to the optimized cutting edge of the insert

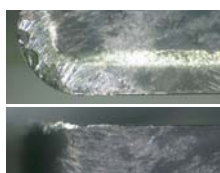


## ( Features )

### • Inconel (9723)



[ UNC805 ]



[ Competitor ]



[ UNC840 ]

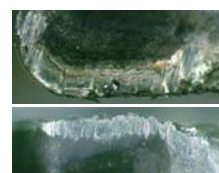


[ Competitor ]

### • Titanium (5832-11)



[ UPC810 ]



[ Competitor ]



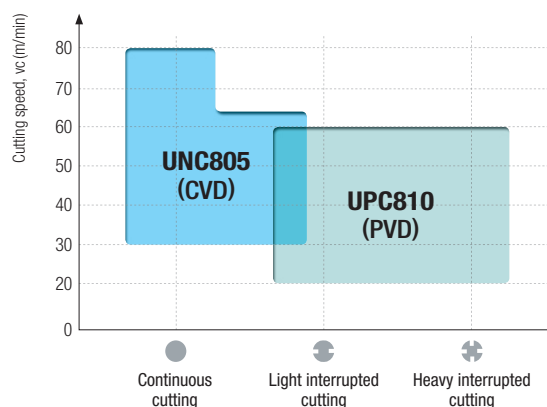
[ UPC845 ]



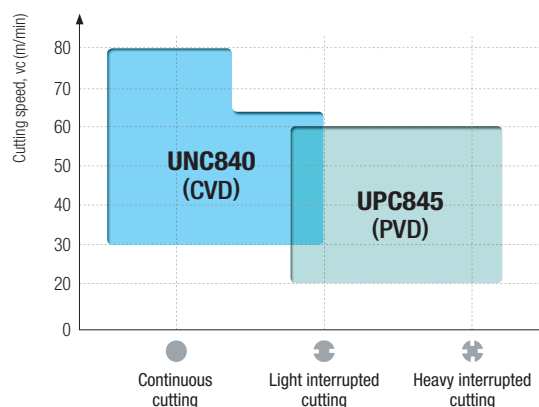
[ Competitor ]

## ( Application range )

### Turning



### Milling



UNC805 (CVD Turning)	UNC840 (CVD Milling)	UPC810 (PVD Turning)	UPC845 (PVD Milling)
<ul style="list-style-type: none"> <li>- Good performance in high speed machining</li> <li>- For high speed and low feed machining</li> <li>- For forged workpiece</li> <li>- For high hardness (HRC35 or above) HRSA</li> <li>- For large-sized workpiece (Ø200 or above)</li> </ul>		<ul style="list-style-type: none"> <li>- Good performance in low speed and high feed machining</li> <li>- For high interrupted cutting conditions</li> <li>- For cast and round bar machining</li> <li>- For low hardness (under HRC35) HRSA</li> <li>- For workpiece (under Ø200)</li> </ul>	



# PC3035

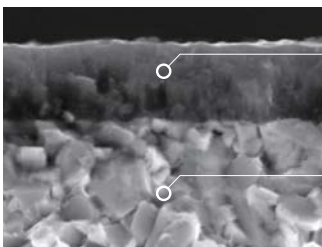
## Inserts for Steel Grooving and Parting

- Suitable substrate for Steel Grooving and Parting and good wear resistance coating layer
- Application of coating surface treatment improving welding resistance and chipping resistance



### { Features }

- Substrate for steel grooving and parting and PVD coating technology



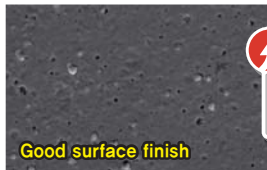
Enhanced wear resistance by high hardness TiAlN coating layer



Improved wear resistance

Application of high toughness substrate technique which is optimized for steel machining

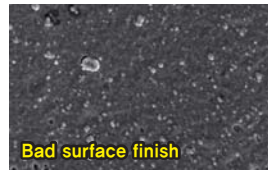
- Coating surface treatment technology



[ PC3035 ]

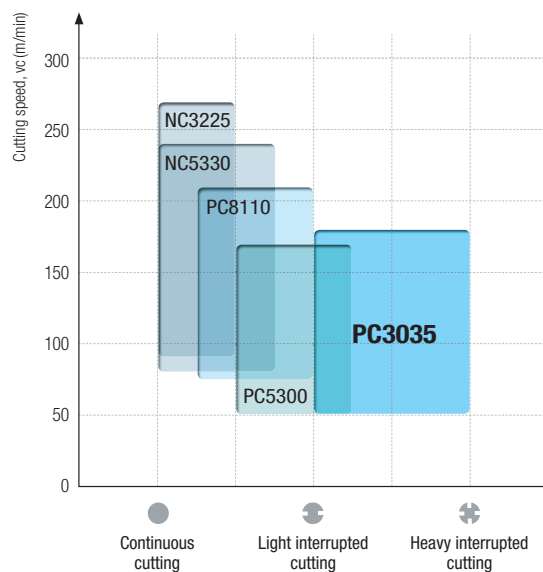


Improved welding resistance and chipping resistance



[ Existing grade ]

### { Application range }



Application range	Grade	$vc$ (m/min)
Continuous, high speed	<b>NC3225</b>	90 ~ 270
Continuous, medium speed	<b>NC5330</b>	80 ~ 240
Low interrupted, medium speed	<b>PC8110</b>	75 ~ 210
Low interrupted, low speed	<b>PC5300</b>	50 ~ 170
Interrupted, medium speed	<b>PC3035</b>	50 ~ 180



# PC3700

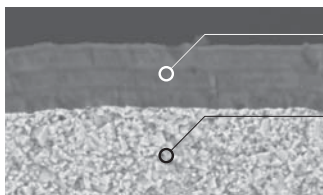
## Milling grade specialized for Steel

- Excellent chip removal rate due to a tough substrate specialized for Steel, and lubricative PVD coating of high-hardness
- A highly chipping-resistant grade for minimized deviation and extended tool life under various cutting conditions



### { Features }

- **Substrate for general Milling applications of Steel and PVD coating treatment**



Stronger resistance to welding and chipping due to the multi-layer coating technology with high hardness and lubricating treatment

Ensuring general machinability due to wear and breakage resistant materials optimized for milling applications of Steel

- **Smooth surface due to special surface treatment**

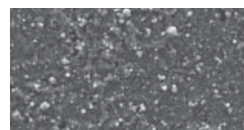
→ Smooth chip evacuation, improved chipping resistance and surface finish of the workpiece

#### Special coating surface treatment



No macro-particle on the coated surface

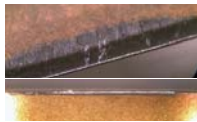
[ PC3700 ]



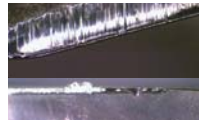
Lots of macro-particles on the coated surface

[ Existing products ]

#### Higher wear resistance



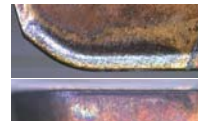
[ PC3700 ]



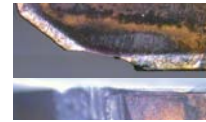
[ Existing products ]

Stronger resistance to welding and chipping due to the multi-layer coating technology with high hardness and lubricating treatment

#### Less unexpected breakage



[ PC3700 ]

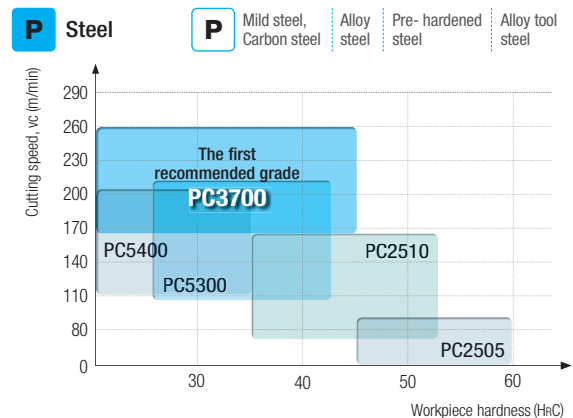
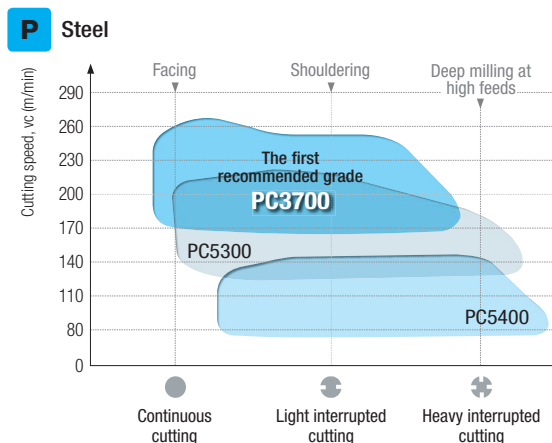


[ Competitor ]

Ensuring general machinability due to wear and breakage resistant materials optimized for milling applications of Steel

### { Application range }

- **Recommended grades and cutting conditions for p-type Milling application**



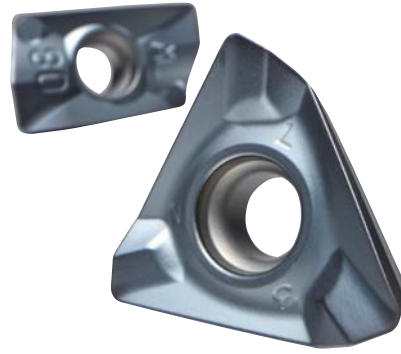




# PC5535

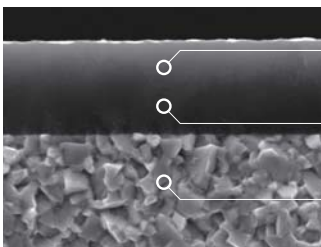
## PVD insert for general Milling

- General use due to high toughness substrate with balance of wear resistance and toughness
- Maximized tool life by applying the omega tech overcoming primary troubles in Milling
- Achieved stable cutting by implementing Edge tech and preventing welding, chipping and unexpected fracture



### { Features }

#### • Omega-Tech™ - applying PVD fusion coating technology



- Maximized coating performance by applying exclusive PVD fusion coating technology
- Increased adherence between substrate and coating layer with the application of newly designed layer
- Fine substrate with balance of wear resistance and toughness

#### • Edge-Tech™ - applying high lubricated edge technology



[ PC5535 ]



[ Competitor ]

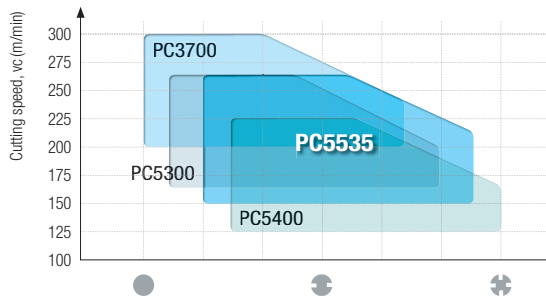
#### Edge technology }

- Preventing welding, chipping and unexpected fracture
- Longer tool life and stable cutting

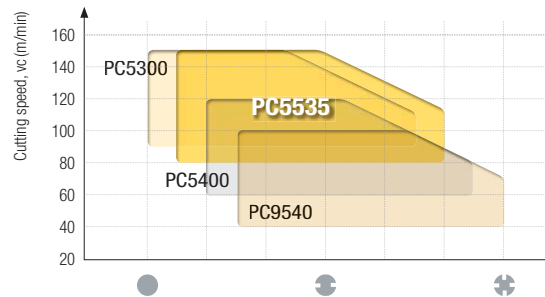


### { Application range }

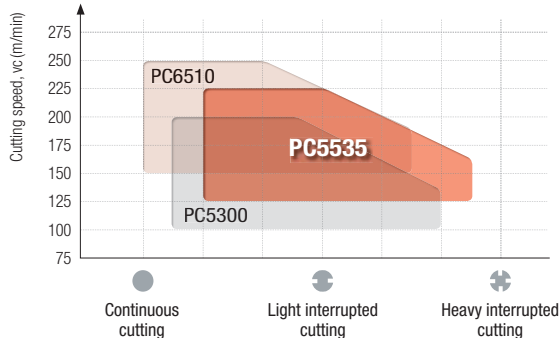
#### P Steel



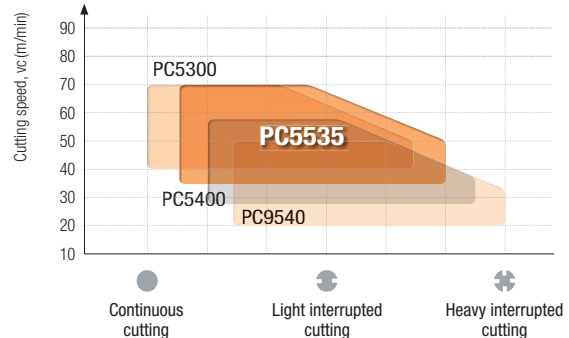
#### M Stainless steel



#### K Cast iron



#### S HRSA

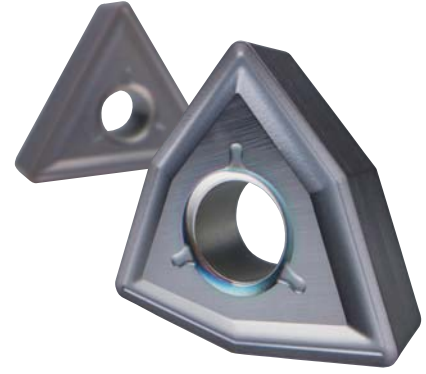




# PC9035

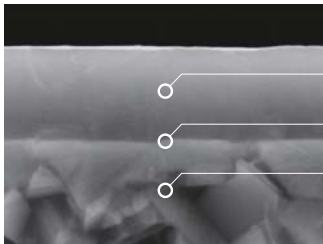
## Stainless steel Turning insert

- Optimally designed PVD grade for medium to finish cutting and interrupted cutting of Stainless steel turning
- High stability of cutting due to applying high toughness PVD coating layer technology with chipping resistance and fracture resistance
- Good chipping resistance and welding resistance in the beginning of cutting through the Edge-Tech™ technology



### ( Features )

#### • Applying TEX - Tech™, high toughness PVD coating layer technology

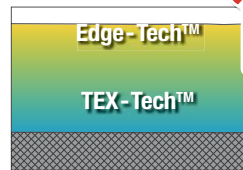


Good chipping resistance due to high toughness and high elasticity coating layer

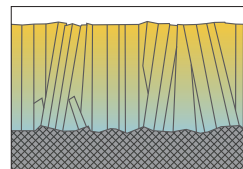
Enhanced adherence by high adherence coating layer

Excellent fracture resistance from applying high toughness substrate

#### • Applying Edge - Tech™, high lubrication edge technology



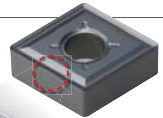
[ PC9035 ]



[ Existing grade ]



Increased welding  
resistance and chipping  
resistance

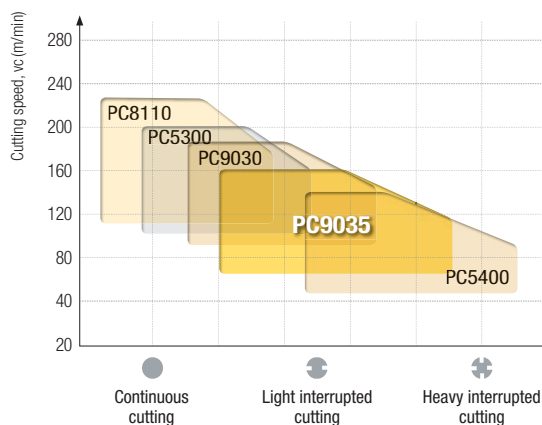


#### Edge-Tech™

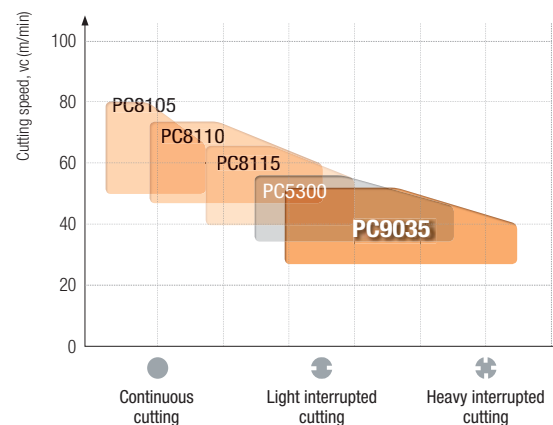
- Special high lubricated cutting edge technology increasing cutting stability through reducing welding, chipping and unexpected fracture

### ( Application range )

#### M Stainless steel



#### S HRSA



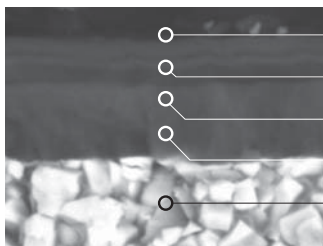
# PC9540

## Insert for Hard-to-cut Stainless steel Milling

- Longer tool life due to higher breakage resistance applying high toughness substrate controlling crack growth
- Excellent and new PVD oxide film with oxidation and heat resistance overcoming the limit of hard-to-cut materials machining
- Stable machinability by preventing welding and chipping due to applying special coating surface treatment

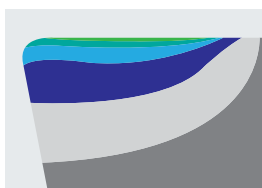


### { Features }



- Improved surface finish → Good welding resistance
- PVD multilayer → Controlling crack growth
- PVD oxide film → Good oxidation and heat resistance
- PVD nitride film → Good wear resistance
- High toughness substrate → Good breakage resistance

### • New PVD oxide film (comparison of thermal conductivity)



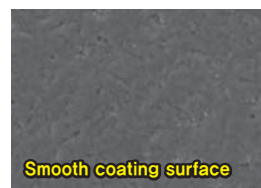
[ PC9540 ]



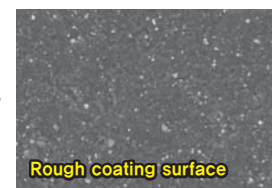
[ Competitor(TiAlN) ]



### • Special coating surface treatment technology

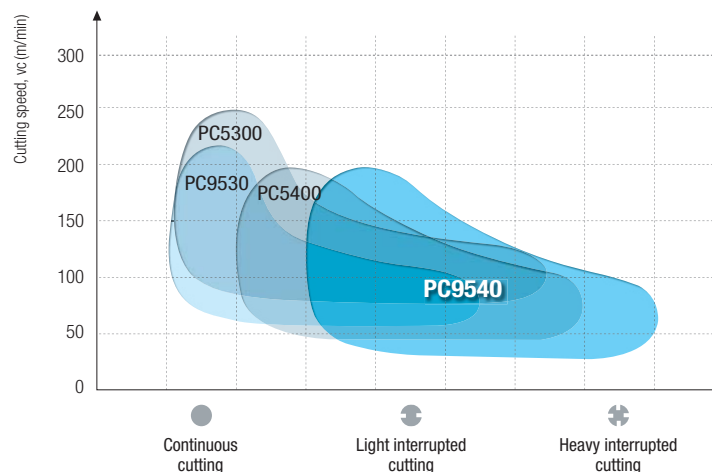


[ PC9540 ]



[ Existing grade ]

### { Application range }

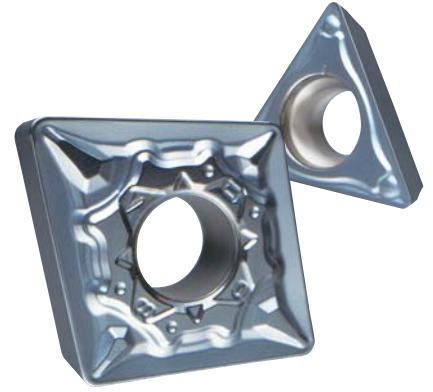




# CC1015/CC1025

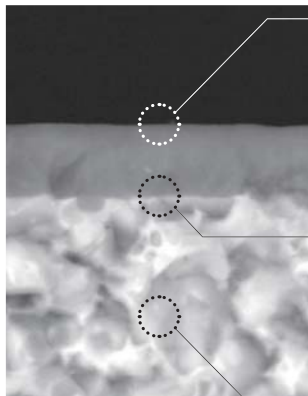
## PVD Cermet for Steel Turning

- Ensured stable tool life from applying Lubrix-Tech™ (high hardness and lubrication PVD coating technology) for increasing flank wear resistance on nose radius
- Smooth cutting surface from applying Edge-Tech™ (high lubrication cutting edge treatment technology) to prevent welding and chipping



### ( Features )

- Applying exclusive PVD Lubrix-Tech™ and Edge-Tech™ technology



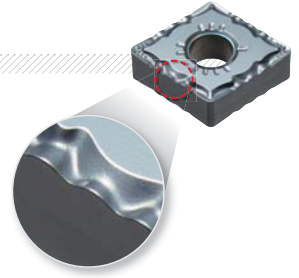
#### ( Edge-Tech™

- High lubrication cutting edge treatment technology
- Reducing welding, chipping and unexpected fracture and increasing tool life and stability

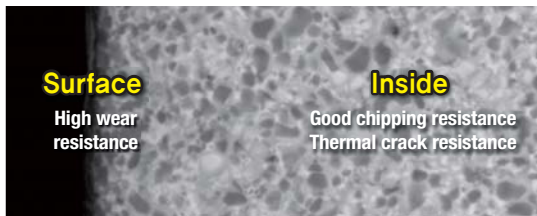


#### ( Lubrix-Tech™

- AlCrN series high hardness lubrication coating technology
- Coating layer's growth direction controlling technology

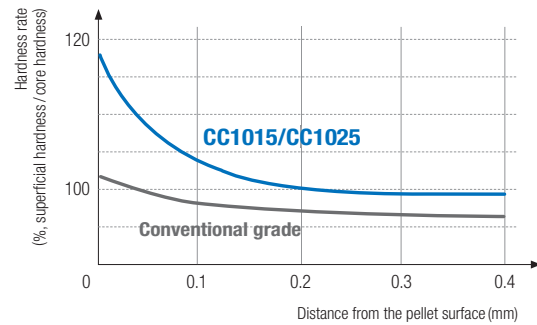


### Inclination functional substrate



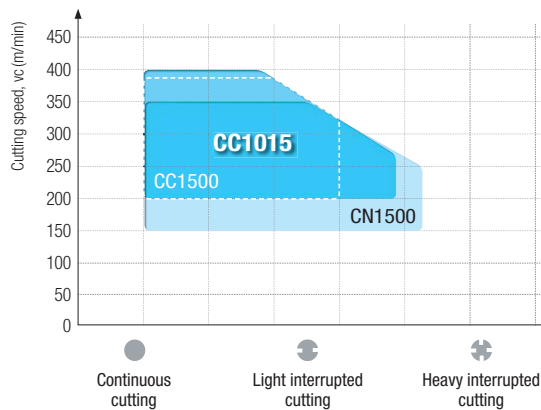
- Inclination functional layer creation with the surface and internal composition's microstructure control
- High chipping resistance and stable tool life

### Hardness rate comparison chart

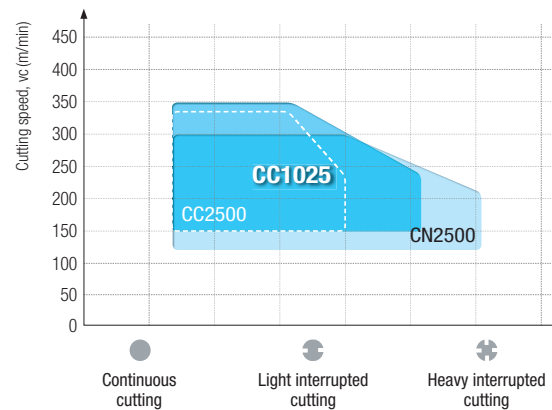


### ( Application range )

#### P Steel



#### P Steel







# Hexa Blade

## Grooving and Parting tool with precision 6 corners

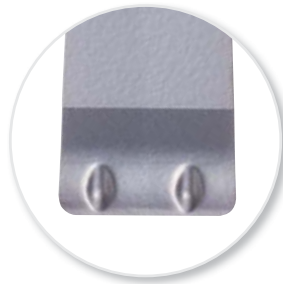
- Grooving and Parting tool with high economical 6 corners
- Increased reliability and stability in cutting due to high qualified cutting edge



### { Features }

#### • M Chip breaker

- Dot-typed chip breaker general cutting for various workpieces
- Good chip control preventing long chip and chip curling
- Stable cutting even in high feed cutting due to strengthened cutting edge structure



#### { Wide clamping area

- More stable clamping system
- Strengthen anti-vibration during machining
- Reliable tool life

#### { Precision insert }

- Superior quality in dimensions
- Excellent corner dimension deviation management
- Equally stable performance

#### { Strong cutting edge }

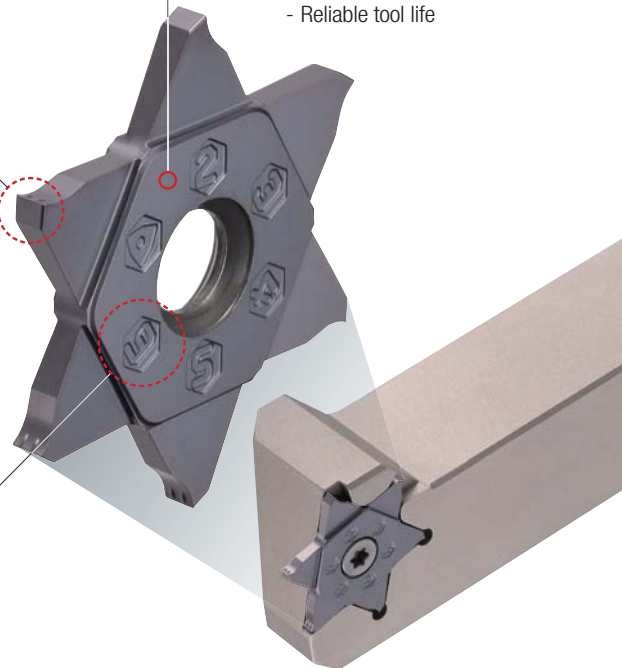
- Increased high feed cutting performance

#### { Neutral hand }

- Convenient use with neutral hand

#### { 6 cornered insert }

- High cost efficiency from multi-corners



### ↳ Type



**Insert**

Cutting width: 1.78 ~ 4mm



**Shank**

Diameter: 20, 25mm



# Saw Man-X

## A solution for Parting and deep Grooving

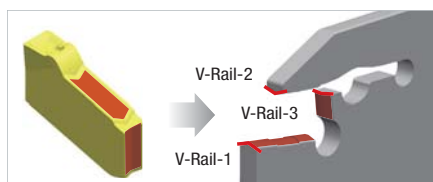
- Stable machining in deep grooving applying clamping system with strong three-way V-Rail
- Improving clamping precision and convenient replacing of inserts with using the exclusive wrench



### ( Features )

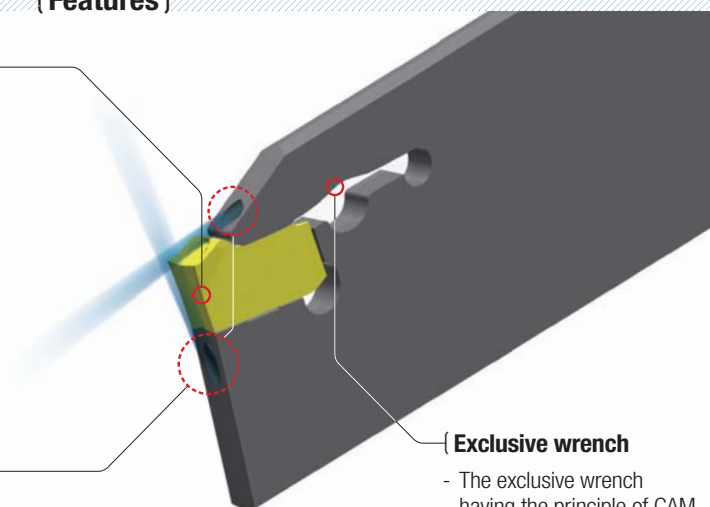
#### Three-way V-Rail

- Tightly clamped inset in the tip seat
- Increased stability by minimized vibration during the machining
- Available for stable high speed, high feed and high depth of cut machining



#### Internal spraying of 2 channel high pressure coolant

- Direct spraying of cutting edge coolant for effective coolant
- Longer tool life in HRSA cutting
- (\*need for exclusive blade and block for high pressure coolant)



#### Exclusive wrench

- The exclusive wrench having the principle of CAM for the Saw Man-X
- More convenient clamping system

### ( Chip breaker features )

Type	Shape	Cutting edge	Features
<b>N Chip breaker</b>			<ul style="list-style-type: none"> <li>• 1<sup>st</sup> recommended in Steel and Cast iron cutting</li> <li>• Negative land cutting edge</li> <li>• For interrupted and high feed cutting</li> </ul>
<b>S Chip breaker</b>			<ul style="list-style-type: none"> <li>• 1<sup>st</sup> recommended in Stainless steel and HRSA cutting</li> <li>• Sharp cutting edge</li> <li>• For high speed and continuous cutting</li> </ul>
<b>N Chip breaker (Lead angle type)</b>			<ul style="list-style-type: none"> <li>• Optimal for pipe and round bar cutting</li> <li>• Negative land cutting edge applying lead angle</li> <li>• Minimized burr and size of PIP</li> </ul>

### ➡ Type



**Insert**

Cutting width: 2, 3, 4, 5, 6 mm



**Blade**

Blade height: 26, 32 mm



**Blade**

[High pressure coolant]  
Blade height: 26 mm



**Shank**

Shank height: 16, 20, 25



**Block**

Block height: 26, 32 mm  
**high pressure coolant Block**  
Block height: 26 mm

# RM6

## Double-Sided 6-Corner Shoulder Milling Tool

- 3 clamping surfaces on the side and strong clamping screws
- High precision, excellent perpendicularity, outstanding surface finish on the flank, accurate tolerance
- High rake angle and sharp cutting edges for lower cutting resistance



### { Features }

#### Streamlined holder design }

- Improved chip evacuation in deep shouldering and slotting

#### Through coolant system }

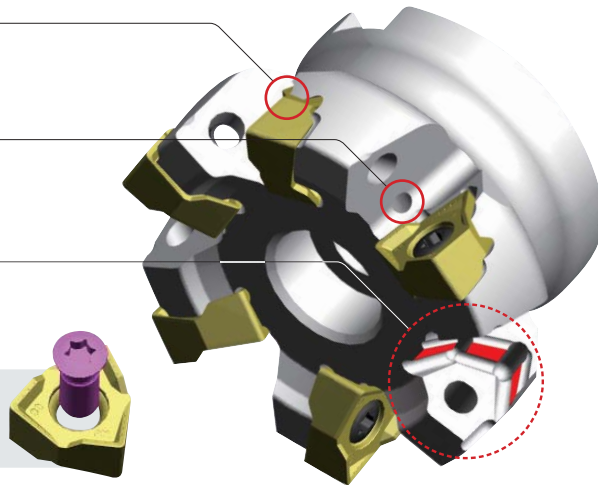
- Improved chip flow and tool life thanks to insert cooling

#### 3-side supporting system }

- Stable tool life

#### Strong clamping screws

- Strong clamping screws enable rigid clamping



#### Higher clamping stability }

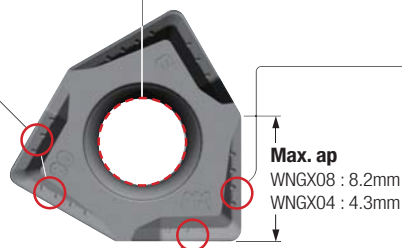
- Wide clamping areas and strong clamping screws for rigid clamping

#### High rake angle chip breaker

- Maintains stable clamping
- Induces smooth chip flow  
→ Increases insert

#### Wide minor cutting edges }

- Improved surface finish
- Enable multi purpose machining incl. plunging

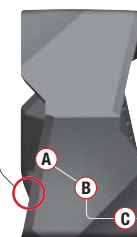


#### { High rake angle cutting edges

- Improved machinability and reduces cutting resistance

#### 3-level flank relief surface }

- Enhances rigidity and enables stable clamping  
→ Improves cutting stability



### ➡ Type



**Cutter**  
Ø40 ~ Ø125



**Shank**  
Ø20 ~ Ø50



**MILLING**

KORLOY Highlight Products  
EMO 2023



# RM8-X

## High helix face Milling tool with 8 cornered double-side inserts

- High performance in Stainless steel machining due to sharp cutting edge and double reverse positive relief surface structure
- Economic tool by double-sided 8 corners and high helix right-handed shape realizing high depth of cut machining



### { Insert features }



#### { High Helix }

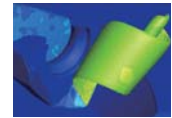
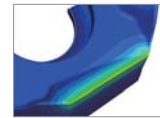
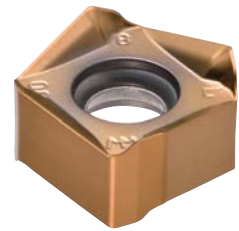
- Improved surface finish
- Reduced cutting load

#### { Variable minor cutting edge chip breaker }

- Protects its corner on the opposite side
- Enhanced chip control

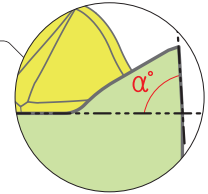
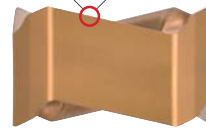
#### { High rake angled major cutting edge / Variable chip breaker }

- Maintain its machinability in high depth of cut
- Enhanced chip control

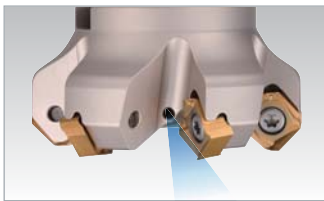


#### { Reversal positive relief angle at the Major cutting edge }

- Protects its corner on the opposite side
- Increased chipping resistance and prevents unexpected breakage

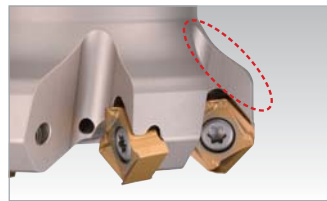


### { Cutter features }



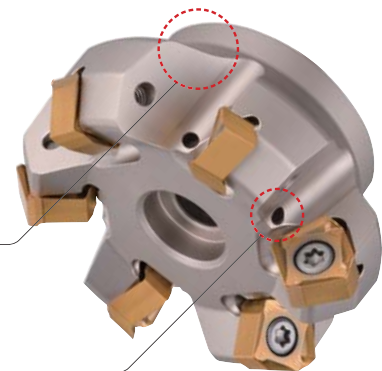
#### { Internal coolant system }

- Improved chip evacuation
- Tool life increase with the inserts' cooling



#### { Steamlined cutter design }

- Improved chip evacuation



### ➡ Type



Cutter

Ø50 ~ Ø125

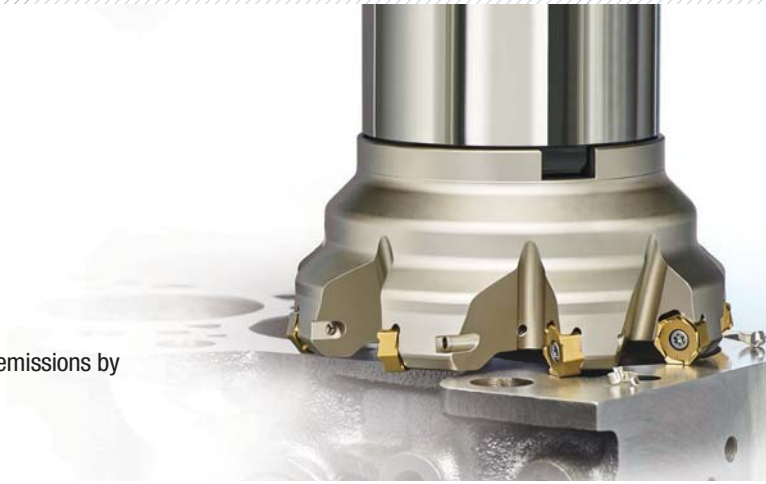




# RM14

## Heptagonal face Mill with 14 double-sided corners

- Minimized chattering of workpiece due to maximum lead angle and sharp cutting edge
- Reduced cutting resistance and improved chip emissions by high helix angle application



### ( Insert features )

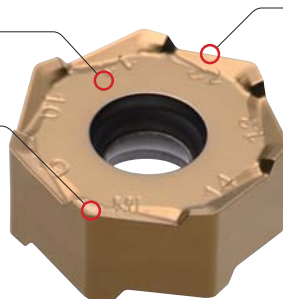
- Wide supporting area of insert ensures stable clamping system.
- High rake angle cutting edge reduces cutting load and increases chip evacuation.
- Thicker insert realizes stability in machining.

#### Wider clamping area

- More stable machining

#### High rake angle chip breaker

- Less cutting load
- Better chip evacuation



#### ( High helix cutting edge

- Better machinability
- Less cutting load



#### ( Thicker insert

- High cutting edge strength

### ( Cutter features )

- The biggest heptagonal lead angle reduces chatter in machining.
- Wedge type clamping system ensures stable clamping.
- Stepped machining is available without interruption of side wall of insert.



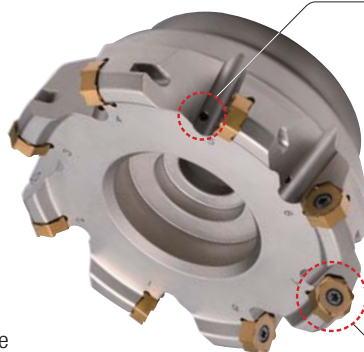
#### The biggest heptagonal lead angle

- Reduced workpiece chattering by reducing axial force



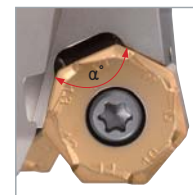
#### Preventing interruption of side wall

- Prevented interruption of side wall by using the most number of corners in deep facing (heptagonal 14 double-sided corners)



#### ( Internal coolant system

- Improved chip evacuation
- Increased tool life due to cooling insert



#### ( Wedge clamping system

- Stable clamping system with an acute angle structure

### ➡ Type



Cutter

Ø50 ~ Ø160



# RMR

## Double-sided round Milling tool with 8 corners

- Improved machining stability with the combination of the reversal positive structure preventing rotation and wide upper and lower clamping sides.
- Helix cutting edge and sharp chip breaker realize smooth cutting.
- Wide minor cutting edge and optimized holder angle enhance high surface finish.



### { Insert features }

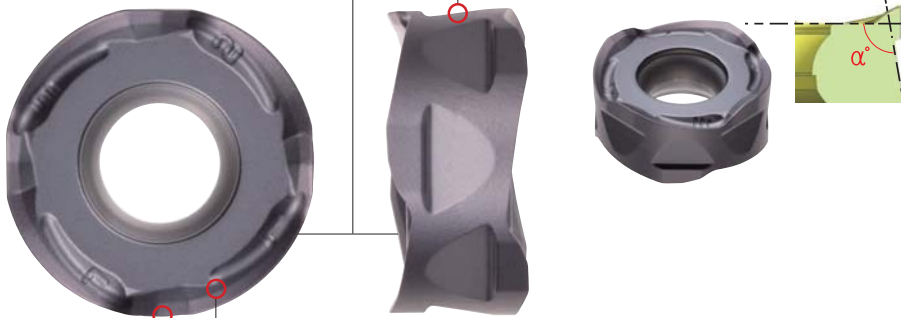
- **High cost efficiency** - Maximum 8 corners are usable due to applying doublesided structure
- **Good surface finish** – The optimal minor cutting edge ensures good surface finish
- **Stable tool life** - The exclusive structure preventing rotation ensures stable machining

#### High Helix }

- Improved surface finish
- Lowered cutting load

#### { Reversal positive structure preventing rotation

- High clamping force
- Stable machinability



#### Wide wiper cutting edge }

- Good surface finish

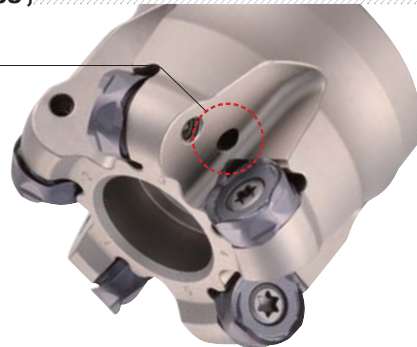
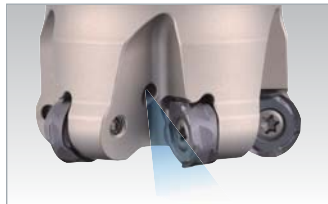
#### { High rake angled major cutting edge/Variable chip breaker

- Good machinability with high depth of cut
- Improved chip control

### { Cutter features }

#### Internal coolant system }

- Longer tool life due to insert cooling



### ↻ Type



**Cutter**  
Ø50 ~ Ø125

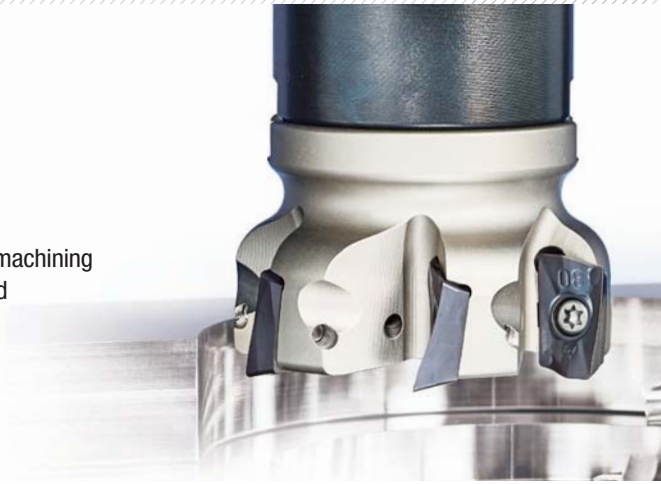


**Shank**  
Ø32 ~ Ø63

# Alpha Mill-X

## Shoulder Milling tool for high helix

- High helix cutting edge realizes high speed and high feed machining (15% higher speed than conventional tool's machining) and increases 20% higher productivity.
- Highly precise cutting edge ensures high quality surface finish in Milling.



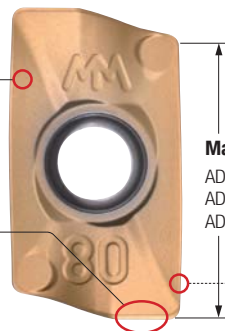
### ( Insert features )

#### High rake angle chip breaker

- Applied high rake angle
- Improved chip control

#### Applied minor cutting edge with a wiper function

- Minor cutting edge design optimized for excellent surface finish



#### Max. ap

ADKT17: 16.5mm  
ADKT12: 11.5mm  
ADKT10: 9.5mm

#### Proprietary relief surface shape

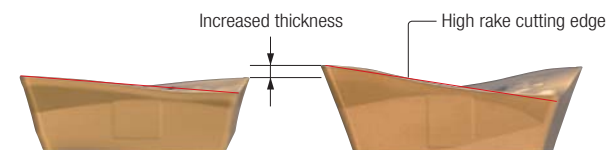
- High rigidity of insert

#### Flat clamping area

- Stable clamping in high speed and high feed machining

#### High rake cutting edge

- Better surface toughness
- Lower cutting load



Competitor  
(APMT1604PDSR-MM)

Alpha Mill-X  
(ADKT170608PESR-MM)

- Applying cutting edge with high rake angle: decreased cutting load
- Thicker insert: high rigidity of insert

→ Optimal for high speed and high feed machining

### ( Cutter features )

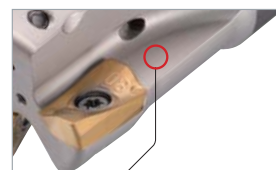


#### High rake angle cutting edge

- Improved surface finish
- Decreased cutting load



Perfect perpendicularity



#### Wider chip pocket

- Maximized chip control
- Outstanding chip control in high speed and high feed machining

### ➡ Type



Cutter  
Ø40 ~ Ø125



Shank  
Ø16 ~ Ø40



MILLING

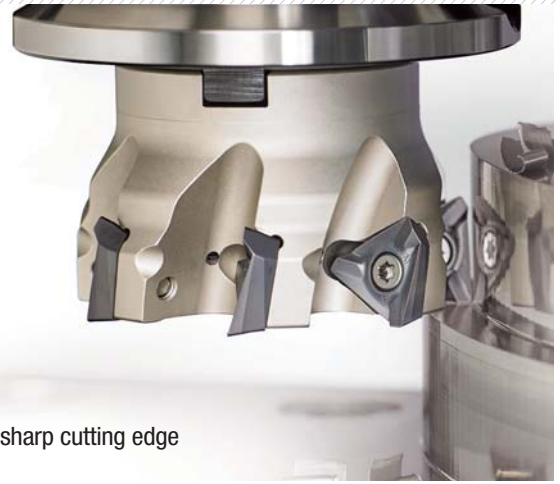
KORLOY Highlight Products  
EMO 2023



# Triple Mill

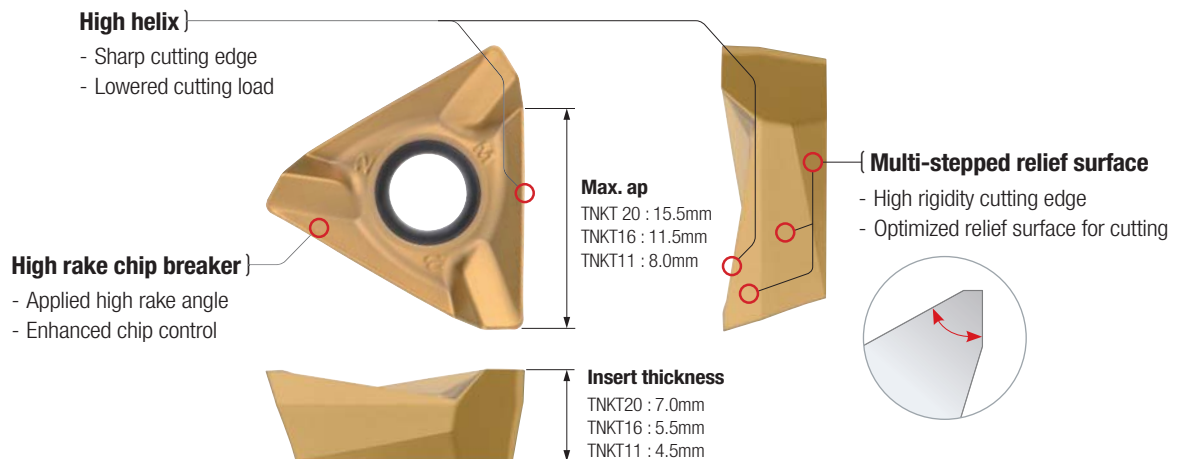
## High depth of cut Milling tool with 3 corners for perpendicularity

- Economical Milling tool with 3 corners with positive cutting edge for high depth of cut machining
- Stable machinability in high feed machining due to enhanced chip evacuation and thicker insert
- High precision machining from less cutting load due to high helix and sharp cutting edge

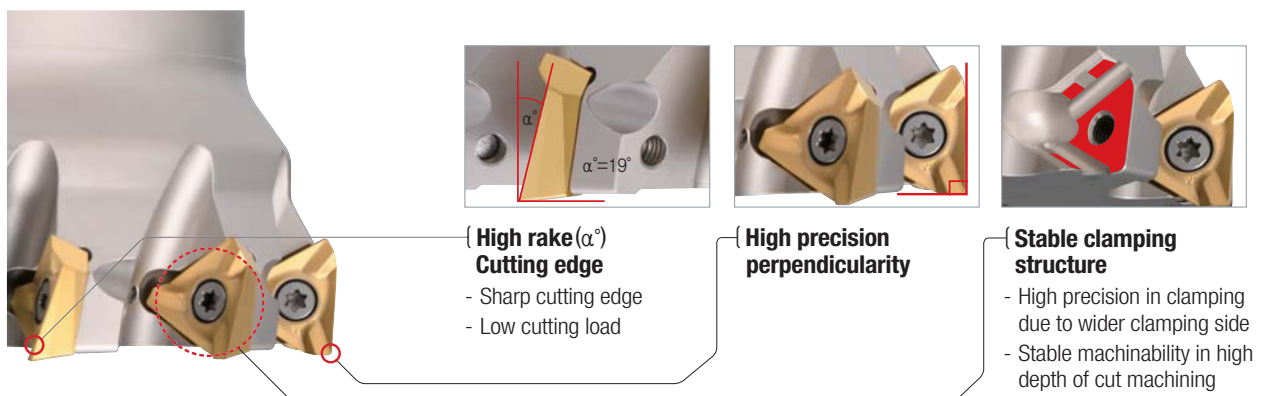


### { Insert features }

- Economical insert with 3 corners due to high depth of cut cutting edge
- Lowered cutting load and enhanced chip evacuation by sharp chip breaker and high helix cutting edge
- Stable machinability even in high cutting conditions from high rigidity design



### { Cutter features }



### ↻ Type



**Cutter**  
Ø50 ~ Ø125



**Shank**  
Ø25 ~ Ø40





# HFMD

## High feed Milling tool with 4 corners for small diameter

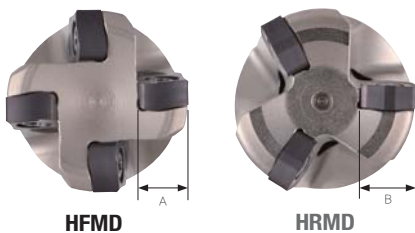
- Available for economical and highly efficient machining with implementation of double sided 4 corner inserts and increase in the number of teeth per cutter diameter
- Available for high speed/high feed machining with high helix edge design and excellent clamping stability

### { Insert features }

- Available for high feed machining with the increase in the number of teeth per cutter diameter
- Excellent chip evacuation in slotting or deep shouldering with minimized interference with side walls

### Highly efficient insert due to fine pitch }

- Able to use fine pitch at the same machining diameter with typical types of milling cutters due to smaller inscribed circle ( $A < B$ )

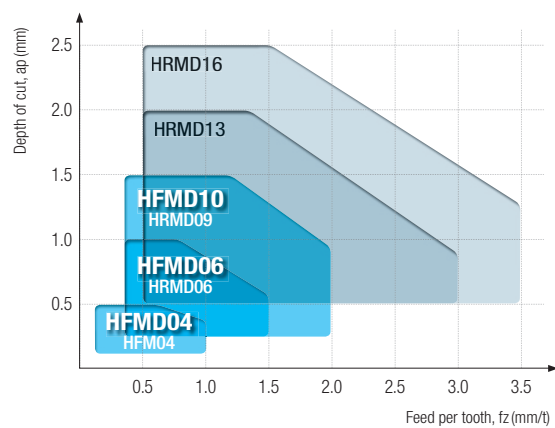
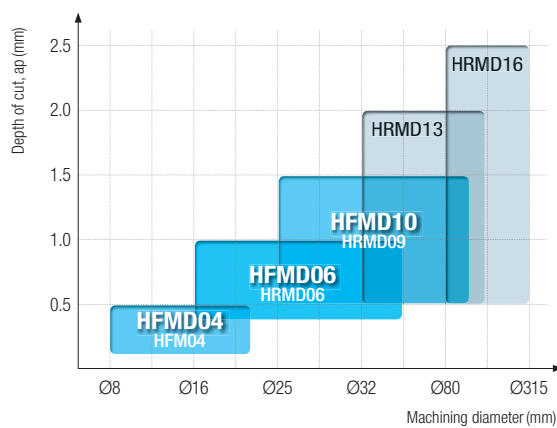


### Economical 4 corner insert }

- Can use 4 corners with 1 insert by utilizing front/back face; High feed due to finer pitch



### { Application range }



### ➡ Type



**Cutter**  
Ø32 ~ Ø100



**Shank**  
Ø8 ~ Ø42



**Modular**  
Ø10 ~ Ø42



# KING Drill

## Optimized insert design for maximum Drilling efficiency

- 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
- 2 different inserts, optimized for the central and peripheral insert locations in order to maximize cutting tool life



### ( Features )

#### • Optimized flute system - 2 coolant holes applied

The optimized shape of the flute increases the rigidity of the Drill body and improves chip evacuation

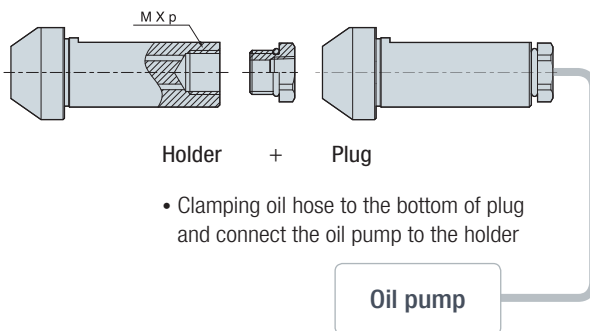


## KING Drill

### For through coolant system with a lathe

Drill with through coolant system for general lathe and CNC lathe without through coolant system

- 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

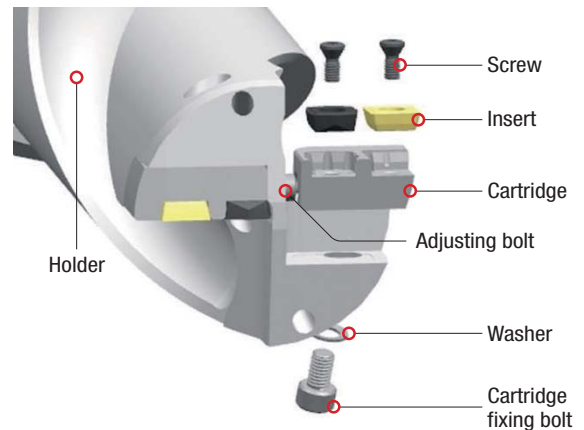


## KING Drill

### For large diameter Drilling

High rigidity drill produces cost efficiency due to cartridge replacement

- Cartridge type for  $\varnothing 61 \sim \varnothing 100$  Drilling
- Peripheral cartridge can adjust the Drilling diameter within 5 mm
- Easy to adjust Drilling diameter with adjusting bolt



### ↻ Type



**KING Drill**  
[2D/3D/4D/5D]  
 $\varnothing 12.0 \sim \varnothing 60.5$



**KING Drill**  
(For through coolant system with a lathe)  
[2D/3D/4D]  
 $\varnothing 13.0 \sim \varnothing 29.5$



**KING Drill**  
(For large diameter Drilling)  
[2D, 3D, 4D]  
 $\varnothing 61.0 \sim \varnothing 100$

# TPDB Plus Drill

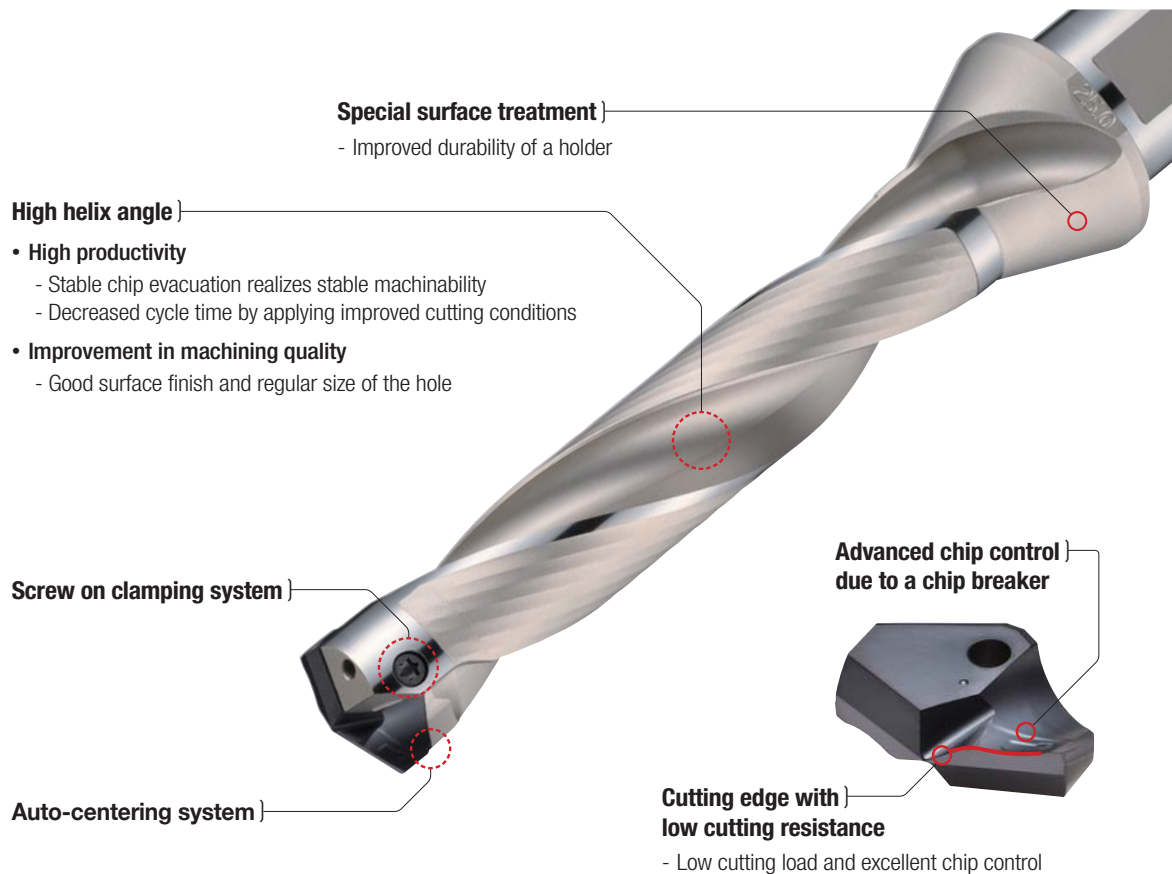
(TPDB Plus/TPDB-DS/TPDB-F/TPDB-H)

## High-quality and high efficiency top solid indexable Drill

- Improved productivity and excellent machining quality through stable machining
- Versatility in machining various surfaces, structural Steel, and medium / large diameter machining

### { Features }

- **Highly precise clamping system** - Superior clamping precision with auto-centering system and highly precise grinding clamping parts
- **Screw on clamping system** - Easy to replace inserts
- **Sharp cutting edge** - Low cutting load and good chip control
- **Holder with excellent durability** - Holder with high rigidity and excellent wear resistance due to special surface treatment
- **Holder with excellent chip control** - Low cutting resistance and outstanding chip evaluation by applying high helix angle



### ➡ Type



**TPDB** [3D/5D/8D/10D/12D]  
 $\varnothing 10.0 \sim \varnothing 32.9$   
**- Standard -**



**TPDB-F** [1.5D]  
 $\varnothing 14.0 \sim \varnothing 30.9$   
**- Flat -**



**TPDB-H** [3D/4D/8D]  
 $\varnothing 14.0 \sim \varnothing 30.9$   
**- H-Beam -**



**TPDB-DS** [3D/5D/8D]  
 $\varnothing 33.0 \sim \varnothing 39.9$   
**- Medium/Large dia. -**



# TPDC Plus Drill

(TPDC-XP, CP, CM, CN, CP-FC)

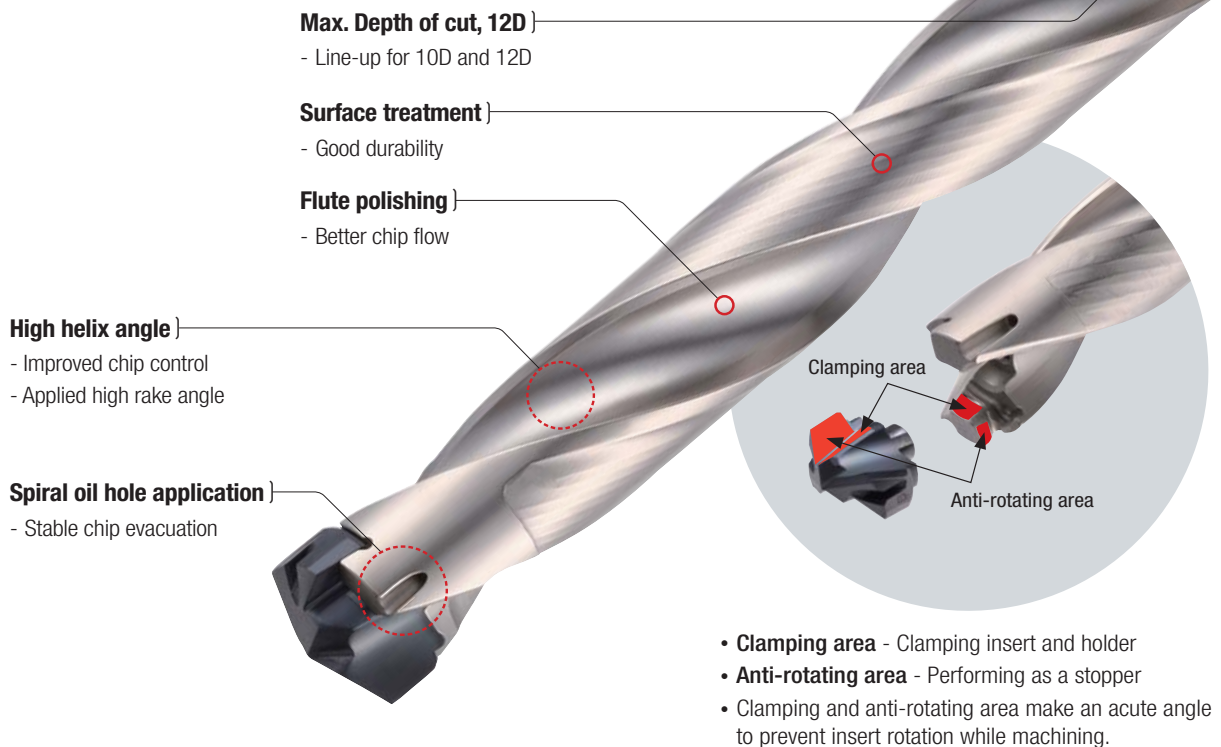
## High quality and high feed top solid indexable Drill

- The optimal tool shape for Drilling realizing high precision and high feed machining as of carbide solid Drill performance level
- Usable for various machining through enlarged line-up by workpieces, depth of cuts and workpiece shapes



### ( Features )

- **One step clamp system** - Increased stability and shortened setting time
- **High helix angle and flute polishing** - Reduced cutting load and enhanced chip evacuation
- Various applications from enlarged line-up by depth of cuts and shapes of workpiece



### ⇒ Insert



### ⇒ Type





# The Mirror Endmill

## High precision mold manufacture solution

- For medium cutting of high precision workpiece and mold machining above HRC60
- Enhanced wear resistance from applying the optimal grade for PCD, cBN



### { Features }

## PCD Endmill

For polishing of high precision workpiece and high hardness mold

- Optimal surface finish by PCD ball Endmill with no edge
- Nano-level surface finish due to its ultra-fine Endmill
- Enhanced wear resistance from applying the optimal grade for PCD



## cBN Endmill

For ultra-fine and mirror-like workpiece and mold with over HRC60 machining

- Higher productivity and surface finish in high speed cutting
- Enhanced wear resistance due to the optimal cBN grade
- Longer tool life by shape with strong cutting edge
- Stable tool life and surface from high precision Endmill



## H-Star Endmill

Proper for the various cutting processes with long neck, rib and taper neck etc

- Stronger cutting edge strength of the tool applied ultra-fine substrate
- Enhanced high temperature heat resistance by applying new coating layer on the edge in high speed cutting
- Stable cutting performance due to the optimal cutting edge for high speed machining



### ➡ Type



**Ball**  
Ø0.3 ~ Ø2.0



**Ball**  
Ø0.4 ~ Ø2.0



**Radius**  
Ø0.4 ~ Ø2.0



**Long neck ball**  
Ø0.1 ~ Ø5.0



# Super Endmill

## Endmills series for Difficult-to-cut materials (Ti and HRSA)

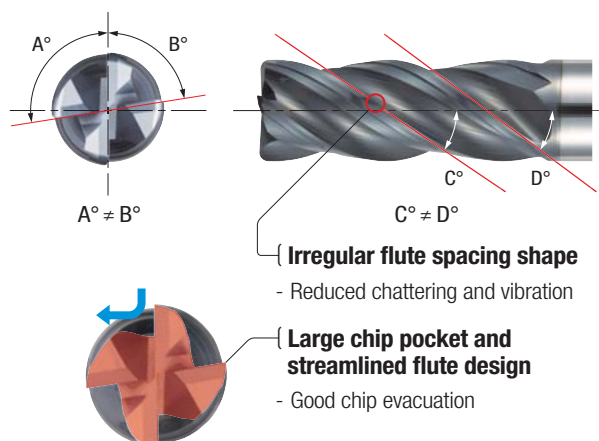
- Machining HRSA and Ti components like engine, turbine and etc. used in aerospace and power generation industries
- Optimal for difficult-to-cut materials machining due to reduced cutting heat and enhanced chip evacuation



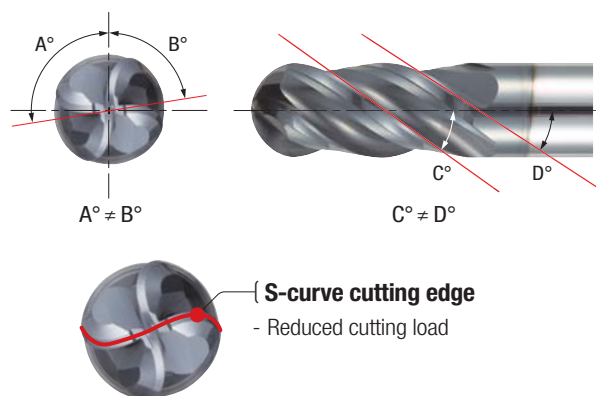
### { Features }

#### Super Endmill for Ti

##### • SFET (Flat) / SRET (Radius)

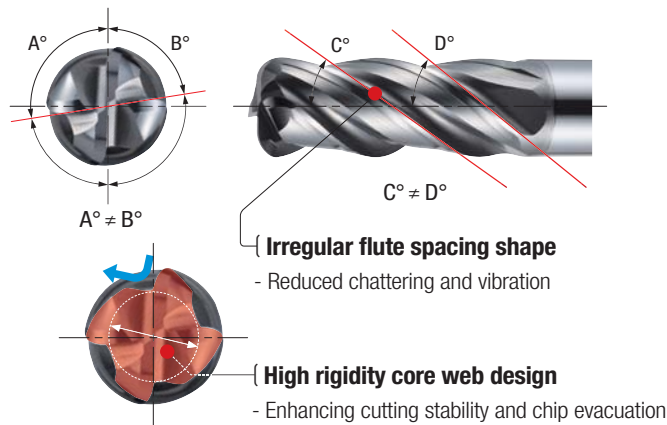


##### • SBET (Ball)

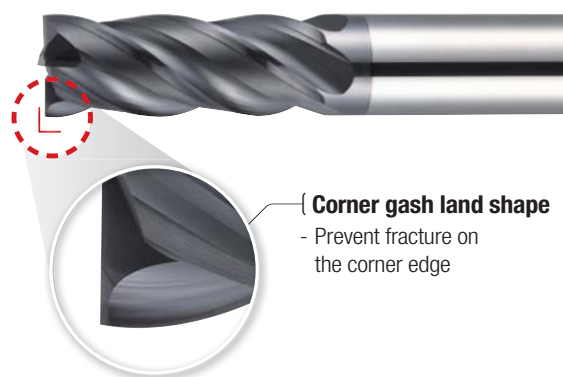


#### Super Endmill for HRSA

##### • SRES4000 (Radius)



##### • SFES4000 (Flat)



### ↻ Type

{ For Ti }



**Flat**  
Ø3.0 ~ Ø20.0



**Radius**  
Ø3.0 ~ Ø20.0



**Ball**  
Ø1.0 ~ Ø12.0

{ For HRSA }



**Flat**  
Ø3.0 ~ Ø20.0



**Radius**  
Ø3.0 ~ Ø20.0

# H-Star Endmill

## Endmill for High hardness Steel cutting

- Stable cutting from High hardness substrate and exclusive new coating layer with good wear resistance application
- Improved initial chipping resistance with optimized edge treatment for high hardness Steel cutting



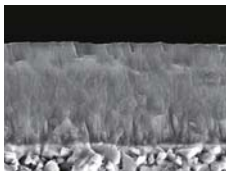
### { Features }

- **High hardness coating layer** - Ensuring stable cutting from high Si content, increased wear resistance and frictional heat resistance due to applying a new AlTiSiN series coating layer
- **High hardness substrate** - Containing ultra-fine WC + Co 9% and expanded general application range by maximizing cutting edge feature
- **Edge treatment** - Increased chipping resistance in the beginning of high hardness Steel cutting and enhanced wear resistance lead to stable cutting



#### High hardness substrate }

- Ultra-fine WC+Co 9%
- Expanded general application range by maximizing cutting edge feature

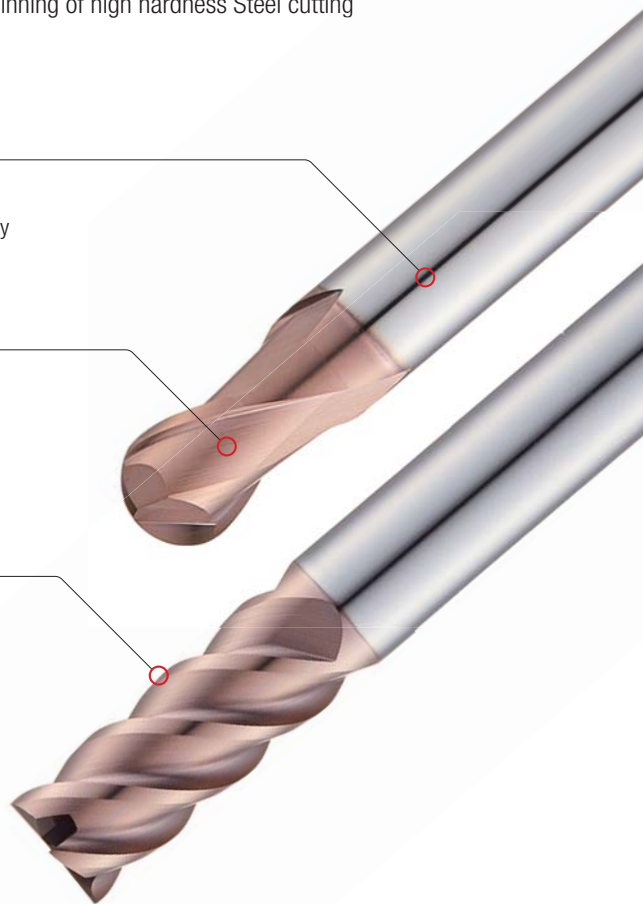
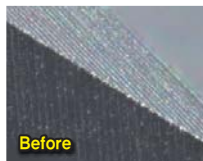


#### High hardness coating layer }

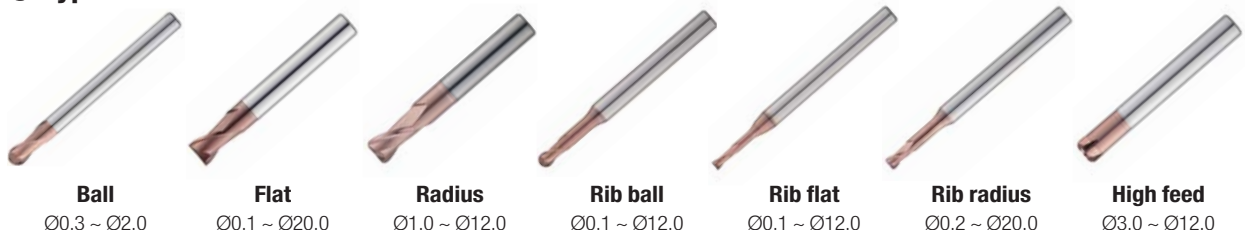
- High Si content
- Enhanced wear resistance
- Stable cutting through frictional heat resistance increase

#### Edge treatment }

- Enhancing chipping resistance in the beginning of high hardness Steel cutting
- Increased wear resistance and stable cutting performance



### ↻ Type





# U-Star Endmill

## General use Endmill for Medium hardness and Alloy steel cutting

- Wide line-ups for cutting various and complicated shaped workpieces
- Long tool life due to new coating and optimal substrate for cutting



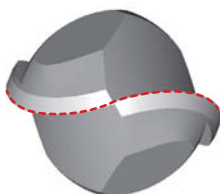
### ( Features )

- Carbide Endmill for HRC30~50 medium hardness steel and die Steel cutting
- Enhanced wear resistance, anti-oxidation and lubrication by applying AlCrN series coating layer
- Enhanced cutting edge strength of ball Endmill applying ultra-fine substrate (PC303W)
- Higher chipping resistance of flat Endmill applying high toughness substrate (PC315W)
- Various shaped line-ups for complicated mold machining
- Suitable for precision cutting with high precision tolerance of h5 shank, flute and radius



#### Applying substrate for medium hardness Steel cutting

- Separating the substrate (PC303W and PC315W) maximizes the features of tool and ensures general use.



#### Applying S-curved gash shape

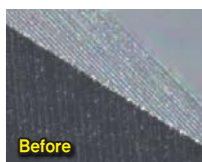
- Increased cutting performance and wear resistance due to dispersing cutting force

#### Edge treatment

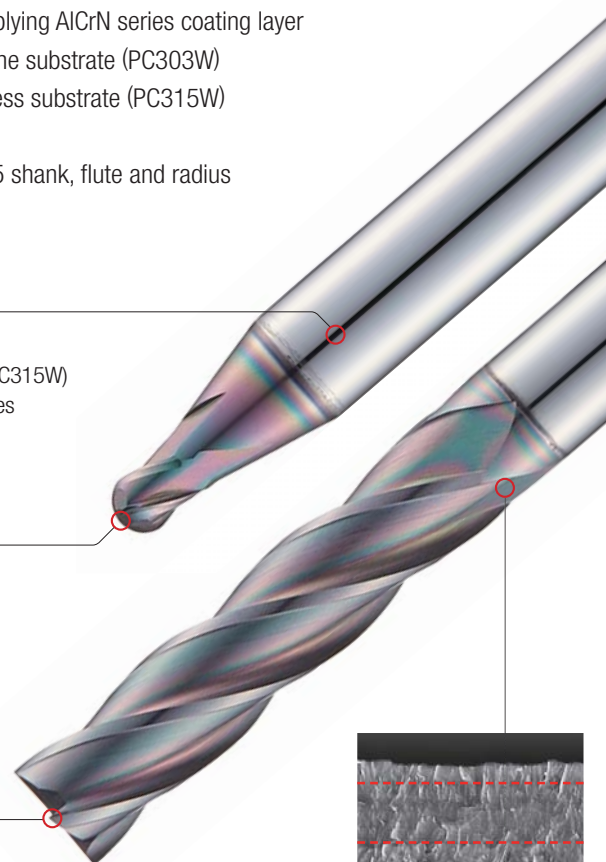
- Enhanced chipping resistance in the beginning of cutting
- Guiding stable cutting for managing the properties of mold machining



After



Before



#### AlCrN base new coating

- Increased wear resistance and oxidation resistance by multi layer
- Enhanced lubrication with Cr containing
- Stable cutting under frictional heat

### ↪ Type



Flat

Ø0.1 ~ Ø25.0



Radius

Ø0.2 ~ Ø20.0



Ball

Ø0.1 ~ Ø25.0



Roughing

Ø3.0 ~ Ø25.0



# S-Star Endmill

## Endmill for Stainless steel machining

- Suitable for difficult to cut material such as STS, Ti, Ni and Inconel
- New coatings with high oxidation resistance and surface hardness
- Advanced surface roughness with improved chip emission and deposition resistance



### { Features }

- Stable high speed processing with minimum vibration, unequal index and optimal rake angle
- High processability and low vibration by applying unequal index in cutting edge
- Minimum vibration through optimized helix angle and R gash, enhanced chip emission with stiffness supplementation
- Reduced friction resistance and improved chip emission by applying new coatings with high surface hardness oxidation resistance
- Enhanced chipping resistance and deposition resistance with new strengthened flute



#### Applying high toughness substrate }

- Chipping resistance and stable cutting from applying high toughness substrate



#### Applying different width and size of AlCrN based layer }

- Applying multi layers
- Increased lubrication due to containing Cr
- Ensured stability against frictional heat
- Secured wear resistance from thicker coating layer

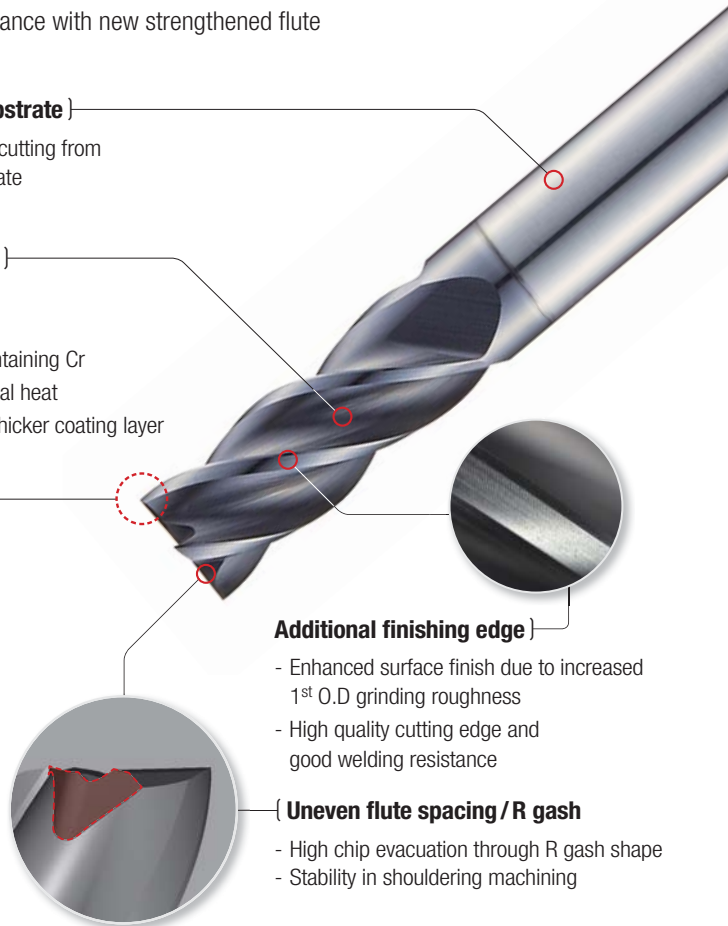
#### Cutting edge treatment }

- Improved chipping resistance in the beginning of cutting
- Better wear resistance and stable cutting
- High quality of product from cutting edge treatment stabilization



After

Before



#### Additional finishing edge }

- Enhanced surface finish due to increased 1<sup>st</sup> O.D grinding roughness
- High quality cutting edge and good welding resistance

#### { Uneven flute spacing / R gash }

- High chip evacuation through R gash shape
- Stability in shouldering machining

### ➞ Type



**Flat**

Ø1.0 ~ Ø20.0



**Radius**

Ø1.0 ~ Ø20.0



**Ball**

Ø1.0 ~ Ø20.0



**Roughing**

Ø3.0 ~ Ø20.0



# G-Star Endmill

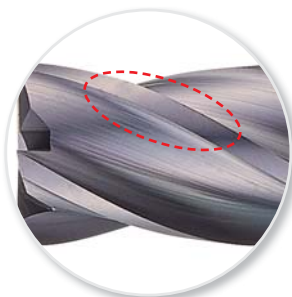
## Endmill for Low hardness

- Suitable for low hardness Steel (HrC10~30) : Alloy steel, Carbon steel, Pre-hardened steel etc.
- General purpose suitable for rough machining, finishing and curved and sloped surfaces

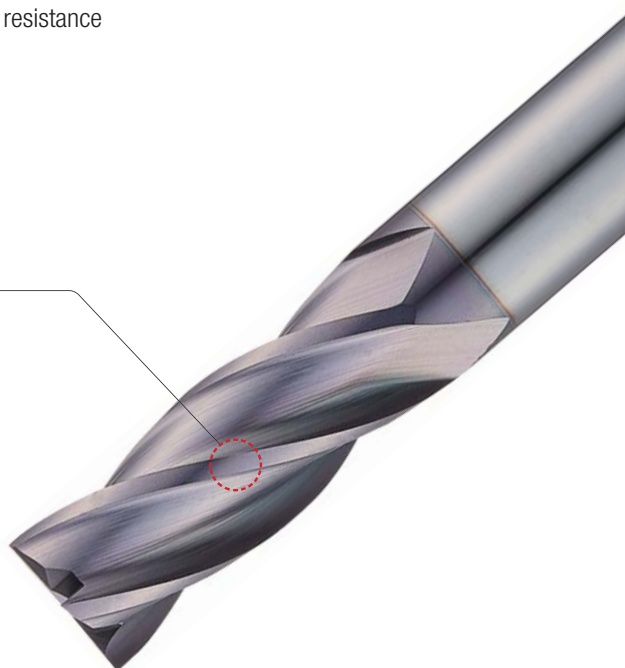


### ( Features )

- Excellent rake angle and cutting edge considered the characteristics of workpiece
- Improved chipping resistance and enhanced machinability by using high toughness materials
- TiAlN coating for enhanced oxidation resistance and chipping resistance



Excellent workpiece finishes by  
45° high helix angle

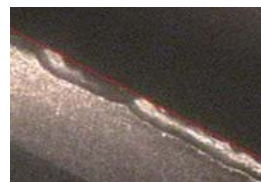


### • Performance evaluation

<b>Workpiece</b>	Carbon steel (STC3)
<b>Cutting condition</b>	vc (m/min) = 140, fz (mm/t) = 0.02, ap (mm) = 10.0 ae (mm) = 0.4, dry
<b>Tool</b>	ZE304100P (Diameter = Ø10 mm)



[ G-Star Endmill ]



[ Competitor ]

### ↻ Type



**Flat**

Ø1.0 ~ Ø20.0



**Radius**

Ø3.0 ~ Ø12.0



**Ball**

Ø1.0 ~ Ø20.0



# A-Star Endmill

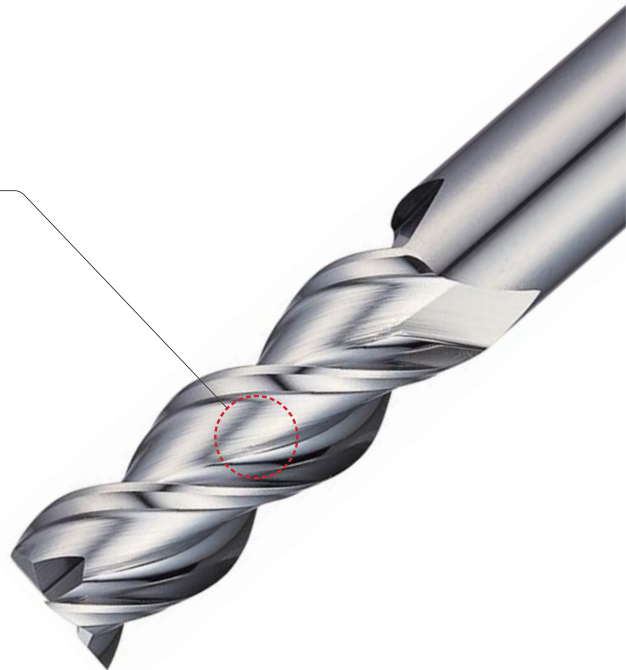
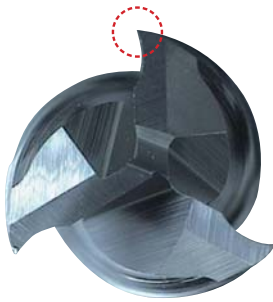
## Endmill for Aluminum machining

- Suitable for Aluminum, Aluminum alloy and Non-ferrous materials
- Various specifications in the line such as ball, single flute and roughing etc. for wide range in machining

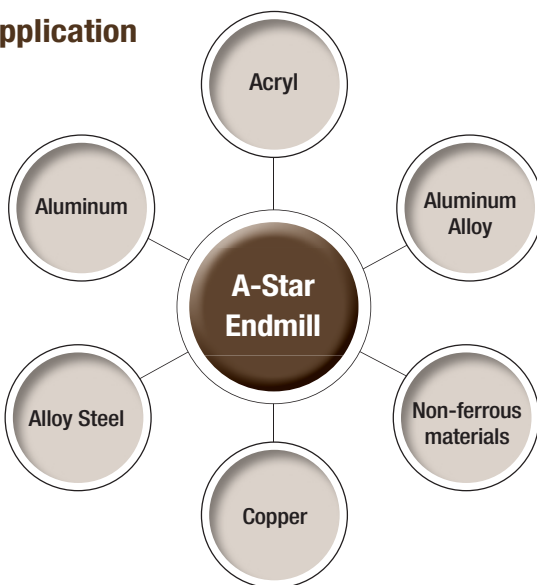


### { Features }

- Sharp cutting edge considered the characteristics of workpiece
- High deposition resistance and enhanced chip emission through the surface of a mirror in the groove



## Application



## ↻ Type



**Flat**  
Ø0.2 ~ Ø25.0



**Radius**  
Ø1.0 ~ Ø20.0



**Ball**  
Ø6.0 ~ Ø20.0



**Roughing**  
Ø6.0 ~ Ø20.0

### For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasses or safety cover to hedge possible dangers. Inappropriate usage or excessive cutting condition may lead tool's breakage or even the fragment's scattering.
- Clamp the workpiece tightly enough to prevent its movement while its machining.
- Properly manage the tool change phase because the inordinately used tool can be easily broken under the excessive cutting load or severe wear, and it may threat the operator's safety.
- Use safety cover because chips evacuated during cutting are hot and sharp and may cause burns and cuts. To remove chips safely, stop machining, put on protective gloves, and use a hook or other tools.
- Prepare for fire prevention measures as the use of the non-water soluble cutting oil may cause fire.
- Use safety cover and other safety supplies because the spare parts or the inserts can be pulled out due to centrifugal force while high speed machining.



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