EN

Technical Information **KORLOY**

Solid Tools Solution



Endmill

Drill

Reamer

Chamfer

Thread



KORLOY

CONTENTS

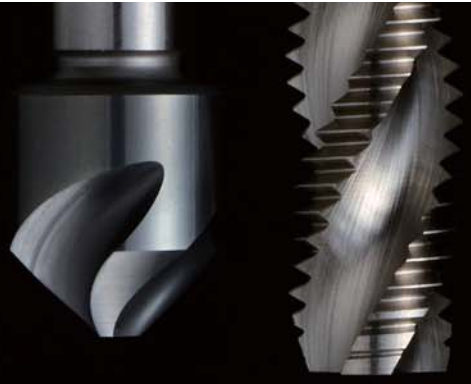
PART 1

Endmill

Endmill index 20

Super Endmill [for difficult-to-cut materials(HRSA/Ti)] 030
H-Star Endmill [for high speed and high hardness(HRC50~63)] 039
U-Star Endmill [for general cutting(HRC30~50)] New 112
G-Star Endmill [for general cutting(HRC10~30)] 196
R+ Endmill [for roughing] 221
S-Star Endmill [for stainless steel] New 228
A-Star Endmill [for aluminum] 241
D Endmill [for graphite] 253
Composite Router Endmill [for composite materials] 262
T Endmill [for dental prostheses] 268
PCD Endmill [for non-ferrous metals] 271





PART 2

Drill

Drill index 272

MSD Plus 276
MSD Plus-S 282
MLD Plus 287
MSD Plus CFRP 290
MSFD 292
P-Star Drill 297
W-Star Drill 315
SSD-N 324
Burnishing Drill 327
Top Solid Drill 329
PCD Drill 330
Gun Drill 333

PART 3

Reamer
Chamfer
Thread

Reamer / Chamfer / Thread index 336

Chucking / Machine Reamer 340
PCD Reamer 342
Cermet Reamer 343
Broach Reamer 344

Chamfer Tool 345
Counter Sink 348

Thread Mill 352
TAP 374

Recommended cutting conditions 409

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

Super Endmill *For HRSA For Ti*

- 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

See page 30.



Super Endmill

Optimal Endmill for Ni Based super alloy HRSA : Inconel718, Hastelloy, waspalloy and etc.



For High Hardness

H-Star Endmill

- Ultra-fine substrate increases cutting edge strength of tools.
- The new coating layer applied provides hardness and a high temperature oxidation resistance of cutting edge in high speed machining
- Optimally designed cutting edge for high speed machining ensures stable machinability.

See page 39.

H-Star Endmill

Suitable for high speed machining of hardened workpieces ($H_RC50\sim63$).

The line-up of long neck, rib, taper neck, etc. is available for using in machining with various shapes.

U-Star Endmill

U-Star Endmill is suitable for machining medium hardness workpieces (HRC30~50) made of alloy steel, carbon steel, die steel, etc.

Full line-up available with various shapes like miniature type, taper neck, ball type, etc.

For mold & die

U-Star Endmill

New

- U-Star Endmill is available for a wide cutting range: roughing, medium cutting and finishing of molds and dies, and for various cutting methods of curved and inclined surfaces, special shapes, etc.
- High toughness substrate actualizes chipping resistance and hardness in machining.
- The new coating technology ensures oxidation resistance and high cutting edge strength.

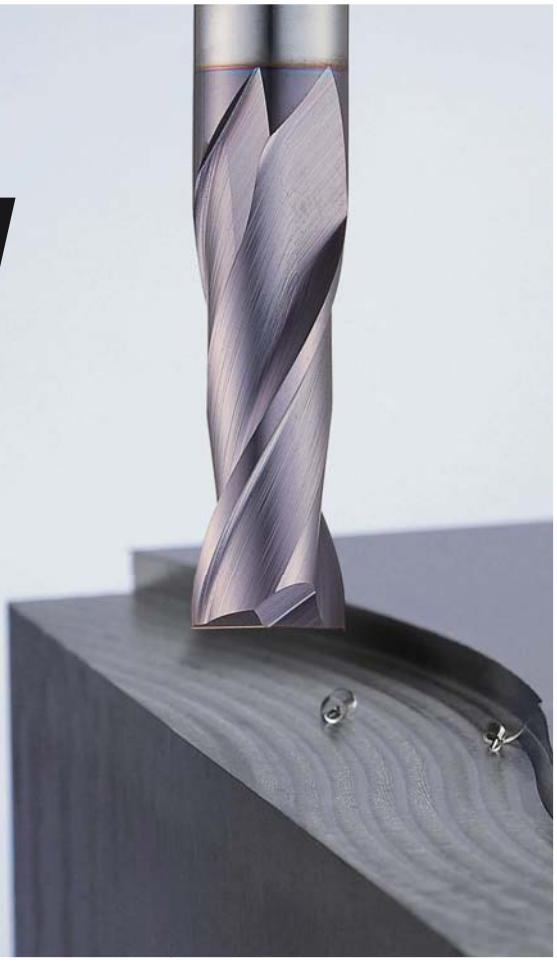
See page 112.

For low hardness

G-Star Endmill

- 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.

See page 196.



G-Star Endmill

Suitable for low hardness steel (HRC10~30); alloy steel, carbon steel, Pre-hardened, hardened steel etc.

General purpose suitable for rough machining, finishing and curved and sloped surfaces



Highly Efficient Roughing Endmill Series

R+ Endmill

- Cost-saving cutting edge design for highly efficient roughing applications
- Reduced cutting load due to both differential pitch and unequal helix formation

See page 221.

R+ Endmill

Blade design ideal for roughing

High machining efficiency due to the special design for medium to rough cutting

For Stainless Steel Machining

S-Star Endmill

New

- High machining efficiency through unequal index cutting edge in all series.
- Excellent chipping resistance and Minimized sudden breakage by using high toughness materials.
- Multi layer coating for enhanced oxidation resistance and high hardness on surface.
- Superb Groove design to improve chip emission according to workpiece's characteristics.

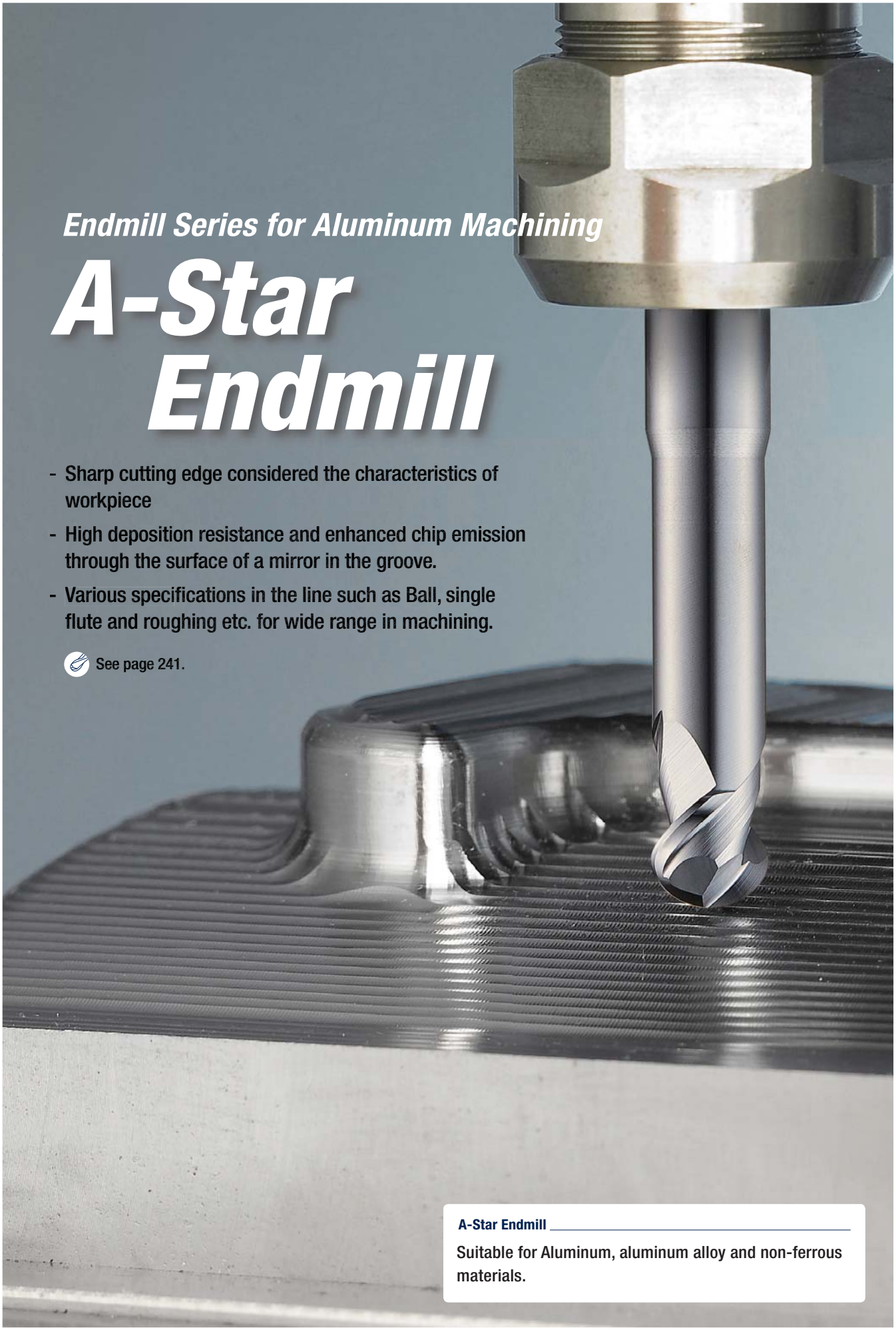
See page 228.



S-Star Endmill

Suitable for the hard-to-cut and low hardness material ; Stainless, Titanium and Inconel etc.

General purpose suitable for rough machining, finishing and curved and sloped surfaces.



Endmill Series for Aluminum Machining

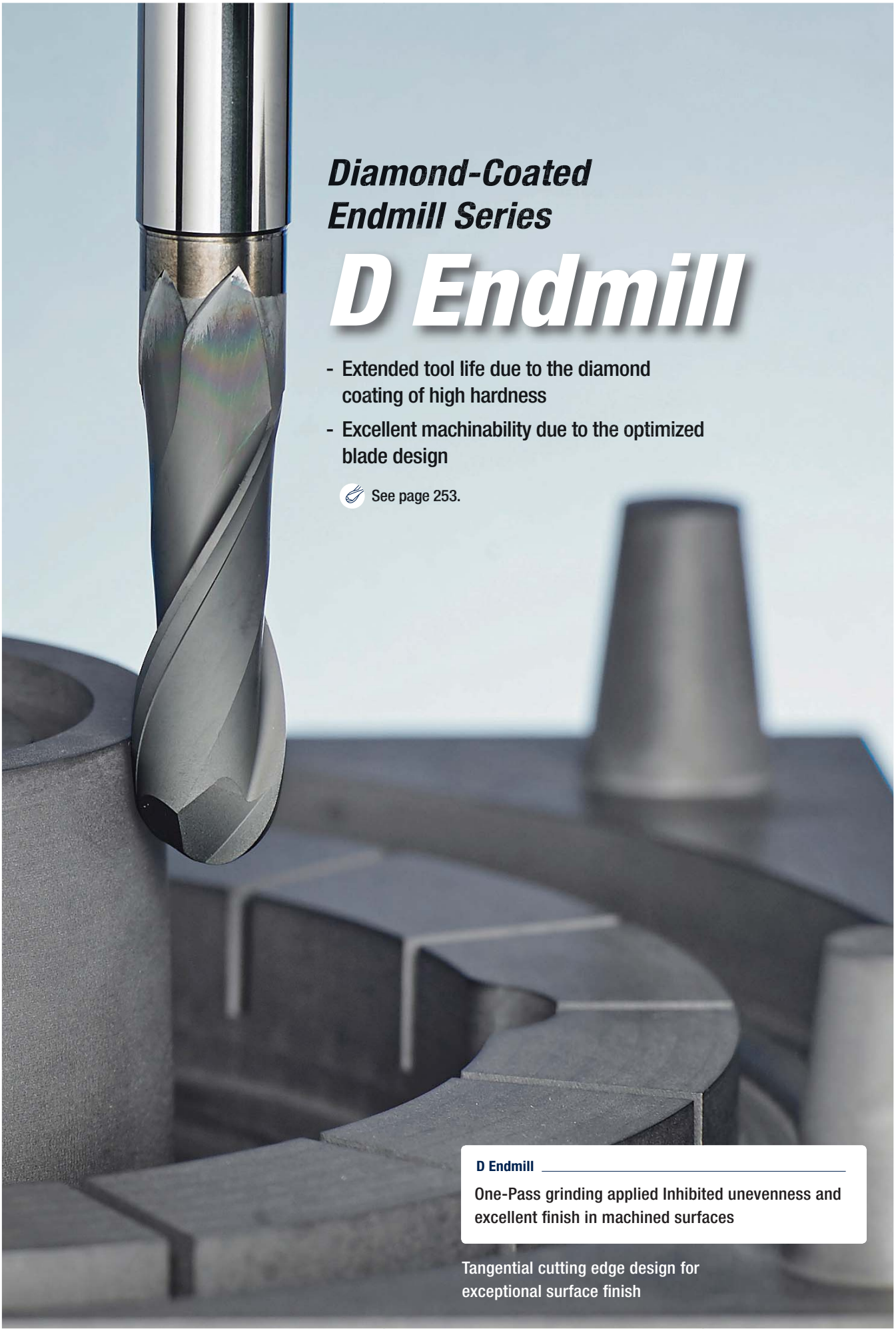
A-Star Endmill

- Sharp cutting edge considered the characteristics of workpiece
- High deposition resistance and enhanced chip emission through the surface of a mirror in the groove.
- Various specifications in the line such as Ball, single flute and roughing etc. for wide range in machining.

See page 241.

A-Star Endmill

Suitable for Aluminum, aluminum alloy and non-ferrous materials.



Diamond-Coated Endmill Series

D Endmill

- Extended tool life due to the diamond coating of high hardness
- Excellent machinability due to the optimized blade design

See page 253.

D Endmill

One-Pass grinding applied Inhibited unevenness and excellent finish in machined surfaces

Tangential cutting edge design for exceptional surface finish



Composite Router Endmill

Nano-crystalline diamond coating for excellent tool life

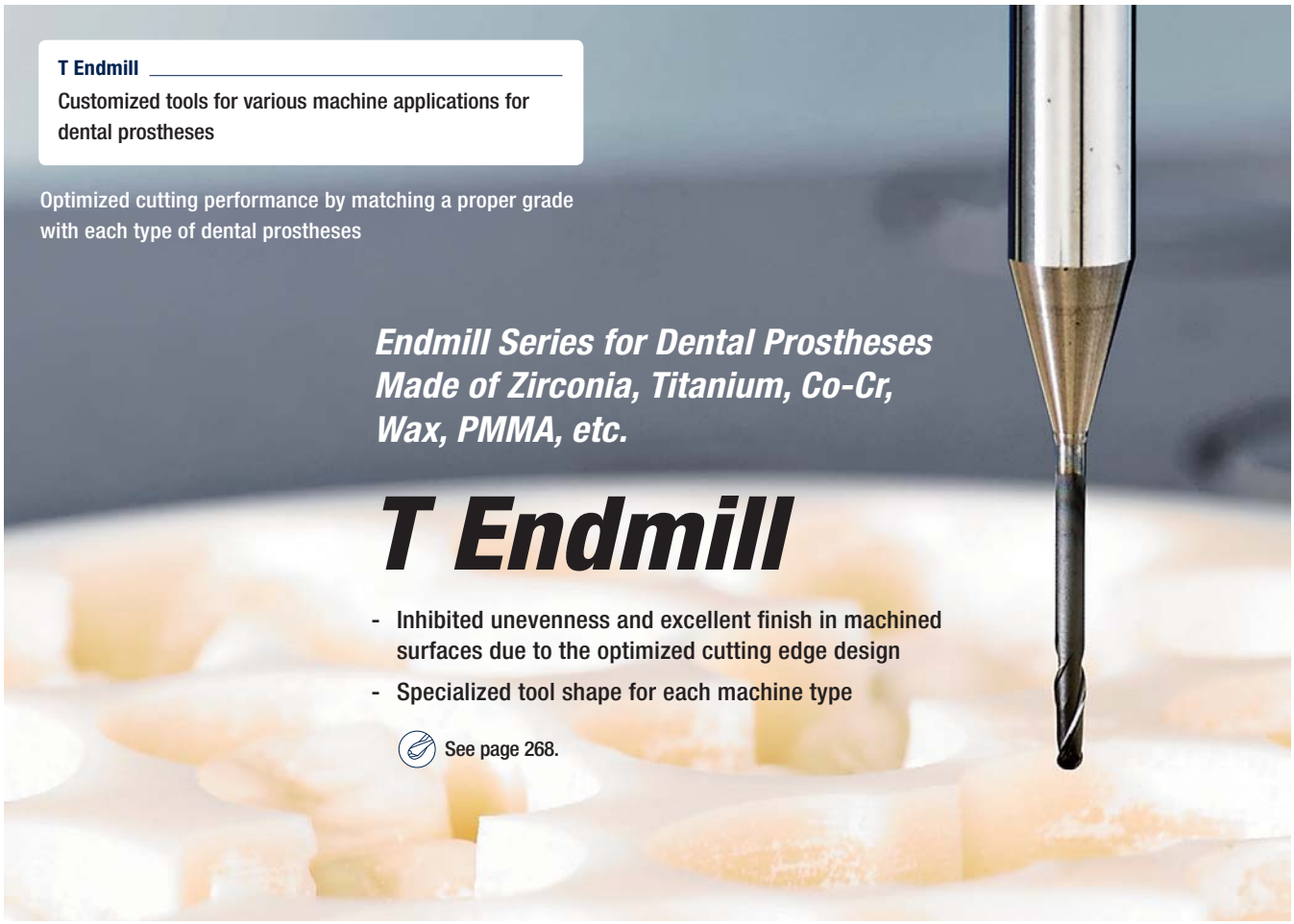
Router Endmill optimized for machining composite materials (CFRP, GFRP, etc.)

Router Endmill Series for Machining Composite Materials

Composite Router Endmill

- Blade design to inhibit delamination and burrs
- Boosted productivity due to highly efficient machining

See page 262.



T Endmill

Customized tools for various machine applications for dental prostheses

Optimized cutting performance by matching a proper grade with each type of dental prostheses

Endmill Series for Dental Prostheses Made of Zirconia, Titanium, Co-Cr, Wax, PMMA, etc.

T Endmill

- Inhibited unevenness and excellent finish in machined surfaces due to the optimized cutting edge design
- Specialized tool shape for each machine type

See page 268.



Highly Efficient Hole Machining for Various Workpieces Including Automotive Components

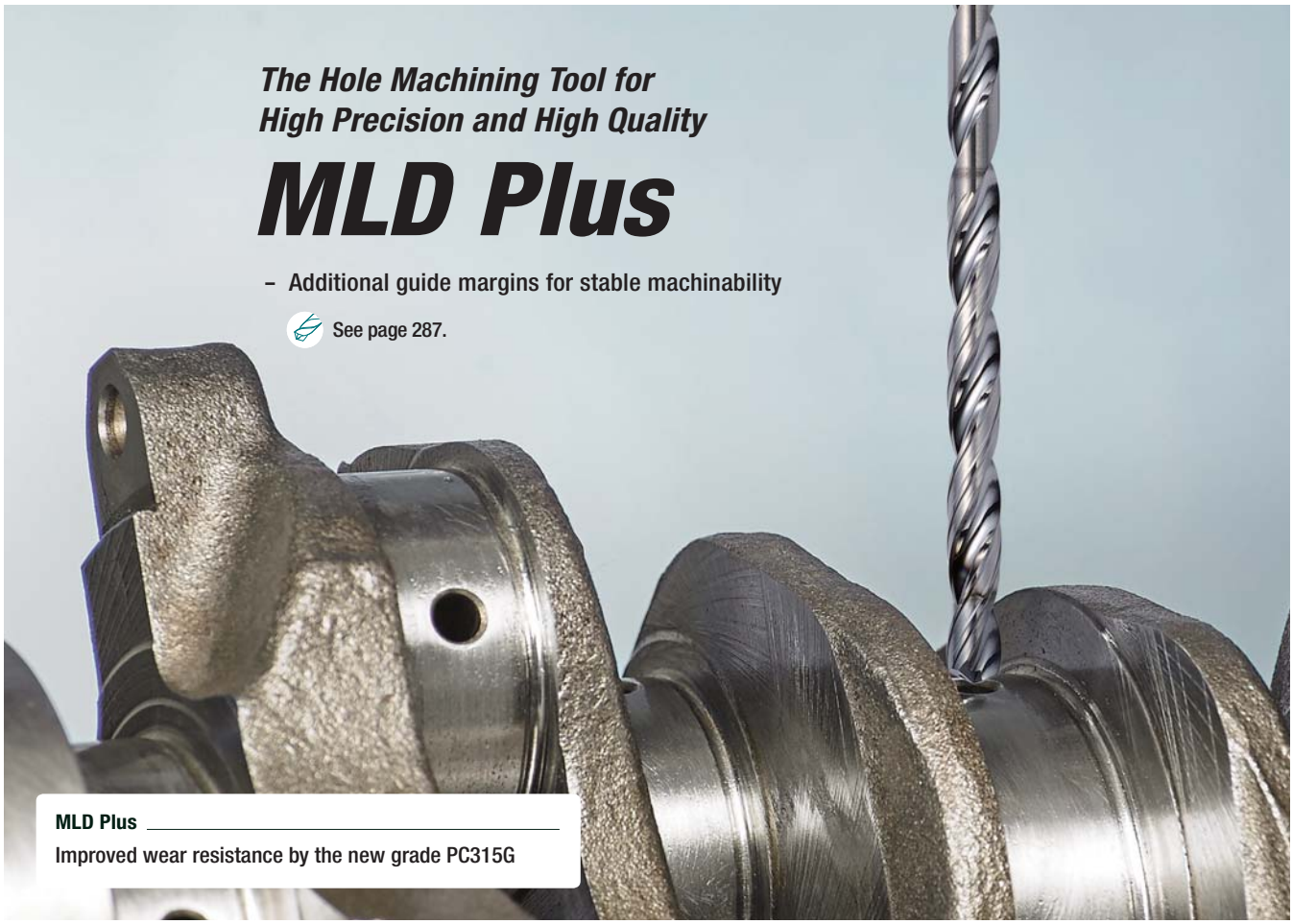
MSD Plus

- Highly efficient hole machining for various workpiece types such as automotive components
- Wider chip pockets for smooth chip evacuation

See page 276.

MSD Plus

Improved wear resistance by the new grade PC325U



The Hole Machining Tool for High Precision and High Quality

MLD Plus

- Additional guide margins for stable machinability

See page 287.

MLD Plus

Improved wear resistance by the new grade PC315G



For Hole Machining of Inconel and Titanium

MSD Plus-S

- Stable machinability with the optimized blade design and chip pockets
- Extended tool life due to excellent high temp resistance to chipping

See page 282.

MSD Plus-S

Specialized for heat-resistant alloys used in aerospace, energy, power generation and automotive industries

Improved productivity and wear resistance due to stable machinability



The Hole Machining Tool Optimized for CFRP

MSD Plus CFRP

- Reduced burrs and excellent hole quality in CFRP machining by the high rake cutting edges

See page 290.

MSD Plus CFRP

Strong wear resistance by the new diamond-coated grade ND2100



The Hole Machining Tool for Wide Applications Including Ramped, Curved and Flat Surfaces

MSFD

- High-quality drilling availability in ramped surfaces by 180° point angle

See page 292.

MSFD

Improved resistance to chipping and welding, and reduced burrs by edge honing and chamfering



Universal drill applied with DIN standard

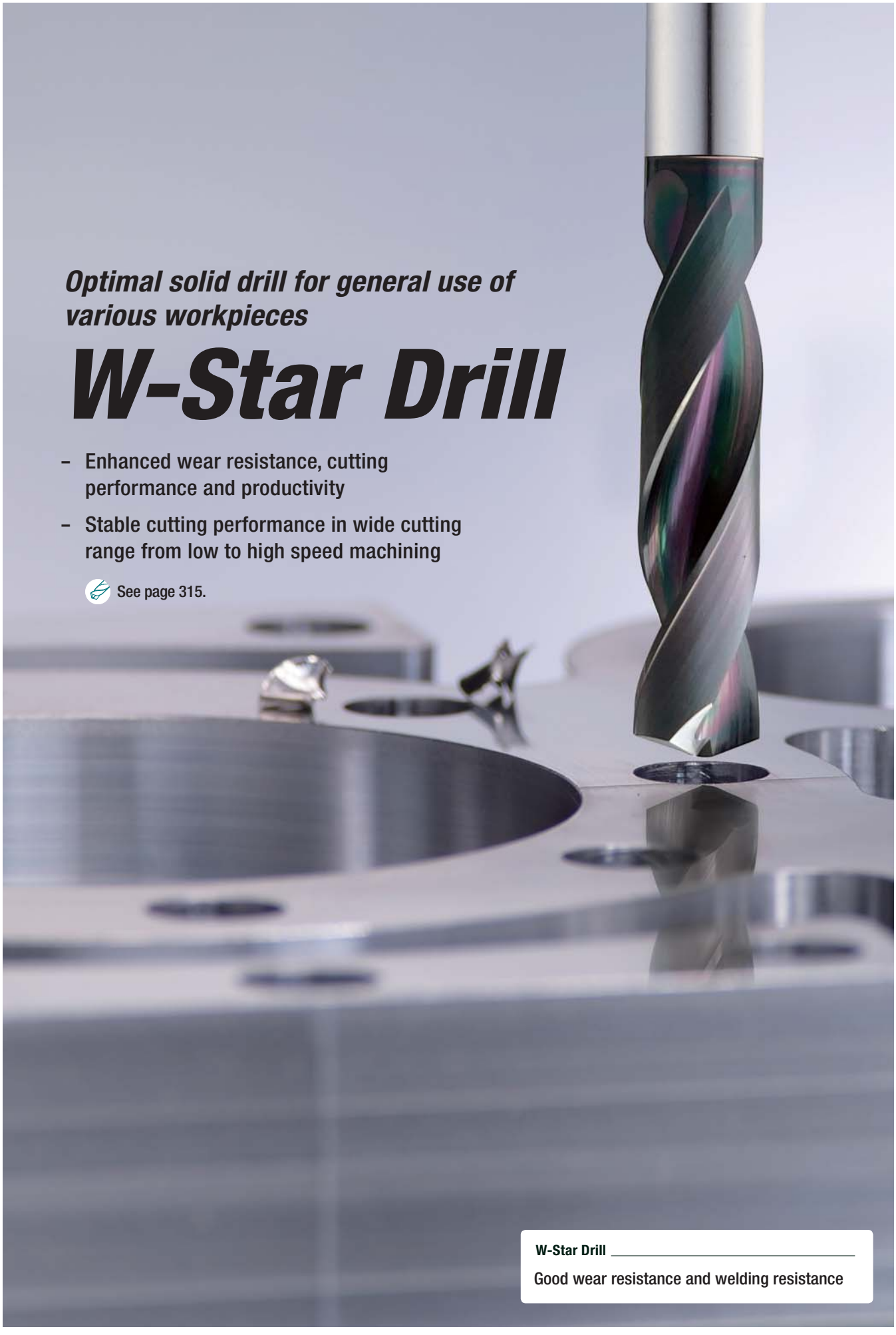
P-Star Drill

- High toughness substrate enabling a high speed and high feed machining.
- The new coating strengthens surface hardness and thermal stability
- Internal coolant series of P-Star Drill actualizes high machinability and reduces frictional heat.

See page 297.

P-Star Drill

Drill applied with DIN standard is suitable for high speed machining (~HRC50).



Optimal solid drill for general use of various workpieces

W-Star Drill

- Enhanced wear resistance, cutting performance and productivity
- Stable cutting performance in wide cutting range from low to high speed machining

See page 315.

W-Star Drill

Good wear resistance and welding resistance



Carbide Solid Drill for Non-ferrous metals and Mild steel Machining

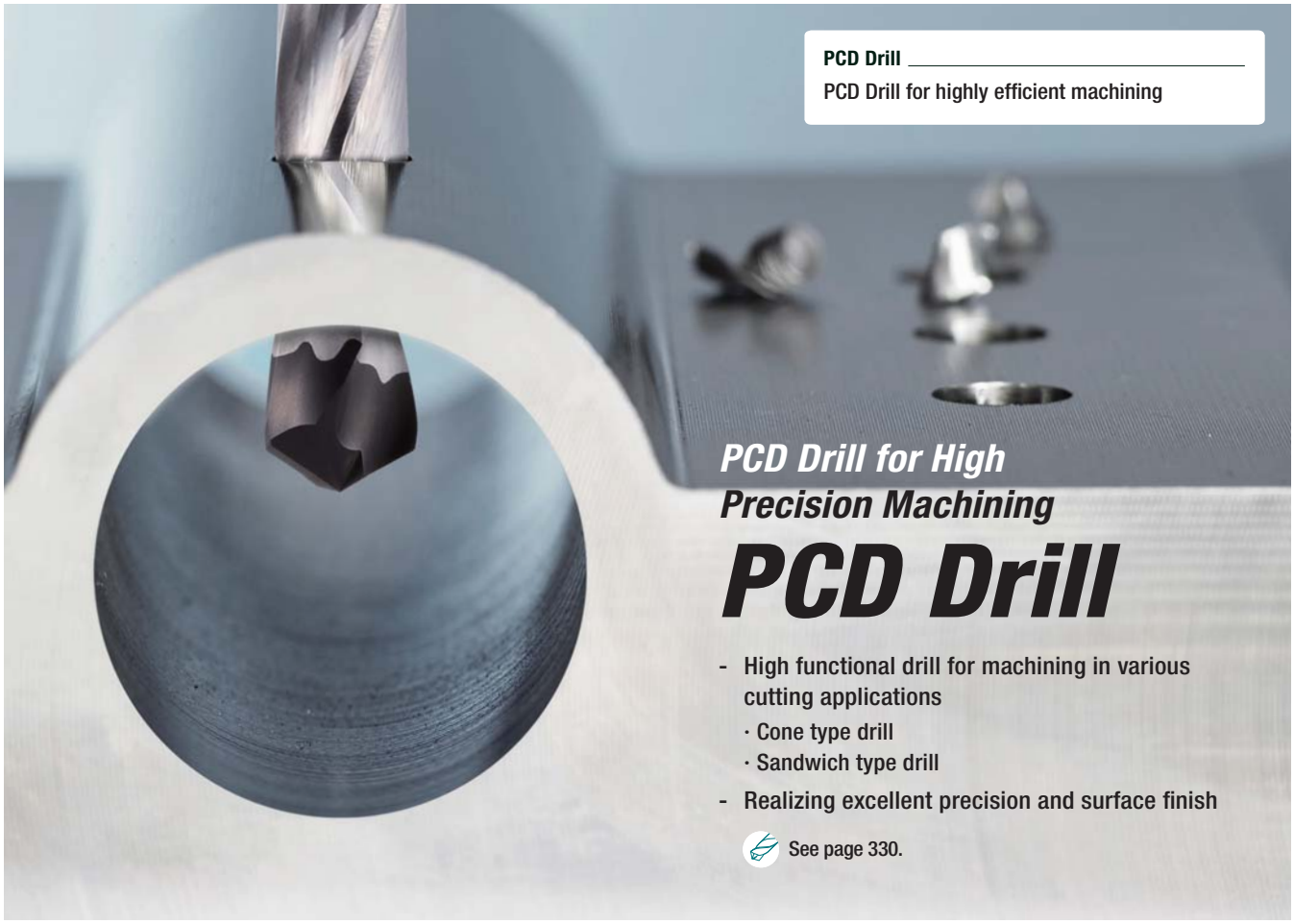
SSD-N

– Stable machining for high productivity

See page 324.

SSD-N

Available for various workpieces such as mild steel and non-ferrous metals



PCD Drill

PCD Drill for highly efficient machining

PCD Drill for High Precision Machining

PCD Drill

- High functional drill for machining in various cutting applications
  - · Cone type drill
  - · Sandwich type drill
- Realizing excellent precision and surface finish

See page 330.

Various counter sinks for high efficient machining

Counter Sink

- Unequal division and unequal lead applied for a high efficiency machining.
- Improved machinability actualizes high precision and stable machining.
- The new coating layer ensures stable machinability and extended tool life.

See page 348.

Counter Sink

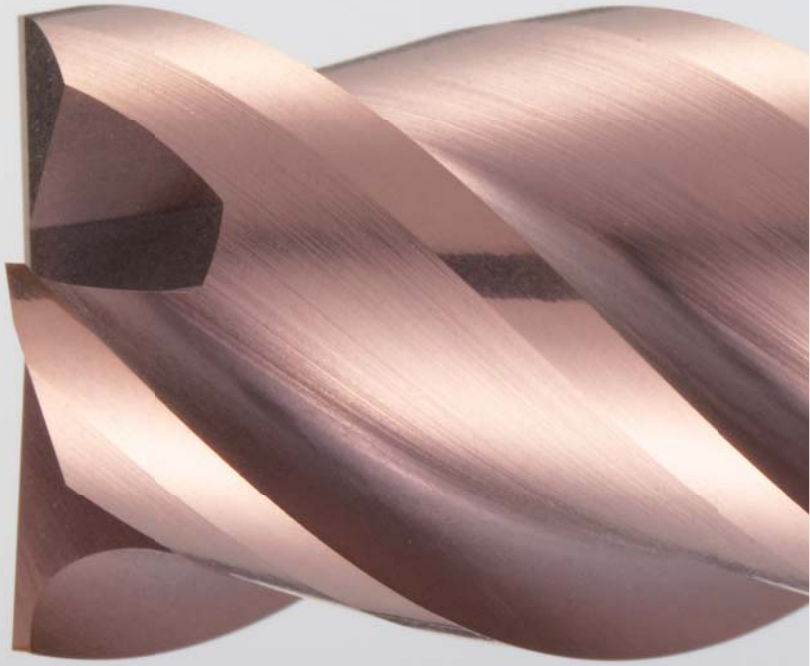
Carbide/HSS countersink with fast and stable performance

PART 1

Endmill



Product details



Super Endmill [for difficult-to-cut materials(HRSA/Ti)] **030**

H-Star Endmill [for high speed and high hardness(HRC50~63)] **039**

U-Star Endmill [for general cutting(HRC30~55)] New **112**

G-Star Endmill [for general cutting(HRC10~30)] **196**

R+ Endmill [for roughing] **221**

S-Star Endmill [for stainless steel] New **228**

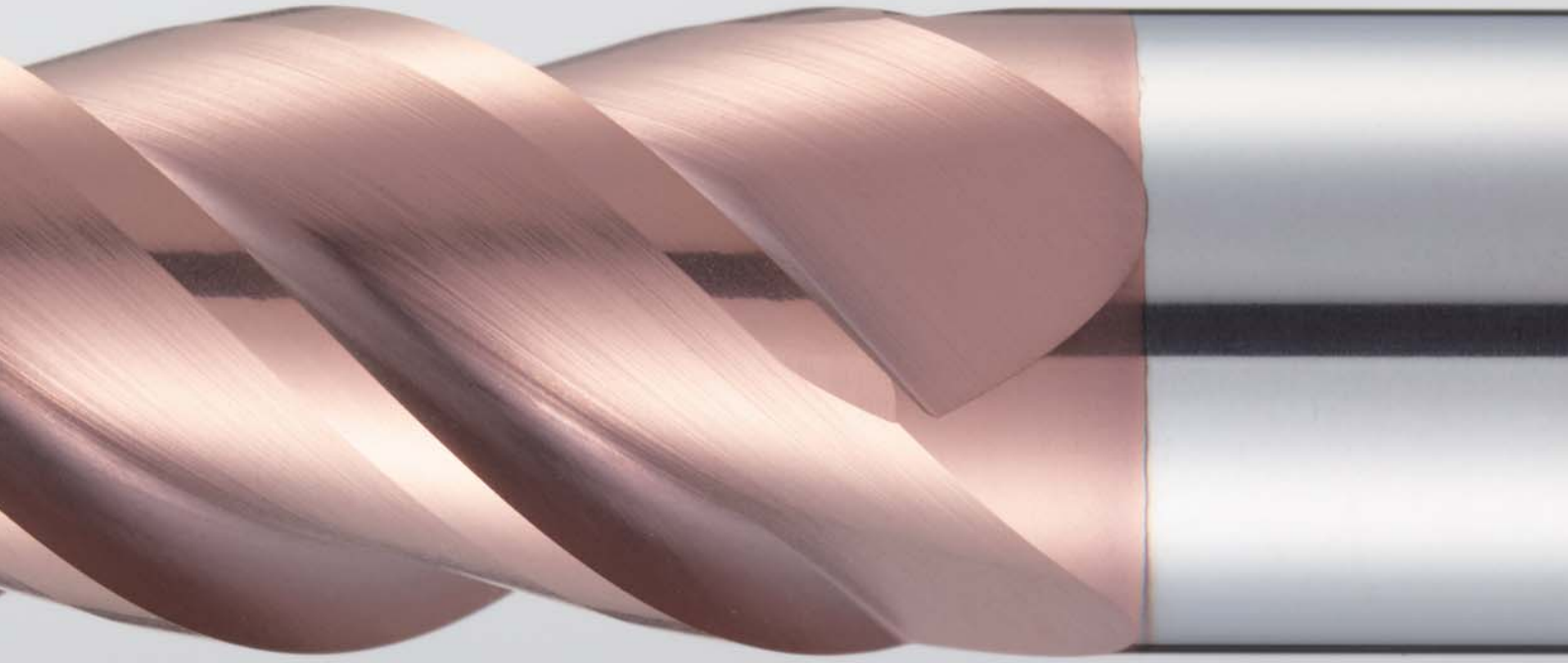
A-Star Endmill [for aluminum] **241**

D Endmill [for graphite] **253**

Composite Router Endmill [for composite materials] **262**

T Endmill [for dental prostheses] **268**

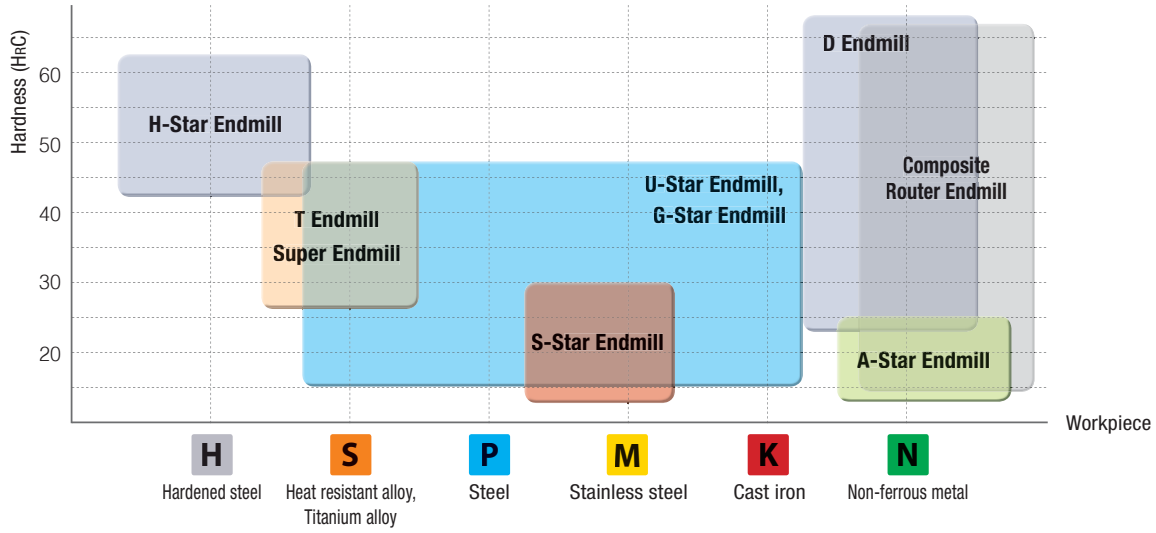
PCD Endmill [for non-ferrous metals] **271**



Technical information for Endmill

KORLOY Endmill

Application area



Tool selection guideline by functions

● 1st recommended ◑ 2nd recommended ○ Not recommended

Type	No. of tooth		Precise finishing	Finishing	Roughing	Slotting	Plunging	Copying	Trochoidal milling
Flat/ Radius	2 teeth		○	○	◑	●	●	○	○
	3 teeth		○	◑	◑	●	◑	○	○
	4 teeth		●	●	●	●	○	○	●
	6 teeth or over		●	●	○	○	○	○	●
Ball	2 teeth		○	○	○	●	○	●	○
	4 teeth		○	○	○	◑	○	●	○

- It is recommended to choose the shortest length tool in every application as possible.
- Stable machining actualizes long tool life and enhanced surface finish.

Line-up and features

Work-piece	Use	Product name	Type	No. of tooth	Diameter (tolerance)	Picture / No. of standard items	Features
H	High hardness (~HRC63)	H-Star Endmill	F, B, R	2~6	0.1~20	 3,007 Items	• Economical tools for high speed and high hardness machining • Available for various shapes of workpiece as long-neck
P K	hardness (~HRC50)	U-Star Endmill	F, B, R, R	2~6	0.1~25	 4,585 Items	• Economical tools for general machining with high performance • For various workpiece machining (carbon steel, alloy steel, cast iron, pre-hardened, etc.)
	General (~HRC30)	G-Star Endmill	F, B, R	2~4	1.0~20	 456 Items	• For general machining with high performance and high quality • For various workpiece machining (carbon steel, alloy steel, cast iron, pre-hardened, etc.)
M	Stainless steel	S-Star Endmill	F, B, R, R	2~7	1.0~20	 187 Items	• Optimal performance in stainless machining • Enhanced oxidation resistance
S	HRSA	Super Endmill	F, R	4	3.0~20	 162 Items	• Endmill for HRSA machining • Optimal for machining of Ni based HRSA such as Inconel, Hastelloy, Waspaloy, etc.
	Titanium	Super Endmill	F, R	2/4	1.0~20	 64 Items	• Endmill for titanium and stainless steel cutting • Longer tool life : high toughness substrate and high lubrication coating layer
N	Non-ferrous metal, Aluminum	A-Star Endmill	F, B, R	2~3	1.0~20	 330 Items	• Effective chip evacuation in high feed machining with U-shape • Double relief angle (stronger cutting edge)
	Composite materials	Composite Router Endmill	F	2~8	4.0~12	 44 Items	• Router for composite material machining • High performance due to Nano-Crystalline dia-coating
	Graphite, Ceramics	D Endmill	F, B, R	2~4	0.6~12	 280 Items	• Longer tool life due to high hardness dia-coating • Applying one-pass grinding and good surface finish
	Dental, metal, wax, Zirconia	T Endmill	B	2	0.6~3	 11 Items	• Endmill for machining materials for stooping teeth, Zirconia, Titanium, Co-Cr, Wax, PMMA, etc. • Applicable to dental milling machine and various materials for stooping teeth
For general machining with special function	Roughing	R+ Endmill	R	2~4	5.0~25	 204 Items	• Endmill with a shape minimizing cutting load for roughing

KORLOY Endmill

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (Ø) Min	Size (Ø) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
Super Endmill	HRSA	Flat	**SFES**		SL	4	3.0	20.0					◎		31
		Radius	**SRES**		SL	4	3.0	20.0					◎		32
	Ti/STS	Flat	**SFET**		UL	4	3.0	20.0		◎			◎		35
		Radius	**SRET**		UL	4	3.0	20.0		◎			◎		36
		SBET	**SBET**		UL	2	1.0	12.0		◎			◎		37
			SBET		UL	4	4.0	12.0		◎			◎		38
H-Star Endmill	High speed, High hardness	Ball	**ESB702**		AlTiN	2	0.1	12.0	◎		◎		○	◎	41
			ESB712		AlTiN	2	1.0	12.0	◎		◎		○	◎	42
			ESB703		AlTiN	3	2.0	12.0	◎		◎		○	◎	43
			ESB734		AlTiN	4	2.0	10.0	◎		◎		○	◎	44
		Flat	**ESE702**		AlTiN	2	0.1	20.0	◎		◎		○	◎	45
			ESE712		AlTiN	2	1.0	6.0	◎		◎		○	◎	46
			ESE704		AlTiN	4	1.0	20.0	◎		◎		○	◎	47
			ESE714		AlTiN	4	1.0	12.0	◎		◎		○	◎	48
			ESE724(6)		AlTiN	4/6	1.0	12.0	◎		◎		○	◎	49
			ESE744		AlTiN	4	1.0	12.0	◎		◎		○	◎	50
			ESE716		AlTiN	6	6.0	20.0	◎		◎		○	◎	51
		Radius	**ESR702**		AlTiN	2	1.0	12.0	◎		◎		○	◎	52
			ESR732		AlTiN	2	1.0	12.0	◎		◎		○	◎	55
			ESR704		AlTiN	4	1.0	12.0	◎		◎		○	◎	56
			ESR714		AlTiN	4	3.0	12.0	◎		◎		○	◎	58
			ESR724		AlTiN	4	6.0	12.0	◎		◎		○	◎	59
			ESR734		AlTiN	4	1.0	12.0	◎		◎		○	◎	60
			ESR706		AlTiN	6	6.0	12.0	◎		◎		○	◎	61

◎: Excellent ○: Good

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (Ø) Min	Size (Ø) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
H-Star Endmill	High speed, High hardness	Radius	ESR736		AlTiN	6	6.0	12.0	◎		◎		○	◎	62
		Rib ball	ESRB712		AlTiN	2	0.1	12.0	◎		◎		○	◎	63
		Rib flat	ESRE712		AlTiN	2	0.1	12.0	◎		◎		○	◎	67
			ESRE714		AlTiN	4	0.5	12.0	◎		◎		○	◎	70
		Rib radius	ESRR712		AlTiN	2	0.2	16.0	◎		◎		○	◎	73
			ESRR714		AlTiN	4	0.5	20.0	◎		◎		○	◎	79
		Flat	ESXE704		AlTiN	4	1.0	12.0	◎		◎		○	◎	86
			ESXE714		AlTiN	4	2.0	12.0	◎		◎		○	◎	87
		Radius	ESXR704		AlTiN	4	2.0	12.0	◎		◎		○	◎	88
		Rib ball	ESLNB20		AlTiN	2	0.1	5.0	◎		◎		○	◎	89
			ESTNB20		AlTiN	2	0.2	10.0	◎		◎		○	◎	93
			ESTNB30		AlTiN	3	2.0	5.0	◎		◎		○	◎	97
		Rib flat	ESLNS20		AlTiN	2	0.1	5.0	◎		◎		○	◎	99
			ESLNS40		AlTiN	4	1.0	5.0	◎		◎		○	◎	103
		Rib radius	ESLNR		AlTiN	2	0.2	3.0	◎		◎		○	◎	105
			ESTNR		AlTiN	2	0.2	3.0	◎		◎		○	◎	109
		High feed	ESPM4		AlTiN	4	3.0	12.0	◎		◎		○	◎	111
U-Star Endmill (New)	General	Flat	UE502		AlCrN	2	0.1	25.0	◎	○	○			◎	115
			UE512		AlCrN	2	0.1	12.0	◎	○	○			◎	117
			UE522		AlCrN	2	1.0	25.0	◎	○	○			◎	120
			UXE502		AlCrN	2	0.1	20.0	◎	○	○			◎	122
			UE504H		AlCrN	4	1.0	20.0	◎	○	○			◎	124
			UE514		AlCrN	4	1.0	12.0	◎	○	○			◎	125
			UE524		AlCrN	4	1.0	25.0	◎	○	○			◎	127

◎: Excellent ○: Good

KORLOY Endmill

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (Ø) Min	Size (Ø) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
U-Star Endmill	General	Flat	ULE504		AlCrN	4	3.0	16.0	◎	○	○			◎	129
			UE504		AlCrN	4	0.8	25.0	◎	○	○			◎	130
			UXE504		AlCrN	4	1.0	20.0	◎	○	○			◎	131
			UE506		AlCrN	6	6.0	20.0	◎	○	○			◎	132
			UTE502		AlCrN	2	0.3	10.0	◎	○	○			◎	133
			UTE504		AlCrN	4	0.8	10.0	◎	○	○			◎	135
		Radius	UR502		AlCrN	2	0.2	20.0	◎	○	○			◎	138
			UR512		AlCrN	2	0.2	20.0	◎	○	○			◎	141
			UR542		AlCrN	2	0.2	4.0	◎	○	○			◎	147
			UR504		AlCrN	4	3.0	20.0	◎	○	○			◎	153
			UR544		AlCrN	4	1.0	4.0	◎	○	○			◎	154
			UXR504		AlCrN	4	1.0	20.0	◎	○	○			◎	158
			UXR514		AlCrN	4	1.0	20.0	◎	○	○			◎	161
			UR506		AlCrN	6	6.0	20.0	◎	○	○			◎	166
			UDR503		AlCrN	3	6.0	20.0	◎	○	○			◎	167
			USPM4		AlCrN	4	1.0	20.0	◎	○	○			◎	168
			UTR504		AlCrN	4	0.8	2.5	◎	○	○			◎	169
		Ball	UB502		AlCrN	2	1.0	25.0	◎	○	○			◎	173
			UB502---P		AlCrN	2	0.1	12.0	◎	○	○			◎	175
			UB512		AlCrN	2	0.1	12.0	◎	○	○			◎	176
			UB512S6		AlCrN	2	0.5	2.0	◎	○	○			◎	180
			UB532		AlCrN	2	3.0	12.0	◎	○	○			◎	181
			UB542		AlCrN	2	0.1	12.0	◎	○	○			◎	182
			USB502		AlCrN	2	3.0	20.0	◎	○	○			◎	189
			UB503		AlCrN	3	1.0	12.0	◎	○	○			◎	190
			UB504		AlCrN	4	1.0	12.0	◎	○	○			◎	191

◎: Excellent ○: Good

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (Ø) Min	Size (Ø) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
U-Star Endmill	General	Ball	UTB502		AlCrN	2	0.3	2.0	◎	○	○			◎	192
		Roughing	UF50		AlCrN	3~5	3.0	25.0	◎	○	○			◎	193
			UF51		AlCrN	3~5	3.0	25.0	◎	○	○			◎	194
			UF51---H		AlCrN	3~5	3.0	25.0	◎	○	○			◎	195
G-Star Endmill	General	Ball	DB312		AlTiN	2	1.0	20.0	◎	○	◎		○		198
			DB342		AlTiN	2	1.0	12.0	◎	○	◎		○		199
		Flat	TX202		AlTiN	2	1.0	20.0	◎	○	◎		○		200
			TX204		AlTiN	4	1.0	20.0	◎	○	◎		○		201
			TX222		AlTiN	2	3.0	20.0	◎	○	◎		○		202
			TX224		AlTiN	4	3.0	20.0	◎	○	◎		○		203
			TX302		AlTiN	2	1.0	20.0	◎	○	◎		○		204
			TX304		AlTiN	4	1.0	20.0	◎	○	◎		○		205
			TX304H		AlTiN	4	3.0	20.0	◎	○	◎		○		206
		Ball	TXB202		AlTiN	2	1.0	20.0	◎	○	◎		○		207
			TXB204		AlTiN	4	2.0	20.0	◎	○	◎		○		208
			TXB222		AlTiN	2	3.0	20.0	◎	○	◎		○		209
			TXB232		AlTiN	2	3.0	20.0	◎	○	◎		○		210
			TXB302		AlTiN	2	1.0	20.0	◎	○	◎		○		211
			TXB304		AlTiN	4	1.0	20.0	◎	○	◎		○		212
		Flat	ZE302P		AlTiN	2	1.0	20.0	◎	○	◎		○		213
			ZE304P		AlTiN	4	1.0	20.0	◎	○	◎		○		214
			ZE322		AlTiN	2	3.0	20.0	◎	○	◎		○		215
			ZE324		AlTiN	4	3.0	20.0	◎	○	◎		○		216
		Radius	ZR304H		AlTiN	4	3.0	12.0	◎	○	◎		○		217
			ZR322		AlTiN	2	3.0	12.0	◎	○	◎		○		218

◎: Excellent ○: Good

KORLOY Endmill

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (Ø) Min	Size (Ø) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
G-Star Endmill	General	Radius	ZR324		AlTiN	4	3.0	12.0	◎	○	◎		○		219
			ZR324H		AlTiN	4	6.0	12.0	◎	○	◎		○		220
R+ Endmill	Aluminum	Roughing	RPAE		Carbide, Non	3	6.0	25.0				◎			222
	General		RPE-FP-H		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		222
			RPLE-FP-H		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		223
			RPE-XG		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		223
			RPE-FP-L		Carbide, TiAlN	4	5.0	20.0	◎	○	◎		○		224
			RPE-RG		Carbide, TiAlCrN	4	5.0	20.0	◎	○	◎		○		224
			RPE-RG		HSS, TiAlN	4	6.0	20.0	◎	○	◎		○		225
			RPE-FF		HSS, TiAlN	4	6.0	20.0	◎	○	◎		○		225
			RPE-FP		HSS, TiAlN	4	6.0	20.0	◎	○	◎		○		226
			RPE-RG		HSS, TiCN HSS, TiN	4	6.0	50.0	◎	○	◎		○		227
S-Star Endmill (New)	STS	Flat	SE502		AlCrN	2	1.0	20.0	○	◎			○		231
			SE503		AlCrN	3	1.0	20.0	○	◎			○		232
			SE504		AlCrN	4	1.0	20.0	○	◎			○		233
			SE506		AlCrN	6	6.0	20.0	○	◎			○		234
		Radius	SR504		AlCrN	4	1.0	20.0	○	◎			○		235
			SR505		AlCrN	5	6.0	20.0	○	◎			○		236
			SR507		AlCrN	7	6.0	20.0	○	◎			○		237
		Ball	SB502		AlCrN	2	1.0	12.0	○	◎			○		238
			SB504		AlCrN	4	3.0	20.0	○	◎			○		239
		Roughing	SF51H		AlCrN	3~5	3.0	20.0	○	◎			○		240
A-Star Endmill	Aluminum	Ball	WAB312		Non	2	6.0	20.0	○			◎			243
		Flat	WAE301		Non	1	0.2	12.0	○			◎			244
			WAE302		Non	2	1.0	25.0	○			◎			245

◎: Excellent ○: Good

Type	Used	Shape	Designation	Figure	Coated	No. of flute	Size (Ø) Min	Size (Ø) Max	Workpiece P Steel	Workpiece M Stainless steel	Workpiece K Cast iron	Workpiece N Non-ferrous metal	Workpiece S Heat resistant alloy, Titanium alloy	Workpiece H Hardened steel	page
A-Star Endmill	Aluminum	Flat	WAE30(2)3		Non	3	1.0	25.0	○			◎			246
		Radius	WAR302		Non	2	6.0	20.0	○			◎			248
			WAR303		Non	3	6.0	20.0	○			◎			249
			WAR502		Non	2	1.0	12.0	○			◎			250
		Radius	WAR503		Non	3	4.0	20.0	○			◎			251
		Roughing	WAF303		Non	3	4.0	20.0	○			◎			252
D Endmill	Graphite, Ceramics	Flat	DFE		Diamond	2	1.0	12.0				◎			254
					Diamond	4	2.0	12.0				◎			255
		Radius	DRE		Diamond	2	0.5	3.0				◎			256
					Diamond	4	4.0	12.0				◎			257
		Ball	DBE		Diamond	2	0.6	12.0				◎			258
					Diamond	4	2.0	12.0				◎			260
Composite Router Endmill	Composite CFRP, GFRP	Flat	CCDR		Diamond	4	6.0	8.0				◎			263
					Diamond	6	10.0	12.0				◎			263
			CCHR		Diamond	4	6.0	8.0				◎			264
					Diamond	6	10.0	12.0				◎			264
			CCR		Diamond	2	4.0	12.0				◎			265
			CCLR		Diamond	4	4.0	12.0				◎			266
			CCRR		Diamond	6	6.0	8.0				◎			267
					Diamond	8	10.0	12.0				◎			267
T Endmill	Dental, Zirconia	Ball	TZBE		Diamond	2	0.6	3.0				◎			268
	Dental, Metal	Ball	TTBE		Diamond	2	0.6	3.0					◎		268
	Dental, Wax		TWBE		-	2	0.6	3.0				◎			268
PCD Endmill	Nonferrous, High speed	Flat	PDE		-	1	4.6	6.0				◎			271
					-	2	6.0	12.0				◎			271

◎: Excellent ○: Good

Super Endmill

Endmill for Ni series HRSA machining (Inconel, Hasteloy, Waspaloy and etc.)

Super Endmill For HRSA

- Super Endmill For HRSA increases cutting performance and cutting stability applying positive rake angle and irregular flute spacing. Also, the new coating layer with high hardness controls fracture in cutting edge and ensures long tool life for HRSA machining by its increased wear resistance.

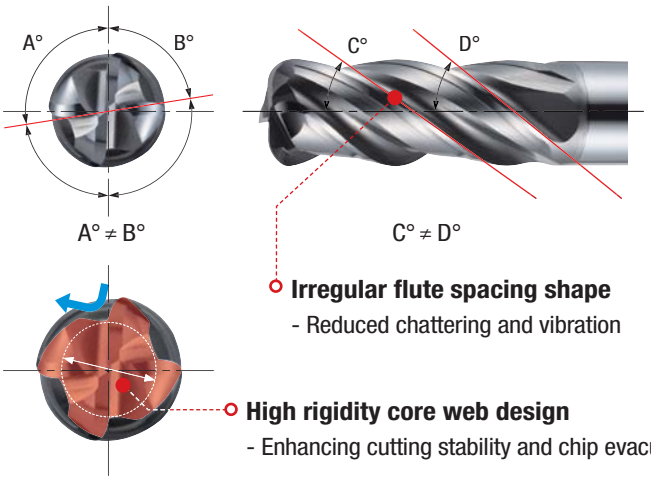
Code system

S	RE	S	4	120	-	080	-	R30
Super Endmill	Type	Workpiece	No. of flute	Tool diameter		Overall length		Corner R
	FE: Flat Endmill RE: Radius Endmill BE: Ball Endmill	S: Super alloy • Inconel718 • Waspaloy • Hastelloy T: Titanium/STS	4: 4 flute	120: Ø12.0 mm		080: 80 mm		R30: 30 mm

Features

- Aerospace and generation industries : Exclusive Endmill series for HRSA workpieces engine, turbine parts and etc.
- Sharp cutting edge : Reducing cutting load and suppression of work hardening
- Longer tool life : Applying high toughness substrate and new grade with high wear resistance

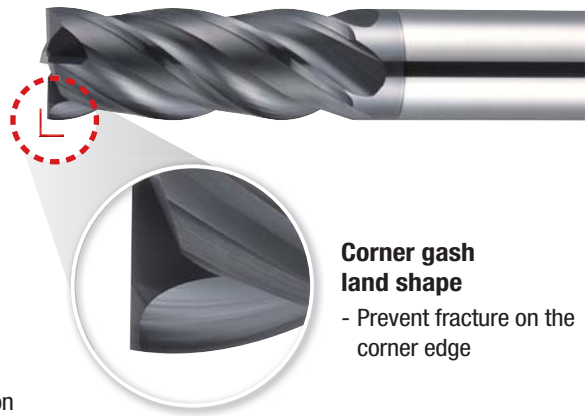
SRES4000 (Radius)



Irregular flute spacing shape
- Reduced chattering and vibration

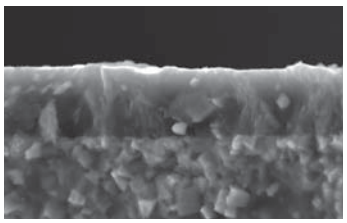
High rigidity core web design
- Enhancing cutting stability and chip evacuation

SFES4000 (Flat)



Corner gash land shape
- Prevent fracture on the corner edge

Grade features



SL coating (Ultra Lubricating coating)
- Applying high lubrication coating and special surface treatment technology
  - Increased welding resistance, chipping resistance and cutting stability by surface treatment technology

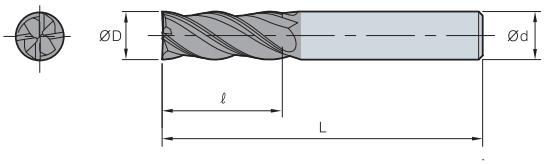
SFES4000 (Flat)



4 | 35°/38° HELIX | SL Coating | DATA p.410

• TOLERANCE

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h6
Ø6.1 ~ Ø20	0 ~ -0.02mm	



(mm)

Designation	ØD	Ød	ℓ	L
SFES4030-050	3	6	8	50
SFES4040-050	4	6	10	50
SFES4050-060	5	6	15	60
SFES4060-060	6	6	15	60
SFES4080-070	8	8	20	70
SFES4100-075	10	10	25	75
SFES4120-080	12	12	30	80
SFES4140-100	14	14	35	90
SFES4160-100	16	16	42	100
SFES4200-100	20	20	48	100

Endmill Super Endmill For HRSA

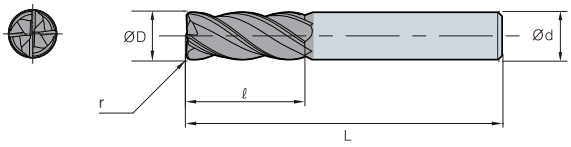
SRES4000 (Radius)



4 | 35°/38° HELIX | R ±0.01 Corner R | SL Coating | DATA p.410

• TOLERANCE

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h5
Ø6.1 ~ Ø20	0 ~ -0.02mm	



(mm)

Designation	ØD	Ød	ℓ	L	r
SRES4030-055-R02	3	6	8	55	0.2
SRES4030-055-R03	3	6	8	55	0.3
SRES4030-055-R05	3	6	8	55	0.5
SRES4040-055-R02	4	6	10	55	0.2
SRES4040-055-R03	4	6	10	55	0.3
SRES4040-055-R05	4	6	10	55	0.5
SRES4040-070-R02	4	6	10	70	0.2
SRES4040-070-R03	4	6	10	70	0.3
SRES4040-070-R05	4	6	10	70	0.5
SRES4050-055-R02	5	6	15	55	0.2
SRES4050-055-R03	5	6	15	55	0.3
SRES4050-055-R05	5	6	15	55	0.5
SRES4050-090-R02	5	6	15	90	0.2
SRES4050-090-R03	5	6	15	90	0.3
SRES4050-090-R05	5	6	15	90	0.5
SRES4060-060-R03	6	6	15	60	0.3
SRES4060-060-R05	6	6	15	60	0.5
SRES4060-060-R08	6	6	15	60	0.8
SRES4060-060-R10	6	6	15	60	1.0
SRES4060-060-R15	6	6	15	60	1.5
SRES4060-060-R20	6	6	15	60	2.0
SRES4060-090-R03	6	6	15	90	0.3
SRES4060-090-R05	6	6	15	90	0.5
SRES4060-090-R08	6	6	15	90	0.8
SRES4060-090-R10	6	6	15	90	1.0
SRES4060-090-R15	6	6	15	90	1.5
SRES4060-090-R20	6	6	15	90	2.0
SRES4080-070-R03	8	8	20	70	0.3
SRES4080-070-R05	8	8	20	70	0.5
SRES4080-070-R08	8	8	20	70	0.8
SRES4080-070-R10	8	8	20	70	1.0
SRES4080-070-R15	8	8	20	70	1.5
SRES4080-070-R20	8	8	20	70	2.0
SRES4080-070-R25	8	8	20	70	2.5
SRES4080-070-R30	8	8	20	70	3.0
SRES4080-100-R03	8	8	20	100	0.3

Designation	ØD	Ød	ℓ	L	r
SRES4080-100-R05	8	8	20	100	0.5
SRES4080-100-R08	8	8	20	100	0.8
SRES4080-100-R10	8	8	20	100	1.0
SRES4080-100-R15	8	8	20	100	1.5
SRES4080-100-R20	8	8	20	100	2.0
SRES4080-100-R25	8	8	20	100	2.5
SRES4080-100-R30	8	8	20	100	3.0
SRES4100-075-R03	10	10	25	75	0.3
SRES4100-075-R05	10	10	25	75	0.5
SRES4100-075-R08	10	10	25	75	0.8
SRES4100-075-R10	10	10	25	75	1.0
SRES4100-075-R15	10	10	25	75	1.5
SRES4100-075-R20	10	10	25	75	2.0
SRES4100-075-R25	10	10	25	75	2.5
SRES4100-075-R30	10	10	25	75	3.0
SRES4100-100-R03	10	10	25	100	0.3
SRES4100-100-R05	10	10	25	100	0.5
SRES4100-100-R08	10	10	25	100	0.8
SRES4100-100-R10	10	10	25	100	1.0
SRES4100-100-R15	10	10	25	100	1.5
SRES4100-100-R20	10	10	25	100	2.0
SRES4100-100-R25	10	10	25	100	2.5
SRES4100-100-R30	10	10	25	100	3.0
SRES4120-080-R05	12	12	30	80	0.5
SRES4120-080-R08	12	12	30	80	0.8
SRES4120-080-R10	12	12	30	80	1.0
SRES4120-080-R15	12	12	30	80	1.5
SRES4120-080-R20	12	12	30	80	2.0
SRES4120-080-R25	12	12	30	80	2.5
SRES4120-080-R30	12	12	30	80	3.0
SRES4120-080-R35	12	12	30	80	3.5
SRES4120-080-R40	12	12	30	80	4.0
SRES4120-110-R05	12	12	30	110	0.5
SRES4120-110-R08	12	12	30	110	0.8
SRES4120-110-R10	12	12	30	110	1.0
SRES4120-110-R15	12	12	30	110	1.5

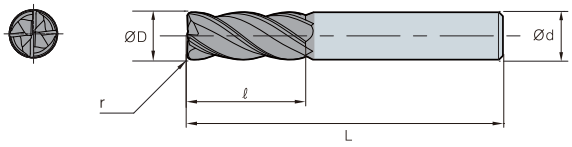
SRES4000 (Radius)



4 | 35°/38° HELIX | R ±0.01 Corner R | SL Coating | DATA p.410

• TOLERANCE

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h5
Ø6.1 ~ Ø20	0 ~ -0.02mm	



Designation	ØD	Ød	ℓ	L	r
SRES4120-110-R20	12	12	30	110	2.0
SRES4120-110-R25	12	12	30	110	2.5
SRES4120-110-R30	12	12	30	110	3.0
SRES4120-110-R35	12	12	30	110	3.5
SRES4120-110-R40	12	12	30	110	4.0
SRES4140-090-R05	14	14	35	90	0.5
SRES4140-090-R08	14	14	35	90	0.8
SRES4140-090-R10	14	14	35	90	1.0
SRES4140-090-R15	14	14	35	90	1.5
SRES4140-090-R20	14	14	35	90	2.0
SRES4140-090-R30	14	14	35	90	3.0
SRES4140-150-R05	14	14	35	150	0.5
SRES4140-150-R08	14	14	35	150	0.8
SRES4140-150-R10	14	14	35	150	1.0
SRES4140-150-R15	14	14	35	150	1.5
SRES4140-150-R20	14	14	35	150	2.0
SRES4140-150-R30	14	14	35	150	3.0
SRES4160-100-R05	16	16	42	100	0.5
SRES4160-100-R08	16	16	42	100	0.8
SRES4160-100-R10	16	16	42	100	1.0
SRES4160-100-R15	16	16	42	100	1.5
SRES4160-100-R20	16	16	42	100	2.0
SRES4160-100-R25	16	16	42	100	2.5
SRES4160-100-R30	16	16	42	100	3.0
SRES4160-100-R35	16	16	42	100	3.5
SRES4160-100-R40	16	16	42	100	4.0
SRES4160-100-R50	16	16	42	100	5.0
SRES4160-100-R60	16	16	42	100	6.0
SRES4160-150-R05	16	16	42	150	0.5
SRES4160-150-R08	16	16	42	150	0.8
SRES4160-150-R10	16	16	42	150	1.0
SRES4160-150-R15	16	16	42	150	1.5
SRES4160-150-R20	16	16	42	150	2.0
SRES4160-150-R25	16	16	42	150	2.5
SRES4160-150-R30	16	16	42	150	3.0
SRES4160-150-R35	16	16	42	150	3.5

Designation	ØD	Ød	ℓ	L	r
SRES4160-150-R40	16	16	42	150	4.0
SRES4160-150-R50	16	16	42	150	5.0
SRES4160-150-R60	16	16	42	150	6.0
SRES4180-100-R05	18	20	45	100	0.5
SRES4180-100-R08	18	20	45	100	0.8
SRES4180-100-R10	18	20	45	100	1.0
SRES4180-100-R15	18	20	45	100	1.5
SRES4180-100-R20	18	20	45	100	2.0
SRES4180-100-R30	18	20	45	100	3.0
SRES4180-150-R05	18	20	45	150	0.5
SRES4180-150-R08	18	20	45	150	0.8
SRES4180-150-R10	18	20	45	150	1.0
SRES4180-150-R15	18	20	45	150	1.5
SRES4180-150-R20	18	20	45	150	2.0
SRES4180-150-R30	18	20	45	150	3.0
SRES4200-100-R05	20	20	48	100	0.5
SRES4200-100-R10	20	20	48	100	1.0
SRES4200-100-R15	20	20	48	100	1.5
SRES4200-100-R20	20	20	48	100	2.0
SRES4200-100-R25	20	20	48	100	2.5
SRES4200-100-R30	20	20	48	100	3.0
SRES4200-100-R35	20	20	48	100	3.5
SRES4200-100-R40	20	20	48	100	4.0
SRES4200-100-R50	20	20	48	100	5.0
SRES4200-100-R60	20	20	48	100	6.0
SRES4200-150-R05	20	20	48	150	0.5
SRES4200-150-R10	20	20	48	150	1.0
SRES4200-150-R15	20	20	48	150	1.5
SRES4200-150-R20	20	20	48	150	2.0
SRES4200-150-R25	20	20	48	150	2.5
SRES4200-150-R30	20	20	48	150	3.0
SRES4200-150-R35	20	20	48	150	3.5
SRES4200-150-R40	20	20	48	150	4.0
SRES4200-150-R50	20	20	48	150	5.0
SRES4200-150-R60	20	20	48	150	6.0

Super Endmill For Ti

Endmills series for difficult-to-cut materials

Super Endmill For Ti

- With its optimal edge structure for Titanium machining and enlarged chip pocket in flutes design, Super Endmill For Ti reduces cutting load and cutting heat and it improves chip evacuation. In addition, applying high toughness substrate and high lubrication coating layer minimizing irregular tool fracture and welding ensure maximized tool life.

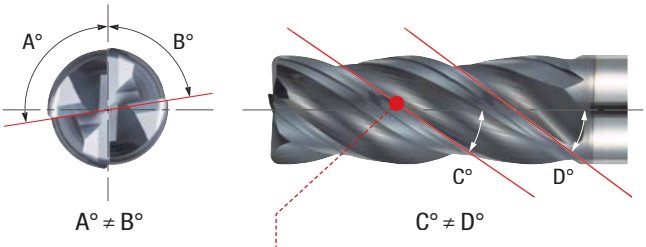
Code system

S	RE	T	4	120	-	080	-	R30
Super Endmill	Type	Workpiece	No. of flute	Tool diameter		Overall length		Corner R
	FE : Flat Endmill RE : Radius Endmill BE : Ball Endmill	T : Titanium/STS S : Super alloy • Inconel718 • Waspaloy • Hastelloy	4: 4 flute	120: Ø12.0 mm		080: 80 mm		R30: 30 mm

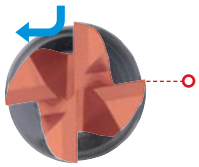
Features

- Endmill for titanium and stainless steel cutting
- Longer tool life : high toughness substrate and high lubrication coating layer

SFET (Flat) / SRET (Radius)

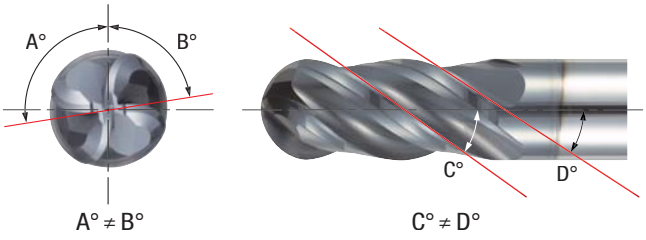


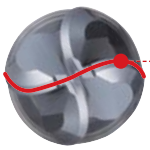
Irregular flute spacing shape
- Reduced chattering and vibration



Large chip pocket and streamlined flute design
- Good chip evacuation

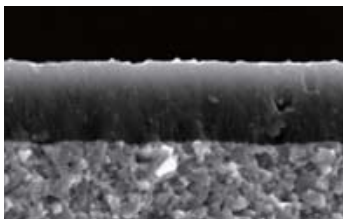
SBET (Ball)





S-curve cutting edge
- Reduced cutting load

Grade features



UL coating (Ultra Lubricating coating)
- Enhanced chip control and welding resistance by exclusive lubrication coating technology
- High chipping resistance substrate

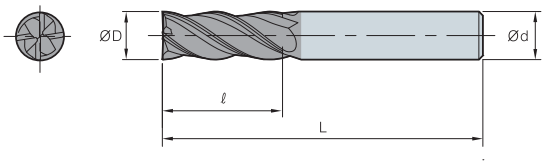
SFET4000 (Flat)



4 | 35°/38° HELIX | UL Coating | DATA p.411

• TOLERANCE

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h6
Ø6.1 ~ Ø20	0 ~ -0.020mm	



(mm)

Designation	ØD	Ød	ℓ	L
SFET4030-050	3	6	8	50
SFET4040-050	4	6	10	50
SFET4050-060	5	6	15	60
SFET4060-060	6	6	15	60
SFET4080-070	8	8	20	70
SFET4100-075	10	10	25	75
SFET4120-080	12	12	30	80
SFET4160-100	16	16	42	100
SFET4200-100	20	20	48	100

Endmill Super Endmill For Ti

SRET4000 (Radius)

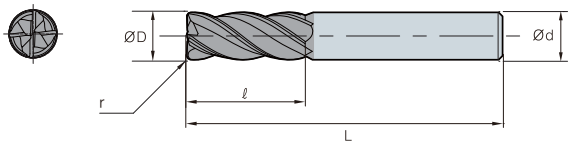


4 | 35°/38° HELIX | UL Coating | DATA

p.411

• TOLERANCE

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h6
Ø6.1 ~ Ø20	0 ~ -0.020mm	



Designation	ØD	Ød	ℓ	L	r
SRET4030-050-R02	3	6	8	50	0.2
SRET4030-050-R05	3	6	8	50	0.5
SRET4040-050-R02	4	6	10	50	0.2
SRET4040-050-R05	4	6	10	50	0.5
SRET4050-060-R02	5	6	15	60	0.2
SRET4050-060-R05	5	6	15	60	0.5
SRET4050-060-R10	5	6	15	60	1
SRET4060-060-R03	6	6	15	60	0.3
SRET4060-060-R05	6	6	15	60	0.5
SRET4060-060-R10	6	6	15	60	1
SRET4080-070-R03	8	8	20	70	0.3
SRET4080-070-R05	8	8	20	70	0.5
SRET4080-070-R10	8	8	20	70	1
SRET4100-075-R03	10	10	25	75	0.3
SRET4100-075-R05	10	10	25	75	0.5
SRET4100-075-R10	10	10	25	75	1
SRET4100-075-R15	10	10	25	75	1.5
SRET4100-075-R20	10	10	25	75	2
SRET4120-080-R05	12	12	30	80	0.5
SRET4120-080-R10	12	12	30	80	1
SRET4120-080-R15	12	12	30	80	1.5
SRET4120-080-R20	12	12	30	80	2
SRET4120-080-R25	12	12	30	80	2.5
SRET4120-080-R30	12	12	30	80	3
SRET4160-100-R05	16	16	42	100	0.5
SRET4160-100-R10	16	16	42	100	1
SRET4200-100-R05	20	20	48	100	0.5
SRET4200-100-R10	20	20	48	100	1

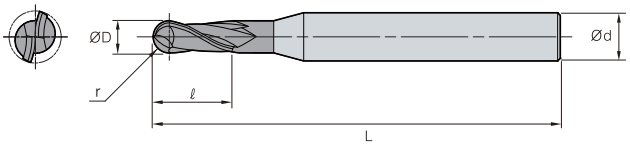
SBET2000 (Ball)



4 | 30° HELIX | R ±0.01 (r tolerance) | UL Coating | DATA (p.412)

• TOLERANCE

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h6
Ø6.1 ~ Ø20	0 ~ -0.020mm	



(mm)

Designation	ØD	Ød	ℓ	L	r
SBET2010-050	1	6	1	50	0.5
SBET2020-050	2	6	2	50	1
SBET2030-050	3	6	3	50	1.5
SBET2040-050	4	6	8	50	2
SBET2040-070	4	6	8	70	2
SBET2050-060	5	6	12	60	2.5
SBET2050-080	5	6	12	80	2.5
SBET2060-060	6	6	12	60	3
SBET2060-090	6	6	12	90	3
SBET2080-070	8	8	16	70	4
SBET2080-100	8	8	16	100	4
SBET2100-075	10	10	20	75	5
SBET2100-100	10	10	20	100	5
SBET2120-080	12	12	25	80	6
SBET2120-100	12	12	25	100	6

Endmill Super Endmill For Ti

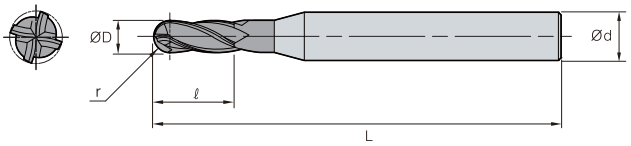
SBET4000 (Ball)



4 | 38°/40° HELIX | R ±0.01 r tolerance | UL Coating | DATA p.412

• TOLERANCE

ØD		Ød
Ø1 ~ Ø6	0 ~ -0.015mm	h6
Ø6.1 ~ Ø20	0 ~ -0.020mm	



Designation	ØD	Ød	ℓ	L	r
SBET4040-050	4	6	8	50	2.0
SBET4040-070	4	6	8	70	2.0
SBET4050-060	5	6	12	60	2.5
SBET4050-080	5	6	12	80	2.5
SBET4060-060	6	6	12	60	3.0
SBET4060-090	6	6	12	90	3.0
SBET4080-070	8	8	16	70	4.0
SBET4080-100	8	8	16	100	4.0
SBET4100-075	10	10	20	75	5.0
SBET4100-100	10	10	20	100	5.0
SBET4120-080	12	12	25	80	6.0
SBET4120-100	12	12	25	100	6.0

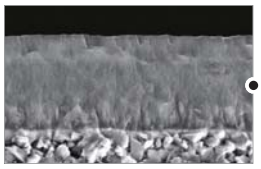
For high hardness

H-Star Endmill

- 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

Features

• High hardness coating layer



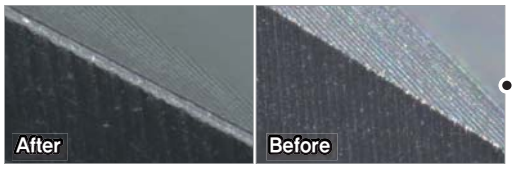
- High Si content
- Enhanced wear resistance
- Stable cutting through frictional heat resistance increase

• High hardness substrate

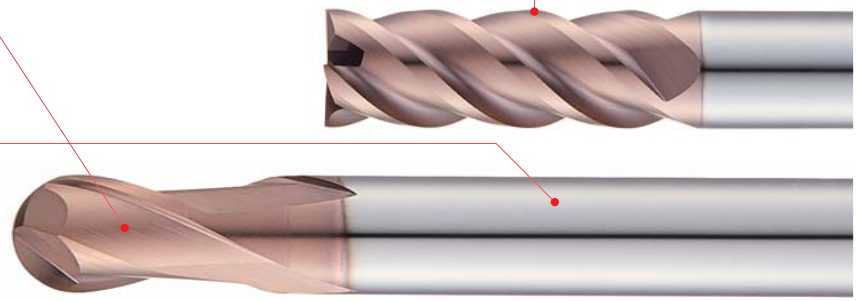


- Ultra-fine WC + Co 9%
- Expanded general application range by maximizing cutting edge feature

• Edge treatment



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



Code system

ES	R	70	4	100	15	32	-	10

H-Star Endmill

Type

B : Ball
E : Flat
R : Radius
XE : Flat (irregular flute spacing)
XR : Radius (irregular flute spacing)
PM : Power mill
RB : Rib ball
RE : Rib flat
RR : Rib radius
LNB : Long neck ball
TNB : Taper neck ball
LNS : Long neck flat
LNR : Long neck radius

Length, Shank type

70 : Neck
71 : Straight, neck
72 : Long shank neck
73 : Long shank
74 : Helix 35°

No. of flute

2 : 2 flutes
3 : 3 flutes
4 : 4 flutes
6 : 6 flutes

Tool dia.

010 : Ø1.0 mm
060 : Ø6.0 mm
065 : Ø6.5 mm
100 : Ø10.0 mm

Corner R

05 : 0.5 mm
15 : 1.5 mm
20 : 2.0 mm

Effective length

10 : 10 mm
12 : 12 mm
32 : 32 mm

Shank dia.

6 : Ø6.0 mm
10 : Ø10.0 mm
12 : Ø12.0 mm

H-Star Endmill

EDP. NO	Appearance	Type	Range	Page
ESB702		2 flutes neck type ball Endmill	Ø0.1 ~ 12.0	41
ESB712		2 flutes ball Endmill	Ø1.0 ~ 12.0	42
ESB703		3 flutes neck type ball Endmill	Ø2.0 ~ 12.0	43
ESB734		4 flutes 15° helix ball Endmill	Ø2.0 ~ 10.0	44
ESE702		2 flutes neck type flat Endmill	Ø0.1 ~ 20.0	45
ESE712		2 flutes flat Endmill	Ø1.0 ~ 12.0	46
ESE704		4 flutes neck type flat Endmill	Ø1.0 ~ 20.0	47
ESE714		4 flutes high helix flat Endmill	Ø1.0 ~ 12.0	48
ESE724(6)		4&6 flutes neck type flat Endmill	Ø1.0 ~ 12.0	49
ESE744		4 flutes high helix flat Endmill	Ø1.0 ~ 12.0	50
ESE716		6 flutes high helix flat Endmill	Ø6.0 ~ 20.0	51
ESR702		2 flutes neck type radius Endmill	Ø1.0 ~ 12.0	52~54
ESR732		2 flutes long shank radius Endmill	Ø1.0 ~ 12.0	55
ESR704		4 flutes neck type radius Endmill	Ø1.0 ~ 12.0	56
ESR714		4 flutes radius Endmill	Ø3.0 ~ 12.0	58
ESR724		4 flutes neck type radius Endmill	Ø6.0 ~ 12.0	59
ESR734		4 flutes long shank radius Endmill	Ø1.0 ~ 12.0	60
ESR706		6 flutes neck type radius Endmill	Ø6.0 ~ 12.0	61
ESR736		6 flutes radius Endmill	Ø6.0 ~ 12.0	62
ESRB712		2 flutes rib ball Endmill	Ø0.1 ~ 12.0	63~66
ESRE712		2 flutes rib neck type flat Endmill	Ø0.1 ~ 12.0	67~69
ESRE714		4 flutes rib sqaure Endmill	Ø0.5 ~ 12.0	70~72
ESRR712		2 flutes rib radius Endmill	Ø0.2 ~ 16.0	73~78
ESRR714		4 flutes rib radius Endmill	Ø0.5 ~ 20.0	79~85
ESXE704		4 flutes neck type flat Endmill	Ø1.0 ~ 12.0	86
ESXE714		4 flutes flat Endmill	Ø2.0 ~ 12.0	87
ESXR704		4 flutes neck type radius Endmill	Ø1.0 ~ 12.0	88
ESLNB20		2 flutes long neck type ball Endmill	Ø0.1 ~ 5.0	89~92
ESTNB20		2 flutes tapered neck type ball Endmill	Ø0.2 ~ 10.0	93~96
ESTNB30		3 flutes tapered neck type ball Endmill	Ø2.0 ~ 5.0	97~98
ESLNS20		2 flutes long neck type flat Endmill	Ø0.1 ~ 5.0	99~102
ESLNS40		4 flutes long neck type flat Endmill	Ø1.0 ~ 5.0	103~104
ESLNR		2 flutes long neck type radius Endmill	Ø0.2 ~ 3.0	105~108
ESTNR		2 flutes tapered neck type radius Endmill	Ø0.2 ~ 3.0	109~110
ESPM4		4 flutes neck type radius Endmill	Ø3.0 ~ 12.0	111

ESB702

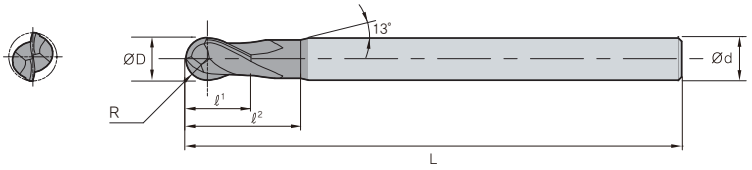
2 flutes neck type ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 or Under) | R ±0.008 (Above R3) | AlTiN | DATA p.413

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESB702001	0.05	0.1	4	0.15	-	40
ESB702002	0.1	0.2	4	0.3	-	40
ESB702003	0.15	0.3	4	0.5	-	40
ESB702004	0.2	0.4	4	0.6	-	40
ESB702005	0.25	0.5	4	0.7	-	40
ESB702006	0.3	0.6	4	0.9	-	40
ESB702007	0.35	0.7	4	1.1	-	40
ESB702008	0.4	0.8	4	1.2	-	40
ESB702009	0.45	0.9	4	1.4	-	40
ESB702010	0.5	1	6	1.5	3	50
ESB702010S4	0.5	1	4	1.5	-	45
ESB702015	0.75	1.5	6	2	4	50
ESB702015S4	0.75	1.5	4	2	-	45
ESB702020	1	2	6	2.5	5	50
ESB702020S4	1	2	4	2.5	-	45
ESB702025	1.25	2.5	6	3	7	50
ESB702030	1.5	3	6	4	10	60
ESB702030S	1.5	3	6	4	10	50
ESB702030S4	1.5	3	4	4	-	45
ESB702031	1.5	3	6	4	10	70
ESB702040	2	4	6	5	10	60
ESB702040S	2	4	6	5	10	50
ESB702040S4	2	4	4	5	-	45
ESB702041	2	4	6	5	10	70
ESB702050	2.5	5	6	6	12	60
ESB702060	3	6	6	7	12	60
ESB702061	3	6	6	7	12	90
ESB702080	4	8	8	9	15	70
ESB702081	4	8	8	9	15	100
ESB702100	5	10	10	11	25	75
ESB702101	5	10	10	11	25	100
ESB702120	6	12	12	12	25	80
ESB702121	6	12	12	12	25	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESB712

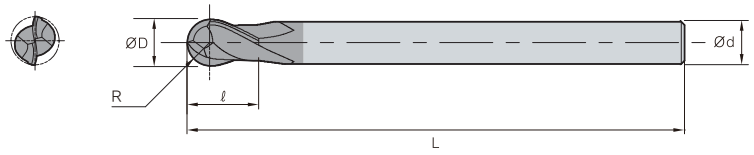
2 flutes ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 or Under) | R ±0.008 (Above R3) | AlTiN | DATA p.413

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
ESB712010	0.5	1	6	2.5	50
ESB712010S	0.5	1	6	1.5	40
ESB712010S4	0.5	1	4	2.5	50
ESB712012	0.6	1.2	6	3	50
ESB712015	0.75	1.5	6	4	50
ESB712015S	0.75	1.5	6	2.5	40
ESB712015S4	0.75	1.5	4	4	50
ESB712020	1	2	6	5	50
ESB712020S	1	2	6	3	40
ESB712020S4	1	2	4	5	50
ESB712025	1.25	2.5	6	7	60
ESB712030	1.5	3	6	8	60
ESB712030S	1.5	3	6	4.5	50
ESB712030S4	1.5	3	4	8	60
ESB712040	2	4	6	8	70
ESB712040S	2	4	6	6	50
ESB712050	2.5	5	6	10	80
ESB712050S	2.5	5	6	7.5	50
ESB712060	3	6	6	12	90
ESB712060S	3	6	6	9	50
ESB712080S	4	8	8	12	50
ESB712081	4	8	8	14	100
ESB712100	5	10	10	18	100
ESB712100S	5	10	10	15	60
ESB712120	6	12	12	22	110
ESB712120S	6	12	12	18	60

※ The above specifications are subject to change without prior notice for product quality improvement.

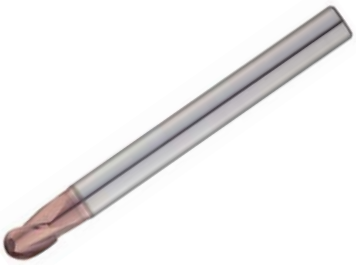
• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESB703

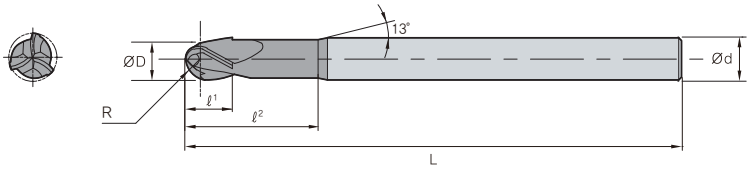
3 flutes neck type ball Endmill



ULTRA FINE | 3 | 30° HELIX | R ±0.005 (R3 or Under) | R ±0.008 (Above R3) | AlTiN | DATA p.413

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESB703020	1	2	6	2.5	5	50
ESB703025	1.25	2.5	6	3	7	50
ESB703030	1.5	3	6	4	10	60
ESB703030S	1.5	3	6	4	10	50
ESB703031	1.5	3	6	4	10	70
ESB703040	2	4	6	5	10	60
ESB703040S	2	4	6	5	10	50
ESB703041	2	4	6	5	10	70
ESB703050	2.5	5	6	6	12	60
ESB703060	3	6	6	7	12	60
ESB703061	3	6	6	7	12	90
ESB703080	4	8	8	9	15	70
ESB703081	4	8	8	9	15	100
ESB703100	5	10	10	11	25	75
ESB703101	5	10	10	11	25	100
ESB703120	6	12	12	12	25	80
ESB703121	6	12	12	12	25	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESB734

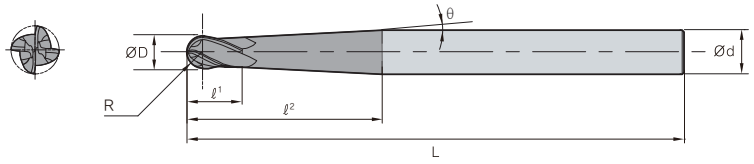
4 flutes 15° helix ball Endmill

ULTRA FINE | 4 | 15° HELIX | R ±0.005 R3 or Under | R ±0.008 Above R3 | AlTiN | DATA p.414

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5





(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	θ	L
ESB734020-2.5	1	2	4	2	25	2.5	60
ESB734020-3.5	1	2	4	2	18	3.5	60
ESB734025-2.5	1.25	2.5	4	3	20	2.5	60
ESB734025-3.0	1.25	2.5	4	3	17	3	60
ESB734030-2.0	1.5	3	6	3	46	2	70
ESB734030-2.5	1.5	3	6	3	37	2.5	70
ESB734040-2.0	2	4	6	4	33	2	70
ESB734040-2.5	2	4	6	4	27	2.5	70
ESB734050-2.5	2.5	5	6	5	16	2.5	70
ESB734060-1.5	3	6	8	6	44	1.5	100
ESB734060-2.5	3	6	8	6	29	2.5	100
ESB734080-1.5	4	8	10	8	46	1.5	100
ESB734080-2.5	4	8	10	8	31	2.5	100
ESB734100-1.5	5	10	12	10	48	1.5	110
ESB734100-2.5	5	10	12	10	33	2.5	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESE702

2 flutes neck type flat Endmill

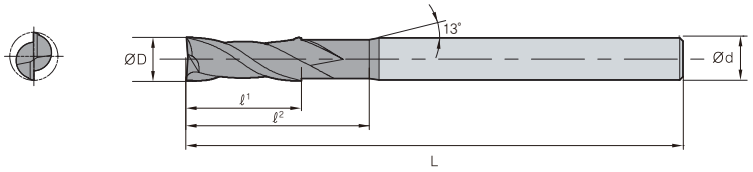


ULTRA FINE | 2 | 30° HELIX | AlTiN | DATA

p.414, 415

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
ESE702001	0.1	4	0.2	-	40
ESE702002	0.2	4	0.4	-	40
ESE702003	0.3	4	0.5	-	40
ESE702004	0.4	4	0.7	-	40
ESE702005	0.5	4	1	-	40
ESE702006	0.6	4	1.2	-	40
ESE702007	0.7	4	1.4	-	40
ESE702008	0.8	4	1.6	-	40
ESE702009	0.9	4	2	-	40
ESE702010	1	6	1.5	-	40
ESE702010S4	1	4	1.5	-	40
ESE702015	1.5	6	2.2	-	40
ESE702020	2	6	3	6	40
ESE702020S4	2	4	3	6	40
ESE702025	2.5	6	4	6	40
ESE702030	3	6	4	7	45
ESE702035	3.5	6	6	9	45
ESE702040	4	6	6	9	45
ESE702045	4.5	6	6	10	45
ESE702050	5	6	6	11	50
ESE702060	6	6	7	14	50
ESE702080	8	8	9	18	60
ESE702100	10	10	12	25	75
ESE702120	12	12	15	30	75
ESE702160	16	16	18	38	90
ESE702200	20	20	24	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESE712

2 flutes flat Endmill



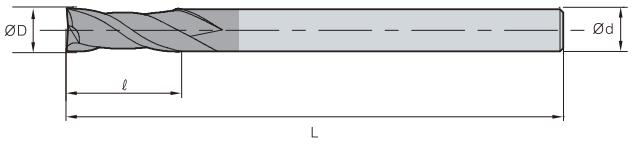
ULTRA FINE | 2 | 35° HELIX | AlTiN | DATA

p.416

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	ØD	Ød	ℓ	L
ESE712010	1	6	3	40
ESE712010-02	1	6	2	40
ESE712010-02S4	1	4	2	40
ESE712010-04	1	6	4	40
ESE712012	1.2	6	3	40
ESE712015	1.5	6	4	40
ESE712015S4	1.5	4	4	40
ESE712015-06	1.5	6	6	40
ESE712015-08	1.5	6	8	40
ESE712020	2	6	5	40
ESE712020S4	2	4	5	40
ESE712020-08	2	6	8	40
ESE712020-10	2	6	10	50
ESE712025	2.5	6	6	40
ESE712025S4	2.5	4	6	40
ESE712030	3	6	8	45
ESE712030S4	3	4	8	45
ESE712030-10	3	6	10	50

Designation	ØD	Ød	ℓ	L
ESE712030-12	3	6	12	50
ESE712035	3.5	6	10	45
ESE712040	4	6	10	45
ESE712040S4	4	4	10	45
ESE712040-12	4	6	12	50
ESE712040-16	4	6	16	60
ESE712045	4.5	6	11	45
ESE712050	5	6	13	50
ESE712055	5.5	6	13	50
ESE712060	6	6	13	50
ESE712060-15	6	6	15	60
ESE712065	6.5	8	16	60
ESE712070	7	8	18	60
ESE712080	8	8	19	60
ESE712100	10	10	22	70
ESE712100-25	10	10	25	70
ESE712120	12	12	26	75
ESE712120-30	12	12	30	75

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESE704

4 flutes neck type flat Endmill

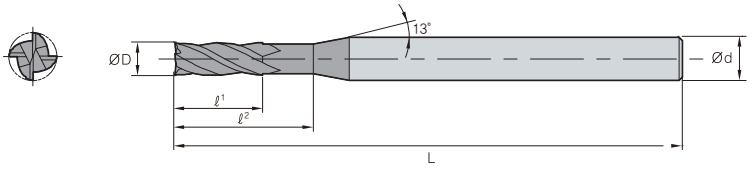


ULTRA FINE | 4 | 30° HELIX | AlTiN | DATA

p.415

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
ESE704010	1	6	1.5	-	40
ESE704010S4	1	4	1.5	-	40
ESE704015	1.5	6	2.2	-	40
ESE704015S4	1.5	4	2.2	-	40
ESE704020	2	6	3	6	40
ESE704020S4	2	4	3	6	40
ESE704025	2.5	6	4	6	40
ESE704025S4	2.5	4	4	6	40
ESE704030	3	6	4	7	45
ESE704030S4	3	4	4	7	45
ESE704035	3.5	6	5	9	45
ESE704040	4	6	5	9	45
ESE704040S4	4	4	5	9	45
ESE704045	4.5	6	6	10	45
ESE704050	5	6	6	11	50
ESE704060	6	6	7	14	50
ESE704080	8	8	9	18	60
ESE704100	10	10	12	25	75
ESE704120	12	12	15	30	75
ESE704160	16	16	18	38	90
ESE704200	20	20	24	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESE714

4 flutes high helix flat Endmill

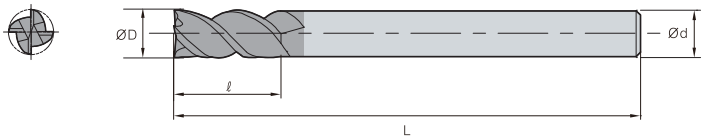


ULTRA FINE | 4 | 45° HELIX | AlTiN | DATA

p.415

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	ØD	Ød	ℓ	L
ESE714010	1	6	2.5	40
ESE714010S4	1	4	2.5	40
ESE714012	1.2	6	3	40
ESE714015	1.5	6	4	40
ESE714015S4	1.5	4	4	40
ESE714020	2	6	5	40
ESE714020S4	2	4	5	40
ESE714025	2.5	6	6	40
ESE714025S4	2.5	4	6	40
ESE714030	3	6	8	45
ESE714030S4	3	4	8	45
ESE714035	3.5	6	9	45
ESE714040	4	6	10	45
ESE714040S4	4	4	10	45
ESE714050	5	6	13	50
ESE714060	6	6	13	50
ESE714060-15	6	6	15	60
ESE714060-15L	6	6	15	90
ESE714080	8	8	19	60
ESE714080L	8	8	19	100
ESE714100	10	10	22	70
ESE714100-25	10	10	25	70
ESE714100-25L	10	10	25	100
ESE714120	12	12	26	75
ESE714120-30	12	12	30	80
ESE714120-30L	12	12	30	100

※ The above specifications are subject to change without prior notice for product quality improvement.

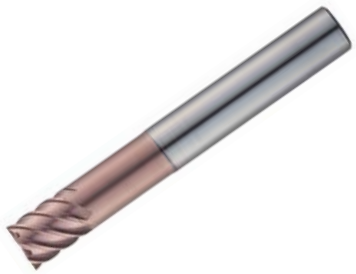
• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESE724(6)

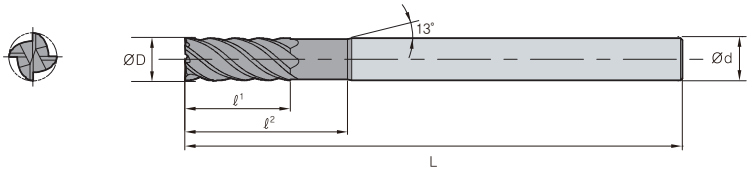
4&6 flutes neck type flat Endmill



ULTRA FINE | 4 | 6 | 45° HELIX Z=4 | 60° HELIX Z=6 | AlTiN | DATA p.417

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L	Z
ESE724010	1	6	1.5	5	45	4
ESE724015	1.5	6	2.2	6	45	4
ESE724020	2	6	3	8	45	4
ESE724030	3	6	4	9	50	4
ESE724040	4	6	5	12	50	4
ESE724040S4L	4	4	5	12	75	4
ESE724050	5	6	6	15	50	4
ESE726060	6	6	7	20	60	6
ESE726080	8	8	9	25	70	6
ESE726100	10	10	12	32	75	6
ESE726120	12	12	15	38	80	6

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESE744

4 flutes high helix flat Endmill

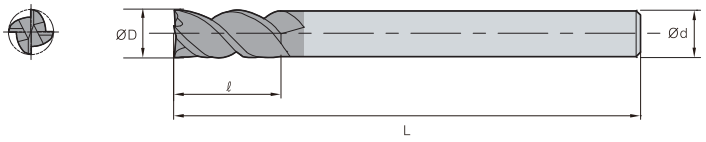


ULTRA FINE | 4 | 35° HELIX | AlTiN | DATA

p.415

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	ØD	Ød	ℓ	L
ESE744010S3	1	3	2.5	40
ESE744010S4	1	4	2.5	40
ESE744010	1	6	2.5	40
ESE744012S3	1.2	3	3	40
ESE744012S4	1.2	4	3	40
ESE744015S3	1.5	3	4	40
ESE744015S4	1.5	4	4	40
ESE744015	1.5	6	4	40
ESE744020S3	2	3	6	40
ESE744020S4	2	4	6	40
ESE744020	2	6	6	40
ESE744025S3	2.5	3	8	45
ESE744025S4	2.5	4	8	45
ESE744025	2.5	6	8	45
ESE744030S3	3	3	8	50
ESE744030S4	3	4	8	45
ESE744030	3	6	8	45
ESE744035	3.5	6	10	45
ESE744040S4	4	4	11	45
ESE744040	4	6	11	45
ESE744045	4.5	6	11	45
ESE744050	5	6	13	50
ESE744055	5.5	6	13	50
ESE744060	6	6	13	50
ESE744080	8	8	19	60
ESE744100	10	10	22	70
ESE744120	12	12	26	75

※ The above specifications are subject to change without prior notice for product quality improvement.

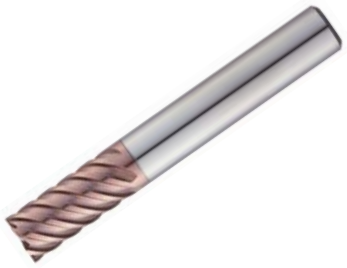
• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESE716

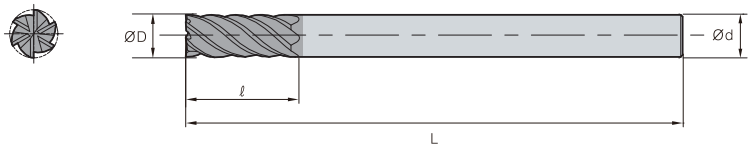
6 flutes high helix flat Endmill



ULTRA FINE | 6 | 50° HELIX | AlTiN | DATA p.417

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	ØD	Ød	ℓ	L
ESE716060	6	6	13	50
ESE716080	8	8	18	60
ESE716100	10	10	22	70
ESE716120	12	12	26	75
ESE716160	16	16	35	90
ESE716200	20	20	44	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

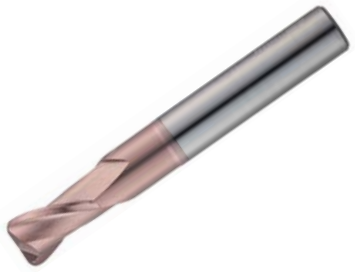
Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESR702

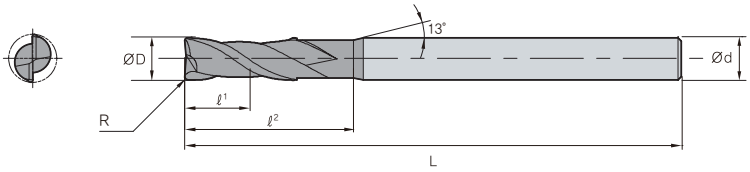
2 flutes neck type radius Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.418, 419

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR70201000503S4	0.05	1	4	1.5	3	50
ESR70201000504S4	0.05	1	4	1.5	4	50
ESR70201000506S4	0.05	1	4	1.5	6	50
ESR70201000508S4	0.05	1	4	1.5	8	50
ESR70201000510S4	0.05	1	4	1.5	10	50
ESR7020100103S4	0.1	1	4	1.5	3	50
ESR7020100104	0.1	1	6	1.5	4	50
ESR7020100104S4	0.1	1	4	1.5	4	50
ESR7020100106	0.1	1	6	1.5	6	50
ESR7020100106S4	0.1	1	4	1.5	6	50
ESR7020100108S4	0.1	1	4	1.5	8	50
ESR7020100110S4	0.1	1	4	1.5	10	50
ESR7020100203S4	0.2	1	4	1.5	3	50
ESR7020100204	0.2	1	6	1.5	4	50
ESR7020100204S4	0.2	1	4	1.5	4	50
ESR7020100206	0.2	1	6	1.5	6	50
ESR7020100206S4	0.2	1	4	1.5	6	50
ESR7020100208S4	0.2	1	4	1.5	8	50
ESR7020100210	0.2	1	6	1.5	10	50
ESR7020100210S4	0.2	1	4	1.5	10	50
ESR7020100212	0.2	1	6	1.5	12	50
ESR7020100303S4	0.3	1	4	1.5	3	50
ESR7020100304S4	0.3	1	4	1.5	4	50
ESR7020100306S4	0.3	1	4	1.5	6	50
ESR7020100308S4	0.3	1	4	1.5	8	50
ESR7020100310S4	0.3	1	4	1.5	10	50
ESR7020120208	0.2	1.2	6	2	8	50
ESR7020120212	0.2	1.2	6	2	12	50
ESR70201500504S4	0.05	1.5	4	2.5	4	50
ESR70201500506S4	0.05	1.5	4	2.5	6	50
ESR70201500508S4	0.05	1.5	4	2.5	8	50
ESR70201500510S4	0.05	1.5	4	2.5	10	50
ESR70201500512S4	0.05	1.5	4	2.5	12	50
ESR7020150104S4	0.1	1.5	4	2.5	4	50
ESR7020150106S4	0.1	1.5	4	2.5	6	50
ESR7020150108S4	0.1	1.5	4	2.5	8	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7020150110S4	0.1	1.5	4	2.5	10	50
ESR7020150112S4	0.1	1.5	4	2.5	12	50
ESR7020150204	0.2	1.5	6	2.5	4	50
ESR7020150204S4	0.2	1.5	4	2.5	4	50
ESR7020150206	0.2	1.5	6	2.5	6	50
ESR7020150206S4	0.2	1.5	4	2.5	6	50
ESR7020150208	0.2	1.5	6	2.5	8	50
ESR7020150208S4	0.2	1.5	4	2.5	8	50
ESR7020150210	0.2	1.5	6	2.5	10	50
ESR7020150210S4	0.2	1.5	4	2.5	10	50
ESR7020150212S4	0.2	1.5	4	2.5	12	50
ESR7020150215	0.2	1.5	6	2.5	15	50
ESR7020150304S4	0.3	1.5	4	2.5	4	50
ESR7020150306S4	0.3	1.5	4	2.5	6	50
ESR7020150308S4	0.3	1.5	4	2.5	8	50
ESR7020150310S4	0.3	1.5	4	2.5	10	50
ESR7020150312S4	0.3	1.5	4	2.5	12	50
ESR7020150504S4	0.5	1.5	4	2.5	4	50
ESR7020150506S4	0.5	1.5	4	2.5	6	50
ESR7020150508S4	0.5	1.5	4	2.5	8	50
ESR7020150510S4	0.5	1.5	4	2.5	10	50
ESR7020150512S4	0.5	1.5	4	2.5	12	50
ESR7020200106S4	0.1	2	4	3	6	50
ESR7020200108	0.1	2	6	3	8	50
ESR7020200108S4	0.1	2	4	3	8	50
ESR7020200110S4	0.1	2	4	3	10	50
ESR7020200112	0.1	2	6	3	12	50
ESR7020200112S4	0.1	2	4	3	12	50
ESR7020200116S4	0.1	2	4	3	16	50
ESR7020200120S4	0.1	2	4	3	20	50
ESR7020200206	0.2	2	6	3	6	50
ESR7020200206S4	0.2	2	4	3	6	50
ESR7020200208S4	0.2	2	4	3	8	50
ESR7020200209	0.2	2	6	3	9	50
ESR7020200210S4	0.2	2	4	3	10	50
ESR7020200212S4	0.2	2	4	3	12	50

ESR702

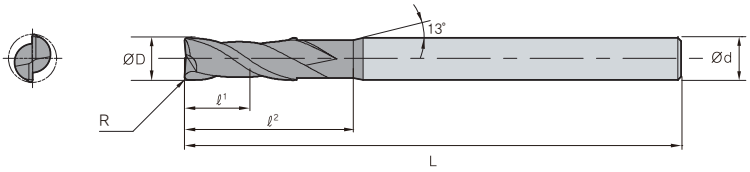
2 flutes neck type radius Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (Ø6 or Under) | R ±0.015 (Above Ø6) | AlTiN | DATA p.418, 419

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7020200216	0.2	2	6	3	16	50
ESR7020200216S4	0.2	2	4	3	16	50
ESR7020200220S4	0.2	2	4	3	20	50
ESR7020200306	0.3	2	6	3	6	50
ESR7020200306S4	0.3	2	4	3	6	50
ESR7020200308S4	0.3	2	4	3	8	50
ESR7020200310S4	0.3	2	4	3	10	50
ESR7020200312S4	0.3	2	4	3	12	50
ESR7020200316S4	0.3	2	4	3	16	50
ESR7020200320S4	0.3	2	4	3	20	50
ESR7020200506	0.5	2	6	3	6	50
ESR7020200506S4	0.5	2	4	3	6	50
ESR7020200508S4	0.5	2	4	3	8	50
ESR7020200509	0.5	2	6	3	9	50
ESR7020200510S4	0.5	2	4	3	10	50
ESR7020200512	0.5	2	6	3	12	50
ESR7020200512S4	0.5	2	4	3	12	50
ESR7020200516	0.5	2	6	3	16	50
ESR7020200516S4	0.5	2	4	3	16	50
ESR7020200520S4	0.5	2	4	3	20	50
ESR7020250208S4	0.2	2.5	4	3.5	8	50
ESR7020250210S4	0.2	2.5	4	3.5	10	50
ESR7020250212S4	0.2	2.5	4	3.5	12	50
ESR7020250216S4	0.2	2.5	4	3.5	16	50
ESR7020250308S4	0.3	2.5	4	3.5	8	50
ESR7020250310S4	0.3	2.5	4	3.5	10	50
ESR7020250312S4	0.3	2.5	4	3.5	12	50
ESR7020250316S4	0.3	2.5	4	3.5	16	50
ESR7020250508S4	0.5	2.5	4	3.5	8	50
ESR7020250510S4	0.5	2.5	4	3.5	10	50
ESR7020250512S4	0.5	2.5	4	3.5	12	50
ESR7020250516S4	0.5	2.5	4	3.5	16	50
ESR7020300108	0.1	3	6	4.5	8	55
ESR7020300110	0.1	3	6	4.5	10	55
ESR7020300112	0.1	3	6	4.5	12	55
ESR7020300116	0.1	3	6	4.5	16	55

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7020300120	0.1	3	6	4.5	20	60
ESR7020300208	0.2	3	6	4.5	8	55
ESR7020300209	0.2	3	6	4.5	9	55
ESR7020300210	0.2	3	6	4.5	10	55
ESR7020300212	0.2	3	6	4.5	12	55
ESR7020300216	0.2	3	6	4.5	16	55
ESR7020300220	0.2	3	6	4.5	20	60
ESR7020300308	0.3	3	6	4.5	8	55
ESR7020300309	0.3	3	6	4.5	9	55
ESR7020300310	0.3	3	6	4.5	10	55
ESR7020300312	0.3	3	6	4.5	12	55
ESR7020300314	0.3	3	6	4.5	14	55
ESR7020300316	0.3	3	6	4.5	16	55
ESR7020300320	0.3	3	6	4.5	20	60
ESR7020300508	0.5	3	6	4.5	8	55
ESR7020300509	0.5	3	6	4.5	9	55
ESR7020300510	0.5	3	6	4.5	10	55
ESR7020300512	0.5	3	6	4.5	12	55
ESR7020300516	0.5	3	6	4.5	16	55
ESR7020300520	0.5	3	6	4.5	20	60
ESR7020301008	1	3	6	4.5	8	55
ESR7020301010	1	3	6	4.5	10	55
ESR7020301012	1	3	6	4.5	12	55
ESR7020301016	1	3	6	4.5	16	55
ESR7020301020	1	3	6	4.5	20	60
ESR7020301025	1	3	6	4.5	25	60
ESR7020400110	0.1	4	6	6	10	55
ESR7020400112	0.1	4	6	6	12	55
ESR7020400116	0.1	4	6	6	16	55
ESR7020400120	0.1	4	6	6	20	60
ESR7020400125	0.1	4	6	6	25	60
ESR7020400210	0.2	4	6	6	10	55
ESR7020400212	0.2	4	6	6	12	55
ESR7020400216	0.2	4	6	6	16	55
ESR7020400220	0.2	4	6	6	20	60
ESR7020400225	0.2	4	6	6	25	60

H-Star Endmill

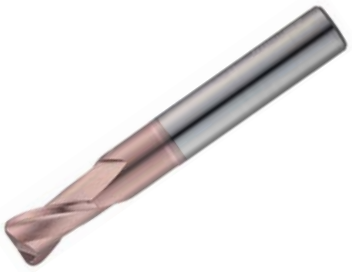
ESR702

2 flutes neck type radius Endmill

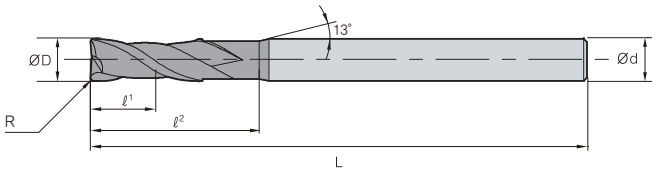
ULTRA FINE | 2 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.418, 419

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	







(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7020400310	0.3	4	6	6	10	55
ESR7020400312	0.3	4	6	6	12	55
ESR7020400316	0.3	4	6	6	16	55
ESR7020400320	0.3	4	6	6	20	60
ESR7020400325	0.3	4	6	6	25	60
ESR7020400510	0.5	4	6	6	10	55
ESR7020400512	0.5	4	6	6	12	55
ESR7020400516	0.5	4	6	6	16	55
ESR7020400520	0.5	4	6	6	20	60
ESR7020400525	0.5	4	6	6	25	60
ESR7020400530	0.5	4	6	6	30	70
ESR7020401010	1	4	6	6	10	55
ESR7020401012	1	4	6	6	12	55
ESR7020401016	1	4	6	6	16	55
ESR7020401020	1	4	6	6	20	60
ESR7020401025	1	4	6	6	25	60
ESR7020401030	1	4	6	6	30	70
ESR7020500318	0.3	5	6	8	18	60
ESR7020600220	0.2	6	6	9	20	60
ESR7020600320	0.3	6	6	9	20	60

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7020600520	0.5	6	6	9	20	60
ESR7020601020	1	6	6	9	20	60
ESR7020601520	1.5	6	6	9	20	60
ESR7020602020	2	6	6	9	20	60
ESR7020800225	0.2	8	8	12	25	60
ESR7020800325	0.3	8	8	12	25	60
ESR7020800525	0.5	8	8	12	25	60
ESR7020801025	1	8	8	12	25	60
ESR7020801525	1.5	8	8	12	25	60
ESR7021000232	0.2	10	10	15	32	70
ESR7021000332	0.3	10	10	15	32	70
ESR7021000532	0.5	10	10	15	32	70
ESR7021001032	1	10	10	15	32	70
ESR7021001532	1.5	10	10	15	32	70
ESR7021002032	2	10	10	15	32	70
ESR7021200338	0.3	12	12	18	38	80
ESR7021200538	0.5	12	12	18	38	80
ESR7021201038	1	12	12	18	38	80
ESR7021201538	1.5	12	12	18	38	80
ESR7021202038	2	12	12	18	38	80

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESR732

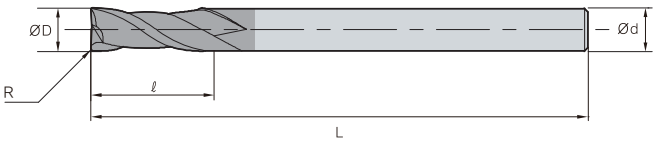
2 flutes long shank radius Endmill

ULTRA FINE | 2 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.419

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	R	ØD	Ød	ℓ	L
ESR73201001	0.1	1	6	2	50
ESR73201002	0.2	1	6	2	50
ESR73201003	0.3	1	6	2	50
ESR73201501	0.1	1.5	6	3	50
ESR73201502	0.2	1.5	6	3	50
ESR73201503	0.3	1.5	6	3	50
ESR73201505	0.5	1.5	6	3	50
ESR73202001	0.1	2	6	5	50
ESR73202002	0.2	2	6	5	50
ESR73202003	0.3	2	6	5	50
ESR73202005	0.5	2	6	5	50
ESR73202501	0.1	2.5	6	7	60
ESR73202502	0.2	2.5	6	7	60
ESR73202503	0.3	2.5	6	7	60
ESR73202505	0.5	2.5	6	7	60
ESR73203001	0.1	3	6	8	60
ESR73203002	0.2	3	6	8	60
ESR73203003	0.3	3	6	8	60
ESR73203005	0.5	3	6	8	60
ESR73204001	0.1	4	6	10	70
ESR73204002	0.2	4	6	10	70
ESR73204003	0.3	4	6	10	70
ESR73204005	0.5	4	6	10	70
ESR73204010	1	4	6	10	70
ESR73205001	0.1	5	6	13	80

Designation	R	ØD	Ød	ℓ	L
ESR73205002	0.2	5	6	13	80
ESR73205003	0.3	5	6	13	80
ESR73205005	0.5	5	6	13	80
ESR73205010	1	5	6	13	80
ESR73206001	0.1	6	6	15	90
ESR73206002	0.2	6	6	15	90
ESR73206003	0.3	6	6	15	90
ESR73206005	0.5	6	6	15	90
ESR73206010	1	6	6	15	90
ESR73208001	0.1	8	8	20	100
ESR73208002	0.2	8	8	20	100
ESR73208003	0.3	8	8	20	100
ESR73208005	0.5	8	8	20	100
ESR73208010	1	8	8	20	100
ESR73208020	2	8	8	20	100
ESR73210002	0.2	10	10	25	100
ESR73210003	0.3	10	10	25	100
ESR73210005	0.5	10	10	25	100
ESR73210010	1	10	10	25	100
ESR73210020	2	10	10	25	100
ESR73212002	0.2	12	12	30	110
ESR73212003	0.3	12	12	30	110
ESR73212005	0.5	12	12	30	110
ESR73212010	1	12	12	30	110
ESR73212020	2	12	12	30	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

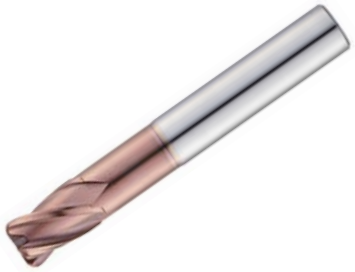
Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESR704

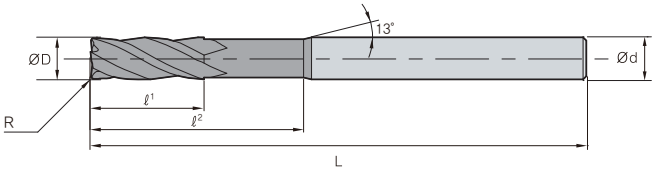
4 flutes neck type radius Endmill



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.419

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7040100103S4	0.1	1	4	2	3	50
ESR7040100104S4	0.1	1	4	2	4	50
ESR7040100106S4	0.1	1	4	2	6	50
ESR7040100203S4	0.2	1	4	2	3	50
ESR7040100204S4	0.2	1	4	2	4	50
ESR7040100206S4	0.2	1	4	2	6	50
ESR7040100303S4	0.3	1	4	2	3	50
ESR7040100304S4	0.3	1	4	2	4	50
ESR7040100306S4	0.3	1	4	2	6	50
ESR7040150104S4	0.1	1.5	4	2.5	4	50
ESR7040150106S4	0.1	1.5	4	2.5	6	50
ESR7040150204S4	0.2	1.5	4	2.5	4	50
ESR7040150206S4	0.2	1.5	4	2.5	6	50
ESR7040150304S4	0.3	1.5	4	2.5	4	50
ESR7040150306S4	0.3	1.5	4	2.5	6	50
ESR7040200106S4	0.1	2	4	3	6	50
ESR7040200108S4	0.1	2	4	3	8	50
ESR7040200206S4	0.2	2	4	3	6	50
ESR7040200208	0.2	2	6	3	8	50
ESR7040200208S4	0.2	2	4	3	8	50
ESR7040200210	0.2	2	6	3	10	50
ESR7040200212	0.2	2	6	3	12	50
ESR7040200306S4	0.3	2	4	3	6	50
ESR7040200308S4	0.3	2	4	3	8	50
ESR7040200506S4	0.5	2	4	3	6	50
ESR7040200508S4	0.5	2	4	3	8	50
ESR7040250106S4	0.1	2.5	4	3.5	6	50
ESR7040300108	0.1	3	6	4	8	55
ESR7040300110	0.1	3	6	4	10	55
ESR7040300112	0.1	3	6	4	12	55
ESR7040300116	0.1	3	6	4	16	55
ESR7040300120	0.1	3	6	4	20	60
ESR7040300208	0.2	3	6	4	8	55
ESR7040300210	0.2	3	6	4	10	55
ESR7040300212	0.2	3	6	4	12	55
ESR7040300216	0.2	3	6	4	16	55

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7040300220	0.2	3	6	4	20	60
ESR7040300308	0.3	3	6	4	8	55
ESR7040300309	0.3	3	6	4	9	55
ESR7040300310	0.3	3	6	4	10	55
ESR7040300312	0.3	3	6	4	12	55
ESR7040300316	0.3	3	6	4	16	55
ESR7040300320	0.3	3	6	4	20	60
ESR7040300508	0.5	3	6	4	8	55
ESR7040300509	0.5	3	6	4	9	55
ESR7040300510	0.5	3	6	4	10	55
ESR7040300512	0.5	3	6	4	12	55
ESR7040300516	0.5	3	6	4	16	55
ESR7040300520	0.5	3	6	4	20	60
ESR7040301008	1	3	6	4	8	55
ESR7040301010	1	3	6	4	10	55
ESR7040301012	1	3	6	4	12	55
ESR7040301016	1	3	6	4	16	55
ESR7040301020	1	3	6	4	20	60
ESR7040400110	0.1	4	6	6	10	55
ESR7040400112	0.1	4	6	6	12	55
ESR7040400116	0.1	4	6	6	16	55
ESR7040400120	0.1	4	6	6	20	60
ESR7040400125	0.1	4	6	6	25	60
ESR7040400210	0.2	4	6	6	10	55
ESR7040400212	0.2	4	6	6	12	55
ESR7040400216	0.2	4	6	6	16	55
ESR7040400220	0.2	4	6	6	20	60
ESR7040400225	0.2	4	6	6	25	60
ESR7040400310	0.3	4	6	6	10	55
ESR7040400312	0.3	4	6	6	12	55
ESR7040400316	0.3	4	6	6	16	55
ESR7040400320	0.3	4	6	6	20	60
ESR7040400325	0.3	4	6	6	25	60
ESR7040400510	0.5	4	6	6	10	55
ESR7040400512	0.5	4	6	6	12	55
ESR7040400516	0.5	4	6	6	16	55

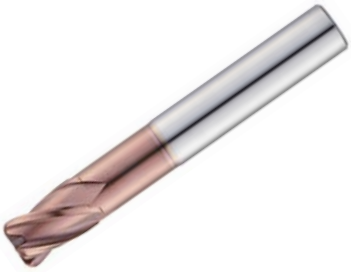
ESR704

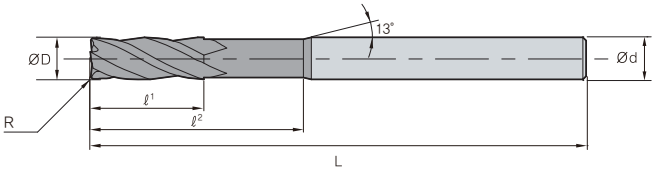
4 flutes neck type radius Endmill

ULTRA FINE | 4 | 30° HELIX | R ±0.01 (Ø6 or Under) | R ±0.015 (Above Ø6) | AlTiN | DATA p.419

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7040400520	0.5	4	6	6	20	60
ESR7040400525	0.5	4	6	6	25	60
ESR7040401010	1	4	6	6	10	55
ESR7040401012	1	4	6	6	12	55
ESR7040401016	1	4	6	6	16	55
ESR7040401020	1	4	6	6	20	60
ESR7040401025	1	4	6	6	25	60
ESR7040600220	0.2	6	6	9	20	60
ESR7040600320	0.3	6	6	9	20	60
ESR7040600520	0.5	6	6	9	20	60
ESR7040601020	1	6	6	9	20	60
ESR7040601520	1.5	6	6	9	20	60
ESR7040602020	2	6	6	9	20	60
ESR7040800225	0.2	8	8	12	25	60
ESR7040800325	0.3	8	8	12	25	60

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7040800525	0.5	8	8	12	25	60
ESR7040801025	1	8	8	12	25	60
ESR7040801525	1.5	8	8	12	25	60
ESR7040802025	2	8	8	12	25	60
ESR7041000232	0.2	10	10	15	32	70
ESR7041000332	0.3	10	10	15	32	70
ESR7041000532	0.5	10	10	15	32	70
ESR7041001032	1	10	10	15	32	70
ESR7041001532	1.5	10	10	15	32	70
ESR7041002032	2	10	10	15	32	70
ESR7041200338	0.3	12	12	18	38	80
ESR7041200538	0.5	12	12	18	38	80
ESR7041201038	1	12	12	18	38	80
ESR7041201538	1.5	12	12	18	38	80
ESR7041202038	2	12	12	18	38	80

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESR714

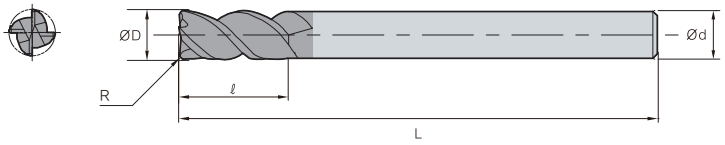
4 flutes radius Endmill



ULTRA FINE | 4 | 45° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.419

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
ESR7140303	0.3	3	6	8	50
ESR7140305S4	0.5	3	4	8	50
ESR7140305	0.5	3	6	8	50
ESR7140403	0.3	4	6	11	50
ESR7140405	0.5	4	6	11	50
ESR7140405S4	0.5	4	4	11	50
ESR7140410	1	4	6	11	50
ESR7140603	0.3	6	6	15	60
ESR7140605	0.5	6	6	15	60
ESR7140610	1	6	6	15	60
ESR7140803	0.3	8	8	20	60
ESR7140805	0.5	8	8	20	60
ESR7140810	1	8	8	20	60
ESR7140815	1.5	8	8	20	60
ESR7140820	2	8	8	20	60
ESR7141003	0.3	10	10	25	70
ESR7141005	0.5	10	10	25	70
ESR7141010	1	10	10	25	70
ESR7141015	1.5	10	10	25	70
ESR7141020	2	10	10	25	70
ESR7141025	2.5	10	10	25	70
ESR7141030	3	10	10	25	70
ESR7141203	0.3	12	12	30	80
ESR7141205	0.5	12	12	30	80
ESR7141210	1	12	12	30	80
ESR7141215	1.5	12	12	30	80
ESR7141220	2	12	12	30	80
ESR7141225	2.5	12	12	30	80
ESR7141230	3	12	12	30	80

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESR724

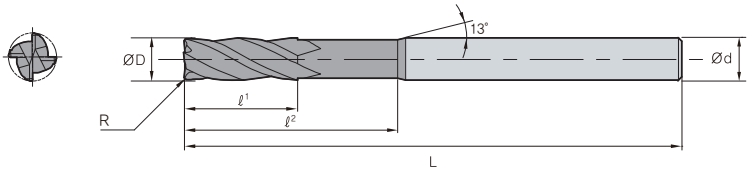
4 flutes neck type radius Endmill



ULTRA FINE | 4 | 30° HELIX | R ±0.01 (Ø6 or Under) | R ±0.015 (Above Ø6) | AlTiN | DATA p.419

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7240600520	0.5	6	6	9	20	90
ESR7240601020	1	6	6	9	20	90
ESR7240800525	0.5	8	8	12	25	100
ESR7240801025	1	8	8	12	25	100
ESR7241000532	0.5	10	10	15	32	100
ESR7241001032	1	10	10	15	32	100
ESR7241002032	2	10	10	15	32	100
ESR7241200538	0.5	12	12	18	38	110
ESR7241201038	1	12	12	18	38	110
ESR7241202038	2	12	12	18	38	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESR734

4 flutes long shank radius Endmill

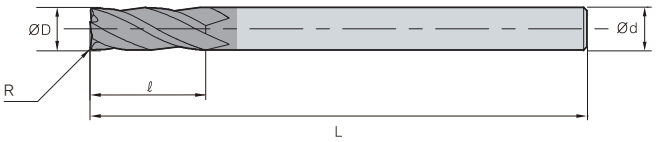


ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.419

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	R	ØD	Ød	ℓ	L
ESR73401001	0.1	1	6	2	50
ESR73401002	0.2	1	6	2	50
ESR73401003	0.3	1	6	2	50
ESR73401501	0.1	1.5	6	3	50
ESR73401502	0.2	1.5	6	3	50
ESR73401503	0.3	1.5	6	3	50
ESR73401505	0.5	1.5	6	3	50
ESR73402001	0.1	2	6	5	50
ESR73402002	0.2	2	6	5	50
ESR73402003	0.3	2	6	5	50
ESR73402005	0.5	2	6	5	50
ESR73402501	0.1	2.5	6	7	60
ESR73402502	0.2	2.5	6	7	60
ESR73402503	0.3	2.5	6	7	60
ESR73402505	0.5	2.5	6	7	60
ESR73403001	0.1	3	6	8	60
ESR73403002	0.2	3	6	8	60
ESR73403003	0.3	3	6	8	60
ESR73403005	0.5	3	6	8	60
ESR73404001	0.1	4	6	10	70
ESR73404002	0.2	4	6	10	70
ESR73404002S4	0.2	4	4	10	70
ESR73404003	0.3	4	6	10	70
ESR73404005	0.5	4	6	10	70
ESR73404005S4	0.5	4	4	10	70
ESR73404010	1	4	6	10	70
ESR73405001	0.1	5	6	13	80

Designation	R	ØD	Ød	ℓ	L
ESR73405002	0.2	5	6	13	80
ESR73405003	0.3	5	6	13	80
ESR73405005	0.5	5	6	13	80
ESR73405010	1	5	6	13	80
ESR73406001	0.1	6	6	15	90
ESR73406002	0.2	6	6	15	90
ESR73406003	0.3	6	6	15	90
ESR73406005	0.5	6	6	15	90
ESR73406010	1	6	6	15	90
ESR73408001	0.1	8	8	20	100
ESR73408002	0.2	8	8	20	100
ESR73408003	0.3	8	8	20	100
ESR73408005	0.5	8	8	20	100
ESR73408010	1	8	8	20	100
ESR73408020	2	8	8	20	100
ESR73410002	0.2	10	10	25	100
ESR73410003	0.3	10	10	25	100
ESR73410005	0.5	10	10	25	100
ESR73410010	1	10	10	25	100
ESR73410020	2	10	10	25	100
ESR73412002	0.2	12	12	30	110
ESR73412003	0.3	12	12	30	110
ESR73412005	0.5	12	12	30	110
ESR73412010	1	12	12	30	110
ESR73412010L	1	12	12	30	150
ESR73412020	2	12	12	30	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESR706

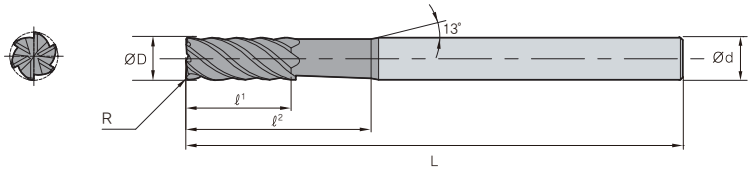
6 flutes neck type radius Endmill



ULTRA FINE | 6 | 45° HELIX | R ±0.01 (Ø6 or Under) | R ±0.015 (Above Ø6) | AlTiN | DATA p.420

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESR7060600314	0.3	6	6	6	14	50
ESR7060600514	0.5	6	6	6	14	50
ESR7060800524	0.5	8	8	8	24	60
ESR7060801024	1	8	8	8	24	60
ESR7061000530	0.5	10	10	10	30	70
ESR7061001030	1	10	10	10	30	70
ESR7061200530	0.5	12	12	12	30	75
ESR7061201030	1	12	12	12	30	75

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

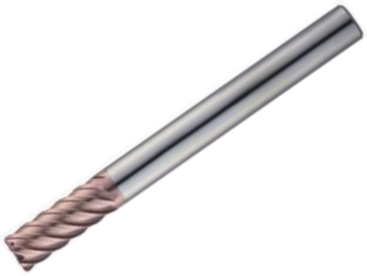
Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESR736

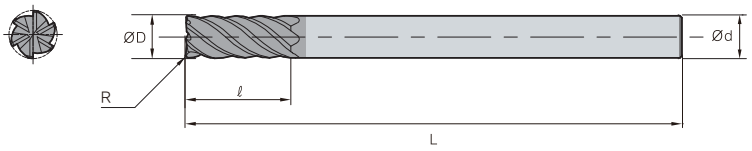
6 flutes radius Endmill



ULTRA FINE | 6 | 45° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.418

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
ESR73606005	0.5	6	6	15	90
ESR73606010	1	6	6	15	90
ESR73608005	0.5	8	8	20	100
ESR73608010	1	8	8	20	100
ESR73610005	0.5	10	10	25	100
ESR73610010	1	10	10	25	100
ESR73612005	0.5	12	12	30	110
ESR73612010	1	12	12	30	110

※ The above specifications are subject to change without prior notice for product quality improvement.

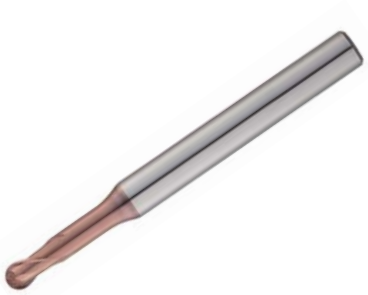
• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESRB712

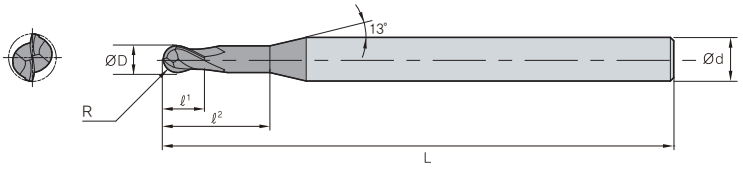
2 flutes rib ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 or Under) | R ±0.008 (Above R3) | AlTiN | DATA p.421~425

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

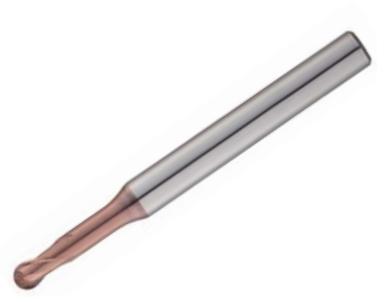
Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRB712001002	0.05	0.1	4	0.1	0.2	40
ESRB712001003	0.05	0.1	4	0.1	0.3	40
ESRB712001005	0.05	0.1	4	0.1	0.5	40
ESRB71200101	0.05	0.1	4	0.1	1	40
ESRB712002005	0.1	0.2	4	0.2	0.5	40
ESRB712002015	0.1	0.2	4	0.2	1.5	40
ESRB71200201	0.1	0.2	4	0.2	1	40
ESRB71200202	0.1	0.2	4	0.2	2	40
ESRB71200203	0.1	0.2	4	0.2	3	40
ESRB712003015	0.15	0.3	4	0.3	1.5	40
ESRB71200301	0.15	0.3	4	0.3	1	40
ESRB712003025	0.15	0.3	4	0.3	2.5	40
ESRB71200302	0.15	0.3	4	0.3	2	40
ESRB71200303	0.15	0.3	4	0.3	3	40
ESRB71200304	0.15	0.3	4	0.3	4	40
ESRB71200305	0.15	0.3	4	0.3	5	40
ESRB712004015	0.2	0.4	4	0.4	1.5	40
ESRB71200401	0.2	0.4	4	0.4	1	40
ESRB712004025	0.2	0.4	4	0.4	2.5	40
ESRB71200402	0.2	0.4	4	0.4	2	40
ESRB71200403	0.2	0.4	4	0.4	3	40
ESRB71200404	0.2	0.4	4	0.4	4	40
ESRB71200405	0.2	0.4	4	0.4	5	40
ESRB71200406	0.2	0.4	4	0.4	6	40
ESRB71200408	0.2	0.4	4	0.4	8	40
ESRB71200410	0.2	0.4	4	0.4	10	40
ESRB712005015	0.25	0.5	4	0.5	1.5	45
ESRB71200501	0.25	0.5	4	0.5	1	45
ESRB71200501S6	0.25	0.5	6	0.5	1	45
ESRB712005025	0.25	0.5	4	0.5	2.5	45
ESRB71200502	0.25	0.5	4	0.5	2	45
ESRB71200502S6	0.25	0.5	6	0.5	2	45
ESRB71200503	0.25	0.5	4	0.5	3	45
ESRB71200504	0.25	0.5	4	0.5	4	45
ESRB71200504S6	0.25	0.5	6	0.5	4	45
ESRB71200505	0.25	0.5	4	0.5	5	45
ESRB71200506	0.25	0.5	4	0.5	6	45
ESRB71200508	0.25	0.5	4	0.5	8	45
ESRB71200510	0.25	0.5	4	0.5	10	45

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71200512	0.25	0.5	4	0.5	12	45
ESRB71200514	0.25	0.5	4	0.5	14	45
ESRB71200516	0.25	0.5	4	0.5	16	45
ESRB71200601	0.3	0.6	4	0.6	1	45
ESRB71200601S6	0.3	0.6	6	0.6	1	45
ESRB71200602	0.3	0.6	4	0.6	2	45
ESRB71200602S6	0.3	0.6	6	0.6	2	45
ESRB71200603	0.3	0.6	4	0.6	3	45
ESRB71200603S6	0.3	0.6	6	0.6	3	45
ESRB71200604	0.3	0.6	4	0.6	4	45
ESRB71200604S6	0.3	0.6	6	0.6	4	45
ESRB71200605	0.3	0.6	4	0.6	5	45
ESRB71200605S6	0.3	0.6	6	0.6	5	45
ESRB71200606	0.3	0.6	4	0.6	6	45
ESRB71200606S6	0.3	0.6	6	0.6	6	45
ESRB71200608	0.3	0.6	4	0.6	8	45
ESRB71200608S6	0.3	0.6	6	0.6	8	45
ESRB71200610	0.3	0.6	4	0.6	10	45
ESRB71200610S6	0.3	0.6	6	0.6	10	45
ESRB71200612	0.3	0.6	4	0.6	12	45
ESRB71200612S6	0.3	0.6	6	0.6	12	45
ESRB71200614	0.3	0.6	4	0.6	14	45
ESRB71200614S6	0.3	0.6	6	0.6	14	45
ESRB71200616	0.3	0.6	4	0.6	16	45
ESRB71200616S6	0.3	0.6	6	0.6	16	50
ESRB71200702	0.35	0.7	4	0.7	2	45
ESRB71200704	0.35	0.7	4	0.7	4	45
ESRB71200706	0.35	0.7	4	0.7	6	45
ESRB71200708	0.35	0.7	4	0.7	8	45
ESRB71200710	0.35	0.7	4	0.7	10	45
ESRB71200712	0.35	0.7	4	0.7	12	45
ESRB71200801	0.4	0.8	4	0.8	1	45
ESRB71200801S6	0.4	0.8	6	0.8	1	45
ESRB71200802	0.4	0.8	4	0.8	2	45
ESRB71200802S6	0.4	0.8	6	0.8	2	45
ESRB71200803	0.4	0.8	4	0.8	3	45
ESRB71200803S6	0.4	0.8	6	0.8	3	45
ESRB71200804	0.4	0.8	4	0.8	4	45
ESRB71200804S6	0.4	0.8	6	0.8	4	45

H-Star Endmill

ESRB712

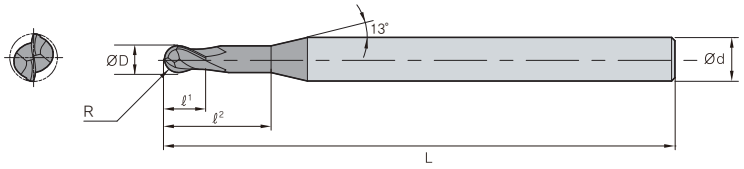
2 flutes rib ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.005 R3 or Under | R ±0.008 Above R3 | AlTiN | DATA p.421~425

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



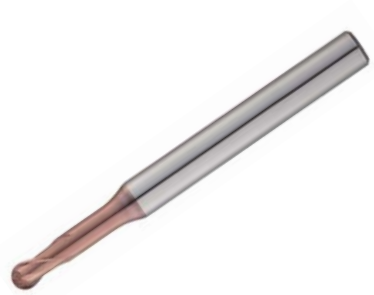
(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71200805	0.4	0.8	4	0.8	5	45
ESRB71200805S6	0.4	0.8	6	0.8	5	45
ESRB71200806	0.4	0.8	4	0.8	6	45
ESRB71200806S6	0.4	0.8	6	0.8	6	45
ESRB71200808	0.4	0.8	4	0.8	8	45
ESRB71200808S6	0.4	0.8	6	0.8	8	45
ESRB71200810	0.4	0.8	4	0.8	10	45
ESRB71200810S6	0.4	0.8	6	0.8	10	45
ESRB71200812	0.4	0.8	4	0.8	12	45
ESRB71200812S6	0.4	0.8	6	0.8	12	45
ESRB71200814	0.4	0.8	4	0.8	14	45
ESRB71200814S6	0.4	0.8	6	0.8	14	45
ESRB71200816	0.4	0.8	4	0.8	16	45
ESRB71200816S6	0.4	0.8	6	0.8	16	50
ESRB71200820	0.4	0.8	4	0.8	20	50
ESRB71200820S6	0.4	0.8	6	0.8	20	55
ESRB71200904	0.45	0.9	4	0.9	4	45
ESRB71200906	0.45	0.9	4	0.9	6	45
ESRB71200908	0.45	0.9	4	0.9	8	45
ESRB71200910	0.45	0.9	4	0.9	10	45
ESRB71201002	0.5	1	4	1	2	50
ESRB71201002S6	0.5	1	6	1	2	50
ESRB71201003	0.5	1	4	1	3	50
ESRB71201003S6	0.5	1	6	1	3	50
ESRB71201004	0.5	1	4	1	4	50
ESRB71201004S6	0.5	1	6	1	4	50
ESRB71201005	0.5	1	4	1	5	50
ESRB71201005S6	0.5	1	6	1	5	50
ESRB71201006	0.5	1	4	1	6	50
ESRB71201006S6	0.5	1	6	1	6	50
ESRB71201007	0.5	1	4	1	7	50
ESRB71201007S6	0.5	1	6	1	7	50
ESRB71201008	0.5	1	4	1	8	50
ESRB71201008S6	0.5	1	6	1	8	50
ESRB71201009	0.5	1	4	1	9	50
ESRB71201009S6	0.5	1	6	1	9	50
ESRB71201010	0.5	1	4	1	10	50
ESRB71201010S6	0.5	1	6	1	10	50
ESRB71201012	0.5	1	4	1	12	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71201012S6	0.5	1	6	1	12	50
ESRB71201014	0.5	1	4	1	14	50
ESRB71201014S6	0.5	1	6	1	14	50
ESRB71201016	0.5	1	4	1	16	50
ESRB71201016S6	0.5	1	6	1	16	50
ESRB71201018	0.5	1	4	1	18	50
ESRB71201018S6	0.5	1	6	1	18	50
ESRB71201020	0.5	1	4	1	20	55
ESRB71201020S6	0.5	1	6	1	20	55
ESRB71201022	0.5	1	4	1	22	60
ESRB71201022S6	0.5	1	6	1	22	60
ESRB71201026	0.5	1	4	1	26	60
ESRB71201026S6	0.5	1	6	1	26	60
ESRB71201030	0.5	1	4	1	30	70
ESRB71201030S6	0.5	1	6	1	30	70
ESRB71201040	0.5	1	4	1	40	80
ESRB71201050	0.5	1	4	1	50	100
ESRB71201204	0.6	1.2	4	1.2	4	50
ESRB71201206	0.6	1.2	4	1.2	6	50
ESRB71201208	0.6	1.2	4	1.2	8	50
ESRB71201210	0.6	1.2	4	1.2	10	50
ESRB71201212	0.6	1.2	4	1.2	12	50
ESRB71201216	0.6	1.2	4	1.2	16	50
ESRB71201220	0.6	1.2	4	1.2	20	50
ESRB71201226	0.6	1.2	4	1.2	26	60
ESRB71201406	0.7	1.4	4	1.4	6	50
ESRB71201408	0.7	1.4	4	1.4	8	50
ESRB71201410	0.7	1.4	4	1.4	10	50
ESRB71201412	0.7	1.4	4	1.4	12	50
ESRB71201416	0.7	1.4	4	1.4	16	50
ESRB71201503	0.75	1.5	4	1.5	3	50
ESRB71201503S6	0.75	1.5	6	1.5	3	50
ESRB71201504	0.75	1.5	4	1.5	4	50
ESRB71201504S6	0.75	1.5	6	1.5	4	50
ESRB71201505	0.75	1.5	4	1.5	5	50
ESRB71201506	0.75	1.5	4	1.5	6	50
ESRB71201506S6	0.75	1.5	6	1.5	6	50
ESRB71201507	0.75	1.5	4	1.5	7	50
ESRB71201508	0.75	1.5	4	1.5	8	50

ESRB712

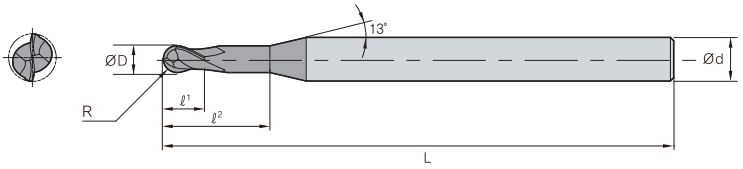
2 flutes rib ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 or Under) | R ±0.008 (Above R3) | AlTiN | DATA p.421~425

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71201508S6	0.75	1.5	6	1.5	8	50
ESRB71201510	0.75	1.5	4	1.5	10	50
ESRB71201510S6	0.75	1.5	6	1.5	10	50
ESRB71201512	0.75	1.5	4	1.5	12	50
ESRB71201512S6	0.75	1.5	6	1.5	12	50
ESRB71201514	0.75	1.5	4	1.5	14	50
ESRB71201514S6	0.75	1.5	6	1.5	14	50
ESRB71201516	0.75	1.5	4	1.5	16	50
ESRB71201516S6	0.75	1.5	6	1.5	16	50
ESRB71201518	0.75	1.5	4	1.5	18	50
ESRB71201518S6	0.75	1.5	6	1.5	18	50
ESRB71201520	0.75	1.5	4	1.5	20	55
ESRB71201520S6	0.75	1.5	6	1.5	20	55
ESRB71201522	0.75	1.5	4	1.5	22	60
ESRB71201522S6	0.75	1.5	6	1.5	22	60
ESRB71201526	0.75	1.5	4	1.5	26	60
ESRB71201526S6	0.75	1.5	6	1.5	26	60
ESRB71201530	0.75	1.5	4	1.5	30	70
ESRB71201530S6	0.75	1.5	6	1.5	30	70
ESRB71201535	0.75	1.5	4	1.5	35	70
ESRB71201535S6	0.75	1.5	6	1.5	35	70
ESRB71201540	0.75	1.5	4	1.5	40	80
ESRB71201540S6	0.75	1.5	6	1.5	40	80
ESRB71201604	0.8	1.6	4	1.6	4	50
ESRB71201606	0.8	1.6	4	1.6	6	50
ESRB71201608	0.8	1.6	4	1.6	8	50
ESRB71201610	0.8	1.6	4	1.6	10	50
ESRB71201612	0.8	1.6	4	1.6	12	50
ESRB71201616	0.8	1.6	4	1.6	16	50
ESRB71201620	0.8	1.6	4	1.6	20	50
ESRB71201804	0.9	1.8	4	1.8	4	50
ESRB71201806	0.9	1.8	4	1.8	6	50
ESRB71201808	0.9	1.8	4	1.8	8	50
ESRB71201810	0.9	1.8	4	1.8	10	50
ESRB71201812	0.9	1.8	4	1.8	12	50
ESRB71201816	0.9	1.8	4	1.8	16	50
ESRB71201820	0.9	1.8	4	1.8	20	50
ESRB71202004	1	2	4	2	4	50
ESRB71202004S6	1	2	6	2	4	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71202006	1	2	4	2	6	50
ESRB71202006S6	1	2	6	2	6	50
ESRB71202008	1	2	4	2	8	50
ESRB71202008S6	1	2	6	2	8	50
ESRB71202010	1	2	4	2	10	50
ESRB71202010S6	1	2	6	2	10	50
ESRB71202012	1	2	4	2	12	50
ESRB71202012S6	1	2	6	2	12	50
ESRB71202014	1	2	4	2	14	50
ESRB71202014S6	1	2	6	2	14	50
ESRB71202016	1	2	4	2	16	50
ESRB71202016S6	1	2	6	2	16	50
ESRB71202018	1	2	4	2	18	55
ESRB71202018S6	1	2	6	2	18	55
ESRB71202020	1	2	4	2	20	55
ESRB71202020S6	1	2	6	2	20	55
ESRB71202022	1	2	4	2	22	60
ESRB71202022S6	1	2	6	2	22	60
ESRB71202026	1	2	4	2	26	60
ESRB71202026S6	1	2	6	2	26	60
ESRB71202030	1	2	4	2	30	70
ESRB71202030S6	1	2	6	2	30	70
ESRB71202035	1	2	4	2	35	70
ESRB71202035S6	1	2	6	2	35	70
ESRB71202040	1	2	4	2	40	80
ESRB71202040S6	1	2	6	2	40	80
ESRB71202045	1	2	4	2	45	90
ESRB71202045S6	1	2	6	2	45	90
ESRB71202050	1	2	4	2	50	100
ESRB71202050S6	1	2	6	2	50	100
ESRB71202060	1	2	4	2	60	110
ESRB71202508	1.25	2.5	4	2.5	8	50
ESRB71202510	1.25	2.5	4	2.5	10	50
ESRB71202512	1.25	2.5	4	2.5	12	50
ESRB71202516	1.25	2.5	4	2.5	16	50
ESRB71202520	1.25	2.5	4	2.5	20	50
ESRB71202522	1.25	2.5	4	2.5	22	60
ESRB71202526	1.25	2.5	4	2.5	26	60
ESRB71202530	1.25	2.5	4	2.5	30	70

H-Star Endmill

ESRB712

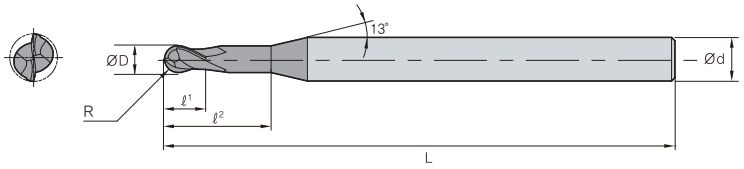
2 flutes rib ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (R3 or Under) | R ±0.008 (Above R3) | AlTiN | DATA p.421~425

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71202535	1.25	2.5	4	2.5	35	70
ESRB71202540	1.25	2.5	4	2.5	40	80
ESRB71202545	1.25	2.5	4	2.5	45	90
ESRB71202550	1.25	2.5	4	2.5	50	100
ESRB71203006	1.5	3	6	3	6	50
ESRB71203008	1.5	3	6	3	8	50
ESRB71203010	1.5	3	6	3	10	50
ESRB71203012	1.5	3	6	3	12	50
ESRB71203014	1.5	3	6	3	14	60
ESRB71203016	1.5	3	6	3	16	60
ESRB71203018	1.5	3	6	3	18	60
ESRB71203020	1.5	3	6	3	20	60
ESRB71203022	1.5	3	6	3	22	65
ESRB71203026	1.5	3	6	3	26	65
ESRB71203030	1.5	3	6	3	30	70
ESRB71203035	1.5	3	6	3	35	70
ESRB71203040	1.5	3	6	3	40	80
ESRB71203045	1.5	3	6	3	45	90
ESRB71203050	1.5	3	6	3	50	100
ESRB71203060	1.5	3	6	3	60	100
ESRB71203510	1.75	3.5	6	3	10	50
ESRB71203516	1.75	3.5	6	3	16	60
ESRB71203520	1.75	3.5	6	3	20	60
ESRB71203526	1.75	3.5	6	3	26	65
ESRB71203530	1.75	3.5	6	3	30	70
ESRB71204008	2	4	6	4	8	50
ESRB71204010	2	4	6	4	10	50
ESRB71204012	2	4	6	4	12	50
ESRB71204014	2	4	6	4	14	60
ESRB71204016	2	4	6	4	16	60
ESRB71204018	2	4	6	4	18	60
ESRB71204020	2	4	6	4	20	60
ESRB71204022	2	4	6	4	22	65
ESRB71204026	2	4	6	4	26	65

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRB71204030	2	4	6	4	30	70
ESRB71204035	2	4	6	4	35	70
ESRB71204040	2	4	6	4	40	80
ESRB71204045	2	4	6	4	45	90
ESRB71204050	2	4	6	4	50	100
ESRB71204055	2	4	6	4	55	100
ESRB71204060	2	4	6	4	60	100
ESRB71205015	2.5	5	6	6	15	60
ESRB71205020	2.5	5	6	6	20	60
ESRB71205026	2.5	5	6	6	26	65
ESRB71205030	2.5	5	6	6	30	70
ESRB71205035	2.5	5	6	6	35	70
ESRB71205040	2.5	5	6	6	40	80
ESRB71205045	2.5	5	6	6	45	90
ESRB71205050	2.5	5	6	6	50	100
ESRB71205055	2.5	5	6	6	55	100
ESRB71205060	2.5	5	6	6	60	100
ESRB7120602090	3	6	6	12	20	90
ESRB71206020	3	6	6	8	20	60
ESRB7120603090	3	6	6	12	30	90
ESRB71206030	3	6	6	8	30	60
ESRB71208025100	4	8	8	14	25	100
ESRB71208025	4	8	8	10	25	70
ESRB71208035100	4	8	8	14	35	100
ESRB71208035	4	8	8	10	35	70
ESRB71210030100	5	10	10	18	30	100
ESRB71210030	5	10	10	12	30	75
ESRB71210040100	5	10	10	18	40	100
ESRB71210040	5	10	10	12	40	75
ESRB71212032110	6	12	12	22	32	110
ESRB71212032	6	12	12	14	32	80
ESRB71212045110	6	12	12	22	45	110
ESRB71212045	6	12	12	14	45	80

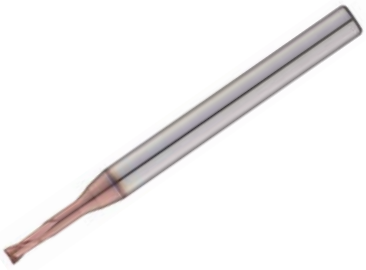
• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESRE712

2 flutes rib neck type flat Endmill

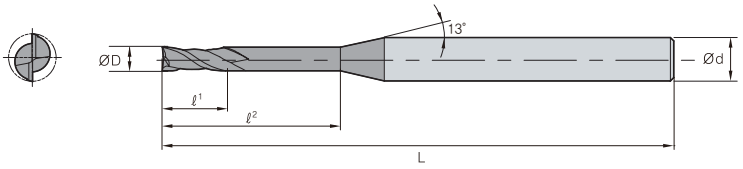


ULTRA FINE | 2 | 30° HELIX | AlTiN | DATA

p.426~430

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

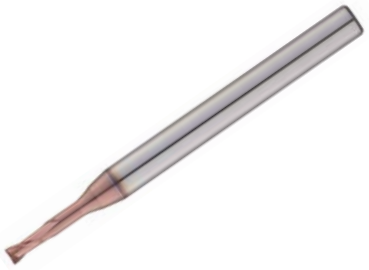
Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE712001003	0.1	4	0.15	0.3	40
ESRE712001005	0.1	4	0.15	0.5	40
ESRE71200101	0.1	4	0.15	1	40
ESRE712002005	0.2	4	0.3	0.5	40
ESRE712002015	0.2	4	0.3	1.5	40
ESRE71200201	0.2	4	0.3	1	40
ESRE71200202	0.2	4	0.3	2	40
ESRE712003015	0.3	4	0.5	1.5	40
ESRE71200301	0.3	4	0.5	1	40
ESRE712003025	0.3	4	0.5	2.5	40
ESRE71200302	0.3	4	0.5	2	40
ESRE71200303	0.3	4	0.5	3	40
ESRE71200304	0.3	4	0.5	4	40
ESRE71200305	0.4	4	0.5	5	40
ESRE712004015	0.4	4	0.6	1.5	40
ESRE71200401	0.4	4	0.6	1	40
ESRE712004025	0.4	4	0.6	2.5	40
ESRE71200402	0.4	4	0.6	2	40
ESRE71200403	0.4	4	0.6	3	40
ESRE71200404	0.4	4	0.6	4	40
ESRE71200405	0.4	4	0.6	5	40
ESRE71200406	0.4	4	0.6	6	40
ESRE71200408	0.4	4	0.6	8	40
ESRE71200410	0.5	4	0.6	10	40
ESRE712005015	0.5	4	0.7	1.5	45
ESRE71200501	0.5	4	0.7	1	45
ESRE712005025	0.5	4	0.7	2.5	45
ESRE71200502	0.5	4	0.7	2	45
ESRE71200503	0.5	4	0.7	3	45
ESRE71200504	0.5	4	0.7	4	45
ESRE71200505	0.5	4	0.7	5	45
ESRE71200506	0.5	4	0.7	6	45
ESRE71200508	0.5	4	0.7	8	45
ESRE71200510	0.5	4	0.7	10	45
ESRE71200512	0.5	4	0.7	12	45
ESRE71200514	0.5	4	0.7	14	45
ESRE71200516	0.5	4	0.7	16	45
ESRE71200602	0.6	4	0.9	2	45

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71200603	0.6	4	0.9	3	45
ESRE71200604	0.6	4	0.9	4	45
ESRE71200605	0.6	4	0.9	5	45
ESRE71200606	0.6	4	0.9	6	45
ESRE71200608	0.6	4	0.9	8	45
ESRE71200610	0.6	4	0.9	10	45
ESRE71200612	0.6	4	0.9	12	45
ESRE71200614	0.6	4	0.9	14	45
ESRE71200616	0.6	4	0.9	16	45
ESRE71200702	0.7	4	1.2	2	45
ESRE71200704	0.7	4	1.2	4	45
ESRE71200706	0.7	4	1.2	6	45
ESRE71200708	0.7	4	1.2	8	45
ESRE71200710	0.7	4	1.2	10	45
ESRE71200712	0.7	4	1.2	12	45
ESRE71200802	0.8	4	1.2	2	45
ESRE71200803	0.8	4	1.2	3	45
ESRE71200804	0.8	4	1.2	4	45
ESRE71200805	0.8	4	1.2	5	45
ESRE71200806	0.8	4	1.2	6	45
ESRE71200808	0.8	4	1.2	8	45
ESRE71200810	0.8	4	1.2	10	45
ESRE71200812	0.8	4	1.2	12	45
ESRE71200814	0.8	4	1.2	14	45
ESRE71200816	0.8	4	1.2	16	45
ESRE71200820	0.8	4	1.2	20	50
ESRE71200906	0.9	4	1.3	6	45
ESRE71200908	0.9	4	1.3	8	45
ESRE71200910	0.9	4	1.3	10	45
ESRE71201002	1	4	1.5	2	50
ESRE71201003	1	4	1.5	3	50
ESRE71201004	1	4	1.5	4	50
ESRE71201005	1	4	1.5	5	50
ESRE71201006	1	4	1.5	6	50
ESRE71201007	1	4	1.5	7	50
ESRE71201008	1	4	1.5	8	50
ESRE71201010	1	4	1.5	10	50
ESRE71201012	1	4	1.5	12	50

H-Star Endmill

ESRE712

2 flutes rib neck type flat Endmill

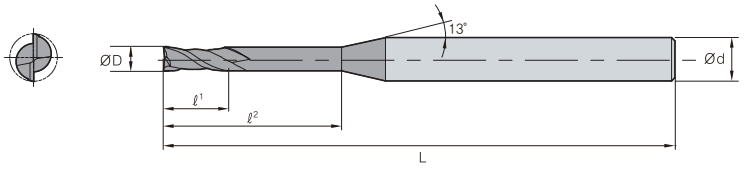


ULTRA FINE | 2 | 30° HELIX | AlTiN | DATA

p.426~430

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71201014	1	4	1.5	14	50
ESRE71201016	1	4	1.5	16	50
ESRE71201018	1	4	1.5	18	50
ESRE71201020	1	4	1.5	20	50
ESRE71201022	1	4	1.5	22	60
ESRE71201026	1	4	1.5	26	60
ESRE71201030	1	4	1.5	30	70
ESRE71201040	1	4	1.5	40	80
ESRE71201050	1	4	1.5	50	100
ESRE71201204	1.2	4	1.8	4	50
ESRE71201206	1.2	4	1.8	6	50
ESRE71201208	1.2	4	1.8	8	50
ESRE71201210	1.2	4	1.8	10	50
ESRE71201212	1.2	4	1.8	12	50
ESRE71201214	1.2	4	1.8	14	50
ESRE71201216	1.2	4	1.8	16	50
ESRE71201220	1.2	4	1.8	20	50
ESRE71201226	1.2	4	1.8	26	60
ESRE71201230	1.2	4	1.8	30	70
ESRE71201406	1.4	4	2.1	6	50
ESRE71201408	1.4	4	2.1	8	50
ESRE71201410	1.4	4	2.1	10	50
ESRE71201414	1.4	4	2.1	14	50
ESRE71201416	1.4	4	2.1	16	50
ESRE71201420	1.4	4	2.1	20	50
ESRE71201504	1.5	4	2.3	4	50
ESRE71201505	1.5	4	2.3	5	50
ESRE71201506	1.5	4	2.3	6	50
ESRE71201507	1.5	4	2.3	7	50
ESRE71201508	1.5	4	2.3	8	50
ESRE71201510	1.5	4	2.3	10	50
ESRE71201512	1.5	4	2.3	12	50
ESRE71201514	1.5	4	2.3	14	50
ESRE71201516	1.5	4	2.3	16	50
ESRE71201518	1.5	4	2.3	18	50
ESRE71201520	1.5	4	2.3	20	50
ESRE71201522	1.5	4	2.3	22	60
ESRE71201526	1.5	4	2.3	26	60

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71201530	1.5	4	2.3	30	70
ESRE71201608	1.6	4	2.3	8	50
ESRE71201610	1.6	4	2.3	10	50
ESRE71201612	1.6	4	2.3	12	50
ESRE71201616	1.6	4	2.3	16	50
ESRE71201620	1.6	4	2.3	20	50
ESRE71201808	1.8	4	2.7	8	50
ESRE71201810	1.8	4	2.7	10	50
ESRE71201812	1.8	4	2.7	12	50
ESRE71201816	1.8	4	2.7	16	50
ESRE71201820	1.8	4	2.7	20	50
ESRE71202006	2	4	3	6	50
ESRE71202008	2	4	3	8	50
ESRE71202010	2	4	3	10	50
ESRE71202012	2	4	3	12	50
ESRE71202014	2	4	3	14	50
ESRE71202016	2	4	3	16	50
ESRE71202018	2	4	3	18	50
ESRE71202020	2	4	3	20	50
ESRE71202022	2	4	3	22	60
ESRE71202026	2	4	3	26	60
ESRE71202030	2	4	3	30	70
ESRE71202035	2	4	3	35	70
ESRE71202040	2	4	3	40	80
ESRE71202045	2	4	3	45	90
ESRE71202050	2	4	3	50	100
ESRE71202060	2	4	3	60	110
ESRE71202508	2.5	4	4	8	50
ESRE71202510	2.5	4	4	10	50
ESRE71202512	2.5	4	4	12	50
ESRE71202514	2.5	4	4	14	50
ESRE71202516	2.5	4	4	16	50
ESRE71202518	2.5	4	4	18	50
ESRE71202520	2.5	4	4	20	50
ESRE71202522	2.5	4	4	22	60
ESRE71202526	2.5	4	4	26	60
ESRE71202530	2.5	4	4	30	70
ESRE71202535	2.5	4	4	35	70

ESRE712

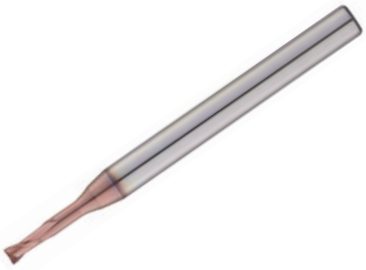
2 flutes rib neck type flat Endmill

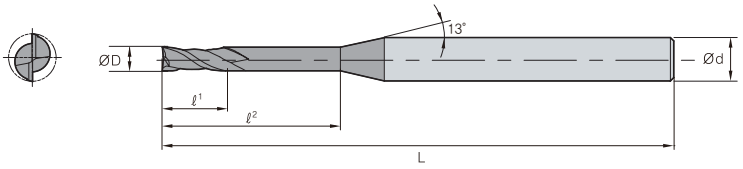
ULTRA FINE | 2 | 30° HELIX | AlTiN | DATA

p.426~430

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71202540	2.5	4	4	40	80
ESRE71202545	2.5	4	4	45	90
ESRE71202550	2.5	4	4	50	100
ESRE71203006	3	6	4.5	6	50
ESRE71203008	3	6	4.5	8	50
ESRE71203010	3	6	4.5	10	50
ESRE71203012	3	6	4.5	12	50
ESRE71203014	3	6	4.5	14	60
ESRE71203016	3	6	4.5	16	60
ESRE71203018	3	6	4.5	18	60
ESRE71203020	3	6	4.5	20	60
ESRE71203022	3	6	4.5	22	65
ESRE71203026	3	6	4.5	26	65
ESRE71203030	3	6	4.5	30	70
ESRE71203035	3	6	4.5	35	70
ESRE71203040	3	6	4.5	40	80
ESRE71203045	3	6	4.5	45	90
ESRE71203050	3	6	4.5	50	100
ESRE71203060	3	6	4.5	60	100
ESRE71204008	4	6	6	8	50
ESRE71204010	4	6	6	10	50
ESRE71204012	4	6	6	12	50
ESRE71204014	4	6	6	14	60
ESRE71204016	4	6	6	16	60
ESRE71204018	4	6	6	18	60
ESRE71204020	4	6	6	20	60
ESRE71204022	4	6	6	22	65
ESRE71204026	4	6	6	26	65

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71204030	4	6	6	30	70
ESRE71204035	4	6	6	35	70
ESRE71204040	4	6	6	40	80
ESRE71204045	4	6	6	45	90
ESRE71204050	4	6	6	50	100
ESRE71204060	4	6	6	60	100
ESRE71205016	5	6	8	16	60
ESRE71205020	5	6	8	20	60
ESRE71205026	5	6	8	26	65
ESRE71205030	5	6	8	30	70
ESRE71205035	5	6	8	35	75
ESRE71205040	5	6	8	40	80
ESRE71205050	5	6	8	50	90
ESRE71205060	5	6	8	60	100
ESRE71206015	6	6	9	15	60
ESRE71206020	6	6	9	20	60
ESRE71206030	6	6	9	30	70
ESRE71206032	6	6	9	32	90
ESRE71208025	8	8	12	25	70
ESRE71208030	8	8	12	30	80
ESRE71208042	8	8	12	42	100
ESRE71210030	10	10	15	30	75
ESRE71210035	10	10	15	35	80
ESRE71210045	10	10	15	45	100
ESRE71212035	12	12	20	35	80
ESRE71212040	12	12	20	40	90
ESRE71212050	12	12	20	50	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

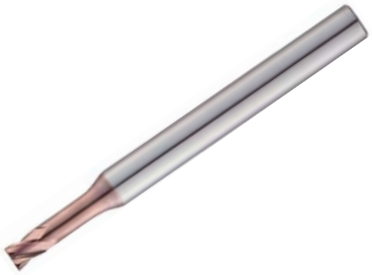
Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESRE714

4 flutes rib sqaure Endmill



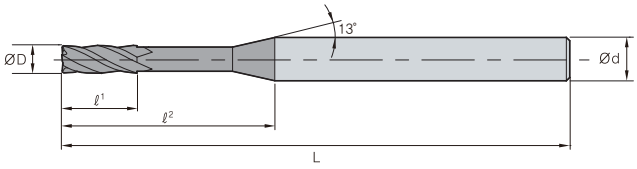
ULTRA FINE | 4 | 30° HELIX | AlTiN | DATA

p.431~434

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





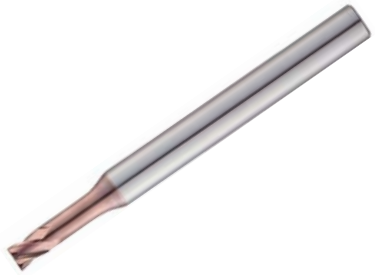
(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71400501	0.5	4	0.5	1	40
ESRE71400502	0.5	4	0.5	2	40
ESRE71400503	0.5	4	0.5	3	45
ESRE71400504	0.5	4	0.5	4	45
ESRE71400505	0.5	4	0.5	5	45
ESRE71400506	0.5	4	0.5	6	45
ESRE71400508	0.5	4	0.5	8	45
ESRE71400510	0.5	4	0.5	10	50
ESRE71400601	0.6	4	0.6	1	45
ESRE71400602	0.6	4	0.6	2	45
ESRE71400603	0.6	4	0.6	3	45
ESRE71400604	0.6	4	0.6	4	45
ESRE71400605	0.6	4	0.6	5	45
ESRE71400606	0.6	4	0.6	6	45
ESRE71400608	0.6	4	0.6	8	45
ESRE71400610	0.6	4	0.6	10	50
ESRE71400612	0.6	4	0.6	12	50
ESRE71400702	0.7	4	0.7	2	45
ESRE71400704	0.7	4	0.7	4	45
ESRE71400706	0.7	4	0.7	6	45
ESRE71400708	0.7	4	0.7	8	45
ESRE71400710	0.7	4	0.7	10	50
ESRE71400801	0.8	4	0.8	1	40
ESRE71400802	0.8	4	0.8	2	40
ESRE71400803	0.8	4	0.8	3	40
ESRE71400804	0.8	4	0.8	4	40
ESRE71400805	0.8	4	0.8	5	40
ESRE71400806	0.8	4	0.8	6	40
ESRE71400808	0.8	4	0.8	8	40
ESRE71400810	0.8	4	0.8	10	50
ESRE71400812	0.8	4	0.8	12	50
ESRE71400816	0.8	4	0.8	16	50
ESRE71401002	1	4	1	2	45
ESRE71401003	1	4	1	3	45
ESRE71401004	1	4	1	4	45
ESRE71401006	1	4	1	6	45

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71401008	1	4	1	8	45
ESRE71401010	1	4	1	10	50
ESRE71401012	1	4	1	12	50
ESRE71401014	1	4	1	14	50
ESRE71401016	1	4	1	16	50
ESRE71401018	1	4	1	18	60
ESRE71401020	1	4	1	20	60
ESRE71401204	1.2	4	1.2	4	45
ESRE71401206	1.2	4	1.2	6	45
ESRE71401208	1.2	4	1.2	8	45
ESRE71401210	1.2	4	1.2	10	50
ESRE71401212	1.2	4	1.2	12	50
ESRE71401216	1.2	4	1.2	16	50
ESRE71401218	1.2	4	1.2	18	60
ESRE71401220	1.2	4	1.2	20	60
ESRE71401406	1.4	4	1.4	6	45
ESRE71401408	1.4	4	1.4	8	45
ESRE71401410	1.4	4	1.4	10	50
ESRE71401412	1.4	4	1.4	12	50
ESRE71401414	1.4	4	1.4	14	50
ESRE71401416	1.4	4	1.4	16	50
ESRE71401504	1.5	4	1.5	4	45
ESRE71401506	1.5	4	1.5	6	45
ESRE71401508	1.5	4	1.5	8	45
ESRE71401510	1.5	4	1.5	10	50
ESRE71401512	1.5	4	1.5	12	50
ESRE71401516	1.5	4	1.5	16	50
ESRE71401518	1.5	4	1.5	18	60
ESRE71401520	1.5	4	1.5	20	60
ESRE71401525	1.5	4	1.5	25	60
ESRE71401530	1.5	4	1.5	30	70
ESRE71401606	1.6	4	1.6	6	45
ESRE71401608	1.6	4	1.6	8	45
ESRE71401610	1.6	4	1.6	10	50
ESRE71401612	1.6	4	1.6	12	50
ESRE71401614	1.6	4	1.6	14	50

ESRE714

4 flutes rib sqaure Endmill

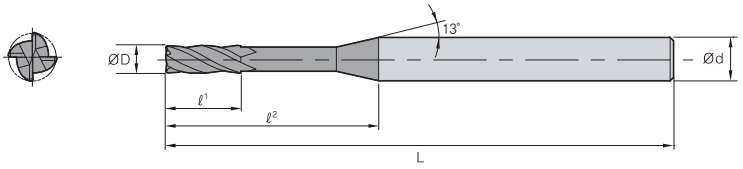


ULTRA FINE | 4 | 30° HELIX | AlTiN | DATA

p.431~434

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71401616	1.6	4	1.6	16	50
ESRE71401618	1.6	4	1.6	18	60
ESRE71401620	1.6	4	1.6	20	60
ESRE71401625	1.6	4	1.6	25	70
ESRE71401806	1.8	4	1.8	6	45
ESRE71401808	1.8	4	1.8	8	45
ESRE71401810	1.8	4	1.8	10	50
ESRE71401812	1.8	4	1.8	12	50
ESRE71401816	1.8	4	1.8	16	50
ESRE71401820	1.8	4	1.8	20	60
ESRE71401825	1.8	4	1.8	25	70
ESRE71402004	2	4	2	4	45
ESRE71402006	2	4	2	6	45
ESRE71402008	2	4	2	8	45
ESRE71402010	2	4	2	10	50
ESRE71402012	2	4	2	12	50
ESRE71402014	2	4	2	14	50
ESRE71402016	2	4	2	16	50
ESRE71402018	2	4	2	18	50
ESRE71402020	2	4	2	20	50
ESRE71402022	2	4	2	22	60
ESRE71402025	2	4	2	25	60
ESRE71402030	2	4	2	30	70
ESRE71402510	2.5	4	2.5	10	50
ESRE71402512	2.5	4	2.5	12	50
ESRE71402516	2.5	4	2.5	16	50
ESRE71402520	2.5	4	2.5	20	50
ESRE71402525	2.5	4	2.5	25	60
ESRE71402530	2.5	4	2.5	30	70
ESRE71403006	3	6	3	6	45
ESRE71403008	3	6	3	8	45
ESRE71403010	3	6	3	10	50
ESRE71403012	3	6	3	12	50
ESRE71403016	3	6	3	16	55
ESRE71403020	3	6	3	20	60
ESRE71403025	3	6	3	25	65

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71403030	3	6	3	30	70
ESRE71403035	3	6	3	35	75
ESRE71403040	3	6	3	40	80
ESRE71403045	3	6	3	45	90
ESRE71403050	3	6	3	50	100
ESRE71403060	3	6	3	60	110
ESRE71403512	3.5	6	3.5	12	50
ESRE71403516	3.5	6	3.5	16	55
ESRE71403520	3.5	6	3.5	20	60
ESRE71403525	3.5	6	3.5	25	65
ESRE71403530	3.5	6	3.5	30	70
ESRE71403535	3.5	6	3.5	35	75
ESRE71403540	3.5	6	3.5	40	80
ESRE71404006	4	6	4	6	50
ESRE71404008	4	6	4	8	50
ESRE71404010	4	6	4	10	50
ESRE71404012	4	6	4	12	50
ESRE71404016	4	6	4	16	55
ESRE71404020	4	6	4	20	60
ESRE71404025	4	6	4	25	65
ESRE71404030	4	6	4	30	70
ESRE71404040	4	6	4	40	80
ESRE71404045	4	6	4	45	90
ESRE71404050	4	6	4	50	100
ESRE71404060	4	6	4	60	110
ESRE71404512	4.5	6	4.5	12	50
ESRE71404516	4.5	6	4.5	16	55
ESRE71404520	4.5	6	4.5	20	60
ESRE71404525	4.5	6	4.5	25	65
ESRE71404530	4.5	6	4.5	30	70
ESRE71404540	4.5	6	4.5	40	80
ESRE71405016	5	6	5	16	60
ESRE71405020	5	6	5	20	60
ESRE71405025	5	6	5	25	65
ESRE71405030	5	6	5	30	70
ESRE71405040	5	6	5	40	80

H-Star Endmill

ESRE714

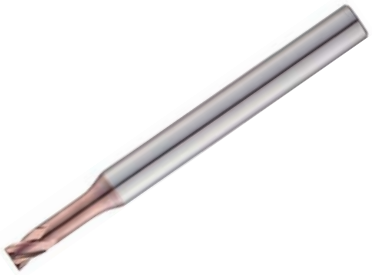
4 flutes rib sqaure Endmill

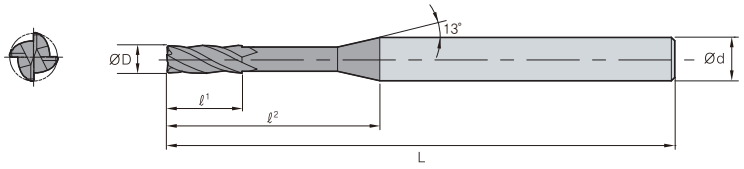
ULTRA FINE | 4 | 30° HELIX | AlTiN | DATA

p.431~434

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71405050	5	6	5	50	100
ESRE71405060	5	6	5	60	110
ESRE71406020	6	6	6	20	60
ESRE71406030	6	6	6	30	75
ESRE71406040	6	6	6	40	80
ESRE71406050	6	6	6	50	90
ESRE71406060	6	6	6	60	100
ESRE71408025	8	8	12	25	65

Designation	ØD	Ød	ℓ1	ℓ2	L
ESRE71408040	8	8	12	40	100
ESRE71408050	8	8	12	50	110
ESRE71410030	10	10	15	30	70
ESRE71410050	10	10	15	50	100
ESRE71410060	10	10	15	60	120
ESRE71412040	12	12	18	40	80
ESRE71412060	12	12	18	60	110
ESRE71412070	12	12	18	70	130

※ The above specifications are subject to change without prior notice for product quality improvement.

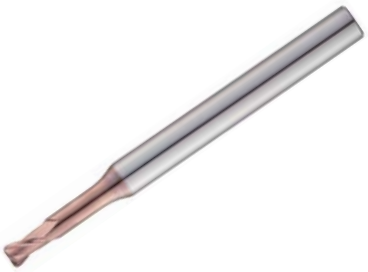
• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESRR712

2 flutes rib radius Endmill

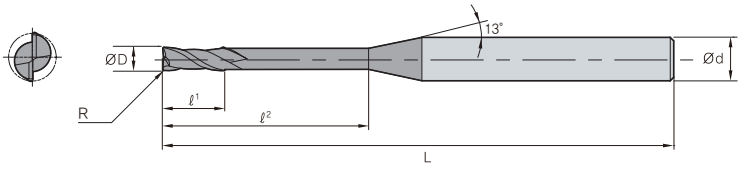


ULTRA FINE | 2 | 30° HELIX | AlTiN | DATA

p.435~444

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



(mm)

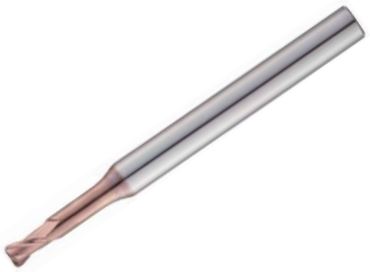
Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR712002002005	0.02	0.2	4	0.2	0.5	40
ESRR71200200201	0.02	0.2	4	0.2	1	40
ESRR712002002015	0.02	0.2	4	0.2	1.5	40
ESRR712002005005	0.05	0.2	4	0.2	0.5	40
ESRR71200200501	0.05	0.2	4	0.2	1	40
ESRR712002005015	0.05	0.2	4	0.2	1.5	40
ESRR71200300201	0.02	0.3	4	0.3	1	40
ESRR71200300202	0.02	0.3	4	0.3	2	40
ESRR71200300203	0.02	0.3	4	0.3	3	40
ESRR71200300501	0.05	0.3	4	0.3	1	40
ESRR71200300502	0.05	0.3	4	0.3	2	40
ESRR71200300503	0.05	0.3	4	0.3	3	40
ESRR71200400201	0.02	0.4	4	0.4	1	40
ESRR71200400202	0.02	0.4	4	0.4	2	40
ESRR71200400203	0.02	0.4	4	0.4	3	40
ESRR71200400204	0.02	0.4	4	0.4	4	40
ESRR71200400501	0.05	0.4	4	0.4	1	40
ESRR71200400502	0.05	0.4	4	0.4	2	40
ESRR71200400503	0.05	0.4	4	0.4	3	40
ESRR71200400504	0.05	0.4	4	0.4	4	40
ESRR71200401001	0.1	0.4	4	0.4	1	40
ESRR712004010015	0.1	0.4	4	0.4	1.5	40
ESRR71200401002	0.1	0.4	4	0.4	2	40
ESRR71200401003	0.1	0.4	4	0.4	3	40
ESRR71200401004	0.1	0.4	4	0.4	4	40
ESRR71200500201	0.02	0.5	4	0.5	1	45
ESRR712005002015	0.02	0.5	4	0.5	1.5	45
ESRR71200500202	0.02	0.5	4	0.5	2	45
ESRR712005002025	0.02	0.5	4	0.5	2.5	45
ESRR71200500203	0.02	0.5	4	0.5	3	45
ESRR71200500204	0.02	0.5	4	0.5	4	45
ESRR71200500205	0.02	0.5	4	0.5	5	45
ESRR71200500206	0.02	0.5	4	0.5	6	45
ESRR71200500208	0.02	0.5	4	0.5	8	45
ESRR71200500210	0.02	0.5	4	0.5	10	45
ESRR71200500501	0.05	0.5	4	0.5	1	45
ESRR712005005015	0.05	0.5	4	0.5	1.5	45
ESRR71200500502	0.05	0.5	4	0.5	2	45
ESRR712005005025	0.05	0.5	4	0.5	2.5	45

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71200500503	0.05	0.5	4	0.5	3	45
ESRR71200500504	0.05	0.5	4	0.5	4	45
ESRR71200500505	0.05	0.5	4	0.5	5	45
ESRR71200500506	0.05	0.5	4	0.5	6	45
ESRR71200500508	0.05	0.5	4	0.5	8	45
ESRR71200500510	0.05	0.5	4	0.5	10	45
ESRR71200501001	0.1	0.5	4	0.5	1	45
ESRR712005010015	0.1	0.5	4	0.5	1.5	45
ESRR71200501002	0.1	0.5	4	0.5	2	45
ESRR712005010025	0.1	0.5	4	0.5	2.5	45
ESRR71200501003	0.1	0.5	4	0.5	3	45
ESRR71200501004	0.1	0.5	4	0.5	4	45
ESRR71200501005	0.1	0.5	4	0.5	5	45
ESRR71200501006	0.1	0.5	4	0.5	6	45
ESRR71200501008	0.1	0.5	4	0.5	8	45
ESRR71200501010	0.1	0.5	4	0.5	10	45
ESRR71200600202	0.02	0.6	4	0.6	2	45
ESRR71200600203	0.02	0.6	4	0.6	3	45
ESRR71200600204	0.02	0.6	4	0.6	4	45
ESRR71200600206	0.02	0.6	4	0.6	6	45
ESRR71200600208	0.02	0.6	4	0.6	8	45
ESRR71200600210	0.02	0.6	4	0.6	10	45
ESRR71200600212	0.02	0.6	4	0.6	12	50
ESRR71200600502	0.05	0.6	4	0.6	2	45
ESRR71200600503	0.05	0.6	4	0.6	3	45
ESRR71200600504	0.05	0.6	4	0.6	4	45
ESRR71200600506	0.05	0.6	4	0.6	6	45
ESRR71200600508	0.05	0.6	4	0.6	8	45
ESRR71200600510	0.05	0.6	4	0.6	10	45
ESRR71200600512	0.05	0.6	4	0.6	12	50
ESRR71200601002	0.1	0.6	4	0.6	2	45
ESRR71200601003	0.1	0.6	4	0.6	3	45
ESRR71200601004	0.1	0.6	4	0.6	4	45
ESRR71200601006	0.1	0.6	4	0.6	6	45
ESRR71200601008	0.1	0.6	4	0.6	8	45
ESRR71200601010	0.1	0.6	4	0.6	10	45
ESRR71200601012	0.1	0.6	4	0.6	12	50
ESRR71200701002	0.1	0.7	4	0.7	2	45
ESRR71200701004	0.1	0.7	4	0.7	4	45

H-Star Endmill

ESRR712

2 flutes rib radius Endmill

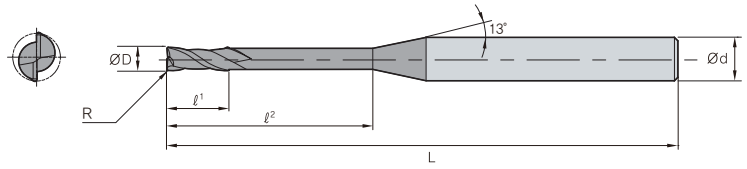


ULTRA FINE | 2 | 30° HELIX | AlTiN | DATA

p.435~444

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



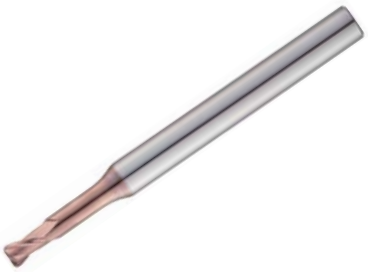
(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71200701006	0.1	0.7	4	0.7	6	45
ESRR71200701008	0.1	0.7	4	0.7	8	45
ESRR71200701010	0.1	0.7	4	0.7	10	45
ESRR71200800202	0.02	0.8	4	0.8	2	45
ESRR71200800204	0.02	0.8	4	0.8	4	45
ESRR71200800206	0.02	0.8	4	0.8	6	45
ESRR71200800208	0.02	0.8	4	0.8	8	45
ESRR71200800210	0.02	0.8	4	0.8	10	45
ESRR71200800212	0.02	0.8	4	0.8	12	50
ESRR71200800502	0.05	0.8	4	0.8	2	45
ESRR71200800504	0.05	0.8	4	0.8	4	45
ESRR71200800506	0.05	0.8	4	0.8	6	45
ESRR71200800508	0.05	0.8	4	0.8	8	45
ESRR71200800510	0.05	0.8	4	0.8	10	45
ESRR71200800512	0.05	0.8	4	0.8	12	50
ESRR71200801002	0.1	0.8	4	0.8	2	45
ESRR71200801004	0.1	0.8	4	0.8	4	45
ESRR71200801006	0.1	0.8	4	0.8	6	45
ESRR71200801008	0.1	0.8	4	0.8	8	45
ESRR71200801010	0.1	0.8	4	0.8	10	45
ESRR71200801012	0.1	0.8	4	0.8	12	50
ESRR71200802002	0.2	0.8	4	0.8	2	45
ESRR71200802004	0.2	0.8	4	0.8	4	45
ESRR71200802006	0.2	0.8	4	0.8	6	45
ESRR71200802008	0.2	0.8	4	0.8	8	45
ESRR71200802010	0.2	0.8	4	0.8	10	45
ESRR71200802012	0.2	0.8	4	0.8	12	50
ESRR71201000204	0.02	1	4	1	4	45
ESRR71201000206	0.02	1	4	1	6	45
ESRR71201000208	0.02	1	4	1	8	45
ESRR71201000210	0.02	1	4	1	10	50
ESRR71201000212	0.02	1	4	1	12	50
ESRR71201000214	0.02	1	4	1	14	50
ESRR71201000216	0.02	1	4	1	16	50
ESRR71201000220	0.02	1	4	1	20	50
ESRR71201000504	0.05	1	4	1	4	45
ESRR71201000506	0.05	1	4	1	6	45
ESRR71201000508	0.05	1	4	1	8	45
ESRR71201000510	0.05	1	4	1	10	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71201000512	0.05	1	4	1	12	50
ESRR71201000514	0.05	1	4	1	14	50
ESRR71201000516	0.05	1	4	1	16	50
ESRR71201000520	0.05	1	4	1	20	50
ESRR71201001004	0.1	1	4	1	4	45
ESRR71201001006	0.1	1	4	1	6	45
ESRR71201001008	0.1	1	4	1	8	45
ESRR71201001010	0.1	1	4	1	10	50
ESRR71201001012	0.1	1	4	1	12	50
ESRR71201001014	0.1	1	4	1	14	50
ESRR71201001016	0.1	1	4	1	16	50
ESRR71201001020	0.1	1	4	1	20	50
ESRR71201002004	0.2	1	4	1	4	45
ESRR71201002006	0.2	1	4	1	6	45
ESRR71201002008	0.2	1	4	1	8	45
ESRR71201002010	0.2	1	4	1	10	50
ESRR71201002012	0.2	1	4	1	12	50
ESRR71201002014	0.2	1	4	1	14	50
ESRR71201002016	0.2	1	4	1	16	50
ESRR71201002020	0.2	1	4	1	20	50
ESRR71201003004	0.3	1	4	1	4	45
ESRR71201003006	0.3	1	4	1	6	45
ESRR71201003008	0.3	1	4	1	8	45
ESRR71201003010	0.3	1	4	1	10	50
ESRR71201003012	0.3	1	4	1	12	50
ESRR71201003014	0.3	1	4	1	14	50
ESRR71201003016	0.3	1	4	1	16	50
ESRR71201003020	0.3	1	4	1	20	50
ESRR71201200204	0.02	1.2	4	1.2	4	45
ESRR71201200206	0.02	1.2	4	1.2	6	45
ESRR71201200208	0.02	1.2	4	1.2	8	45
ESRR71201200210	0.02	1.2	4	1.2	10	50
ESRR71201200212	0.02	1.2	4	1.2	12	50
ESRR71201200214	0.02	1.2	4	1.2	14	50
ESRR71201200216	0.02	1.2	4	1.2	16	50
ESRR71201200220	0.02	1.2	4	1.2	20	50
ESRR71201200504	0.05	1.2	4	1.2	4	45
ESRR71201200506	0.05	1.2	4	1.2	6	45
ESRR71201200508	0.05	1.2	4	1.2	8	45

ESRR712

2 flutes rib radius Endmill

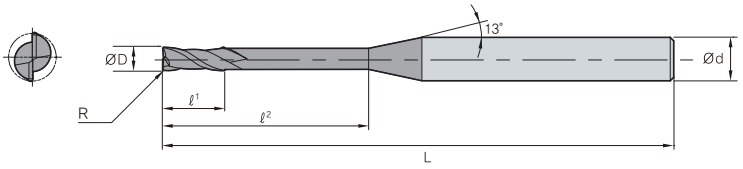


ULTRA FINE | 2 | 30° HELIX | AlTiN | DATA

p.435~444

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



(mm)

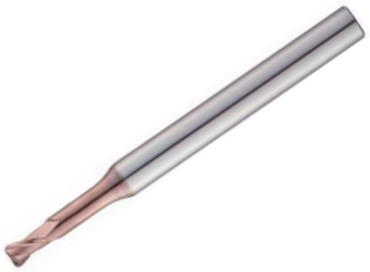
Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71201200510	0.05	1.2	4	1.2	10	50
ESRR71201200512	0.05	1.2	4	1.2	12	50
ESRR71201200514	0.05	1.2	4	1.2	14	50
ESRR71201200516	0.05	1.2	4	1.2	16	50
ESRR71201200520	0.05	1.2	4	1.2	20	50
ESRR71201201004	0.1	1.2	4	1.2	4	45
ESRR71201201006	0.1	1.2	4	1.2	6	45
ESRR71201201008	0.1	1.2	4	1.2	8	45
ESRR71201201010	0.1	1.2	4	1.2	10	50
ESRR71201201012	0.1	1.2	4	1.2	12	50
ESRR71201201014	0.1	1.2	4	1.2	14	50
ESRR71201201016	0.1	1.2	4	1.2	16	50
ESRR71201201020	0.1	1.2	4	1.2	20	50
ESRR71201202004	0.2	1.2	4	1.2	4	45
ESRR71201202006	0.2	1.2	4	1.2	6	45
ESRR71201202008	0.2	1.2	4	1.2	8	45
ESRR71201202010	0.2	1.2	4	1.2	10	50
ESRR71201202012	0.2	1.2	4	1.2	12	50
ESRR71201202014	0.2	1.2	4	1.2	14	50
ESRR71201202016	0.2	1.2	4	1.2	16	50
ESRR71201202020	0.2	1.2	4	1.2	20	50
ESRR71201203004	0.3	1.2	4	1.2	4	45
ESRR71201203006	0.3	1.2	4	1.2	6	45
ESRR71201203008	0.3	1.2	4	1.2	8	45
ESRR71201203010	0.3	1.2	4	1.2	10	50
ESRR71201203012	0.3	1.2	4	1.2	12	50
ESRR71201203014	0.3	1.2	4	1.2	14	50
ESRR71201203016	0.3	1.2	4	1.2	16	50
ESRR71201203020	0.3	1.2	4	1.2	20	50
ESRR71201500204	0.02	1.5	4	1.5	4	45
ESRR71201500206	0.02	1.5	4	1.5	6	45
ESRR71201500208	0.02	1.5	4	1.5	8	45
ESRR71201500210	0.02	1.5	4	1.5	10	50
ESRR71201500212	0.02	1.5	4	1.5	12	50
ESRR71201500214	0.02	1.5	4	1.5	14	50
ESRR71201500216	0.02	1.5	4	1.5	16	50
ESRR71201500220	0.02	1.5	4	1.5	20	50
ESRR71201500504	0.05	1.5	4	1.5	4	45
ESRR71201500506	0.05	1.5	4	1.5	6	45

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71201500508	0.05	1.5	4	1.5	8	45
ESRR71201500510	0.05	1.5	4	1.5	10	50
ESRR71201500512	0.05	1.5	4	1.5	12	50
ESRR71201500514	0.05	1.5	4	1.5	14	50
ESRR71201500516	0.05	1.5	4	1.5	16	50
ESRR71201500520	0.05	1.5	4	1.5	20	50
ESRR71201501004	0.1	1.5	4	1.5	4	45
ESRR71201501006	0.1	1.5	4	1.5	6	45
ESRR71201501008	0.1	1.5	4	1.5	8	45
ESRR71201501010	0.1	1.5	4	1.5	10	50
ESRR71201501012	0.1	1.5	4	1.5	12	50
ESRR71201501014	0.1	1.5	4	1.5	14	50
ESRR71201501016	0.1	1.5	4	1.5	16	50
ESRR71201501020	0.1	1.5	4	1.5	20	50
ESRR71201502004	0.2	1.5	4	1.5	4	45
ESRR71201502006	0.2	1.5	4	1.5	6	45
ESRR71201502008	0.2	1.5	4	1.5	8	45
ESRR71201502010	0.2	1.5	4	1.5	10	50
ESRR71201502012	0.2	1.5	4	1.5	12	50
ESRR71201502014	0.2	1.5	4	1.5	14	50
ESRR71201502016	0.2	1.5	4	1.5	16	50
ESRR71201502020	0.2	1.5	4	1.5	20	50
ESRR71201503004	0.3	1.5	4	1.5	4	45
ESRR71201503006	0.3	1.5	4	1.5	6	45
ESRR71201503008	0.3	1.5	4	1.5	8	45
ESRR71201503010	0.3	1.5	4	1.5	10	50
ESRR71201503012	0.3	1.5	4	1.5	12	50
ESRR71201503014	0.3	1.5	4	1.5	14	50
ESRR71201503016	0.3	1.5	4	1.5	16	50
ESRR71201503020	0.3	1.5	4	1.5	20	50
ESRR71201505004	0.5	1.5	4	1.5	4	45
ESRR71201505006	0.5	1.5	4	1.5	6	45
ESRR71201505008	0.5	1.5	4	1.5	8	45
ESRR71201505010	0.5	1.5	4	1.5	10	50
ESRR71201505012	0.5	1.5	4	1.5	12	50
ESRR71201505014	0.5	1.5	4	1.5	14	50
ESRR71201505016	0.5	1.5	4	1.5	16	50
ESRR71201505020	0.5	1.5	4	1.5	20	50
ESRR71202000206	0.02	2	4	2	6	45

H-Star Endmill

ESRR712

2 flutes rib radius Endmill

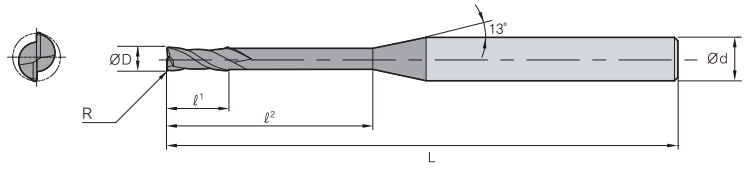


ULTRA FINE | 2 | 30° HELIX | AlTiN | DATA

p.435~444

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



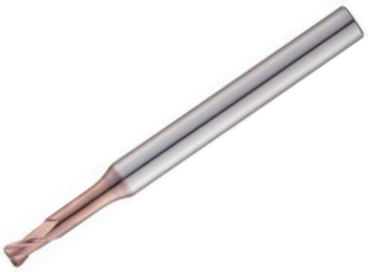
(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71202000208	0.02	2	4	2	8	45
ESRR71202000210	0.02	2	4	2	10	50
ESRR71202000212	0.02	2	4	2	12	50
ESRR71202000214	0.02	2	4	2	14	50
ESRR71202000216	0.02	2	4	2	16	50
ESRR71202000220	0.02	2	4	2	20	50
ESRR71202000225	0.02	2	4	2	25	60
ESRR71202000506	0.05	2	4	2	6	45
ESRR71202000508	0.05	2	4	2	8	45
ESRR71202000510	0.05	2	4	2	10	50
ESRR71202000512	0.05	2	4	2	12	50
ESRR71202000514	0.05	2	4	2	14	50
ESRR71202000516	0.05	2	4	2	16	50
ESRR71202000520	0.05	2	4	2	20	50
ESRR71202000525	0.05	2	4	2	25	60
ESRR71202001006	0.1	2	4	2	6	45
ESRR71202001008	0.1	2	4	2	8	45
ESRR71202001010	0.1	2	4	2	10	50
ESRR71202001012	0.1	2	4	2	12	50
ESRR71202001014	0.1	2	4	2	14	50
ESRR71202001016	0.1	2	4	2	16	50
ESRR71202001020	0.1	2	4	2	20	50
ESRR71202001025	0.1	2	4	2	25	60
ESRR71202001030	0.1	2	4	2	30	70
ESRR71202002006	0.2	2	4	2	6	45
ESRR71202002008	0.2	2	4	2	8	45
ESRR71202002010	0.2	2	4	2	10	50
ESRR71202002012	0.2	2	4	2	12	50
ESRR71202002014	0.2	2	4	2	14	50
ESRR71202002016	0.2	2	4	2	16	50
ESRR71202002020	0.2	2	4	2	20	50
ESRR71202002025	0.2	2	4	2	25	60
ESRR71202002030	0.2	2	4	2	30	70
ESRR71202003006	0.3	2	4	2	6	45
ESRR71202003008	0.3	2	4	2	8	45
ESRR71202003010	0.3	2	4	2	10	50
ESRR71202003012	0.3	2	4	2	12	50
ESRR71202003014	0.3	2	4	2	14	50
ESRR71202003016	0.3	2	4	2	16	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71202003020	0.3	2	4	2	20	50
ESRR71202003025	0.3	2	4	2	25	60
ESRR71202003030	0.3	2	4	2	30	70
ESRR71202005006	0.5	2	4	2	6	45
ESRR71202005008	0.5	2	4	2	8	45
ESRR71202005010	0.5	2	4	2	10	50
ESRR71202005012	0.5	2	4	2	12	50
ESRR71202005014	0.5	2	4	2	14	50
ESRR71202005016	0.5	2	4	2	16	50
ESRR71202005020	0.5	2	4	2	20	50
ESRR71202005025	0.5	2	4	2	25	60
ESRR71202005030	0.5	2	4	2	30	70
ESRR71202501010	0.1	2.5	4	2.5	10	50
ESRR71202501016	0.1	2.5	4	2.5	16	50
ESRR71202501020	0.1	2.5	4	2.5	20	50
ESRR71202501025	0.1	2.5	4	2.5	25	60
ESRR71202501030	0.1	2.5	4	2.5	30	70
ESRR71202502010	0.2	2.5	4	2.5	10	50
ESRR71202502016	0.2	2.5	4	2.5	16	50
ESRR71202502020	0.2	2.5	4	2.5	20	50
ESRR71202503010	0.3	2.5	4	2.5	10	50
ESRR71202503016	0.3	2.5	4	2.5	16	50
ESRR71202503020	0.3	2.5	4	2.5	20	50
ESRR71202505010	0.5	2.5	4	2.5	10	50
ESRR71202505016	0.5	2.5	4	2.5	16	50
ESRR71202505020	0.5	2.5	4	2.5	20	50
ESRR71203001010	0.1	3	6	3	10	50
ESRR71203001012	0.1	3	6	3	12	50
ESRR71203001016	0.1	3	6	3	16	55
ESRR71203001020	0.1	3	6	3	20	60
ESRR71203001025	0.1	3	6	3	25	65
ESRR71203001030	0.1	3	6	3	30	70
ESRR71203001035	0.1	3	6	3	35	75
ESRR71203001040	0.1	3	6	3	40	80
ESRR71203002010	0.2	3	6	3	10	50
ESRR71203002012	0.2	3	6	3	12	50
ESRR71203002016	0.2	3	6	3	16	55
ESRR71203002020	0.2	3	6	3	20	60
ESRR71203002025	0.2	3	6	3	25	65

ESRR712

2 flutes rib radius Endmill

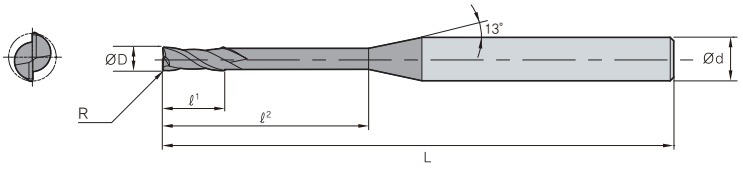


ULTRA FINE | 2 | 30° HELIX | AlTiN | DATA

p.435~444

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



(mm)

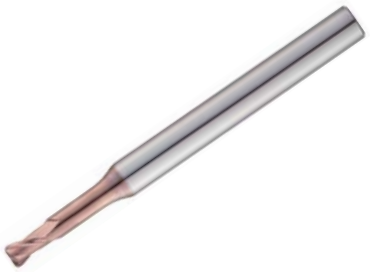
Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71203002030	0.2	3	6	3	30	70
ESRR71203002035	0.2	3	6	3	35	75
ESRR71203002040	0.2	3	6	3	40	80
ESRR71203003010	0.3	3	6	3	10	50
ESRR71203003012	0.3	3	6	3	12	50
ESRR71203003016	0.3	3	6	3	16	55
ESRR71203003020	0.3	3	6	3	20	60
ESRR71203003025	0.3	3	6	3	25	65
ESRR71203003030	0.3	3	6	3	30	70
ESRR71203003035	0.3	3	6	3	35	75
ESRR71203003040	0.3	3	6	3	40	80
ESRR71203005010	0.5	3	6	3	10	50
ESRR71203005012	0.5	3	6	3	12	50
ESRR71203005016	0.5	3	6	3	16	55
ESRR71203005020	0.5	3	6	3	20	60
ESRR71203005025	0.5	3	6	3	25	65
ESRR71203005030	0.5	3	6	3	30	70
ESRR71203005035	0.5	3	6	3	35	75
ESRR71203005040	0.5	3	6	3	40	80
ESRR71203010010	1	3	6	3	10	50
ESRR71203010012	1	3	6	3	12	50
ESRR71203010016	1	3	6	3	16	55
ESRR71203010020	1	3	6	3	20	60
ESRR71203010025	1	3	6	3	25	65
ESRR71203010030	1	3	6	3	30	70
ESRR71203010035	1	3	6	3	35	75
ESRR71203010040	1	3	6	3	40	80
ESRR71204001012	0.1	4	6	4	12	50
ESRR71204001016	0.1	4	6	4	16	55
ESRR71204001020	0.1	4	6	4	20	60
ESRR71204001025	0.1	4	6	4	25	65
ESRR71204001030	0.1	4	6	4	30	70
ESRR71204001035	0.1	4	6	4	35	75
ESRR71204001040	0.1	4	6	4	40	80
ESRR71204002012	0.2	4	6	4	12	50
ESRR71204002016	0.2	4	6	4	16	55
ESRR71204002020	0.2	4	6	4	20	60
ESRR71204002025	0.2	4	6	4	25	65
ESRR71204002030	0.2	4	6	4	30	70

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71204002035	0.2	4	6	4	35	75
ESRR71204002040	0.2	4	6	4	40	80
ESRR71204003012	0.3	4	6	4	12	50
ESRR71204003016	0.3	4	6	4	16	55
ESRR71204003020	0.3	4	6	4	20	60
ESRR71204003025	0.3	4	6	4	25	65
ESRR71204003030	0.3	4	6	4	30	70
ESRR71204003035	0.3	4	6	4	35	75
ESRR71204003040	0.3	4	6	4	40	80
ESRR71204005012	0.5	4	6	4	12	50
ESRR71204005016	0.5	4	6	4	16	55
ESRR71204005020	0.5	4	6	4	20	60
ESRR71204005025	0.5	4	6	4	25	65
ESRR71204005030	0.5	4	6	4	30	70
ESRR71204005035	0.5	4	6	4	35	75
ESRR71204005040	0.5	4	6	4	40	80
ESRR71204010012	1	4	6	4	12	50
ESRR71204010016	1	4	6	4	16	55
ESRR71204010020	1	4	6	4	20	60
ESRR71204010025	1	4	6	4	25	65
ESRR71204010030	1	4	6	4	30	70
ESRR71204010035	1	4	6	4	35	75
ESRR71204010040	1	4	6	4	40	80
ESRR71205002015	0.2	5	6	6	15	60
ESRR71205002025	0.2	5	6	6	25	70
ESRR71205002030	0.2	5	6	6	30	70
ESRR71205002040	0.2	5	6	6	40	80
ESRR71205005015	0.5	5	6	6	15	60
ESRR71205005025	0.5	5	6	6	25	70
ESRR71205005030	0.5	5	6	6	30	70
ESRR71205005040	0.5	5	6	6	40	80
ESRR71205010015	1	5	6	6	15	60
ESRR71205010025	1	5	6	6	25	70
ESRR71205010030	1	5	6	6	30	70
ESRR71205010040	1	5	6	6	40	80
ESRR71206001020	0.1	6	6	7	20	60
ESRR71206001040	0.1	6	6	7	40	80
ESRR71206002020	0.2	6	6	7	20	60
ESRR71206002040	0.2	6	6	7	40	80

H-Star Endmill

ESRR712

2 flutes rib radius Endmill

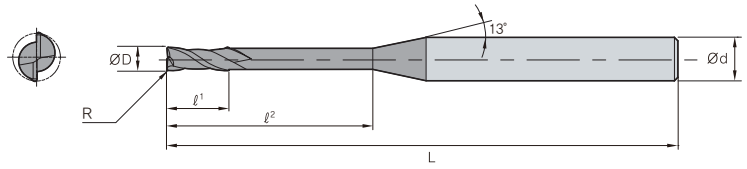


ULTRA FINE | 2 | 30° HELIX | AlTiN | DATA

p.435~444

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø16	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71206003020	0.3	6	6	7	20	60
ESRR71206003040	0.3	6	6	7	40	80
ESRR71206005020	0.5	6	6	7	20	60
ESRR71206005040	0.5	6	6	7	40	80
ESRR71206010020	1	6	6	7	20	60
ESRR71206010040	1	6	6	7	40	80
ESRR71206015020	1.5	6	6	7	20	60
ESRR71206015040	1.5	6	6	7	40	80
ESRR71208002022	0.2	8	8	9	22	65
ESRR71208003022	0.3	8	8	9	22	65
ESRR71205005022	0.5	5	8	9	22	65
ESRR71208010022	1	8	8	9	22	65
ESRR71208015022	1.5	8	8	9	22	65
ESRR71210002024	0.2	10	10	11	24	70

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71210003024	0.3	10	10	11	24	70
ESRR71210005024	0.5	10	10	11	24	70
ESRR71210010024	1	10	10	11	24	70
ESRR71210015024	1.5	10	10	11	24	70
ESRR71210020024	2	10	10	11	24	70
ESRR71212002026	0.2	12	12	13	26	80
ESRR71212003026	0.3	12	12	13	26	80
ESRR71212005026	0.5	12	12	13	26	80
ESRR71212010026	1	12	12	13	26	80
ESRR71212015026	1.5	12	12	13	26	80
ESRR71212020026	2	12	12	13	26	80
ESRR71212030026	3	12	12	13	26	80
ESRR71216005035	0.5	16	16	20	35	110
ESRR71216010035	1	16	16	20	35	110

※ The above specifications are subject to change without prior notice for product quality improvement.

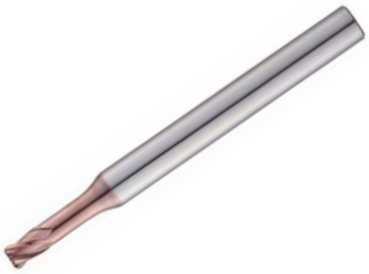
• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESRR714

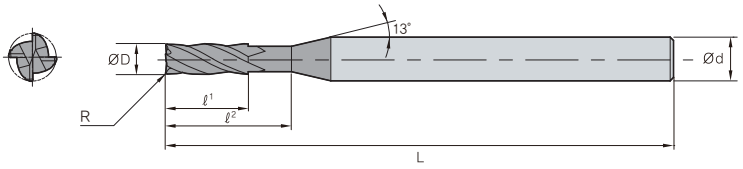
4 flutes rib radius Endmill



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.445~456

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

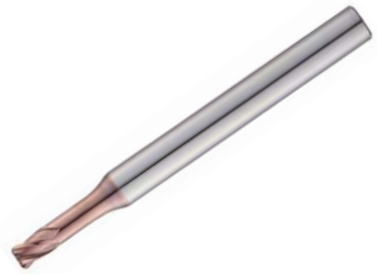
Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71400500502	0.05	0.5	4	0.5	2	45
ESRR71400500504	0.05	0.5	4	0.5	4	45
ESRR71400500506	0.05	0.5	4	0.5	6	45
ESRR71400500508	0.05	0.5	4	0.5	8	45
ESRR71400501002	0.1	0.5	4	0.5	2	45
ESRR71400501004	0.1	0.5	4	0.5	4	45
ESRR71400501006	0.1	0.5	4	0.5	6	45
ESRR71400501008	0.1	0.5	4	0.5	8	45
ESRR71400600502	0.05	0.6	4	0.6	2	45
ESRR71400600504	0.05	0.6	4	0.6	4	45
ESRR71400600506	0.05	0.6	4	0.6	6	45
ESRR71400600508	0.05	0.6	4	0.6	8	45
ESRR71400601002	0.1	0.6	4	0.6	2	45
ESRR71400601004	0.1	0.6	4	0.6	4	45
ESRR71400601006	0.1	0.6	4	0.6	6	45
ESRR71400601008	0.1	0.6	4	0.6	8	45
ESRR71400700502	0.05	0.7	4	0.7	2	45
ESRR71400700504	0.05	0.7	4	0.7	4	45
ESRR71400700506	0.05	0.7	4	0.7	6	45
ESRR71400700508	0.05	0.7	4	0.7	8	45
ESRR71400701002	0.1	0.7	4	0.7	2	45
ESRR71400701004	0.1	0.7	4	0.7	4	45
ESRR71400701006	0.1	0.7	4	0.7	6	45
ESRR71400701008	0.1	0.7	4	0.7	8	45
ESRR71400800202	0.02	0.8	4	0.8	2	45
ESRR71400800204	0.02	0.8	4	0.8	4	45
ESRR71400800206	0.02	0.8	4	0.8	6	45
ESRR71400800208	0.02	0.8	4	0.8	8	45
ESRR71400800210	0.02	0.8	4	0.8	10	45
ESRR71400800212	0.02	0.8	4	0.8	12	50
ESRR71400800502	0.05	0.8	4	0.8	2	45
ESRR71400800504	0.05	0.8	4	0.8	4	45
ESRR71400800506	0.05	0.8	4	0.8	6	45
ESRR71400800508	0.05	0.8	4	0.8	8	45
ESRR71400800510	0.05	0.8	4	0.8	10	45
ESRR71400800512	0.05	0.8	4	0.8	12	50
ESRR71400801002	0.1	0.8	4	0.8	2	45
ESRR71400801004	0.1	0.8	4	0.8	4	45
ESRR71400801006	0.1	0.8	4	0.8	6	45

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71400801008	0.1	0.8	4	0.8	8	45
ESRR71400801010	0.1	0.8	4	0.8	10	45
ESRR71400801012	0.1	0.8	4	0.8	12	50
ESRR71401000204	0.02	1	4	1	4	45
ESRR71401000206	0.02	1	4	1	6	45
ESRR71401000208	0.02	1	4	1	8	45
ESRR71401000210	0.02	1	4	1	10	50
ESRR71401000212	0.02	1	4	1	12	50
ESRR71401000214	0.02	1	4	1	14	50
ESRR71401000216	0.02	1	4	1	16	50
ESRR71401000220	0.02	1	4	1	20	50
ESRR71401000503	0.05	1	4	1	3	45
ESRR71401000504	0.05	1	4	1	4	45
ESRR71401000506	0.05	1	4	1	6	45
ESRR71401000508	0.05	1	4	1	8	45
ESRR71401000510	0.05	1	4	1	10	50
ESRR71401000512	0.05	1	4	1	12	50
ESRR71401000514	0.05	1	4	1	14	50
ESRR71401000516	0.05	1	4	1	16	50
ESRR71401000520	0.05	1	4	1	20	50
ESRR71401001003	0.1	1	4	1	3	45
ESRR71401001004	0.1	1	4	1	4	45
ESRR71401001006	0.1	1	4	1	6	45
ESRR71401001008	0.1	1	4	1	8	45
ESRR71401001010	0.1	1	4	1	10	50
ESRR71401001012	0.1	1	4	1	12	50
ESRR71401001014	0.1	1	4	1	14	50
ESRR71401001016	0.1	1	4	1	16	50
ESRR71401001020	0.1	1	4	1	20	50
ESRR71401002003	0.2	1	4	1	3	45
ESRR71401002004	0.2	1	4	1	4	45
ESRR71401002006	0.2	1	4	1	6	45
ESRR71401002008	0.2	1	4	1	8	45
ESRR71401002010	0.2	1	4	1	10	50
ESRR71401002012	0.2	1	4	1	12	50
ESRR71401002014	0.2	1	4	1	14	50
ESRR71401002016	0.2	1	4	1	16	50
ESRR71401002020	0.2	1	4	1	20	50
ESRR71401003003	0.3	1	4	1	3	45

H-Star Endmill

ESRR714

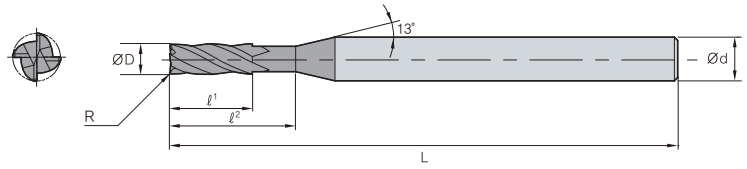
4 flutes rib radius Endmill



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.445~456

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



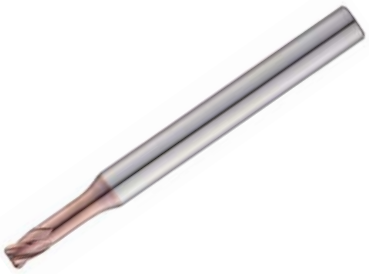
(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71401003004	0.3	1	4	1	4	45
ESRR71401003006	0.3	1	4	1	6	45
ESRR71401003008	0.3	1	4	1	8	45
ESRR71401003010	0.3	1	4	1	10	50
ESRR71401003012	0.3	1	4	1	12	50
ESRR71401003014	0.3	1	4	1	14	50
ESRR71401003016	0.3	1	4	1	16	50
ESRR71401003020	0.3	1	4	1	20	50
ESRR71401200204	0.02	1.2	4	1.2	4	45
ESRR71401200206	0.02	1.2	4	1.2	6	45
ESRR71401200208	0.02	1.2	4	1.2	8	45
ESRR71401200210	0.02	1.2	4	1.2	10	50
ESRR71401200212	0.02	1.2	4	1.2	12	50
ESRR71401200214	0.02	1.2	4	1.2	14	50
ESRR71401200216	0.02	1.2	4	1.2	16	50
ESRR71401200220	0.02	1.2	4	1.2	20	50
ESRR71401200503	0.05	1.2	4	1.2	3	45
ESRR71401200504	0.05	1.2	4	1.2	4	45
ESRR71401200506	0.05	1.2	4	1.2	6	45
ESRR71401200508	0.05	1.2	4	1.2	8	45
ESRR71401200510	0.05	1.2	4	1.2	10	50
ESRR71401200512	0.05	1.2	4	1.2	12	50
ESRR71401200514	0.05	1.2	4	1.2	14	50
ESRR71401200516	0.05	1.2	4	1.2	16	50
ESRR71401200520	0.05	1.2	4	1.2	20	50
ESRR71401201003	0.1	1.2	4	1.2	3	45
ESRR71401201004	0.1	1.2	4	1.2	4	45
ESRR71401201006	0.1	1.2	4	1.2	6	45
ESRR71401201008	0.1	1.2	4	1.2	8	45
ESRR71401201010	0.1	1.2	4	1.2	10	50
ESRR71401201012	0.1	1.2	4	1.2	12	50
ESRR71401201014	0.1	1.2	4	1.2	14	50
ESRR71401201016	0.1	1.2	4	1.2	16	50
ESRR71401201020	0.1	1.2	4	1.2	20	50
ESRR71401202003	0.2	1.2	4	1.2	3	45
ESRR71401202004	0.2	1.2	4	1.2	4	45
ESRR71401202006	0.2	1.2	4	1.2	6	45
ESRR71401202008	0.2	1.2	4	1.2	8	45
ESRR71401202010	0.2	1.2	4	1.2	10	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71401202012	0.2	1.2	4	1.2	12	50
ESRR71401202014	0.2	1.2	4	1.2	14	50
ESRR71401202016	0.2	1.2	4	1.2	16	50
ESRR71401202020	0.2	1.2	4	1.2	20	50
ESRR71401203003	0.3	1.2	4	1.2	3	45
ESRR71401203004	0.3	1.2	4	1.2	4	45
ESRR71401203006	0.3	1.2	4	1.2	6	45
ESRR71401203008	0.3	1.2	4	1.2	8	45
ESRR71401203010	0.3	1.2	4	1.2	10	50
ESRR71401203012	0.3	1.2	4	1.2	12	50
ESRR71401203016	0.3	1.2	4	1.2	16	50
ESRR71401203020	0.3	1.2	4	1.2	20	50
ESRR71401500206	0.02	1.5	4	1.5	6	45
ESRR71401500208	0.02	1.5	4	1.5	8	45
ESRR71401500210	0.02	1.5	4	1.5	10	50
ESRR71401500212	0.02	1.5	4	1.5	12	50
ESRR71401500214	0.02	1.5	4	1.5	14	50
ESRR71401500216	0.02	1.5	4	1.5	16	50
ESRR71401500220	0.02	1.5	4	1.5	20	50
ESRR71401500222	0.02	1.5	4	1.5	22	60
ESRR71401500504	0.05	1.5	4	1.5	4	45
ESRR71401500506	0.05	1.5	4	1.5	6	45
ESRR71401500508	0.05	1.5	4	1.5	8	45
ESRR71401500510	0.05	1.5	4	1.5	10	50
ESRR71401500512	0.05	1.5	4	1.5	12	50
ESRR71401500514	0.05	1.5	4	1.5	14	50
ESRR71401500516	0.05	1.5	4	1.5	16	50
ESRR71401500520	0.05	1.5	4	1.5	20	50
ESRR71401500522	0.05	1.5	4	1.5	22	60
ESRR71401500526	0.05	1.5	4	1.5	26	60
ESRR71401501004	0.1	1.5	4	1.5	4	45
ESRR71401501006	0.1	1.5	4	1.5	6	45
ESRR71401501008	0.1	1.5	4	1.5	8	45
ESRR71401501010	0.1	1.5	4	1.5	10	50
ESRR71401501012	0.1	1.5	4	1.5	12	50
ESRR71401501014	0.1	1.5	4	1.5	14	50
ESRR71401501016	0.1	1.5	4	1.5	16	50
ESRR71401501020	0.1	1.5	4	1.5	20	50
ESRR71401501022	0.1	1.5	4	1.5	22	60

ESRR714

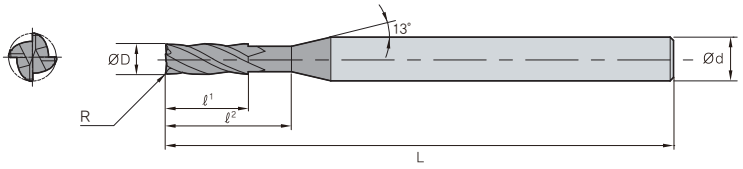
4 flutes rib radius Endmill



ULTRA FINE | 4 | 30° HELIX | R ±0.01 (Ø6 or Under) | R ±0.015 (Above Ø6) | AlTiN | DATA p.445~456

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

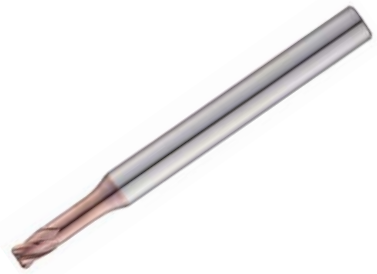
Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71401501026	0.1	1.5	4	1.5	26	60
ESRR71401502004	0.2	1.5	4	1.5	4	45
ESRR71401502006	0.2	1.5	4	1.5	6	45
ESRR71401502008	0.2	1.5	4	1.5	8	45
ESRR71401502010	0.2	1.5	4	1.5	10	50
ESRR71401502012	0.2	1.5	4	1.5	12	50
ESRR71401502014	0.2	1.5	4	1.5	14	50
ESRR71401502016	0.2	1.5	4	1.5	16	50
ESRR71401502020	0.2	1.5	4	1.5	20	50
ESRR71401502022	0.2	1.5	4	1.5	22	60
ESRR71401502025	0.2	1.5	4	1.5	25	60
ESRR71401503004	0.3	1.5	4	1.5	4	45
ESRR71401503006	0.3	1.5	4	1.5	6	45
ESRR71401503008	0.3	1.5	4	1.5	8	45
ESRR71401503010	0.3	1.5	4	1.5	10	50
ESRR71401503012	0.3	1.5	4	1.5	12	50
ESRR71401503014	0.3	1.5	4	1.5	14	50
ESRR71401503016	0.3	1.5	4	1.5	16	50
ESRR71401503020	0.3	1.5	4	1.5	20	50
ESRR71401503022	0.3	1.5	4	1.5	22	60
ESRR71401503025	0.3	1.5	4	1.5	25	60
ESRR71401505004	0.5	1.5	4	1.5	4	45
ESRR71401505006	0.5	1.5	4	1.5	6	45
ESRR71401505008	0.5	1.5	4	1.5	8	45
ESRR71401505010	0.5	1.5	4	1.5	10	50
ESRR71401505012	0.5	1.5	4	1.5	12	50
ESRR71401505014	0.5	1.5	4	1.5	14	50
ESRR71401505016	0.5	1.5	4	1.5	16	50
ESRR71401505020	0.5	1.5	4	1.5	20	50
ESRR71401505022	0.5	1.5	4	1.5	22	60
ESRR71401505025	0.5	1.5	4	1.5	25	60
ESRR71402000206	0.02	2	4	2	6	45
ESRR71402000208	0.02	2	4	2	8	45
ESRR71402000210	0.02	2	4	2	10	50
ESRR71402000212	0.02	2	4	2	12	50
ESRR71402000214	0.02	2	4	2	14	50
ESRR71402000216	0.02	2	4	2	16	50
ESRR71402000220	0.02	2	4	2	20	50
ESRR71402000225	0.02	2	4	2	25	60

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71402000230	0.02	2	4	2	30	70
ESRR71402000506	0.05	2	4	2	6	45
ESRR71402000508	0.05	2	4	2	8	45
ESRR71402000510	0.05	2	4	2	10	50
ESRR71402000512	0.05	2	4	2	12	50
ESRR71402000514	0.05	2	4	2	14	50
ESRR71402000516	0.05	2	4	2	16	50
ESRR71402000520	0.05	2	4	2	20	50
ESRR71402000525	0.05	2	4	2	25	60
ESRR71402000530	0.05	2	4	2	30	70
ESRR71402001006	0.1	2	4	2	6	45
ESRR71402001008	0.1	2	4	2	8	45
ESRR71402001010	0.1	2	4	2	10	50
ESRR71402001012	0.1	2	4	2	12	50
ESRR71402001014	0.1	2	4	2	14	50
ESRR71402001016	0.1	2	4	2	16	50
ESRR71402001020	0.1	2	4	2	20	50
ESRR71402001022	0.1	2	4	2	22	60
ESRR71402001025	0.1	2	4	2	25	60
ESRR71402001030	0.1	2	4	2	30	70
ESRR71402002006	0.2	2	4	2	6	45
ESRR71402002008	0.2	2	4	2	8	45
ESRR71402002010	0.2	2	4	2	10	50
ESRR71402002012	0.2	2	4	2	12	50
ESRR71402002014	0.2	2	4	2	14	50
ESRR71402002016	0.2	2	4	2	16	50
ESRR71402002020	0.2	2	4	2	20	50
ESRR71402002022	0.2	2	4	2	22	60
ESRR71402002025	0.2	2	4	2	25	60
ESRR71402002030	0.2	2	4	2	30	70
ESRR71402003006	0.3	2	4	2	6	45
ESRR71402003008	0.3	2	4	2	8	45
ESRR71402003010	0.3	2	4	2	10	50
ESRR71402003012	0.3	2	4	2	12	50
ESRR71402003014	0.3	2	4	2	14	50
ESRR71402003016	0.3	2	4	2	16	50
ESRR71402003020	0.3	2	4	2	20	50
ESRR71402003022	0.3	2	4	2	22	60
ESRR71402003025	0.3	2	4	2	25	60

H-Star Endmill

ESRR714

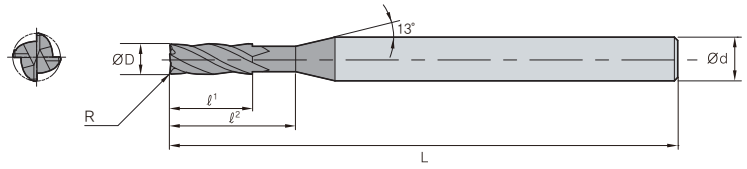
4 flutes rib radius Endmill



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.445~456

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



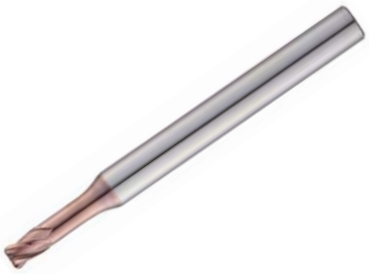
(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71402003030	0.3	2	4	2	30	70
ESRR71402005006	0.5	2	4	3	6	45
ESRR71402005008	0.5	2	4	2	8	45
ESRR71402005010	0.5	2	4	2	10	50
ESRR71402005012	0.5	2	4	2	12	50
ESRR71402005014	0.5	2	4	2	14	50
ESRR71402005016	0.5	2	4	2	16	50
ESRR71402005020	0.5	2	4	2	20	50
ESRR71402005022	0.5	2	4	2	22	60
ESRR71402005025	0.5	2	4	2	25	60
ESRR71402005030	0.5	2	4	2	30	70
ESRR71402501008	0.1	2.5	4	2.5	8	45
ESRR71402501010	0.1	2.5	4	2.5	10	50
ESRR71402501012	0.1	2.5	4	2.5	12	50
ESRR71402501014	0.1	2.5	4	2.5	14	50
ESRR71402501016	0.1	2.5	4	2.5	16	50
ESRR71402501020	0.1	2.5	4	2.5	20	50
ESRR71402501025	0.1	2.5	4	2.5	25	60
ESRR71402501030	0.1	2.5	4	2.5	30	70
ESRR71402502008	0.2	2.5	4	2.5	8	45
ESRR71402502010	0.2	2.5	4	2.5	10	50
ESRR71402502012	0.2	2.5	4	2.5	12	50
ESRR71402502014	0.2	2.5	4	2.5	14	50
ESRR71402502016	0.2	2.5	4	2.5	16	50
ESRR71402502020	0.2	2.5	4	2.5	20	50
ESRR71402502025	0.2	2.5	4	2.5	25	60
ESRR71402502030	0.2	2.5	4	2.5	30	70
ESRR71402503008	0.3	2.5	4	2.5	8	45
ESRR71402503010	0.3	2.5	4	2.5	10	50
ESRR71402503012	0.3	2.5	4	2.5	12	50
ESRR71402503014	0.3	2.5	4	2.5	14	50
ESRR71402503016	0.3	2.5	4	2.5	16	50
ESRR71402503020	0.3	2.5	4	2.5	20	50
ESRR71402503025	0.3	2.5	4	2.5	25	60
ESRR71402503030	0.3	2.5	4	2.5	30	70
ESRR71402505008	0.5	2.5	4	2.5	8	45
ESRR71402505010	0.5	2.5	4	2.5	10	50
ESRR71402505012	0.5	2.5	4	2.5	12	50
ESRR71402505014	0.5	2.5	4	2.5	14	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71402505016	0.5	2.5	4	2.5	16	50
ESRR71402505020	0.5	2.5	4	2.5	20	50
ESRR71402505025	0.5	2.5	4	2.5	25	60
ESRR71402505030	0.5	2.5	4	2.5	30	70
ESRR71403001008	0.1	3	6	3	8	45
ESRR71403001010	0.1	3	6	3	10	50
ESRR71403001012	0.1	3	6	3	12	50
ESRR71403001014	0.1	3	6	3	14	50
ESRR71403001016	0.1	3	6	3	16	55
ESRR71403001020	0.1	3	6	3	20	60
ESRR71403001025	0.1	3	6	3	25	65
ESRR71403001030	0.1	3	6	3	30	70
ESRR71403001035	0.1	3	6	3	35	75
ESRR71403001040	0.1	3	6	3	40	80
ESRR71403001045	0.1	3	6	3	45	90
ESRR71403002008	0.2	3	6	3	8	45
ESRR71403002010	0.2	3	6	3	10	50
ESRR71403002012	0.2	3	6	3	12	50
ESRR71403002014	0.2	3	6	3	14	50
ESRR71403002016	0.2	3	6	3	16	55
ESRR71403002020	0.2	3	6	3	20	60
ESRR71403002025	0.2	3	6	3	25	65
ESRR71403002030	0.2	3	6	3	30	70
ESRR71403002035	0.2	3	6	3	35	75
ESRR71403002040	0.2	3	6	3	40	80
ESRR71403002045	0.2	3	6	3	45	90
ESRR71403003008	0.3	3	6	3	8	45
ESRR71403003010	0.3	3	6	3	10	50
ESRR71403003012	0.3	3	6	3	12	50
ESRR71403003014	0.3	3	6	3	14	50
ESRR71403003016	0.3	3	6	3	16	55
ESRR71403003020	0.3	3	6	3	20	60
ESRR71403003025	0.3	3	6	3	25	65
ESRR71403003030	0.3	3	6	3	30	70
ESRR71403003035	0.3	3	6	3	35	75
ESRR71403003040	0.3	3	6	3	40	80
ESRR71403003045	0.3	3	6	3	45	90
ESRR71403005008	0.5	3	6	3	8	45
ESRR71403005010	0.5	3	6	3	10	50

ESRR714

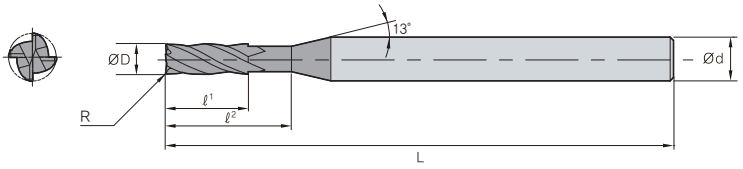
4 flutes rib radius Endmill



ULTRA FINE | 4 | 30° HELIX | R ±0.01 (Ø6 or Under) | R ±0.015 (Above Ø6) | AlTiN | DATA p.445~456

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

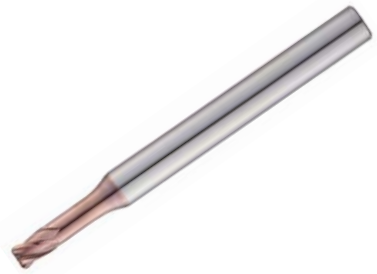
Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71403005012	0.5	3	6	3	12	50
ESRR71403005014	0.5	3	6	3	14	50
ESRR71403005016	0.5	3	6	3	16	55
ESRR71403005020	0.5	3	6	3	20	60
ESRR71403005025	0.5	3	6	3	25	65
ESRR71403005030	0.5	3	6	3	30	70
ESRR71403005035	0.5	3	6	3	35	75
ESRR71403005040	0.5	3	6	3	40	80
ESRR71403005045	0.5	3	6	3	45	90
ESRR71403005050	0.5	3	6	3	50	100
ESRR71403010008	1	3	6	3	8	45
ESRR71403010010	1	3	6	3	10	50
ESRR71403010012	1	3	6	3	12	50
ESRR71403010014	1	3	6	3	14	50
ESRR71403010016	1	3	6	3	16	55
ESRR71403010020	1	3	6	3	20	60
ESRR71403010025	1	3	6	3	25	65
ESRR71403010030	1	3	6	3	30	70
ESRR71403010035	1	3	6	3	35	75
ESRR71403010040	1	3	6	3	40	80
ESRR71403010045	1	3	6	3	45	90
ESRR71403010050	1	3	6	3	50	100
ESRR71404001010	0.1	4	6	4	10	50
ESRR71404001012	0.1	4	6	4	12	50
ESRR71404001013	0.1	4	6	4	13	55
ESRR71404001016	0.1	4	6	4	16	55
ESRR71404001020	0.1	4	6	4	20	60
ESRR71404001025	0.1	4	6	4	25	65
ESRR71404001030	0.1	4	6	4	30	70
ESRR71404001035	0.1	4	6	4	35	75
ESRR71404001040	0.1	4	6	4	40	80
ESRR71404001045	0.1	4	6	4	45	90
ESRR71404001050	0.1	4	6	4	50	100
ESRR71404002010	0.2	4	6	4	10	50
ESRR71404002012	0.2	4	6	4	12	50
ESRR71404002013	0.2	4	6	4	13	55
ESRR71404002016	0.2	4	6	4	16	55
ESRR71404002020	0.2	4	6	4	20	60
ESRR71404002025	0.2	4	6	4	25	65

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71404002030	0.2	4	6	4	30	70
ESRR71404002035	0.2	4	6	4	35	75
ESRR71404002040	0.2	4	6	4	40	80
ESRR71404002045	0.2	4	6	4	45	90
ESRR71404002050	0.2	4	6	4	50	100
ESRR71404003010	0.3	4	6	4	10	50
ESRR71404003012	0.3	4	6	4	12	50
ESRR71404003013	0.3	4	6	4	13	55
ESRR71404003016	0.3	4	6	4	16	55
ESRR71404003020	0.3	4	6	4	20	60
ESRR71404003025	0.3	4	6	4	25	65
ESRR71404003030	0.3	4	6	4	30	70
ESRR71404003035	0.3	4	6	4	35	75
ESRR71404003040	0.3	4	6	4	40	80
ESRR71404003045	0.3	4	6	4	45	90
ESRR71404003050	0.3	4	6	4	50	100
ESRR71404005010	0.5	4	6	4	10	50
ESRR71404005012	0.5	4	6	4	12	50
ESRR71404005013	0.5	4	6	4	13	55
ESRR71404005016	0.5	4	6	4	16	55
ESRR71404005020	0.5	4	6	4	20	60
ESRR71404005025	0.5	4	6	4	25	65
ESRR71404005030	0.5	4	6	4	30	70
ESRR71404005035	0.5	4	6	4	35	75
ESRR71404005040	0.5	4	6	4	40	80
ESRR71404005045	0.5	4	6	4	45	90
ESRR71404005050	0.5	4	6	4	50	100
ESRR71404005055	0.5	4	6	4	55	100
ESRR71404010010	1	4	6	4	10	50
ESRR71404010012	1	4	6	4	12	50
ESRR71404010013	1	4	6	4	13	55
ESRR71404010016	1	4	6	4	16	55
ESRR71404010020	1	4	6	4	20	60
ESRR71404010025	1	4	6	4	25	65
ESRR71404010030	1	4	6	4	30	70
ESRR71404010035	1	4	6	4	35	75
ESRR71404010040	1	4	6	4	40	80
ESRR71404010045	1	4	6	4	45	90
ESRR71404010050	1	4	6	4	50	100

H-Star Endmill

ESRR714

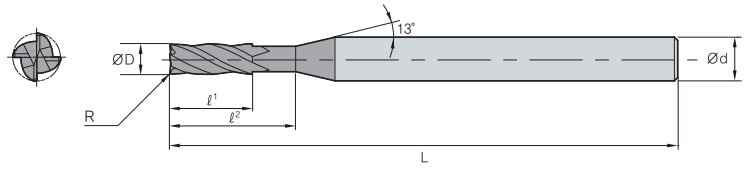
4 flutes rib radius Endmill



ULTRA FINE | 4 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.445~456

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



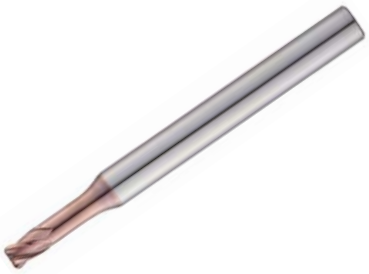
(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71404010055	1	4	6	4	55	100
ESRR71405001016	0.1	5	6	5	16	60
ESRR71405001030	0.1	5	6	5	30	70
ESRR71405001040	0.1	5	6	5	40	80
ESRR71405002016	0.2	5	6	5	16	60
ESRR71405002030	0.2	5	6	5	30	70
ESRR71405002040	0.2	5	6	5	40	80
ESRR71405003016	0.3	5	6	5	16	60
ESRR71405003030	0.3	5	6	5	30	70
ESRR71405003040	0.3	5	6	5	40	80
ESRR71405005016	0.5	5	6	5	16	60
ESRR71405005030	0.5	5	6	5	30	70
ESRR71405005040	0.5	5	6	5	40	80
ESRR71405005050	0.5	5	6	5	50	100
ESRR71405005060	0.5	5	6	5	60	110
ESRR71405010016	1	5	6	5	16	60
ESRR71405010030	1	5	6	5	30	70
ESRR71405010040	1	5	6	5	40	80
ESRR71405010050	1	5	6	5	50	100
ESRR71405010060	1	5	6	5	60	110
ESRR71405015015	1.5	5	6	5	15	60
ESRR71405020015	2	5	6	5	15	60
ESRR71406001020	0.1	6	6	7	20	60
ESRR71406001040	0.1	6	6	7	40	80
ESRR71406001050	0.1	6	6	7	50	100
ESRR71406002020	0.2	6	6	7	20	60
ESRR71406002040	0.2	6	6	7	40	80
ESRR71406002050	0.2	6	6	7	50	100
ESRR71406003020	0.3	6	6	7	20	60
ESRR71406003030	0.3	6	6	7	30	70
ESRR71406003040	0.3	6	6	7	40	80
ESRR71406003050	0.3	6	6	7	50	100
ESRR71406005020	0.5	6	6	7	20	60
ESRR71406005030	0.5	6	6	7	30	70
ESRR71406005040	0.5	6	6	7	40	80
ESRR71406005050	0.5	6	6	7	50	100
ESRR71406005060	0.5	6	6	7	60	110
ESRR71406010020	1	6	6	7	20	60
ESRR71406010030	1	6	6	7	30	70

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71406010040	1	6	6	7	40	80
ESRR71406010050	1	6	6	7	50	100
ESRR71406010060	1	6	6	7	60	110
ESRR71406015020	1.5	6	6	7	20	60
ESRR71406015040	1.5	6	6	7	40	80
ESRR71406015050	1.5	6	6	7	50	100
ESRR71406020020	2	6	6	7	20	60
ESRR71406020030	2	6	6	7	30	70
ESRR71406020040	2	6	6	7	40	80
ESRR71406020050	2	6	6	7	50	100
ESRR71408001025	0.1	8	8	9	25	70
ESRR71408002022	0.2	8	8	9	22	65
ESRR71408002040	0.2	8	8	9	40	100
ESRR71408003022	0.3	8	8	9	22	65
ESRR71408003040	0.3	8	8	9	40	100
ESRR71408005022	0.5	8	8	9	22	65
ESRR71408005035	0.5	8	8	9	35	100
ESRR71408005040	0.5	8	8	9	40	100
ESRR71408005050	0.5	8	8	9	50	120
ESRR71408005060	0.5	8	8	9	60	120
ESRR71408010022	1	8	8	9	22	65
ESRR71408010035	1	8	8	9	35	100
ESRR71408010040	1	8	8	9	40	100
ESRR71408010050	1	8	8	9	50	120
ESRR71408010060	1	8	8	9	60	120
ESRR71408015022	1.5	8	8	9	22	65
ESRR71408015040	1.5	8	8	9	40	100
ESRR71408020022	2	8	8	9	22	65
ESRR71408020040	2	8	8	9	40	100
ESRR71408020050	2	8	8	9	50	120
ESRR71410001030	0.1	10	10	11	30	75
ESRR71410002024	0.2	10	10	11	24	70
ESRR71410002040	0.2	10	10	11	40	100
ESRR71410003024	0.3	10	10	11	24	70
ESRR71410003040	0.3	10	10	11	40	100
ESRR71410005024	0.5	10	10	11	24	70
ESRR71410005040	0.5	10	10	11	40	100
ESRR71410005050	0.5	10	10	11	50	120
ESRR71410005060	0.5	10	10	11	60	120

ESRR714

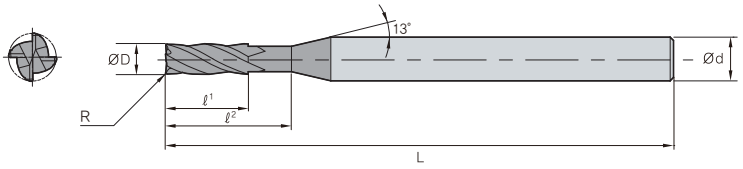
4 flutes rib radius Endmill



ULTRA FINE | 4 | 30° HELIX | R ±0.01 (Ø6 or Under) | R ±0.015 (Above Ø6) | AlTiN | DATA p.445~456

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71410010024	1	10	10	11	24	70
ESRR71410010040	1	10	10	11	40	100
ESRR71410010050	1	10	10	11	50	120
ESRR71410010060	1	10	10	11	60	120
ESRR71410015024	1.5	10	10	11	24	70
ESRR71410015040	1.5	10	10	11	40	100
ESRR71410020024	2	10	10	11	24	70
ESRR71410020040	2	10	10	11	40	100
ESRR71410020050	2	10	10	11	50	120
ESRR71410025024	2.5	10	10	11	24	70
ESRR71412002032	0.2	12	12	13	32	80
ESRR71412003026	0.3	12	12	13	26	80
ESRR71412003045	0.3	12	12	13	45	110
ESRR71412005026	0.5	12	12	13	26	80
ESRR71412005040	0.5	12	12	13	40	110
ESRR71412005060	0.5	12	12	13	60	130

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESRR71412010026	1	12	12	13	26	80
ESRR71412010040	1	12	12	13	40	110
ESRR71412010060	1	12	12	13	60	130
ESRR71412015026	1.5	12	12	13	26	80
ESRR71412020026	2	12	12	13	26	80
ESRR71412020040	2	12	12	13	40	110
ESRR71412030026	3	12	12	13	26	80
ESRR71416005035	0.5	16	16	20	35	100
ESRR71416005050	0.5	16	20	35	50	150
ESRR71416010035	1	16	16	20	35	100
ESRR71416010050	1	16	20	35	50	150
ESRR71420005040	0.5	20	20	25	40	100
ESRR71420005055	0.5	20	20	40	55	150
ESRR71420010040	1	20	20	25	40	100
ESRR71420010055	1	20	20	40	55	150

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESXE704

4 flutes neck type flat Endmill

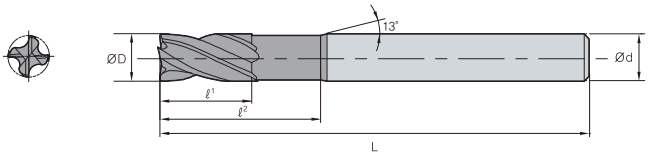


ULTRA FINE | 4 | M HELIX | AlTiN | DATA

p.457

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h5



(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
ESXE704010	1	4	1.5	4	45
ESXE704020	2	4	3	6	45
ESXE704030	3	6	4	7	45
ESXE704040	4	6	5	9	45
ESXE704060	6	6	7	14	50
ESXE704080	8	8	9	18	60
ESXE704100	10	10	12	25	75
ESXE704120	12	12	15	30	75

※ The above specifications are subject to change without prior notice for product quality improvement.

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESXE714

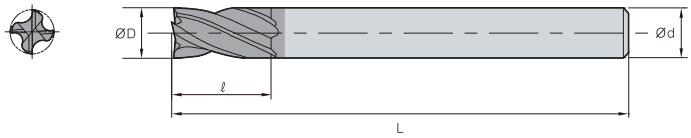
4 flutes flat Endmill



ULTRA FINE | 4 | M HELIX | AlTiN | DATA p.457

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h5



(mm)

Designation	ØD	Ød	ℓ	L
ESXE714020	2	4	5	45
ESXE714030	3	6	8	45
ESXE714040	4	6	10	45
ESXE714040S4	4	4	10	45
ESXE714060	6	6	16	50
ESXE714080	8	8	20	60
ESXE714100	10	10	25	75
ESXE714120	12	12	35	85

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

H-Star Endmill

ESXR704

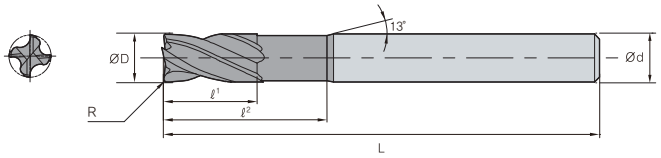
4 flutes neck type radius Endmill



ULTRA FINE | 4 | M HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.457

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESXR70401000504	0.05	1	4	1.5	4	45
ESXR70402000506	0.05	2	4	3	6	45
ESXR70402000507	0.05	2	4	2.5	7	50
ESXR7040200107	0.1	2	4	2.5	7	50
ESXR7040300107	0.1	3	6	4	7	45
ESXR7040300109	0.1	3	6	4	9	55
ESXR7040300209	0.2	3	6	4	9	55
ESXR7040300309	0.3	3	6	4	9	55
ESXR7040300312	0.3	3	6	4	12	55
ESXR7040300316	0.3	3	6	4	16	55
ESXR7040400109	0.1	4	6	5	9	45
ESXR7040400212	0.2	4	6	5	12	55
ESXR7040400212S4	0.2	4	4	5	12	55
ESXR7040400312	0.3	4	6	5	12	55
ESXR7040400316	0.3	4	6	5	16	55
ESXR7040400320	0.3	4	6	5	20	55
ESXR7040400512	0.5	4	6	5	12	55
ESXR7040400516	0.5	4	6	5	16	55
ESXR7040400516S4	0.5	4	4	5	16	55
ESXR7040400520	0.5	4	6	5	20	55
ESXR7040401012	1	4	6	5	12	55
ESXR7040500116	0.1	5	6	6	16	60
ESXR7040500216	0.2	5	6	6	16	60
ESXR7040500316	0.3	5	6	6	16	60
ESXR7040500516	0.5	5	6	6	16	60
ESXR7040501016	1	5	6	6	16	60
ESXR7040600120	0.1	6	6	7	20	60
ESXR7040600214	0.2	6	6	7	14	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESXR7040600220	0.2	6	6	7	20	60
ESXR7040600320	0.3	6	6	7	20	60
ESXR7040600520	0.5	6	6	7	20	60
ESXR7040601020	1	6	6	7	20	60
ESXR7040601520	1.5	6	6	7	20	60
ESXR7040800125	0.1	8	8	9	25	60
ESXR7040800218	0.2	8	8	9	18	60
ESXR7040800225	0.2	8	8	9	25	60
ESXR7040800325	0.3	8	8	9	25	60
ESXR7040800525	0.5	8	8	9	25	60
ESXR7040801025	1	8	8	9	25	60
ESXR7040801525	1.5	8	8	9	25	60
ESXR7040802025	2	8	8	9	25	60
ESXR7041000225	0.2	10	10	12	25	75
ESXR7041000232	0.2	10	10	11	32	75
ESXR7041000332	0.3	10	10	11	32	75
ESXR7041000532	0.5	10	10	11	32	75
ESXR7041001032	1	10	10	11	32	75
ESXR7041001532	1.5	10	10	11	32	75
ESXR7041002032	2	10	10	11	32	75
ESXR7041200238	0.2	12	12	12	38	75
ESXR7041200330	0.3	12	12	15	30	75
ESXR7041200338	0.3	12	12	12	38	75
ESXR7041200538	0.5	12	12	12	38	75
ESXR7041201038	1	12	12	12	38	75
ESXR7041201538	1.5	12	12	12	38	75
ESXR7041202038	2	12	12	12	38	75

※ The above specifications are subject to change without prior notice for product quality improvement.

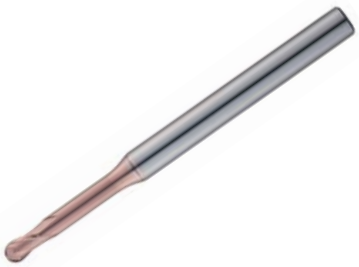
• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESLNB20

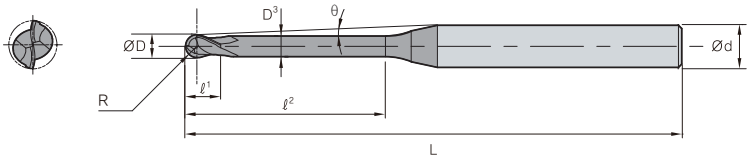
2 flutes long neck type ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.005 Above Ø6 | AlTiN | DATA p.457

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5



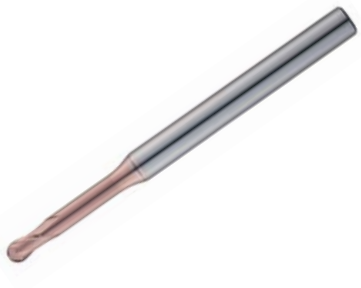
(mm)

Designation	Sizes(mm)								Effective length by inclination angle				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNB2001-0.2	0.05	0.1	4	0.08	0.2	0.08	11.8	45	0.3	0.3	0.3	0.4	0.4
ESLNB2001-0.3	0.05	0.1	4	0.08	0.3	0.08	11.7	45	0.4	0.4	0.5	0.5	0.5
ESLNB2001-0.5	0.05	0.1	4	0.08	0.5	0.08	11.4	45	0.6	0.7	0.7	0.7	0.8
ESLNB2002-0.5	0.1	0.2	4	0.15	0.5	0.17	11.5	50	1.2	1.3	1.5	1.6	2
ESLNB2002-1	0.1	0.2	4	0.15	1	0.17	10.9	50	1.7	1.9	2.1	2.3	2.7
ESLNB2002-1.5	0.1	0.2	4	0.15	1.5	0.17	10.4	50	2.3	2.5	2.8	3	3.4
ESLNB2002-2	0.1	0.2	4	0.15	2	0.17	9.9	50	2.8	3.1	3.4	3.6	4.1
ESLNB2002-2.5	0.1	0.2	4	0.15	2.5	0.17	9.5	50	3.4	3.7	4	4.2	4.7
ESLNB2002-3.0	0.1	0.2	4	0.15	3	0.17	9.1	50	3.9	4.3	4.6	4.9	5.4
ESLNB2003-1	0.15	0.3	4	0.25	1	0.27	10.9	50	1.7	1.9	2.1	2.3	2.7
ESLNB2003-1.5	0.15	0.3	4	0.25	1.5	0.27	10.4	50	2.3	2.5	2.7	3	3.4
ESLNB2003-2	0.15	0.3	4	0.25	2	0.27	9.9	50	2.8	3.1	3.4	3.6	4
ESLNB2003-2.5	0.15	0.3	4	0.25	2.5	0.27	9.5	50	3.4	3.7	4	4.2	4.7
ESLNB2003-3	0.15	0.3	4	0.25	3	0.27	9.1	50	3.9	4.3	4.6	4.8	5.3
ESLNB2004-1	0.2	0.4	4	0.3	1	0.37	11	50	1.7	1.9	2.1	2.3	2.7
ESLNB2004-1.5	0.2	0.4	4	0.3	1.5	0.37	10.4	50	2.3	2.5	2.7	2.9	3.4
ESLNB2004-2	0.2	0.4	4	0.3	2	0.37	9.9	50	2.8	3.1	3.4	3.6	4
ESLNB2004-2.5	0.2	0.4	4	0.3	2.5	0.37	9.5	50	3.4	3.7	4	4.2	4.7
ESLNB2004-3	0.2	0.4	4	0.3	3	0.37	9.1	50	3.9	4.3	4.6	4.8	5.3
ESLNB2004-3.5	0.2	0.4	4	0.3	3.5	0.37	8.7	50	4.5	4.8	5.2	5.4	6
ESLNB2004-4	0.2	0.4	4	0.3	4	0.37	8.3	50	5	5.4	5.7	6	6.6
ESLNB2004-4.5	0.2	0.4	4	0.3	4.5	0.37	8	50	5.6	6	6.3	6.6	7.2
ESLNB2005-1	0.25	0.5	4	0.35	1	0.47	11	50	1.7	1.9	2.1	2.3	2.6
ESLNB2005-2	0.25	0.5	4	0.35	2	0.47	9.9	50	2.8	3.1	3.3	3.6	4
ESLNB2005-3	0.25	0.5	4	0.35	3	0.47	9	50	3.9	4.3	4.6	4.8	5.3
ESLNB2005-4	0.25	0.5	4	0.35	4	0.47	8.3	50	5	5.4	5.7	6	6.6
ESLNB2005-5	0.25	0.5	4	0.35	5	0.47	7.7	50	6.1	6.5	6.9	7.2	7.8
ESLNB2005-6	0.25	0.5	4	0.35	6	0.47	7.1	50	7.2	7.6	8	8.4	9
ESLNB2005-8	0.25	0.5	4	0.35	8	0.47	6.3	50	9.3	9.9	10.3	10.7	11.4
ESLNB2006-1	0.3	0.6	4	0.4	1	0.57	11	50	1.7	1.9	2.1	2.3	2.6
ESLNB2006-2	0.3	0.6	4	0.4	2	0.57	9.9	50	2.8	3.1	3.3	3.6	4
ESLNB2006-3	0.3	0.6	4	0.4	3	0.57	9	50	3.9	4.3	4.5	4.8	5.3
ESLNB2006-4	0.3	0.6	4	0.4	4	0.57	8.3	50	5	5.4	5.7	6	6.6
ESLNB2006-5	0.3	0.6	4	0.4	5	0.57	7.6	50	6.1	6.5	6.9	7.2	7.8
ESLNB2006-6	0.3	0.6	4	0.4	6	0.57	7.1	50	7.2	7.6	8	8.4	9
ESLNB2006-7	0.3	0.6	4	0.4	7	0.57	6.6	50	8.3	8.8	9.2	9.5	10.2

H-Star Endmill

ESLNB20

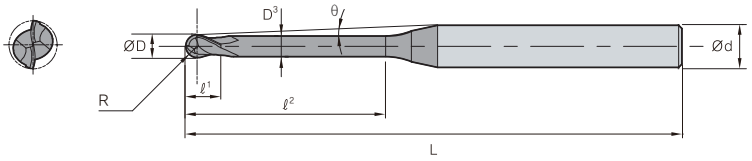
2 flutes long neck type ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.005 Above Ø6 | AlTiN | DATA p.457

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5

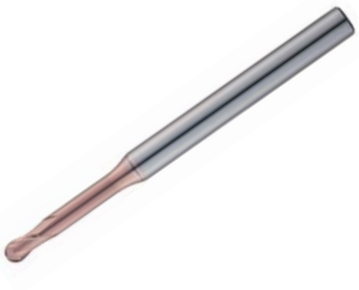


(mm)

Designation	Sizes(mm)								Effective length by inclination angle				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNB2006-8	0.3	0.6	4	0.4	8	0.57	6.2	50	9.3	9.9	10.3	10.7	11.4
ESLNB2006-9	0.3	0.6	4	0.4	9	0.57	5.8	50	10.4	10.9	11.4	11.8	12.5
ESLNB2006-10	0.3	0.6	4	0.4	10	0.57	5.5	50	11.4	12	12.5	12.9	13.7
ESLNB2006-12	0.3	0.6	4	0.4	12	0.57	5	50	13.6	14.2	14.7	15.2	16
ESLNB2008-2	0.4	0.8	4	0.5	2	0.77	9.9	50	2.8	3.1	3.3	3.5	4
ESLNB2008-4	0.4	0.8	4	0.5	4	0.77	8.2	50	5	5.4	5.7	6	6.5
ESLNB2008-5	0.4	0.8	4	0.5	5	0.77	7.5	50	6.1	6.5	6.9	7.2	7.8
ESLNB2008-6	0.4	0.8	4	0.5	6	0.77	7	50	7.2	7.6	8	8.4	9
ESLNB2008-8	0.4	0.8	4	0.5	8	0.77	6.1	50	9.3	9.8	10.3	10.7	11.3
ESLNB2008-10	0.4	0.8	4	0.5	10	0.77	5.4	50	11.4	12	12.5	12.9	13.7
ESLNB2010-2	0.5	1	4	0.8	2	0.96	9.9	50	2.9	3.1	3.3	3.5	4
ESLNB2010-3	0.5	1	4	0.8	3	0.96	8.9	50	4	4.3	4.5	4.8	5.3
ESLNB2010-4	0.5	1	4	0.8	4	0.96	8.1	50	5	5.4	5.7	6	6.5
ESLNB2010-5	0.5	1	4	0.8	5	0.96	7.4	50	6.1	6.5	6.9	7.2	7.8
ESLNB2010-6	0.5	1	4	0.8	6	0.96	6.8	50	7.2	7.7	8	8.4	9
ESLNB2010-7	0.5	1	4	0.8	7	0.96	6.3	50	8.3	8.8	9.2	9.5	10.2
ESLNB2010-8	0.5	1	4	0.8	8	0.96	5.9	50	9.3	9.9	10.3	10.7	11.3
ESLNB2010-9	0.5	1	4	0.8	9	0.96	5.5	50	10.4	11	11.4	11.8	12.5
ESLNB2010-10	0.5	1	4	0.8	10	0.96	5.2	50	11.5	12	12.5	12.9	13.7
ESLNB2010-12	0.5	1	4	0.8	12	0.96	4.6	55	13.6	14.2	14.7	15.2	15.9
ESLNB2010-14	0.5	1	4	0.8	14	0.96	4.2	55	15.7	16.4	16.9	17.4	18.5
ESLNB2010-16	0.5	1	4	0.8	16	0.96	3.8	55	17.8	18.5	19.1	19.6	21.2
ESLNB2010-18	0.5	1	4	0.8	18	0.96	3.5	60	19.9	20.7	21.3	21.8	23.8
ESLNB2010-20	0.5	1	4	0.8	20	0.96	3.3	60	22	22.8	23.4	24	26.5
ESLNB2012-4	0.6	1.2	4	1.1	4	1.15	7.9	50	5.1	5.4	5.7	6	6.5
ESLNB2012-6	0.6	1.2	4	1.1	6	1.15	6.6	50	7.2	7.7	8	8.4	9
ESLNB2012-8	0.6	1.2	4	1.1	8	1.15	5.7	50	9.4	9.9	10.3	10.7	11.3
ESLNB2012-10	0.6	1.2	4	1.1	10	1.15	5	50	11.5	12.1	12.5	12.9	13.7
ESLNB2012-12	0.6	1.2	4	1.1	12	1.15	4.5	55	13.6	14.2	14.7	15.2	15.9
ESLNB2014-8	0.7	1.4	4	1.3	8	1.34	5.5	50	9.4	9.9	10.3	10.7	11.3
ESLNB2014-12	0.7	1.4	4	1.3	12	1.34	4.3	55	13.6	14.2	14.7	15.2	15.9
ESLNB2014-16	0.7	1.4	4	1.3	16	1.34	3.5	55	17.8	18.5	19.1	19.6	21.2
ESLNB2015-4	0.75	1.5	4	1.35	4	1.44	7.7	50	5.1	5.4	5.7	6	6.5
ESLNB2015-6	0.75	1.5	4	1.35	6	1.44	6.4	50	7.3	7.7	8	8.4	9
ESLNB2015-8	0.75	1.5	4	1.35	8	1.44	5.4	50	9.4	9.9	10.3	10.7	11.3
ESLNB2015-10	0.75	1.5	4	1.35	10	1.44	4.7	50	11.5	12.1	12.5	12.9	13.7

ESLNB20

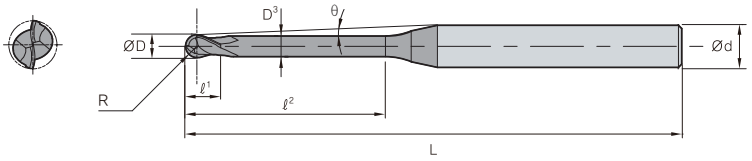
2 flutes long neck type ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.005 Above Ø6 | AlTiN | DATA p.457

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5



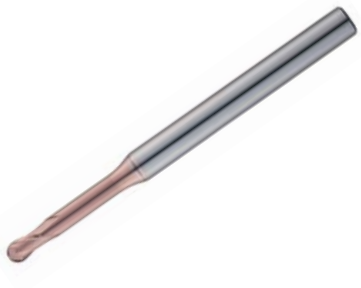
(mm)

Designation	Sizes(mm)								Effective length by inclination angle				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNB2015-12	0.75	1.5	4	1.35	12	1.44	4.2	55	13.6	14.2	14.7	15.2	15.9
ESLNB2015-14	0.75	1.5	4	1.35	14	1.44	3.8	55	15.7	16.4	16.9	17.4	18.5
ESLNB2015-16	0.75	1.5	4	1.35	16	1.44	3.4	55	17.8	18.5	19.1	19.6	21.1
ESLNB2015-20	0.75	1.5	4	1.35	20	1.44	2.9	60	22	22.8	23.4	24	-
ESLNB2016-8	0.8	1.6	4	1.4	8	1.54	5.3	50	9.4	9.9	10.3	10.7	11.3
ESLNB2016-10	0.8	1.6	4	1.4	10	1.54	4.6	55	11.5	12.1	12.5	12.9	13.7
ESLNB2016-12	0.8	1.6	4	1.4	12	1.54	4.1	55	13.6	14.2	14.7	15.2	15.9
ESLNB2016-16	0.8	1.6	4	1.4	16	1.54	3.3	55	17.8	18.5	19.1	19.6	21.1
ESLNB2016-20	0.8	1.6	4	1.4	20	1.54	2.8	60	22	22.8	23.4	24	-
ESLNB2018-8	0.9	1.8	4	1.6	8	1.73	5.1	50	9.4	9.9	10.3	10.7	11.3
ESLNB2018-12	0.9	1.8	4	1.6	12	1.73	3.9	55	13.7	14.3	14.7	15.2	15.9
ESLNB2018-16	0.9	1.8	4	1.6	16	1.73	3.1	55	17.9	18.6	19.1	19.6	21.1
ESLNB2018-20	0.9	1.8	4	1.6	20	1.73	2.6	60	22	22.8	23.4	24	-
ESLNB2020-3	1	2	4	1.7	3	1.92	8.3	50	4.1	4.4	4.6	4.8	5.2
ESLNB2020-4	1	2	4	3	4	1.92	7.3	50	5.2	5.5	5.8	6	6.5
ESLNB2020-6	1	2	4	3	6	1.92	5.8	50	7.3	7.7	8.1	8.4	9
ESLNB2020-8	1	2	4	3	8	1.92	4.9	50	9.5	9.9	10.3	10.7	11.3
ESLNB2020-10	1	2	4	3	10	1.92	4.2	50	11.6	12.1	12.6	12.9	13.6
ESLNB2020-12	1	2	4	3	12	1.92	3.7	55	13.7	14.3	14.8	15.2	15.9
ESLNB2020-14	1	2	4	3	14	1.92	3.2	55	15.8	16.4	16.9	17.4	18.5
ESLNB2020-16	1	2	4	3	16	1.92	2.9	55	17.9	18.6	19.1	19.6	-
ESLNB2020-18	1	2	4	3	18	1.92	2.7	60	20	20.7	21.3	21.8	-
ESLNB2020-20	1	2	4	3	20	1.92	2.4	60	22.1	22.8	23.4	24	-
ESLNB2020-22	1	2	4	3	22	1.92	2.3	60	24.1	24.9	25.6	26.3	-
ESLNB2020-25	1	2	4	3	25	1.92	2	65	27.3	28.1	28.8	-	-
ESLNB2020-30	1	2	4	3	30	1.92	1.7	70	32.4	33.4	34.2	-	-
ESLNB2020-35	1	2	4	3	35	1.92	1.5	75	37.6	38.6	-	-	-
ESLNB2020-40	1	2	4	3	40	1.92	1.4	80	42.8	43.8	-	-	-
ESLNB2025-10	1.25	2.5	4	4	10	2.4	3.4	50	11.6	12.1	12.6	13	13.6
ESLNB2025-16	1.25	2.5	4	4	16	2.4	2.3	55	17.9	18.6	19.1	19.6	-
ESLNB2025-20	1.25	2.5	4	4	20	2.4	1.9	60	22.1	22.8	23.5	-	-
ESLNB2030-8	1.5	3	6	4	8	2.88	6.2	55	9.6	10	10.4	10.7	11.3
ESLNB2030-10	1.5	3	6	4	10	2.88	5.5	55	11.7	12.2	12.6	13	13.6
ESLNB2030-13	1.5	3	6	4	13	2.88	4.6	60	14.8	15.4	15.9	16.3	17.1
ESLNB2030-16	1.5	3	6	4	16	2.88	4	60	18	18.6	19.1	19.6	21.1
ESLNB2030-18	1.5	3	6	4	18	2.88	3.6	60	20	20.7	21.3	21.8	23.7

H-Star Endmill

ESLNB20

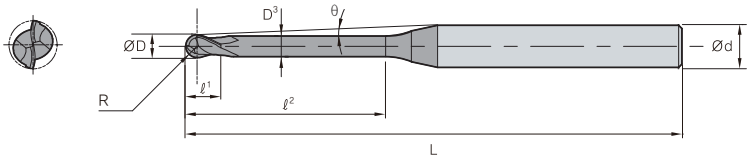
2 flutes long neck type ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.005 (Above Ø6) | AlTiN | DATA p.457

• TOLERANCE

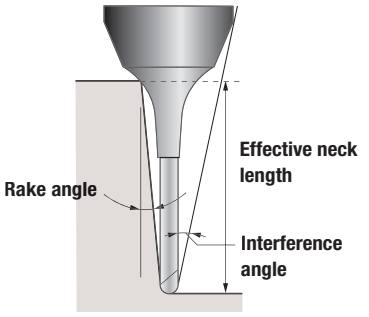
ØD		Ød
All sizes	0 ~ -0.012mm	h5

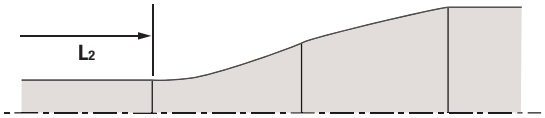


(mm)

Designation	Sizes(mm)								Effective length by inclination angle				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNB2030-20	1.5	3	6	4	20	2.88	3.4	65	22.1	22.9	23.5	24	26.4
ESLNB2030-25	1.5	3	6	4	25	2.88	2.8	70	27.3	28.2	28.8	29.9	-
ESLNB2030-30	1.5	3	6	4	30	2.88	2.5	75	32.5	33.4	34.3	35.9	-
ESLNB2030-35	1.5	3	6	4	35	2.88	2.2	80	37.7	38.7	40	41.9	-
ESLNB2040-10	2	4	6	5	10	3.9	4.5	55	11.6	12.1	12.5	12.9	13.5
ESLNB2040-13	2	4	6	5	13	3.9	3.6	60	14.7	15.3	15.8	16.2	17
ESLNB2040-16	2	4	6	5	16	3.9	3.1	60	17.9	18.5	19.1	19.5	20.9
ESLNB2040-20	2	4	6	5	20	3.9	2.5	65	22.1	22.8	23.4	23.9	-
ESLNB2040-25	2	4	6	5	25	3.9	2.1	70	27.3	28.1	28.8	29.8	-
ESLNB2040-30	2	4	6	5	30	3.9	1.8	75	32.4	33.4	34.2	-	-
ESLNB2040-35	2	4	6	5	35	3.9	1.6	80	37.6	38.6	39.9	-	-
ESLNB2040-40	2	4	6	5	40	3.9	1.4	80	42.8	43.8	-	-	-
ESLNB2040-45	2	4	6	5	45	3.9	1.2	90	47.9	49.1	-	-	-
ESLNB2040-50	2	4	6	5	50	3.9	1.1	100	53.1	54.5	-	-	-
ESLNB2050-20	2.5	5	6	6	20	4.9	1.4	65	22	22.8	-	-	-
ESLNB2050-25	2.5	5	6	6	25	4.9	1.2	70	27.2	28.1	-	-	-
ESLNB2050-30	2.5	5	6	6	30	4.9	1	75	32.4	-	-	-	-
ESLNB2050-35	2.5	5	6	6	35	4.9	0.8	80	42.8	-	-	-	-
ESLNB2050-40	2.5	5	6	6	40	4.9	0.7	90	42.8	-	-	-	-

※ The above specifications are subject to change without prior notice for product quality improvement.





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESTNB20

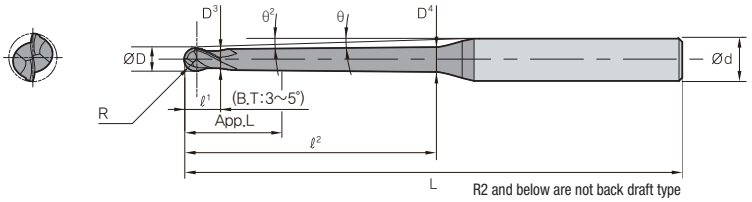
2 flutes tapered neck type ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (Ø6 or Under) | R ±0.015 (Above Ø6) | AlTiN | DATA p.458~460

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	Sizes(mm)											Effective length by inclination angle				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB2002-1-04	0.1	0.2	4	0.15	1	0.4	0.17	0.18	1.35	10.9	50	1.5	1.7	1.8	2	2.3
ESTNB2002-1.5-04	0.1	0.2	4	0.15	1.5	0.4	0.17	0.19	1.77	10.4	50	2	2.2	2.4	2.6	2.9
ESTNB2002-2-09	0.1	0.2	4	0.15	2	0.9	0.17	0.23	1.1	10.1	50	-	2.8	3.1	3.4	3.9
ESTNB2002-2.5-09	0.1	0.2	4	0.15	2.5	0.9	0.17	0.24	1.1	9.6	50	-	3.3	3.7	4	4.5
ESTNB2003-2-04	0.15	0.3	4	0.25	2	0.4	0.28	0.29	2.19	10	50	2.5	2.8	3	3.2	3.5
ESTNB2003-3-09	0.15	0.3	4	0.25	3	0.9	0.28	0.36	1.2	9.3	50	-	3.8	4.2	4.5	5.1
ESTNB2003-4-09	0.15	0.3	4	0.25	4	0.9	0.28	0.39	1.2	8.6	50	-	4.8	5.3	5.7	6.3
ESTNB2004-2-04	0.2	0.4	4	0.3	2	0.4	0.37	0.39	2.2	10	50	2.5	2.8	3	3.2	3.5
ESTNB2004-3-04	0.2	0.4	4	0.3	3	0.4	0.37	0.41	2.44	9.1	50	3.6	3.9	4.1	4.4	4.8
ESTNB2004-4-04	0.2	0.4	4	0.3	4	0.4	0.37	0.42	2.44	8.4	50	4.7	5.2	5.6	5.9	6.5
ESTNB2004-4-09	0.2	0.4	4	0.3	4	0.9	0.37	0.49	1.25	8.5	50	-	4.8	5.3	5.7	6.3
ESTNB2004-5-04	0.2	0.4	4	0.3	5	0.4	0.37	0.44	2.44	7.8	50	5.7	6.3	6.7	7.1	7.7
ESTNB2004-5-09	0.2	0.4	4	0.3	5	0.9	0.37	0.52	1.25	7.9	50	-	5.9	6.4	6.8	7.5
ESTNB2005-4-04	0.25	0.5	4	0.35	4	0.4	0.47	0.52	2.49	8.4	50	4.6	5	5.3	5.5	5.9
ESTNB2005-8-09	0.25	0.5	4	0.35	8	0.9	0.47	0.71	1.3	6.5	50	-	8.9	9.6	10.1	10.9
ESTNB2005-12-09	0.25	0.5	4	0.35	12	0.9	0.47	0.84	1.3	5.3	50	-	13	13.9	14.5	15.4
ESTNB20054-2-04	0.27	0.54	4	0.37	2	0.4	0.52	0.54	1.8	10	50	2.3	2.5	2.7	2.8	3
ESTNB20054-4-04	0.27	0.54	4	0.37	4	0.4	0.52	0.57	1.8	8.4	50	4.5	4.9	5.2	5.5	5.9
ESTNB20054-5-04	0.27	0.54	4	0.37	5	0.4	0.52	0.59	1.8	7.8	50	5.5	6	6.3	6.6	7.1
ESTNB20054-6-04	0.27	0.54	4	0.37	6	0.4	0.52	0.6	1.8	7.2	50	6.7	7.3	7.8	8.2	8.8
ESTNB20054-6.5-04	0.27	0.54	4	0.37	6.5	0.4	0.52	0.61	1.8	7	50	7.2	7.9	8.3	8.7	9.4
ESTNB20054-7-04	0.27	0.54	4	0.37	7	0.4	0.52	0.61	1.8	6.8	50	7.7	8.4	8.9	9.3	10
ESTNB2006-2-04	0.3	0.6	4	0.4	2	0.4	0.57	0.59	2.17	10	50	2.4	2.5	2.7	2.8	3
ESTNB2006-4-04	0.3	0.6	4	0.4	4	0.4	0.57	0.62	2.54	8.4	50	4.6	5	5.2	5.5	5.9
ESTNB2006-6-04	0.3	0.6	4	0.4	6	0.4	0.57	0.65	2.54	7.2	50	6.8	7.4	7.8	8.2	8.8
ESTNB2006-6-09	0.3	0.6	4	0.4	6	0.9	0.57	0.75	1.35	7.3	50	-	6.9	7.5	7.9	8.6
ESTNB2006-8-09	0.3	0.6	4	0.4	8	0.9	0.57	0.81	1.35	6.4	50	-	8.9	9.6	10.1	10.9
ESTNB2006-10-04	0.3	0.6	4	0.4	10	0.4	0.57	0.7	2.54	5.6	50	10.8	11.7	12.2	12.7	13.5
ESTNB2006-10-09	0.3	0.6	4	0.4	10	0.9	0.57	0.87	1.35	5.7	50	-	11	11.8	12.3	13.2
ESTNB2006-12-09	0.3	0.6	4	0.4	12	0.9	0.57	0.93	1.35	5.2	55	-	13	13.9	14.5	15.4
ESTNB2006-15-04	0.3	0.6	4	0.4	15	0.4	0.57	0.77	2.54	4.4	55	15.9	17	17.6	18.2	19.2
ESTNB2006-15-09	0.3	0.6	4	0.4	15	0.9	0.57	1.03	1.35	4.5	55	-	16.1	17.1	17.7	18.8
ESTNB2008-4-04	0.4	0.8	4	0.5	4	0.4	0.77	0.82	2.64	8.3	50	4.6	4.9	5.2	5.5	5.9
ESTNB2008-6-04	0.4	0.8	4	0.5	6	0.4	0.77	0.85	2.64	7.1	50	6.6	7.1	7.5	7.7	8.3
ESTNB2008-8-09	0.4	0.8	4	0.5	8	0.9	0.77	1.01	1.45	6.3	50	-	8.9	9.6	10.1	10.9
ESTNB2008-12-09	0.4	0.8	4	0.5	12	0.9	0.77	1.13	1.45	5	55	-	13	13.9	14.5	15.4

H-Star Endmill

ESTNB20

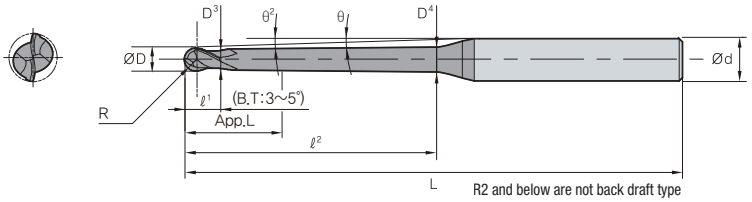
2 flutes tapered neck type ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.458~460

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	Sizes(mm)											Effective length by inclination angle				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB2008-16-09	0.4	0.8	4	0.5	16	0.9	0.77	1.26	1.45	4.2	55	-	17.1	18.1	18.8	19.9
ESTNB2009-4-04	0.45	0.9	4	0.6	4	0.4	0.86	0.91	3.46	8.2	50	4.5	4.7	4.9	5.1	5.4
ESTNB2009-8-04	0.45	0.9	4	0.6	8	0.4	0.86	0.96	3.46	6.1	55	8.7	9.3	9.7	10	10.6
ESTNB2009-12-04	0.45	0.9	4	0.6	12	0.4	0.86	1.02	3.46	4.8	55	12.9	13.8	14.4	14.9	15.7
ESTNB2009-16-04	0.45	0.9	4	0.6	16	0.4	0.86	1.08	3.46	4	60	17	18	18.7	19.3	20.5
ESTNB2009-18-04	0.45	0.9	4	0.6	18	0.4	0.86	1.1	3.46	3.7	65	19.1	20.1	20.9	21.5	23.1
ESTNB2009-20-04	0.45	0.9	4	0.6	20	0.4	0.86	1.13	3.46	3.4	65	21.1	22.2	23	23.6	25.6
ESTNB2009-22-04	0.45	0.9	4	0.6	22	0.4	0.86	1.16	3.46	3.2	65	23.1	24.3	25.1	25.8	28.2
ESTNB2009-24-04	0.45	0.9	4	0.6	24	0.4	0.86	1.19	3.46	3	70	25.2	26.4	27.2	27.9	-
ESTNB2010-6-04	0.5	1	6	0.8	6	0.4	0.94	1.01	5.09	8.3	50	6.8	7.2	7.5	7.8	8.3
ESTNB2010-8-04	0.5	1	6	0.8	8	0.4	0.94	1.04	5.09	7.5	55	8.8	9.3	9.7	10	10.6
ESTNB2010-10-04	0.5	1	6	0.8	10	0.4	0.94	1.07	5.09	6.8	55	11	11.7	12.3	12.7	13.5
ESTNB2010-10-09	0.5	1	6	0.8	10	0.9	0.94	1.23	2.7	6.9	55	-	11.2	11.9	12.4	13.2
ESTNB2010-15-09	0.5	1	6	0.8	15	0.9	0.94	1.39	2.7	5.7	60	-	16.2	17.1	17.8	18.8
ESTNB2010-20-04	0.5	1	6	0.8	20	0.4	0.94	1.21	5.09	4.7	65	21.2	22.3	23	23.6	25.7
ESTNB2010-20-09	0.5	1	6	0.8	20	0.4	0.94	1.54	2.7	4.8	65	-	21.3	22.4	23.1	24.6
ESTNB2010-25-09	0.5	1	6	0.8	25	0.4	0.94	1.7	2.7	4.2	70	-	26.4	27.6	28.4	30.8
ESTNB2010-30-04	0.5	1	6	0.8	30	0.4	0.94	1.35	5.09	3.6	75	31.3	32.7	33.6	34.8	38.5
ESTNB2010-30-09	0.5	1	6	0.8	30	0.9	0.94	1.86	2.7	3.7	75	-	31.4	32.8	33.7	36.9
ESTNB2010-35-09	0.5	1	6	0.8	35	0.9	0.94	2.02	2.7	3.3	80	-	36.5	38	39	43.1
ESTNB2010-40-09	0.5	1	6	0.8	40	0.9	0.94	2.17	2.7	3	85	-	41.6	43.2	44.4	-
ESTNB2010-50-09	0.5	1	6	0.8	50	0.9	0.94	2.49	2.7	2.5	95	-	51.7	53.5	55.5	-
ESTNB2010-60-09	0.5	1	6	0.8	60	0.9	0.94	2.8	2.7	2.2	105	-	61.8	63.8	66.6	-
ESTNB2010-70-09	0.5	1	6	0.8	70	0.9	0.94	3.11	2.7	1.9	115	-	71.9	74	-	-
ESTNB2015-8-04	0.75	1.5	6	1.35	8	0.4	1.42	1.51	7.07	7.3	55	8.9	9.4	9.7	10	10.6
ESTNB2015-10-04	0.75	1.5	6	1.35	10	0.4	1.42	1.54	7.07	6.6	55	10.9	11.5	11.9	12.2	12.9
ESTNB2015-12-04	0.75	1.5	6	1.35	12	0.4	1.42	1.57	7.07	6	55	13	13.6	14	14.4	15.4
ESTNB2015-15-09	0.75	1.5	6	1.35	15	0.9	1.42	1.85	3.89	5.4	60	-	16.4	17.2	17.8	18.8
ESTNB2015-20-09	0.75	1.5	6	1.35	20	0.9	1.42	2.01	3.89	4.5	65	-	21.4	22.4	23.2	24.7
ESTNB2015-30-09	0.75	1.5	6	1.35	30	0.9	1.42	2.32	3.89	3.4	75	-	31.5	32.9	33.7	37
ESTNB2018-4-04	0.9	1.8	6	1.6	4	0.4	1.73	1.76	4.38	9.2	50	4.6	4.8	4.9	5.1	5.4
ESTNB2018-8-04	0.9	1.8	6	1.6	8	0.4	1.73	1.82	6.61	7.1	50	8.6	9	9.2	9.4	10.2
ESTNB2018-12-04	0.9	1.8	6	1.6	12	0.4	1.73	1.88	6.61	5.8	55	12.9	13.5	14	14.4	15.4
ESTNB2018-16-04	0.9	1.8	6	1.6	16	0.4	1.73	1.93	6.61	4.9	60	17	17.7	18.3	18.7	20.5
ESTNB2018-20-04	0.9	1.8	6	1.6	20	0.4	1.73	1.99	6.61	4.3	65	21.2	22.3	23	23.6	25.6
ESTNB2018-24-04	0.9	1.8	6	1.6	24	0.4	1.73	2.04	6.61	3.8	65	25.3	26.5	27.3	27.9	30.8

ESTNB20

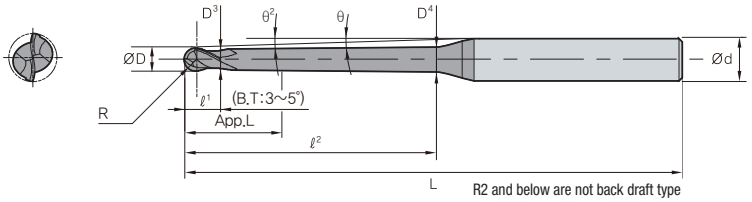
2 flutes tapered neck type ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (Ø6 or Under) | R ±0.015 (Above Ø6) | AlTiN | DATA p.458~460

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



R2 and below are not back draft type

(mm)

Designation	Sizes(mm)											Effective length by inclination angle				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB2018-28-04	0.9	1.8	6	1.6	28	0.4	1.73	2.1	6.61	3.4	70	29.4	30.6	31.5	32.4	35.9
ESTNB2018-32-04	0.9	1.8	6	1.6	32	0.4	1.73	2.15	6.61	3	70	33.4	34.8	35.7	37.1	-
ESTNB2018-36-04	0.9	1.8	6	1.6	36	0.4	1.73	2.21	6.61	2.8	75	37.5	38.9	39.9	41.7	-
ESTNB2018-38-04	0.9	1.8	6	1.6	38	0.4	1.73	2.24	6.61	2.7	80	39.5	41	42	44	-
ESTNB2018-40-04	0.9	1.8	6	1.6	40	0.4	1.73	2.27	6.61	2.6	80	41.5	43.1	44.2	46.3	-
ESTNB2020-8-04	1	2	6	1.7	8	0.4	1.92	2.01	7.42	7	50	8.7	9	9.2	9.5	10.2
ESTNB2020-12-04	1	2	6	1.7	12	0.4	1.92	2.06	7.42	5.7	55	13	13.6	14	14.4	15.4
ESTNB2020-16-04	1	2	6	1.7	16	0.4	1.92	2.12	7.42	4.8	60	17	17.7	18.3	18.7	20.5
ESTNB2020-20-04	1	2	6	1.7	20	0.4	1.92	2.18	7.42	4.1	65	21.3	22.3	23	23.6	25.6
ESTNB2020-20-09	1	2	6	1.7	20	0.9	1.92	2.5	4.24	4.2	65	-	21.4	22.4	23.2	24.6
ESTNB2020-25-09	1	2	6	1.7	25	0.9	1.92	2.65	4.24	3.6	65	-	26.5	27.7	28.5	30.8
ESTNB2020-30-04	1	2	6	1.7	30	0.4	1.92	2.32	7.42	3.1	70	31.4	32.7	33.6	34.8	38.5
ESTNB2020-30-09	1	2	6	1.7	30	0.9	1.92	2.81	4.24	3.2	70	-	31.6	32.9	33.7	36.9
ESTNB2020-35-09	1	2	6	1.7	35	0.9	1.92	2.97	4.24	2.8	75	-	36.6	38	39	-
ESTNB2020-40-04	1	2	6	1.7	40	0.4	1.92	2.46	7.42	2.5	80	41.5	43.1	44.2	46.3	-
ESTNB2020-40-09	1	2	6	1.7	40	0.9	1.92	3.12	4.24	2.6	80	-	41.7	43.2	44.5	-
ESTNB2020-50-09	1	2	6	1.7	50	0.9	1.92	3.44	4.24	2.1	90	-	51.5	53.5	55.5	-
ESTNB2020-60-09	1	2	6	1.7	60	0.9	1.92	3.75	4.24	1.8	100	-	61.9	63.8	-	-
ESTNB2020-70-09	1	2	6	1.7	70	0.9	1.92	4.07	4.24	1.8	110	-	72	74.1	-	-
ESTNB2030-8-04	1.5	3	6	2.5	8	0.4	2.86	2.94	8.5	6.3	50	8.8	9.1	9.3	9.5	10.3
ESTNB2030-16-04	1.5	3	6	2.5	16	0.4	2.86	3.05	12.52	4.1	55	17.2	17.8	18.3	18.7	20.6
ESTNB2030-20-04	1.5	3	6	2.5	20	0.4	2.86	3.1	12.52	3.4	60	21.2	22	22.6	23.3	25.7
ESTNB2030-30-04	1.5	3	6	2.5	30	0.4	2.86	3.24	12.52	2.5	70	31.6	32.8	33.7	34.9	-
ESTNB2030-30-09	1.5	3	6	2.5	30	0.9	2.86	3.72	6.95	2.6	70	-	31.8	33	33.8	-
ESTNB2030-40-04	1.5	3	6	2.5	40	0.4	2.86	3.38	12.52	2	80	41.7	43.2	44.3	-	-
ESTNB2030-40-09	1.5	3	6	2.5	40	0.9	2.86	4.04	6.95	2	80	-	41.9	43.3	-	-
ESTNB2030-50-09	1.5	3	6	2.5	50	0.9	2.86	4.35	6.95	1.7	90	-	52	53.6	-	-
ESTNB2030-60-09	1.5	3	6	2.5	60	0.9	2.86	4.67	6.95	1.4	100	-	62.1	-	-	-
ESTNB2030-70-09	1.5	3	6	2.5	70	0.9	2.86	4.98	6.95	1.2	110	-	72.1	-	-	-
ESTNB2040-20-10	2	4	8	8	20	1	3.86	4.28	12.01	5	70	20.5	21.6	22.3	22.8	23.5
ESTNB2040-30-10	2	4	8	8	30	1	3.86	4.63	12.01	3.51	80	22	31.6	32.5	33.2	34.16
ESTNB2040-40-10	2	4	8	8	40	1	3.86	4.98	12.01	2.7	90	22	42	43.4	44.3	-
ESTNB2040-50-10	2	4	8	8	50	1	3.86	5.33	12.01	2.2	100	22	52	53.6	54.7	-
ESTNB2040-60-10	2	4	8	8	60	1	3.86	5.68	12.01	1.9	110	22	62	63.8	-	-
ESTNB2050-30-10	2.5	5	8	10	30	1	4.86	5.56	14.01	2.8	80	25.5	31.7	32.6	33.2	-
ESTNB2050-40-10	2.5	5	8	10	40	1	4.86	5.91	14.01	2.1	90	25.5	41.7	42.8	43.5	-

H-Star Endmill

ESTNB20

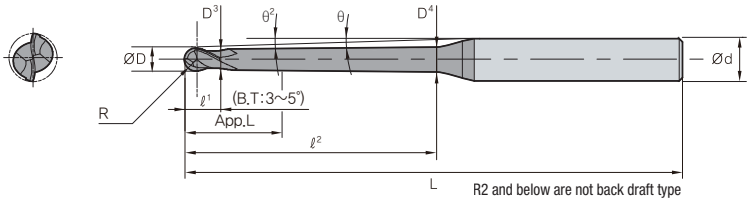
2 flutes tapered neck type ball Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 Ø6 or Under | R ±0.015 Above Ø6 | AlTiN | DATA p.458~460

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	Sizes(mm)											Effective length by inclination angle				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB2050-60-10	2.5	5	8	10	60	1	4.86	6.61	14.01	1.5	110	25.5	62.1	-	-	-
ESTNB2060-30-10	3	6	8	12	30	1	5.86	6.49	16.01	1.9	80	29	31.8	32.6	-	-
ESTNB2060-40-10	3	6	8	12	40	1	5.86	6.84	16.01	1.5	90	29	41.8	-	-	-
ESTNB2060-50-10	3	6	8	12	50	1	5.86	7.19	16.01	1.2	100	29	51.8	-	-	-
ESTNB2060-60-10	3	6	10	12	60	1	5.86	7.54	16.01	1.9	110	29	62.2	63.9	-	-
ESTNB2060-70-10	3	6	10	12	70	1	5.86	7.89	16.01	1.7	120	29	72.2	74.1	-	-
ESTNB2060-80-10	3	6	10	12	80	1	5.86	8.23	16.01	1.5	130	29	82.2	-	-	-
ESTNB2080-50-10	4	8	10	14	50	1	7.86	9.12	18.01	1.2	110	32	51.9	-	-	-
ESTNB2080-60-10	4	8	10	14	60	1	7.86	9.47	18.01	1	120	32	-	-	-	-
ESTNB2080-70-10	4	8	10	14	70	1	7.86	9.82	18.01	0.9	130	32	-	-	-	-
ESTNB2080-80-10	4	8	12	14	80	1	7.86	10.16	18.01	1.5	140	32	82.3	-	-	-
ESTNB2100-60-10	5	10	12	18	60	1	9.86	11.33	22.01	1.1	130	39	62.1	-	-	-
ESTNB2100-75-10	5	10	12	18	75	1	9.86	11.85	22.01	0.9	140	39	-	-	-	-

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESTNB30

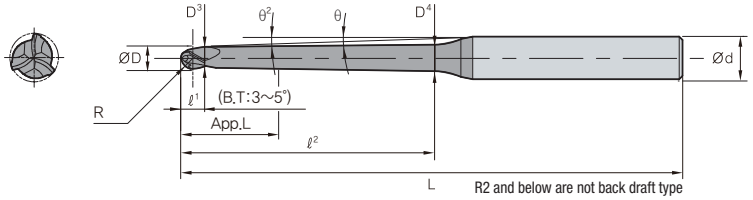
3 flutes tapered neck type ball Endmill



ULTRA FINE | 3 | 30° HELIX | R ±0.005 (All sizes) | AlTiN | DATA p.461~464

• TOLERANCE

ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	Sizes(mm)											Effective length by inclination angle				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB3020-8-04	1	2	6	1.7	8	0.4	1.92	2.01	7.42	7	50	8.7	9	9.2	9.5	10.2
ESTNB3020-12-04	1	2	6	1.7	12	0.4	1.92	2.06	7.42	5.7	55	13	13.6	14	14.4	15.4
ESTNB3020-16-04	1	2	6	1.7	16	0.4	1.92	2.12	7.42	4.8	60	17	17.7	18.3	18.7	20.5
ESTNB3020-20-04	1	2	6	1.7	20	0.4	1.92	2.18	7.42	4.1	65	21.3	22.3	23	23.6	25.6
ESTNB3020-20-09	1	2	6	1.7	20	0.9	1.92	2.5	4.24	4.2	65	-	21.4	22.4	23.2	24.6
ESTNB3020-25-09	1	2	6	1.7	25	0.9	1.92	2.65	4.24	3.6	65	-	26.5	27.7	28.5	30.8
ESTNB3020-30-04	1	2	6	1.7	30	0.4	1.92	2.32	7.42	3.1	70	31.4	32.7	33.6	34.8	38.5
ESTNB3020-30-09	1	2	6	1.7	30	0.9	1.92	2.81	4.24	3.2	70	-	31.6	32.9	33.7	36.9
ESTNB3020-35-09	1	2	6	1.7	35	0.9	1.92	2.97	4.24	2.8	75	-	36.6	38	39	-
ESTNB3020-40-04	1	2	6	1.7	40	0.4	1.92	2.46	7.42	2.5	80	41.5	43.1	44.2	46.3	-
ESTNB3020-40-09	1	2	6	1.7	40	0.9	1.92	3.12	4.24	2.6	80	-	41.7	43.2	44.5	-
ESTNB3020-50-09	1	2	6	1.7	50	0.9	1.92	3.44	4.24	2.1	90	-	51.8	53.5	55.5	-
ESTNB3020-60-09	1	2	6	1.7	60	0.9	1.92	3.75	4.24	1.8	100	-	61.9	63.8	-	-
ESTNB3020-70-09	1	2	6	1.7	70	0.9	1.92	4.07	4.24	1.6	110	-	72	74.1	-	-
ESTNB3030-8-04	1.5	3	6	2.5	8	0.4	2.86	2.94	8.5	6.3	50	8.8	9.1	9.3	9.5	10.3
ESTNB3030-16-04	1.5	3	6	2.5	16	0.4	2.86	3.05	12.52	4.1	55	17.2	17.8	18.3	18.7	20.6
ESTNB3030-20-04	1.5	3	6	2.5	20	0.4	2.86	3.1	12.52	3.4	60	21.2	22	22.6	23.3	25.7
ESTNB3030-30-04	1.5	3	6	2.5	30	0.4	2.86	3.24	12.52	2.5	70	31.6	32.8	33.7	34.9	-
ESTNB3030-30-09	1.5	3	6	2.5	30	0.9	2.86	3.72	6.95	2.6	70	-	31.8	33	33.8	-
ESTNB3030-40-04	1.5	3	6	2.5	40	0.4	2.86	3.38	12.52	2	80	41.7	43.2	44.3	-	-
ESTNB3030-40-09	1.5	3	6	2.5	40	0.9	2.86	4.04	6.95	2	80	-	41.9	43.3	-	-
ESTNB3030-50-09	1.5	3	6	2.5	50	0.9	2.86	4.35	6.95	1.7	90	-	52	53.6	-	-
ESTNB3030-60-09	1.5	3	6	2.5	60	0.9	2.86	4.67	6.95	1.4	100	-	62.1	-	-	-
ESTNB3030-70-09	1.5	3	6	2.5	70	0.9	2.86	4.98	6.95	1.2	110	-	72.1	-	-	-
ESTNB3040-20-10	2	4	8	8	20	1	3.86	4.28	12.01	5	70	20.5	21.6	22.3	22.8	23.5
ESTNB3040-30-10	2	4	8	8	30	1	3.86	4.63	12.01	3.6	80	22	31.6	32.5	33.2	34.1
ESTNB3040-40-10	2	4	8	8	40	1	3.86	4.98	12.01	2.7	90	22	42	43.4	44.3	-
ESTNB3040-50-10	2	4	8	8	50	1	3.86	5.33	12.01	2.2	100	22	52	53.6	54.7	-
ESTNB3040-60-10	2	4	8	8	60	1	3.86	5.68	12.01	1.9	110	22	62	63.8	-	-
ESTNB3050-30-10	2.5	5	8	10	30	1	4.86	5.56	14.01	2.8	80	25.5	31.7	32.6	33.2	-

H-Star Endmill

ESTNB30

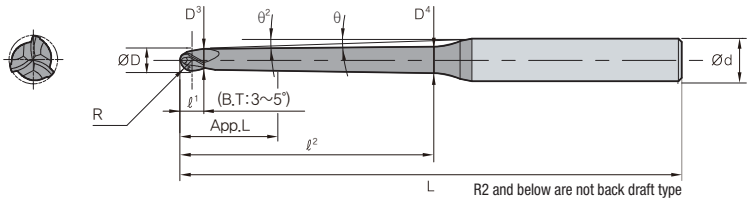
3 flutes tapered neck type ball Endmill



ULTRA FINE | 3 | 30° HELIX | R ±0.005 (All sizes) | AlTiN | DATA (p.461~464)

• TOLERANCE

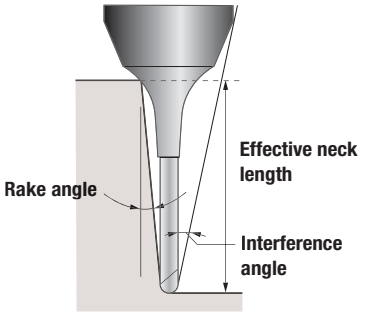
ØD		Ød
~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	

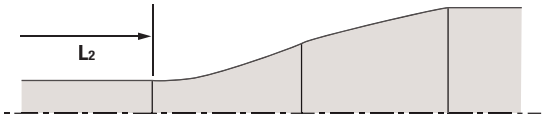


(mm)

Designation	Sizes(mm)											Effective length by inclination angle				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNB3050-40-10	2.5	5	8	10	40	1	4.86	5.91	14.01	2.1	90	25.5	41.7	42.8	43.5	-
ESTNB3050-60-10	2.5	5	8	10	60	1	4.86	6.61	12.52	1.5	110	25.5	62.1	-	-	-

※ The above specifications are subject to change without prior notice for product quality improvement.





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

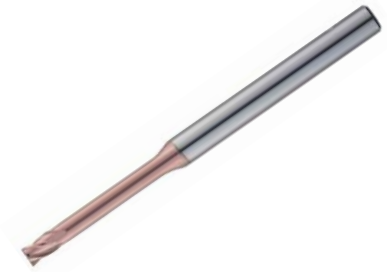
• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESLNS20

2 flutes long neck type flat Endmill

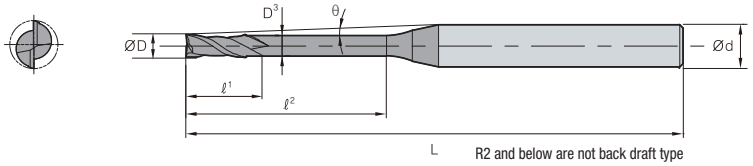


ULTRA FINE | 2 | 45° HELIX | AlTiN | DATA

p.465

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5



R2 and below are not back draft type

(mm)

Designation	Sizes(mm)							Effective length by inclination angle				
	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS2001-0.3	0.1	4	0.15	0.3	0.08	11.6	45	0.4	0.4	0.5	0.5	0.5
ESLNS2001-0.5	0.1	4	0.15	0.5	0.08	11.4	45	0.6	0.7	0.7	0.7	0.8
ESLNS2001-1	0.1	4	0.15	1	0.08	10.9	45	1.2	1.2	1.2	1.3	1.4
ESLNS2002-0.5	0.2	4	0.3	0.5	0.17	11.3	50	1.2	1.3	1.5	1.7	2
ESLNS2002-1	0.2	4	0.3	1	0.17	10.8	50	1.7	1.9	2.2	2.4	2.7
ESLNS2002-1.5	0.2	4	0.3	1.5	0.17	10.3	50	2.3	2.5	2.8	3	3.4
ESLNS2003-1	0.3	4	0.45	1	0.27	10.8	50	1.7	1.9	2.2	2.4	2.7
ESLNS2003-1.5	0.3	4	0.45	1.5	0.27	10.3	50	2.3	2.5	2.8	3	3.4
ESLNS2003-2	0.3	4	0.45	2	0.27	9.8	50	2.8	3.1	3.4	3.6	4.1
ESLNS2003-2.5	0.3	4	0.45	2.5	0.27	9.4	50	3.4	3.7	4	4.3	4.7
ESLNS2003-3	0.3	4	0.45	3	0.27	9	50	3.9	4.3	4.6	4.9	5.4
ESLNS2004-1	0.4	4	0.6	1	0.37	10.7	50	1.7	1.9	2.2	2.4	2.7
ESLNS2004-1.5	0.4	4	0.6	1.5	0.37	10.2	50	2.3	2.5	2.8	3	3.4
ESLNS2004-2	0.4	4	0.6	2	0.37	9.7	50	2.8	3.1	3.4	3.6	4.1
ESLNS2004-2.5	0.4	4	0.6	2.5	0.37	9.3	50	3.4	3.7	4	4.3	4.7
ESLNS2004-3	0.4	4	0.6	3	0.37	8.9	50	3.9	4.3	4.6	4.9	5.4
ESLNS2004-3.5	0.4	4	0.6	3.5	0.37	8.6	50	4.5	4.9	5.2	5.5	6
ESLNS2004-4	0.4	4	0.6	4	0.37	8.2	50	5	5.4	5.8	6.1	6.6
ESLNS2004-5	0.4	4	0.6	5	0.37	7.6	50	6.1	6.6	6.9	7.3	7.8
ESLNS2004-6	0.4	4	0.6	6	0.37	7.1	50	7.2	7.7	8.1	8.4	9
ESLNS2005-1	0.5	4	0.75	1	0.47	10.7	50	1.7	1.9	2.2	2.4	2.7
ESLNS2005-1.5	0.5	4	0.75	1.5	0.47	10.2	50	2.3	2.5	2.8	3	3.4
ESLNS2005-2	0.5	4	0.75	2	0.47	9.7	50	2.8	3.1	3.4	3.6	4.1
ESLNS2005-2.5	0.5	4	0.75	2.5	0.47	9.3	50	3.4	3.7	4	4.3	4.7
ESLNS2005-3	0.5	4	0.75	3	0.47	8.9	50	3.9	4.3	4.6	4.9	5.4
ESLNS2005-4	0.5	4	0.75	4	0.47	8.1	50	5	5.4	5.8	6.1	6.6
ESLNS2005-5	0.5	4	0.75	5	0.47	7.5	50	6.1	6.6	6.9	7.3	7.8
ESLNS2005-6	0.5	4	0.75	6	0.47	7	50	7.2	7.7	8.1	8.4	9
ESLNS2005-8	0.5	4	0.75	8	0.47	6.2	50	9.3	9.9	10.3	10.7	11.4
ESLNS2006-2	0.6	4	0.9	2	0.57	9.6	50	2.8	3.1	3.4	3.6	4.1
ESLNS2006-4	0.6	4	0.9	4	0.57	6.9	50	7.2	7.7	8.1	8.4	9
ESLNS2006-6	0.6	4	0.9	6	0.57	6.1	50	9.3	9.9	10.3	10.7	11.4
ESLNS2006-8	0.6	4	0.9	8	0.57	5.4	50	11.5	12.1	12.6	13	13.7
ESLNS2006-10	0.6	4	0.9	10	0.57	9.6	50	2.8	3.1	3.4	3.6	4.1
ESLNS2007-2	0.7	4	1.05	2	0.67	8	50	5	5.4	5.8	6.1	6.6
ESLNS2007-4	0.7	4	1.05	4	0.67	6.9	50	7.2	7.7	8.1	8.4	9
ESLNS2007-6	0.7	4	1.05	6	0.67	6	50	9.3	9.9	10.3	10.7	11.4
ESLNS2007-8	0.7	4	1.05	8	0.67	5.3	50	11.5	12.1	12.6	13	13.7
ESLNS2007-10	0.7	4	1.2	10	0.77	7.9	50	5	5.4	5.8	6.1	6.6
ESLNS2008-4	0.8	4	1.2	4	0.77	6.8	50	7.2	7.7	8.1	8.4	9

H-Star Endmill

ESLNS20

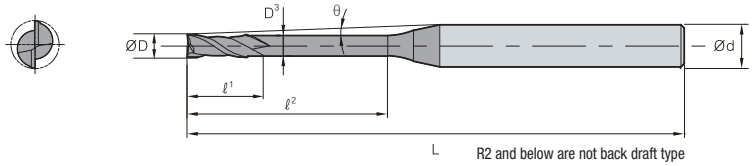
2 flutes long neck type flat Endmill



ULTRA FINE | 2 | 45° HELIX | AlTiN | DATA p.465

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5



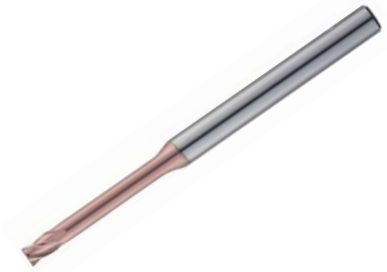
R2 and below are not back draft type

(mm)

Designation	Sizes(mm)							Effective length by inclination angle				
	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS2008-6	0.8	4	1.2	6	0.77	5.9	50	9.3	9.9	10.3	10.7	11.4
ESLNS2008-8	0.8	4	1.2	8	0.77	5.2	50	11.5	12.1	12.6	13	13.7
ESLNS2008-10	0.8	4	1.2	10	0.77	4.7	55	13.6	14.2	14.8	15.2	16
ESLNS2008-12	0.8	4	1.2	12	0.77	6.7	55	7.2	7.7	8.1	8.4	9.1
ESLNS2009-6	0.9	4	1.35	6	0.86	5.8	50	9.4	9.9	10.4	10.7	11.4
ESLNS2009-8	0.9	4	1.35	8	0.86	5.1	50	11.5	12.1	12.6	13	13.7
ESLNS2009-10	0.9	4	1.35	10	0.86	4.6	55	13.6	14.3	14.8	15.2	16
ESLNS2009-12	0.9	4	1.35	12	0.86	9.4	55	2.9	3.2	3.4	3.7	4.1
ESLNS2010-2	1	4	1.5	2	0.96	7.7	50	5.1	5.5	5.8	6.1	6.6
ESLNS2010-4	1	4	1.5	4	0.96	6.6	50	7.2	7.7	8.1	8.4	9.1
ESLNS2010-6	1	4	1.5	6	0.96	5.7	50	9.4	9.9	10.4	10.7	11.4
ESLNS2010-8	1	4	1.5	8	0.96	5	50	11.5	12.1	12.6	13	13.7
ESLNS2010-10	1	4	1.5	10	0.96	4.5	55	13.6	14.3	14.8	15.2	16
ESLNS2010-12	1	4	1.5	12	0.96	4.1	55	15.7	16.4	17	17.4	18.7
ESLNS2010-14	1	4	1.5	14	0.96	3.8	60	17.8	18.6	19.1	19.6	21.3
ESLNS2010-16	1	4	1.5	16	0.96	3.2	60	22	22.8	23.5	24	26.6
ESLNS2010-20	1	4	1.5	20	0.96	6.3	60	7.3	7.7	8.1	8.5	9.1
ESLNS2012-6	1.2	4	1.8	6	1.15	5.5	50	9.4	9.9	10.4	10.8	11.4
ESLNS2012-8	1.2	4	1.8	8	1.15	4.8	50	11.5	12.1	12.6	13	13.7
ESLNS2012-10	1.2	4	1.8	10	1.15	11.5	50	12.1	12.6	13	13.7	16
ESLNS2012-12	1.2	4	1.8	12	1.15	4.3	55	13.6	14.3	14.8	15.2	16
ESLNS2012-16	1.2	4	1.8	16	1.15	3.6	55	17.8	18.6	19.2	19.7	21.3
ESLNS2014-6	1.4	4	2.1	6	1.34	6.1	50	7.3	7.8	8.1	8.5	9.1
ESLNS2014-8	1.4	4	2.1	8	1.34	5.3	50	9.4	10	10.4	10.8	11.5
ESLNS2014-10	1.4	4	2.1	10	1.34	4.6	50	11.6	12.1	12.6	13	13.8
ESLNS2014-12	1.4	4	2.1	12	1.34	4.1	55	13.7	14.3	14.8	15.3	16.1
ESLNS2014-14	1.4	4	2.1	14	1.34	3.7	55	15.8	16.5	17	17.5	18.7
ESLNS2014-16	1.4	4	2.1	16	1.34	3.4	55	17.9	18.6	19.2	19.7	21.4
ESLNS2015-4	1.5	4	2.25	4	1.44	7.2	50	5.2	5.5	5.9	6.2	6.7
ESLNS2015-6	1.5	4	2.25	6	1.44	6	50	7.3	7.8	8.1	8.5	9.1
ESLNS2015-8	1.5	4	2.25	8	1.44	5.1	50	9.4	10	10.4	10.8	11.5
ESLNS2015-10	1.5	4	2.25	10	1.44	4.5	50	11.6	12.1	12.6	13	13.8
ESLNS2015-12	1.5	4	2.25	12	1.44	4	55	13.7	14.3	14.8	15.3	16.1
ESLNS2015-14	1.5	4	2.25	14	1.44	3.6	55	15.8	16.5	17	17.5	18.7
ESLNS2015-16	1.5	4	2.25	16	1.44	3.3	55	17.9	18.6	19.2	19.7	-
ESLNS2015-18	1.5	4	2.25	18	1.44	3	60	20	20.7	21.3	21.9	-
ESLNS2015-20	1.5	4	2.25	20	1.44	2.8	60	22	22.9	23.5	24.1	-
ESLNS2015-25	1.5	4	2.25	25	1.44	2.4	65	27.3	28.1	28.8	30	-
ESLNS2016-6	1.6	4	2.4	6	1.54	5.9	50	7.3	7.8	8.1	8.5	9.1
ESLNS2016-8	1.6	4	2.4	8	1.54	5	50	9.4	10	10.4	10.8	11.5

ESLNS20

2 flutes long neck type flat Endmill

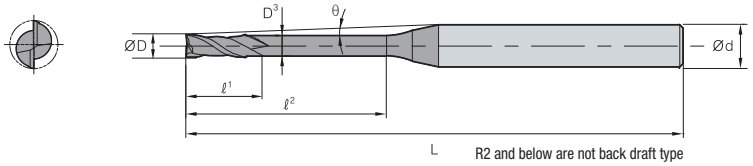


ULTRA FINE | 2 | 45° HELIX | AlTiN | DATA

p.465

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5



R2 and below are not back draft type

(mm)

Designation	Sizes(mm)							Effective length by inclination angle				
	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS2016-10	1.6	4	2.4	10	1.54	4.4	50	11.6	12.1	12.6	13	13.8
ESLNS2016-12	1.6	4	2.4	12	1.54	3.9	55	13.7	14.3	14.8	15.3	16.1
ESLNS2016-14	1.6	4	2.4	14	1.54	3.5	55	15.8	16.5	17	17.5	18.7
ESLNS2016-16	1.6	4	2.4	16	1.54	3.2	55	17.9	18.6	19.2	19.7	21.4
ESLNS2016-18	1.6	4	2.4	18	1.54	2.9	60	20	20.7	21.3	21.9	-
ESLNS2016-20	1.6	4	2.4	20	1.54	2.7	60	22	22.9	23.5	24.1	-
ESLNS2018-6	1.8	4	2.7	6	1.73	5.6	50	7.4	7.8	8.2	8.5	9.1
ESLNS2018-8	1.8	4	2.7	8	1.73	4.8	50	9.5	10	10.4	10.8	11.5
ESLNS2018-10	1.8	4	2.7	10	1.73	4.2	50	11.6	12.2	12.6	13	13.8
ESLNS2018-12	1.8	4	2.7	12	1.73	3.7	55	13.7	14.3	14.8	15.3	16.1
ESLNS2018-14	1.8	4	2.7	14	1.73	3.3	55	15.8	16.5	17	17.5	18.8
ESLNS2018-16	1.8	4	2.7	16	1.73	3	55	17.9	18.6	19.2	19.7	-
ESLNS2018-18	1.8	4	2.7	18	1.73	2.7	60	20	20.7	21.3	21.9	-
ESLNS2018-20	1.8	4	2.7	20	1.73	2.5	60	22.1	22.9	23.5	24.1	-
ESLNS2020-4	2	4	3	4	1.92	6.5	50	5.3	5.6	5.9	6.2	6.7
ESLNS2020-6	2	4	3	6	1.92	5.3	50	7.4	7.8	8.2	8.5	9.1
ESLNS2020-8	2	4	3	8	1.92	4.5	50	9.5	10	10.4	10.8	11.5
ESLNS2020-10	2	4	3	10	1.92	3.9	50	11.6	12.2	12.7	13.1	13.8
ESLNS2020-12	2	4	3	12	1.92	3.4	55	13.7	14.3	14.9	15.3	16.1
ESLNS2020-14	2	4	3	14	1.92	3.1	55	15.8	16.5	17	17.5	18.8
ESLNS2020-16	2	4	3	16	1.92	2.8	55	17.9	18.6	19.2	19.7	-
ESLNS2020-18	2	4	3	18	1.92	2.6	60	20	20.8	21.4	21.9	-
ESLNS2020-20	2	4	3	20	1.92	2.4	60	22.1	22.9	23.5	24.1	-
ESLNS2020-25	2	4	3	25	1.92	2	65	27.3	28.2	28.9	-	-
ESLNS2020-30	2	4	3	30	1.92	1.7	70	32.5	33.4	34.4	-	-
ESLNS2025-8	2.5	4	3.75	8	2.4	3.7	50	9.6	10.1	10.5	10.9	11.5
ESLNS2025-10	2.5	4	3.75	10	2.4	3.1	50	11.7	12.2	12.7	13.1	13.8
ESLNS2025-12	2.5	4	3.75	12	2.4	2.7	55	13.8	14.4	14.9	15.3	-
ESLNS2025-14	2.5	4	3.75	14	2.4	2.4	55	15.9	16.5	17.1	17.5	-
ESLNS2025-16	2.5	4	3.75	16	2.4	2.2	55	18	18.7	19.2	19.7	-
ESLNS2025-18	2.5	4	3.75	18	2.4	2	55	20.1	20.8	21.4	-	-
ESLNS2025-20	2.5	4	3.75	20	2.4	1.8	60	22.1	22.9	23.5	-	-
ESLNS2025-25	2.5	4	3.75	25	2.4	1.5	60	27.3	28.2	-	-	-
ESLNS2025-30	2.5	4	3.75	30	2.4	1.3	70	32.6	33.5	-	-	-
ESLNS2030-8	3	6	4.5	8	2.88	5.6	55	9.6	10.1	10.5	10.9	11.5
ESLNS2030-10	3	6	4.5	10	2.88	5	55	11.7	12.3	12.7	13.1	13.8
ESLNS2030-12	3	6	4.5	12	2.88	4.5	60	13.8	14.4	14.9	15.4	16.3
ESLNS2030-14	3	6	4.5	14	2.88	4.1	60	15.9	16.6	17.1	17.6	18.9
ESLNS2030-16	3	6	4.5	16	2.88	3.7	60	18	18.7	19.3	19.8	21.6
ESLNS2030-18	3	6	4.5	18	2.88	3.4	60	20.1	20.8	21.4	21.9	24.2

H-Star Endmill

ESLNS20

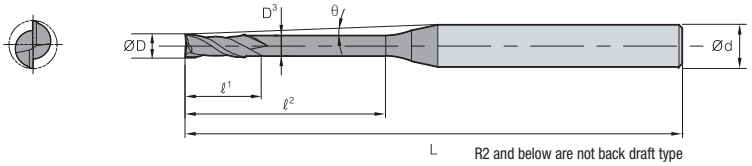
2 flutes long neck type flat Endmill



ULTRA FINE | 2 | 45° HELIX | AlTiN | DATA p.465

• TOLERANCE

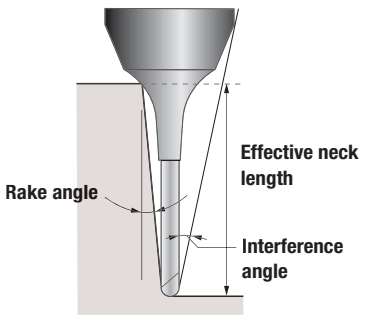
ØD		Ød
All sizes	0 ~ -0.012mm	h5

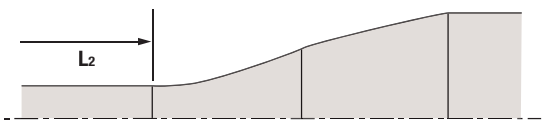


(mm)

Designation	Sizes(mm)							Effective length by inclination angle				
	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS2030-20	3	6	4.5	20	2.88	3.2	65	22.2	23	23.6	24.2	26.9
ESLNS2030-25	3	6	4.5	25	2.88	2.7	70	27.4	28.2	28.9	30.2	-
ESLNS2030-30	3	6	4.5	30	2.88	2.4	75	32.6	33.5	34.5	36.2	-
ESLNS2030-35	3	6	4.5	35	2.88	2.1	80	37.7	38.7	40.2	42.2	-
ESLNS2030-40	3	6	4.5	40	2.88	1.9	90	42.9	43.9	45.9	-	-
ESLNS2040-12	4	6	6	12	3.85	3.4	60	13.9	14.5	15	15.4	16.3
ESLNS2040-16	4	6	6	16	3.85	2.8	60	18.1	18.8	19.3	19.8	-
ESLNS2040-20	4	6	6	20	3.85	2.3	70	22.3	23	23.6	24.3	-
ESLNS2040-25	4	6	6	25	3.85	2	70	27.4	28.3	28.9	-	-
ESLNS2040-30	4	6	6	30	3.85	1.7	80	32.6	33.5	34.6	-	-
ESLNS2040-35	4	6	6	35	3.85	1.5	80	37.8	38.8	-	-	-
ESLNS2040-40	4	6	6	40	3.85	1.3	90	42.9	44	-	-	-
ESLNS2040-45	4	6	6	45	3.85	1.2	90	48.1	49.4	-	-	-
ESLNS2040-50	4	6	6	50	3.85	1.1	100	53.2	54.8	-	-	-
ESLNS2050-16	5	6	7.5	16	4.85	1.5	60	18.1	18.8	-	-	-
ESLNS2050-20	5	6	7.5	20	4.85	1.3	60	22.3	23	-	-	-
ESLNS2050-25	5	6	7.5	25	4.85	1.1	70	27.4	28.3	-	-	-
ESLNS2050-30	5	6	7.5	30	4.85	0.9	70	32.6	-	-	-	-
ESLNS2050-35	5	6	7.5	35	4.85	0.8	80	37.8	-	-	-	-
ESLNS2050-40	5	6	7.5	40	4.85	0.7	90	42.9	-	-	-	-
ESLNS2050-50	5	6	7.5	50	4.85	0.6	100	53.2	-	-	-	-

※ The above specifications are subject to change without prior notice for product quality improvement.





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

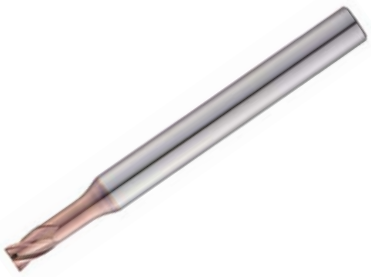
• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESLNS40

4 flutes long neck type flat Endmill

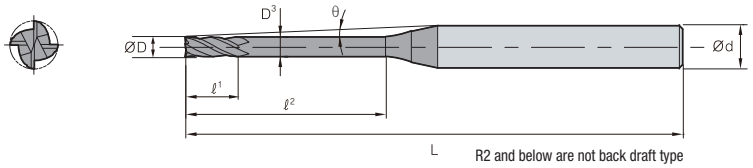


ULTRA FINE | 4 | 30° HELIX | AlTiN | DATA

p.465

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5



R2 and below are not back draft type

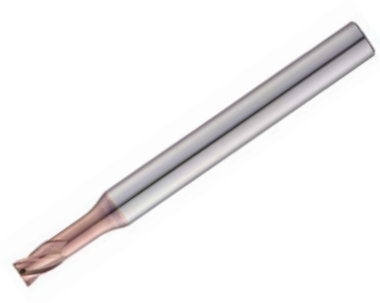
(mm)

Designation	Sizes(mm)							Effective length by inclination angle				
	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS4010-4	1	4	1.5	4	0.96	7.7	50	5.1	5.5	5.8	6.1	6.6
ESLNS4010-6	1	4	1.5	6	0.96	6.6	50	7.2	7.7	8.1	8.4	9.1
ESLNS4010-8	1	4	1.5	8	0.96	5.7	50	9.4	9.9	10.4	10.7	11.4
ESLNS4010-10	1	4	1.5	10	0.96	5	50	11.5	12.1	12.6	13	13.7
ESLNS4015-4	1.5	4	2.25	4	1.44	7.2	50	5.2	5.5	5.9	6.2	6.7
ESLNS4015-6	1.5	4	2.25	6	1.44	6	50	7.3	7.8	8.1	8.5	9.1
ESLNS4015-8	1.5	4	2.25	8	1.44	5.1	50	9.4	10	10.4	10.8	11.5
ESLNS4015-10	1.5	4	2.25	10	1.44	4.5	50	11.6	12.1	12.6	13	13.8
ESLNS4015-12	1.5	4	2.25	12	1.44	4	55	13.7	14.3	14.8	15.3	16.1
ESLNS4015-14	1.5	4	2.25	14	1.44	3.6	55	15.8	16.5	17	17.5	18.7
ESLNS4015-16	1.5	4	2.25	16	1.44	3.3	55	17.9	18.6	19.2	19.7	-
ESLNS4015-18	1.5	4	2.25	18	1.44	3	60	20	20.7	21.3	21.9	-
ESLNS4015-20	1.5	4	2.25	20	1.44	2.8	60	22	22.9	23.5	24.1	-
ESLNS4015-25	1.5	4	2.25	25	1.44	2.4	65	27.3	28.1	28.8	30	-
ESLNS4020-4	2	4	3	4	1.92	6.5	50	5.3	5.6	5.9	6.2	6.7
ESLNS4020-6	2	4	3	6	1.92	5.3	50	7.4	7.8	8.2	8.5	9.1
ESLNS4020-8	2	4	3	8	1.92	4.5	50	9.5	10	10.4	10.8	11.5
ESLNS4020-10	2	4	3	10	1.92	3.9	50	11.6	12.2	12.7	13.1	13.8
ESLNS4020-12	2	4	3	12	1.92	3.4	55	13.7	14.3	14.9	15.3	16.1
ESLNS4020-14	2	4	3	14	1.92	3.1	55	15.8	16.5	17	17.5	18.8
ESLNS4020-16	2	4	3	16	1.92	2.8	55	17.9	18.6	19.2	19.7	-
ESLNS4020-18	2	4	3	18	1.92	2.6	60	20	20.8	21.4	21.9	-
ESLNS4020-20	2	4	3	20	1.92	2.4	60	22.1	22.9	23.5	24.1	-
ESLNS4020-25	2	4	3	25	1.92	2	65	27.3	28.2	28.9	-	-
ESLNS4020-30	2	4	3	30	1.92	1.7	70	32.5	33.4	34.4	-	-
ESLNS4025-8	2.5	4	3.75	8	2.4	3.7	50	9.6	10.1	10.5	10.9	11.5
ESLNS4025-10	2.5	4	3.75	10	2.4	3.1	50	11.7	12.2	12.7	13.1	13.8
ESLNS4025-12	2.5	4	3.75	12	2.4	2.7	55	13.8	14.4	14.9	15.3	-
ESLNS4025-14	2.5	4	3.75	14	2.4	2.4	55	15.9	16.5	17.1	17.5	-
ESLNS4025-16	2.5	4	3.75	16	2.4	2.2	55	18	18.7	19.2	19.7	-
ESLNS4025-18	2.5	4	3.75	18	2.4	2	60	20.1	20.8	21.4	-	-
ESLNS4025-20	2.5	4	3.75	20	2.4	1.8	60	22.1	22.9	23.5	-	-
ESLNS4025-25	2.5	4	3.75	25	2.4	1.5	65	27.3	28.2	-	-	-
ESLNS4025-30	2.5	4	3.75	30	2.4	1.3	70	32.6	33.5	-	-	-
ESLNS4030-8	3	6	4.5	8	2.88	5.6	55	9.6	10.1	10.5	10.9	11.5
ESLNS4030-10	3	6	4.5	10	2.88	5	55	11.7	12.3	12.7	13.1	13.8

H-Star Endmill

ESLNS40

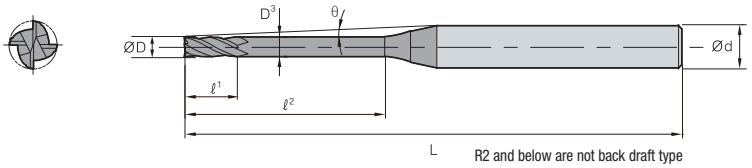
4 flutes long neck type flat Endmill



ULTRA FINE | 4 | 30° HELIX | AlTiN | DATA p.465

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5



R2 and below are not back draft type

(mm)

Designation	Sizes(mm)							Effective length by inclination angle				
	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNS4030-12	3	6	4.5	12	2.88	4.5	60	13.8	14.4	14.9	15.4	16.3
ESLNS4030-14	3	6	4.5	14	2.88	4.1	60	15.9	16.6	17.1	17.6	18.9
ESLNS4030-16	3	6	4.5	16	2.88	3.7	60	18	18.7	19.3	19.8	21.6
ESLNS4030-18	3	6	4.5	18	2.88	3.4	60	20.1	20.8	21.4	21.9	24.2
ESLNS4030-20	3	6	4.5	20	2.88	3.2	65	22.2	23	23.6	24.2	26.9
ESLNS4030-25	3	6	4.5	25	2.88	2.7	70	27.4	28.2	28.9	30.2	-
ESLNS4030-30	3	6	4.5	30	2.88	2.4	75	32.6	33.5	34.5	36.2	-
ESLNS4030-35	3	6	4.5	35	2.88	2.1	80	37.7	38.7	40.2	42.2	-
ESLNS4030-40	3	6	4.5	40	2.88	1.9	90	42.9	43.9	45.9	-	-
ESLNS4040-12	4	6	6	12	3.85	3.4	60	13.9	14.5	15	15.4	16.3
ESLNS4040-16	4	6	6	16	3.85	2.8	60	18.1	18.8	19.3	19.8	-
ESLNS4040-20	4	6	6	20	3.85	2.3	70	22.3	23	23.6	24.3	-
ESLNS4040-25	4	6	6	25	3.85	2	70	27.4	28.3	28.9	-	-
ESLNS4040-30	4	6	6	30	3.85	1.7	80	32.6	33.5	34.6	-	-
ESLNS4040-35	4	6	6	35	3.85	1.5	80	37.8	38.8	-	-	-
ESLNS4040-40	4	6	6	40	3.85	1.3	90	42.9	44	-	-	-
ESLNS4040-45	4	6	6	45	3.85	1.2	90	48.1	49.4	-	-	-
ESLNS4040-50	4	6	6	50	3.85	1.1	100	53.2	54.8	-	-	-
ESLNS4050-16	5	6	7.5	16	4.85	1.5	60	18.1	18.8	-	-	-
ESLNS4050-20	5	6	7.5	20	4.85	1.3	60	22.3	23	-	-	-
ESLNS4050-25	5	6	7.5	25	4.85	1.1	70	27.4	28.3	-	-	-
ESLNS4050-30	5	6	7.5	30	4.85	0.9	70	32.6	-	-	-	-
ESLNS4050-35	5	6	7.5	35	4.85	0.8	80	37.8	-	-	-	-
ESLNS4050-40	5	6	7.5	40	4.85	0.7	90	42.9	-	-	-	-
ESLNS4050-50	5	6	7.5	50	4.85	0.6	100	53.2	-	-	-	-

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESLNR

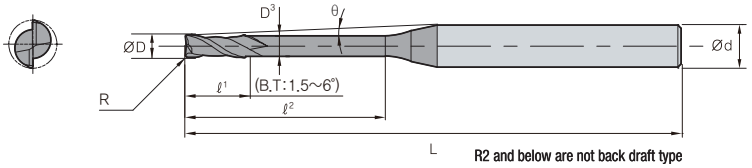
2 flutes long neck type radius Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (All sizes) | AlTiN | DATA (p.466~468)

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5



R2 and below are not back draft type

(mm)

Designation	Sizes(mm)								Effective length by inclination angle				
	R	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNR2002-0.5-005	0.05	0.2	4	0.15	0.5	0.17	11.4	50	0.9	1	1	1.1	12
ESLNR2002-1-005	0.05	0.2	4	0.15	1	0.17	10.9	50	1.6	1.7	1.9	2	2.3
ESLNR2002-1.5-005	0.05	0.2	4	0.15	1.5	0.17	10.3	50	2.1	2.3	2.5	2.7	3
ESLNR2002-2-005	0.05	0.2	4	0.15	2	0.17	9.9	50	2.8	3.1	3.4	3.6	4.1
ESLNR2003-1-005	0.05	0.3	4	0.25	1	0.27	10.8	50	1.4	1.5	1.6	1.7	1.9
ESLNR2003-1.5-005	0.05	0.3	4	0.25	1.5	0.27	10.3	50	2.1	2.3	2.5	2.7	3
ESLNR2003-2.5-005	0.05	0.3	4	0.25	2.5	0.27	9.8	50	2.7	2.9	3.1	3.3	3.6
ESLNR2003-2-005	0.05	0.3	4	0.25	2	0.27	9.4	50	3.2	3.5	3.7	3.9	4.3
ESLNR2003-3-005	0.05	0.3	4	0.25	3	0.27	9	50	3.9	4.3	4.6	4.9	5.4
ESLNR2004-1-005	0.05	0.4	4	0.3	1	0.37	10.8	50	1.4	1.5	1.6	1.7	1.9
ESLNR2004-1.5-005	0.05	0.4	4	0.3	1.5	0.37	10.3	50	2	2.1	2.2	2.3	2.5
ESLNR2004-2-005	0.05	0.4	4	0.3	2	0.37	9.8	50	2.7	2.9	3.1	3.3	3.6
ESLNR2004-2.5-005	0.05	0.4	4	0.3	2.5	0.37	9.4	50	3.2	3.5	3.7	3.9	4.3
ESLNR2004-3-005	0.05	0.4	4	0.3	3	0.37	9	50	3.8	4	4.3	4.5	4.9
ESLNR2004-3.5-005	0.05	0.4	4	0.3	3.5	0.37	8.6	50	4.3	4.6	4.9	5.1	5.5
ESLNR2004-4-005	0.05	0.4	4	0.3	4	0.37	8.3	50	5	5.4	5.8	6.1	6.6
ESLNR2004-2-01	0.1	0.4	4	0.3	2	0.37	9.8	50	2.7	2.9	3.1	3.3	3.6
ESLNR2004-3-01	0.1	0.4	4	0.3	3	0.37	9	50	3.8	4	4.3	4.5	4.9
ESLNR2004-4-01	0.1	0.4	4	0.3	4	0.37	8.3	50	5	5.4	5.8	6.1	6.6
ESLNR2005-1-005	0.05	0.5	4	0.35	1	0.47	10.8	50	1.4	1.5	1.6	1.7	1.9
ESLNR2005-2-005	0.05	0.5	4	0.35	2	0.47	9.7	50	2.5	2.6	2.8	2.9	3.1
ESLNR2005-3-005	0.05	0.5	4	0.35	3	0.47	8.9	50	3.8	4	4.3	4.5	4.9
ESLNR2005-4-005	0.05	0.5	4	0.35	4	0.47	8.2	50	4.8	5.2	5.4	5.7	6.1
ESLNR2005-5-005	0.05	0.5	4	0.35	5	0.47	7.6	50	6.1	6.6	6.9	7.3	7.8
ESLNR2005-6-005	0.05	0.5	4	0.35	6	0.47	7	50	7.2	7.7	8.1	8.4	9
ESLNR2005-1-01	0.1	0.5	4	0.35	1	0.47	10.8	50	1.4	1.5	1.6	1.7	1.9
ESLNR2005-2-01	0.1	0.5	4	0.35	2	0.47	9.8	50	2.5	2.6	2.8	2.9	3.1
ESLNR2005-3-01	0.1	0.5	4	0.35	3	0.47	8.9	50	3.8	4	4.3	4.5	4.9
ESLNR2005-4-01	0.1	0.5	4	0.35	4	0.47	8.2	50	4.8	5.2	5.4	5.7	6.1
ESLNR2005-5-01	0.1	0.5	4	0.35	5	0.47	7.6	50	6.1	6.5	6.9	7.2	7.8
ESLNR2005-6-01	0.1	0.5	4	0.35	6	0.47	7.1	50	7.2	7.7	8.1	8.4	9
ESLNR2006-2-01	0.1	0.6	4	0.4	2	0.57	9.7	50	2.5	2.6	2.8	2.9	3.1
ESLNR2006-4-01	0.1	0.6	4	0.4	4	0.57	8.1	50	4.8	5.2	5.4	5.7	6.1
ESLNR2006-6-01	0.1	0.6	4	0.4	6	0.57	7	50	7.2	7.7	8.1	8.4	9

H-Star Endmill

ESLNR

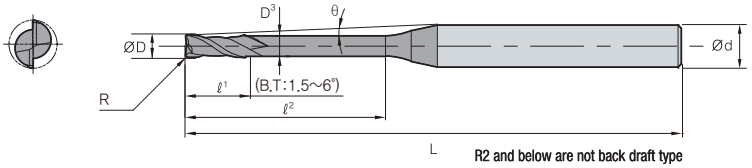
2 flutes long neck type radius Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 All sizes | AlTiN | DATA p.466~468

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5



R2 and below are not back draft type

(mm)

Designation	Sizes(mm)								Effective length by inclination angle				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNR2006-8-01	0.1	0.6	4	0.4	8	0.57	6.1	50	9.3	9.9	10.3	10.7	11
ESLNR2006-10-01	0.1	0.6	4	0.4	10	0.57	5.5	50	11.5	12.1	12.5	13	13.7
ESLNR2008-4-01	0.1	0.8	4	0.5	4	4	8	50	4.8	5.2	5.4	5.7	6.1
ESLNR2008-6-01	0.1	0.8	4	0.5	6	6	6.8	50	7	7.4	7.7	7.9	8.4
ESLNR2008-8-01	0.1	0.8	4	0.5	8	8	5.9	50	9.3	9.9	10.3	10.7	11.4
ESLNR2008-12-01	0.1	0.8	4	0.5	12	12	4.7	50	13.6	14.2	14.7	15.2	16
ESLNR2008-4-02	0.2	0.8	4	0.5	4	4	8	50	4.8	5.1	5.4	5.6	6.1
ESLNR2008-6-02	0.2	0.8	4	0.5	6	6	6.9	50	7	7.3	7.7	7.9	8.4
ESLNR2010-4-01	0.1	1	4	0.8	4	0.94	7.7	50	4.7	4.9	5.1	5.2	5.5
ESLNR2010-6-01	0.1	1	4	0.8	6	0.94	6.6	50	7.1	7.4	7.7	8	8.5
ESLNR2010-8-01	0.1	1	4	0.8	8	0.94	5.7	50	9.2	9.6	9.9	10.2	10.8
ESLNR2010-10-01	0.1	1	4	0.8	10	0.94	5.1	50	11.6	12.1	12.6	13	13.7
ESLNR2010-12-01	0.1	1	4	0.8	12	0.94	4.5	55	13.7	14.3	14.8	15.3	16
ESLNR2010-16-01	0.1	1	4	0.8	16	0.94	3.8	60	17.9	18.6	19.2	19.7	21.3
ESLNR2010-20-01	0.1	1	4	0.8	20	0.94	3.2	60	22	22.8	23.5	24	26.7
ESLNR2010-4-02	0.2	1	4	0.8	4	0.94	7.8	50	4.7	4.9	5.1	5.2	5.5
ESLNR2010-6-02	0.2	1	4	0.8	6	0.94	6.6	50	7.1	7.4	7.7	8	8.5
ESLNR2010-8-02	0.2	1	4	0.8	8	0.94	5.8	50	9.2	9.6	9.9	10.2	10.8
ESLNR2010-10-02	0.2	1	4	0.8	10	0.94	5.1	50	11.6	12.1	12.6	13	13.7
ESLNR2010-12-02	0.2	1	4	0.8	12	0.94	4.6	55	13.7	14.3	14.8	15.2	16
ESLNR2010-16-02	0.2	1	4	0.8	16	0.94	3.8	60	17.9	18.6	19.2	19.7	21.3
ESLNR2010-20-02	0.2	1	4	0.8	20	0.94	3.2	60	22	22.8	23.5	24	26.6
ESLNR2010-6-03	0.3	1	4	0.8	6	0.94	6.7	50	7.1	7.4	7.7	8	8.4
ESLNR2010-10-03	0.3	1	4	0.8	10	0.94	5.1	50	11.5	12.1	12.6	13	13.7
ESLNR2010-16-03	0.3	1	4	0.8	16	0.94	3.8	60	17.9	18.6	19.1	19.6	21.3
ESLNR2010-20-03	0.3	1	4	0.8	20	0.94	3.2	60	22	22.8	23.5	24	26.6
ESLNR2015-4-01	0.1	1.5	4	1.35	4	1.42	7.2	50	4.8	4.9	5.1	5.3	5.5
ESLNR2015-8-01	0.1	1.5	4	1.35	8	1.42	5.2	50	9.2	9.6	10	10.3	10.8
ESLNR2015-12-01	0.1	1.5	4	1.35	12	1.42	4	55	13.4	13.9	14.3	14.7	16.1
ESLNR2015-15-01	0.1	1.5	4	1.35	15	1.42	3.5	55	16.9	17.6	18.1	18.6	20.1
ESLNR2015-20-01	0.1	1.5	4	1.35	20	1.42	2.8	60	22.1	22.9	23.5	24.1	-
ESLNR2015-4-02	0.2	1.5	4	1.35	4	1.42	7.3	50	4.7	4.9	5.1	5.3	5.5
ESLNR2015-8-02	0.2	1.5	4	1.35	8	1.42	5.2	50	9.2	9.6	10	10.3	10.8
ESLNR2015-12-02	0.2	1.5	4	1.35	12	1.42	4.1	55	13.4	13.9	14.3	14.7	16.1

ESLNR

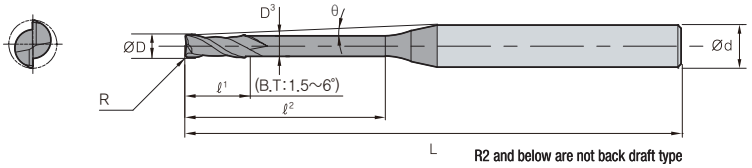
2 flutes long neck type radius Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 All sizes | AlTiN | DATA p.466~468

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5



R2 and below are not back draft type

(mm)

Designation	Sizes(mm)								Effective length by inclination angle				
	R	ØD	Ød	ℓ1	ℓ2	D3	θ	L	0.5°	1°	1.5°	2°	3°
ESLNR2015-15-02	0.2	1.5	4	1.35	15	1.42	3.5	55	16.9	17.5	18.1	18.6	20
ESLNR2015-20-02	0.2	1.5	4	1.35	20	1.42	2.8	60	22.1	22.9	23.5	24.1	-
ESLNR2015-8-03	0.3	1.5	4	1.35	8	1.42	5.2	50	9.2	9.6	10	10.3	10.8
ESLNR2015-15-03	0.3	1.5	4	1.35	15	1.42	3.5	55	16.9	17.5	18.1	18.6	20
ESLNR2015-20-03	0.3	1.5	4	1.35	20	1.42	2.8	60	22.1	22.9	23.5	24	-
ESLNR2020-6-02	0.2	2	4	1.7	6	1.92	5.4	50	6.8	7.1	7.3	7.5	8.1
ESLNR2020-8-02	0.2	2	4	1.7	8	1.92	4.6	50	8.9	9.2	9.4	9.7	10.8
ESLNR2020-12-02	0.2	2	4	1.7	12	1.92	3.5	55	13.4	13.9	14.3	14.7	16.1
ESLNR2020-16-02	0.2	2	4	1.7	16	1.92	2.8	55	17.6	18.1	18.6	19.3	-
ESLNR2020-20-02	0.2	2	4	1.7	20	1.92	2.4	60	22.1	22.9	23.5	24.1	-
ESLNR2020-25-02	0.2	2	4	1.7	25	1.92	2	65	27.3	28.2	28.8	-	-
ESLNR2020-30-02	0.2	2	4	1.7	30	1.92	1.7	70	32.5	33.4	34.4	-	-
ESLNR2020-8-03	0.3	2	4	1.7	8	1.92	4.6	50	8.9	9.2	9.4	9.7	10.7
ESLNR2020-16-03	0.3	2	4	1.7	16	1.92	2.8	55	17.6	18.1	18.6	19.3	-
ESLNR2020-20-03	0.3	2	4	1.7	20	1.92	2.4	60	22.1	22.9	23.5	24	-
ESLNR2020-6-05	0.5	2	4	1.7	6	1.92	5.5	50	6.8	7.1	7.3	7.4	8
ESLNR2020-8-05	0.5	2	4	1.7	8	1.92	4.7	50	8.9	9.2	9.4	9.6	10.7
ESLNR2020-12-05	0.5	2	4	1.7	12	1.92	3.5	55	13.4	13.9	14.3	14.6	16
ESLNR2020-16-05	0.5	2	4	1.7	16	1.92	2.9	55	17.6	18.1	18.6	19.2	-
ESLNR2020-20-05	0.5	2	4	1.7	20	1.92	2.4	60	22.1	22.9	23.5	24	-
ESLNR2020-25-05	0.5	2	4	1.7	25	1.92	2	65	27.3	28.1	28.8	-	-
ESLNR2020-30-05	0.5	2	4	1.7	30	1.92	1.7	70	32.5	33.4	34.3	-	-
ESLNR2020-8-08	0.8	2	4	1.7	8	1.92	4.8	50	8.9	9.2	9.4	9.6	10.6
ESLNR2020-16-08	0.8	2	4	1.7	16	1.92	2.9	55	17.6	18.1	18.6	19.2	-
ESLNR2020-20-08	0.8	2	4	1.7	20	1.92	2.4	60	22.1	22.8	23.5	24	-
ESLNR2030-8-02	0.2	3	6	2.5	8	2.86	5.7	55	9	9.3	9.5	9.9	10.9
ESLNR2030-12-02	0.2	3	6	2.5	12	2.86	4.5	60	13.1	13.5	14	14.7	16.2
ESLNR2030-16-02	0.2	3	6	2.5	16	2.86	3.8	60	17.7	18.2	18.7	19.5	21.6
ESLNR2030-20-02	0.2	3	6	2.5	20	2.86	3.2	65	21.8	22.4	23.1	24.2	26.9
ESLNR2030-30-02	0.2	3	6	2.5	30	2.86	2.4	75	32.6	33.5	34.5	36.2	-
ESLNR2030-35-02	0.2	3	6	2.5	35	2.86	2.1	80	37.7	38.7	40.2	42.2	-
ESLNR2030-8-03	0.3	3	6	2.5	8	2.86	5.7	55	9	9.3	9.5	9.9	10.9
ESLNR2030-16-03	0.3	3	6	2.5	16	2.86	3.8	60	17.7	18.2	18.7	19.4	21.5
ESLNR2030-20-03	0.3	3	6	2.5	20	2.86	3.2	65	21.8	22.4	23.1	24.2	26.8

H-Star Endmill

ESLNR

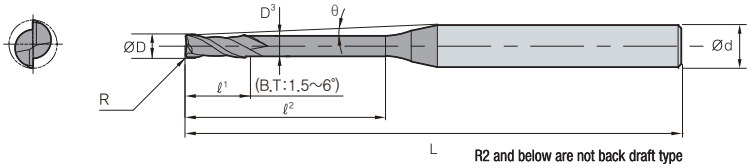
2 flutes long neck type radius Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (All sizes) | AlTiN | DATA (p.466~468)

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.012mm	h5

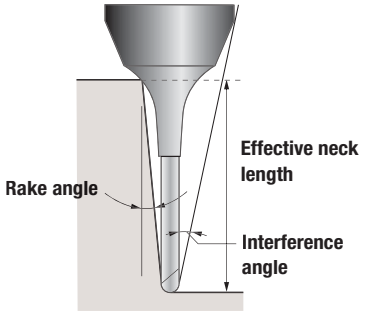


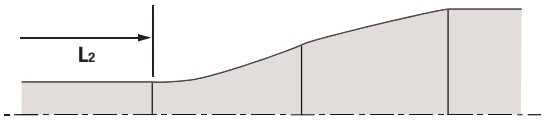
R2 and below are not back draft type

(mm)

Designation	Sizes(mm)								Effective length by inclination angle				
	R	ØD	Ød	ℓ¹	ℓ²	D³	θ	L	0.5°	1°	1.5°	2°	3°
ESLNR2030-30-03	0.3	3	6	2.5	30	2.86	2.4	75	32.6	33.5	34.5	36.2	-
ESLNR2030-8-05	0.5	3	6	2.5	8	2.86	5.8	55	9	9.3	9.5	9.8	10.8
ESLNR2030-12-05	0.5	3	6	2.5	12	2.86	4.6	60	13.1	13.5	13.9	14.6	16.2
ESLNR2030-16-05	0.5	3	6	2.5	16	2.86	3.8	60	17.7	18.2	18.7	19.4	21.5
ESLNR2030-20-05	0.5	3	6	2.5	20	2.86	3.2	65	21.8	22.4	23.1	24.2	26.8
ESLNR2030-30-05	0.5	3	6	2.5	30	2.86	2.4	75	32.6	33.5	34.5	36.1	-
ESLNR2030-35-05	0.5	3	6	2.5	35	2.86	2.1	80	37.7	38.7	40.2	42.1	-

※ The above specifications are subject to change without prior notice for product quality improvement.





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESTNR

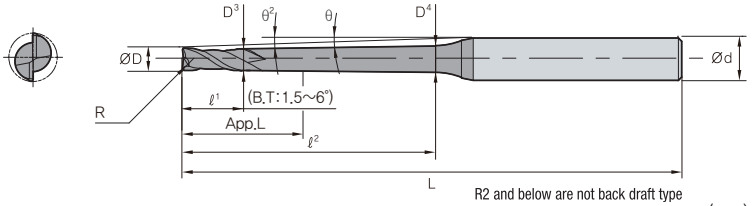
2 flutes tapered neck type radius Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (All sizes) | AlTiN | DATA (p.469~470)

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.015mm	h5



R2 and below are not back draft type

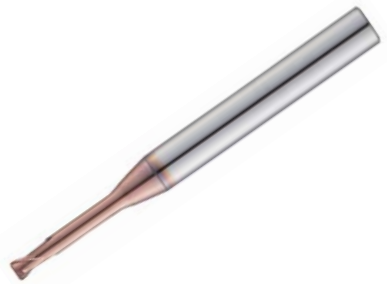
(mm)

Designation	Sizes(mm)											Effective length by inclination angle				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNR2002-2-09005	0.05	0.2	4	0.15	2	0.9	0.17	0.23	1.1	10	50	-	2.8	3.1	3.4	3.9
ESTNR2004-4-09005	0.05	0.4	4	0.3	4	0.9	0.37	0.49	1.25	8.4	50	-	4.9	5.3	5.7	6.3
ESTNR2004-5-09005	0.05	0.4	4	0.3	5	0.9	0.37	0.52	1.25	7.8	50	-	5.9	6.4	6.8	7.5
ESTNR2004-4-0901	0.1	0.4	4	0.3	4	0.9	0.37	0.49	1.25	8.5	50	-	4.9	5.3	5.7	6.3
ESTNR2004-5-0901	0.1	0.4	4	0.3	5	0.9	0.37	0.52	1.25	7.9	50	-	5.9	6.4	6.8	7.5
ESTNR2005-5-0901	0.1	0.5	4	0.35	5	0.9	0.47	0.62	1.3	7.8	50	-	5.9	6.4	6.8	7.5
ESTNR2005-8-0901	0.1	0.5	4	0.35	8	0.9	0.47	0.71	1.3	6.4	50	-	9	9.7	10.2	11
ESTNR2005-10-0901	0.1	0.5	4	0.35	10	0.9	0.47	0.77	1.3	5.8	55	-	11	11.8	12.4	13.2
ESTNR2006-12-0901	0.1	0.6	4	0.4	12	0.9	0.57	0.93	1.35	5.1	55	-	13	13.9	14.5	15.5
ESTNR2006-15-0901	0.1	0.6	4	0.4	15	0.9	0.57	13	1.35	4.5	55	-	16.1	17.1	17.8	18.8
ESTNR2008-6-0402	0.2	0.8	4	0.5	6	0.4	0.77	0.85	2.64	7	50	6.6	7.1	7.5	7.8	8.3
ESTNR2008-12-0902	0.2	0.8	4	0.5	12	0.9	0.77	1.13	1.45	5	55	-	13	13.9	14.5	15.5
ESTNR2010-8-0402	0.2	1	6	0.8	8	0.4	0.94	14	5.09	7.4	55	8.8	9.3	9.7	10.1	10.6
ESTNR2010-10-0902	0.2	1	6	0.8	10	0.9	0.94	1.23	5.09	6.8	55	-	11.2	11.9	12.4	13.3
ESTNR2010-15-0902	0.2	1	6	0.8	15	0.9	0.94	1.39	2.7	5.6	60	-	16.3	17.2	17.8	18.8
ESTNR2010-20-0902	0.2	1	6	0.8	20	0.9	0.94	1.54	2.7	4.8	65	-	21.3	22.4	23.2	24.7
ESTNR2010-25-0902	0.2	1	6	0.8	25	0.9	0.94	1.7	2.7	4.1	70	-	26.4	27.6	28.5	30.9
ESTNR2010-30-0902	0.2	1	6	0.8	30	0.9	0.94	1.86	2.7	3.7	75	-	31.5	32.8	33.7	37
ESTNR2010-35-0902	0.2	1	6	0.8	35	0.9	0.94	22	2.7	3.3	80	-	36.5	38	39	43.2
ESTNR2010-8-0403	0.3	1	6	0.8	8	0.4	0.94	14	2.7	7.4	55	8.8	9.3	9.7	10	10.6
ESTNR2010-15-0903	0.3	1	6	0.8	15	0.9	0.94	1.39	2.7	5.6	60	-	16.3	17.2	17.8	18.8
ESTNR2010-25-0903	0.3	1	6	0.8	25	0.9	0.94	1.7	2.7	4.2	70	-	26.4	27.6	28.5	30.8
ESTNR2010-30-0903	0.3	1	6	0.8	30	0.9	0.94	1.86	2.7	3.7	75	-	31.5	32.8	33.7	37
ESTNR2015-10-0402	0.2	1.5	6	1.35	10	0.4	1.42	1.54	7.07	6.4	55	11	11.5	11.9	12.3	13
ESTNR2015-15-0902	0.2	1.5	6	1.35	15	0.9	1.42	1.85	7.07	5.3	60	-	16.4	17.3	17.9	18.9
ESTNR2015-20-0902	0.2	1.5	6	1.35	20	0.9	1.42	21	3.89	4.5	65	-	21.5	22.5	23.2	24.9
ESTNR2015-25-0902	0.2	1.5	6	1.35	25	0.9	1.42	2.16	3.89	3.9	70	-	26.6	27.7	28.5	31
ESTNR2015-30-0902	0.2	1.5	6	1.35	30	0.9	1.42	2.32	3.89	3.4	75	-	31.6	32.9	33.8	37.1
ESTNR2015-10-0403	0.3	1.5	6	1.35	10	0.4	1.42	1.54	3.89	6.4	55	11	11.5	11.9	12.3	13
ESTNR2015-20-0903	0.3	1.5	6	1.35	20	0.9	1.42	21	3.89	4.5	65	-	21.5	22.5	23.2	24.8
ESTNR2015-25-0903	0.3	1.5	6	1.35	25	0.9	1.42	2.16	3.89	3.9	70	-	26.5	27.7	28.5	31
ESTNR2015-30-0903	0.3	1.5	6	1.35	30	0.9	1.42	2.32	3.89	3.4	75	-	31.6	32.9	33.8	37.1
ESTNR2020-30-0902	0.2	2	6	1.7	30	0.9	1.92	2.81	7.42	3.1	70	-	31.6	32.9	33.8	37.2
ESTNR2020-40-0902	0.2	2	6	1.7	40	0.9	1.92	3.12	7.42	2.5	80	-	41.8	43.3	44.6	-
ESTNR2020-50-0902	0.2	2	6	1.7	50	0.9	1.92	3.44	7.42	2.1	90	-	51.9	53.6	55.7	-
ESTNR2020-12-0403	0.3	2	6	1.7	12	0.4	1.92	2.06	7.42	5.5	55	13	13.6	14.1	14.5	15.6
ESTNR2020-20-0903	0.3	2	6	1.7	20	0.9	1.92	2.5	4.24	4.1	65	-	21.5	22.5	23.2	24.9
ESTNR2020-30-0903	0.3	2	6	1.7	30	0.9	1.92	2.81	4.24	3.1	70	-	31.6	32.9	33.8	37.1

H-Star Endmill

ESTNR

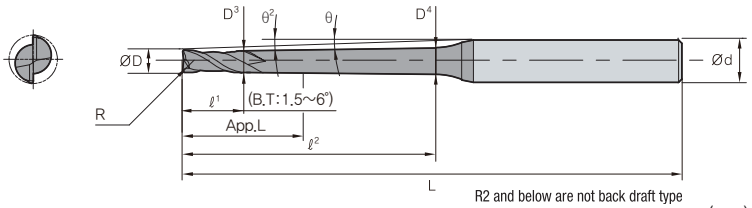
2 flutes tapered neck type radius Endmill



ULTRA FINE | 2 | 30° HELIX | R ±0.01 (All sizes) | AlTiN | DATA (p.469~470)

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.015mm	h5

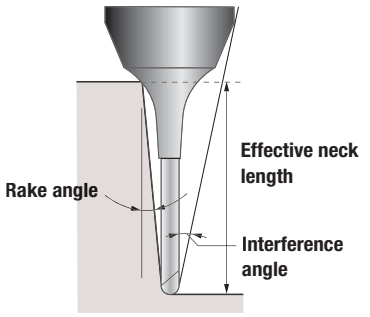


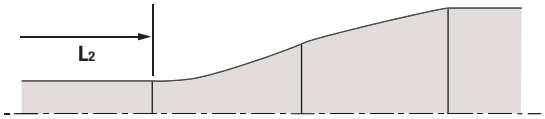
R2 and below are not back draft type

(mm)

Designation	Sizes(mm)											Effective length by inclination angle				
	R	ØD	Ød	ℓ1	ℓ2	θ	D3	D4	App. L	θ2	L	0.5°	1°	1.5°	2°	3°
ESTNR2020-40-0903	0.3	2	6	1.7	40	0.9	1.92	3.12	4.24	2.5	80	-	41.7	43.3	44.6	-
ESTNR2020-50-0903	0.3	2	6	1.7	50	0.9	1.92	3.44	4.24	2.1	90	-	51.8	53.6	55.7	-
ESTNR2020-8-0405	0.5	2	6	1.7	8	0.4	1.92	2.01	4.24	6.8	50	8.7	9	9.3	9.5	10.4
ESTNR2020-12-0405	0.5	2	6	1.7	12	0.4	1.92	2.06	4.24	5.6	55	13	13.6	14.1	14.4	15.5
ESTNR2020-16-0405	0.5	2	6	1.7	16	0.4	1.92	2.12	4.24	4.7	60	17	17.8	18.3	18.7	20.7
ESTNR2020-20-0905	0.5	2	6	1.7	20	0.9	1.92	2.5	4.24	4.2	65	-	21.5	22.5	23.2	24.8
ESTNR2020-25-0905	0.5	2	6	1.7	25	0.9	1.92	2.65	4.24	3.6	65	-	26.6	27.7	28.5	30.9
ESTNR2020-30-0905	0.5	2	6	1.7	30	0.9	1.92	2.81	4.24	3.1	70	-	31.6	32.9	33.8	37.1
ESTNR2020-40-0905	0.5	2	6	1.7	40	0.9	1.92	3.12	4.24	2.5	80	-	41.7	43.2	44.6	-
ESTNR2020-50-0905	0.5	2	6	1.7	50	0.9	1.92	3.44	4.24	2.1	90	-	51.8	53.6	55.6	-
ESTNR2030-40-0902	0.2	3	6	2.5	40	0.9	2.86	4.04	6.95	2	80	-	42	43.4	-	-
ESTNR2030-50-0902	0.2	3	6	2.5	50	0.9	2.86	4.35	6.95	1.6	90	-	52.1	53.7	-	-
ESTNR2030-60-0902	0.2	3	6	2.5	60	0.9	2.86	4.67	6.95	1.4	100	-	62.2	-	-	-
ESTNR2030-40-0903	0.3	3	6	2.5	40	0.9	2.86	4.04	6.95	2	80	-	42	43.4	-	-
ESTNR2030-50-0903	0.3	3	6	2.5	50	0.9	2.86	4.35	6.95	1.7	90	-	52.1	53.7	-	-
ESTNR2030-60-0903	0.3	3	6	2.5	60	0.9	2.86	4.67	6.95	1.4	100	-	62.2	-	-	-
ESTNR2030-40-0905	0.5	3	6	2.5	40	0.9	2.86	4.04	6.95	2	80	-	42	43.4	-	-
ESTNR2030-50-0905	0.5	3	6	2.5	50	0.9	2.86	4.35	6.95	1.7	90	-	52.1	53.7	-	-
ESTNR2030-60-0905	0.5	3	6	2.5	60	0.9	2.86	4.67	6.95	1.4	100	-	62.1	-	-	-

※ The above specifications are subject to change without prior notice for product quality improvement.





※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

ESPM4

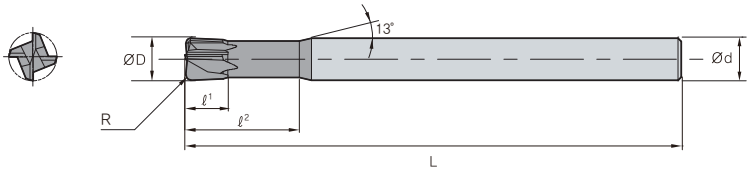
4 flutes neck type radius Endmill



ULTRA FINE | 4 | 0° HELIX | R ±0.015 All sizes | AlTiN | DATA p.471

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ESPM4030-05	0.5	3	6	1.2	8	50
ESPM4040-05	0.5	4	6	1.5	10	50
ESPM4060-05	0.5	6	6	2.5	12	60
ESPM4060-10	1	6	6	2.5	12	60
ESPM4060-15	1.5	6	6	2.5	12	60
ESPM4060-15L	1.5	6	6	2.5	12	90
ESPM4080-10	1	8	8	3.5	16	60
ESPM4080-20	2	8	8	3.5	16	60
ESPM4080-20L	2	8	8	3.5	16	100
ESPM4100-10	1	10	10	4	20	70
ESPM4100-20	2	10	10	4	20	70
ESPM4100-20L	2	10	10	4	20	100
ESPM4120-20	2	12	12	5	25	80
ESPM4120-30	3	12	12	5	25	80
ESPM4120-30L	3	12	12	5	25	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~63					
		○	◎	◎	○				

◎: Excellent ○: Good

For mold & die

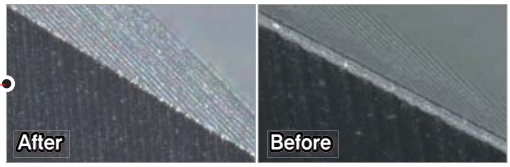
U-Star Endmill New

- 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

Features

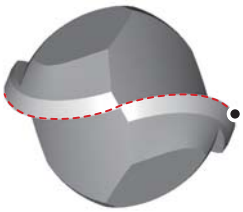
- Enhanced cutting edge strength of ball Endmill applying ultra-fine substrate (PC303W)
- Higher chipping resistance of flat Endmill applying high toughness substrate (PC315W)
- Various shaped line-ups for complicated mold machining
- Suitable for precision cutting with high precision tolerance of h5 shank, flute and radius

• Edge treatment

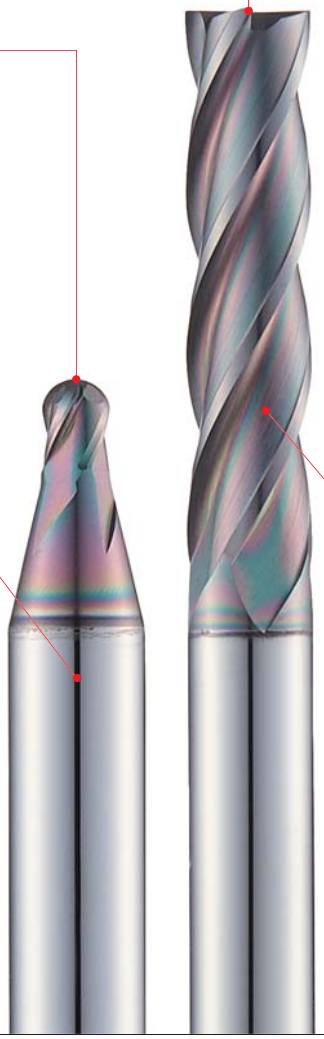


- Enhanced chipping resistance in the beginning of cutting
- Guiding stable cutting for managing the properties of mold machining

• Applying S-curved gash shape



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

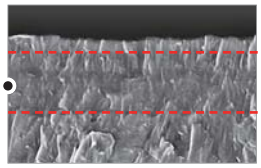


• Applying substrate for medium hardness steel cutting



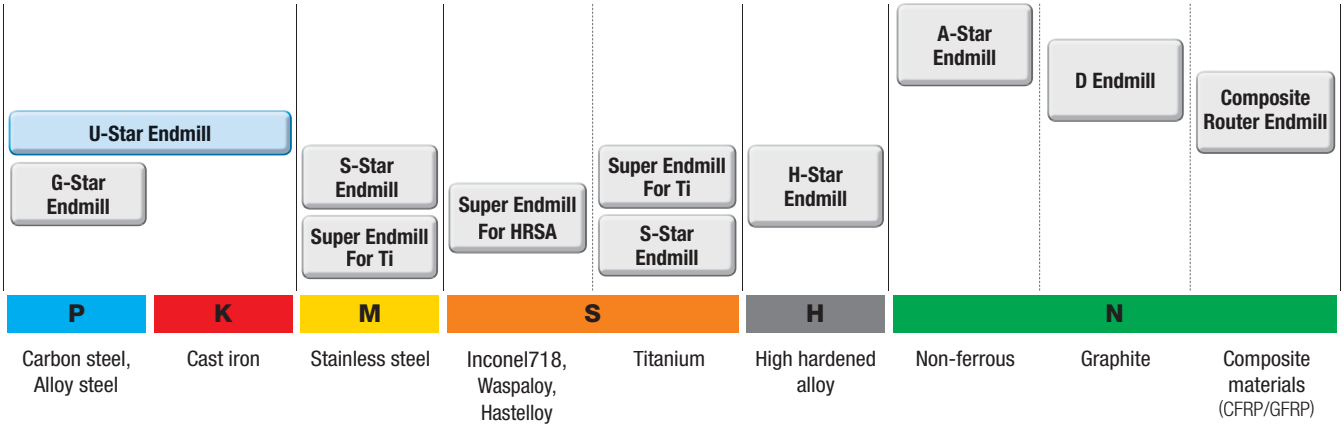
- Separating the substrate (PC303W and PC315W) maximizes the features of tool and ensures general use.

• AlCrN base new coating



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

Tool selection guide



Code system



U-Star Endmill

Length, Shank type
50 : Straight
51 : Neck
52 : Long shank
53 : Lollipop
54 : Taper neck

Tool dia.
010 : Ø1.0 mm
060 : Ø6.0 mm
250 : Ø25.0 mm

Effective length
005 : 0.5 mm
10 : 10 mm
50 : 50 mm

Shank dia.
S3 : Ø3 mm
S6 : Ø6 mm
S20 : Ø20 mm

Type
B : Ball
SB : Staright ball
E : Flat
R : Radius
SPM : High feed
XE : Heavy cut flat
XR : Multi helix radius
TE : Taper flat
TR : Taper radius
TB : Taper ball
DR : Double radius
F : Roughing
LE : Flat (lathe)

No. of flute
2 : 2 flute
3 : 3 flute
4 : 4 flute
5 : 5 flute
6 : 6 flute

Corner R
005 : 0.05 mm
010 : 0.10 mm
020 : 0.20 mm

Overall length
50 : 50 mm
100 : 100 mm
150 : 150 mm

U-Star Endmill

EDP. NO	Appearance	Type	Range	Page
UE502		2 flutes flat Endmill	Ø0.1 ~ 25.0	115~116
UE512		2 flutes long neck flat Endmill	Ø0.1 ~ 12.0	117~119
UE522		2 flutes flat Endmill	Ø1.0 ~ 25.0	120~121
UXE502		2 flutes flat Endmill for heavy cuts	Ø0.1 ~ 20.0	122~123
UE504H		4 flutes 45° helix flat Endmill	Ø1.0 ~ 20.0	124
UE514		4 flutes long neck flat Endmill	Ø1.0 ~ 12.0	125~126
UE524		4 flutes flat Endmill	Ø1.0 ~ 25.0	127~128
ULE504		4 flutes automatic cnc flat Endmill	Ø3.0 ~ 16.0	129
UE504		4 flutes flat Endmill	Ø0.8 ~ 25.0	130
UXE504		4 flutes flat Endmill for heavy cuts	Ø1.0 ~ 20.0	131
UE506		6 flutes flat Endmill	Ø6.0 ~ 20.0	132
UTE502		2 flutes tapered flat Endmill	Ø0.3 ~ 10.0	133~134
UTE504		4 flutes tapered flat Endmill	Ø0.8 ~ 10.0	135~137
UR502		2 flutes radius Endmill	Ø0.2 ~ 20.0	138~140
UR512		2 flutes neck type radius Endmill	Ø0.2 ~ 20.0	141~146
UR542		2 flutes tapered neck radius Endmill	Ø0.2 ~ 4.0	147~152
UR504		4 flutes radius Endmill	Ø3.0 ~ 20.0	153
UR544		4 flutes tapered neck radius Endmill	Ø1.0 ~ 4.0	154~157
UXR504		4 flutes multi helix radius Endmill	Ø1.0 ~ 20.0	158~160
UXR514		4 flutes multi helix neck radius Endmill	Ø1.0 ~ 20.0	161~165
UR506		6 flutes radius Endmill	Ø6.0 ~ 20.0	166
UDR503		3 flutes double radius Endmill	Ø6.0 ~ 20.0	167
USPM4		4 flutes radius Endmill for high speed machining	Ø1.0 ~ 20.0	168
UTR504		4 flutes tapered radius Endmill	Ø0.8 ~ 2.5	169~172
UB502		2 flutes ball Endmill	Ø1.0 ~ 25.0	173~174
UB502---P		2 flutes high precision ball Endmill	Ø0.1 ~ 12.0	175
UB512		2 flutes long neck ball Endmill	Ø0.1 ~ 12.0	176~179
UB512S6		2 flutes long neck ball Endmill (shank 6)	Ø0.5 ~ 2.0	180
UB532		2 flutes lollipop style ball Endmill	Ø3.0 ~ 12.0	181
UB542		2 flutes tapered neck ball Endmill	Ø0.1 ~ 12.0	182~188
USB502		2 flutes straight ball Endmill	Ø3.0 ~ 20.0	189
UB503		3 flutes ball Endmill	Ø1.0 ~ 12.0	190
UB504		4 flutes ball Endmill	Ø1.0 ~ 12.0	191
UTB502		2 flutes tapered ball Endmill	Ø0.3 ~ 2.0	192
UF50		3~5 flutes chamfer pitch roughing Endmill	Ø3.0 ~ 25.0	193
UF51		3~5 flutes fine pitch roughing Endmill	Ø3.0 ~ 25.0	194
UF51---H		3~5 flutes 45° helix fine pitch roughing Endmill	Ø3.0 ~ 25.0	195

UE502

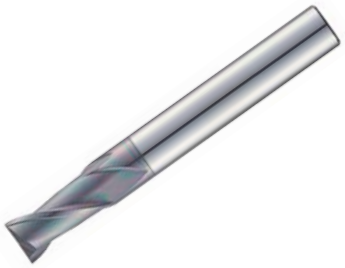
2 flutes flat Endmill

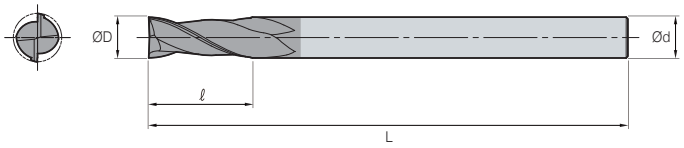
CARBIDE | 2 | 30° HELIX | AlCrN | DATA

p.472

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	





(mm)

Designation	ØD	Ød	ℓ	L
UE502001S3	0.1	3	0.2	40
UE502001	0.1	4	0.2	40
UE5020015	0.15	4	0.3	40
UE502002S3	0.2	3	0.4	40
UE502002	0.2	4	0.4	40
UE5020025	0.25	4	0.5	40
UE502003S3	0.3	3	0.6	40
UE502003	0.3	4	0.6	40
UE5020035	0.35	4	0.7	40
UE502004S3	0.4	3	0.8	40
UE502004	0.4	4	0.8	40
UE5020045	0.45	4	0.9	40
UE502005S3	0.5	3	1	40
UE502005	0.5	4	1	40
UE5020055	0.55	4	1.1	40
UE502006S3	0.6	3	1.2	40
UE502006	0.6	4	1.2	40
UE5020065	0.65	4	1.3	40
UE502007S3	0.7	3	1.4	40
UE502007	0.7	4	1.4	40
UE5020075	0.75	4	1.5	40
UE502008S3	0.8	3	1.6	40
UE502008	0.8	4	1.6	40
UE5020085	0.85	4	1.7	40
UE502009S3	0.9	3	1.8	40
UE502009	0.9	4	1.8	40
UE5020095	0.95	4	2	40
UE502010S3	1	3	2.5	50
UE502010S4	1	4	2.5	50
UE502010	1	6	2.5	50
UE502011S4	1.1	4	3	50
UE502012S3	1.2	3	3	50
UE502012S4	1.2	4	3	50
UE502012	1.2	6	3	50
UE502013S4	1.3	4	3	50
UE502014S4	1.4	4	4	50

Designation	ØD	Ød	ℓ	L
UE502015S3	1.5	3	4	50
UE502015S4	1.5	4	4	50
UE502015	1.5	6	4	50
UE502016S4	1.6	4	4	50
UE502017S4	1.7	4	4	50
UE502018S4	1.8	4	5	50
UE502019S4	1.9	4	5	50
UE502020S3	2	3	6	50
UE502020S4	2	4	6	50
UE502020	2	6	6	50
UE502021S4	2.1	4	6	50
UE502022S4	2.2	4	6	50
UE502023S4	2.3	4	6	50
UE502024S4	2.4	4	6	50
UE502025S3	2.5	3	7	50
UE502025	2.5	6	7	50
UE502025S4	2.5	4	8	50
UE502026S4	2.6	4	8	50
UE502027S4	2.7	4	8	50
UE502028S4	2.8	4	8	50
UE502029S4	2.9	4	8	50
UE502030S3	3	3	8	50
UE502030S4	3	4	8	50
UE502030	3	6	8	50
UE502035S4	3.5	4	10	50
UE502035	3.5	6	10	50
UE502040080S4	4	4	10	80
UE502040S4	4	4	10	50
UE502040	4	6	10	50
UE502045	4.5	6	14	50
UE502050	5	6	15	60
UE502055	5.5	6	15	60
UE502060	6	6	15	60
UE502065	6.5	8	18	60
UE502070	7	8	20	60
UE502075	7.5	8	20	60

U-Star Endmill

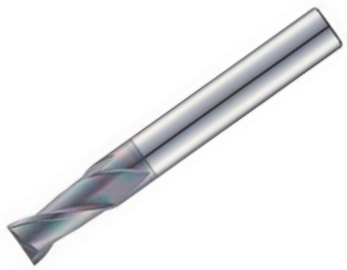
UE502

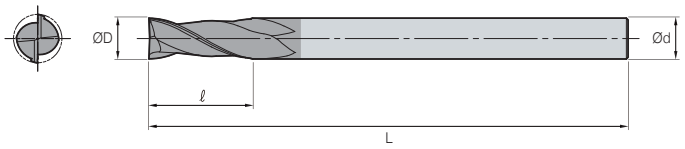
2 flutes flat Endmill

CARBIDE | 2 | 30° HELIX | AlCrN | DATA p.472

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	





Designation	ØD	Ød	ℓ	L
UE502080	8	8	20	70
UE502085	8.5	10	22	70
UE502090	9	10	22	70
UE502095	9.5	10	24	70
UE502100	10	10	25	75
UE502105	10.5	12	26	75
UE502110	11	12	30	75
UE502115	11.5	12	30	80
UE502120	12	12	30	80
UE502130	13	12	35	100
UE502140S16	14	16	35	100
UE502140	14	14	35	100
UE502140S12	14	12	35	100

Designation	ØD	Ød	ℓ	L
UE502150	15	16	38	100
UE502160	16	16	40	100
UE502170	17	16	42	100
UE502180	18	18	45	100
UE502180S16	18	16	45	100
UE502190	19	20	45	100
UE502200	20	20	45	100
UE502210	21	20	45	100
UE502220	22	20	45	100
UE502230	23	25	50	120
UE502240	24	25	50	120
UE502250	25	25	50	120

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UE512

2 flutes long neck flat Endmill

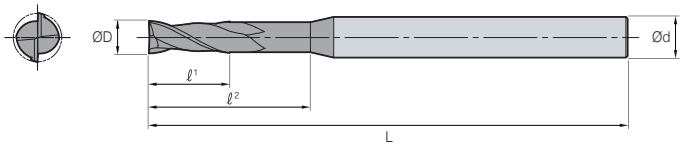
CARBIDE | 2 | 30° HELIX | AlCrN | DATA

p.473~477

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
UE512001003	0.1	4	0.15	0.3	40
UE512001005	0.1	4	0.15	0.5	40
UE51200101	0.1	4	0.15	1	40
UE512002005	0.2	4	0.3	0.5	40
UE51200201	0.2	4	0.3	1	40
UE512002015	0.2	4	0.3	1.5	40
UE51200202	0.2	4	0.3	2	40
UE51200301	0.3	4	0.5	1	40
UE512003015	0.3	4	0.5	1.5	40
UE51200302	0.3	4	0.5	2	40
UE512003025	0.3	4	0.5	2.5	40
UE51200303	0.3	4	0.5	3	40
UE51200304	0.3	4	0.5	4	40
UE51200305	0.3	4	0.5	5	40
UE51200401	0.4	4	0.6	1	40
UE512004015	0.4	4	0.6	1.5	40
UE51200402	0.4	4	0.6	2	40
UE512004025	0.4	4	0.6	2.5	40
UE51200403	0.4	4	0.6	3	40
UE51200404	0.4	4	0.6	4	40
UE51200405	0.4	4	0.6	5	40
UE51200406	0.4	4	0.6	6	40
UE51200408	0.4	4	0.6	8	40
UE51200410	0.4	4	0.6	10	40
UE51200501	0.5	4	0.7	1	45
UE512005015	0.5	4	0.7	1.5	45
UE51200502	0.5	4	0.7	2	45
UE512005025	0.5	4	0.7	2.5	45
UE51200503	0.5	4	0.7	3	45
UE51200504	0.5	4	0.7	4	45
UE51200505	0.5	4	0.7	5	45
UE51200506	0.5	4	0.7	6	45
UE51200508	0.5	4	0.7	8	45
UE51200510	0.5	4	0.7	10	45
UE51200512	0.5	4	0.7	12	45
UE51200514	0.5	4	0.7	14	45
UE51200516	0.5	4	0.7	16	45

Designation	ØD	Ød	ℓ1	ℓ2	L
UE51200602	0.6	4	0.9	2	45
UE51200603	0.6	4	0.9	3	45
UE51200604	0.6	4	0.9	4	45
UE51200605	0.6	4	0.9	5	45
UE51200606	0.6	4	0.9	6	45
UE51200608	0.6	4	0.9	8	45
UE51200610	0.6	4	0.9	10	45
UE51200612	0.6	4	0.9	12	45
UE51200614	0.6	4	0.9	14	45
UE51200616	0.6	4	0.9	16	45
UE51200702	0.7	4	1.2	2	45
UE51200704	0.7	4	1.2	4	45
UE51200706	0.7	4	1.2	6	45
UE51200708	0.7	4	1.2	8	45
UE51200710	0.7	4	1.2	10	45
UE51200712	0.7	4	1.2	12	45
UE51200802	0.8	4	1.2	2	45
UE51200803	0.8	4	1.2	3	45
UE51200804	0.8	4	1.2	4	45
UE51200805	0.8	4	1.2	5	45
UE51200806	0.8	4	1.2	6	45
UE51200808	0.8	4	1.2	8	45
UE51200810	0.8	4	1.2	10	45
UE51200812	0.8	4	1.2	12	45
UE51200814	0.8	4	1.2	14	45
UE51200816	0.8	4	1.2	16	45
UE51200820	0.8	4	1.2	20	45
UE51200906	0.9	4	1.3	6	45
UE51200908	0.9	4	1.3	8	45
UE51200910	0.9	4	1.3	10	45
UE51201002	1	4	1.5	2	50
UE51201003	1	4	1.5	3	50
UE51201004	1	4	1.5	4	50
UE51201005	1	4	1.5	5	50
UE51201006	1	4	1.5	6	50
UE51201007	1	4	1.5	7	50
UE51201008	1	4	1.5	8	50

U-Star Endmill

UE512

2 flutes long neck flat Endmill

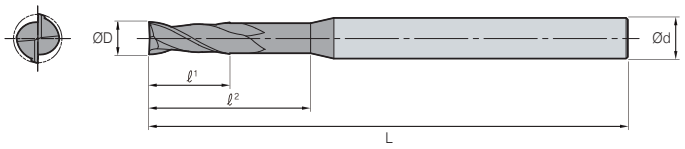
CARBIDE | 2 | 30° HELIX | AlCrN | DATA

p.473~477

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
UE51201010	1	4	1.5	10	50
UE51201012	1	4	1.5	12	50
UE51201014	1	4	1.5	14	50
UE51201016	1	4	1.5	16	50
UE51201018	1	4	1.5	18	50
UE51201020	1	4	1.5	20	50
UE51201022	1	4	1.5	22	60
UE51201026	1	4	1.5	26	60
UE51201030	1	4	1.5	30	70
UE51201040	1	4	1.5	40	80
UE51201050	1	4	1.5	50	100
UE51201204	1.2	4	1.8	4	50
UE51201206	1.2	4	1.8	6	50
UE51201208	1.2	4	1.8	8	50
UE51201210	1.2	4	1.8	10	50
UE51201212	1.2	4	1.8	12	50
UE51201214	1.2	4	1.8	14	50
UE51201216	1.2	4	1.8	16	50
UE51201220	1.2	4	1.8	20	50
UE51201226	1.2	4	1.8	26	60
UE51201230	1.2	4	1.8	30	70
UE51201406	1.4	4	2.1	6	50
UE51201408	1.4	4	2.1	8	50
UE51201410	1.4	4	2.1	10	50
UE51201414	1.4	4	2.1	14	50
UE51201416	1.4	4	2.1	16	50
UE51201420	1.4	4	2.1	20	50
UE51201504	1.5	4	2.3	4	50
UE51201505	1.5	4	2.3	5	50
UE51201506	1.5	4	2.3	6	50
UE51201507	1.5	4	2.3	7	50
UE51201508	1.5	4	2.3	8	50
UE51201510	1.5	4	2.3	10	50
UE51201512	1.5	4	2.3	12	50
UE51201514	1.5	4	2.3	14	50
UE51201516	1.5	4	2.3	16	50
UE51201518	1.5	4	2.3	18	50

Designation	ØD	Ød	ℓ1	ℓ2	L
UE51201520	1.5	4	2.3	20	50
UE51201522	1.5	4	2.3	22	60
UE51201526	1.5	4	2.3	26	60
UE51201530	1.5	4	2.3	30	70
UE51201608	1.6	4	2.3	8	50
UE51201610	1.6	4	2.3	10	50
UE51201612	1.6	4	2.3	12	50
UE51201616	1.6	4	2.3	16	50
UE51201620	1.6	4	2.3	20	50
UE51201808	1.8	4	2.7	8	50
UE51201810	1.8	4	2.7	10	50
UE51201812	1.8	4	2.7	12	50
UE51201816	1.8	4	2.7	16	50
UE51201820	1.8	4	2.7	20	50
UE51202006	2	4	3	6	50
UE51202008	2	4	3	8	50
UE51202010	2	4	3	10	50
UE51202012	2	4	3	12	50
UE51202014	2	4	3	14	50
UE51202016	2	4	3	16	50
UE51202018	2	4	3	18	50
UE51202020	2	4	3	20	50
UE51202022	2	4	3	22	60
UE51202026	2	4	3	26	60
UE51202030	2	4	3	30	70
UE51202035	2	4	3	35	70
UE51202040	2	4	3	40	80
UE51202045	2	4	3	45	90
UE51202050	2	4	3	50	100
UE51202060	2	4	3	60	110
UE51202508	2.5	4	4	8	50
UE51202510	2.5	4	4	10	50
UE51202512	2.5	4	4	12	50
UE51202514	2.5	4	4	14	50
UE51202516	2.5	4	4	16	50
UE51202518	2.5	4	4	18	50
UE51202520	2.5	4	4	20	50

UE512

2 flutes long neck flat Endmill

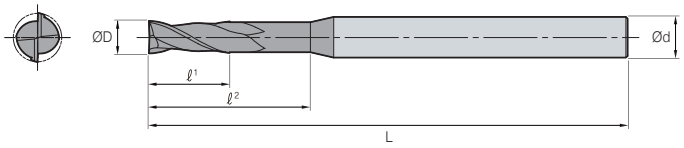
CARBIDE | 2 | 30° HELIX | AlCrN | DATA

p.473~477

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
UE51202522	2.5	4	4	22	60
UE51202526	2.5	4	4	26	60
UE51202530	2.5	4	4	30	70
UE51202535	2.5	4	4	35	70
UE51202540	2.5	4	4	40	80
UE51202545	2.5	4	4	45	90
UE51202550	2.5	4	4	50	100
UE51203006	3	6	4.5	6	50
UE51203008	3	6	4.5	8	50
UE51203010	3	6	4.5	10	50
UE51203012	3	6	4.5	12	50
UE51203014	3	6	4.5	14	60
UE51203016	3	6	4.5	16	60
UE51203018	3	6	4.5	18	60
UE51203020	3	6	4.5	20	60
UE51203022	3	6	4.5	22	65
UE51203026	3	6	4.5	26	65
UE51203030	3	6	4.5	30	70
UE51203035	3	6	4.5	35	70
UE51203040	3	6	4.5	40	80
UE51203045	3	6	4.5	45	90
UE51203050	3	6	4.5	50	100
UE51203060	3	6	4.5	60	100
UE51204008	4	6	6	8	50
UE51204010	4	6	6	10	50
UE51204012	4	6	6	12	50
UE51204014	4	6	6	14	60
UE51204016	4	6	6	16	60
UE51204018	4	6	6	18	60
UE51204020	4	6	6	20	60

Designation	ØD	Ød	ℓ1	ℓ2	L
UE51204022	4	6	6	22	65
UE51204026	4	6	6	26	65
UE51204030	4	6	6	30	70
UE51204035	4	6	6	35	70
UE51204040	4	6	6	40	80
UE51204045	4	6	6	45	90
UE51204050	4	6	6	50	100
UE51204060	4	6	6	60	100
UE51205016	5	6	8	16	60
UE51205020	5	6	8	20	60
UE51205026	5	6	8	26	65
UE51205030	5	6	8	30	70
UE51205035	5	6	8	35	75
UE51205040	5	6	8	40	80
UE51205050	5	6	8	50	90
UE51205060	5	6	8	60	100
UE51206015	6	6	9	15	60
UE51206020	6	6	9	20	60
UE51206030	6	6	9	30	70
UE51206032	6	6	9	32	90
UE51208025	8	8	12	25	70
UE51208030	8	8	12	30	80
UE51208042	8	8	12	42	100
UE51210030	10	10	15	30	75
UE51210035	10	10	15	35	80
UE51210045	10	10	15	45	100
UE51212035	12	12	20	35	80
UE51212040	12	12	20	40	90
UE51212050	12	12	20	50	110

• Applicable Workpiece

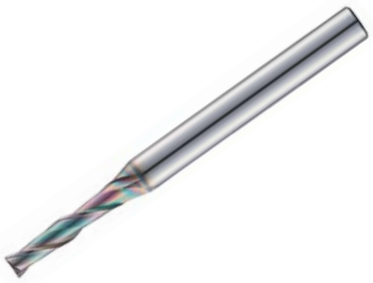
Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UE522

2 flutes flat Endmill

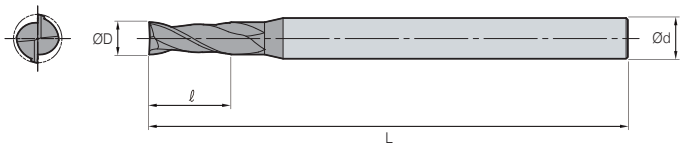


CARBIDE | 2 | 30° HELIX | AlCrN | DATA

p.478

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	



(mm)

Designation	ØD	Ød	ℓ	L
UE52201003	1	6	3	60
UE52201004	1	6	4	60
UE52201005	1	6	5	60
UE52201006	1	6	6	60
UE52201007	1	6	7	60
UE52201008	1	6	8	60
UE52201010	1	6	10	60
UE52201012	1	6	12	60
UE52201204	1.2	6	4	60
UE52201206	1.2	6	6	60
UE52201208	1.2	6	8	60
UE52201210	1.2	6	10	60
UE52201212	1.2	6	12	60
UE52201506	1.5	6	6	60
UE52201508	1.5	6	8	60
UE52201510	1.5	6	10	60
UE52201512	1.5	6	12	60
UE52201514	1.5	6	14	60
UE52201516	1.5	6	16	60
UE52202008	2	6	8	60
UE52202010	2	6	10	60
UE52202012	2	6	12	60
UE52202014	2	6	14	60
UE52202016	2	6	16	60
UE52202510	2.5	6	10	60
UE52202512	2.5	6	12	60
UE52202516	2.5	6	16	60
UE52202520	2.5	6	20	60
UE52202526	2.5	6	26	60
UE52203010	3	6	10	70
UE52203012	3	6	12	70
UE52203014	3	6	14	70
UE52203016	3	6	16	70
UE52203016S3	3	3	16	100
UE52203020	3	6	20	70
UE52203026	3	6	26	70
UE52203030	3	6	30	70

Designation	ØD	Ød	ℓ	L
UE52204012	4	6	12	70
UE52204016	4	6	16	70
UE52204020	4	6	20	70
UE52204020S4	4	4	20	100
UE52204026	4	6	26	70
UE52204030	4	6	30	70
UE52205015	5	6	15	70
UE52205020	5	6	20	70
UE52205025100	5	6	25	100
UE52205025	5	6	25	70
UE52205030	5	6	30	80
UE52205035	5	6	35	90
UE52205040	5	6	40	100
UE52206015080	6	6	15	80
UE52206015	6	6	15	60
UE52206020090	6	6	20	90
UE52206020	6	6	20	70
UE52206025	6	6	25	75
UE52206030150	6	6	30	150
UE52206030100	6	6	30	100
UE52206030	6	6	30	80
UE52206035	6	6	35	90
UE52206040120	6	6	40	120
UE52206040	6	6	40	90
UE52206045	6	6	45	150
UE52207035	7	8	35	85
UE52208020	8	8	20	100
UE52208025	8	8	25	80
UE52208030100	8	8	30	100
UE52208030	8	8	30	80
UE52208035	8	8	35	90
UE52208040150	8	8	40	150
UE52208040120	8	8	40	120
UE52208040	8	8	40	90
UE52208045	8	8	45	100
UE52208050150	8	8	50	150
UE52208050	8	8	50	100

UE522

2 flutes flat Endmill

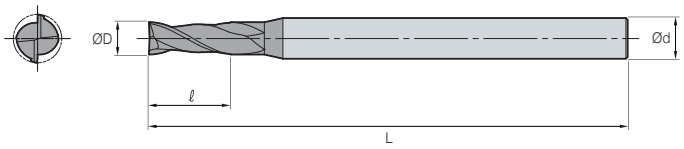
CARBIDE | 2 | 30° HELIX | AlCrN | DATA

p.478

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	





(mm)

Designation	ØD	Ød	ℓ	L
UE52209045	9	10	45	100
UE52210025	10	10	25	100
UE52210030100	10	10	30	100
UE52210030	10	10	30	80
UE52210035	10	10	35	90
UE52210040120	10	10	40	120
UE52210040	10	10	40	90
UE52210045	10	10	45	100
UE52210050200	10	10	50	200
UE52210050150	10	10	50	150
UE52210050	10	10	50	100
UE52210055	10	10	55	150
UE52210060200	10	10	60	200
UE52210060155	10	10	60	155
UE52210060	10	10	60	110
UE52211050	11	12	50	110
UE52212035	12	12	35	90
UE52212040120	12	12	40	120
UE52212040	12	12	40	100
UE52212045	12	12	45	130
UE52212050150	12	12	50	150
UE52212050	12	12	50	100
UE52212055	12	12	55	110
UE52212060200	12	12	60	200
UE52212060150	12	12	60	150
UE52212060	12	12	60	110
UE52212065	12	12	65	150
UE52212070200	12	12	70	200
UE52212070	12	12	70	120
UE52214040	14	16	40	110
UE52214050	14	16	50	110
UE52214060150	14	16	60	150

Designation	ØD	Ød	ℓ	L
UE52214060	14	16	60	120
UE52216040150	16	16	40	150
UE52216040	16	16	40	120
UE52216050150	16	16	50	150
UE52216050	16	16	50	110
UE52216060	16	16	60	120
UE52216070200	16	16	70	200
UE52216070150	16	16	70	150
UE52216070	16	16	70	130
UE52216080	16	16	80	150
UE52216090	16	16	90	150
UE522160110	16	16	110	200
UE522160120	16	16	120	250
UE52218050	18	20	50	120
UE52218060	18	18	60	120
UE52218070	18	20	70	130
UE522180100	18	20	100	200
UE52220050150	20	20	50	150
UE52220050	20	20	50	110
UE52220060	20	20	60	130
UE52220070	20	20	70	130
UE52220080	20	20	80	150
UE52220090200	20	20	90	200
UE52220090	20	20	90	150
UE522200110	20	20	110	200
UE522200120	20	20	120	250
UE52222075	22	20	75	150
UE522220110	22	20	110	200
UE52225070	25	25	70	150
UE52225090	25	25	90	150
UE522250110	25	25	110	200
UE522250120	25	25	120	250

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UXE502

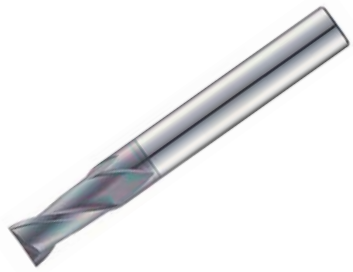
2 flutes flat Endmill for heavy cuts

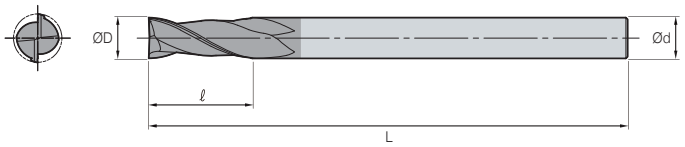
CARBIDE | 2 | 30° HELIX | AlCrN | DATA

p.472

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø7	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	





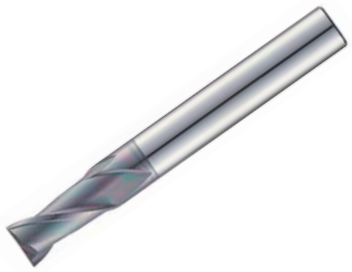
(mm)

Designation	ØD	Ød	ℓ	L
UXE502001001	0.1	4	0.1	40
UXE502001	0.1	4	0.2	40
UXE502001003	0.1	4	0.3	40
UXE502002002	0.2	4	0.2	40
UXE502002	0.2	4	0.4	40
UXE502002006	0.2	4	0.6	40
UXE502003003	0.3	4	0.3	40
UXE502003	0.3	4	0.6	40
UXE502003009	0.3	4	0.9	40
UXE502004004	0.4	4	0.4	40
UXE502004	0.4	4	0.8	40
UXE502004012	0.4	4	1.2	40
UXE502005005	0.5	4	0.5	40
UXE502005	0.5	4	1	40
UXE502005015	0.5	4	1.5	40
UXE502006006	0.6	4	0.6	40
UXE502006	0.6	4	1.2	40
UXE502006018	0.6	4	1.8	40
UXE502007007	0.7	4	0.7	40
UXE502007	0.7	4	1.4	40
UXE502007021	0.7	4	2.1	40
UXE502008008	0.8	4	0.8	40
UXE502008	0.8	4	1.6	40
UXE502008024	0.8	4	2.4	40
UXE502009009	0.9	4	0.9	40
UXE502009	0.9	4	1.8	40
UXE502009027	0.9	4	2.7	40
UXE50201001	1	6	1	40
UXE50201002	1	6	2	40
UXE502010	1	6	2.5	50
UXE50201003	1	6	3	50
UXE50201004	1	6	4	50
UXE50201006	1	6	6	50
UXE50201202	1.2	6	2	40
UXE502012	1.2	6	3	50
UXE50201204	1.2	6	4	50
UXE50201206	1.2	6	6	50

Designation	ØD	Ød	ℓ	L
UXE502015015	1.5	6	1.5	40
UXE50201503	1.5	6	3	40
UXE502015	1.5	6	4	50
UXE50201506	1.5	6	6	50
UXE50201508	1.5	6	8	50
UXE50201510	1.5	6	10	50
UXE50202002	2	6	2	40
UXE50202004	2	6	4	40
UXE502020	2	6	6	50
UXE50202008	2	6	8	50
UXE50202010	2	6	10	50
UXE50202012	2	6	12	50
UXE502025025	2.5	6	2.5	40
UXE50202505	2.5	6	5	40
UXE502025	2.5	6	7	50
UXE50202510	2.5	6	10	50
UXE50202512	2.5	6	12	50
UXE50203003	3	6	3	40
UXE50203006	3	6	6	40
UXE502030	3	6	8	50
UXE50203010	3	6	10	50
UXE50203012	3	6	12	50
UXE50203014	3	6	14	50
UXE50203510	3.5	6	10	50
UXE50204004	4	6	4	40
UXE50204008	4	6	8	40
UXE502040	4	6	10	50
UXE50204012	4	6	12	50
UXE50204014	4	6	14	50
UXE50204016	4	6	16	50
UXE50204511	4.5	6	11	50
UXE50205005	5	6	5	50
UXE50205010	5	6	10	50
UXE502050	5	6	15	60
UXE50205020	5	6	20	60
UXE50205025	5	6	25	60
UXE50205513	5.5	6	13	50

UXE502

2 flutes flat Endmill for heavy cuts

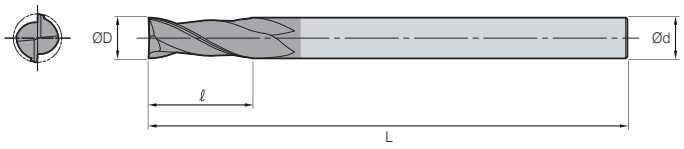


CARBIDE | 2 | 30° HELIX | AlCrN | DATA

p.472

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø7	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	ØD	Ød	ℓ	L
UXE50206006	6	6	6	50
UXE50206012	6	6	12	50
UXE502060	6	6	15	60
UXE50206020	6	6	20	60
UXE50206025	6	6	25	60
UXE50206513	6.5	8	13	60
UXE50207018	7	8	18	60
UXE50208016	8	8	16	60
UXE502080	8	8	20	70
UXE50208025	8	8	25	70
UXE50208030	8	8	30	70
UXE50210022	10	10	22	65

Designation	ØD	Ød	ℓ	L
UXE502100	10	10	25	75
UXE50210030	10	10	30	75
UXE50210035	10	10	35	75
UXE50212026	12	12	26	70
UXE502120	12	12	30	80
UXE50212035	12	12	35	80
UXE50212040	12	12	40	80
UXE502140	14	16	35	100
UXE502160	16	16	32	100
UXE50216040	16	16	40	100
UXE502180	18	20	45	100
UXE502200	20	20	45	100

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UE504H

4 flutes 45° helix flat Endmill

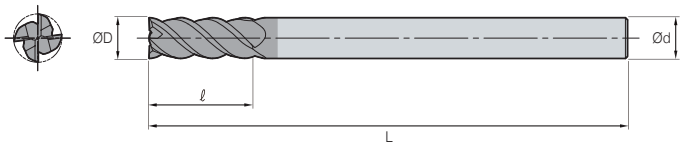


CARBIDE | 4 | 45° HELIX | AlCrN | DATA

p.478

• TOLERANCE

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

Designation	ØD	Ød	ℓ	L
UE504H010	1	6	2.5	50
UE504H01004	1	6	4	60
UE504H01006	1	6	6	60
UE504H015	1.5	6	4	50
UE504H01506	1.5	6	6	60
UE504H01508	1.5	6	8	60
UE504H020	2	6	6	50
UE504H02008	2	6	8	60
UE504H02010	2	6	10	60
UE504H030	3	6	8	50
UE504H03010	3	6	10	70
UE504H03012	3	6	12	70
UE504H03016	3	6	16	70
UE504H040	4	6	10	50
UE504H04012	4	6	12	70
UE504H04016	4	6	16	70
UE504H04020	4	6	20	70
UE504H050	5	6	15	50
UE504H05030	5	6	30	80
UE504H060	6	6	15	60
UE504H06020	6	6	20	70

Designation	ØD	Ød	ℓ	L
UE504H06030	6	6	30	80
UE504H080	8	8	20	70
UE504H08030	8	8	30	80
UE504H08035	8	8	35	90
UE504H08040	8	8	40	90
UE504H100	10	10	25	75
UE504H10030	10	10	30	80
UE504H10040	10	10	40	90
UE504H10050	10	10	50	100
UE504H120	12	12	30	80
UE504H12040	12	12	40	90
UE504H12050	12	12	50	100
UE504H12060	12	12	60	110
UE504H160	16	16	40	100
UE504H16050	16	16	50	110
UE504H16060	16	16	60	120
UE504H160110	16	16	110	200
UE504H200	20	20	45	100
UE504H20060	20	20	60	120
UE504H20070	20	20	70	130
UE504H200110	20	20	110	200

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UE514

4 flutes long neck flat Endmill

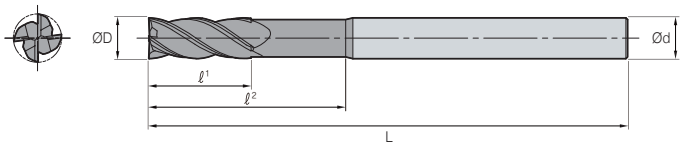
CARBIDE | 4 | 35° HELIX | AlCrN | DATA

p.479

• TOLERANCE

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.03mm	h5





(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
UE51401002	1	4	1.5	2	50
UE51401003	1	4	1.5	3	50
UE51401004	1	4	1.5	4	50
UE51401005	1	4	1.5	5	50
UE51401006	1	4	1.5	6	50
UE51401007	1	4	1.5	7	50
UE51401008	1	4	1.5	8	50
UE51401010	1	4	1.5	10	50
UE51401012	1	4	1.5	12	50
UE51401014	1	4	1.5	14	50
UE51401016	1	4	1.5	16	50
UE51401018	1	4	1.5	18	50
UE51401020	1	4	1.5	20	50
UE51401022	1	4	1.5	22	60
UE51401026	1	4	1.5	26	60
UE51401030	1	4	1.5	30	70
UE51401040	1	4	1.5	40	80
UE51401050	1	4	1.5	50	100
UE51401204	1.2	4	1.8	4	50
UE51401206	1.2	4	1.8	6	50
UE51401208	1.2	4	1.8	8	50
UE51401210	1.2	4	1.8	10	50
UE51401212	1.2	4	1.8	12	50
UE51401214	1.2	4	1.8	14	50
UE51401216	1.2	4	1.8	16	50
UE51401220	1.2	4	1.8	20	50
UE51401226	1.2	4	1.8	26	60
UE51401230	1.2	4	1.8	30	70
UE51401504	1.5	4	2.3	4	50
UE51401505	1.5	4	2.3	5	50
UE51401506	1.5	4	2.3	6	50
UE51401507	1.5	4	2.3	7	50
UE51401508	1.5	4	2.3	8	50
UE51401510	1.5	4	2.3	10	50
UE51401512	1.5	4	2.3	12	50
UE51401514	1.5	4	2.3	14	50
UE51401516	1.5	4	2.3	16	50

Designation	ØD	Ød	ℓ1	ℓ2	L
UE51401518	1.5	4	2.3	18	50
UE51401520	1.5	4	2.3	20	50
UE51401522	1.5	4	2.3	22	60
UE51401526	1.5	4	2.3	26	60
UE51401530	1.5	4	2.3	30	70
UE51402006	2	4	3	6	50
UE51402008	2	4	3	8	50
UE51402010	2	4	3	10	50
UE51402012	2	4	3	12	50
UE51402014	2	4	3	14	50
UE51402016	2	4	3	16	50
UE51402018	2	4	3	18	50
UE51402020	2	4	3	20	50
UE51402022	2	4	3	22	60
UE51402026	2	4	3	26	60
UE51402030	2	4	3	30	70
UE51402035	2	4	3	35	70
UE51402040	2	4	3	40	80
UE51402045	2	4	3	45	90
UE51402050	2	4	3	50	100
UE51402060	2	4	3	60	110
UE51402508	2.5	4	4	8	50
UE51402510	2.5	4	4	10	50
UE51402512	2.5	4	4	12	50
UE51402514	2.5	4	4	14	50
UE51402516	2.5	4	4	16	50
UE51402518	2.5	4	4	18	50
UE51402520	2.5	4	4	20	50
UE51402522	2.5	4	4	22	60
UE51402526	2.5	4	4	26	60
UE51402530	2.5	4	4	30	70
UE51402535	2.5	4	4	35	70
UE51402540	2.5	4	4	40	80
UE51402545	2.5	4	4	45	90
UE51402550	2.5	4	4	50	100
UE51403006	3	6	4.5	6	50
UE51403008	3	6	4.5	8	50

U-Star Endmill

UE514

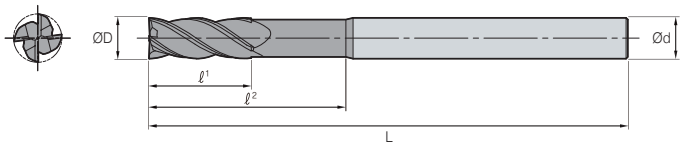
4 flutes long neck flat Endmill



CARBIDE | 4 | 35° HELIX | AlCrN | DATA p.479

• TOLERANCE

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.03mm	h5



(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
UE51403010	3	6	4.5	10	50
UE51403012	3	6	4.5	12	50
UE51403014	3	6	4.5	14	60
UE51403016	3	6	4.5	16	60
UE51403018	3	6	4.5	18	60
UE51403020	3	6	4.5	20	60
UE51403022	3	6	4.5	22	65
UE51403026	3	6	4.5	26	65
UE51403030	3	6	4.5	30	70
UE51403035	3	6	4.5	35	70
UE51403040	3	6	4.5	40	80
UE51403045	3	6	4.5	45	90
UE51403050	3	6	4.5	50	100
UE51403060	3	6	4.5	60	100
UE51404008	4	6	4.5	8	50
UE51404010	4	6	4.5	10	50
UE51404012	4	6	4.5	12	50
UE51404014	4	6	4.5	14	60
UE51404016	4	6	4.5	16	60
UE51404018	4	6	4.5	18	60
UE51404020	4	6	4.5	20	60
UE51404022	4	6	4.5	22	65
UE51404026	4	6	4.5	26	65
UE51404030	4	6	4.5	30	70
UE51404035	4	6	4.5	35	70

Designation	ØD	Ød	ℓ1	ℓ2	L
UE51404040	4	6	4.5	40	80
UE51404045	4	6	4.5	45	90
UE51404050	4	6	4.5	50	100
UE51404060	4	6	4.5	60	100
UE51405016	5	6	8	16	60
UE51405020	5	6	8	20	60
UE51405026	5	6	8	26	65
UE51405030	5	6	8	30	70
UE51405035	5	6	8	35	75
UE51405040	5	6	8	40	80
UE51405050	5	6	8	50	90
UE51405060	5	6	8	60	100
UE51406015	6	6	9	15	60
UE51406020	6	6	9	20	60
UE51406030	6	6	9	30	70
UE51406032	6	6	9	32	90
UE51408025	8	8	12	25	70
UE51408030	8	8	12	30	80
UE51408042	8	8	12	42	100
UE51410030	10	10	15	30	75
UE51410035	10	10	15	35	80
UE51410045	10	10	15	45	100
UE51412035	12	12	20	35	80
UE51412040	12	12	20	40	90
UE51412050	12	12	20	50	110

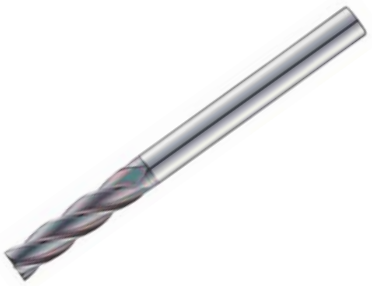
• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UE524

4 flutes flat Endmill

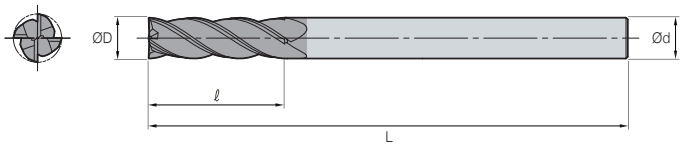


CARBIDE | 4 | 35° HELIX | AlCrN | DATA

p.479

• TOLERANCE

ØD		Ød
Ø1 ~ Ø25	0 ~ -0.03mm	h5



(mm)

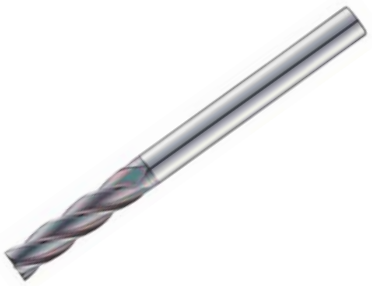
Designation	ØD	Ød	ℓ	L
UE52401003	1	6	3	60
UE52401004	1	6	4	60
UE52401005	1	6	5	60
UE52401006	1	6	6	60
UE52401007	1	6	7	60
UE52401008	1	6	8	60
UE52401010	1	6	10	60
UE52401012	1	6	12	60
UE52401204	1.2	6	4	60
UE52401206	1.2	6	6	60
UE52401208	1.2	6	8	60
UE52401210	1.2	6	10	60
UE52401212	1.2	6	12	60
UE52401506	1.5	6	6	60
UE52401508	1.5	6	8	60
UE52401510	1.5	6	10	60
UE52401512	1.5	6	12	60
UE52401514	1.5	6	14	60
UE52401516	1.5	6	16	60
UE52401520	1.5	6	20	60
UE52401526	1.5	6	26	60
UE52402008	2	6	8	60
UE52402008S4	2	4	8	40
UE52402010	2	6	10	60
UE52402012	2	6	12	60
UE52402014	2	6	14	60
UE52402016	2	6	16	60
UE52402510	2.5	6	10	60
UE52402512	2.5	6	12	60
UE52402516	2.5	6	16	60
UE52402520	2.5	6	20	60
UE52402526	2.5	6	26	60
UE52403010	3	6	10	70
UE52403012	3	6	12	70
UE52403014	3	6	14	70
UE52403016	3	6	16	70
UE52403016S3	3	3	16	100
UE52403020	3	6	20	70
UE52403026	3	6	26	70
UE52403030	3	6	30	70
UE52403035	3	6	35	90

Designation	ØD	Ød	ℓ	L
UE52404012	4	6	12	70
UE52404016	4	6	16	70
UE52404020	4	6	20	70
UE52404020S4	4	4	20	100
UE52404026	4	6	26	70
UE52404030	4	6	30	70
UE52405015	5	6	15	70
UE52405020	5	6	20	70
UE52405025100	5	6	25	100
UE52405025	5	6	25	70
UE52405030	5	6	30	80
UE52405035	5	6	35	90
UE52405040	5	6	40	100
UE52406015080	6	6	15	80
UE52406015	6	6	15	60
UE52406020090	6	6	20	90
UE52406020	6	6	20	70
UE52406025	6	6	25	75
UE52406030150	6	6	30	150
UE52406030100	6	6	30	100
UE52406030	6	6	30	80
UE52406030100	6	6	30	100
UE52406030	6	6	30	80
UE52406035	6	6	35	90
UE52406040120	6	6	40	120
UE52406040	6	6	40	90
UE52406045	6	6	45	150
UE52407035	7	8	35	85
UE52408020	8	8	20	100
UE52408025	8	8	25	80
UE52408030100	8	8	30	100
UE52408030	8	8	30	80
UE52408035	8	8	35	90
UE52408040150	8	8	40	150
UE52408040120	8	8	40	120
UE52408040	8	8	40	90
UE52408045	8	8	45	100
UE52408050150	8	8	50	150
UE52408050	8	8	50	100
UE52408060	8	8	60	155
UE52408080	8	8	80	200

U-Star Endmill

UE524

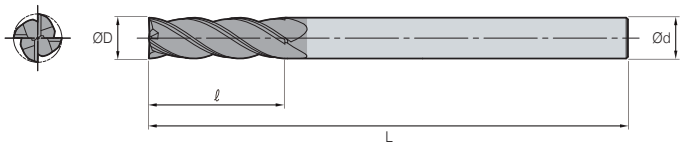
4 flutes flat Endmill



CARBIDE | 4 | 35° HELIX | AlCrN | DATA p.479

• TOLERANCE

ØD		Ød
Ø1 ~ Ø25	0 ~ -0.03mm	h5



(mm)

Designation	ØD	Ød	ℓ	L
UE52409045	9	10	45	100
UE52410025	10	10	25	100
UE524100100	10	10	30	100
UE52410030	10	10	30	80
UE52410035	10	10	35	90
UE52410040120	10	10	40	120
UE52410040	10	10	40	90
UE52410045	10	10	45	100
UE52410050200	10	10	50	200
UE52410050150	10	10	50	150
UE52410050	10	10	50	100
UE52410055	10	10	55	150
UE52410060200	10	10	60	200
UE52410060155	10	10	60	155
UE52410060	10	10	60	110
UE52410080200	10	10	80	200
UE52411050	11	12	50	110
UE52412030	12	12	30	110
UE52412035	12	12	35	90
UE52412040120	12	12	40	120
UE52412040	12	12	40	100
UE52412045	12	12	45	130
UE52412050150	12	12	50	150
UE52412050	12	12	50	100
UE52412055	12	12	55	110
UE52412060200	12	12	60	200
UE52412060150	12	12	60	150
UE52412060	12	12	60	110
UE52412065	12	12	65	150
UE52412070200	12	12	70	200
UE52412070	12	12	70	120
UE52412080	12	12	80	200
UE52414040	14	16	40	110
UE52414050	14	16	50	110
UE52414060	14	16	60	150

Designation	ØD	Ød	ℓ	L
UE52416040	16	16	40	150
UE52416050150	16	16	50	150
UE52416050	16	16	50	110
UE52416060	16	16	60	120
UE52416070200	16	16	70	200
UE52416070150	16	16	70	150
UE52416070	16	16	70	130
UE52416080	16	16	80	150
UE52416090	16	16	90	150
UE524160100	16	16	100	200
UE524160110	16	16	110	200
UE524160120	16	16	120	250
UE52418050	18	20	50	120
UE52418070	18	20	70	130
UE524180100	18	20	100	200
UE52420050150	20	20	50	150
UE52420050	20	20	50	110
UE52420060	20	20	60	130
UE52420070	20	20	70	130
UE52420080	20	20	80	150
UE52420090200	20	20	90	200
UE52420090	20	20	90	150
UE524200100	20	20	100	200
UE524200110	20	20	110	200
UE524200120	20	20	120	250
UE524200130	20	20	130	250
UE52422075	22	20	75	150
UE524220110	22	20	110	200
UE52425070	25	25	70	150
UE52425090	25	25	90	150
UE524250100	25	25	100	200
UE524250110	25	25	110	200
UE524250120	25	25	120	250
UE524250150	25	25	150	250

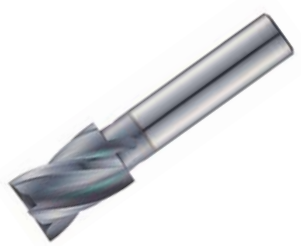
• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

ULE504

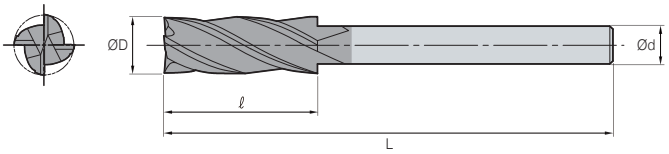
4 flutes automatic CNC flat Endmill



CARBIDE | 4 | 30° HELIX | AlCrN | DATA p.480

• TOLERANCE

ØD		Ød
Ø3 ~ Ø16	0 ~ -0.02mm	h5



(mm)

Designation	ØD	Ød	ℓ	L
ULE504030S04	3	4	3	35
ULE504040S04	4	4	4	35
ULE504060S06	6	6	6	35
ULE504070S07	7	7	20	45
ULE504080S08	8	8	8	45
ULE504080S06	8	6	8	35
ULE504080S07	8	7	15	45
ULE504090S07	9	7	15	45
ULE504100S06	10	6	10	35
ULE504100S10	10	10	15	45
ULE504100S07	10	7	15	45
ULE504110S07	11	7	15	45
ULE504120S10	12	10	12	45
ULE504120S06	12	6	12	35
ULE504120S07	12	7	15	45
ULE504120-25S10	12	10	25	55
ULE504130S10	13	10	25	55
ULE504140S10	14	10	25	55
ULE504140S07	14	7	25	55
ULE504160S10	16	10	25	60

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UE504

4 flutes flat Endmill

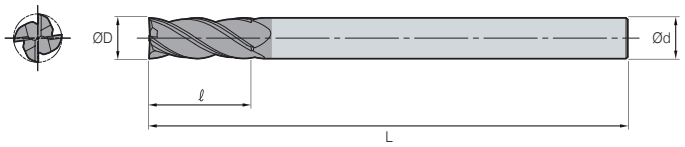
CARBIDE | 4 | 34° HELIX | 36° HELIX | AlCrN | DATA

p.480

• TOLERANCE

ØD		Ød
Ø0.8 ~ Ø25	0 ~ -0.03mm	h5





(mm)

Designation	ØD	Ød	ℓ	L
UE504008	0.8	4	1.6	40
UE504009	0.9	4	1.8	40
UE504010	1	6	2.5	50
UE504012	1.2	6	3	50
UE504015	1.5	6	4	50
UE504020	2	6	6	50
UE504025	2.5	6	7	50
UE504030	3	6	8	50
UE504035	3.5	6	10	50
UE504040	4	6	10	50
UE504045	4.5	6	14	50
UE504050	5	6	15	60
UE504055	5.5	6	15	60
UE504060	6	6	15	60
UE504065	6.5	8	18	60
UE504070	7	8	20	60
UE504075	7.5	8	20	60
UE504080	8	8	20	70
UE504085	8.5	10	22	70
UE504090	9	10	22	70
UE504095	9.5	10	24	70
UE504100	10	10	25	75

Designation	ØD	Ød	ℓ	L
UE504105	10.5	12	26	75
UE504110	11	12	30	75
UE504115	11.5	12	30	80
UE504120	12	12	30	80
UE504125	12.5	12	30	80
UE504130	13	12	35	100
UE504140	14	16	35	100
UE504140S14	14	14	35	100
UE504140S12	14	12	35	100
UE504150	15	16	38	100
UE504160	16	16	40	100
UE504170	17	16	42	100
UE504180	18	18	45	100
UE504180S16	18	16	45	100
UE504190	19	20	45	100
UE504200	20	20	45	100
UE504210	21	20	45	100
UE504220	22	20	45	100
UE504230	23	25	50	120
UE504240	24	25	50	120
UE504250	25	25	50	120

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UXE504

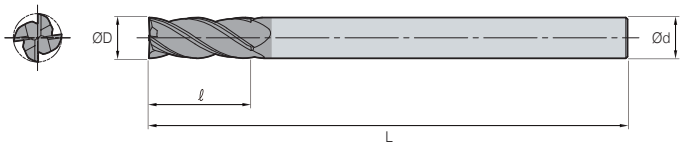
4 flutes flat Endmill for heavy cuts

CARBIDE | 4 | 34° HELIX | 36° HELIX | AlCrN | DATA p.480

• TOLERANCE

ØD		Ød
Ø1 ~ Ø25	0 ~ -0.03mm	h5





(mm)

Designation	ØD	Ød	ℓ	L
UXE50401001	1	6	1	40
UXE50401002	1	6	2	40
UXE504010	1	6	2.5	50
UXE50401003	1	6	3	50
UXE50401004	1	6	4	50
UXE50401006	1	6	6	50
UXE50401202	1.2	6	2	40
UXE504012	1.2	6	3	50
UXE50401204	1.2	6	4	50
UXE50401206	1.2	6	6	50
UXE504015015	1.5	6	1.5	40
UXE50401503	1.5	6	3	40
UXE504015	1.5	6	4	50
UXE50401506	1.5	6	6	50
UXE50401508	1.5	6	8	50
UXE50401510	1.5	6	10	50
UXE50402002	2	6	2	40
UXE50402004	2	6	4	40
UXE504020	2	6	6	50
UXE50402008	2	6	8	50
UXE50402010	2	6	10	50
UXE50402012	2	6	12	50
UXE504025025	2.5	6	2.5	40
UXE50402505	2.5	6	5	40
UXE504025	2.5	6	7	50
UXE50402510	2.5	6	10	50
UXE50402512	2.5	6	12	50
UXE50403003	3	6	3	40
UXE50403006	3	6	6	40
UXE504030	3	6	8	50
UXE50403010	3	6	10	50
UXE50403012	3	6	12	50
UXE50403014	3	6	14	50

Designation	ØD	Ød	ℓ	L
UXE50404004	4	6	4	40
UXE50404008	4	6	8	40
UXE504040	4	6	10	50
UXE50404012	4	6	12	50
UXE50404014	4	6	14	50
UXE50404016	4	6	16	50
UXE50405005	5	6	5	50
UXE50405010	5	6	10	50
UXE504050	5	6	15	60
UXE50405020	5	6	20	60
UXE50405025	5	6	25	60
UXE50406006	6	6	6	50
UXE50406012	6	6	12	50
UXE504060	6	6	15	60
UXE50406020	6	6	20	60
UXE50406025	6	6	25	60
UXE50408016	8	8	16	60
UXE504080	8	8	20	70
UXE50408025	8	8	25	70
UXE50408030	8	8	30	70
UXE50410022	10	10	22	65
UXE504100	10	10	25	75
UXE50410030	10	10	30	75
UXE50410035	10	10	35	75
UXE50412026	12	12	26	70
UXE504120	12	12	30	80
UXE50412035	12	12	35	80
UXE50412040	12	12	40	80
UXE504140	14	16	35	100
UXE50416032	16	16	32	100
UXE504160	16	16	40	100
UXE504180	18	20	45	100
UXE504200	20	20	45	100

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UE506

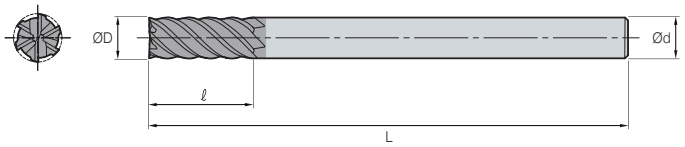
6 flutes flat Endmill



CARBIDE | 6 | 45° HELIX | AlCrN | DATA p.481

• TOLERANCE

ØD		Ød
Ø6 ~ Ø25	0 ~ -0.03mm	h5



(mm)

Designation	ØD	Ød	ℓ	L
UE506060	6	6	15	60
UE50606020	6	6	20	70
UE50606030110	6	6	30	110
UE50606030	6	6	30	80
UE506070	7	8	18	60
UE506080	8	8	20	70
UE50608030	8	8	30	80
UE50608035	8	8	35	90
UE50608040130	8	8	40	130
UE50608040	8	8	40	90
UE506090	9	10	22	70
UE506100	10	10	25	75
UE50610030	10	10	30	80
UE50610040	10	10	40	90
UE50610050150	10	10	50	150
UE50610050	10	10	50	100
UE506110	11	12	26	75
UE506120	12	12	30	80
UE50612040	12	12	40	90
UE50612050	12	12	50	100

Designation	ØD	Ød	ℓ	L
UE50612060150	12	12	60	150
UE50612060	12	12	60	110
UE506130	13	14	32	85
UE506140	14	14	32	85
UE506160	16	16	40	100
UE50616050	16	16	50	110
UE50616060	16	16	60	120
UE50616090	16	16	90	150
UE506160110250	16	16	110	250
UE506160110	16	16	110	200
UE506180	18	18	44	100
UE506200	20	20	45	100
UE50620060	20	20	60	120
UE50620070	20	20	70	130
UE506200110300	20	20	110	300
UE506200110250	20	20	110	250
UE506200110	20	20	110	200
UE506250	25	25	50	120
UE506251	25	25	92	180

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UTE502

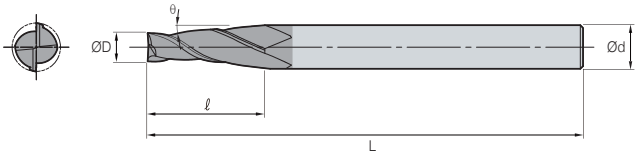
2 flutes tapered flat Endmill

CARBIDE | 2 | 30° HELIX | AlCrN | DATA p.482

• TOLERANCE

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.03mm	h5





(mm)

Designation	ØD	Ød	ℓ	θ	L
UTE502003005	0.3	4	1.2	0.5	40
UTE50200301	0.3	4	1.2	1	40
UTE502003015	0.3	4	1.2	1.5	40
UTE50200302	0.3	4	1.2	2	40
UTE50200303	0.3	4	1.5	3	40
UTE50200305	0.3	4	1.5	5	40
UTE50200307	0.3	4	1.5	7	40
UTE50200310	0.3	4	1.5	10	40
UTE502004005	0.4	4	1.6	0.5	40
UTE50200401	0.4	4	1.6	1	40
UTE502004015	0.4	4	1.6	1.5	40
UTE50200402	0.4	4	1.6	2	40
UTE50200403	0.4	4	1.6	3	40
UTE50200405	0.4	4	2	5	40
UTE50200407	0.4	4	2	7	40
UTE50200410	0.4	4	2	10	40
UTE502005005	0.5	4	2	0.5	45
UTE50200501	0.5	4	2	1	45
UTE502005015	0.5	4	2	1.5	45
UTE50200502	0.5	4	2	2	45
UTE50200503	0.5	4	2	3	45
UTE50200505	0.5	4	2.5	5	45
UTE50200507	0.5	4	2.5	7	45
UTE50200510	0.5	4	2.5	10	45
UTE502006005	0.6	4	2.4	0.5	45
UTE50200601	0.6	4	2.4	1	45
UTE502006015	0.6	4	2.4	1.5	45
UTE50200602	0.6	4	2.4	2	45
UTE50200603	0.6	4	2.4	3	45
UTE50200605	0.6	4	3	5	45
UTE50200607	0.6	4	3	7	45
UTE50200610	0.6	4	3	10	45
UTE502007005	0.7	4	2.8	0.5	45
UTE50200701	0.7	4	2.8	1	45
UTE502007015	0.7	4	2.8	1.5	45
UTE50200702	0.7	4	2.8	2	45

Designation	ØD	Ød	ℓ	θ	L
UTE50200703	0.7	4	2.8	3	45
UTE50200705	0.7	4	3.5	5	45
UTE50200707	0.7	4	3.5	7	45
UTE50200710	0.7	4	3.5	10	45
UTE502008005	0.8	4	3.2	0.5	45
UTE50200801	0.8	4	3.2	1	45
UTE502008015	0.8	4	3.2	1.5	45
UTE50200802	0.8	4	3.2	2	45
UTE50200803	0.8	4	3.2	3	45
UTE50200805	0.8	4	4	5	45
UTE50200807	0.8	4	4	7	45
UTE50200810	0.8	4	4	10	45
UTE502010005	1	4	4	0.5	50
UTE50201001	1	4	4	1	50
UTE502010015	1	4	4	1.5	50
UTE50201002	1	4	6	2	50
UTE50201003	1	4	6	3	50
UTE50201005	1	4	8	5	50
UTE50201007	1	4	8	7	50
UTE50201010	1	4	8	10	50
UTE502015005	1.5	4	6	0.5	50
UTE50201501	1.5	4	6	1	50
UTE502015015	1.5	4	6	1.5	50
UTE50201502	1.5	4	8	2	50
UTE50201503	1.5	4	8	3	50
UTE50201505	1.5	4	10	5	50
UTE50201507	1.5	4	10	7	50
UTE50201510	1.5	6	10	10	50
UTE502020005	2	4	8	0.5	50
UTE50202001	2	4	8	1	50
UTE502020015	2	4	8	1.5	50
UTE50202002	2	4	10	2	50
UTE50202003	2	4	10	3	50
UTE50202005	2	6	12	5	50
UTE50202007	2	6	12	7	50
UTE50202010	2	8	12	10	50

U-Star Endmill

UTE502

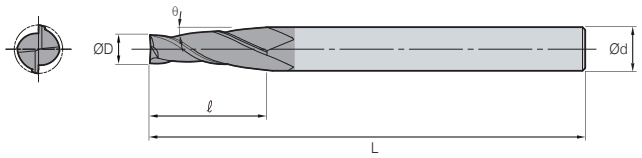
2 flutes tapered flat Endmill

CARBIDE | 2 | 30° HELIX | AlCrN | DATA p.482

• TOLERANCE

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.03mm	h5





(mm)

Designation	ØD	Ød	ℓ	θ	L
UTE502025005	2.5	6	10	0.5	50
UTE50202501	2.5	6	10	1	50
UTE502025015	2.5	6	10	1.5	50
UTE50202502	2.5	6	12	2	50
UTE50202503	2.5	6	12	3	50
UTE50202505	2.5	6	14	5	50
UTE50202507	2.5	6	14	7	50
UTE50202510	2.5	8	14	10	50
UTE502030005	3	6	12	0.5	50
UTE50203001	3	6	12	1	50
UTE502030015	3	6	12	1.5	50
UTE50203002	3	6	14	2	50
UTE50203003	3	6	14	3	50
UTE50203005	3	6	16	5	50
UTE50203007	3	8	16	7	50
UTE50203010	3	10	16	10	50
UTE502040005	4	6	16	0.5	60
UTE50204001	4	6	16	1	60
UTE502040015	4	6	16	1.5	60
UTE50204002	4	6	16	2	60
UTE50204003	4	6	19	3	60
UTE50204005	4	8	22	5	65
UTE50204007	4	8	16	7	65
UTE50204010	4	10	17	10	65
UTE502060005	6	8	20	0.5	65
UTE50206001	6	8	20	1	65
UTE502060015	6	8	20	1.5	65
UTE50206002	6	8	20	2	65

Designation	ØD	Ød	ℓ	θ	L
UTE50206003	6	8	19	3	65
UTE50206005	6	10	22	5	75
UTE50206007	6	12	24	7	75
UTE50206010	6	12	17	10	75
UTE502070005	7	8	28	0.5	70
UTE50207001	7	8	28	1	70
UTE502070015	7	10	28	1.5	70
UTE50207002	7	10	28	2	80
UTE50207003	7	10	28	3	80
UTE50207005	7	12	28	5	80
UTE502080005	8	10	35	0.5	90
UTE50208001	8	10	35	1	90
UTE502080015	8	10	35	1.5	90
UTE50208002	8	10	28	2	90
UTE50208003	8	12	38	3	90
UTE50208005	8	16	45	5	100
UTE50208007	8	16	32	7	90
UTE50208010	8	20	34	10	100
UTE50208010S25	8	25	48	10	150
UTE502100005	10	12	40	0.5	90
UTE50210001	10	12	40	1	90
UTE502100015	10	12	38	1.5	90
UTE50210002	10	16	40	2	75
UTE50210003	10	16	40	3	100
UTE50210005	10	16	34	5	100
UTE50210007	10	20	40	7	90
UTE50210010	10	25	42	10	100

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UTE504

4 flutes tapered flat Endmill

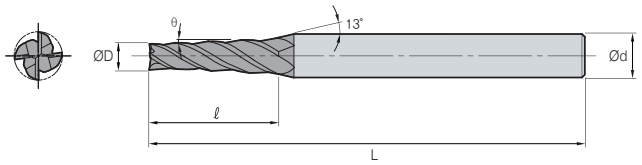
CARBIDE | 4 | 30° HELIX | AlCrN | DATA

p.482

• TOLERANCE

ØD		Ød
Ø0.8 ~ Ø12	0 ~ -0.08mm	h5





(mm)

Designation	ØD	Ød	ℓ	θ	L
UTE50400800504	0.8	4	4	0.5	45
UTE50400800506	0.8	4	6	0.5	45
UTE50400800508	0.8	4	8	0.5	45
UTE50400800510	0.8	4	10	0.5	45
UTE50400800512	0.8	4	12	0.5	45
UTE50400801004	0.8	4	4	1	45
UTE50400801006	0.8	4	6	1	45
UTE50400801008	0.8	4	8	1	45
UTE50400801010	0.8	4	10	1	45
UTE50400801012	0.8	4	12	1	45
UTE50400801504	0.8	4	4	1.5	45
UTE50400801506	0.8	4	6	1.5	45
UTE50400801508	0.8	4	8	1.5	45
UTE50400801510	0.8	4	10	1.5	45
UTE50400801512	0.8	4	12	1.5	45
UTE50400802004	0.8	4	4	2	45
UTE50400802006	0.8	4	6	2	45
UTE50400802008	0.8	4	8	2	45
UTE50400802010	0.8	4	10	2	45
UTE50400802012	0.8	4	12	2	45
UTE50401000504	1	4	4	0.5	50
UTE50401000506	1	4	6	0.5	50
UTE50401000508	1	4	8	0.5	50
UTE50401000510	1	4	10	0.5	50
UTE50401000512	1	4	12	0.5	50
UTE50401000516	1	4	16	0.5	50
UTE50401001004	1	4	4	1	50
UTE50401001006	1	4	6	1	50
UTE50401001008	1	4	8	1	50
UTE50401001010	1	4	10	1	50
UTE50401001012	1	4	12	1	50
UTE50401001016	1	4	16	1	50
UTE50401001504	1	4	4	1.5	50
UTE50401001506	1	4	6	1.5	50
UTE50401001508	1	4	8	1.5	50
UTE50401001510	1	4	10	1.5	50
UTE50401001512	1	4	12	1.5	50

Designation	ØD	Ød	ℓ	θ	L
UTE50401001516	1	4	16	1.5	50
UTE50401002004	1	4	4	2	50
UTE50401002006	1	4	6	2	50
UTE50401002008	1	4	8	2	50
UTE50401002010	1	4	10	2	50
UTE50401002012	1	4	12	2	50
UTE50401002016	1	4	16	2	50
UTE50401003004	1	4	4	3	50
UTE50401003006	1	4	6	3	50
UTE50401003008	1	4	8	3	50
UTE50401003010	1	4	10	3	50
UTE50401003012	1	4	12	3	50
UTE50401003016	1	4	16	3	50
UTE50401200506	1.2	4	6	0.5	50
UTE50401200508	1.2	4	8	0.5	50
UTE50401200510	1.2	4	10	0.5	50
UTE50401200512	1.2	4	12	0.5	50
UTE50401200516	1.2	4	16	0.5	50
UTE50401201006	1.2	4	6	1	50
UTE50401201008	1.2	4	8	1	50
UTE50401201010	1.2	4	10	1	50
UTE50401201012	1.2	4	12	1	50
UTE50401201016	1.2	4	16	1	50
UTE50401201506	1.2	4	6	1.5	50
UTE50401201508	1.2	4	8	1.5	50
UTE50401201510	1.2	4	10	1.5	50
UTE50401201512	1.2	4	12	1.5	50
UTE50401201516	1.2	4	16	1.5	50
UTE50401202006	1.2	4	6	2	50
UTE50401202008	1.2	4	8	2	50
UTE50401202010	1.2	4	10	2	50
UTE50401202012	1.2	4	12	2	50
UTE50401202016	1.2	4	16	2	50
UTE50401203006	1.2	4	6	3	50
UTE50401203008	1.2	4	8	3	50
UTE50401203010	1.2	4	10	3	50
UTE50401203012	1.2	4	12	3	50

U-Star Endmill

UTE504

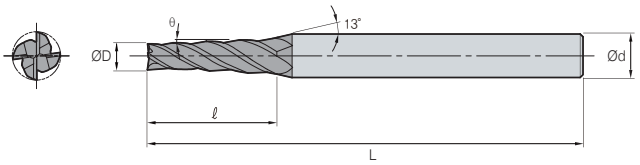
4 flutes tapered flat Endmill



CARBIDE | 4 | 30° HELIX | AlCrN | DATA p.482

• TOLERANCE

ØD		Ød
Ø0.8 ~ Ø12	0 ~ -0.08mm	h5



(mm)

Designation	ØD	Ød	ℓ	θ	L
UTE50401203016	1.2	4	16	3	50
UTE50401500506	1.5	4	6	0.5	50
UTE50401500508	1.5	4	8	0.5	50
UTE50401500510	1.5	4	10	0.5	50
UTE50401500512	1.5	4	12	0.5	50
UTE50401500516	1.5	4	16	0.5	50
UTE50401500520	1.5	4	20	0.5	60
UTE50401501006	1.5	4	6	1	50
UTE50401501008	1.5	4	8	1	50
UTE50401501010	1.5	4	10	1	50
UTE50401501012	1.5	4	12	1	50
UTE50401501016	1.5	4	16	1	50
UTE50401501020	1.5	4	20	1	60
UTE50401501506	1.5	4	6	1.5	50
UTE50401501508	1.5	4	8	1.5	50
UTE50401501510	1.5	4	10	1.5	50
UTE50401501512	1.5	4	12	1.5	50
UTE50401501516	1.5	4	16	1.5	50
UTE50401501520	1.5	4	20	1.5	60
UTE50401502006	1.5	4	6	2	50
UTE50401502008	1.5	4	8	2	50
UTE50401502010	1.5	4	10	2	50
UTE50401502012	1.5	4	12	2	50
UTE50401502016	1.5	4	16	2	50
UTE50401502020	1.5	4	20	2	60
UTE50401503006	1.5	4	6	3	50
UTE50401503008	1.5	4	8	3	50
UTE50401503010	1.5	4	10	3	50
UTE50401503012	1.5	4	12	3	50
UTE50401503016	1.5	4	16	3	50
UTE50401503020	1.5	4	20	3	60
UTE50402000508	2	4	8	0.5	50
UTE50402000510	2	4	10	0.5	50
UTE50402000512	2	4	12	0.5	50
UTE50402000516	2	4	16	0.5	50
UTE50402000520	2	4	20	0.5	60
UTE50402000525	2	4	25	0.5	60

Designation	ØD	Ød	ℓ	θ	L
UTE50402001008	2	4	8	1	50
UTE50402001010	2	4	10	1	50
UTE50402001012	2	4	12	1	50
UTE50402001016	2	4	16	1	50
UTE50402001020	2	4	20	1	60
UTE50402001025	2	4	25	1	60
UTE50402001508	2	4	8	1.5	50
UTE50402001510	2	4	10	1.5	50
UTE50402001512	2	4	12	1.5	50
UTE50402001516	2	4	16	1.5	50
UTE50402001520	2	4	20	1.5	60
UTE50402001525	2	4	25	1.5	60
UTE50402002008	2	4	8	2	50
UTE50402002010	2	4	10	2	50
UTE50402002012	2	4	12	2	50
UTE50402002016	2	4	16	2	50
UTE50402002020	2	4	20	2	60
UTE50402002025	2	4	25	2	60
UTE50402003008	2	4	8	3	50
UTE50402003010	2	4	10	3	50
UTE50402003012	2	4	12	3	50
UTE50402003016	2	4	16	3	50
UTE50402003020	2	6	20	3	60
UTE50402003025	2	6	25	3	60
UTE50402500510	2.5	4	10	0.5	50
UTE50402500512	2.5	4	12	0.5	50
UTE50402500516	2.5	4	16	0.5	50
UTE50402500520	2.5	4	20	0.5	60
UTE50402500525	2.5	4	25	0.5	60
UTE50402500530	2.5	4	30	0.5	60
UTE50402501010	2.5	4	10	1	50
UTE50402501012	2.5	4	12	1	50
UTE50402501016	2.5	4	16	1	50
UTE50402501020	2.5	4	20	1	60
UTE50402501025	2.5	4	25	1	60
UTE50402501030	2.5	4	30	1	60
UTE50402501510	2.5	4	10	1.5	50

UTE504

4 flutes tapered flat Endmill

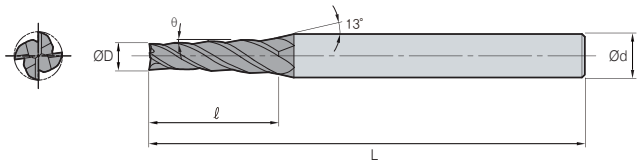
CARBIDE | 4 | 30° HELIX | AlCrN | DATA

p.482

• TOLERANCE

ØD		Ød
Ø0.8 ~ Ø12	0 ~ -0.08mm	h5





(mm)

Designation	ØD	Ød	ℓ	θ	L
UTE50402501512	2.5	4	12	1.5	50
UTE50402501516	2.5	4	16	1.5	50
UTE50402501520	2.5	4	20	1.5	60
UTE50402501525	2.5	4	25	1.5	60
UTE50402501530	2.5	6	30	1.5	60
UTE50402502010	2.5	4	10	2	50
UTE50402502012	2.5	4	12	2	50
UTE50402502016	2.5	4	16	2	50
UTE50402502020	2.5	4	20	2	60
UTE50402502025	2.5	6	25	2	60
UTE50402502030	2.5	6	30	2	60
UTE50402503010	2.5	4	10	3	50
UTE50402503012	2.5	4	12	3	50
UTE50402503016	2.5	6	16	3	50
UTE50402503020	2.5	6	20	3	60
UTE50402503025	2.5	6	25	3	60
UTE50402503030	2.5	6	30	3	60
UTE504030005	3	6	12	0.5	50
UTE50403001	3	6	12	1	50
UTE504030015	3	6	12	1.5	50
UTE50403002	3	6	14	2	50
UTE50403003	3	6	14	3	50
UTE50403005	3	6	16	5	50
UTE50403007	3	8	16	7	50
UTE50403010	3	10	16	10	50
UTE504040005	4	6	16	0.5	60
UTE50404001	4	6	16	1	60
UTE504040015	4	6	16	1.5	60
UTE50404002	4	6	16	2	60
UTE50404003	4	6	19	3	60
UTE50404005	4	8	22	5	65
UTE50404007	4	8	16	7	65

Designation	ØD	Ød	ℓ	θ	L
UTE50404010	4	10	17	10	65
UTE504060005	6	8	20	0.5	65
UTE50406001	6	8	20	1	65
UTE504060015	6	8	20	1.5	65
UTE50406002	6	8	20	2	65
UTE50406003	6	8	19	3	65
UTE50406005	6	10	22	5	75
UTE50406007	6	12	24	7	75
UTE50406010	6	12	17	10	75
UTE504070005	7	8	28	0.5	70
UTE50407001	7	8	28	1	70
UTE504070015	7	10	28	1.5	70
UTE50407002	7	10	28	2	80
UTE50407003	7	10	28	3	80
UTE50407005	7	12	28	5	80
UTE504080005	8	10	35	0.5	90
UTE50408001	8	10	35	1	90
UTE504080015	8	10	35	1.5	90
UTE50408002	8	10	28	2	90
UTE50408003	8	12	38	3	90
UTE50408005	8	16	45	5	100
UTE50408007	8	16	32	7	90
UTE50408010	8	20	34	10	100
UTE504100005	10	12	40	0.5	90
UTE50410001	10	12	40	1	90
UTE504100015	10	12	38	1.5	90
UTE50410002	10	16	40	2	90
UTE50410003	10	16	40	3	100
UTE50410005	10	16	34	5	100
UTE50410007	10	20	40	7	90
UTE50410010	10	25	42	10	100

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UR502

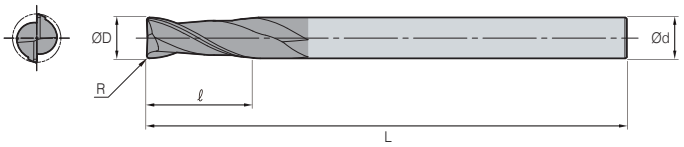
2 flutes radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 Corner R | AlCrN | DATA p.483

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø7 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
UR502002002	0.02	0.2	4	0.4	40
UR502002005	0.05	0.2	4	0.4	40
UR502003002	0.02	0.3	4	0.6	40
UR502003005	0.05	0.3	4	0.6	40
UR502004005	0.05	0.4	4	0.8	40
UR50200401	0.1	0.4	4	0.8	40
UR502005005	0.05	0.5	4	1	40
UR50200501	0.1	0.5	4	1	40
UR502006005	0.05	0.6	4	1.2	40
UR50200601	0.1	0.6	4	1.2	40
UR50200602	0.2	0.6	4	1.2	40
UR502007005	0.05	0.7	4	1.4	40
UR50200701	0.1	0.7	4	1.4	40
UR50200702	0.2	0.7	4	1.4	40
UR502008005	0.05	0.8	4	1.6	40
UR50200801	0.1	0.8	4	1.6	40
UR50200802	0.2	0.8	4	1.6	40
UR502009005	0.05	0.9	4	1.8	40
UR50200901	0.1	0.9	4	1.8	40
UR502010005	0.05	1	6	2.5	50
UR50201001	0.1	1	6	2.5	50
UR50201002	0.2	1	6	2.5	50
UR50201003	0.3	1	6	2.5	50
UR502012005	0.05	1.2	6	3	50
UR50201201	0.1	1.2	6	3	50
UR50201202	0.2	1.2	6	3	50
UR50201203	0.3	1.2	6	3	50
UR502015005	0.05	1.5	6	4	50
UR50201501	0.1	1.5	6	4	50
UR50201502	0.2	1.5	6	4	50
UR50201503	0.3	1.5	6	4	50
UR50201505	0.5	1.5	6	4	50
UR50202001	0.1	2	6	6	50
UR50202002	0.2	2	6	6	50
UR50202003	0.3	2	6	6	50
UR50202005	0.5	2	6	6	50
UR50202501	0.1	2.5	6	7	60
UR50202502	0.2	2.5	6	7	60
UR50202503	0.3	2.5	6	7	60

Designation	R	ØD	Ød	ℓ	L
UR50202505	0.5	2.5	6	7	60
UR50203001	0.1	3	6	8	60
UR50203002	0.2	3	6	8	60
UR50203003	0.3	3	6	8	60
UR50203005	0.5	3	6	8	60
UR50203010	1	3	6	8	60
UR50203501	0.1	3.5	6	10	70
UR50203502	0.2	3.5	6	10	70
UR50203503	0.3	3.5	6	10	70
UR50203505	0.5	3.5	6	10	70
UR50204001	0.1	4	6	10	70
UR50204001100S4	0.1	4	4	10	100
UR50204001S4	0.1	4	4	10	70
UR50204002	0.2	4	6	10	70
UR50204002100S4	0.2	4	4	10	100
UR50204002S4	0.2	4	4	10	70
UR50204003	0.3	4	6	10	70
UR50204003100S4	0.3	4	4	10	100
UR50204003S4	0.3	4	4	10	70
UR50204005	0.5	4	6	10	70
UR50204005100S4	0.5	4	4	10	100
UR50204005S4	0.5	4	4	10	70
UR50204010	1	4	6	10	70
UR50204010100S4	1	4	4	10	100
UR50204010S4	1	4	4	10	70
UR50204501	0.1	4.5	6	11	80
UR50204502	0.2	4.5	6	11	80
UR50204503	0.3	4.5	6	11	80
UR50204505	0.5	4.5	6	11	80
UR50205001	0.1	5	6	13	90
UR50205002	0.2	5	6	13	90
UR50205003	0.3	5	6	13	90
UR50205005	0.5	5	6	13	90
UR50205010	1	5	6	13	90
UR50205501	0.1	5.5	6	13	90
UR50205502	0.2	5.5	6	13	90
UR50205503	0.3	5.5	6	13	90
UR50205505	0.5	5.5	6	13	90
UR50205510	1	5.5	6	13	90

UR502

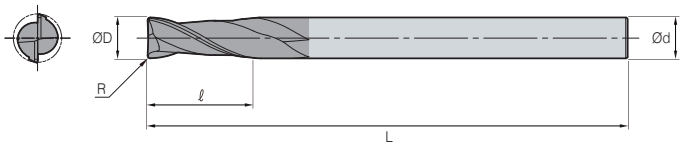
2 flutes radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 Corner R | AlCrN | DATA p.483

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø7 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
UR50206001	0.1	6	6	15	90
UR50206002	0.2	6	6	15	90
UR50206003	0.3	6	6	15	90
UR5020600360	0.3	6	6	15	60
UR50206005	0.5	6	6	15	90
UR50206005110	0.5	6	6	15	110
UR50206005130	0.5	6	6	15	130
UR5020600560	0.5	6	6	15	60
UR50206010	1	6	6	15	90
UR50206010110	1	6	6	15	110
UR50206010130	1	6	6	15	130
UR5020601060	1	6	6	15	60
UR50206015	1.5	6	6	15	90
UR50206020	2	6	6	15	90
UR50207001	0.1	7	8	16	90
UR50207002	0.2	7	8	16	90
UR50207003	0.3	7	8	16	90
UR50207005	0.5	7	8	16	90
UR50207010	1	7	8	16	90
UR50207020	2	7	8	16	90
UR50208001	0.1	8	8	20	100
UR50208002	0.2	8	8	20	100
UR50208003	0.3	8	8	20	100
UR5020800370	0.3	8	8	20	70
UR50208005	0.5	8	8	20	100
UR50208005120	0.5	8	8	20	120
UR50208005150	0.5	8	8	20	150
UR5020800570	0.5	8	8	20	70
UR50208010	1	8	8	20	100
UR50208010120	1	8	8	20	120
UR50208010150	1	8	8	20	150
UR5020801070	1	8	8	20	70
UR50208015	1.5	8	8	20	100
UR50208020	2	8	8	20	100
UR50208025	2.5	8	8	20	100
UR50208030	3	8	8	20	100
UR50210001	0.1	10	10	25	100
UR50210002	0.2	10	10	25	100
UR50210003	0.3	10	10	25	100

Designation	R	ØD	Ød	ℓ	L
UR5021000375	0.3	10	10	25	75
UR50210005	0.5	10	10	25	100
UR50210005130	0.5	10	10	25	130
UR50210005150	0.5	10	10	25	150
UR5021000575	0.5	10	10	25	75
UR50210010	1	10	10	25	100
UR50210010130	1	10	10	25	130
UR50210010150	1	10	10	25	150
UR5021001075	1	10	10	25	75
UR50210015	1.5	10	10	25	100
UR50210020	2	10	10	25	100
UR50210025	2.5	10	10	25	100
UR50210030	3	10	10	25	100
UR50210040	4	10	10	25	100
UR50211002	0.2	11	12	25	110
UR50211003	0.3	11	12	25	110
UR50211005	0.5	11	12	25	110
UR50211010	1	11	12	25	110
UR50211020	2	11	12	25	110
UR50212001	0.1	12	12	30	110
UR50212002	0.2	12	12	30	110
UR50212003	0.3	12	12	30	110
UR5021200380	0.3	12	12	30	80
UR50212005	0.5	12	12	30	110
UR50212005130	0.5	12	12	30	130
UR50212005150	0.5	12	12	30	150
UR5021200580	0.5	12	12	30	80
UR50212010	1	12	12	30	110
UR50212010130	1	12	12	30	130
UR50212010150	1	12	12	30	150
UR5021201080	1	12	12	30	80
UR50212015	1.5	12	12	30	110
UR50212020	2	12	12	30	110
UR50212025	2.5	12	12	30	110
UR50212030	3	12	12	30	110
UR50212040	4	12	12	30	110
UR50212050	5	12	12	30	110
UR50214005	0.5	14	16	30	150
UR50214010	1	14	16	30	150

U-Star Endmill

UR502

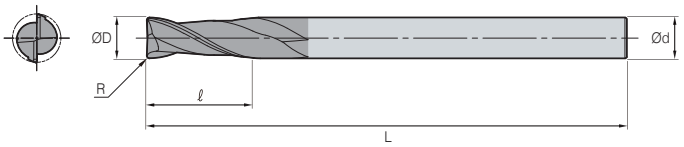
2 flutes radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 Corner R | AlCrN | DATA p.483

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø7 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
UR50214020	2	14	16	30	150
UR50216005	0.5	16	16	32	150
UR50216010	1	16	16	32	150
UR50216015	1.5	16	16	32	150
UR502002002	0.02	0.2	4	0.4	40
UR502002005	0.05	0.2	4	0.4	40
UR502003002	0.02	0.3	4	0.6	40
UR502003005	0.05	0.3	4	0.6	40
UR502004005	0.05	0.4	4	0.8	40
UR50200401	0.1	0.4	4	0.8	40
UR502005005	0.05	0.5	4	1	40
UR50200501	0.1	0.5	4	1	40
UR502006005	0.05	0.6	4	1.2	40
UR50200601	0.1	0.6	4	1.2	40
UR50200602	0.2	0.6	4	1.2	40
UR502007005	0.05	0.7	4	1.4	40
UR50200701	0.1	0.7	4	1.4	40
UR50200702	0.2	0.7	4	1.4	40
UR502008005	0.05	0.8	4	1.6	40
UR50200801	0.1	0.8	4	1.6	40
UR50200802	0.2	0.8	4	1.6	40
UR502009005	0.05	0.9	4	1.8	40
UR50200901	0.1	0.9	4	1.8	40
UR502010005	0.05	1	6	2.5	50
UR50201001	0.1	1	6	2.5	50
UR50201002	0.2	1	6	2.5	50
UR50201003	0.3	1	6	2.5	50
UR502012005	0.05	1.2	6	3	50
UR50201201	0.1	1.2	6	3	50
UR50201202	0.2	1.2	6	3	50
UR50201203	0.3	1.2	6	3	50
UR502015005	0.05	1.5	6	4	50
UR50201501	0.1	1.5	6	4	50

Designation	R	ØD	Ød	ℓ	L
UR50201502	0.2	1.5	6	4	50
UR50201503	0.3	1.5	6	4	50
UR50201505	0.5	1.5	6	4	50
UR50202001	0.1	2	6	6	50
UR50202002	0.2	2	6	6	50
UR50202003	0.3	2	6	6	50
UR50202005	0.5	2	6	6	50
UR50202501	0.1	2.5	6	7	60
UR50202502	0.2	2.5	6	7	60
UR50202503	0.3	2.5	6	7	60
UR50202505	0.5	2.5	6	7	60
UR50203001	0.1	3	6	8	60
UR50203002	0.2	3	6	8	60
UR50203003	0.3	3	6	8	60
UR50203005	0.5	3	6	8	60
UR50203010	1	3	6	8	60
UR50203501	0.1	3.5	6	10	70
UR50203502	0.2	3.5	6	10	70
UR50203503	0.3	3.5	6	10	70
UR50203505	0.5	3.5	6	10	70
UR50204001	0.1	4	6	10	70
UR50204001100S4	0.1	4	4	10	100
UR50204001S4	0.1	4	4	10	70
UR50204002	0.2	4	6	10	70
UR50204002100S4	0.2	4	4	10	100
UR50204002S4	0.2	4	4	10	70
UR50204003	0.3	4	6	10	70
UR50204003100S4	0.3	4	4	10	100
UR50204003S4	0.3	4	4	10	70
UR50204005	0.5	4	6	10	70
UR50204005100S4	0.5	4	4	10	100
UR50204005S4	0.5	4	4	10	70
UR50204010	1	4	6	10	70

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UR512

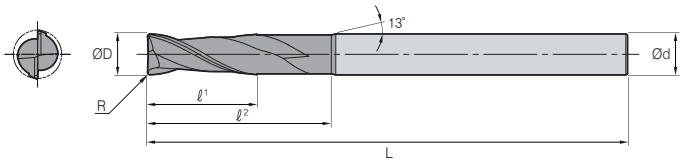
2 flutes neck type radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR512002002005	0.02	0.2	4	0.3	0.5	40
UR51200200201	0.02	0.2	4	0.3	1	40
UR512002002015	0.02	0.2	4	0.3	1.5	40
UR51200200202	0.02	0.2	4	0.3	2	40
UR512002005005	0.05	0.2	4	0.3	0.5	40
UR51200200501	0.05	0.2	4	0.3	1	40
UR512002005015	0.05	0.2	4	0.3	1.5	40
UR51200200502	0.05	0.2	4	0.3	2	40
UR51200300201	0.02	0.3	4	0.5	1	40
UR51200300202	0.02	0.3	4	0.5	2	40
UR51200300203	0.02	0.3	4	0.5	3	40
UR51200300501	0.05	0.3	4	0.5	1	40
UR51200300502	0.05	0.3	4	0.5	2	40
UR51200300503	0.05	0.3	4	0.5	3	40
UR51200400501	0.05	0.4	4	0.6	1	40
UR512004005015	0.05	0.4	4	0.6	1.5	40
UR51200400502	0.05	0.4	4	0.6	2	40
UR512004005025	0.05	0.4	4	0.6	2.5	40
UR51200400503	0.05	0.4	4	0.6	3	40
UR51200400504	0.05	0.4	4	0.6	4	40
UR5120040101	0.1	0.4	4	0.6	1	40
UR512004010l5	0.1	0.4	4	0.6	1.5	40
UR5120040102	0.1	0.4	4	0.6	2	40
UR51200401025	0.1	0.4	4	0.6	2.5	40
UR5120040103	0.1	0.4	4	0.6	3	40
UR5120040104	0.1	0.4	4	0.6	4	40
UR51200500501	0.05	0.5	4	0.7	1	45
UR512005005015	0.05	0.5	4	0.7	1.5	45
UR51200500502	0.05	0.5	4	0.7	2	45
UR512005005025	0.05	0.5	4	0.7	2.5	45
UR51200500503	0.05	0.5	4	0.7	3	45
UR51200500504	0.05	0.5	4	0.7	4	45
UR51200500505	0.05	0.5	4	0.7	5	45
UR51200500506	0.05	0.5	4	0.7	6	45
UR5120050101	0.1	0.5	4	0.7	1	45
UR51200501015	0.1	0.5	4	0.7	1.5	45
UR5120050102	0.1	0.5	4	0.7	2	45
UR51200501025	0.1	0.5	4	0.7	2.5	45

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR5120050103	0.1	0.5	4	0.7	3	45
UR5120050104	0.1	0.5	4	0.7	4	45
UR5120050105	0.1	0.5	4	0.7	5	45
UR5120050106	0.1	0.5	4	0.7	6	45
UR51200600502	0.05	0.6	4	0.9	2	45
UR51200600503	0.05	0.6	4	0.9	3	45
UR51200600504	0.05	0.6	4	0.9	4	45
UR51200600506	0.05	0.6	4	0.9	6	45
UR51200600508	0.05	0.6	4	0.9	8	45
UR51200600510	0.05	0.6	4	0.9	10	45
UR5120060102	0.1	0.6	4	0.9	2	45
UR5120060103	0.1	0.6	4	0.9	3	45
UR5120060104	0.1	0.6	4	0.9	4	45
UR5120060106	0.1	0.6	4	0.9	6	45
UR5120060108	0.1	0.6	4	0.9	8	45
UR5120060110	0.1	0.6	4	0.9	10	45
UR5120060202	0.2	0.6	4	0.9	2	45
UR5120060203	0.2	0.6	4	0.9	3	45
UR5120060204	0.2	0.6	4	0.9	4	45
UR5120060206	0.2	0.6	4	0.9	6	45
UR5120060208	0.2	0.6	4	0.9	8	45
UR5120060210	0.2	0.6	4	0.9	10	45
UR51200700502	0.05	0.7	4	1.2	2	45
UR51200700504	0.05	0.7	4	1.2	4	45
UR51200700506	0.05	0.7	4	1.2	6	45
UR51200700508	0.05	0.7	4	1.2	8	45
UR51200700510	0.05	0.7	4	1.2	10	45
UR5120070102	0.1	0.7	4	1.2	2	45
UR5120070104	0.1	0.7	4	1.2	4	45
UR5120070106	0.1	0.7	4	1.2	6	45
UR5120070108	0.1	0.7	4	1.2	8	45
UR5120070110	0.1	0.7	4	1.2	10	45
UR5120070202	0.2	0.7	4	1.2	2	45
UR5120070204	0.2	0.7	4	1.2	4	45
UR5120070206	0.2	0.7	4	1.2	6	45
UR5120070208	0.2	0.7	4	1.2	8	45
UR5120070210	0.2	0.7	4	1.2	10	45
UR51200800502	0.05	0.8	4	1.2	2	45

U-Star Endmill

UR512

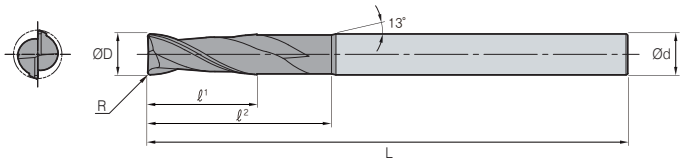
2 flutes neck type radius Endmill

CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	





(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR51200800503	0.05	0.8	4	1.2	3	45
UR51200800504	0.05	0.8	4	1.2	4	45
UR51200800506	0.05	0.8	4	1.2	6	45
UR51200800508	0.05	0.8	4	1.2	8	45
UR51200800510	0.05	0.8	4	1.2	10	45
UR5120080102	0.1	0.8	4	1.2	2	45
UR5120080103	0.1	0.8	4	1.2	3	45
UR5120080104	0.1	0.8	4	1.2	4	45
UR5120080106	0.1	0.8	4	1.2	6	45
UR5120080108	0.1	0.8	4	1.2	8	45
UR5120080110	0.1	0.8	4	1.2	10	45
UR5120080202	0.2	0.8	4	1.2	2	45
UR5120080203	0.2	0.8	4	1.2	3	45
UR5120080204	0.2	0.8	4	1.2	4	45
UR5120080206	0.2	0.8	4	1.2	6	45
UR5120080208	0.2	0.8	4	1.2	8	45
UR5120080210	0.2	0.8	4	1.2	10	45
UR51201000503	0.05	1	4	1.5	3	50
UR51201000504	0.05	1	4	1.5	4	50
UR51201000506	0.05	1	4	1.5	6	50
UR51201000508	0.05	1	4	1.5	8	50
UR51201000510	0.05	1	4	1.5	10	50
UR51201000512	0.05	1	4	1.5	12	50
UR51201000514	0.05	1	4	1.5	14	50
UR51201000516	0.05	1	4	1.5	16	50
UR51201000520	0.05	1	4	1.5	20	50
UR5120100103	0.1	1	4	1.5	3	50
UR5120100104	0.1	1	4	1.5	4	50
UR5120100106	0.1	1	4	1.5	6	50
UR5120100108	0.1	1	4	1.5	8	50
UR5120100110	0.1	1	4	1.5	10	50
UR5120100112	0.1	1	4	1.5	12	50
UR5120100114	0.1	1	4	1.5	14	50
UR5120100116	0.1	1	4	1.5	16	50
UR5120100120	0.1	1	4	1.5	20	50
UR5120100203	0.2	1	4	1.5	3	50
UR5120100204	0.2	1	4	1.5	4	50
UR5120100206	0.2	1	4	1.5	6	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR5120100208	0.2	1	4	1.5	8	50
UR5120100210	0.2	1	4	1.5	10	50
UR5120100212	0.2	1	4	1.5	12	50
UR5120100214	0.2	1	4	1.5	14	50
UR5120100216	0.2	1	4	1.5	16	50
UR5120100220	0.2	1	4	1.5	20	50
UR5120100303	0.3	1	4	1.5	3	50
UR5120100304	0.3	1	4	1.5	4	50
UR5120100306	0.3	1	4	1.5	6	50
UR5120100308	0.3	1	4	1.5	8	50
UR5120100310	0.3	1	4	1.5	10	50
UR5120100312	0.3	1	4	1.5	12	50
UR5120100314	0.3	1	4	1.5	14	50
UR5120100316	0.3	1	4	1.5	16	50
UR5120100320	0.3	1	4	1.5	20	50
UR51201200503	0.05	1.2	4	1.8	3	50
UR51201200504	0.05	1.2	4	1.8	4	50
UR51201200506	0.05	1.2	4	1.8	6	50
UR51201200508	0.05	1.2	4	1.8	8	50
UR51201200510	0.05	1.2	4	1.8	10	50
UR51201200512	0.05	1.2	4	1.8	12	50
UR51201200516	0.05	1.2	4	1.8	16	50
UR51201200520	0.05	1.2	4	1.8	20	50
UR5120120103	0.1	1.2	4	1.8	3	50
UR5120120104	0.1	1.2	4	1.8	4	50
UR5120120106	0.1	1.2	4	1.8	6	50
UR5120120108	0.1	1.2	4	1.8	8	50
UR5120120110	0.1	1.2	4	1.8	10	50
UR5120120112	0.1	1.2	4	1.8	12	50
UR5120120116	0.1	1.2	4	1.8	16	50
UR5120120120	0.1	1.2	4	1.8	20	50
UR5120120203	0.2	1.2	4	1.8	3	50
UR5120120204	0.2	1.2	4	1.8	4	50
UR5120120206	0.2	1.2	4	1.8	6	50
UR5120120208	0.2	1.2	4	1.8	8	50
UR5120120210	0.2	1.2	4	1.8	10	50
UR5120120212	0.2	1.2	4	1.8	12	50
UR5120120216	0.2	1.2	4	1.8	16	50

UR512

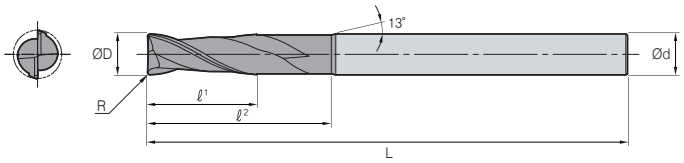
2 flutes neck type radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR5120120220	0.2	1.2	4	1.8	20	50
UR5120120303	0.3	1.2	4	1.8	3	50
UR5120120304	0.3	1.2	4	1.8	4	50
UR5120120306	0.3	1.2	4	1.8	6	50
UR5120120308	0.3	1.2	4	1.8	8	50
UR5120120310	0.3	1.2	4	1.8	10	50
UR5120120312	0.3	1.2	4	1.8	12	50
UR5120120316	0.3	1.2	4	1.8	16	50
UR5120120320	0.3	1.2	4	1.8	20	50
UR51201500504	0.05	1.5	4	2.3	4	50
UR51201500506	0.05	1.5	4	2.3	6	50
UR51201500508	0.05	1.5	4	2.3	8	50
UR51201500510	0.05	1.5	4	2.3	10	50
UR51201500512	0.05	1.5	4	2.3	12	50
UR51201500514	0.05	1.5	4	2.3	14	50
UR51201500516	0.05	1.5	4	2.3	16	50
UR51201500520	0.05	1.5	4	2.3	20	50
UR51201500522	0.05	1.5	4	2.3	22	60
UR51201500526	0.05	1.5	4	2.3	26	60
UR5120150104	0.1	1.5	4	2.3	4	50
UR5120150106	0.1	1.5	4	2.3	6	50
UR5120150108	0.1	1.5	4	2.3	8	50
UR5120150110	0.1	1.5	4	2.3	10	50
UR5120150112	0.1	1.5	4	2.3	12	50
UR5120150114	0.1	1.5	4	2.3	14	50
UR5120150116	0.1	1.5	4	2.3	16	50
UR5120150120	0.1	1.5	4	2.3	20	50
UR5120150122	0.1	1.5	4	2.3	22	60
UR5120150126	0.1	1.5	4	2.3	26	60
UR5120150204	0.2	1.5	4	2.3	4	50
UR5120150206	0.2	1.5	4	2.3	6	50
UR5120150208	0.2	1.5	4	2.3	8	50
UR5120150210	0.2	1.5	4	2.3	10	50
UR5120150212	0.2	1.5	4	2.3	12	50
UR5120150214	0.2	1.5	4	2.3	14	50
UR5120150216	0.2	1.5	4	2.3	16	50
UR5120150220	0.2	1.5	4	2.3	20	50
UR5120150222	0.2	1.5	4	2.3	22	60

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR5120150226	0.2	1.5	4	2.3	26	60
UR5120150304	0.3	1.5	4	2.3	4	50
UR5120150306	0.3	1.5	4	2.3	6	50
UR5120150308	0.3	1.5	4	2.3	8	50
UR5120150310	0.3	1.5	4	2.3	10	50
UR5120150312	0.3	1.5	4	2.3	12	50
UR5120150314	0.3	1.5	4	2.3	14	50
UR5120150316	0.3	1.5	4	2.3	16	50
UR5120150320	0.3	1.5	4	2.3	20	50
UR5120150322	0.3	1.5	4	2.3	22	60
UR5120150326	0.3	1.5	4	2.3	26	60
UR5120150504	0.5	1.5	4	2.3	4	50
UR5120150506	0.5	1.5	4	2.3	6	50
UR5120150508	0.5	1.5	4	2.3	8	50
UR5120150510	0.5	1.5	4	2.3	10	50
UR5120150512	0.5	1.5	4	2.3	12	50
UR5120150514	0.5	1.5	4	2.3	14	50
UR5120150516	0.5	1.5	4	2.3	16	50
UR5120150520	0.5	1.5	4	2.3	20	50
UR5120150522	0.5	1.5	4	2.3	22	60
UR5120150526	0.5	1.5	4	2.3	26	60
UR5120200106	0.1	2	4	3	6	50
UR5120200108	0.1	2	4	3	8	50
UR5120200110	0.1	2	4	3	10	50
UR5120200112	0.1	2	4	3	12	50
UR5120200114	0.1	2	4	3	14	50
UR5120200116	0.1	2	4	3	16	50
UR5120200120	0.1	2	4	3	20	50
UR5120200122	0.1	2	4	3	22	60
UR5120200126	0.1	2	4	3	26	60
UR5120200130	0.1	2	4	3	30	70
UR5120200206	0.2	2	4	3	6	50
UR5120200208	0.2	2	4	3	8	50
UR5120200210	0.2	2	4	3	10	50
UR5120200212	0.2	2	4	3	12	50
UR5120200214	0.2	2	4	3	14	50
UR5120200216	0.2	2	4	3	16	50
UR5120200220	0.2	2	4	3	20	50

U-Star Endmill

UR512

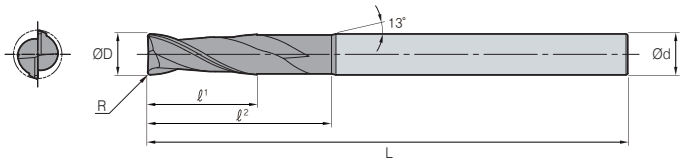
2 flutes neck type radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR5120200222	0.2	2	4	3	22	60
UR5120200226	0.2	2	4	3	26	60
UR5120200230	0.2	2	4	3	30	70
UR5120200306	0.3	2	4	3	6	50
UR5120200308	0.3	2	4	3	8	50
UR5120200310	0.3	2	4	3	10	50
UR5120200312	0.3	2	4	3	12	50
UR5120200314	0.3	2	4	3	14	50
UR5120200316	0.3	2	4	3	16	50
UR5120200320	0.3	2	4	3	20	50
UR5120200322	0.3	2	4	3	22	60
UR5120200326	0.3	2	4	3	26	60
UR5120200330	0.3	2	4	3	30	70
UR5120200506	0.5	2	4	3	6	50
UR5120200508	0.5	2	4	3	8	50
UR5120200510	0.5	2	4	3	10	50
UR5120200512	0.5	2	4	3	12	50
UR5120200514	0.5	2	4	3	14	50
UR5120200516	0.5	2	4	3	16	50
UR5120200520	0.5	2	4	3	20	50
UR5120200522	0.5	2	4	3	22	60
UR5120200526	0.5	2	4	3	26	60
UR5120200530	0.5	2	4	3	30	70
UR5120250108	0.1	2.5	4	4	8	50
UR5120250110	0.1	2.5	4	4	10	50
UR5120250112	0.1	2.5	4	4	12	50
UR5120250114	0.1	2.5	4	4	14	50
UR5120250116	0.1	2.5	4	4	16	50
UR5120250120	0.1	2.5	4	4	20	50
UR5120250126	0.1	2.5	4	4	26	60
UR5120250130	0.1	2.5	4	4	30	70
UR5120250208	0.2	2.5	4	4	8	50
UR5120250210	0.2	2.5	4	4	10	50
UR5120250212	0.2	2.5	4	4	12	50
UR5120250214	0.2	2.5	4	4	14	50
UR5120250216	0.2	2.5	4	4	16	50
UR5120250220	0.2	2.5	4	4	20	50
UR5120250226	0.2	2.5	4	4	26	60

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR5120250230	0.2	2.5	4	4	30	70
UR5120250308	0.3	2.5	4	4	8	50
UR5120250310	0.3	2.5	4	4	10	50
UR5120250312	0.3	2.5	4	4	12	50
UR5120250314	0.3	2.5	4	4	14	50
UR5120250316	0.3	2.5	4	4	16	50
UR5120250320	0.3	2.5	4	4	20	50
UR5120250326	0.3	2.5	4	4	26	60
UR5120250330	0.3	2.5	4	4	30	70
UR5120250508	0.5	2.5	4	4	8	50
UR5120250510	0.5	2.5	4	4	10	50
UR5120250512	0.5	2.5	4	4	12	50
UR5120250514	0.5	2.5	4	4	14	50
UR5120250516	0.5	2.5	4	4	16	50
UR5120250520	0.5	2.5	4	4	20	50
UR5120250526	0.5	2.5	4	4	26	60
UR5120250530	0.5	2.5	4	4	30	70
UR5120300108	0.1	3	6	4.5	8	50
UR5120300110	0.1	3	6	4.5	10	50
UR5120300112	0.1	3	6	4.5	12	50
UR5120300114	0.1	3	6	4.5	14	60
UR5120300116	0.1	3	6	4.5	16	60
UR5120300120	0.1	3	6	4.5	20	60
UR5120300126	0.1	3	6	4.5	26	65
UR5120300130	0.1	3	6	4.5	30	70
UR5120300135	0.1	3	6	4.5	35	70
UR5120300140	0.1	3	6	4.5	40	80
UR5120300208	0.2	3	6	4.5	8	50
UR5120300210	0.2	3	6	4.5	10	50
UR5120300212	0.2	3	6	4.5	12	50
UR5120300214	0.2	3	6	4.5	14	60
UR5120300216	0.2	3	6	4.5	16	60
UR5120300220	0.2	3	6	4.5	20	60
UR5120300226	0.2	3	6	4.5	26	65
UR5120300230	0.2	3	6	4.5	30	70
UR5120300235	0.2	3	6	4.5	35	70
UR5120300240	0.2	3	6	4.5	40	80
UR5120300308	0.3	3	6	4.5	8	50

UR512

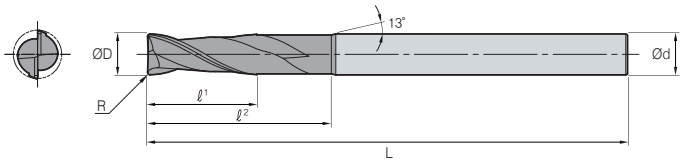
2 flutes neck type radius Endmill

CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	





(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR5120300310	0.3	3	6	4.5	10	50
UR5120300312	0.3	3	6	4.5	12	50
UR5120300314	0.3	3	6	4.5	14	60
UR5120300316	0.3	3	6	4.5	16	60
UR5120300320	0.3	3	6	4.5	20	60
UR5120300326	0.3	3	6	4.5	26	65
UR5120300330	0.3	3	6	4.5	30	70
UR5120300335	0.3	3	6	4.5	35	70
UR5120300340	0.3	3	6	4.5	40	80
UR5120300508	0.5	3	6	4.5	8	50
UR5120300510	0.5	3	6	4.5	10	50
UR5120300512	0.5	3	6	4.5	12	50
UR5120300514	0.5	3	6	4.5	14	60
UR5120300516	0.5	3	6	4.5	16	60
UR5120300520	0.5	3	6	4.5	20	60
UR5120300526	0.5	3	6	4.5	26	65
UR5120300530	0.5	3	6	4.5	30	70
UR5120300535	0.5	3	6	4.5	35	70
UR5120300540	0.5	3	6	4.5	40	80
UR5120301008	1	3	6	4.5	8	50
UR5120301010	1	3	6	4.5	10	50
UR5120301012	1	3	6	4.5	12	50
UR5120301014	1	3	6	4.5	14	60
UR5120301016	1	3	6	4.5	16	60
UR5120301020	1	3	6	4.5	20	60
UR5120301026	1	3	6	4.5	26	65
UR5120301030	1	3	6	4.5	30	70
UR5120301035	1	3	6	4.5	35	70
UR5120301040	1	3	6	4.5	40	80
UR5120400110	0.1	4	6	6	10	50
UR5120400112	0.1	4	6	6	12	50
UR5120400114	0.1	4	6	6	14	60
UR5120400116	0.1	4	6	6	16	60
UR5120400120	0.1	4	6	6	20	60
UR5120400126	0.1	4	6	6	26	65
UR5120400130	0.1	4	6	6	30	65
UR5120400135	0.1	4	6	6	35	70
UR5120400140	0.1	4	6	6	40	80

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR5120400145	0.1	4	6	6	45	90
UR5120400150	0.1	4	6	6	50	100
UR5120400210	0.2	4	6	6	10	50
UR5120400212	0.2	4	6	6	12	50
UR5120400214	0.2	4	6	6	14	60
UR5120400216	0.2	4	6	6	16	60
UR5120400220	0.2	4	6	6	20	60
UR5120400226	0.2	4	6	6	26	65
UR5120400230	0.2	4	6	6	30	65
UR5120400235	0.2	4	6	6	35	70
UR5120400240	0.2	4	6	6	40	80
UR5120400245	0.2	4	6	6	45	90
UR5120400250	0.2	4	6	6	50	100
UR5120400310	0.3	4	6	6	10	50
UR5120400312	0.3	4	6	6	12	50
UR5120400314	0.3	4	6	6	14	60
UR5120400316	0.3	4	6	6	16	60
UR5120400320	0.3	4	6	6	20	60
UR5120400326	0.3	4	6	6	26	65
UR5120400330	0.3	4	6	6	30	65
UR5120400335	0.3	4	6	6	35	70
UR5120400340	0.3	4	6	6	40	80
UR5120400345	0.3	4	6	6	45	90
UR5120400350	0.3	4	6	6	50	100
UR5120400510	0.5	4	6	6	10	50
UR5120400512	0.5	4	6	6	12	50
UR5120400514	0.5	4	6	6	14	60
UR5120400516	0.5	4	6	6	16	60
UR5120400520	0.5	4	6	6	20	60
UR5120400526	0.5	4	6	6	26	65
UR5120400530	0.5	4	6	6	30	65
UR5120400535	0.5	4	6	6	35	70
UR5120400540	0.5	4	6	6	40	80
UR5120400545	0.5	4	6	6	45	90
UR5120400550	0.5	4	6	6	50	100
UR5120401010	1	4	6	6	10	50
UR5120401012	1	4	6	6	12	50
UR5120401014	1	4	6	6	14	60

U-Star Endmill

UR512

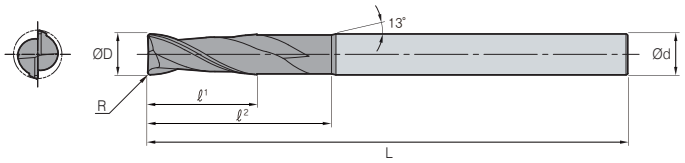
2 flutes neck type radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR5120401016	1	4	6	6	16	60
UR5120401020	1	4	6	6	20	60
UR5120401026	1	4	6	6	26	65
UR5120401030	1	4	6	6	30	65
UR5120401035	1	4	6	6	35	70
UR5120401040	1	4	6	6	40	80
UR5120401045	1	4	6	6	45	90
UR5120401050	1	4	6	6	50	100
UR51205001	0.1	5	6	8	15	60
UR51205002	0.2	5	6	8	15	60
UR51205003	0.3	5	6	8	15	60
UR51205005	0.5	5	6	8	15	60
UR51205010	1	5	6	8	15	60
UR51205015	1.5	5	6	8	15	60
UR51205020	2	5	6	8	15	60
UR51206001	0.1	6	6	9	20	60
UR51206002	0.2	6	6	9	20	60
UR51206003	0.3	6	6	9	20	60
UR5120600390	0.3	6	6	15	30	90
UR51206005	0.5	6	6	9	20	60
UR5120600590	0.5	6	6	15	30	90
UR51206010	1	6	6	9	20	60
UR5120601090	1	6	6	15	30	90
UR51206015	1.5	6	6	9	20	60
UR51206020	2	6	6	9	20	60
UR51208001	0.1	8	8	12	25	70
UR51208002	0.2	8	8	12	25	70
UR51208003	0.3	8	8	12	25	70
UR51208003100	0.3	8	8	20	35	100
UR51208005	0.5	8	8	12	25	70
UR51208005100	0.5	8	8	20	35	100

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UR51208010	1	8	8	12	25	70
UR51208010100	1	8	8	20	35	100
UR51208015	1.5	8	8	12	25	70
UR51208020	2	8	8	12	25	70
UR51210001	0.1	10	10	15	30	75
UR51210002	0.2	10	10	15	30	75
UR51210003	0.3	10	10	15	30	75
UR51210003100	0.3	10	10	25	40	100
UR51210005	0.5	10	10	15	30	75
UR51210005100	0.5	10	10	25	40	100
UR51210010	1	10	10	15	30	75
UR51210010100	1	10	10	25	40	100
UR51210015	1.5	10	10	15	30	75
UR51210020	2	10	10	15	30	75
UR51212002	0.2	12	12	18	32	80
UR51212003	0.3	12	12	18	32	80
UR51212003110	0.3	12	12	30	45	110
UR51212005	0.5	12	12	18	32	80
UR51212005110	0.5	12	12	30	45	110
UR51212010	1	12	12	18	32	80
UR51212010110	1	12	12	30	45	110
UR51212015	1.5	12	12	18	32	80
UR51212020	2	12	12	18	32	80
UR51216005	0.5	16	16	20	35	100
UR51216005150	0.5	16	16	35	50	150
UR51216010	1	16	16	20	35	100
UR51216010150	1	16	16	35	50	150
UR51220005	0.5	20	20	25	40	100
UR51220005150	0.5	20	20	40	55	150
UR51220010	1	20	20	25	40	100
UR51220010150	1	20	20	40	55	150

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UR542

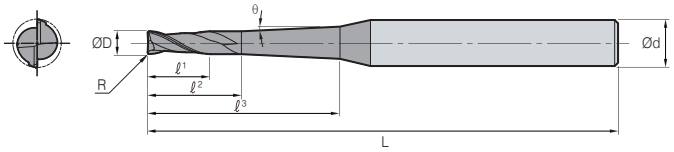
2 flutes tapered neck radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR5420020050101	0.05	0.2	4	0.3	0.4	1	1	40
UR5420020050102	0.05	0.2	4	0.3	0.4	2	1	40
UR5420020050103	0.05	0.2	4	0.3	0.4	3	1	40
UR5420020050201	0.05	0.2	4	0.3	0.4	1	2	40
UR5420020050202	0.05	0.2	4	0.3	0.4	2	2	40
UR5420020050203	0.05	0.2	4	0.3	0.4	3	2	40
UR5420030050102	0.05	0.3	4	0.5	0.6	2	1	40
UR5420030050103	0.05	0.3	4	0.5	0.6	3	1	40
UR5420030050104	0.05	0.3	4	0.5	0.6	4	1	40
UR5420030050105	0.05	0.3	4	0.5	0.6	5	1	40
UR5420030050202	0.05	0.3	4	0.5	0.6	2	2	40
UR5420030050203	0.05	0.3	4	0.5	0.6	3	2	40
UR5420030050204	0.05	0.3	4	0.5	0.6	4	2	40
UR5420030050205	0.05	0.3	4	0.5	0.6	5	2	40
UR5420040050102	0.05	0.4	4	0.6	0.8	2	1	50
UR5420040050103	0.05	0.4	4	0.6	0.8	3	1	50
UR5420040050104	0.05	0.4	4	0.6	0.8	4	1	50
UR5420040050105	0.05	0.4	4	0.6	0.8	5	1	50
UR5420040050106	0.05	0.4	4	0.6	0.8	6	1	50
UR5420040050202	0.05	0.4	4	0.6	0.8	2	2	50
UR5420040050203	0.05	0.4	4	0.6	0.8	3	2	50
UR5420040050204	0.05	0.4	4	0.6	0.8	4	2	50
UR5420040050205	0.05	0.4	4	0.6	0.8	5	2	50
UR5420040050206	0.05	0.4	4	0.6	0.8	6	2	50
UR542004010102	0.1	0.4	4	0.6	0.8	2	1	50
UR542004010103	0.1	0.4	4	0.6	0.8	3	1	50
UR542004010104	0.1	0.4	4	0.6	0.8	4	1	50
UR542004010105	0.1	0.4	4	0.6	0.8	5	1	50
UR542004010106	0.1	0.4	4	0.6	0.8	6	1	50
UR542004010202	0.1	0.4	4	0.6	0.8	2	2	50
UR542004010203	0.1	0.4	4	0.6	0.8	3	2	50
UR5420040050204	0.05	0.4	4	0.6	0.8	4	2	50
UR5420040050205	0.05	0.4	4	0.6	0.8	5	2	50
UR5420040050206	0.05	0.4	4	0.6	0.8	6	2	50
UR542004010102	0.1	0.4	4	0.6	0.8	2	1	50
UR542004010103	0.1	0.4	4	0.6	0.8	3	1	50
UR542004010104	0.1	0.4	4	0.6	0.8	4	1	50

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542004010105	0.1	0.4	4	0.6	0.8	5	1	50
UR542004010106	0.1	0.4	4	0.6	0.8	6	1	50
UR542004010202	0.1	0.4	4	0.6	0.8	2	2	50
UR542004010203	0.1	0.4	4	0.6	0.8	3	2	50
UR542004010204	0.1	0.4	4	0.6	0.8	4	2	50
UR542004010205	0.1	0.4	4	0.6	0.8	5	2	50
UR542004010206	0.1	0.4	4	0.6	0.8	6	2	50
UR5420050050104	0.05	0.5	4	0.7	1	4	1	50
UR5420050050106	0.05	0.5	4	0.7	1	6	1	50
UR5420050050108	0.05	0.5	4	0.7	1	8	1	50
UR5420050050110	0.05	0.5	4	0.7	1	10	1	50
UR5420050050204	0.05	0.5	4	0.7	1	4	2	50
UR5420050050206	0.05	0.5	4	0.7	1	6	2	50
UR5420050050208	0.05	0.5	4	0.7	1	8	2	50
UR5420050050210	0.05	0.5	4	0.7	1	10	2	50
UR542005010104	0.1	0.5	4	0.7	1	4	1	50
UR542005010106	0.1	0.5	4	0.7	1	6	1	50
UR542005010108	0.1	0.5	4	0.7	1	8	1	50
UR542005010110	0.1	0.5	4	0.7	1	10	1	50
UR542005010204	0.1	0.5	4	0.7	1	4	2	50
UR542005010206	0.1	0.5	4	0.7	1	6	2	50
UR542005010208	0.1	0.5	4	0.7	1	8	2	50
UR542005010210	0.1	0.5	4	0.7	1	10	2	50
UR542006010104	0.1	0.6	4	0.9	1.2	4	1	50
UR542006010106	0.1	0.6	4	0.9	1.2	6	1	50
UR5420020050101	0.05	0.2	4	0.3	0.4	1	1	40
UR5420020050102	0.05	0.2	4	0.3	0.4	2	1	40
UR5420020050103	0.05	0.2	4	0.3	0.4	3	1	40
UR5420020050201	0.05	0.2	4	0.3	0.4	1	2	40
UR5420020050202	0.05	0.2	4	0.3	0.4	2	2	40
UR5420020050203	0.05	0.2	4	0.3	0.4	3	2	40
UR5420030050102	0.05	0.3	4	0.5	0.6	2	1	40
UR5420030050103	0.05	0.3	4	0.5	0.6	3	1	40
UR5420030050104	0.05	0.3	4	0.5	0.6	4	1	40
UR5420030050105	0.05	0.3	4	0.5	0.6	5	1	40
UR5420030050202	0.05	0.3	4	0.5	0.6	2	2	40
UR5420030050203	0.05	0.3	4	0.5	0.6	3	2	40

U-Star Endmill

UR542

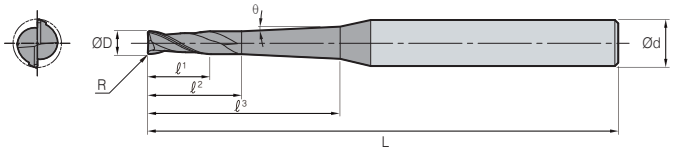
2 flutes tapered neck radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR5420030050204	0.05	0.3	4	0.5	0.6	4	2	40
UR5420030050205	0.05	0.3	4	0.5	0.6	5	2	40
UR5420040050102	0.05	0.4	4	0.6	0.8	2	1	50
UR5420040050103	0.05	0.4	4	0.6	0.8	3	1	50
UR5420040050104	0.05	0.4	4	0.6	0.8	4	1	50
UR5420040050105	0.05	0.4	4	0.6	0.8	5	1	50
UR5420040050106	0.05	0.4	4	0.6	0.8	6	1	50
UR5420040050202	0.05	0.4	4	0.6	0.8	2	2	50
UR5420040050203	0.05	0.4	4	0.6	0.8	3	2	50
UR5420040050204	0.05	0.4	4	0.6	0.8	4	2	50
UR5420040050205	0.05	0.4	4	0.6	0.8	5	2	50
UR5420040050206	0.05	0.4	4	0.6	0.8	6	2	50
UR542004010102	0.1	0.4	4	0.6	0.8	2	1	50
UR542004010103	0.1	0.4	4	0.6	0.8	3	1	50
UR542004010104	0.1	0.4	4	0.6	0.8	4	1	50
UR542004010105	0.1	0.4	4	0.6	0.8	5	1	50
UR542004010106	0.1	0.4	4	0.6	0.8	6	1	50
UR542004010202	0.1	0.4	4	0.6	0.8	2	2	50
UR542004010203	0.1	0.4	4	0.6	0.8	3	2	50
UR542004010204	0.1	0.4	4	0.6	0.8	4	2	50
UR542004010205	0.1	0.4	4	0.6	0.8	5	2	50
UR542004010206	0.1	0.4	4	0.6	0.8	6	2	50
UR5420050050104	0.05	0.5	4	0.7	1	4	1	50
UR5420050050106	0.05	0.5	4	0.7	1	6	1	50
UR5420050050108	0.05	0.5	4	0.7	1	8	1	50
UR5420050050110	0.05	0.5	4	0.7	1	10	1	50
UR5420050050204	0.05	0.5	4	0.7	1	4	2	50
UR5420050050206	0.05	0.5	4	0.7	1	6	2	50
UR5420050050208	0.05	0.5	4	0.7	1	8	2	50
UR5420050050210	0.05	0.5	4	0.7	1	10	2	50
UR542005010104	0.1	0.5	4	0.7	1	4	1	50
UR542005010106	0.1	0.5	4	0.7	1	6	1	50
UR542005010108	0.1	0.5	4	0.7	1	8	1	50
UR542005010110	0.1	0.5	4	0.7	1	10	1	50
UR542005010204	0.1	0.5	4	0.7	1	4	2	50
UR542005010206	0.1	0.5	4	0.7	1	6	2	50
UR542005010208	0.1	0.5	4	0.7	1	8	2	50

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542005010210	0.1	0.5	4	0.7	1	10	2	50
UR542006010104	0.1	0.6	4	0.9	1.2	4	1	50
UR542006010106	0.1	0.6	4	0.9	1.2	6	1	50
UR542006010108	0.1	0.6	4	0.9	1.2	8	1	50
UR542006010110	0.1	0.6	4	0.9	1.2	10	1	50
UR542006010112	0.1	0.6	4	0.9	1.2	12	1	50
UR542006010204	0.1	0.6	4	0.9	1.2	4	2	50
UR542006010206	0.1	0.6	4	0.9	1.2	6	2	50
UR542006010208	0.1	0.6	4	0.9	1.2	8	2	50
UR542006010210	0.1	0.6	4	0.9	1.2	10	2	50
UR542006010212	0.1	0.6	4	0.9	1.2	12	2	50
UR542006020104	0.2	0.6	4	0.9	1.2	4	1	50
UR542006020106	0.2	0.6	4	0.9	1.2	6	1	50
UR542006020108	0.2	0.6	4	0.9	1.2	8	1	50
UR542006020110	0.2	0.6	4	0.9	1.2	10	1	50
UR542006020112	0.2	0.6	4	0.9	1.2	12	1	50
UR542006020204	0.2	0.6	4	0.9	1.2	4	2	50
UR542006020206	0.2	0.6	4	0.9	1.2	6	2	50
UR542006020208	0.2	0.6	4	0.9	1.2	8	2	50
UR542006020210	0.2	0.6	4	0.9	1.2	10	2	50
UR542006020212	0.2	0.6	4	0.9	1.2	12	2	50
UR542008010104	0.1	0.8	4	1.2	1.6	4	1	50
UR542008010106	0.1	0.8	4	1.2	1.6	6	1	50
UR542008010108	0.1	0.8	4	1.2	1.6	8	1	50
UR542008010110	0.1	0.8	4	1.2	1.6	10	1	50
UR542008010112	0.1	0.8	4	1.2	1.6	12	1	50
UR542008010116	0.1	0.8	4	1.2	1.6	16	1	50
UR542008010204	0.1	0.8	4	1.2	1.6	4	2	50
UR542008010206	0.1	0.8	4	1.2	1.6	6	2	50
UR542008010208	0.1	0.8	4	1.2	1.6	8	2	50
UR542008010210	0.1	0.8	4	1.2	1.6	10	2	50
UR542008010212	0.1	0.8	4	1.2	1.6	12	2	50
UR542008010216	0.1	0.8	4	1.2	1.6	16	2	50
UR542008020104	0.2	0.8	4	1.2	1.6	4	1	50
UR542008020106	0.2	0.8	4	1.2	1.6	6	1	50
UR542008020108	0.2	0.8	4	1.2	1.6	8	1	50
UR542008020110	0.2	0.8	4	1.2	1.6	10	1	50

UR542

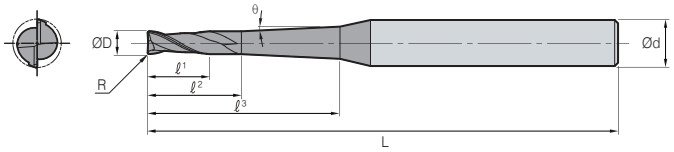
2 flutes tapered neck radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542008020112	0.2	0.8	4	1.2	1.6	12	1	50
UR542008020116	0.2	0.8	4	1.2	1.6	16	1	50
UR542008020204	0.2	0.8	4	1.2	1.6	4	2	50
UR542008020206	0.2	0.8	4	1.2	1.6	6	2	50
UR542008020208	0.2	0.8	4	1.2	1.6	8	2	50
UR542008020210	0.2	0.8	4	1.2	1.6	10	2	50
UR542008020212	0.2	0.8	4	1.2	1.6	12	2	50
UR542008020216	0.2	0.8	4	1.2	1.6	16	2	50
UR542010010106	0.1	1	4	1.5	2.5	6	1	50
UR542010010108	0.1	1	4	1.5	2.5	8	1	50
UR542010010110	0.1	1	4	1.5	2.5	10	1	50
UR542010010112	0.1	1	4	1.5	2.5	12	1	50
UR542010010116	0.1	1	4	1.5	2.5	16	1	50
UR542010010120	0.1	1	4	1.5	2.5	20	1	50
UR542010010125	0.1	1	4	1.5	2.5	25	1	60
UR542010010130	0.1	1	4	1.5	2.5	30	1	70
UR542010010140	0.1	1	4	1.5	2.5	40	1	80
UR542010010150	0.1	1	6	1.5	2.5	50	1	90
UR542010010206	0.1	1	4	1.5	2.5	6	2	50
UR542010010208	0.1	1	4	1.5	2.5	8	2	50
UR542010010210	0.1	1	4	1.5	2.5	10	2	50
UR542010010212	0.1	1	4	1.5	2.5	12	2	50
UR542010010216	0.1	1	4	1.5	2.5	16	2	50
UR542010010220	0.1	1	4	1.5	2.5	20	2	50
UR542010010225	0.1	1	4	1.5	2.5	25	2	60
UR542010010230	0.1	1	4	1.5	2.5	30	2	70
UR542010010240	0.1	1	4	1.5	2.5	40	2	80
UR542010010250	0.1	1	6	1.5	2.5	50	2	90
UR542010020106	0.2	1	4	1.5	2.5	6	1	50
UR542010020108	0.2	1	4	1.5	2.5	8	1	50
UR542010020110	0.2	1	4	1.5	2.5	10	1	50
UR542010020112	0.2	1	4	1.5	2.5	12	1	50
UR542010020116	0.2	1	4	1.5	2.5	16	1	50
UR542010020120	0.2	1	4	1.5	2.5	20	1	50
UR542010020125	0.2	1	4	1.5	2.5	25	1	60
UR542010020130	0.2	1	4	1.5	2.5	30	1	70
UR542010020140	0.2	1	4	1.5	2.5	40	1	80

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542010020150	0.2	1	6	1.5	2.5	50	1	90
UR542010020206	0.2	1	4	1.5	2.5	6	2	50
UR542010020208	0.2	1	4	1.5	2.5	8	2	50
UR542010020210	0.2	1	4	1.5	2.5	10	2	50
UR542010020212	0.2	1	4	1.5	2.5	12	2	50
UR542010020216	0.2	1	4	1.5	2.5	16	2	50
UR542010020220	0.2	1	4	1.5	2.5	20	2	50
UR542010020225	0.2	1	4	1.5	2.5	25	2	60
UR542010020230	0.2	1	4	1.5	2.5	30	2	70
UR542010020240	0.2	1	4	1.5	2.5	40	2	80
UR542010020250	0.2	1	6	1.5	2.5	50	2	90
UR542012010108	0.1	1.2	4	1.8	3	8	1	50
UR542012010112	0.1	1.2	4	1.8	3	12	1	50
UR542012010116	0.1	1.2	4	1.8	3	16	1	50
UR542012010120	0.1	1.2	4	1.8	3	20	1	50
UR542012010125	0.1	1.2	4	1.8	3	25	1	60
UR542012010130	0.1	1.2	4	1.8	3	30	1	70
UR542012010208	0.1	1.2	4	1.8	3	8	2	50
UR542012010212	0.1	1.2	4	1.8	3	12	2	50
UR542012010216	0.1	1.2	4	1.8	3	16	2	50
UR542012010220	0.1	1.2	4	1.8	3	20	2	50
UR542012010225	0.1	1.2	4	1.8	3	25	2	60
UR542012010230	0.1	1.2	4	1.8	3	30	2	70
UR542012020108	0.2	1.2	4	1.8	3	8	1	50
UR542012020112	0.2	1.2	4	1.8	3	12	1	50
UR542012020116	0.2	1.2	4	1.8	3	16	1	50
UR542012020120	0.2	1.2	4	1.8	3	20	1	50
UR542012020125	0.2	1.2	4	1.8	3	25	1	60
UR542012020130	0.2	1.2	4	1.8	3	30	1	70
UR542012020208	0.2	1.2	4	1.8	3	8	2	50
UR542012020212	0.2	1.2	4	1.8	3	12	2	50
UR542012020216	0.2	1.2	4	1.8	3	16	2	50
UR542012020220	0.2	1.2	4	1.8	3	20	2	50
UR542012020225	0.2	1.2	4	1.8	3	25	2	60
UR542012020230	0.2	1.2	4	1.8	3	30	2	70
UR542015010108	0.1	1.5	4	2.3	3	8	1	50
UR542015010110	0.1	1.5	4	2.3	3	10	1	50

U-Star Endmill

UR542

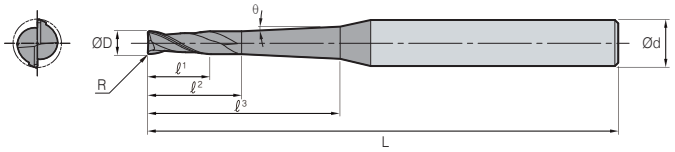
2 flutes tapered neck radius Endmill

CARBIDE | 2 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5





(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542015010112	0.1	1.5	4	2.3	3	12	1	50
UR542015010116	0.1	1.5	4	2.3	3	16	1	50
UR542015010120	0.1	1.5	4	2.3	3	20	1	50
UR542015010125	0.1	1.5	4	2.3	3	25	1	60
UR542015010130	0.1	1.5	4	2.3	3	30	1	70
UR542015010140	0.1	1.5	4	2.3	3	40	1	80
UR542015010150	0.1	1.5	4	2.3	3	50	1	90
UR542015010208	0.1	1.5	4	2.3	3	8	2	50
UR542015010210	0.1	1.5	4	2.3	3	10	2	50
UR542015010212	0.1	1.5	4	2.3	3	12	2	50
UR542015010216	0.1	1.5	4	2.3	3	16	2	50
UR542015010220	0.1	1.5	4	2.3	3	20	2	50
UR542015010225	0.1	1.5	4	2.3	3	25	2	60
UR542015010230	0.1	1.5	4	2.3	3	30	2	70
UR542015010240	0.1	1.5	6	2.3	3	40	2	80
UR542015010250	0.1	1.5	6	2.3	3	50	2	90
UR542015020108	0.2	1.5	4	2.3	3	8	1	50
UR542015020110	0.2	1.5	4	2.3	3	10	1	50
UR542015020112	0.2	1.5	4	2.3	3	12	1	50
UR542015020116	0.2	1.5	4	2.3	3	16	1	50
UR542015020120	0.2	1.5	4	2.3	3	20	1	50
UR542015020125	0.2	1.5	4	2.3	3	25	1	60
UR542015020130	0.2	1.5	4	2.3	3	30	1	70
UR542015020140	0.2	1.5	4	2.3	3	40	1	80
UR542015020150	0.2	1.5	4	2.3	3	50	1	90
UR542015020208	0.2	1.5	4	2.3	3	8	2	50
UR542015020210	0.2	1.5	4	2.3	3	10	2	50
UR542015020212	0.2	1.5	4	2.3	3	12	2	50
UR542015020216	0.2	1.5	4	2.3	3	16	2	50
UR542015020220	0.2	1.5	4	2.3	3	20	2	50
UR542015020225	0.2	1.5	4	2.3	3	25	2	60
UR542015020230	0.2	1.5	4	2.3	3	30	2	70
UR542015020240	0.2	1.5	6	2.3	3	40	2	80
UR542015020250	0.2	1.5	6	2.3	3	50	2	90
UR542015030108	0.3	1.5	4	2.3	3	8	1	50
UR542015030110	0.3	1.5	4	2.3	3	10	1	50
UR542015030112	0.3	1.5	4	2.3	3	12	1	50

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542015030116	0.3	1.5	4	2.3	3	16	1	50
UR542015030120	0.3	1.5	4	2.3	3	20	1	50
UR542015030125	0.3	1.5	4	2.3	3	25	1	60
UR542015030130	0.3	1.5	4	2.3	3	30	1	70
UR542015030140	0.3	1.5	4	2.3	3	40	1	80
UR542015030150	0.3	1.5	4	2.3	3	50	1	90
UR542015030208	0.3	1.5	4	2.3	3	8	2	50
UR542015030210	0.3	1.5	4	2.3	3	10	2	50
UR542015030212	0.3	1.5	4	2.3	3	12	2	50
UR542015030216	0.3	1.5	4	2.3	3	16	2	50
UR542015030220	0.3	1.5	4	2.3	3	20	2	50
UR542015030225	0.3	1.5	4	2.3	3	25	2	60
UR542015030230	0.3	1.5	4	2.3	3	30	2	70
UR542015030240	0.3	1.5	6	2.3	3	40	2	80
UR542015030250	0.3	1.5	6	2.3	3	50	2	90
UR542020010110	0.1	2	4	2	5	10	1	50
UR542020010112	0.1	2	4	2	5	12	1	50
UR542020010116	0.1	2	4	2	5	16	1	50
UR542020010120	0.1	2	4	2	5	20	1	50
UR542020010125	0.1	2	4	2	5	25	1	60
UR542020010130	0.1	2	4	2	5	30	1	70
UR542020010140	0.1	2	6	2	5	40	1	80
UR542020010150	0.1	2	6	2	5	50	1	100
UR542020010160	0.1	2	6	2	5	60	1	100
UR542020010180	0.1	2	6	2	5	80	1	140
UR542020010210	0.1	2	4	2	5	10	2	50
UR542020010212	0.1	2	4	2	5	12	2	50
UR542020010216	0.1	2	4	2	5	16	2	50
UR542020010220	0.1	2	4	2	5	20	2	50
UR542020010225	0.1	2	4	2	5	25	2	60
UR542020010230	0.1	2	4	2	5	30	2	70
UR542020010240	0.1	2	6	2	5	40	2	80
UR542020010250	0.1	2	6	2	5	50	2	100
UR542020010260	0.1	2	6	2	5	60	2	100
UR542020010280	0.1	2	8	2	5	80	2	140
UR542020020110	0.2	2	4	2	5	10	1	50
UR542020020112	0.2	2	4	2	5	12	1	50

UR542

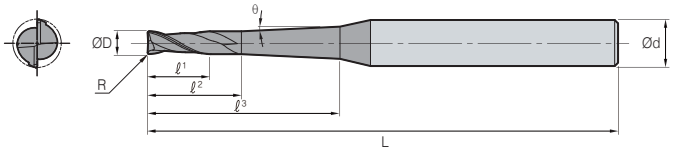
2 flutes tapered neck radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542020020116	0.2	2	4	2	5	16	1	50
UR542020020120	0.2	2	4	2	5	20	1	50
UR542020020125	0.2	2	4	2	5	25	1	60
UR542020020130	0.2	2	4	2	5	30	1	70
UR542020020140	0.2	2	6	2	5	40	1	80
UR542020020150	0.2	2	6	2	5	50	1	100
UR542020020160	0.2	2	6	2	5	60	1	100
UR542020020180	0.2	2	6	2	5	80	1	140
UR542020020210	0.2	2	4	2	5	10	2	50
UR542020020212	0.2	2	4	2	5	12	2	50
UR542020020216	0.2	2	4	2	5	16	2	50
UR542020020220	0.2	2	4	2	5	20	2	50
UR542020020225	0.2	2	4	2	5	25	2	60
UR542020020230	0.2	2	4	2	5	30	2	70
UR542020020240	0.2	2	6	2	5	40	2	80
UR542020020250	0.2	2	6	2	5	50	2	100
UR542020020260	0.2	2	6	2	5	60	2	100
UR542020020280	0.2	2	8	2	5	80	2	140
UR542020030110	0.3	2	4	2	5	10	1	50
UR542020030112	0.3	2	4	2	5	12	1	50
UR542020030116	0.3	2	4	2	5	16	1	50
UR542020030120	0.3	2	4	2	5	20	1	50
UR542020030125	0.3	2	4	2	5	25	1	60
UR542020030130	0.3	2	4	2	5	30	1	70
UR542020030140	0.3	2	6	2	5	40	1	80
UR542020030150	0.3	2	6	2	5	50	1	100
UR542020030160	0.3	2	6	2	5	60	1	100
UR542020030180	0.3	2	6	2	5	80	1	140
UR542020030210	0.3	2	4	2	5	10	2	50
UR542020030212	0.3	2	4	2	5	12	2	50
UR542020030216	0.3	2	4	2	5	16	2	50
UR542020030220	0.3	2	4	2	5	20	2	50
UR542020030225	0.3	2	4	2	5	25	2	60
UR542020030230	0.3	2	4	2	5	30	2	70
UR542020030240	0.3	2	6	2	5	40	2	80
UR542020030250	0.3	2	6	2	5	50	2	100
UR542020030260	0.3	2	6	2	5	60	2	100

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542020030280	0.3	2	8	2	5	80	2	140
UR542020050110	0.5	2	4	2	5	10	1	50
UR542020050112	0.5	2	4	2	5	12	1	50
UR542020050116	0.5	2	4	2	5	16	1	50
UR542020050120	0.5	2	4	2	5	20	1	50
UR542020050125	0.5	2	4	2	5	25	1	60
UR542020050130	0.5	2	4	2	5	30	1	70
UR542020050140	0.5	2	6	2	5	40	1	80
UR542020050150	0.5	2	6	2	5	50	1	100
UR542020050160	0.5	2	6	2	5	60	1	100
UR542020050180	0.5	2	6	2	5	80	1	140
UR542020050210	0.5	2	4	2	5	10	2	50
UR542020050212	0.5	2	4	2	5	12	2	50
UR542020050216	0.5	2	4	2	5	16	2	50
UR542020050220	0.5	2	4	2	5	20	2	50
UR542020050225	0.5	2	4	2	5	25	2	60
UR542020050230	0.5	2	4	2	5	30	2	70
UR542020050240	0.5	2	6	2	5	40	2	80
UR542020050250	0.5	2	6	2	5	50	2	100
UR542020050260	0.5	2	6	2	5	60	2	100
UR542020050280	0.5	2	8	2	5	80	2	140
UR542030020116	0.2	3	6	4.5	6	16	1	60
UR542030020120	0.2	3	6	4.5	6	20	1	65
UR542030020130	0.2	3	6	4.5	6	30	1	70
UR542030020140	0.2	3	6	4.5	6	40	1	80
UR542030020150	0.2	3	6	4.5	6	50	1	90
UR542030020160	0.2	3	6	4.5	6	60	1	100
UR542030020216	0.2	3	6	4.5	6	16	2	60
UR542030020220	0.2	3	6	4.5	6	20	2	65
UR542030020230	0.2	3	6	4.5	6	30	2	70
UR542030020240	0.2	3	6	4.5	6	40	2	80
UR542030020250	0.2	3	8	4.5	6	50	2	90
UR542030020260	0.2	3	8	4.5	6	60	2	100
UR542030020270	0.2	3	8	4.5	6	70	2	120
UR542030030116	0.3	3	6	4.5	6	16	1	60
UR542030030120	0.3	3	6	4.5	6	20	1	65
UR542030030130	0.3	3	6	4.5	6	30	1	70

U-Star Endmill

UR542

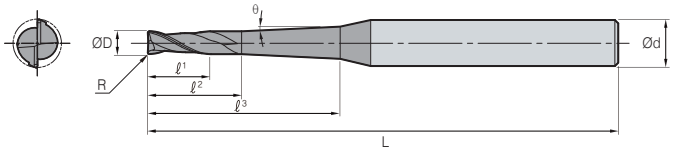
2 flutes tapered neck radius Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø4	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542030030140	0.3	3	6	4.5	6	40	1	80
UR542030030150	0.3	3	6	4.5	6	50	1	90
UR542030030160	0.3	3	6	4.5	6	60	1	100
UR542030030216	0.3	3	6	4.5	6	16	2	60
UR542030030220	0.3	3	6	4.5	6	20	2	65
UR542030030230	0.3	3	6	4.5	6	30	2	70
UR542030030240	0.3	3	6	4.5	6	40	2	80
UR542030030250	0.3	3	8	4.5	6	50	2	90
UR542030030260	0.3	3	8	4.5	6	60	2	100
UR542030030270	0.3	3	8	4.5	6	70	2	120
UR542030050116	0.5	3	6	4.5	6	16	1	60
UR542030050120	0.5	3	6	4.5	6	20	1	65
UR542030050130	0.5	3	6	4.5	6	30	1	70
UR542030050140	0.5	3	6	4.5	6	40	1	80
UR542030050150	0.5	3	6	4.5	6	50	1	90
UR542030050160	0.5	3	6	4.5	6	60	1	100
UR542030050216	0.5	3	6	4.5	6	16	2	60
UR542030050220	0.5	3	6	4.5	6	20	2	65
UR542030050230	0.5	3	6	4.5	6	30	2	70
UR542030050240	0.5	3	6	4.5	6	40	2	80
UR542030050250	0.5	3	8	4.5	6	50	2	90
UR542030050260	0.5	3	8	4.5	6	60	2	100
UR542030050270	0.5	3	8	4.5	6	70	2	120
UR542040020140	0.2	4	6	6	8	40	1	90

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR542040020150	0.2	4	6	6	8	50	1	100
UR542040020160	0.2	4	6	6	8	60	1	110
UR542040020170	0.2	4	8	6	8	70	1	120
UR542040020240	0.2	4	8	6	8	40	2	90
UR542040020250	0.2	4	8	6	8	50	2	100
UR542040020260	0.2	4	8	6	8	60	2	110
UR542040020270	0.2	4	10	6	8	70	2	120
UR542040030140	0.3	4	6	6	8	40	1	90
UR542040030150	0.3	4	6	6	8	50	1	100
UR542040030160	0.3	4	6	6	8	60	1	110
UR542040030170	0.3	4	8	6	8	70	1	120
UR542040030240	0.3	4	8	6	8	40	2	90
UR542040030250	0.3	4	8	6	8	50	2	100
UR542040030260	0.3	4	8	6	8	60	2	110
UR542040030270	0.3	4	10	6	8	70	2	120
UR542040050140	0.5	4	6	6	8	40	1	90
UR542040050150	0.5	4	6	6	8	50	1	100
UR542040050160	0.5	4	6	6	8	60	1	110
UR542040050170	0.5	4	8	6	8	70	1	120
UR542040050240	0.5	4	8	6	8	40	2	90
UR542040050250	0.5	4	8	6	8	50	2	100
UR542040050260	0.5	4	8	6	8	60	2	110
UR542040050270	0.5	4	10	6	8	70	2	120

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UR504

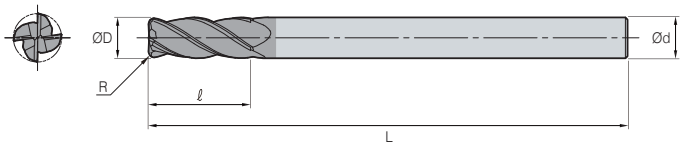
4 flutes radius Endmill

CARBIDE | 4 | 40° HELIX | R ±0.02 Corner R | AlCrN | DATA p.484

• TOLERANCE

ØD		Ød
Ø3 ~ Ø20	0 ~ -0.03mm	h5





(mm)

Designation	R	ØD	Ød	ℓ	L
UR50403002	0.2	3	6	8	60
UR50403002S4	0.2	3	4	8	60
UR50403003	0.3	3	6	8	60
UR50403005	0.5	3	6	8	60
UR50403005S4	0.5	3	4	8	60
UR50404002	0.2	4	6	10	70
UR50404002S4	0.2	4	4	10	70
UR50404003	0.3	4	6	10	70
UR50404005	0.5	4	6	10	70
UR50404005S4	0.5	4	4	10	70
UR50404010	1	4	6	10	70
UR50404010S4	1	4	4	10	70
UR50405002	0.2	5	6	13	90
UR50405003	0.3	5	6	13	90
UR50405003060	0.3	5	6	13	60
UR50405005	0.5	5	6	13	90
UR50405005060	0.5	5	6	13	60
UR50405010	1	5	6	13	90
UR50406002	0.2	6	6	13	90
UR50406003	0.3	6	6	15	90
UR50406003060	0.3	6	6	15	60
UR50406005	0.5	6	6	15	90
UR50406005060	0.5	6	6	15	60
UR50406010	1	6	6	15	90
UR50406010060	1	6	6	15	60
UR50408003	0.3	8	8	20	100
UR50408003070	0.3	8	8	20	70
UR50408005	0.5	8	8	20	100
UR50408005070	0.5	8	8	20	70
UR50408010	1	8	8	20	100
UR50408010070	1	8	8	20	70
UR50408015	1.5	8	8	20	100
UR50408020	2	8	8	20	100
UR50410003	0.3	10	10	25	100

Designation	R	ØD	Ød	ℓ	L
UR50410003075	0.3	10	10	25	75
UR50410005	0.5	10	10	25	100
UR50410005075	0.5	10	10	25	75
UR50410010	1	10	10	25	100
UR50410010075	1	10	10	25	75
UR50410015	1.5	10	10	25	100
UR50410020	2	10	10	25	100
UR50410025	2.5	10	10	25	100
UR50412003	0.3	12	12	30	110
UR50412003080	0.3	12	12	30	80
UR50412005	0.5	12	12	30	110
UR50412005080	0.5	12	12	30	80
UR50412010	1	12	12	30	110
UR50412010080	1	12	12	30	80
UR50412015	1.5	12	12	30	110
UR50412020	2	12	12	30	110
UR50412025	2.5	12	12	30	110
UR50412030	3	12	12	30	110
UR50416005	0.5	16	16	32	150
UR50416005100	0.5	16	16	32	100
UR50416010	1	16	16	32	150
UR50416010100	1	16	16	32	100
UR50416015	1.5	16	16	32	150
UR50416015100	1.5	16	16	32	100
UR50416020	2	16	16	32	150
UR50416020100	2	16	16	32	100
UR50420005	0.5	20	20	38	150
UR50420005100	0.5	20	20	38	100
UR50420010	1	20	20	38	150
UR50420010100	1	20	20	38	100
UR50420015	1.5	20	20	38	150
UR50420015100	1.5	20	20	38	100
UR50420020	2	20	20	38	150
UR50420020100	2	20	20	38	100

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UR544

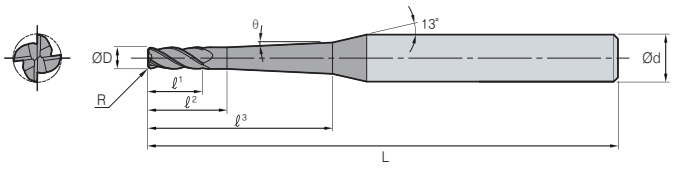
4 flutes tapered neck radius Endmill



CARBIDE | 4 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.485

• TOLERANCE

ØD		Ød
Ø1 ~ Ø4	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544010010106	0.1	1	4	1.5	2.5	6	1	50
UR544010010108	0.1	1	4	1.5	2.5	8	1	50
UR544010010110	0.1	1	4	1.5	2.5	10	1	50
UR544010010112	0.1	1	4	1.5	2.5	12	1	50
UR544010010116	0.1	1	4	1.5	2.5	16	1	50
UR544010010120	0.1	1	4	1.5	2.5	20	1	50
UR544010010125	0.1	1	4	1.5	2.5	25	1	60
UR544010010130	0.1	1	4	1.5	2.5	30	1	70
UR544010010140	0.1	1	4	1.5	2.5	40	1	80
UR544010010150	0.1	1	4	1.5	2.5	50	1	90
UR544010010206	0.1	1	4	1.5	2.5	6	1	50
UR544010010208	0.1	1	4	1.5	2.5	8	2	50
UR544010010210	0.1	1	4	1.5	2.5	10	2	50
UR544010010212	0.1	1	4	1.5	2.5	12	2	50
UR544010010216	0.1	1	4	1.5	2.5	16	2	50
UR544010010220	0.1	1	4	1.5	2.5	20	2	50
UR544010010225	0.1	1	4	1.5	2.5	25	2	60
UR544010010230	0.1	1	4	1.5	2.5	30	2	70
UR544010010240	0.1	1	4	1.5	2.5	40	2	80
UR544010010250	0.1	1	6	1.5	2.5	50	2	90
UR544010020106	0.2	1	4	1.5	2.5	6	2	50
UR544010020108	0.2	1	4	1.5	2.5	8	1	50
UR544010020110	0.2	1	4	1.5	2.5	10	1	50
UR544010020112	0.2	1	4	1.5	2.5	12	1	50
UR544010020116	0.2	1	4	1.5	2.5	16	1	50
UR544010020120	0.2	1	4	1.5	2.5	20	1	50
UR544010020125	0.2	1	4	1.5	2.5	25	1	60
UR544010020130	0.2	1	4	1.5	2.5	30	1	70
UR544010020140	0.2	1	4	1.5	2.5	40	1	80
UR544010020150	0.2	1	4	1.5	2.5	50	1	90
UR544010020206	0.2	1	4	1.5	2.5	6	1	50
UR544010020208	0.2	1	4	1.5	2.5	8	2	50
UR544010020210	0.2	1	4	1.5	2.5	10	2	50
UR544010020212	0.2	1	4	1.5	2.5	12	2	50
UR544010020216	0.2	1	4	1.5	2.5	16	2	50
UR544010020220	0.2	1	4	1.5	2.5	20	2	50

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544010020225	0.2	1	4	1.5	2.5	25	2	60
UR544010020230	0.2	1	4	1.5	2.5	30	2	70
UR544010020240	0.2	1	4	1.5	2.5	40	2	80
UR544010020250	0.2	1	6	1.5	2.5	50	2	90
UR544012010108	0.1	1.2	4	1.8	3	8	2	50
UR544012010112	0.1	1.2	4	1.8	3	12	1	50
UR544012010116	0.1	1.2	4	1.8	3	16	1	50
UR544012010120	0.1	1.2	4	1.8	3	20	1	50
UR544012010125	0.1	1.2	4	1.8	3	25	1	60
UR544012010130	0.1	1.2	4	1.8	3	30	1	70
UR544012010208	0.1	1.2	4	1.8	3	8	1	50
UR544012010212	0.1	1.2	4	1.8	3	12	2	50
UR544012010216	0.1	1.2	4	1.8	3	16	2	50
UR544012010220	0.1	1.2	4	1.8	3	20	2	50
UR544012010225	0.1	1.2	4	1.8	3	25	2	60
UR544012010230	0.1	1.2	4	1.8	3	30	2	70
UR544012020108	0.2	1.2	4	1.8	3	8	2	50
UR544012020112	0.2	1.2	4	1.8	3	12	1	50
UR544012020116	0.2	1.2	4	1.8	3	16	1	50
UR544012020120	0.2	1.2	4	1.8	3	20	1	50
UR544012020125	0.2	1.2	4	1.8	3	25	1	60
UR544012020130	0.2	1.2	4	1.8	3	30	1	70
UR544012020208	0.2	1.2	4	1.8	3	8	1	50
UR544012020212	0.2	1.2	4	1.8	3	12	2	50
UR544012020216	0.2	1.2	4	1.8	3	16	2	50
UR544012020220	0.2	1.2	4	1.8	3	20	2	50
UR544012020225	0.2	1.2	4	1.8	3	25	2	60
UR544012020230	0.2	1.2	4	1.8	3	30	2	70
UR544015010108	0.1	1.5	4	2.3	3	8	2	50
UR544015010110	0.1	1.5	4	2.3	3	10	1	50
UR544015010112	0.1	1.5	4	2.3	3	12	1	50
UR544015010116	0.1	1.5	4	2.3	3	16	1	50
UR544015010120	0.1	1.5	4	2.3	3	20	1	50
UR544015010125	0.1	1.5	4	2.3	3	25	1	60
UR544015010130	0.1	1.5	4	2.3	3	30	1	70
UR544015010140	0.1	1.5	4	2.3	3	40	1	80

UR544

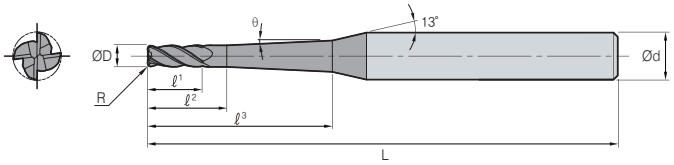
4 flutes tapered neck radius Endmill



CARBIDE | 4 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.485

• TOLERANCE

ØD		Ød
Ø1 ~ Ø4	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544015010150	0.1	1.5	4	2.3	3	50	1	90
UR544015010208	0.1	1.5	4	2.3	3	8	1	50
UR544015010210	0.1	1.5	4	2.3	3	10	2	50
UR544015010212	0.1	1.5	4	2.3	3	12	2	50
UR544015010216	0.1	1.5	4	2.3	3	16	2	50
UR544015010220	0.1	1.5	4	2.3	3	20	2	50
UR544015010225	0.1	1.5	4	2.3	3	25	2	60
UR544015010230	0.1	1.5	4	2.3	3	30	2	70
UR544015010240	0.1	1.5	6	2.3	3	40	2	80
UR544015010250	0.1	1.5	6	2.3	3	50	2	90
UR544015020108	0.2	1.5	4	2.3	3	8	2	50
UR544015020110	0.2	1.5	4	2.3	3	10	1	50
UR544015020112	0.2	1.5	4	2.3	3	12	1	50
UR544015020116	0.2	1.5	4	2.3	3	16	1	50
UR544015020120	0.2	1.5	4	2.3	3	20	1	50
UR544015020125	0.2	1.5	4	2.3	3	25	1	60
UR544015020130	0.2	1.5	4	2.3	3	30	1	70
UR544015020140	0.2	1.5	4	2.3	3	40	1	80
UR544015020150	0.2	1.5	4	2.3	3	50	1	90
UR544015020208	0.2	1.5	4	2.3	3	8	1	50
UR544015020210	0.2	1.5	4	2.3	3	10	2	50
UR544015020212	0.2	1.5	4	2.3	3	12	2	50
UR544015020216	0.2	1.5	4	2.3	3	16	2	50
UR544015020220	0.2	1.5	4	2.3	3	20	2	50
UR544015020225	0.2	1.5	4	2.3	3	25	2	60
UR544015020230	0.2	1.5	4	2.3	3	30	2	70
UR544015020240	0.2	1.5	6	2.3	3	40	2	80
UR544015020250	0.2	1.5	6	2.3	3	50	2	90
UR544015030108	0.3	1.5	4	2.3	3	8	2	50
UR544015030110	0.3	1.5	4	2.3	3	10	1	50
UR544015030112	0.3	1.5	4	2.3	3	12	1	50
UR544015030116	0.3	1.5	4	2.3	3	16	1	50
UR544015030120	0.3	1.5	4	2.3	3	20	1	50
UR544015030125	0.3	1.5	4	2.3	3	25	1	60
UR544015030130	0.3	1.5	4	2.3	3	30	1	70
UR544015030140	0.3	1.5	4	2.3	3	40	1	80

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544015030150	0.3	1.5	4	2.3	3	50	1	90
UR544015030208	0.3	1.5	4	2.3	3	8	1	50
UR544015030210	0.3	1.5	4	2.3	3	10	2	50
UR544015030212	0.3	1.5	4	2.3	3	12	2	50
UR544015030216	0.3	1.5	4	2.3	3	16	2	50
UR544015030220	0.3	1.5	4	2.3	3	20	2	50
UR544015030225	0.3	1.5	4	2.3	3	25	2	60
UR544015030230	0.3	1.5	4	2.3	3	30	2	70
UR544015030240	0.3	1.5	6	2.3	3	40	2	80
UR544015030250	0.3	1.5	6	2.3	3	50	2	90
UR544020010110	0.1	2	4	2	5	10	2	50
UR544020010112	0.1	2	4	2	5	12	1	50
UR544020010116	0.1	2	4	2	5	16	1	50
UR544020010120	0.1	2	4	2	5	20	1	50
UR544020010125	0.1	2	4	2	5	25	1	60
UR544020010130	0.1	2	4	2	5	30	1	70
UR544020010140	0.1	2	6	2	5	40	1	80
UR544020010150	0.1	2	6	2	5	50	1	100
UR544020010160	0.1	2	6	2	5	60	1	100
UR544020010180	0.1	2	6	2	5	80	1	140
UR544020010210	0.1	2	4	2	5	10	1	50
UR544020010212	0.1	2	4	2	5	12	2	50
UR544020010216	0.1	2	4	2	5	16	2	50
UR544020010220	0.1	2	4	2	5	20	2	50
UR544020010225	0.1	2	4	2	5	25	2	60
UR544020010230	0.1	2	4	2	5	30	2	70
UR544020010240	0.1	2	6	2	5	40	2	80
UR544020010250	0.1	2	6	2	5	50	2	100
UR544020010260	0.1	2	6	2	5	60	2	100
UR544020010280	0.1	2	8	2	5	80	2	140
UR544020020110	0.2	2	4	2	5	10	2	50
UR544020020112	0.2	2	4	2	5	12	1	50
UR544020020116	0.2	2	4	2	5	16	1	50
UR544020020120	0.2	2	4	2	5	20	1	50
UR544020020125	0.2	2	4	2	5	25	1	60
UR544020020130	0.2	2	4	2	5	30	1	70

U-Star Endmill

UR544

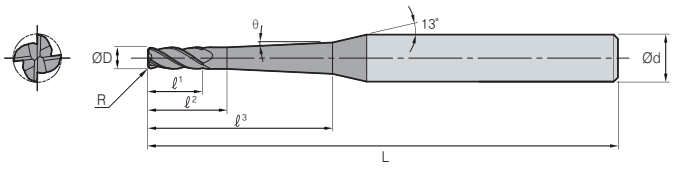
4 flutes tapered neck radius Endmill



CARBIDE | 4 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.485

• TOLERANCE

ØD		Ød
Ø1 ~ Ø4	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544020020140	0.2	2	6	2	5	40	1	80
UR544020020150	0.2	2	6	2	5	50	1	100
UR544020020160	0.2	2	6	2	5	60	1	100
UR544020020180	0.2	2	6	2	5	80	1	140
UR544020020210	0.2	2	4	2	5	10	1	50
UR544020020212	0.2	2	4	2	5	12	2	50
UR544020020216	0.2	2	4	2	5	16	2	50
UR544020020220	0.2	2	4	2	5	20	2	50
UR544020020225	0.2	2	4	2	5	25	2	60
UR544020020230	0.2	2	4	2	5	30	2	70
UR544020020240	0.2	2	6	2	5	40	2	80
UR544020020250	0.2	2	6	2	5	50	2	100
UR544020020260	0.2	2	6	2	5	60	2	100
UR544020020280	0.2	2	8	2	5	80	2	140
UR544020030110	0.3	2	4	2	5	10	2	50
UR544020030112	0.3	2	4	2	5	12	1	50
UR544020030116	0.3	2	4	2	5	16	1	50
UR544020030120	0.3	2	4	2	5	20	1	50
UR544020030125	0.3	2	4	2	5	25	1	60
UR544020030130	0.3	2	4	2	5	30	1	70
UR544020030140	0.3	2	6	2	5	40	1	80
UR544020030150	0.3	2	6	2	5	50	1	100
UR544020030160	0.3	2	6	2	5	60	1	100
UR544020030180	0.3	2	6	2	5	80	1	140
UR544020030210	0.3	2	4	2	5	10	1	50
UR544020030212	0.3	2	4	2	5	12	2	50
UR544020030216	0.3	2	4	2	5	16	2	50
UR544020030220	0.3	2	4	2	5	20	2	50
UR544020030225	0.3	2	4	2	5	25	2	60
UR544020030230	0.3	2	4	2	5	30	2	70
UR544020030240	0.3	2	6	2	5	40	2	80
UR544020030250	0.3	2	6	2	5	50	2	100
UR544020030260	0.3	2	6	2	5	60	2	100
UR544020030280	0.3	2	8	2	5	80	2	140
UR544020050110	0.5	2	4	2	5	10	2	50
UR544020050112	0.5	2	4	2	5	12	1	50

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544020050116	0.5	2	4	2	5	16	1	50
UR544020050120	0.5	2	4	2	5	20	1	50
UR544020050125	0.5	2	4	2	5	25	1	60
UR544020050130	0.5	2	4	2	5	30	1	70
UR544020050140	0.5	2	6	2	5	40	1	80
UR544020050150	0.5	2	6	2	5	50	1	100
UR544020050160	0.5	2	6	2	5	60	1	100
UR544020050180	0.5	2	6	2	5	80	1	140
UR544020050210	0.5	2	4	2	5	10	1	50
UR544020050212	0.5	2	4	2	5	12	2	50
UR544020050216	0.5	2	4	2	5	16	2	50
UR544020050220	0.5	2	4	2	5	20	2	50
UR544020050225	0.5	2	4	2	5	25	2	60
UR544020050230	0.5	2	4	2	5	30	2	70
UR544020050240	0.5	2	6	2	5	40	2	80
UR544020050250	0.5	2	6	2	5	50	2	100
UR544020050260	0.5	2	6	2	5	60	2	100
UR544020050280	0.5	2	8	2	5	80	2	140
UR544030020116	0.2	3	6	4.5	6	16	2	60
UR544030020120	0.2	3	6	4.5	6	20	1	65
UR544030020130	0.2	3	6	4.5	6	30	1	70
UR544030020140	0.2	3	6	4.5	6	40	1	80
UR544030020150	0.2	3	6	4.5	6	50	1	90
UR544030020160	0.2	3	6	4.5	6	60	1	100
UR544030020216	0.2	3	6	4.5	6	16	1	60
UR544030020220	0.2	3	6	4.5	6	20	2	65
UR544030020230	0.2	3	6	4.5	6	30	2	70
UR544030020240	0.2	3	6	4.5	6	40	2	80
UR544030020250	0.2	3	8	4.5	6	50	2	90
UR544030020260	0.2	3	8	4.5	6	60	2	100
UR544030020270	0.2	3	8	4.5	6	70	2	120
UR544030030116	0.3	3	6	4.5	6	16	2	60
UR544030030120	0.3	3	6	4.5	6	20	1	65
UR544030030130	0.3	3	6	4.5	6	30	1	70
UR544030030140	0.3	3	6	4.5	6	40	1	80
UR544030030150	0.3	3	6	4.5	6	50	1	90

UR544

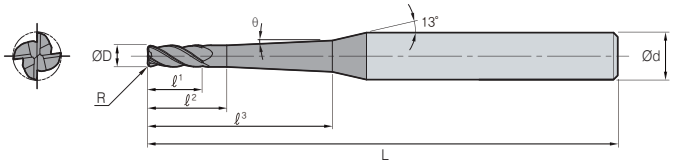
4 flutes tapered neck radius Endmill



CARBIDE | 4 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.485

• TOLERANCE

ØD		Ød
Ø1 ~ Ø4	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544030030160	0.3	3	6	4.5	6	60	1	100
UR544030030216	0.3	3	6	4.5	6	16	1	60
UR544030030220	0.3	3	6	4.5	6	20	2	65
UR544030030230	0.3	3	6	4.5	6	30	2	70
UR544030030240	0.3	3	6	4.5	6	40	2	80
UR544030030250	0.3	3	8	4.5	6	50	2	90
UR544030030260	0.3	3	8	4.5	6	60	2	100
UR544030030270	0.3	3	8	4.5	6	70	2	120
UR544030050116	0.5	3	6	4.5	6	16	2	60
UR544030050120	0.5	3	6	4.5	6	20	1	65
UR544030050130	0.5	3	6	4.5	6	30	1	70
UR544030050140	0.5	3	6	4.5	6	40	1	80
UR544030050150	0.5	3	6	4.5	6	50	1	90
UR544030050160	0.5	3	6	4.5	6	60	1	100
UR544030050216	0.5	3	6	4.5	6	16	1	60
UR544030050220	0.5	3	6	4.5	6	20	2	65
UR544030050230	0.5	3	6	4.5	6	30	2	70
UR544030050240	0.5	3	6	4.5	6	40	2	80
UR544030050250	0.5	3	8	4.5	6	50	2	90
UR544030050260	0.5	3	8	4.5	6	60	2	100
UR544030050270	0.5	3	8	4.5	6	70	2	120
UR544040020140	0.2	4	6	6	8	40	2	90
UR544040020150	0.2	4	6	6	8	50	1	100

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UR544040020160	0.2	4	6	6	8	60	1	110
UR544040020170	0.2	4	8	6	8	70	1	120
UR544040020240	0.2	4	8	6	8	40	1	90
UR544040020250	0.2	4	8	6	8	50	2	100
UR544040020260	0.2	4	8	6	8	60	2	110
UR544040020270	0.2	4	10	6	8	70	2	120
UR544040030140	0.3	4	6	6	8	40	2	90
UR544040030150	0.3	4	6	6	8	50	1	100
UR544040030160	0.3	4	6	6	8	60	1	110
UR544040030170	0.3	4	8	6	8	70	1	120
UR544040030240	0.3	4	8	6	8	40	1	90
UR544040030250	0.3	4	8	6	8	50	2	100
UR544040030260	0.3	4	8	6	8	60	2	110
UR544040030270	0.3	4	10	6	8	70	2	120
UR544040050140	0.5	4	6	6	8	40	2	90
UR544040050150	0.5	4	6	6	8	50	1	100
UR544040050160	0.5	4	6	6	8	60	1	110
UR544040050170	0.5	4	8	6	8	70	1	120
UR544040050240	0.5	4	8	6	8	40	1	90
UR544040050250	0.5	4	8	6	8	50	2	100
UR544040050260	0.5	4	8	6	8	60	2	110
UR544040050270	0.5	4	10	6	8	70	2	120

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UXR504

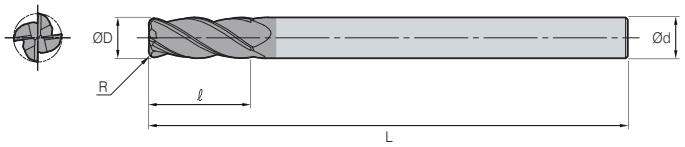
4 flutes multi helix radius Endmill



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 Corner R | AlCrN | DATA p.486

• TOLERANCE

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	ℓ	L
UXR504010005	0.05	1	6	2.5	50
UXR50401001	0.1	1	6	2.5	50
UXR50401002	0.2	1	6	2.5	50
UXR50401003	0.3	1	6	2.5	50
UXR504012005	0.05	1.2	6	3	50
UXR50401201	0.1	1.2	6	3	50
UXR50401202	0.2	1.2	6	3	50
UXR50401203	0.3	1.2	6	3	50
UXR504015005	0.05	1.5	6	4	50
UXR50401501	0.1	1.5	6	4	50
UXR50401502	0.2	1.5	6	4	50
UXR50401503	0.3	1.5	6	4	50
UXR50401505	0.5	1.5	6	4	50
UXR50402001	0.1	2	6	6	50
UXR50402002	0.2	2	6	6	50
UXR50402003	0.3	2	6	6	50
UXR50402005	0.5	2	6	6	50
UXR50402501	0.1	2.5	6	7	60
UXR50402502	0.2	2.5	6	7	60
UXR50402503	0.3	2.5	6	7	60
UXR50402505	0.5	2.5	6	7	60
UXR50403001	0.1	3	6	8	60
UXR50403002	0.2	3	6	8	60
UXR50403003	0.3	3	6	8	60
UXR50403005	0.5	3	6	8	60
UXR50403010	1	3	6	8	60
UXR50403501	0.1	3.5	6	10	70
UXR50403502	0.2	3.5	6	10	70
UXR50403503	0.3	3.5	6	10	70
UXR50403505	0.5	3.5	6	10	70
UXR50404001	0.1	4	6	10	70
UXR50404001100S4	0.1	4	4	10	100
UXR50404001S4	0.1	4	4	10	70
UXR50404002	0.2	4	6	10	70
UXR50404002100S4	0.2	4	4	10	100
UXR50404002S4	0.2	4	4	10	70

Designation	R	ØD	Ød	ℓ	L
UXR50404003	0.3	4	6	10	70
UXR50404003100S4	0.3	4	4	10	100
UXR50404003S4	0.3	4	4	10	70
UXR50404005	0.5	4	6	10	70
UXR50404005100S4	0.5	4	4	10	100
UXR50404005S4	0.5	4	4	10	70
UXR50404010	1	4	6	10	70
UXR50404010100S4	1	4	4	10	100
UXR50404010S4	1	4	4	10	70
UXR50404501	0.1	4.5	6	11	80
UXR50404502	0.2	4.5	6	11	80
UXR50404503	0.3	4.5	6	11	80
UXR50404505	0.5	4.5	6	11	80
UXR50405001	0.1	5	6	13	90
UXR50405002	0.2	5	6	13	90
UXR50405003	0.3	5	6	13	90
UXR50405005	0.5	5	6	13	90
UXR50405010	1	5	6	13	90
UXR50405501	0.1	5.5	6	13	90
UXR50405502	0.2	5.5	6	13	90
UXR50405503	0.3	5.5	6	13	90
UXR50405505	0.5	5.5	6	13	90
UXR50405510	1	5.5	6	13	90
UXR50406001	0.1	6	6	15	90
UXR50406001060	0.1	6	6	15	60
UXR50406002	0.2	6	6	15	90
UXR50406002060	0.2	6	6	15	60
UXR50406003	0.3	6	6	15	90
UXR50406005	0.5	6	6	15	90
UXR50406005060	0.5	6	6	15	60
UXR50406005110	0.5	6	6	15	110
UXR50406005130	0.5	6	6	15	130
UXR50406010	1	6	6	15	90
UXR50406010060	1	6	6	15	60
UXR50406010110	1	6	6	15	110
UXR50406010130	1	6	6	15	130

UXR504

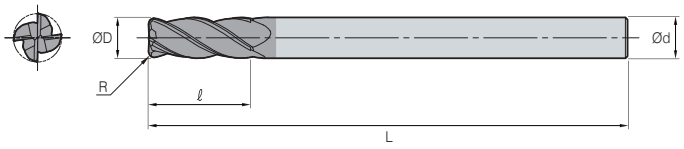
4 flutes multi helix radius Endmill



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 Corner R | AlCrN | DATA p.486

• TOLERANCE

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	ℓ	L
UXR50406015	1.5	6	6	15	90
UXR50406020	2	6	6	15	90
UXR50407001	0.1	7	8	16	90
UXR50407002	0.2	7	8	16	90
UXR50407003	0.3	7	8	16	90
UXR50407005	0.5	7	8	16	90
UXR50407010	1	7	8	16	90
UXR50407020	2	7	8	16	90
UXR50408001	0.1	8	8	20	100
UXR50408002	0.2	8	8	20	100
UXR50408003	0.3	8	8	20	100
UXR50408003070	0.3	8	8	20	70
UXR50408005	0.5	8	8	20	100
UXR50408005070	0.5	8	8	20	70
UXR50408005120	0.5	8	8	20	120
UXR50408005150	0.5	8	8	20	150
UXR50408010	1	8	8	20	100
UXR50408010070	1	8	8	20	70
UXR50408010120	1	8	8	20	120
UXR50408010150	1	8	8	20	150
UXR50408015	1.5	8	8	20	100
UXR50408015070	1.5	8	8	20	70
UXR50408020	2	8	8	20	100
UXR50408020070	2	8	8	20	70
UXR50408025	2.5	8	8	20	100
UXR50408030	3	8	8	20	100
UXR50410001	0.1	10	10	25	100
UXR50410002	0.2	10	10	25	100
UXR50410003	0.3	10	10	25	100
UXR50410003075	0.3	10	10	25	75
UXR50410005	0.5	10	10	25	100
UXR50410005075	0.5	10	10	25	75
UXR50410005130	0.5	10	10	22	130
UXR50410005150	0.5	10	10	22	150
UXR50410010	1	10	10	25	100
UXR50410010075	1	10	10	25	75

Designation	R	ØD	Ød	ℓ	L
UXR50410010130	1	10	10	22	130
UXR50410010150	1	10	10	22	150
UXR50410015	1.5	10	10	25	100
UXR50410020	2	10	10	25	100
UXR50410025	2.5	10	10	25	100
UXR50410030	3	10	10	25	100
UXR50410040	4	10	10	25	100
UXR50411002	0.2	11	12	25	110
UXR50411003	0.3	11	12	25	110
UXR50411005	0.5	11	12	25	110
UXR50411010	1	11	12	25	110
UXR50411020	2	11	12	25	110
UXR50412001	0.1	12	12	30	110
UXR50412002	0.2	12	12	30	110
UXR50412003	0.3	12	12	30	110
UXR50412003080	0.3	12	12	30	80
UXR50412005	0.5	12	12	30	110
UXR50412005080	0.5	12	12	30	80
UXR50412005130	0.5	12	12	30	130
UXR50412005150	0.5	12	12	30	150
UXR50412010	1	12	12	30	110
UXR50412010080	1	12	12	30	80
UXR50412010130	1	12	12	30	130
UXR50412010150	1	12	12	30	150
UXR50412015	1.5	12	12	30	110
UXR50412015080	1.5	12	12	30	80
UXR50412020	2	12	12	30	110
UXR50412020080	2	12	12	30	80
UXR50412025	2.5	12	12	30	110
UXR50412025080	2.5	12	12	30	80
UXR50412030	3	12	12	30	110
UXR50412030080	3	12	12	30	80
UXR50412040	4	12	12	30	110
UXR50412050	5	12	12	30	110
UXR50414005	0.5	14	16	35	150
UXR50414010	1	14	16	35	150

U-Star Endmill

UXR504

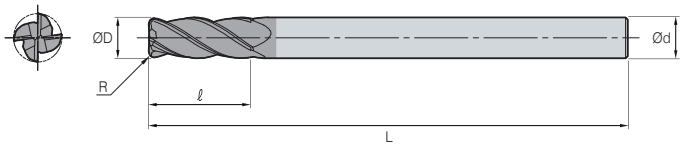
4 flutes multi helix radius Endmill

CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 Corner R | AlCrN | DATA p.486

• TOLERANCE

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5





(mm)

Designation	R	ØD	Ød	ℓ	L
UXR50414020	2	14	16	35	150
UXR50416005	0.5	16	16	40	100
UXR50416005150	0.5	16	16	40	150
UXR50416010	1	16	16	40	100
UXR50416010150	1	16	16	40	150
UXR50416015	1.5	16	16	40	100
UXR50416015150	1.5	16	16	40	150
UXR50416020	2	16	16	40	100
UXR50416020150	2	16	16	40	150
UXR50416030	3	16	16	40	100

Designation	R	ØD	Ød	ℓ	L
UXR50420005	0.5	20	20	45	110
UXR50420005150	0.5	20	20	45	150
UXR50420010	1	20	20	45	110
UXR50420010150	1	20	20	45	150
UXR50420015	1.5	20	20	45	110
UXR50420015150	1.5	20	20	45	150
UXR50420020	2	20	20	45	110
UXR50420020150	2	20	20	45	150
UXR50420030	3	20	20	45	110

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UXR514

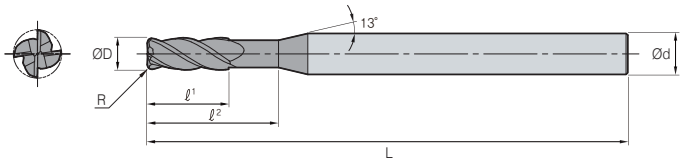
4 flutes multi helix neck radius Endmill



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 Corner R | AlCrN | DATA p.485

• TOLERANCE

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UXR51401000503	0.05	1	4	1.5	3	50
UXR51401000504	0.05	1	4	1.5	4	50
UXR51401000506	0.05	1	4	1.5	6	50
UXR51401000508	0.05	1	4	1.5	8	50
UXR51401000510	0.05	1	4	1.5	10	50
UXR51401000512	0.05	1	4	1.5	12	50
UXR51401000514	0.05	1	4	1.5	14	50
UXR51401000516	0.05	1	4	1.5	16	50
UXR51401000520	0.05	1	4	1.5	20	50
UXR5140100103	0.1	1	4	1.5	3	50
UXR5140100104	0.1	1	4	1.5	4	50
UXR5140100106	0.1	1	4	1.5	6	50
UXR5140100108	0.1	1	4	1.5	8	50
UXR5140100110	0.1	1	4	1.5	10	50
UXR5140100112	0.1	1	4	1.5	12	50
UXR5140100114	0.1	1	4	1.5	14	50
UXR5140100116	0.1	1	4	1.5	16	50
UXR5140100120	0.1	1	4	1.5	20	50
UXR5140100203	0.2	1	4	1.5	3	50
UXR5140100204	0.2	1	4	1.5	4	50
UXR5140100206	0.2	1	4	1.5	6	50
UXR5140100208	0.2	1	4	1.5	8	50
UXR5140100210	0.2	1	4	1.5	10	50
UXR5140100212	0.2	1	4	1.5	12	50
UXR5140100214	0.2	1	4	1.5	14	50
UXR5140100216	0.2	1	4	1.5	16	50
UXR5140100220	0.2	1	4	1.5	20	50
UXR5140100303	0.3	1	4	1.5	3	50
UXR5140100304	0.3	1	4	1.5	4	50
UXR5140100306	0.3	1	4	1.5	6	50
UXR5140100308	0.3	1	4	1.5	8	50
UXR5140100310	0.3	1	4	1.5	10	50
UXR5140100312	0.3	1	4	1.5	12	50
UXR5140100314	0.3	1	4	1.5	14	50
UXR5140100316	0.3	1	4	1.5	16	50
UXR5140100320	0.3	1	4	1.5	20	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UXR51401200503	0.05	1.2	4	1.8	3	50
UXR51401200504	0.05	1.2	4	1.8	4	50
UXR51401200506	0.05	1.2	4	1.8	6	50
UXR51401200508	0.05	1.2	4	1.8	8	50
UXR51401200510	0.05	1.2	4	1.8	10	50
UXR51401200512	0.05	1.2	4	1.8	12	50
UXR51401200516	0.05	1.2	4	1.8	16	50
UXR51401200520	0.05	1.2	4	1.8	20	50
UXR5140120103	0.1	1.2	4	1.8	3	50
UXR5140120104	0.1	1.2	4	1.8	4	50
UXR5140120106	0.1	1.2	4	1.8	6	50
UXR5140120108	0.1	1.2	4	1.8	8	50
UXR5140120110	0.1	1.2	4	1.8	10	50
UXR5140120112	0.1	1.2	4	1.8	12	50
UXR5140120116	0.1	1.2	4	1.8	16	50
UXR5140120120	0.1	1.2	4	1.8	20	50
UXR5140120203	0.2	1.2	4	1.8	3	50
UXR5140120204	0.2	1.2	4	1.8	4	50
UXR5140120206	0.2	1.2	4	1.8	6	50
UXR5140120208	0.2	1.2	4	1.8	8	50
UXR5140120210	0.2	1.2	4	1.8	10	50
UXR5140120212	0.2	1.2	4	1.8	12	50
UXR5140120216	0.2	1.2	4	1.8	16	50
UXR5140120220	0.2	1.2	4	1.8	20	50
UXR5140120303	0.3	1.2	4	1.8	3	50
UXR5140120304	0.3	1.2	4	1.8	4	50
UXR5140120306	0.3	1.2	4	1.8	6	50
UXR5140120308	0.3	1.2	4	1.8	8	50
UXR5140120310	0.3	1.2	4	1.8	10	50
UXR5140120312	0.3	1.2	4	1.8	12	50
UXR5140120316	0.3	1.2	4	1.8	16	50
UXR5140120320	0.3	1.2	4	1.8	20	50
UXR51401500504	0.05	1.5	4	2.3	4	50
UXR51401500506	0.05	1.5	4	2.3	6	50
UXR51401500508	0.05	1.5	4	2.3	8	50
UXR51401500510	0.05	1.5	4	2.3	10	50

U-Star Endmill

UXR514

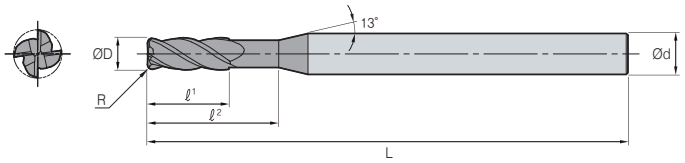
4 flutes multi helix neck radius Endmill



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 Corner R | AlCrN | DATA p.485

• TOLERANCE

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UXR51401500512	0.05	1.5	4	2.3	12	50
UXR51401500514	0.05	1.5	4	2.3	14	50
UXR51401500516	0.05	1.5	4	2.3	16	50
UXR51401500520	0.05	1.5	4	2.3	20	50
UXR51401500522	0.05	1.5	4	2.3	22	60
UXR51401500526	0.05	1.5	4	2.3	26	60
UXR5140150104	0.1	1.5	4	2.3	4	50
UXR5140150106	0.1	1.5	4	2.3	6	50
UXR5140150108	0.1	1.5	4	2.3	8	50
UXR5140150110	0.1	1.5	4	2.3	10	50
UXR5140150112	0.1	1.5	4	2.3	12	50
UXR5140150114	0.1	1.5	4	2.3	14	50
UXR5140150116	0.1	1.5	4	2.3	16	50
UXR5140150120	0.1	1.5	4	2.3	20	50
UXR5140150122	0.1	1.5	4	2.3	22	60
UXR5140150126	0.1	1.5	4	2.3	26	60
UXR5140150204	0.2	1.5	4	2.3	4	50
UXR5140150206	0.2	1.5	4	2.3	6	50
UXR5140150208	0.2	1.5	4	2.3	8	50
UXR5140150210	0.2	1.5	4	2.3	10	50
UXR5140150212	0.2	1.5	4	2.3	12	50
UXR5140150214	0.2	1.5	4	2.3	14	50
UXR5140150216	0.2	1.5	4	2.3	16	50
UXR5140150220	0.2	1.5	4	2.3	20	50
UXR5140150222	0.2	1.5	4	2.3	22	60
UXR5140150226	0.2	1.5	4	2.3	26	60
UXR5140150304	0.3	1.5	4	2.3	4	50
UXR5140150306	0.3	1.5	4	2.3	6	50
UXR5140150308	0.3	1.5	4	2.3	8	50
UXR5140150310	0.3	1.5	4	2.3	10	50
UXR5140150312	0.3	1.5	4	2.3	12	50
UXR5140150314	0.3	1.5	4	2.3	14	50
UXR5140150316	0.3	1.5	4	2.3	16	50
UXR5140150320	0.3	1.5	4	2.3	20	50
UXR5140150322	0.3	1.5	4	2.3	22	60
UXR5140150326	0.3	1.5	4	2.3	26	60

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140150504	0.5	1.5	4	2.3	4	50
UXR5140150506	0.5	1.5	4	2.3	6	50
UXR5140150508	0.5	1.5	4	2.3	8	50
UXR5140150510	0.5	1.5	4	2.3	10	50
UXR5140150512	0.5	1.5	4	2.3	12	50
UXR5140150514	0.5	1.5	4	2.3	14	50
UXR5140150516	0.5	1.5	4	2.3	16	50
UXR5140150520	0.5	1.5	4	2.3	20	50
UXR5140150522	0.5	1.5	4	2.3	22	60
UXR5140150526	0.5	1.5	4	2.3	26	60
UXR5140200106	0.1	2	4	3	6	50
UXR5140200108	0.1	2	4	3	8	50
UXR5140200110	0.1	2	4	3	10	50
UXR5140200112	0.1	2	4	3	12	50
UXR5140200114	0.1	2	4	3	14	50
UXR5140200116	0.1	2	4	3	16	50
UXR5140200120	0.1	2	4	3	20	50
UXR5140200122	0.1	2	4	3	22	60
UXR5140200126	0.1	2	4	3	26	60
UXR5140200130	0.1	2	4	3	30	70
UXR5140200206	0.2	2	4	3	6	50
UXR5140200208	0.2	2	4	3	8	50
UXR5140200210	0.2	2	4	3	10	50
UXR5140200212	0.2	2	4	3	12	50
UXR5140200214	0.2	2	4	3	14	50
UXR5140200216	0.2	2	4	3	16	50
UXR5140200220	0.2	2	4	3	20	50
UXR5140200222	0.2	2	4	3	22	60
UXR5140200226	0.2	2	4	3	26	60
UXR5140200230	0.2	2	4	3	30	70
UXR5140200306	0.3	2	4	3	6	50
UXR5140200308	0.3	2	4	3	8	50
UXR5140200310	0.3	2	4	3	10	50
UXR5140200312	0.3	2	4	3	12	50
UXR5140200314	0.3	2	4	3	14	50
UXR5140200316	0.3	2	4	3	16	50

UXR514

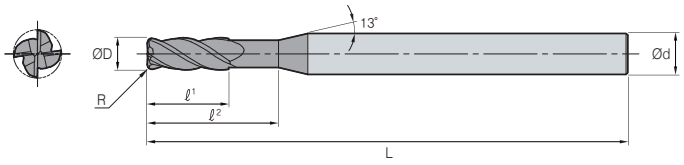
4 flutes multi helix neck radius Endmill



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 Corner R | AlCrN | DATA p.485

• TOLERANCE

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140200320	0.3	2	4	3	20	50
UXR5140200322	0.3	2	4	3	22	60
UXR5140200326	0.3	2	4	3	26	60
UXR5140200330	0.3	2	4	3	30	70
UXR5140200506	0.5	2	4	3	6	50
UXR5140200508	0.5	2	4	3	8	50
UXR5140200510	0.5	2	4	3	10	50
UXR5140200512	0.5	2	4	3	12	50
UXR5140200514	0.5	2	4	3	14	50
UXR5140200516	0.5	2	4	3	16	50
UXR5140200520	0.5	2	4	3	20	50
UXR5140200522	0.5	2	4	3	22	60
UXR5140200526	0.5	2	4	3	26	60
UXR5140200530	0.5	2	4	3	30	70
UXR5140250108	0.1	2.5	4	4	8	50
UXR5140250110	0.1	2.5	4	4	10	50
UXR5140250112	0.1	2.5	4	4	12	50
UXR5140250114	0.1	2.5	4	4	14	50
UXR5140250116	0.1	2.5	4	4	16	50
UXR5140250120	0.1	2.5	4	4	20	50
UXR5140250126	0.1	2.5	4	4	26	60
UXR5140250130	0.1	2.5	4	4	30	70
UXR5140250208	0.2	2.5	4	4	8	50
UXR5140250210	0.2	2.5	4	4	10	50
UXR5140250212	0.2	2.5	4	4	12	50
UXR5140250214	0.2	2.5	4	4	14	50
UXR5140250216	0.2	2.5	4	4	16	50
UXR5140250220	0.2	2.5	4	4	20	50
UXR5140250226	0.2	2.5	4	4	26	60
UXR5140250230	0.2	2.5	4	4	30	70
UXR5140250308	0.3	2.5	4	4	8	50
UXR5140250310	0.3	2.5	4	4	10	50
UXR5140250312	0.3	2.5	4	4	12	50
UXR5140250314	0.3	2.5	4	4	14	50
UXR5140250316	0.3	2.5	4	4	16	50
UXR5140250320	0.3	2.5	4	4	20	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140250326	0.3	2.5	4	4	26	60
UXR5140250330	0.3	2.5	4	4	30	70
UXR5140250508	0.5	2.5	4	4	8	50
UXR5140250510	0.5	2.5	4	4	10	50
UXR5140250512	0.5	2.5	4	4	12	50
UXR5140250514	0.5	2.5	4	4	14	50
UXR5140250516	0.5	2.5	4	4	16	50
UXR5140250520	0.5	2.5	4	4	20	50
UXR5140250526	0.5	2.5	4	4	26	60
UXR5140250530	0.5	2.5	4	4	30	70
UXR5140300108	0.1	3	6	4.5	8	50
UXR5140300110	0.1	3	6	4.5	10	50
UXR5140300112	0.1	3	6	4.5	12	50
UXR5140300114	0.1	3	6	4.5	14	60
UXR5140300116	0.1	3	6	4.5	16	60
UXR5140300120	0.1	3	6	4.5	20	60
UXR5140300126	0.1	3	6	4.5	26	65
UXR5140300130	0.1	3	6	4.5	30	70
UXR5140300135	0.1	3	6	4.5	35	70
UXR5140300140	0.1	3	6	4.5	40	80
UXR5140300208	0.2	3	6	4.5	8	50
UXR5140300210	0.2	3	6	4.5	10	50
UXR5140300212	0.2	3	6	4.5	12	50
UXR5140300214	0.2	3	6	4.5	14	60
UXR5140300216	0.2	3	6	4.5	16	60
UXR5140300220	0.2	3	6	4.5	20	60
UXR5140300226	0.2	3	6	4.5	26	65
UXR5140300230	0.2	3	6	4.5	30	70
UXR5140300235	0.2	3	6	4.5	35	70
UXR5140300240	0.2	3	6	4.5	40	80
UXR5140300308	0.3	3	6	4.5	8	50
UXR5140300310	0.3	3	6	4.5	10	50
UXR5140300312	0.3	3	6	4.5	12	50
UXR5140300314	0.3	3	6	4.5	14	60
UXR5140300316	0.3	3	6	4.5	16	60
UXR5140300320	0.3	3	6	4.5	20	60

U-Star Endmill

UXR514

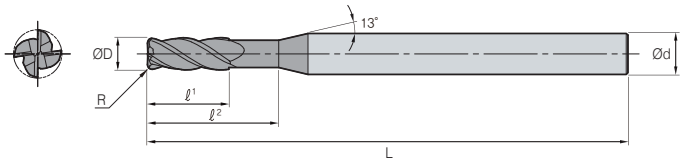
4 flutes multi helix neck radius Endmill



CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 Corner R | AlCrN | DATA p.485

• TOLERANCE

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140300326	0.3	3	6	4.5	26	65
UXR5140300330	0.3	3	6	4.5	30	70
UXR5140300335	0.3	3	6	4.5	35	70
UXR5140300340	0.3	3	6	4.5	40	80
UXR5140300508	0.5	3	6	4.5	8	50
UXR5140300510	0.5	3	6	4.5	10	50
UXR5140300512	0.5	3	6	4.5	12	50
UXR5140300514	0.5	3	6	4.5	14	60
UXR5140300516	0.5	3	6	4.5	16	60
UXR5140300520	0.5	3	6	4.5	20	60
UXR5140300526	0.5	3	6	4.5	26	65
UXR5140300530	0.5	3	6	4.5	30	70
UXR5140300535	0.5	3	6	4.5	35	70
UXR5140300540	0.5	3	6	4.5	40	80
UXR5140301008	1	3	6	4.5	8	50
UXR5140301010	1	3	6	4.5	10	50
UXR5140301012	1	3	6	4.5	12	50
UXR5140301014	1	3	6	4.5	14	60
UXR5140301016	1	3	6	4.5	16	60
UXR5140301020	1	3	6	4.5	20	60
UXR5140301026	1	3	6	4.5	26	65
UXR5140301030	1	3	6	4.5	30	70
UXR5140301035	1	3	6	4.5	35	70
UXR5140301040	1	3	6	4.5	40	80
UXR5140400110	0.1	4	6	6	10	50
UXR5140400112	0.1	4	6	6	12	50
UXR5140400114	0.1	4	6	6	14	60
UXR5140400116	0.1	4	6	6	16	60
UXR5140400120	0.1	4	6	6	20	60
UXR5140400126	0.1	4	6	6	26	65
UXR5140400130	0.1	4	6	6	30	70
UXR5140400135	0.1	4	6	6	35	70
UXR5140400140	0.1	4	6	6	40	80
UXR5140400145	0.1	4	6	6	45	90
UXR5140400150	0.1	4	6	6	50	100
UXR5140400210	0.2	4	6	6	10	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140400212	0.2	4	6	6	12	50
UXR5140400214	0.2	4	6	6	14	60
UXR5140400216	0.2	4	6	6	16	60
UXR5140400220	0.2	4	6	6	20	60
UXR5140400226	0.2	4	6	6	26	65
UXR5140400230	0.2	4	6	6	30	70
UXR5140400235	0.2	4	6	6	35	70
UXR5140400240	0.2	4	6	6	40	80
UXR5140400245	0.2	4	6	6	45	90
UXR5140400250	0.2	4	6	6	50	100
UXR5140400310	0.3	4	6	6	10	50
UXR5140400312	0.3	4	6	6	12	50
UXR5140400314	0.3	4	6	6	14	60
UXR5140400316	0.3	4	6	6	16	60
UXR5140400320	0.3	4	6	6	20	60
UXR5140400326	0.3	4	6	6	26	65
UXR5140400330	0.3	4	6	6	30	70
UXR5140400335	0.3	4	6	6	35	70
UXR5140400340	0.3	4	6	6	40	80
UXR5140400345	0.3	4	6	6	45	90
UXR5140400350	0.3	4	6	6	50	100
UXR5140400510	0.5	4	6	6	10	50
UXR5140400512	0.5	4	6	6	12	50
UXR5140400514	0.5	4	6	6	14	60
UXR5140400516	0.5	4	6	6	16	60
UXR5140400520	0.5	4	6	6	20	60
UXR5140400526	0.5	4	6	6	26	65
UXR5140400530	0.5	4	6	6	30	70
UXR5140400535	0.5	4	6	6	35	70
UXR5140400540	0.5	4	6	6	40	80
UXR5140400545	0.5	4	6	6	45	90
UXR5140400550	0.5	4	6	6	50	100
UXR5140401010	1	4	6	6	10	50
UXR5140401012	1	4	6	6	12	50
UXR5140401014	1	4	6	6	14	60
UXR5140401016	1	4	6	6	16	60

UXR514

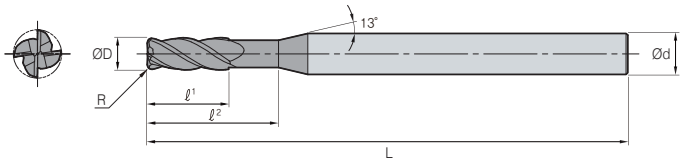
4 flutes multi helix neck radius Endmill

CARBIDE | 4 | 34° HELIX | 36° HELIX | R ±0.02 Corner R | AlCrN | DATA p.485

• TOLERANCE

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5





(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UXR5140401020	1	4	6	6	20	60
UXR5140401026	1	4	6	6	26	65
UXR5140401030	1	4	6	6	30	70
UXR5140401035	1	4	6	6	35	70
UXR5140401040	1	4	6	6	40	80
UXR5140401045	1	4	6	6	45	90
UXR5140401050	1	4	6	6	50	100
UXR51405001	0.1	5	6	8	15	60
UXR51405002	0.2	5	6	8	15	60
UXR51405003	0.3	5	6	8	15	60
UXR51405005	0.5	5	6	8	15	60
UXR51405010	1	5	6	8	15	60
UXR51405015	1.5	5	6	8	15	60
UXR51405020	2	5	6	8	15	60
UXR51406001	0.1	6	6	9	20	60
UXR51406002	0.2	6	6	9	20	60
UXR51406003	0.3	6	6	9	20	60
UXR51406003090	0.3	6	6	15	30	90
UXR51406005	0.5	6	6	9	20	60
UXR51406005090	0.5	6	6	15	30	90
UXR51406010	1	6	6	9	20	60
UXR51406010090	1	6	6	15	30	90
UXR51406015	1.5	6	6	9	20	60
UXR51406020	2	6	6	9	20	60
UXR51408001	0.1	8	8	12	25	70
UXR51408002	0.2	8	8	12	25	70
UXR51408003	0.3	8	8	12	25	70
UXR51408003100	0.3	8	8	20	35	100
UXR51408005	0.5	8	8	12	25	70
UXR51408005100	0.5	8	8	20	35	100
UXR51408010	1	8	8	12	25	70

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UXR51408010100	1	8	8	20	35	100
UXR51408015	1.5	8	8	12	25	70
UXR51408020	2	8	8	12	25	70
UXR51410001	0.1	10	10	15	30	75
UXR51410002	0.2	10	10	15	30	75
UXR51410003	0.3	10	10	15	30	75
UXR51410003100	0.3	10	10	25	40	100
UXR51410005	0.5	10	10	15	30	75
UXR51410005100	0.5	10	10	25	40	100
UXR51410010	1	10	10	15	30	75
UXR51410010100	1	10	10	25	40	100
UXR51410015	1.5	10	10	15	30	75
UXR51410020	2	10	10	15	30	75
UXR51412002	0.2	12	12	18	32	80
UXR51412003	0.3	12	12	18	32	80
UXR51412003110	0.3	12	12	30	45	110
UXR51412005	0.5	12	12	18	32	80
UXR51412005110	0.5	12	12	30	45	110
UXR51412010	1	12	12	18	32	80
UXR51412010110	1	12	12	30	45	110
UXR51412015	1.5	12	12	18	32	80
UXR51412020	2	12	12	18	32	80
UXR51416005	0.5	16	16	20	35	100
UXR51416005150	0.5	16	16	35	50	150
UXR51416010	1	16	16	20	35	100
UXR51416010150	1	16	16	35	50	150
UXR51420005	0.5	20	20	25	40	100
UXR51420005150	0.5	20	20	40	55	150
UXR51420010	1	20	20	25	40	100
UXR51420010150	1	20	20	40	55	150

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UR506

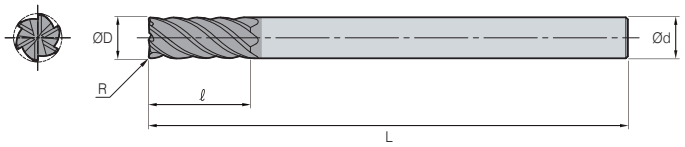
6 flutes radius Endmill



CARBIDE | 6 | 45° HELIX | R ±0.015 Corner R | AlCrN | DATA p.486

• TOLERANCE

ØD		Ød
Ø6 ~ Ø20	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	ℓ	L
UR50606003	0.3	6	6	15	90
UR50606005	0.5	6	6	15	90
UR50606010	1	6	6	15	90
UR50608003	0.3	8	8	20	100
UR50608005	0.5	8	8	20	100
UR50608010	1	8	8	20	100
UR50610003	0.3	10	10	25	100
UR50610005	0.5	10	10	25	100
UR50610010	1	10	10	25	100
UR50612003	0.3	12	12	30	110
UR50612005	0.5	12	12	30	110
UR50612010	1	12	12	30	110
UR50616005	0.5	16	16	32	150
UR50616010	1	16	16	32	150
UR50616015	1.5	16	16	32	150
UR50616020	2	16	16	32	150
UR50620005	0.5	20	20	38	150
UR50620010	1	20	20	38	150
UR50620015	1.5	20	20	38	150
UR50620020	2	20	20	38	150

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UDR503

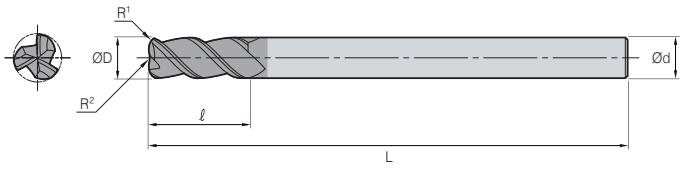
3 flutes double radius Endmill



CARBIDE | 3 | 45° HELIX | R ±0.02 Corner R | AlCrN | DATA p.487

• TOLERANCE

ØD		Ød
Ø6 ~ Ø20	0 ~ -0.02mm	h5



(mm)

Designation	R	ØD	Ød	R²	ℓ	L
UDR50306005	0.5	6	6	6	10	90
UDR50306010	1	6	6	6	10	90
UDR50306020	2	6	6	6	10	90
UDR50308005	0.5	8	8	8	16	100
UDR50308010	1	8	8	8	16	100
UDR50308020	2	8	8	8	16	100
UDR50310005	0.5	10	10	10	20	100
UDR50310010	1	10	10	10	20	100
UDR50310020	2	10	10	10	20	100
UDR50312005	0.5	12	12	12	24	110
UDR50312010	1	12	12	12	24	110
UDR50312020	2	12	12	12	24	110
UDR50316005	0.5	16	16	16	32	150
UDR50316010	1	16	16	16	32	150
UDR50320005	0.5	20	20	20	40	150
UDR50320010	1	20	20	20	40	150

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

USPM4

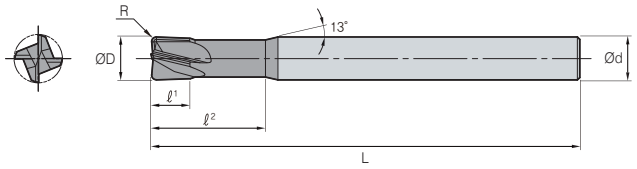
4 flutes radius Endmill for high speed machining

CARBIDE | 4 | 10° HELIX | R ±0.02 Corner R | AlCrN | DATA p.488



• TOLERANCE

ØD		Ød
Ø1 ~ Ø20	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
USPM4010-01	0.1	1	6	1	2.5	50
USPM4010-02	0.2	1	6	1	2.5	50
USPM4010-03	0.3	1	6	1	2.5	50
USPM4015-02	0.2	1.5	6	1.5	4	50
USPM4015-03	0.3	1.5	6	1.5	4	50
USPM4015-05	0.5	1.5	6	1.5	4	50
USPM4020-02	0.2	2	6	2	6	50
USPM4020-03	0.3	2	6	2	6	50
USPM4020-05	0.5	2	6	2	6	50
USPM4030-02	0.2	3	6	3	8	50
USPM4030-03	0.3	3	6	3	8	50
USPM4030-05	0.5	3	6	3	8	50
USPM4040-02	0.2	4	6	4	10	50
USPM4040-03	0.3	4	6	4	10	50
USPM4040-05	0.5	4	6	4	10	50
USPM4040-10	1	4	6	4	10	50
USPM4060-02	0.2	6	6	6	15	60
USPM4060-02L	0.2	6	6	6	15	90
USPM4060-03	0.3	6	6	6	15	60
USPM4060-03L	0.3	6	6	6	15	90
USPM4060-05	0.5	6	6	6	15	60
USPM4060-05L	0.5	6	6	6	15	90
USPM4060-10	1	6	6	6	15	60
USPM4060-10L	1	6	6	6	15	90
USPM4060-20	2	6	6	6	15	60
USPM4060-20L	2	6	6	6	15	90
USPM4080-02	0.2	8	8	8	20	70
USPM4080-02L	0.2	8	8	8	20	100
USPM4080-03	0.3	8	8	8	20	70
USPM4080-03L	0.3	8	8	8	20	100
USPM4080-05	0.5	8	8	8	20	70
USPM4080-05L	0.5	8	8	8	20	100
USPM4080-10	1	8	8	8	20	70
USPM4080-10L	1	8	8	8	20	100
USPM4080-20	2	8	8	8	20	70
USPM4080-20L	2	8	8	8	20	100

Designation	R	ØD	Ød	ℓ1	ℓ2	L
USPM4100-02	0.2	10	10	10	25	75
USPM4100-02L	0.2	10	10	10	25	100
USPM4100-03	0.3	10	10	10	25	75
USPM4100-03L	0.3	10	10	10	25	100
USPM4100-05	0.5	10	10	10	25	75
USPM4100-05L	0.5	10	10	10	25	100
USPM4100-10	1	10	10	10	25	75
USPM4100-10L	1	10	10	10	25	100
USPM4100-15	1.5	10	10	10	25	75
USPM4100-15L	1.5	10	10	10	25	100
USPM4100-20	2	10	10	10	25	75
USPM4100-20L	2	10	10	10	25	100
USPM4120-03	0.3	12	12	12	30	80
USPM4120-03L	0.3	12	12	12	30	110
USPM4120-05	0.5	12	12	12	30	80
USPM4120-05L	0.5	12	12	12	30	110
USPM4120-10	1	12	12	12	30	80
USPM4120-10L	1	12	12	12	30	110
USPM4120-15	1.5	12	12	12	30	80
USPM4120-15L	1.5	12	12	12	30	110
USPM4120-20	2	12	12	12	30	80
USPM4120-20L	2	12	12	12	30	110
USPM4120-30	3	12	12	12	30	80
USPM4120-30L	3	12	12	12	30	110
USPM4160-05	0.5	16	16	16	35	100
USPM4160-05L	0.5	16	16	16	35	150
USPM4160-10	1	16	16	16	35	100
USPM4160-10L	1	16	16	16	35	150
USPM4160-20	2	16	16	16	35	100
USPM4160-20L	2	16	16	16	35	150
USPM4200-05	0.5	20	20	20	40	100
USPM4200-05L	0.5	20	20	20	40	150
USPM4200-10	1	20	20	20	40	100
USPM4200-10L	1	20	20	20	40	150
USPM4200-20	2	20	20	20	40	100
USPM4200-20L	2	20	20	20	40	150

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UTR504

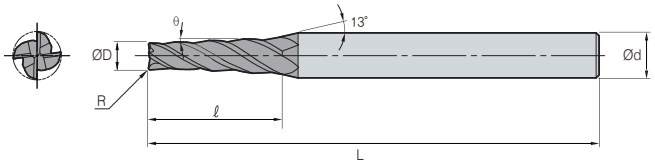
4 flutes tapered radius Endmill



CARBIDE | 4 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.488

• TOLERANCE

ØD		Ød
Ø0.8 ~ Ø2.5	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	θ	ℓ	L
UTR504008010104	0.1	0.8	4	1	4	45
UTR504008010106	0.1	0.8	4	1	6	45
UTR504008010108	0.1	0.8	4	1	8	45
UTR5040080101504	0.1	0.8	4	1.5	4	45
UTR5040080101506	0.1	0.8	4	1.5	6	45
UTR5040080101508	0.1	0.8	4	1.5	8	45
UTR504008020104	0.2	0.8	4	1	4	45
UTR504008020106	0.2	0.8	4	1	6	45
UTR504008020108	0.2	0.8	4	1	8	45
UTR5040080201504	0.2	0.8	4	1.5	4	45
UTR5040080201506	0.2	0.8	4	1.5	6	45
UTR5040080201508	0.2	0.8	4	1.5	8	45
UTR504010010104	0.1	1	4	1	4	50
UTR504010010106	0.1	1	4	1	6	50
UTR504010010108	0.1	1	4	1	8	50
UTR504010010110	0.1	1	4	1	10	50
UTR504010010112	0.1	1	4	1	12	50
UTR5040100101504	0.1	1	4	1.5	4	50
UTR5040100101506	0.1	1	4	1.5	6	50
UTR5040100101508	0.1	1	4	1.5	8	50
UTR5040100101510	0.1	1	4	1.5	10	50
UTR5040100101512	0.1	1	4	1.5	12	50
UTR504010010204	0.1	1	4	2	4	50
UTR504010010206	0.1	1	4	2	6	50
UTR504010010208	0.1	1	4	2	8	50
UTR504010010210	0.1	1	4	2	10	50
UTR504010010212	0.1	1	4	2	12	50
UTR504010010304	0.1	1	4	3	4	50
UTR504010010306	0.1	1	4	3	6	50
UTR504010010308	0.1	1	4	3	8	50
UTR504010010310	0.1	1	4	3	10	50
UTR504010010312	0.1	1	4	3	12	50
UTR504010020104	0.2	1	4	1	4	50
UTR504010020106	0.2	1	4	1	6	50
UTR504010020108	0.2	1	4	1	8	50
UTR504010020110	0.2	1	4	1	10	50

Designation	R	ØD	Ød	θ	ℓ	L
UTR504010020112	0.2	1	4	1	12	50
UTR5040100201504	0.2	1	4	1.5	4	50
UTR5040100201506	0.2	1	4	1.5	6	50
UTR5040100201508	0.2	1	4	1.5	8	50
UTR5040100201510	0.2	1	4	1.5	10	50
UTR5040100201512	0.2	1	4	1.5	12	50
UTR504010020204	0.2	1	4	2	4	50
UTR504010020206	0.2	1	4	2	6	50
UTR504010020208	0.2	1	4	2	8	50
UTR504010020210	0.2	1	4	2	10	50
UTR504010020212	0.2	1	4	2	12	50
UTR504010020304	0.2	1	4	3	4	50
UTR504010020306	0.2	1	4	3	6	50
UTR504010020308	0.2	1	4	3	8	50
UTR504010020310	0.2	1	4	3	10	50
UTR504010020312	0.2	1	4	3	12	50
UTR504010030104	0.3	1	4	1	4	50
UTR504010030106	0.3	1	4	1	6	50
UTR504010030108	0.3	1	4	1	8	50
UTR504010030110	0.3	1	4	1	10	50
UTR504010030112	0.3	1	4	1	12	50
UTR5040100301504	0.3	1	4	1.5	4	50
UTR5040100301506	0.3	1	4	1.5	6	50
UTR5040100301508	0.3	1	4	1.5	8	50
UTR5040100301510	0.3	1	4	1.5	10	50
UTR5040100301512	0.3	1	4	1.5	12	50
UTR504010030204	0.3	1	4	2	4	50
UTR504010030206	0.3	1	4	2	6	50
UTR504010030208	0.3	1	4	2	8	50
UTR504010030210	0.3	1	4	2	10	50
UTR504010030212	0.3	1	4	2	12	50
UTR504010030304	0.3	1	4	3	4	50
UTR504010030306	0.3	1	4	3	6	50
UTR504010030308	0.3	1	4	3	8	50
UTR504010030310	0.3	1	4	3	10	50
UTR504010030312	0.3	1	4	3	12	50

U-Star Endmill

UTR504

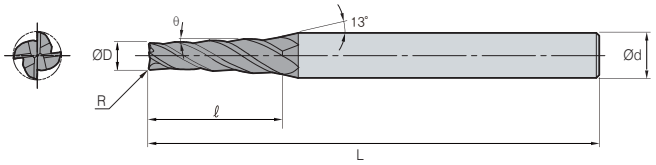
4 flutes tapered radius Endmill



CARBIDE | 4 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.488

• TOLERANCE

ØD		Ød
Ø0.8 ~ Ø2.5	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	θ	ℓ	L
UTR504012010106	0.1	1.2	4	1	6	50
UTR504012010108	0.1	1.2	4	1	8	50
UTR504012010110	0.1	1.2	4	1	10	50
UTR504012010112	0.1	1.2	4	1	12	50
UTR504012010206	0.1	1.2	4	2	6	50
UTR504012010208	0.1	1.2	4	2	8	50
UTR504012010210	0.1	1.2	4	2	10	50
UTR504012010212	0.1	1.2	4	2	12	50
UTR504012010306	0.1	1.2	4	3	6	50
UTR504012010308	0.1	1.2	4	3	8	50
UTR504012010310	0.1	1.2	4	3	10	50
UTR504012010312	0.1	1.2	4	3	12	50
UTR504012020106	0.2	1.2	4	1	6	50
UTR504012020108	0.2	1.2	4	1	8	50
UTR504012020110	0.2	1.2	4	1	10	50
UTR504012020112	0.2	1.2	4	1	12	50
UTR504012020206	0.2	1.2	4	2	6	50
UTR504012020208	0.2	1.2	4	2	8	50
UTR504012020210	0.2	1.2	4	2	10	50
UTR504012020212	0.2	1.2	4	2	12	50
UTR504012020306	0.2	1.2	4	3	6	50
UTR504012020308	0.2	1.2	4	3	8	50
UTR504012020310	0.2	1.2	4	3	10	50
UTR504012020312	0.2	1.2	4	3	12	50
UTR504012030106	0.3	1.2	4	1	6	50
UTR504012030108	0.3	1.2	4	1	8	50
UTR504012030110	0.3	1.2	4	1	10	50
UTR504012030112	0.3	1.2	4	1	12	50
UTR504012030206	0.3	1.2	4	2	6	50
UTR504012030208	0.3	1.2	4	2	8	50
UTR504012030210	0.3	1.2	4	2	10	50
UTR504012030212	0.3	1.2	4	2	12	50
UTR504012030306	0.3	1.2	4	3	6	50
UTR504012030308	0.3	1.2	4	3	8	50
UTR504012030310	0.3	1.2	4	3	10	50
UTR504012030312	0.3	1.2	4	3	12	50

Designation	R	ØD	Ød	θ	ℓ	L
UTR504015010106	0.1	1.5	4	1	6	50
UTR504015010108	0.1	1.5	4	1	8	50
UTR504015010110	0.1	1.5	4	1	10	50
UTR504015010112	0.1	1.5	4	1	12	50
UTR504015010116	0.1	1.5	4	1	16	50
UTR504015010120	0.1	1.5	4	1	20	60
UTR504015010206	0.1	1.5	4	2	6	50
UTR504015010208	0.1	1.5	4	2	8	50
UTR504015010210	0.1	1.5	4	2	10	50
UTR504015010212	0.1	1.5	4	2	12	50
UTR504015010216	0.1	1.5	4	2	16	50
UTR504015010220	0.1	1.5	4	2	20	60
UTR504015010306	0.1	1.5	4	3	6	50
UTR504015010308	0.1	1.5	4	3	8	50
UTR504015010310	0.1	1.5	4	3	10	50
UTR504015010312	0.1	1.5	4	3	12	50
UTR504015010316	0.1	1.5	4	3	16	50
UTR504015010320	0.1	1.5	4	3	20	60
UTR504015020106	0.2	1.5	4	1	6	50
UTR504015020108	0.2	1.5	4	1	8	50
UTR504015020110	0.2	1.5	4	1	10	50
UTR504015020112	0.2	1.5	4	1	12	50
UTR504015020116	0.2	1.5	4	1	16	50
UTR504015020120	0.2	1.5	4	1	20	60
UTR504015020206	0.2	1.5	4	2	6	50
UTR504015020208	0.2	1.5	4	2	8	50
UTR504015020210	0.2	1.5	4	2	10	50
UTR504015020212	0.2	1.5	4	2	12	50
UTR504015020216	0.2	1.5	4	2	16	50
UTR504015020220	0.2	1.5	4	2	20	60
UTR504015020306	0.2	1.5	4	3	6	50
UTR504015020308	0.2	1.5	4	3	8	50
UTR504015020310	0.2	1.5	4	3	10	50
UTR504015020312	0.2	1.5	4	3	12	50
UTR504015020316	0.2	1.5	4	3	16	50
UTR504015020320	0.2	1.5	4	3	20	60

UTR504

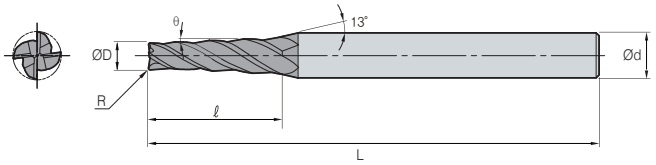
4 flutes tapered radius Endmill

CARBIDE | 4 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.488

• TOLERANCE

ØD		Ød
Ø0.8 ~ Ø2.5	0 ~ -0.03mm	h5





(mm)

Designation	R	ØD	Ød	θ	ℓ	L
UTR504015030106	0.3	1.5	4	1	6	50
UTR504015030108	0.3	1.5	4	1	8	50
UTR504015030110	0.3	1.5	4	1	10	50
UTR504015030112	0.3	1.5	4	1	12	50
UTR504015030116	0.3	1.5	4	1	16	50
UTR504015030120	0.3	1.5	4	1	20	60
UTR504015030206	0.3	1.5	4	2	6	50
UTR504015030208	0.3	1.5	4	2	8	50
UTR504015030210	0.3	1.5	4	2	10	50
UTR504015030212	0.3	1.5	4	2	12	50
UTR504015030216	0.3	1.5	4	2	16	50
UTR504015030220	0.3	1.5	4	2	20	60
UTR504015030306	0.3	1.5	4	3	6	50
UTR504015030308	0.3	1.5	4	3	8	50
UTR504015030310	0.3	1.5	4	3	10	50
UTR504015030312	0.3	1.5	4	3	12	50
UTR504015030316	0.3	1.5	4	3	16	50
UTR504015030320	0.3	1.5	4	3	20	60
UTR504020010108	0.1	2	4	1	8	50
UTR504020010110	0.1	2	4	1	10	50
UTR504020010112	0.1	2	4	1	12	50
UTR504020010116	0.1	2	4	1	16	50
UTR504020010120	0.1	2	4	1	20	60
UTR504020010125	0.1	2	4	1	25	60
UTR504020010208	0.1	2	4	2	8	50
UTR504020010210	0.1	2	4	2	10	50
UTR504020010212	0.1	2	4	2	12	50
UTR504020010216	0.1	2	4	2	16	50
UTR504020010220	0.1	2	4	2	20	60
UTR504020010225	0.1	2	4	2	25	60
UTR504020010308	0.1	2	4	3	8	50
UTR504020010310	0.1	2	4	3	10	50
UTR504020010312	0.1	2	4	3	12	50
UTR504020010316	0.1	2	4	3	16	50
UTR504020010320	0.1	2	6	3	20	60
UTR504020010325	0.1	2	6	3	25	60

Designation	R	ØD	Ød	θ	ℓ	L
UTR504020020108	0.2	2	4	1	8	50
UTR504020020110	0.2	2	4	1	10	50
UTR504020020112	0.2	2	4	1	12	50
UTR504020020116	0.2	2	4	1	16	50
UTR504020020120	0.2	2	4	1	20	60
UTR504020020125	0.2	2	4	1	25	60
UTR504020020208	0.2	2	4	2	8	50
UTR504020020210	0.2	2	4	2	10	50
UTR504020020212	0.2	2	4	2	12	50
UTR504020020216	0.2	2	4	2	16	50
UTR504020020220	0.2	2	4	2	20	60
UTR504020020225	0.2	2	4	2	25	60
UTR504020020308	0.2	2	4	3	8	50
UTR504020020310	0.2	2	4	3	10	50
UTR504020020312	0.2	2	4	3	12	50
UTR504020020316	0.2	2	4	3	16	50
UTR504020020320	0.2	2	6	3	20	60
UTR504020020325	0.2	2	6	3	25	60
UTR504020030108	0.3	2	4	1	8	50
UTR504020030110	0.3	2	4	1	10	50
UTR504020030112	0.3	2	4	1	12	50
UTR504020030116	0.3	2	4	1	16	50
UTR504020030120	0.3	2	4	1	20	60
UTR504020030125	0.3	2	4	1	25	60
UTR504020030208	0.3	2	4	2	8	50
UTR504020030210	0.3	2	4	2	10	50
UTR504020030212	0.3	2	4	2	12	50
UTR504020030216	0.3	2	4	2	16	50
UTR504020030220	0.3	2	4	2	20	60
UTR504020030225	0.3	2	4	2	25	60
UTR504020030308	0.3	2	4	3	8	50
UTR504020030310	0.3	2	4	3	10	50
UTR504020030312	0.3	2	4	3	12	50
UTR504020030316	0.3	2	4	3	16	50
UTR504020030320	0.3	2	6	3	20	60
UTR504020030325	0.3	2	6	3	25	60

U-Star Endmill

UTR504

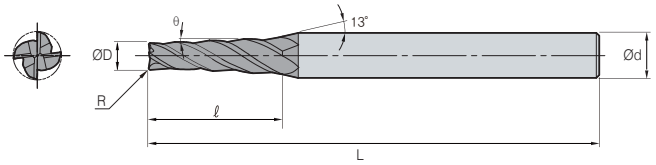
4 flutes tapered radius Endmill



CARBIDE | 4 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.488

• TOLERANCE

ØD		Ød
Ø0.8 ~ Ø2.5	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	θ	ℓ	L
UTR504025010110	0.1	2.5	4	1	10	50
UTR504025010112	0.1	2.5	4	1	12	50
UTR504025010116	0.1	2.5	4	1	16	50
UTR504025010120	0.1	2.5	4	1	20	60
UTR504025010125	0.1	2.5	4	1	25	60
UTR504025010130	0.1	2.5	4	1	30	60
UTR504025010210	0.1	2.5	4	2	10	50
UTR504025010212	0.1	2.5	4	2	12	50
UTR504025010216	0.1	2.5	4	2	16	50
UTR504025010220	0.1	2.5	4	2	20	60
UTR504025010225	0.1	2.5	6	2	25	60
UTR504025010230	0.1	2.5	6	2	30	60
UTR504025010310	0.1	2.5	4	3	10	50
UTR504025010312	0.1	2.5	4	3	12	50
UTR504025010316	0.1	2.5	6	3	16	50
UTR504025010320	0.1	2.5	6	3	20	60
UTR504025010325	0.1	2.5	6	3	25	60
UTR504025010330	0.1	2.5	6	3	30	60
UTR504025020110	0.2	2.5	4	1	10	50
UTR504025020112	0.2	2.5	4	1	12	50
UTR504025020116	0.2	2.5	4	1	16	50
UTR504025020120	0.2	2.5	4	1	20	60
UTR504025020125	0.2	2.5	4	1	25	60
UTR504025020130	0.2	2.5	4	1	30	60
UTR504025020210	0.2	2.5	4	2	10	50
UTR504025020212	0.2	2.5	4	2	12	50
UTR504025020216	0.2	2.5	4	2	16	50

Designation	R	ØD	Ød	θ	ℓ	L
UTR504025020220	0.2	2.5	4	2	20	60
UTR504025020225	0.2	2.5	6	2	25	60
UTR504025020230	0.2	2.5	6	2	30	60
UTR504025020310	0.2	2.5	4	3	10	50
UTR504025020312	0.2	2.5	4	3	12	50
UTR504025020316	0.2	2.5	6	3	16	50
UTR504025020320	0.2	2.5	6	3	20	60
UTR504025020325	0.2	2.5	6	3	25	60
UTR504025020330	0.2	2.5	6	3	30	60
UTR504025030110	0.3	2.5	4	1	10	50
UTR504025030112	0.3	2.5	4	1	12	50
UTR504025030116	0.3	2.5	4	1	16	50
UTR504025030120	0.3	2.5	4	1	20	60
UTR504025030125	0.3	2.5	4	1	25	60
UTR504025030130	0.3	2.5	4	1	30	60
UTR504025030212	0.3	2.5	4	2	12	50
UTR504025030216	0.3	2.5	4	2	16	50
UTR504025030220	0.3	2.5	4	2	20	60
UTR504025030225	0.3	2.5	6	2	25	60
UTR504025030230	0.3	2.5	6	2	30	60
UTR504025030310	0.3	2.5	4	3	10	50
UTR504025030312	0.3	2.5	4	3	12	50
UTR504025030316	0.3	2.5	6	3	16	50
UTR504025030320	0.3	2.5	6	3	20	60
UTR504025030325	0.3	2.5	6	3	25	60
UTR504025030330	0.3	2.5	6	3	30	60

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UB502

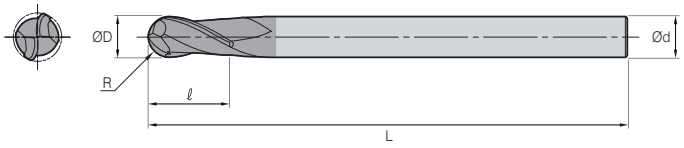
2 flutes ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 Corner R | AlCrN | DATA p.489

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
UB502001S	0.05	0.1	4	0.1	40
UB502001	0.05	0.1	4	0.2	40
UB502001S3	0.05	0.1	3	0.2	40
UB5020015S	0.075	0.15	4	0.15	40
UB5020015	0.075	0.15	4	0.3	40
UB5020015S3	0.075	0.15	3	0.3	40
UB502002S	0.1	0.2	4	0.2	40
UB502002	0.1	0.2	4	0.4	40
UB502002S3	0.1	0.2	3	0.4	40
UB502003S	0.15	0.3	4	0.3	40
UB502003	0.15	0.3	4	0.6	40
UB502003S3	0.15	0.3	3	0.6	40
UB502004S	0.2	0.4	4	0.4	40
UB502004	0.2	0.4	4	0.8	40
UB502004S3	0.2	0.4	3	0.8	40
UB502005S	0.25	0.5	4	0.5	40
UB502005	0.25	0.5	4	1	40
UB502005S3	0.25	0.5	3	1	40
UB502006S	0.3	0.6	4	0.6	40
UB502006	0.3	0.6	4	1.2	40
UB502006S3	0.3	0.6	3	1.2	40
UB502007S	0.35	0.7	4	0.7	40
UB502007	0.35	0.7	4	1.4	40
UB502007S3	0.35	0.7	3	1.4	40
UB502008S	0.4	0.8	4	0.8	40
UB502008	0.4	0.8	4	1.6	40
UB502008S3	0.4	0.8	3	1.6	40
UB502009S	0.45	0.9	4	0.9	40
UB502009	0.45	0.9	4	1.8	40
UB502009S3	0.45	0.9	3	1.8	40
UB502010S	0.5	1	6	1.5	40
UB502010S3	0.5	1	3	2.5	50
UB502010S4	0.5	1	4	2.5	50
UB502010	0.5	1	6	2.5	50
UB502010070	0.5	1	6	2.5	70
UB502010100	0.5	1	6	2.5	100
UB502012S	0.6	1.2	6	2	40

Designation	R	ØD	Ød	ℓ	L
UB502012S3	0.6	1.2	3	3	50
UB502012S4	0.6	1.2	4	3	50
UB502012	0.6	1.2	6	3	50
UB502012070	0.6	1.2	6	3	70
UB502012100	0.6	1.2	6	3	100
UB502015S	0.75	1.5	6	2.5	40
UB502015S3	0.75	1.5	3	4	50
UB502015S4	0.75	1.5	4	4	50
UB502015	0.75	1.5	6	4	50
UB502015070	0.75	1.5	6	4	70
UB502015100	0.75	1.5	6	4	100
UB502020S	1	2	6	3	40
UB502020S3	1	2	3	5	50
UB502020S4	1	2	4	5	50
UB502020	1	2	6	5	50
UB502020080	1	2	6	5	80
UB502020100	1	2	6	5	100
UB502025S	1.25	2.5	6	4	40
UB502025S3	1.25	2.5	3	6	60
UB502025S4	1.25	2.5	4	6	60
UB502025	1.25	2.5	6	6	60
UB502025080	1.25	2.5	6	6	80
UB502025100	1.25	2.5	6	6	100
UB502030S	1.5	3	6	4.5	40
UB502030S3	1.5	3	3	6	60
UB502030S4	1.5	3	4	6	60
UB502030	1.5	3	6	6	60
UB502030080	1.5	3	6	6	80
UB502030100	1.5	3	6	6	100
UB502035	1.75	3.5	6	8	70
UB502040S	2	4	6	6	50
UB502040S4	2	4	4	8	70
UB502040	2	4	6	8	70
UB502040100S4	2	4	4	8	100
UB502040120S4	2	4	4	8	120
UB502040100	2	4	6	8	100
UB502040120	2	4	6	8	120

U-Star Endmill

UB502

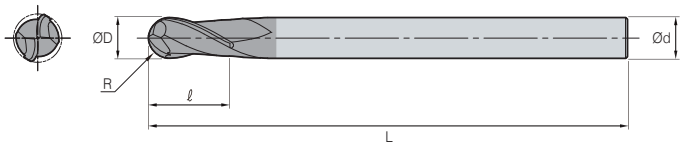
2 flutes ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 Corner R | AlCrN | DATA p.489

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
UB502045	2.25	4.5	6	9	80
UB502050S	2.5	5	6	7.5	60
UB502050	2.5	5	6	10	80
UB502050S5	2.5	5	5	10	80
UB502055	2.75	5.5	6	11	90
UB502060S	3	6	6	9	50
UB502060060	3	6	6	9	60
UB502060080	3	6	6	9	80
UB502060	3	6	6	12	90
UB502060110	3	6	6	12	110
UB502060130	3	6	6	12	130
UB502060150	3	6	6	12	150
UB502065	3.25	6.5	8	13	90
UB502070	3.5	7	8	14	90
UB502080S	4	8	8	12	50
UB502080060	4	8	8	12	60
UB502080080	4	8	8	12	80
UB502080090	4	8	8	12	90
UB502080	4	8	8	14	100
UB502080130	4	8	8	14	130
UB502080150	4	8	8	14	150
UB502085	4.25	8.5	10	16	100
UB502090	4.5	9	10	18	100
UB502100S	5	10	10	15	50
UB502100060	5	10	10	15	60
UB502100080	5	10	10	15	80
UB502100090	5	10	10	15	90
UB502100	5	10	10	18	100
UB502100130	5	10	10	18	130
UB502100150	5	10	10	18	150

Designation	R	ØD	Ød	ℓ	L
UB502100180	5	10	10	18	180
UB502100200	5	10	10	18	200
UB502110	5.5	11	12	20	100
UB502120S	6	12	12	18	60
UB502120080	6	12	12	18	80
UB502120090	6	12	12	18	90
UB502120100	6	12	12	18	100
UB502120	6	12	12	24	110
UB502120130	6	12	12	24	130
UB502120150	6	12	12	24	150
UB502120180	6	12	12	24	180
UB502120200	6	12	12	24	200
UB502130	6.5	13	12	24	100
UB502140S12	7	14	12	26	100
UB502140	7	14	14	26	100
UB502140S16	7	14	16	26	100
UB502150	7.5	15	16	28	140
UB502160100	8	16	16	24	100
UB502160130	8	16	16	24	130
UB502160	8	16	16	30	150
UB502160180	8	16	16	30	180
UB502160200	8	16	16	30	200
UB502180S16	9	18	16	34	150
UB502180	9	18	18	34	150
UB502200100	10	20	20	30	100
UB502200130	10	20	20	30	130
UB502200	10	20	20	38	150
UB502200200	10	20	20	38	200
UB502250120	12.5	25	25	50	120
UB502250180	12.5	25	25	50	180

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

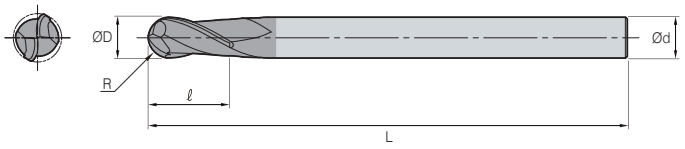
◎: Excellent ○: Good

UB502...P

2 flutes high precision ball Endmill

CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.002 Corner R | AlCrN | DATA p.489





• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø6.5 ~ Ø25	0 ~ -0.015mm	

(mm)

Designation	R	ØD	Ød	ℓ	L
UB502001P	0.05	0.1	4	0.2	40
UB5020015P	0.075	0.15	4	0.3	40
UB502002P	0.1	0.2	4	0.4	40
UB502003P	0.15	0.3	4	0.6	40
UB502004P	0.2	0.4	4	0.8	40
UB502005P	0.25	0.5	4	1	40
UB502006P	0.3	0.6	4	1.2	40
UB502007P	0.35	0.7	4	1.4	40
UB502008P	0.4	0.8	4	1.6	40
UB502009P	0.45	0.9	4	1.8	40
UB502010P	0.5	1	6	2.5	50
UB502012P	0.6	1.2	6	3	50
UB502015P	0.75	1.5	6	4	50
UB502020P	1	2	6	5	50
UB502025P	1.25	2.5	6	6	60
UB502030P	1.5	3	6	6	60
UB502040P	2	4	6	8	70
UB502050P	2.5	5	6	10	80
UB502060P	3	6	6	12	90
UB502080P	4	8	8	14	100
UB502100P	5	10	10	18	100
UB502120P	6	12	12	24	110

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UB512

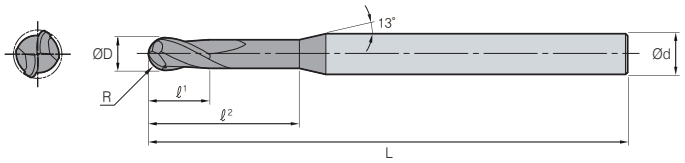
2 flutes long neck ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 Corner R | AlCrN | DATA p.490~494

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UB512001002	0.05	0.1	4	0.1	0.2	40
UB512001003	0.05	0.1	4	0.1	0.3	40
UB512001005	0.05	0.1	4	0.1	0.5	40
UB51200101	0.05	0.1	4	0.1	1	40
UB512002005	0.1	0.2	4	0.2	0.5	40
UB51200201	0.1	0.2	4	0.2	1	40
UB512002015	0.1	0.2	4	0.2	1.5	40
UB51200202	0.1	0.2	4	0.2	2	40
UB51200203	0.1	0.2	4	0.2	3	40
UB51200301	0.15	0.3	4	0.3	1	40
UB512003015	0.15	0.3	4	0.3	1.5	40
UB51200302	0.15	0.3	4	0.3	2	40
UB512003025	0.15	0.3	4	0.3	2.5	40
UB51200303	0.15	0.3	4	0.3	3	40
UB51200304	0.15	0.3	4	0.3	4	40
UB51200305	0.15	0.3	4	0.3	5	40
UB51200401	0.2	0.4	4	0.4	1	40
UB512004015	0.2	0.4	4	0.4	1.5	40
UB51200402	0.2	0.4	4	0.4	2	40
UB512004025	0.2	0.4	4	0.4	2.5	40
UB51200403	0.2	0.4	4	0.4	3	40
UB51200404	0.2	0.4	4	0.4	4	40
UB51200405	0.2	0.4	4	0.4	5	40
UB51200406	0.2	0.4	4	0.4	6	40
UB51200408	0.2	0.4	4	0.4	8	40
UB51200410	0.2	0.4	4	0.4	10	40
UB51200501	0.25	0.5	4	0.5	1	45
UB512005015	0.25	0.5	4	0.5	1.5	45
UB51200502	0.25	0.5	4	0.5	2	45
UB512005025	0.25	0.5	4	0.5	2.5	45
UB51200503	0.25	0.5	4	0.5	3	45
UB51200504	0.25	0.5	4	0.5	4	45
UB51200505	0.25	0.5	4	0.5	5	45
UB51200506	0.25	0.5	4	0.5	6	45

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UB51200508	0.25	0.5	4	0.5	8	45
UB51200510	0.25	0.5	4	0.5	10	45
UB51200512	0.25	0.5	4	0.5	12	45
UB51200514	0.25	0.5	4	0.5	14	45
UB51200516	0.25	0.5	4	0.5	16	45
UB51200601	0.3	0.6	4	0.6	1	45
UB51200602	0.3	0.6	4	0.6	2	45
UB51200603	0.3	0.6	4	0.6	3	45
UB51200604	0.3	0.6	4	0.6	4	45
UB51200605	0.3	0.6	4	0.6	5	45
UB51200606	0.3	0.6	4	0.6	6	45
UB51200608	0.3	0.6	4	0.6	8	45
UB51200610	0.3	0.6	4	0.6	10	45
UB51200612	0.3	0.6	4	0.6	12	45
UB51200614	0.3	0.6	4	0.6	14	45
UB51200616	0.3	0.6	4	0.6	16	45
UB51200702	0.35	0.7	4	0.7	2	45
UB51200704	0.35	0.7	4	0.7	4	45
UB51200706	0.35	0.7	4	0.7	6	45
UB51200708	0.35	0.7	4	0.7	8	45
UB51200710	0.35	0.7	4	0.7	10	45
UB51200712	0.35	0.7	4	0.7	12	45
UB51200801	0.4	0.8	4	0.8	1	45
UB51200802	0.4	0.8	4	0.8	2	45
UB51200803	0.4	0.8	4	0.8	3	45
UB51200804	0.4	0.8	4	0.8	4	45
UB51200805	0.4	0.8	4	0.8	5	45
UB51200806	0.4	0.8	4	0.8	6	45
UB51200807	0.4	0.8	4	0.8	7	45
UB51200808	0.4	0.8	4	0.8	8	45
UB51200810	0.4	0.8	4	0.8	10	45
UB51200812	0.4	0.8	4	0.8	12	45
UB51200814	0.4	0.8	4	0.8	14	45
UB51200816	0.4	0.8	4	0.8	16	45

UB512

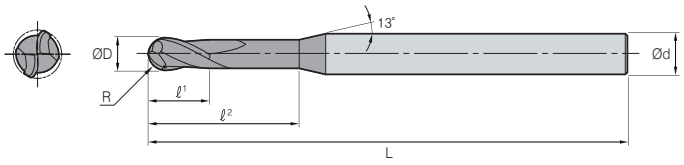
2 flutes long neck ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 Corner R | AlCrN | DATA p.490~494

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UB51200820	0.4	0.8	4	0.8	20	45
UB51200904	0.45	0.9	4	0.9	4	45
UB51200906	0.45	0.9	4	0.9	6	45
UB51200908	0.45	0.9	4	0.9	8	45
UB51200910	0.45	0.9	4	0.9	10	45
UB51201002	0.5	1	4	1	2	50
UB512010025	0.5	1	4	1	2.5	50
UB51201003	0.5	1	4	1	3	50
UB51201004	0.5	1	4	1	4	50
UB51201005	0.5	1	4	1	5	50
UB51201006	0.5	1	4	1	6	50
UB51201007	0.5	1	4	1	7	50
UB51201008	0.5	1	4	1	8	50
UB51201009	0.5	1	4	1	9	50
UB51201010	0.5	1	4	1	10	50
UB51201012	0.5	1	4	1	12	50
UB51201014	0.5	1	4	1	14	50
UB51201016	0.5	1	4	1	16	50
UB51201018	0.5	1	4	1	18	50
UB51201020	0.5	1	4	1	20	55
UB51201022	0.5	1	4	1	22	60
UB51201026	0.5	1	4	1	26	60
UB51201030	0.5	1	4	1	30	70
UB51201040	0.5	1	4	1	40	80
UB51201050	0.5	1	4	1	50	100
UB51201204	0.6	1.2	4	1.2	4	50
UB51201206	0.6	1.2	4	1.2	6	50
UB51201208	0.6	1.2	4	1.2	8	50
UB51201210	0.6	1.2	4	1.2	10	50
UB51201212	0.6	1.2	4	1.2	12	50
UB51201214	0.6	1.2	4	1.2	14	50
UB51201216	0.6	1.2	4	1.2	16	50
UB51201220	0.6	1.2	4	1.2	20	55
UB51201226	0.6	1.2	4	1.2	26	60

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UB51201406	0.7	1.4	4	1.4	6	50
UB51201408	0.7	1.4	4	1.4	8	50
UB51201410	0.7	1.4	4	1.4	10	50
UB51201412	0.7	1.4	4	1.4	12	50
UB51201416	0.7	1.4	4	1.4	16	50
UB51201503	0.75	1.5	4	1.5	3	50
UB51201504	0.75	1.5	4	1.5	4	50
UB51201505	0.75	1.5	4	1.5	5	50
UB51201506	0.75	1.5	4	1.5	6	50
UB51201507	0.75	1.5	4	1.5	7	50
UB51201508	0.75	1.5	4	1.5	8	50
UB51201510	0.75	1.5	4	1.5	10	50
UB51201512	0.75	1.5	4	1.5	12	50
UB51201514	0.75	1.5	4	1.5	14	50
UB51201516	0.75	1.5	4	1.5	16	50
UB51201518	0.75	1.5	4	1.5	18	50
UB51201520	0.75	1.5	4	1.5	20	55
UB51201522	0.75	1.5	4	1.5	22	60
UB51201526	0.75	1.5	4	1.5	26	60
UB51201530	0.75	1.5	4	1.5	30	70
UB51201535	0.75	1.5	4	1.5	35	70
UB51201540	0.75	1.5	4	1.5	40	80
UB51201604	0.8	1.6	4	1.6	4	50
UB51201606	0.8	1.6	4	1.6	6	50
UB51201608	0.8	1.6	4	1.6	8	50
UB51201610	0.8	1.6	4	1.6	10	50
UB51201612	0.8	1.6	4	1.6	12	50
UB51201616	0.8	1.6	4	1.6	16	50
UB51201620	0.8	1.6	4	1.6	20	50
UB51201804	0.9	1.8	4	1.8	4	50
UB51201806	0.9	1.8	4	1.8	6	50
UB51201808	0.9	1.8	4	1.8	8	50
UB51201810	0.9	1.8	4	1.8	10	50
UB51201812	0.9	1.8	4	1.8	12	50

U-Star Endmill

UB512

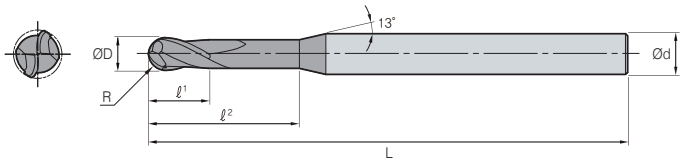
2 flutes long neck ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 Corner R | AlCrN | DATA p.490~494

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UB51201816	0.9	1.8	4	1.8	16	50
UB51201820	0.9	1.8	4	1.8	20	50
UB51202004	1	2	4	2	4	50
UB51202005	1	2	4	2	5	50
UB51202006	1	2	4	2	6	50
UB51202008	1	2	4	2	8	50
UB51202010	1	2	4	2	10	50
UB51202012	1	2	4	2	12	50
UB51202014	1	2	4	2	14	50
UB51202016	1	2	4	2	16	50
UB51202018	1	2	4	2	18	55
UB51202020	1	2	4	2	20	55
UB51202022	1	2	4	2	22	60
UB51202026	1	2	4	2	26	60
UB51202030	1	2	4	2	30	70
UB51202035	1	2	4	2	35	70
UB51202040	1	2	4	2	40	80
UB51202045	1	2	4	2	45	90
UB51202050	1	2	4	2	50	100
UB51202060	1	2	4	2	60	110
UB51202508	1.25	2.5	4	2.5	8	50
UB51202510	1.25	2.5	4	2.5	10	50
UB51202512	1.25	2.5	4	2.5	12	50
UB51202516	1.25	2.5	4	2.5	16	50
UB51202520	1.25	2.5	4	2.5	20	50
UB51202522	1.25	2.5	4	2.5	22	60
UB51202526	1.25	2.5	4	2.5	26	60
UB51202530	1.25	2.5	4	2.5	30	70
UB51202535	1.25	2.5	4	2.5	35	70
UB51202540	1.25	2.5	4	2.5	40	80
UB51202545	1.25	2.5	4	2.5	45	90
UB51202550	1.25	2.5	4	2.5	50	100
UB51203006	1.5	3	6	3	6	50
UB51203008	1.5	3	6	3	8	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UB51203010	1.5	3	6	3	10	50
UB51203012	1.5	3	6	3	12	50
UB51203014	1.5	3	6	3	14	60
UB51203016	1.5	3	6	3	16	60
UB51203018	1.5	3	6	3	18	60
UB51203020	1.5	3	6	3	20	60
UB51203022	1.5	3	6	3	22	65
UB51203026	1.5	3	6	3	26	65
UB51203030	1.5	3	6	3	30	70
UB51203035	1.5	3	6	3	35	70
UB51203040	1.5	3	6	3	40	80
UB51203045	1.5	3	6	3	45	90
UB51203050	1.5	3	6	3	50	100
UB51203060	1.5	3	6	3	60	100
UB51204008	2	4	6	4	8	50
UB51204010	2	4	6	4	10	50
UB51204012	2	4	6	4	12	50
UB51204014	2	4	6	4	14	60
UB51204016	2	4	6	4	16	60
UB51204018	2	4	6	4	18	60
UB51204020	2	4	6	4	20	60
UB51204022	2	4	6	4	22	65
UB51204026	2	4	6	4	26	65
UB51204030	2	4	6	4	30	70
UB51204035	2	4	6	4	35	70
UB51204040	2	4	6	4	40	80
UB51204045	2	4	6	4	45	90
UB51204050	2	4	6	4	50	100
UB51204055	2	4	6	4	55	100
UB51204060	2	4	6	4	60	100
UB51205015	2.5	5	6	6	15	60
UB51205020	2.5	5	6	6	20	60
UB51205026	2.5	5	6	6	26	65
UB51205030	2.5	5	6	6	30	70

UB512

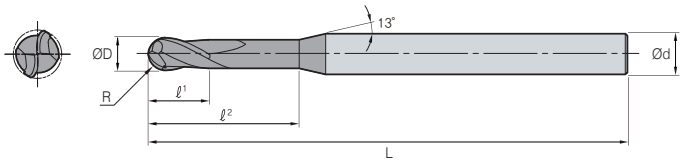
2 flutes long neck ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 | R ±0.005 Corner R | AlCrN | DATA p.490~494

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UB51205035	2.5	5	6	6	35	70
UB51205040	2.5	5	6	6	40	80
UB51205045	2.5	5	6	6	45	90
UB51205050	2.5	5	6	6	50	100
UB51205055	2.5	5	6	6	55	100
UB51205060	2.5	5	6	6	60	100
UB51206020	3	6	6	8	20	60
UB5120602090	3	6	6	12	20	90
UB51206030	3	6	6	8	30	60
UB5120603090	3	6	6	12	30	90
UB51208025	4	8	8	10	25	70

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UB51208025100	4	8	8	14	25	100
UB51208035	4	8	8	10	35	70
UB51208035100	4	8	8	14	35	100
UB51210030	5	10	10	12	30	75
UB51210030100	5	10	10	18	30	100
UB51210040	5	10	10	12	40	75
UB51210040100	5	10	10	18	40	100
UB51212032	6	12	12	14	32	80
UB51212032110	6	12	12	22	32	110
UB51212045	6	12	12	14	45	80
UB51212045110	6	12	12	22	45	110

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UB512S6

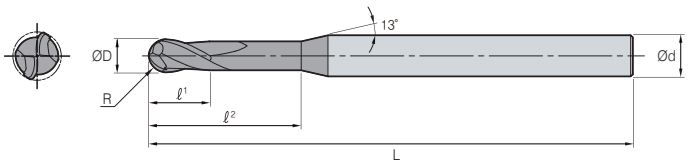
2 flutes long neck ball Endmill (shank 6)



CARBIDE | 2 | 30° HELIX | R ±0.005 Corner R | AlCrN | DATA p.490~494

• TOLERANCE

ØD		Ød
Ø0.5 ~ Ø2	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UB51200501S6	0.25	0.5	6	0.5	1	45
UB51200502S6	0.25	0.5	6	0.5	2	45
UB51200504S6	0.25	0.5	6	0.5	4	45
UB51200601S6	0.3	0.6	6	0.6	1	45
UB51200602S6	0.3	0.6	6	0.6	2	45
UB51200603S6	0.3	0.6	6	0.6	3	45
UB51200604S6	0.3	0.6	6	0.6	4	45
UB51200605S6	0.3	0.6	6	0.6	5	45
UB51200606S6	0.3	0.6	6	0.6	6	45
UB51200608S6	0.3	0.6	6	0.6	8	45
UB51200610S6	0.3	0.6	6	0.6	10	45
UB51200612S6	0.3	0.6	6	0.6	12	45
UB51200614S6	0.3	0.6	6	0.6	14	45
UB51200616S6	0.3	0.6	6	0.6	16	45
UB51200801S6	0.4	0.8	6	0.8	1	45
UB51200802S6	0.4	0.8	6	0.8	2	45
UB51200803S6	0.4	0.8	6	0.8	3	45
UB51200804S6	0.4	0.8	6	0.8	4	45
UB51200805S6	0.4	0.8	6	0.8	5	45
UB51200806S6	0.4	0.8	6	0.8	6	45
UB51200808S6	0.4	0.8	6	0.8	8	45
UB51200810S6	0.4	0.8	6	0.8	10	45
UB51200812S6	0.4	0.8	6	0.8	12	45
UB51200814S6	0.4	0.8	6	0.8	14	45
UB51200816S6	0.4	0.8	6	0.8	16	45
UB51200820S6	0.4	0.8	6	0.8	20	55
UB51201002S6	0.5	1	6	1	2	50
UB51201003S6	0.5	1	6	1	3	50
UB51201004S6	0.5	1	6	1	4	50
UB51201005S6	0.5	1	6	1	5	50
UB51201006S6	0.5	1	6	1	6	50
UB51201007S6	0.5	1	6	1	7	50
UB51201008S6	0.5	1	6	1	8	50
UB51201009S6	0.5	1	6	1	9	50
UB51201010S6	0.5	1	6	1	10	50
UB51201012S6	0.5	1	6	1	12	50
UB51201014S6	0.5	1	6	1	14	50

Designation	R	ØD	Ød	ℓ1	ℓ2	L
UB51201016S6	0.5	1	6	1	16	50
UB51201018S6	0.5	1	6	1	18	50
UB51201020S6	0.5	1	6	1	20	55
UB51201022S6	0.5	1	6	1	22	60
UB51201026S6	0.5	1	6	1	26	60
UB51201030S6	0.5	1	6	1	30	70
UB51201503S6	0.75	1.5	6	1.5	3	50
UB51201504S6	0.75	1.5	6	1.5	4	50
UB51201506S6	0.75	1.5	6	1.5	6	50
UB51201508S6	0.75	1.5	6	1.5	8	50
UB51201510S6	0.75	1.5	6	1.5	10	50
UB51201512S6	0.75	1.5	6	1.5	12	50
UB51201514S6	0.75	1.5	6	1.5	14	50
UB51201516S6	0.75	1.5	6	1.5	16	50
UB51201518S6	0.75	1.5	6	1.5	18	50
UB51201520S6	0.75	1.5	6	1.5	20	55
UB51201522S6	0.75	1.5	6	1.5	22	60
UB51201526S6	0.75	1.5	6	1.5	26	60
UB51201530S6	0.75	1.5	6	1.5	30	70
UB51201535S6	0.75	1.5	6	1.5	35	70
UB51201540S6	0.75	1.5	6	1.5	40	80
UB51202004S6	1	2	6	2	4	50
UB51202006S6	1	2	6	2	6	50
UB51202008S6	1	2	6	2	8	50
UB51202010S6	1	2	6	2	10	50
UB51202012S6	1	2	6	2	12	50
UB51202014S6	1	2	6	2	14	50
UB51202016S6	1	2	6	2	16	50
UB51202018S6	1	2	6	2	18	50
UB51202020S6	1	2	6	2	20	50
UB51202022S6	1	2	6	2	22	60
UB51202026S6	1	2	6	2	26	60
UB51202030S6	1	2	6	2	30	70
UB51202035S6	1	2	6	2	35	70
UB51202040S6	1	2	6	2	40	80
UB51202045S6	1	2	6	2	45	90
UB51202050S6	1	2	6	2	50	100

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UB532

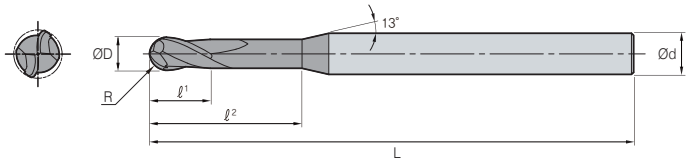
2 flutes lollipop style ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.005 Corner R | AlCrN | DATA p.490~494

• TOLERANCE

ØD		Ød
Ø0.5 ~ Ø2	0 ~ -0.012mm	h5



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	θ	L
UB532030	1.5	3	6	2.3	16	1.5	80
UB532040	2	4	6	3.1	20	1.5	80
UB532050	2.5	5	6	3.9	25	1.5	80
UB532060	3	6	6	4.9	30	1.5	100
UB532080	4	8	8	6.3	35	1.5	100
UB532100	5	10	10	7.9	40	1.5	100
UB532120	6	12	12	9.5	50	1.5	100

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UB542

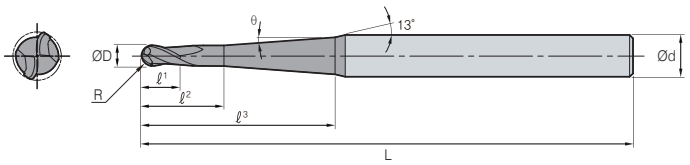
2 flutes tapered neck ball Endmill

CARBIDE | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | AlCrN | DATA p.495

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB54200105005	0.05	0.1	4	0.1	-	0.5	0.5	40
UB5420010501	0.05	0.1	4	0.1	-	1	0.5	40
UB54200110005	0.05	0.1	4	0.1	-	0.5	1	40
UB5420011001	0.05	0.1	4	0.1	-	1	1	40
UB54200115005	0.05	0.1	4	0.1	-	0.5	1.5	40
UB5420011501	0.05	0.1	4	0.1	-	1	1.5	40
UB54200120005	0.05	0.1	4	0.1	-	0.5	2	40
UB5420012001	0.05	0.1	4	0.1	-	1	2	40
UB54200130005	0.05	0.1	4	0.1	-	0.5	3	40
UB5420013001	0.05	0.1	4	0.1	-	1	3	40
UB5420020501	0.1	0.2	4	0.2	0.4	1	0.5	40
UB5420020502	0.1	0.2	4	0.2	0.4	2	0.5	40
UB5420020503	0.1	0.2	4	0.2	0.4	3	0.5	40
UB5420021001	0.1	0.2	4	0.2	0.4	1	1	40
UB5420021002	0.1	0.2	4	0.2	0.4	2	1	40
UB5420021003	0.1	0.2	4	0.2	0.4	3	1	40
UB5420021501	0.1	0.2	4	0.2	0.4	1	1.5	40
UB5420021502	0.1	0.2	4	0.2	0.4	2	1.5	40
UB5420021503	0.1	0.2	4	0.2	0.4	3	1.5	40
UB5420022001	0.1	0.2	4	0.2	0.4	1	2	40
UB5420022002	0.1	0.2	4	0.2	0.4	2	2	40
UB5420022003	0.1	0.2	4	0.2	0.4	3	2	40
UB5420023001	0.1	0.2	4	0.2	0.4	1	3	40
UB5420023002	0.1	0.2	4	0.2	0.4	2	3	40
UB5420023003	0.1	0.2	4	0.2	0.4	3	3	40
UB5420025002	0.1	0.2	4	0.2	0.4	2	5	40
UB5420025003	0.1	0.2	4	0.2	0.4	3	5	40
UB5420030502	0.15	0.3	4	0.3	0.6	2	0.5	40
UB5420030503	0.15	0.3	4	0.3	0.6	3	0.5	40
UB5420030504	0.15	0.3	4	0.3	0.6	4	0.5	40
UB5420030505	0.15	0.3	4	0.3	0.6	5	0.5	40
UB5420031002	0.15	0.3	4	0.3	0.6	2	1	40
UB5420031003	0.15	0.3	4	0.3	0.6	3	1	40
UB5420031004	0.15	0.3	4	0.3	0.6	4	1	40
UB5420031005	0.15	0.3	4	0.3	0.6	5	1	40
UB5420031502	0.15	0.3	4	0.3	0.6	2	1.5	40

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420031503	0.15	0.3	4	0.3	0.6	3	1.5	40
UB5420031504	0.15	0.3	4	0.3	0.6	4	1.5	40
UB5420031505	0.15	0.3	4	0.3	0.6	5	1.5	40
UB5420032002	0.15	0.3	4	0.3	0.6	2	2	40
UB5420032003	0.15	0.3	4	0.3	0.6	3	2	40
UB5420032004	0.15	0.3	4	0.3	0.6	4	2	40
UB5420032005	0.15	0.3	4	0.3	0.6	5	2	40
UB5420033002	0.15	0.3	4	0.3	0.6	2	3	40
UB5420033003	0.15	0.3	4	0.3	0.6	3	3	40
UB5420033004	0.15	0.3	4	0.3	0.6	4	3	40
UB5420033005	0.15	0.3	4	0.3	0.6	5	3	40
UB5420035005	0.15	0.3	4	0.3	0.6	5	5	40
UB5420040502	0.2	0.4	4	0.4	0.8	2	0.5	50
UB5420040503	0.2	0.4	4	0.4	0.8	3	0.5	50
UB5420040504	0.2	0.4	4	0.4	0.8	4	0.5	50
UB5420040505	0.2	0.4	4	0.4	0.8	5	0.5	50
UB5420040506	0.2	0.4	4	0.4	0.8	6	0.5	50
UB5420041002	0.2	0.4	4	0.4	0.8	2	1	50
UB5420041003	0.2	0.4	4	0.4	0.8	3	1	50
UB5420041004	0.2	0.4	4	0.4	0.8	4	1	50
UB5420041005	0.2	0.4	4	0.4	0.8	5	1	50
UB5420041006	0.2	0.4	4	0.4	0.8	6	1	50
UB5420041502	0.2	0.4	4	0.4	0.8	2	1.5	50
UB5420041503	0.2	0.4	4	0.4	0.8	3	1.5	50
UB5420041504	0.2	0.4	4	0.4	0.8	4	1.5	50
UB5420041505	0.2	0.4	4	0.4	0.8	5	1.5	50
UB5420041506	0.2	0.4	4	0.4	0.8	6	1.5	50
UB5420042002	0.2	0.4	4	0.4	0.8	2	2	50
UB5420042003	0.2	0.4	4	0.4	0.8	3	2	50
UB5420042004	0.2	0.4	4	0.4	0.8	4	2	50
UB5420042005	0.2	0.4	4	0.4	0.8	5	2	50
UB5420042006	0.2	0.4	4	0.4	0.8	6	2	50
UB5420043002	0.2	0.4	4	0.4	0.8	2	3	50
UB5420043003	0.2	0.4	4	0.4	0.8	3	3	50
UB5420043004	0.2	0.4	4	0.4	0.8	4	3	50
UB5420043005	0.2	0.4	4	0.4	0.8	5	3	50

UB542

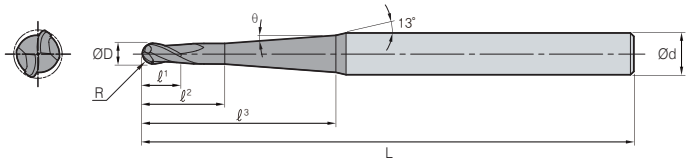
2 flutes tapered neck ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | AlCrN | DATA p.495

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420043006	0.2	0.4	4	0.4	0.8	6	3	50
UB5420045004	0.2	0.4	4	0.4	0.8	4	5	50
UB5420045006	0.2	0.4	4	0.4	0.8	6	5	50
UB5420050504	0.25	0.5	4	0.5	1	4	0.5	50
UB5420050506	0.25	0.5	4	0.5	1	6	0.5	50
UB5420050508	0.25	0.5	4	0.5	1	8	0.5	50
UB5420050510	0.25	0.5	4	0.5	1	10	0.5	50
UB5420051004	0.25	0.5	4	0.5	1	4	1	50
UB5420051006	0.25	0.5	4	0.5	1	6	1	50
UB5420051008	0.25	0.5	4	0.5	1	8	1	50
UB5420051010	0.25	0.5	4	0.5	1	10	1	50
UB5420051504	0.25	0.5	4	0.5	1	4	1.5	50
UB5420051506	0.25	0.5	4	0.5	1	6	1.5	50
UB5420051508	0.25	0.5	4	0.5	1	8	1.5	50
UB5420051510	0.25	0.5	4	0.5	1	10	1.5	50
UB5420052004	0.25	0.5	4	0.5	1	4	2	50
UB5420052006	0.25	0.5	4	0.5	1	6	2	50
UB5420052008	0.25	0.5	4	0.5	1	8	2	50
UB5420052010	0.25	0.5	4	0.5	1	10	2	50
UB5420053004	0.25	0.5	4	0.5	1	4	3	50
UB5420053006	0.25	0.5	4	0.5	1	6	3	50
UB5420053008	0.25	0.5	4	0.5	1	8	3	50
UB5420053010	0.25	0.5	4	0.5	1	10	3	50
UB5420060504	0.3	0.6	4	0.6	1.2	4	0.5	50
UB5420060506	0.3	0.6	4	0.6	1.2	6	0.5	50
UB5420060508	0.3	0.6	4	0.6	1.2	8	0.5	50
UB5420060510	0.3	0.6	4	0.6	1.2	10	0.5	50
UB5420060512	0.3	0.6	4	0.6	1.2	12	0.5	50
UB5420061004	0.3	0.6	4	0.6	1.2	4	1	50
UB5420061006	0.3	0.6	4	0.6	1.2	6	1	50
UB5420061008	0.3	0.6	4	0.6	1.2	8	1	50
UB5420061010	0.3	0.6	4	0.6	1.2	10	1	50
UB5420061012	0.3	0.6	4	0.6	1.2	12	1	50
UB5420061504	0.3	0.6	4	0.6	1.2	4	1.5	50
UB5420061506	0.3	0.6	4	0.6	1.2	6	1.5	50
UB5420061508	0.3	0.6	4	0.6	1.2	8	1.5	50

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420061510	0.3	0.6	4	0.6	1.2	10	1.5	50
UB5420061512	0.3	0.6	4	0.6	1.2	12	1.5	50
UB5420062004	0.3	0.6	4	0.6	1.2	4	2	50
UB5420062006	0.3	0.6	4	0.6	1.2	6	2	50
UB5420062008	0.3	0.6	4	0.6	1.2	8	2	50
UB5420062010	0.3	0.6	4	0.6	1.2	10	2	50
UB5420062012	0.3	0.6	4	0.6	1.2	12	2	50
UB5420063004	0.3	0.6	4	0.6	1.2	4	3	50
UB5420063006	0.3	0.6	4	0.6	1.2	6	3	50
UB5420063008	0.3	0.6	4	0.6	1.2	8	3	50
UB5420063010	0.3	0.6	4	0.6	1.2	10	3	50
UB5420063012	0.3	0.6	4	0.6	1.2	12	3	50
UB5420080504	0.4	0.8	4	0.8	1.6	4	0.5	50
UB5420080506	0.4	0.8	4	0.8	1.6	6	0.5	50
UB5420080508	0.4	0.8	4	0.8	1.6	8	0.5	50
UB5420080510	0.4	0.8	4	0.8	1.6	10	0.5	50
UB5420080512	0.4	0.8	4	0.8	1.6	12	0.5	50
UB5420080516	0.4	0.8	4	0.8	1.6	16	0.5	50
UB5420081004	0.4	0.8	4	0.8	1.6	4	1	50
UB5420081006	0.4	0.8	4	0.8	1.6	6	1	50
UB5420081008	0.4	0.8	4	0.8	1.6	8	1	50
UB5420081010	0.4	0.8	4	0.8	1.6	10	1	50
UB5420081012	0.4	0.8	4	0.8	1.6	12	1	50
UB5420081016	0.4	0.8	4	0.8	1.6	16	1	50
UB5420081504	0.4	0.8	4	0.8	1.6	4	1.5	50
UB5420081506	0.4	0.8	4	0.8	1.6	6	1.5	50
UB5420081508	0.4	0.8	4	0.8	1.6	8	1.5	50
UB5420081510	0.4	0.8	4	0.8	1.6	10	1.5	50
UB5420081512	0.4	0.8	4	0.8	1.6	12	1.5	50
UB5420081516	0.4	0.8	4	0.8	1.6	16	1.5	50
UB5420082004	0.4	0.8	4	0.8	1.6	4	2	50
UB5420082006	0.4	0.8	4	0.8	1.6	6	2	50
UB5420082008	0.4	0.8	4	0.8	1.6	8	2	50
UB5420082010	0.4	0.8	4	0.8	1.6	10	2	50
UB5420082012	0.4	0.8	4	0.8	1.6	12	2	50
UB5420082016	0.4	0.8	4	0.8	1.6	16	2	50

U-Star Endmill

UB542

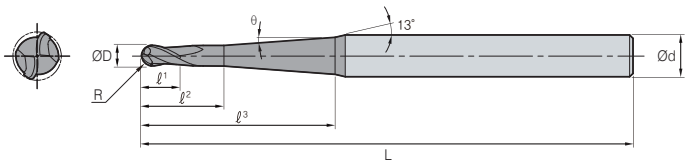
2 flutes tapered neck ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | AlCrN | DATA p.495

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420083004	0.4	0.8	4	0.8	1.6	4	3	50
UB5420083006	0.4	0.8	4	0.8	1.6	6	3	50
UB5420083008	0.4	0.8	4	0.8	1.6	8	3	50
UB5420083010	0.4	0.8	4	0.8	1.6	10	3	50
UB5420083012	0.4	0.8	4	0.8	1.6	12	3	50
UB5420083016	0.4	0.8	4	0.8	1.6	16	3	50
UB5420100506	0.5	1	4	1	2.5	6	0.5	50
UB5420100508	0.5	1	4	1	2.5	8	0.5	50
UB5420100510	0.5	1	4	1	2.5	10	0.5	50
UB5420100512	0.5	1	4	1	2.5	12	0.5	50
UB5420100516	0.5	1	4	1	2.5	16	0.5	50
UB5420100520	0.5	1	4	1	2.5	20	0.5	50
UB5420100525	0.5	1	4	1	2.5	25	0.5	60
UB5420100530	0.5	1	4	1	2.5	30	0.5	70
UB5420100540	0.5	1	4	1	2.5	40	0.5	80
UB5420100550	0.5	1	4	1	2.5	50	0.5	90
UB5420101006	0.5	1	4	1	2.5	6	1	50
UB5420101008	0.5	1	4	1	2.5	8	1	50
UB5420101010	0.5	1	4	1	2.5	10	1	50
UB5420101012	0.5	1	4	1	2.5	12	1	50
UB5420101016	0.5	1	4	1	2.5	16	1	50
UB5420101020	0.5	1	4	1	2.5	20	1	50
UB5420101025	0.5	1	4	1	2.5	25	1	60
UB5420101030	0.5	1	4	1	2.5	30	1	70
UB5420101040	0.5	1	4	1	2.5	40	1	80
UB5420101050	0.5	1	4	1	2.5	50	1	90
UB5420101506	0.5	1	4	1	2.5	6	1.5	50
UB5420101508	0.5	1	4	1	2.5	8	1.5	50
UB5420101510	0.5	1	4	1	2.5	10	1.5	50
UB5420101512	0.5	1	4	1	2.5	12	1.5	50
UB5420101516	0.5	1	4	1	2.5	16	1.5	50
UB5420101520	0.5	1	4	1	2.5	20	1.5	50
UB5420101525	0.5	1	4	1	2.5	25	1.5	60
UB5420101530	0.5	1	4	1	2.5	30	1.5	70
UB5420101540	0.5	1	4	1	2.5	40	1.5	80
UB5420101550	0.5	1	4	1	2.5	50	1.5	90

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420102006	0.5	1	4	1	2.5	6	2	50
UB5420102008	0.5	1	4	1	2.5	8	2	50
UB5420102010	0.5	1	4	1	2.5	10	2	50
UB5420102012	0.5	1	4	1	2.5	12	2	50
UB5420102016	0.5	1	4	1	2.5	16	2	50
UB5420102020	0.5	1	4	1	2.5	20	2	50
UB5420102025	0.5	1	4	1	2.5	25	2	60
UB5420102030	0.5	1	4	1	2.5	30	2	70
UB5420102040	0.5	1	4	1	2.5	40	2	80
UB5420102050	0.5	1	6	1	2.5	50	2	90
UB5420103006	0.5	1	4	1	2.5	6	3	50
UB5420103008	0.5	1	4	1	2.5	8	3	50
UB5420103010	0.5	1	4	1	2.5	10	3	50
UB5420103012	0.5	1	4	1	2.5	12	3	50
UB5420103016	0.5	1	4	1	2.5	16	3	50
UB5420103020	0.5	1	4	1	2.5	20	3	50
UB5420103025	0.5	1	4	1	2.5	25	3	60
UB5420103030	0.5	1	6	1	2.5	30	3	70
UB5420103040	0.5	1	6	1	2.5	40	3	80
UB5420103050	0.5	1	6	1	2.5	50	3	90
UB5420105030	0.5	1	6	1	2.5	30	5	70
UB5420120508	0.6	1.2	4	1.2	3	8	0.5	50
UB5420120512	0.6	1.2	4	1.2	3	12	0.5	50
UB5420120516	0.6	1.2	4	1.2	3	16	0.5	50
UB5420120520	0.6	1.2	4	1.2	3	20	0.5	50
UB5420120525	0.6	1.2	4	1.2	3	25	0.5	60
UB5420120530	0.6	1.2	4	1.2	3	30	0.5	70
UB5420121008	0.6	1.2	4	1.2	3	8	1	50
UB5420121012	0.6	1.2	4	1.2	3	12	1	50
UB5420121016	0.6	1.2	4	1.2	3	16	1	50
UB5420121020	0.6	1.2	4	1.2	3	20	1	50
UB5420121025	0.6	1.2	4	1.2	3	25	1	60
UB5420121030	0.6	1.2	4	1.2	3	30	1	70
UB5420121508	0.6	1.2	4	1.2	3	8	1.5	50
UB5420121512	0.6	1.2	4	1.2	3	12	1.5	50
UB5420121516	0.6	1.2	4	1.2	3	16	1.5	50

UB542

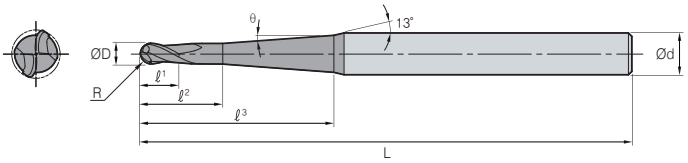
2 flutes tapered neck ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | AlCrN | DATA p.495

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420121520	0.6	1.2	4	1.2	3	20	1.5	50
UB5420121525	0.6	1.2	4	1.2	3	25	1.5	60
UB5420121530	0.6	1.2	4	1.2	3	30	1.5	70
UB5420122008	0.6	1.2	4	1.2	3	8	2	50
UB5420122012	0.6	1.2	4	1.2	3	12	2	50
UB5420122016	0.6	1.2	4	1.2	3	16	2	50
UB5420122020	0.6	1.2	4	1.2	3	20	2	50
UB5420122025	0.6	1.2	4	1.2	3	25	2	60
UB5420122030	0.6	1.2	4	1.2	3	30	2	70
UB5420123008	0.6	1.2	4	1.2	3	8	3	50
UB5420123012	0.6	1.2	4	1.2	3	12	3	50
UB5420123016	0.6	1.2	4	1.2	3	16	3	50
UB5420123020	0.6	1.2	4	1.2	3	20	3	50
UB5420123025	0.6	1.2	4	1.2	3	25	3	60
UB5420123030	0.6	1.2	6	1.2	3	30	5	70
UB5420150508	0.75	1.5	4	1.5	4	8	0.5	50
UB5420150510	0.75	1.5	4	1.5	4	10	0.5	50
UB5420150512	0.75	1.5	4	1.5	4	12	0.5	50
UB5420150516	0.75	1.5	4	1.5	4	16	0.5	50
UB5420150520	0.75	1.5	4	1.5	4	20	0.5	50
UB5420150525	0.75	1.5	4	1.5	4	25	0.5	60
UB5420150530	0.75	1.5	4	1.5	4	30	0.5	70
UB5420150540	0.75	1.5	4	1.5	4	40	0.5	80
UB5420150550	0.75	1.5	4	1.5	4	50	0.5	90
UB5420151008	0.75	1.5	4	1.5	4	8	1	50
UB5420151010	0.75	1.5	4	1.5	4	10	1	50
UB5420151012	0.75	1.5	4	1.5	4	12	1	50
UB5420151016	0.75	1.5	4	1.5	4	16	1	50
UB5420151020	0.75	1.5	4	1.5	4	20	1	50
UB5420151025	0.75	1.5	4	1.5	4	25	1	60
UB5420151030	0.75	1.5	4	1.5	4	30	1	70
UB5420151040	0.75	1.5	4	1.5	4	40	1	80
UB5420151050	0.75	1.5	4	1.5	4	50	1	90
UB5420151508	0.75	1.5	4	1.5	4	8	1.5	50
UB5420151510	0.75	1.5	4	1.5	4	10	1.5	50
UB5420151512	0.75	1.5	4	1.5	4	12	1.5	50

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420151516	0.75	1.5	4	1.5	4	16	1.5	50
UB5420151520	0.75	1.5	4	1.5	4	20	1.5	50
UB5420151525	0.75	1.5	4	1.5	4	25	1.5	60
UB5420151530	0.75	1.5	4	1.5	4	30	1.5	70
UB5420151540	0.75	1.5	4	1.5	4	40	1.5	80
UB5420151550	0.75	1.5	4	1.5	4	50	1.5	90
UB5420121016	0.6	1.2	4	1.2	3	16	1	50
UB5420121020	0.6	1.2	4	1.2	3	20	1	50
UB5420121025	0.6	1.2	4	1.2	3	25	1	60
UB5420121030	0.6	1.2	4	1.2	3	30	1	70
UB5420121508	0.6	1.2	4	1.2	3	8	1.5	50
UB5420121512	0.6	1.2	4	1.2	3	12	1.5	50
UB5420121516	0.6	1.2	4	1.2	3	16	1.5	50
UB5420121520	0.6	1.2	4	1.2	3	20	1.5	50
UB5420121525	0.6	1.2	4	1.2	3	25	1.5	60
UB5420121530	0.6	1.2	4	1.2	3	30	1.5	70
UB5420122008	0.6	1.2	4	1.2	3	8	2	50
UB5420122012	0.6	1.2	4	1.2	3	12	2	50
UB5420122016	0.6	1.2	4	1.2	3	16	2	50
UB5420122020	0.6	1.2	4	1.2	3	20	2	50
UB5420122025	0.6	1.2	4	1.2	3	25	2	60
UB5420122030	0.6	1.2	4	1.2	3	30	2	70
UB5420123008	0.6	1.2	4	1.2	3	8	3	50
UB5420123012	0.6	1.2	4	1.2	3	12	3	50
UB5420123016	0.6	1.2	4	1.2	3	16	3	50
UB5420123020	0.6	1.2	4	1.2	3	20	3	50
UB5420123025	0.6	1.2	4	1.2	3	25	3	60
UB5420123030	0.6	1.2	6	1.2	3	30	5	70
UB5420150508	0.75	1.5	4	1.5	4	8	0.5	50
UB5420150510	0.75	1.5	4	1.5	4	10	0.5	50
UB5420150512	0.75	1.5	4	1.5	4	12	0.5	50
UB5420150516	0.75	1.5	4	1.5	4	16	0.5	50
UB5420150520	0.75	1.5	4	1.5	4	20	0.5	50
UB5420150525	0.75	1.5	4	1.5	4	25	0.5	60
UB5420150530	0.75	1.5	4	1.5	4	30	0.5	70
UB5420150540	0.75	1.5	4	1.5	4	40	0.5	80

U-Star Endmill

UB542

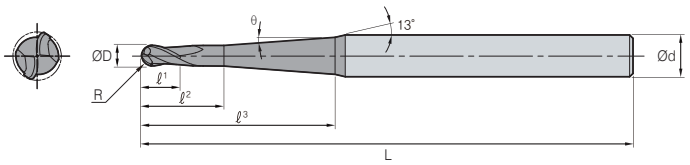
2 flutes tapered neck ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | AlCrN | DATA p.495

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420150550	0.75	1.5	4	1.5	4	50	0.5	90
UB5420151008	0.75	1.5	4	1.5	4	8	1	50
UB5420151010	0.75	1.5	4	1.5	4	10	1	50
UB5420151012	0.75	1.5	4	1.5	4	12	1	50
UB5420151016	0.75	1.5	4	1.5	4	16	1	50
UB5420151020	0.75	1.5	4	1.5	4	20	1	50
UB5420151025	0.75	1.5	4	1.5	4	25	1	60
UB5420151030	0.75	1.5	4	1.5	4	30	1	70
UB5420151040	0.75	1.5	4	1.5	4	40	1	80
UB5420151050	0.75	1.5	4	1.5	4	50	1	90
UB5420151508	0.75	1.5	4	1.5	4	8	1.5	50
UB5420151510	0.75	1.5	4	1.5	4	10	1.5	50
UB5420151512	0.75	1.5	4	1.5	4	12	1.5	50
UB5420151516	0.75	1.5	4	1.5	4	16	1.5	50
UB5420151520	0.75	1.5	4	1.5	4	20	1.5	50
UB5420151525	0.75	1.5	4	1.5	4	25	1.5	60
UB5420151530	0.75	1.5	4	1.5	4	30	1.5	70
UB5420151540	0.75	1.5	4	1.5	4	40	1.5	80
UB5420151550	0.75	1.5	4	1.5	4	50	1.5	90
UB5420152008	0.75	1.5	4	1.5	4	8	2	50
UB5420152010	0.75	1.5	4	1.5	4	10	2	50
UB5420152012	0.75	1.5	4	1.5	4	12	2	50
UB5420152016	0.75	1.5	4	1.5	4	16	2	50
UB5420152020	0.75	1.5	4	1.5	4	20	2	50
UB5420152025	0.75	1.5	4	1.5	4	25	2	60
UB5420152030	0.75	1.5	4	1.5	4	30	2	70
UB5420152040	0.75	1.5	6	1.5	4	40	2	80
UB5420152050	0.75	1.5	6	1.5	4	50	2	90
UB5420153020	0.75	1.5	6	1.5	4	20	3	50
UB5420153030	0.75	1.5	6	1.5	4	30	3	70
UB5420153040	0.75	1.5	6	1.5	4	40	3	80
UB5420153050	0.75	1.5	8	1.5	4	50	3	90
UB5420155030	0.75	1.5	8	1.5	4	30	5	70
UB5420200510	1	2	4	2	5	10	0.5	50
UB5420200512	1	2	4	2	5	12	0.5	50
UB5420200516	1	2	4	2	5	16	0.5	50

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420200520	1	2	4	2	5	20	0.5	50
UB5420200525	1	2	4	2	5	25	0.5	60
UB5420200530	1	2	4	2	5	30	0.5	70
UB5420200540	1	2	4	2	5	40	0.5	80
UB5420200550	1	2	6	2	5	50	0.5	100
UB5420200560	1	2	6	2	5	60	0.5	100
UB5420200580	1	2	6	2	5	80	0.5	140
UB5420201010	1	2	4	2	5	10	1	50
UB5420201012	1	2	4	2	5	12	1	50
UB5420201016	1	2	4	2	5	16	1	50
UB5420201020	1	2	4	2	5	20	1	50
UB5420201025	1	2	4	2	5	25	1	60
UB5420201030	1	2	4	2	5	30	1	70
UB5420201040	1	2	6	2	5	40	1	80
UB5420201050	1	2	6	2	5	50	1	100
UB5420201060	1	2	6	2	5	60	1	100
UB5420201080	1	2	6	2	5	80	1	140
UB5420201510	1	2	4	2	5	10	1.5	50
UB5420201512	1	2	4	2	5	12	1.5	50
UB5420201516	1	2	4	2	5	16	1.5	50
UB5420201520	1	2	4	2	5	20	1.5	50
UB5420201525	1	2	4	2	5	25	1.5	60
UB5420201530	1	2	6	2	5	30	1.5	70
UB5420201540	1	2	6	2	5	40	1.5	80
UB5420201550	1	2	6	2	5	50	1.5	100
UB5420201560	1	2	6	2	5	60	1.5	100
UB5420201580	1	2	6	2	5	80	1.5	140
UB5420202010	1	2	4	2	5	10	2	50
UB5420202012	1	2	4	2	5	12	2	50
UB5420202016	1	2	4	2	5	16	2	50
UB5420202020	1	2	4	2	5	20	2	55
UB5420202025	1	2	4	2	5	25	2	60
UB5420202030	1	2	4	2	5	30	2	70
UB5420202040	1	2	6	2	5	40	2	80
UB5420202050	1	2	6	2	5	50	2	90
UB5420202060	1	2	6	2	5	60	2	100

UB542

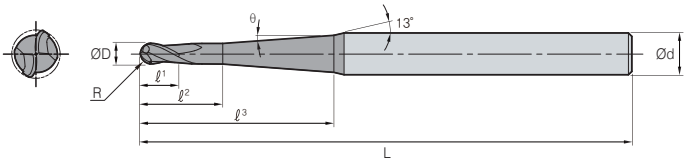
2 flutes tapered neck ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | AlCrN | DATA p.495

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420202080	1	2	8	2	5	80	2	140
UB5420203030	1	2	6	2	5	30	3	70
UB5420203040	1	2	6	2	5	40	3	80
UB5420203050	1	2	8	2	5	50	3	90
UB5420203060	1	2	8	2	5	60	3	100
UB5420203080	1	2	10	2	5	80	3	140
UB5420205030	1	2	8	2	5	30	5	70
UB5420205040	1	2	10	2	5	40	5	90
UB5420300516	1.5	3	6	4.5	6	16	0.5	60
UB5420300520	1.5	3	6	4.5	6	20	0.5	65
UB5420300530	1.5	3	6	4.5	6	30	0.5	70
UB5420300540	1.5	3	6	4.5	6	40	0.5	80
UB5420300550	1.5	3	6	4.5	6	50	0.5	90
UB5420300560	1.5	3	6	4.5	6	60	0.5	100
UB5420301016	1.5	3	6	4.5	6	16	1	60
UB5420301020	1.5	3	6	4.5	6	20	1	65
UB5420301030	1.5	3	6	4.5	6	30	1	70
UB5420301040	1.5	3	6	4.5	6	40	1	80
UB5420301050	1.5	3	6	4.5	6	50	1	90
UB5420301060	1.5	3	6	4.5	6	60	1	100
UB5420301070	1.5	3	6	4.5	6	70	1	120
UB5420301516	1.5	3	6	4.5	6	16	1.5	60
UB5420301520	1.5	3	6	4.5	6	20	1.5	65
UB5420301530	1.5	3	6	4.5	6	30	1.5	70
UB5420301540	1.5	3	6	4.5	6	40	1.5	80
UB5420301550	1.5	3	6	4.5	6	50	1.5	90
UB5420301560	1.5	3	6	4.5	6	60	1.5	100
UB5420302016	1.5	3	6	4.5	6	16	2	60
UB5420302020	1.5	3	6	4.5	6	20	2	65
UB5420302030	1.5	3	6	4.5	6	30	2	70
UB5420302040	1.5	3	6	4.5	6	40	2	80
UB5420302050	1.5	3	8	4.5	6	50	2	90
UB5420303030	1.5	3	6	4.5	6	30	3	70
UB5420303040	1.5	3	8	4.5	6	40	3	90
UB5420305030	1.5	3	8	4.5	6	30	5	70
UB5420305040	1.5	3	10	4.5	6	40	5	90

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB5420400540	2	4	6	6	8	40	0.5	90
UB5420400550	2	4	6	6	8	50	0.5	100
UB5420400560	2	4	6	6	8	60	0.5	110
UB5420400570	2	4	6	6	8	70	0.5	120
UB5420401040	2	4	6	6	8	40	1	90
UB5420401050	2	4	6	6	8	50	1	100
UB5420401060	2	4	8	6	8	60	1	110
UB5420401070	2	4	8	6	8	70	1	120
UB5420401540	2	4	6	6	8	40	1.5	90
UB5420401550	2	4	8	6	8	50	1.5	100
UB5420401560	2	4	8	6	8	60	1.5	110
UB5420401570	2	4	8	6	8	70	1.5	120
UB5420403050	2	4	10	6	8	50	3	100
UB5420405050	2	4	12	6	8	50	5	100
UB5420501060	2.5	5	8	10	13	60	1	120
UB5420501560	2.5	5	8	10	13	60	1.5	120
UB5420503040	2.5	5	8	10	13	40	3	120
UB5420601060	3	6	8	12	15	60	1	120
UB5420601090	3	6	10	12	15	90	1	150
UB5420601560	3	6	10	12	15	60	1.5	120
UB5420601590	3	6	10	12	15	90	1.5	150
UB5420602060	3	6	10	12	15	60	2	120
UB5420602090	3	6	12	12	15	90	2	150
UB5420603060	3	6	12	12	15	60	3	120
UB5420603090	3	6	14	12	15	90	3	150
UB54208010100	4	8	12	14	18	100	1	150
UB5420801070	4	8	10	14	18	70	1	130
UB54208015100	4	8	14	14	18	100	1.5	150
UB5420801570	4	8	12	14	18	70	1.5	130
UB54208020100	4	8	14	14	18	100	2	150
UB5420802070	4	8	12	14	18	70	2	130
UB54208030100	4	8	18	14	18	100	3	150
UB5420803070	4	8	14	14	18	70	3	130
UB54210010100	5	10	14	18	22	100	1	200
UB5421001070	5	10	12	18	22	70	1	130
UB5421001080	5	10	14	18	22	80	1	150

U-Star Endmill

UB542

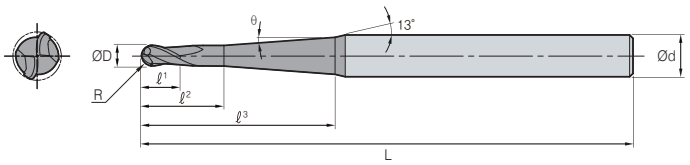
2 flutes tapered neck ball Endmill

CARBIDE | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | AlCrN | DATA p.495

• TOLERANCE

ØD		Ød
Ø0.1 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø12	0 ~ -0.015mm	





(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB54210015100	5	10	16	18	22	100	1.5	200
UB5421001570	5	10	14	18	22	70	1.5	130
UB5421001580	5	10	14	18	22	80	1.5	150
UB54210020100	5	10	16	18	22	100	2	200
UB5421002070	5	10	14	18	22	70	2	130
UB5421002080	5	10	16	18	22	80	2	150
UB54210030100	5	10	20	18	22	100	3	200
UB5421003070	5	10	16	18	22	70	3	130
UB5421003080	5	10	18	18	22	80	3	150
UB54212010100	6	12	16	22	25	100	1	200
UB5421201060	6	12	14	22	25	60	1	130
UB5421201080	6	12	14	22	25	80	1	150
UB5421201090	6	12	16	22	25	90	1	180

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
UB54212015100	6	12	16	22	25	100	1.5	200
UB5421201560	6	12	14	22	25	60	1.5	130
UB5421201580	6	12	16	22	25	80	1.5	150
UB5421201590	6	12	16	22	25	90	1.5	180
UB54212020100	6	12	18	22	25	100	2	200
UB5421202060	6	12	16	22	25	60	2	130
UB5421202080	6	12	16	22	25	80	2	150
UB5421202090	6	12	18	22	25	90	2	180
UB54212030100	6	12	20	22	25	100	3	200
UB5421203060	6	12	16	22	25	60	3	130
UB5421203080	6	12	18	22	25	80	3	150
UB5421203090	6	12	20	22	25	90	3	180

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

USB502

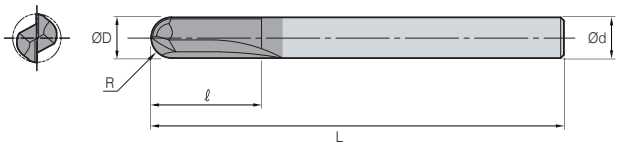
2 flutes straight ball Endmill



CARBIDE | 2 | 0° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | AlCrN | DATA p.496

• TOLERANCE

ØD		Ød
Ø3 ~ Ø6	0 ~ -0.012mm	h5
Ø8 ~ Ø20	0 ~ -0.015mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
USB502030	1.5	3	6	10	70
USB502040	2	4	6	12	70
USB502050	2.5	5	6	18	90
USB502060	3	6	6	20	90
USB502080	4	8	8	25	100
USB502100	5	10	10	30	100
USB502120	6	12	12	32	110
USB502160	8	16	16	35	150
USB502200	10	20	20	40	150

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UB503

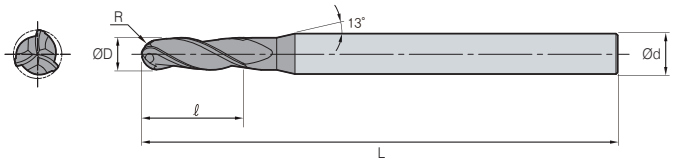
3 flutes ball Endmill



CARBIDE | 3 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | AlCrN | DATA p.496

• TOLERANCE

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.02mm	h5



(mm)

Designation	R	ØD	Ød	ℓ	L
UB503010	0.5	1	6	1	50
UB503015	0.75	1.5	6	1.5	50
UB503020	1	2	6	2	50
UB503030	1.5	3	6	3	60
UB503040	2	4	6	4	70
UB503050	2.5	5	6	5	80
UB503060	3	6	6	6	90
UB503080	4	8	8	8	100
UB503100	5	10	10	10	100
UB503120	6	12	12	12	110

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UB504

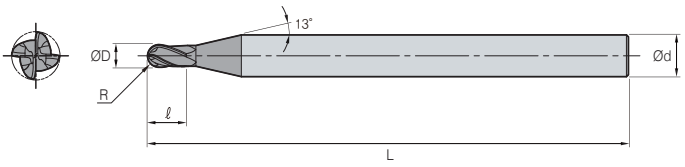
4 flutes ball Endmill



CARBIDE | 4 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | AlCrN | DATA p.497

• TOLERANCE

ØD		Ød
Ø1 ~ Ø12	0 ~ -0.02mm	h5



(mm)

Designation	R	ØD	Ød	ℓ	L
UB504010	0.5	1	6	1	50
UB504015	0.75	1.5	6	1.5	50
UB504020	1	2	6	2	50
UB504030	1.5	3	6	3	60
UB504040	2	4	6	4	70
UB504050	2.5	5	6	5	80
UB504060	3	6	6	6	90
UB504080	4	8	8	8	100
UB504100	5	10	10	10	100
UB504120	6	12	12	12	110

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UTB502

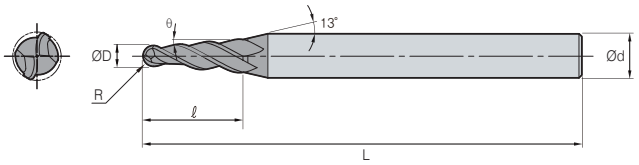
2 flutes tapered ball Endmill



CARBIDE | 2 | 30° HELIX | R ±0.01 Corner R | AlCrN | DATA p.497

• TOLERANCE

ØD		Ød
Ø0.3 ~ Ø2	0 ~ -0.03mm	h5



(mm)

Designation	R	ØD	Ød	ℓ	θ	L
UTB502003005	0.15	0.3	4	1.2	0.5	40
UTB50200301	0.15	0.3	4	1.2	1	40
UTB502003015	0.15	0.3	4	1.2	1.5	40
UTB50200302	0.15	0.3	4	1.2	2	40
UTB50200303	0.15	0.3	4	1.2	3	40
UTB50200305	0.15	0.3	4	1.2	5	40
UTB50200307	0.15	0.3	4	1.5	7	40
UTB50200310	0.15	0.3	4	1.5	10	40
UTB502004005	0.2	0.4	4	1.6	0.5	40
UTB50200401	0.2	0.4	4	1.6	1	40
UTB502004015	0.2	0.4	4	1.6	1.5	40
UTB50200402	0.2	0.4	4	1.6	2	40
UTB50200403	0.2	0.4	4	1.6	3	40
UTB50200405	0.2	0.4	4	1.6	5	40
UTB50200407	0.2	0.4	4	2	7	40
UTB50200410	0.2	0.4	4	2	10	40
UTB502005005	0.25	0.5	4	2	0.5	45
UTB50200501	0.25	0.5	4	2	1	45
UTB502005015	0.25	0.5	4	2	1.5	45
UTB50200502	0.25	0.5	4	2	2	45
UTB50200503	0.25	0.5	4	2	3	45
UTB50200505	0.25	0.5	4	2	5	45
UTB50200507	0.25	0.5	4	2.5	7	45
UTB50200510	0.25	0.5	4	2.5	10	45
UTB502006005	0.3	0.6	4	2	0.5	45
UTB50200601	0.3	0.6	4	2	1	45
UTB502006015	0.3	0.6	4	2	1.5	45
UTB50200602	0.3	0.6	4	2	2	45
UTB50200603	0.3	0.6	4	2	3	45
UTB50200605	0.3	0.6	4	2	5	45
UTB50200607	0.3	0.6	4	2.5	7	45
UTB50200610	0.3	0.6	4	2.5	10	45
UTB502007005	0.35	0.7	4	2.5	0.5	45
UTB50200701	0.35	0.7	4	2.5	1	45
UTB502007015	0.35	0.7	4	2.5	1.5	45
UTB50200702	0.35	0.7	4	2.5	2	45

Designation	R	ØD	Ød	ℓ	θ	L
UTB50200703	0.35	0.7	4	2.5	3	45
UTB50200705	0.35	0.7	4	2.5	5	45
UTB50200707	0.35	0.7	4	3	7	45
UTB50200710	0.35	0.7	4	3	10	45
UTB502008005	0.4	0.8	4	3.2	0.5	45
UTB50200801	0.4	0.8	4	3.2	1	45
UTB502008015	0.4	0.8	4	3.2	1.5	45
UTB50200802	0.4	0.8	4	3.2	2	45
UTB50200803	0.4	0.8	4	3.2	3	45
UTB50200805	0.4	0.8	4	3.2	5	45
UTB50200807	0.4	0.8	4	3.2	7	45
UTB50200810	0.4	0.8	4	3.2	10	45
UTB502010005	0.5	1	4	4	0.5	50
UTB50201001	0.5	1	4	4	1	50
UTB502010015	0.5	1	4	4	1.5	50
UTB50201002	0.5	1	4	4	2	50
UTB50201003	0.5	1	4	4	3	50
UTB50201005	0.5	1	4	4	5	50
UTB50201007	0.5	1	4	4	7	50
UTB50201010	0.5	1	4	4	10	50
UTB502015005	0.75	1.5	4	6	0.5	50
UTB50201501	0.75	1.5	4	6	1	50
UTB502015015	0.75	1.5	4	6	1.5	50
UTB50201502	0.75	1.5	4	7	2	50
UTB50201503	0.75	1.5	4	8	3	50
UTB50201505	0.75	1.5	4	10	5	50
UTB50201507	0.75	1.5	4	10	7	50
UTB50201510	0.75	1.5	6	10	10	50
UTB502020005	1	2	4	6	0.5	50
UTB50202001	1	2	4	6	1	50
UTB502020015	1	2	4	6	1.5	50
UTB50202002	1	2	4	10	2	50
UTB50202003	1	2	4	10	3	50
UTB50202005	1	2	4	10	5	50
UTB50202007	1	2	6	10	7	50
UTB50202010	1	2	6	11	10	50

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UF50

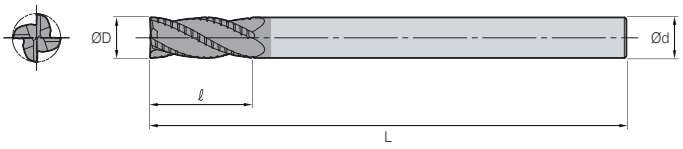
3~5 flutes chamfer pitch roughing Endmill



CARBIDE | CHAMFERED | 3~5 | 29° HELIX | 31° HELIX | R ±0.025 (Corner R) | AlCrN | DATA p.498

• TOLERANCE

ØD		Ød
Ø3 ~ Ø25	0 ~ -0.05mm	h5



(mm)

Designation	R	ØD	Ød	ℓ	L	z
UF503030	0.2	3	6	8	50	3
UF503040	0.2	4	6	10	50	3
UF504050	0.2	5	6	13	50	4
UF504060	0.2	6	6	10	50	4
UF50406015	0.2	6	6	15	60	4
UF504070	0.2	7	8	18	70	4
UF504080	0.2	8	8	12	60	4
UF50408020	0.2	8	8	20	70	4
UF504090	0.3	9	10	22	75	4
UF504100	0.3	10	10	15	65	4
UF50410025	0.3	10	10	25	75	4
UF504110	0.3	11	12	27	80	4
UF504120	0.3	12	12	20	70	4
UF50412030	0.3	12	12	30	80	4
UF505130	0.5	13	12	35	100	5
UF505140S16	0.5	14	16	35	100	5
UF505140	0.5	14	14	35	100	5
UF505150	0.5	15	16	35	100	5
UF505160	1	16	16	25	80	5
UF50516040	1	16	16	40	100	5
UF505180S20	1	18	20	40	100	5
UF505180	1	18	18	40	100	5
UF505200	1	20	20	25	80	5
UF50520045	1	20	20	45	100	5
UF505250	1	25	25	45	100	5

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

U-Star Endmill

UF51

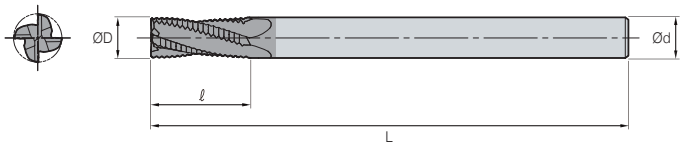
3~5 flutes fine pitch roughing Endmill

CARBIDE | FINE | 3-5 | 20° HELIX | AlCrN | DATA p.498



• TOLERANCE

ØD		Ød
Ø3	0 ~ -0.04mm	h5
Ø4 ~ Ø6	0 ~ -0.048mm	
Ø7 ~ Ø10	0 ~ -0.058mm	
Ø11 ~ Ø18	0 ~ -0.07mm	
Ø20 ~ Ø25	0 ~ -0.084mm	



(mm)

Designation	ØD	Ød	ℓ	L	z
UF513030	3	6	8	50	3
UF513040	4	6	10	50	3
UF513050	5	6	13	50	3
UF513060	6	6	15	60	3
UF51306020	6	6	20	60	3
UF513070	7	8	18	70	3
UF513080	8	8	20	70	3
UF51308025	8	8	25	70	3
UF514090	9	10	22	75	4
UF514100	10	10	25	75	4
UF51410030	10	10	30	75	4
UF514110	11	12	27	80	4
UF514120	12	12	30	80	4
UF51412035	12	12	35	80	4
UF514130	13	12	35	100	4
UF514140	14	16	35	100	4
UF514160	16	16	40	100	4
UF514180	18	18	40	100	4
UF514200	20	20	50	100	4
UF515250	25	25	50	100	5

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

UF51H

3~5 flutes 45° helix fine pitch roughing Endmill

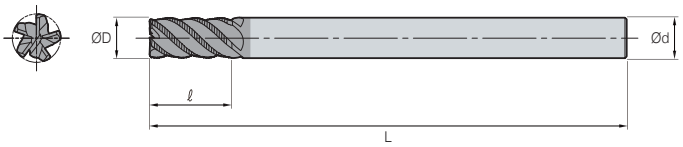
CARBIDE | FINE | 3~5 | 45° HELIX | AlCrN | DATA

p.499

• TOLERANCE

ØD		Ød
Ø3 ~ Ø25	0 ~ -0.05mm	h5





(mm)

Designation	C	ØD	Ød	ℓ	L	z
UF513030H	0.2	3	6	8	50	3
UF513040H	0.2	4	6	10	50	3
UF514050H	0.3	5	6	13	50	4
UF514060H	0.3	6	6	10	50	4
UF51406015H	0.3	6	6	15	60	4
UF514070H	0.4	7	8	18	70	4
UF514080H	0.4	8	8	12	60	4
UF51408020H	0.4	8	8	20	70	4
UF514090H	0.4	9	10	22	75	4
UF514100H	0.4	10	10	15	65	4
UF51410025H	0.4	10	10	25	75	4
UF514110H	0.5	11	12	27	80	4
UF514120H	0.5	12	12	20	70	4
UF51412030H	0.5	12	12	30	80	4
UF515130H	0.5	13	12	35	100	5
UF515140S16H	0.5	14	16	35	100	5
UF515140H	0.5	14	14	35	100	5
UF515160H	0.5	16	16	25	80	5
UF51516040H	0.5	16	16	40	100	5
UF515180S20H	0.5	18	20	40	100	5
UF515180H	0.5	18	18	40	100	5
UF515200H	0.5	20	20	25	80	5
UF51520045H	0.5	20	20	45	100	5
UF515250H	0.5	25	25	45	100	5

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○		○				

◎: Excellent ○: Good

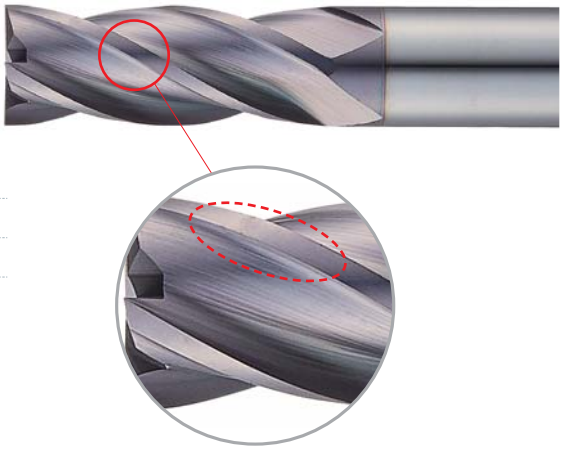
For low hardness

G-Star Endmill

- Suitable for low hardness steel (HRC10 ~ 30); Alloy steel, Carbon steel, Pre-harden, Hardened steel etc.
- General purpose suitable for rough machining, Finishing and curved and sloped surfaces

Features

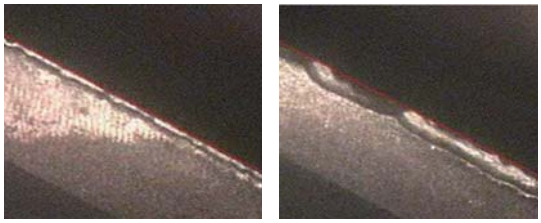
- Excellent rake angle and cutting edge considered the characteristics of workpiece.
- Improved chipping resistance and enhanced machinability by using high toughness materials
- TiAlN coating for enhanced oxidation resistance and chipping resistance



- Excellent workpiece finishes by 45°high helix angle

Performance evaluation

Workpiece	STC3
Cutting condition	n (rpm) = 4,515, Feed = 845, ap = 10, ae = 0.4
Tool	ZE304100P



KORLOY | Competitor

Code system

Z	R	32	4H	08	-	10	-	S4

Type
D: Dynamic
Z: G-Star Endmill
T: Thunder

Appearance
B: Ball
E: Flat
R: Radius
X: Flat
S: Flat
XB: Ball

Length, Shank type
30: Straight
31: Standard
32: Long Cutting Length
33: Long Shank
34: Tapered Neck

No. of flute
2: 2 flutes
4: 4 flutes
4H: 4 flutes (Helix 45°)

Cutting dia.
1 ~ 20

Corner R
0.2 ~ 3 mm

Shank dia.
4 ~ 20 mm

EDP. NO	Appearance	Type	Range	Page
DB312		2 flutes ball nose Endmill	Ø1.0 ~ 20.0	198
DB342		2 flutes tapered neck type ball nose Endmill	Ø1.0 ~ 12.0	199
TX202		2 flutes short shank flat Endmill	Ø1.0 ~ 20.0	200
TX204		4 flutes short shank flat Endmill	Ø1.0 ~ 20.0	201
TX222		2 flutes long flat Endmill	Ø3.0 ~ 20.0	202
TX224		4 flutes long flat Endmill	Ø3.0 ~ 20.0	203
TX302		2 flutes flat Endmill	Ø1.0 ~ 20.0	204
TX304		4 flutes flat Endmill	Ø1.0 ~ 20.0	205
TX304H		4 flutes 45° helix flat Endmill	Ø3.0 ~ 20.0	206
TXB202		2 flutes short shank ball nose Endmill	Ø1.0 ~ 20.0	207
TXB204		4 flutes short shank ball nose Endmill	Ø2.0 ~ 20.0	208
TXB222		2 flutes long ball nose Endmill	Ø3.0 ~ 20.0	209
TXB232		2 flutes long shank ball nose Endmill	Ø3.0 ~ 20.0	210
TXB302		2 flutes ball nose Endmill	Ø1.0 ~ 20.0	211
TXB304		4 flutes ball nose Endmill	Ø1.0 ~ 20.0	212
ZE302P		2 flutes flat Endmill	Ø1.0 ~ 20.0	213
ZE304P		4 flutes flat Endmill	Ø1.0 ~ 20.0	214
ZE322		2 flutes extra long flat Endmill	Ø3.0 ~ 20.0	215
ZE324		4 flutes extra long flat Endmill	Ø3.0 ~ 20.0	216
ZR304H		4 flutes 45° helix radius Endmill	Ø3.0 ~ 12.0	217
ZR322		2 flutes long shank radius Endmill	Ø3.0 ~ 12.0	218
ZR324		4 flutes long shank radius Endmill	Ø3.0 ~ 12.0	219
ZR324H		4 flutes 45° helix radius Endmill	Ø6.0 ~ 12.0	220

G-Star Endmill

DB312

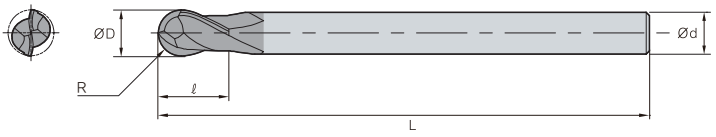
2 flutes ball nose Endmill

FINE GRAIN | 2 | 30° HELIX | R ±0.01 All sizes | AlTiN | DATA p.500

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6.5





(mm)

Designation	R	ØD	Ød	ℓ	L
DB312 010 S4	0.5	1	4	2.5	50
DB312 010	0.5	1	6	2.5	50
DB312 012	0.6	1.2	6	3	50
DB312 015	0.75	1.5	6	4	50
DB312 020 S4	1	2	4	5	50
DB312 020	1	2	6	5	50
DB312 025	1.25	2.5	6	6	60
DB312 030 S3	1.5	3	3	8	60
DB312 030 S4	1.5	3	4	8	60
DB312 030	1.5	3	6	8	60
DB312 035	1.75	3.5	6	8	70
DB312 040 S4	2	4	4	8	70
DB312 040	2	4	6	8	70
DB312 045	2.25	4.5	6	8	70
DB312 050	2.5	5	6	10	80

Designation	R	ØD	Ød	ℓ	L
DB312 055	2.75	5.5	6	10	80
DB312 060S	3	6	6	12	60
DB312 060	3	6	6	12	90
DB312 065	3.25	6.5	8	12	90
DB312 070	3.5	7	8	14	90
DB312 080S	4	8	8	14	60
DB312 080	4	8	8	14	100
DB312 090	4.5	9	10	18	100
DB312 100S	5	10	10	18	60
DB312 100	5	10	10	18	100
DB312 120	6	12	12	22	110
DB312 140	7	14	14	26	110
DB312 160	8	16	16	30	140
DB312 180	9	18	18	34	140
DB312 200	10	20	20	38	160

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

DB342

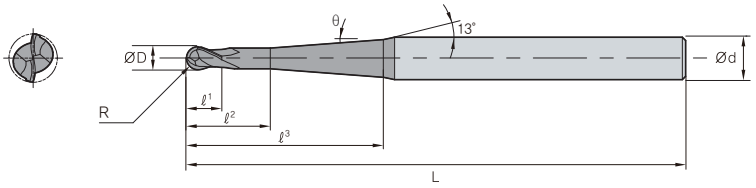
2 flutes tapered neck type ball nose Endmill



FINE GRAIN | 2 | 30° HELIX | R ±0.01 All sizes | AiTIN | DATA p.500

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	ℓ3	θ	L
DB342 01015	0.5	1	6	2	4	23	1°30′	60
DB342 01050	0.5	1	6	2	4	23	5°	60
DB342 01030	0.5	1	6	2	4	42	3°	80
DB342 02015	1	2	6	4	6	23	1°30′	60
DB342 02050	1	2	6	4	6	23	5°	60
DB342 02030	1	2	6	4	6	41	3°	80
DB342 03030	1.5	3	6	6	8	32	3°	70
DB342 03015	1.5	3	6	6	8	52	1°30′	90
DB342 04030	2	4	6	8	10	28	3°	70
DB342 04015	2	4	6	8	10	49	1°30′	90
DB342 05030	2.5	5	8	10	12	41	3°	90
DB342 05015	2.5	5	8	10	12	61	1°30′	110
DB342 06030	3	6	8	12	15	34	3°	90
DB342 06015	3	6	8	12	15	53	1°30′	110
DB342 08030	4	8	10	14	17	36	3°	100
DB342 08015	4	8	10	14	17	55	1°30′	120
DB342 10030	5	10	12	18	21	40	3°	110
DB342 10015	5	10	12	18	21	59	1°30′	130
DB342 12030	6	12	16	22	25	63	3°	140
DB342 12015	6	12	16	22	25	83	1°30′	160

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

TX202

2 flutes short shank flat Endmill

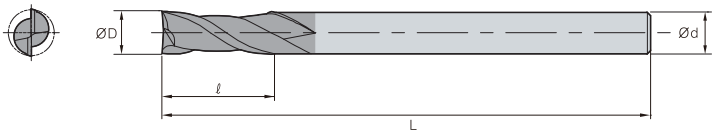


FINE GRAIN | 2 | 30° HELIX | AlTiN | DATA

p.501

• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	-0.014 ~ -0.028mm	h6
Ø4 ~ Ø6	-0.02 ~ -0.038mm	
Ø7 ~ Ø10	-0.025 ~ -0.047mm	
Ø12 ~ Ø18	-0.032 ~ -0.059mm	
Ø20 ~	-0.04 ~ -0.073mm	



(mm)

Designation	ØD	Ød	ℓ	L
TX202 010	1	3	3	39
TX202 015	1.5	3	5	39
TX202 020	2	3	7	39
TX202 025	2.5	3	8	39
TX202 030	3	3	10	39
TX202 040	4	4	14	51
TX202 050	5	5	16	51
TX202 060	6	6	19	64
TX202 080	8	8	21	64
TX202 100	10	10	25	70
TX202 120	12	12	25	76
TX202 160	16	16	32	89
TX202 200	20	20	38	102

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

TX204

4 flutes short shank flat Endmill

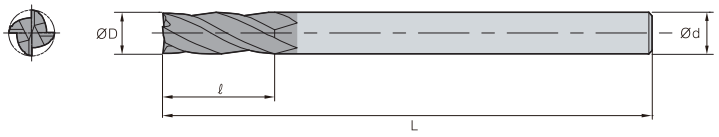


FINE GRAIN | 4 | 30° HELIX | AlTiN | DATA

p.502

• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	-0.014 ~ -0.028mm	h6
Ø4 ~ Ø6	-0.02 ~ -0.038mm	
Ø7 ~ Ø10	-0.025 ~ -0.047mm	
Ø12 ~ Ø18	-0.032 ~ -0.059mm	
Ø20 ~	-0.04 ~ -0.073mm	



(mm)

Designation	ØD	Ød	ℓ	L
TX204 010	1	3	3	39
TX204 015	1.5	3	5	39
TX204 020	2	3	7	39
TX204 025	2.5	3	8	39
TX204 030	3	3	10	39
TX204 040	4	4	14	51
TX204 050	5	5	16	51
TX204 060	6	6	19	64
TX204 080	8	8	21	64
TX204 100	10	10	25	70
TX204 120	12	12	25	76
TX204 160	16	16	32	89
TX204 200	20	20	38	102

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

TX222

2 flutes long flat Endmill

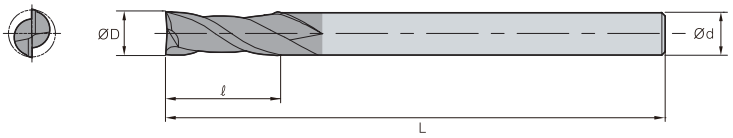


FINE GRAIN | 2 | 30° HELIX | AlTiN | DATA

p.501

• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	-0.014 ~ -0.028mm	h6
Ø4 ~ Ø6	-0.02 ~ -0.038mm	
Ø7 ~ Ø10	-0.025 ~ -0.047mm	
Ø12 ~ Ø18	-0.032 ~ -0.059mm	
Ø20 ~	-0.04 ~ -0.073mm	



(mm)

Designation	ØD	Ød	ℓ	L
TX222 030	3	3	20	60
TX222 040	4	4	20	60
TX222 050	5	5	25	75
TX222 060	6	6	30	75
TX222 080	8	8	30	75
TX222 100	10	10	40	100
TX222 120	12	12	45	100
TX222 140	14	14	45	100
TX222 160	16	16	45	100
TX222 180	18	18	45	100
TX222 200	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

TX224

4 flutes long flat Endmill

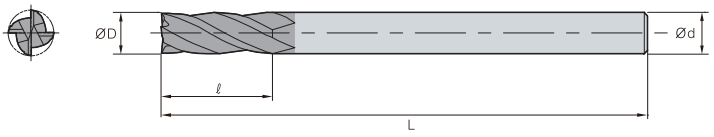


FINE GRAIN | 4 | 30° HELIX | AlTiN | DATA

p.502

• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	-0.014 ~ -0.028mm	h6
Ø4 ~ Ø6	-0.02 ~ -0.038mm	
Ø7 ~ Ø10	-0.025 ~ -0.047mm	
Ø12 ~ Ø18	-0.032 ~ -0.059mm	
Ø20 ~	-0.04 ~ -0.073mm	



(mm)

Designation	ØD	Ød	ℓ	L
TX224 030	3	3	20	60
TX224 040	4	4	20	60
TX224 050	5	5	25	75
TX224 060	6	6	30	75
TX224 080	8	8	30	75
TX224 081	8	8	30	100
TX224 100	10	10	40	100
TX224 120	12	12	45	100
TX224 140	14	14	45	100
TX224 160	16	16	45	100
TX224 180	18	18	45	100
TX224 200	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

TX302

2 flutes flat Endmill

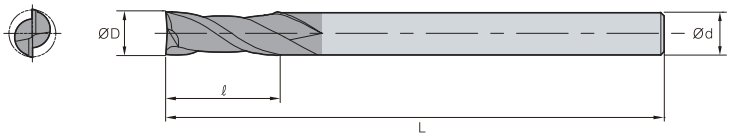


FINE GRAIN | 2 | 30° HELIX | AlTiN | DATA

p.502

• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	-0.014 ~ -0.028mm	h6
Ø4 ~ Ø6	-0.02 ~ -0.038mm	
Ø7 ~ Ø10	-0.025 ~ -0.047mm	
Ø12 ~ Ø18	-0.032 ~ -0.059mm	
Ø20 ~	-0.04 ~ -0.073mm	



(mm)

Designation	ØD	Ød	ℓ	L
TX302 010	1	4	3	50
TX302 015	1.5	4	4	50
TX302 020	2	4	6	50
TX302 025	2.5	4	8	50
TX302 030	3	4	9	50
TX302 040	4	4	11	50
TX302 050	5	6	13	50
TX302 060	6	6	16	50
TX302 070	7	8	16	60
TX302 080	8	8	19	60
TX302 090	9	10	19	60
TX302 100	10	10	25	75
TX302 120	12	12	30	75
TX302 140	14	14	32	75
TX302 160	16	16	32	100
TX302 180	18	18	32	100
TX302 200	20	20	38	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

TX304

4 flutes flat Endmill

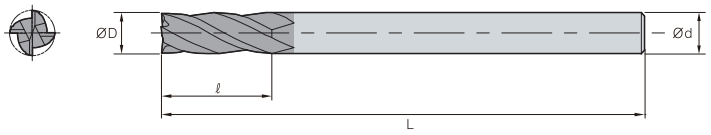


FINE GRAIN | 4 | 30° HELIX | AlTiN | DATA

p.502

• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	-0.014 ~ -0.028mm	h6
Ø4 ~ Ø6	-0.02 ~ -0.038mm	
Ø7 ~ Ø10	-0.025 ~ -0.047mm	
Ø12 ~ Ø18	-0.032 ~ -0.059mm	
Ø20 ~	-0.04 ~ -0.073mm	



(mm)

Designation	ØD	Ød	ℓ	L
TX304 010	1	4	3	50
TX304 015	1.5	4	4	50
TX304 020	2	4	6	50
TX304 025	2.5	4	8	50
TX304 030	3	4	9	50
TX304 040	4	4	11	50
TX304 050	5	6	13	50
TX304 060	6	6	16	50
TX304 070	7	8	16	60
TX304 080	8	8	19	60
TX304 090	9	10	19	60
TX304 100	10	10	25	75
TX304 120	12	12	30	75
TX304 140	14	14	32	75
TX304 160	16	16	32	100
TX304 180	18	18	32	100
TX304 200	20	20	38	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

TX304H

4 flutes 45° helix flat Endmill

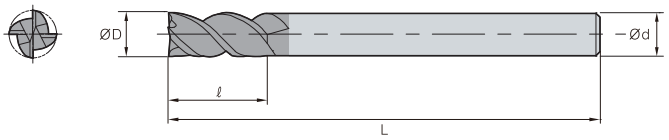


FINE GRAIN | 4 | 45° HELIX | AiTIN | DATA

p.503

• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	-0.014 ~ -0.028mm	h6
Ø4 ~ Ø6	-0.02 ~ -0.038mm	
Ø7 ~ Ø10	-0.025 ~ -0.047mm	
Ø12 ~ Ø18	-0.032 ~ -0.059mm	
Ø20 ~	-0.04 ~ -0.073mm	



(mm)

Designation	ØD	Ød	ℓ	L
TX304H 030	3	6	8	50
TX304H 030 S3	3	3	8	50
TX304H 030 S4	3	4	8	50
TX304H 040	4	6	11	50
TX304H 040 S4	4	4	11	50
TX304H 050	5	6	13	50
TX304H 060	6	6	13	50
TX304H 080	8	8	19	60
TX304H 100	10	10	22	70
TX304H 120	12	12	26	75
TX304H 130	13	12	26	80
TX304H 140	14	14	26	80
TX304H 160	16	16	32	90
TX304H 180	18	18	32	100
TX304H 200	20	20	38	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

TXB202

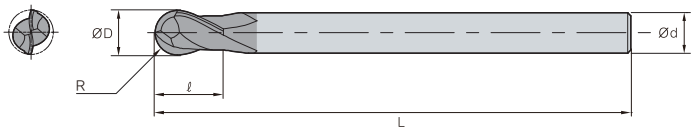
2 flutes short shank ball nose Endmill

FINE GRAIN | 2 | 30° HELIX | R ±0.02 All sizes | AiTIN | DATA p.503

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.04mm	h6





(mm)

Designation	R	ØD	Ød	ℓ	L
TXB202 010	0.5	1	3	3	39
TXB202 015	0.75	1.5	3	5	39
TXB202 020	1	2	3	7	39
TXB202 025	1.25	2.5	3	8	39
TXB202 030	1.5	3	3	10	39
TXB202 040	2	4	4	14	51
TXB202 050	2.5	5	5	16	51
TXB202 060	3	6	6	19	64
TXB202 080	4	8	8	21	64
TXB202 100	5	10	10	25	70
TXB202 120	6	12	12	25	76
TXB202 160	8	16	16	32	89
TXB202 200	10	20	20	38	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

TXB204

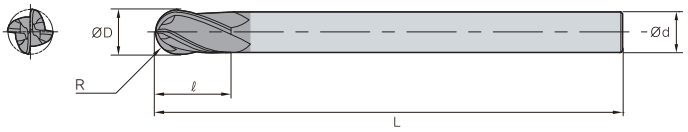
4 flutes short shank ball nose Endmill

FINE GRAIN | 4 | 30° HELIX | R ±0.01 All sizes | AlTiN | DATA p.504

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.04mm	h6





(mm)

Designation	R	ØD	Ød	ℓ	L
TXB204 020	1	2	3	7	39
TXB204 030	1.5	3	3	10	39
TXB204 040	2	4	4	14	51
TXB204 050	2.5	5	5	16	51
TXB204 060	3	6	6	19	64
TXB204 080	4	8	8	21	64
TXB204 100	5	10	10	25	70
TXB204 120	6	12	12	25	76
TXB204 160	8	16	16	32	89
TXB204 200	10	20	20	38	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

TXB222

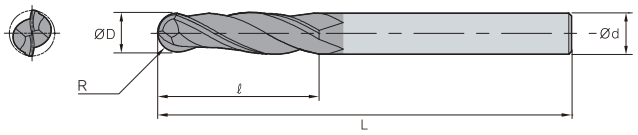
2 flutes long ball nose Endmill



FINE GRAIN | 2 | 30° HELIX | R ±0.02 All sizes | AiTIN | DATA p.503

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.04mm	h6



(mm)

Designation	R	ØD	Ød	ℓ	L
TXB222 030	1.5	3	3	20	60
TXB222 040	2	4	4	20	60
TXB222 050	2.5	5	5	25	75
TXB222 060	3	6	6	30	75
TXB222 080	4	8	8	30	100
TXB222 100	5	10	10	40	100
TXB222 120	6	12	12	45	100
TXB222 140	7	14	14	45	100
TXB222 160	8	16	16	45	100
TXB222 180	9	18	18	45	100
TXB222 200	10	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

TXB232

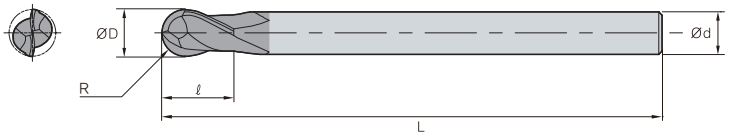
2 flutes long shank ball nose Endmill



FINE GRAIN | 2 | 30° HELIX | R ±0.02 All sizes | AlTiN | DATA p.503

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.04mm	h6



(mm)

Designation	R	ØD	Ød	ℓ	L
TXB232 030	1.5	3	3	5	75
TXB232 040	2	4	4	8	75
TXB232 050	2.5	5	5	9	75
TXB232 060	3	6	6	10	100
TXB232 060-75	3	6	6	10	75
TXB232 080	4	8	8	12	100
TXB232 080-75	4	8	8	12	75
TXB232 100	5	10	10	14	100
TXB232 100L	5	10	10	14	150
TXB232 120	6	12	12	16	100
TXB232 120L	6	12	12	16	150
TXB232 140	7	14	14	18	100
TXB232 160	8	16	16	22	150
TXB232 200	10	20	20	26	150

※ The above specifications are subject to change without prior notice for product quality improvement.

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

TXB302

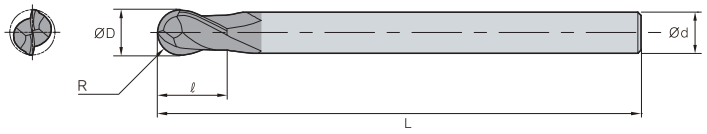
2 flutes ball nose Endmill

FINE GRAIN | 2 | 30° HELIX | R ±0.02 (All sizes) | AiTIN | DATA p.503

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.04mm	h6





(mm)

Designation	R	ØD	Ød	ℓ	L
TXB302 010	0.5	1	4	2	50
TXB302 015	0.75	1.5	4	3	50
TXB302 020	1	2	4	4	50
TXB302 025	1.25	2.5	4	6	50
TXB302 030	1.5	3	4	6	50
TXB302 040	2	4	4	8	50
TXB302 050	2.5	5	6	10	50
TXB302 060	3	6	6	12	50
TXB302 080	4	8	8	14	60
TXB302 100	5	10	10	18	75
TXB302 120	6	12	12	22	75
TXB302 140	7	14	14	32	75
TXB302 160	8	16	16	32	100
TXB302 180	9	18	18	32	100
TXB302 200	10	20	20	38	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

TXB304

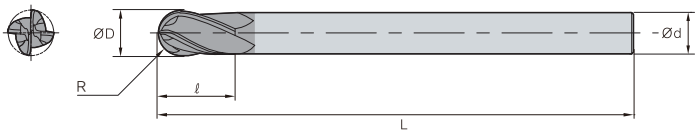
4 flutes ball nose Endmill



FINE GRAIN | 4 | 30° HELIX | R ±0.02 (All sizes) | AlTiN | DATA (p.504)

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.04mm	h6



(mm)

Designation	R	ØD	Ød	ℓ	L
TXB304 010	0.5	1	4	2	50
TXB304 015	0.75	1.5	4	3	50
TXB304 020	1	2	4	4	50
TXB304 030	1.5	3	4	6	50
TXB304 040	2	4	4	8	50
TXB304 050	2.5	5	6	10	50
TXB304 060	3	6	6	12	50
TXB304 080	4	8	8	14	60
TXB304 100	5	10	10	18	75
TXB304 120	6	12	12	22	75
TXB304 140	7	14	14	32	75
TXB304 160	8	16	16	32	100
TXB304 180	9	18	18	32	100
TXB304 200	10	20	20	38	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

ZE302P

2 flutes flat Endmill

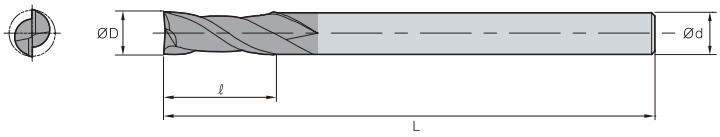


FINE GRAIN | 2 | 30° HELIX | AlTiN | DATA

p.505

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6



(mm)

Designation	ØD	Ød	ℓ	L
ZE302 010P	1	6	2.5	50
ZE302 015P	1.5	6	4	50
ZE302 020P	2	6	6	50
ZE302 025P	2.5	6	8	50
ZE302 030P	3	6	10	50
ZE302 035P	3.5	6	10	50
ZE302 040P	4	6	12	50
ZE302 045P	4.5	6	14	50
ZE302 050P	5	6	15	60
ZE302 055P	5.5	6	15	60
ZE302 060P	6	6	15	60
ZE302 065P	6.5	8	18	60
ZE302 070P	7	8	20	65
ZE302 075P	7.5	8	20	65
ZE302 080P	8	8	20	65
ZE302 085P	8.5	10	22	70
ZE302 090P	9	10	22	70
ZE302 095P	9.5	10	24	70
ZE302 100P	10	10	25	70
ZE302 105P	10.5	12	26	80
ZE302 110P	11	12	30	80
ZE302 115P	11.5	12	30	80
ZE302 120P	12	12	30	80
ZE302 130P	13	12	35	90
ZE302 140P	14	14	35	100
ZE302 150P	15	16	40	100
ZE302 160P	16	16	40	100
ZE302 180P	18	18	45	100
ZE302 200P	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

ZE304P

4 flutes flat Endmill

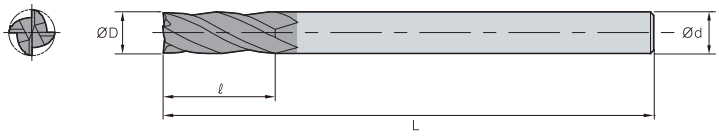


FINE GRAIN | 4 | 30° HELIX | AlTiN | DATA

p.506

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6



(mm)

Designation	ØD	Ød	ℓ	L
ZE304 010P	1	6	2.5	50
ZE304 015P	1.5	6	4	50
ZE304 020P	2	6	6	50
ZE304 025P	2.5	6	8	50
ZE304 030P	3	6	10	50
ZE304 035P	3.5	6	10	50
ZE304 040P	4	6	12	50
ZE304 045P	4.5	6	14	50
ZE304 050P	5	6	15	60
ZE304 055P	5.5	6	15	60
ZE304 060P	6	6	15	60
ZE304 065P	6.5	8	18	60
ZE304 070P	7	8	20	65
ZE304 075P	7.5	8	20	65
ZE304 080P	8	8	20	65
ZE304 085P	8.5	10	22	70
ZE304 090P	9	10	22	70
ZE304 095P	9.5	10	24	70
ZE304 100P	10	10	25	70
ZE304 105P	10.5	12	26	80
ZE304 110P	11	12	30	80
ZE304 115P	11.5	12	30	80
ZE304 120P	12	12	30	80
ZE304 130P	13	12	35	90
ZE304 140P	14	14	35	100
ZE304 150P	15	16	40	100
ZE304 160P	16	16	40	100
ZE304 180P	18	18	45	100
ZE304 200P	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

ZE322

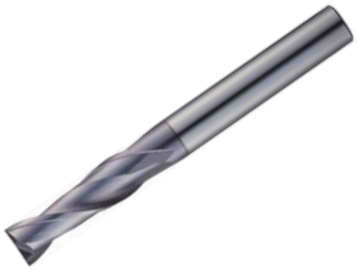
2 flutes extra long flat Endmill

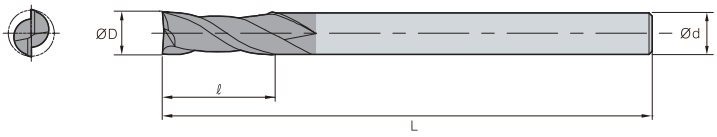
FINE GRAIN | 2 | 30° HELIX | AiTIN | DATA

p.505

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.03mm	h6





(mm)

Designation	ØD	Ød	ℓ	L
ZE322 030	3	6	15	60
ZE322 031	3	6	20	70
ZE322 030S	3	3	20	100
ZE322 040	4	6	15	60
ZE322 041	4	6	20	70
ZE322 040S	4	4	20	100
ZE322 050	5	6	20	60
ZE322 051	5	6	20	80
ZE322 052	5	6	25	100
ZE322 060	6	6	20	80
ZE322 061	6	6	30	100
ZE322 062	6	6	40	150
ZE322 080	8	8	30	90
ZE322 081	8	8	35	100
ZE322 082	8	8	40	150
ZE322 100	10	10	30	90

Designation	ØD	Ød	ℓ	L
ZE322 101	10	10	35	100
ZE322 102	10	10	45	150
ZE322 103	10	10	55	180
ZE322 120	12	12	30	90
ZE322 121	12	12	40	110
ZE322 122	12	12	50	150
ZE322 123	12	12	60	200
ZE322 140	14	14	40	120
ZE322 141	14	14	60	150
ZE322 160	16	16	50	140
ZE322 161	16	16	70	160
ZE322 162	16	16	80	200
ZE322 180	18	18	50	140
ZE322 200	20	20	60	150
ZE322 201	20	20	100	200
ZE322 202	20	20	130	250

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

ZE324

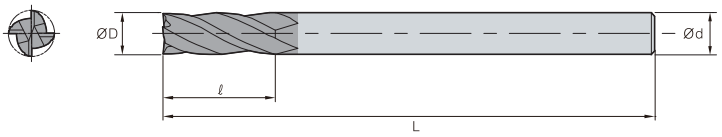
4 flutes extra long flat Endmill

FINE GRAIN | 4 | 30° HELIX | AlTiN | DATA p.506

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.03mm	h6





(mm)

Designation	ØD	Ød	ℓ	L
ZE324 030	3	6	15	60
ZE324 031	3	6	20	70
ZE324 030S	3	3	20	100
ZE324 040	4	6	15	60
ZE324 041	4	6	20	70
ZE324 040S	4	4	20	100
ZE324 050	5	6	20	60
ZE324 051	5	6	20	80
ZE324 052	5	6	25	100
ZE324 060	6	6	20	80
ZE324 061	6	6	30	100
ZE324 062	6	6	40	150
ZE324 080	8	8	30	90
ZE324 081	8	8	35	100
ZE324 082	8	8	40	150
ZE324 100	10	10	30	90

Designation	ØD	Ød	ℓ	L
ZE324 101	10	10	35	100
ZE324 102	10	10	45	150
ZE324 103	10	10	55	180
ZE324 120	12	12	30	90
ZE324 121	12	12	40	110
ZE324 122	12	12	50	150
ZE324 123	12	12	60	200
ZE324 140	14	14	40	120
ZE324 141	14	14	60	150
ZE324 160	16	16	50	140
ZE324 161	16	16	70	160
ZE324 162	16	16	80	200
ZE324 180	18	18	50	140
ZE324 200	20	20	60	150
ZE324201	20	20	100	200
ZE324202	20	20	130	250

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

ZR304H

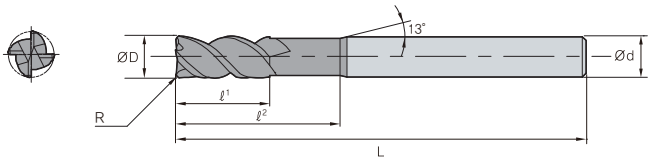
4 flutes 45° helix radius Endmill

FINE GRAIN | 4 | 45° HELIX | R ±0.02 All sizes | AlTiN | DATA p.504

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.03mm	h6





(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ZR304H 0303	0.3	3	6	4	12	55
ZR304H 0302S3	0.2	3	3	4	12	55
ZR304H 0303S4	0.3	3	4	4	12	55
ZR304H 0305	0.5	3	6	4	12	55
ZR304H 0305S3	0.5	3	3	4	12	55
ZR304H 0305S4	0.5	3	4	4	12	55
ZR304H 0402S4	0.2	4	4	5	16	55
ZR304H 0403	0.3	4	6	5	16	55
ZR304H 0403S4	0.3	4	4	5	16	55
ZR304H 0405	0.5	4	6	5	16	55
ZR304H 0405S4	0.5	4	4	5	16	55
ZR304H 0605	0.5	6	6	7	20	60
ZR304H 0610	1	6	6	7	20	60
ZR304H 0805	0.5	8	8	10	25	65
ZR304H 0810	1	8	8	10	25	65
ZR304H 1005	0.5	10	10	12	30	70
ZR304H 1010	1	10	10	12	30	70
ZR304H 1015	1.5	10	10	12	30	70
ZR304H 1020	2	10	10	12	30	70
ZR304H 1205	0.5	12	12	15	30	80
ZR304H 1210	1	12	12	15	30	80
ZR304H 1215	1.5	12	12	15	30	80
ZR304H 1220	2	12	12	15	30	80

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

ZR322

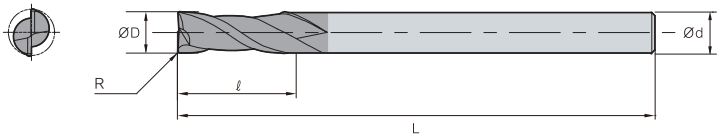
2 flutes long shank radius Endmill

FINE GRAIN | 2 | 30° HELIX | R ±0.02 (All sizes) | AlTiN | DATA (p.507)

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.03mm	h6





(mm)

Designation	R	ØD	Ød	ℓ	L
ZR322 0302S4	0.2	3	4	8	60
ZR322 0302	0.2	3	6	8	60
ZR322 0303	0.3	3	6	8	60
ZR322 0305S4	0.5	3	4	8	60
ZR322 0305	0.5	3	6	8	60
ZR322 0402S4	0.2	4	4	11	70
ZR322 0402	0.2	4	6	11	70
ZR322 0403	0.3	4	6	11	70
ZR322 0405S4	0.5	4	4	11	70
ZR322 0405	0.5	4	6	11	70
ZR322 0410S4	1	4	4	11	70
ZR322 0410	1	4	6	11	70
ZR322 0502	0.2	5	6	13	80
ZR322 0503	0.3	5	6	13	80
ZR322 0505	0.5	5	6	13	80
ZR322 0510	1	5	6	13	80
ZR322 0602	0.2	6	6	13	90
ZR322 0603	0.3	6	6	13	90
ZR322 0605	0.5	6	6	13	90

Designation	R	ØD	Ød	ℓ	L
ZR322 0610	1	6	6	13	90
ZR322 0803	0.3	8	8	19	100
ZR322 0805	0.5	8	8	19	100
ZR322 0810	1	8	8	19	100
ZR322 0815	1.5	8	8	19	100
ZR322 0820	2	8	8	19	100
ZR322 1003	0.3	10	10	22	100
ZR322 1005	0.5	10	10	22	100
ZR322 1010	1	10	10	22	100
ZR322 1015	1.5	10	10	22	100
ZR322 1020	2	10	10	22	100
ZR322 1025	2.5	10	10	22	100
ZR322 1205	0.5	12	12	26	110
ZR322 1210	1	12	12	26	110
ZR322 1215	1.5	12	12	26	110
ZR322 1220	2	12	12	26	110
ZR322 1225	2.5	12	12	26	110
ZR322 1230	3	12	12	26	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

ZR324

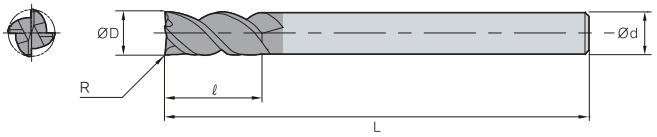
4 flutes long shank radius Endmill

FINE GRAIN | 4 | 30° HELIX | R ±0.02 (All sizes) | AiTIN | DATA p.507

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.03mm	h6





(mm)

Designation	R	ØD	Ød	ℓ	L
ZR324 0302S4	0.2	3	4	8	60
ZR324 0302	0.2	3	6	8	60
ZR324 0303	0.3	3	6	8	60
ZR324 0305S4	0.5	3	4	8	60
ZR324 0305	0.5	3	6	8	60
ZR324 0402S4	0.2	4	4	11	70
ZR324 0402	0.2	4	6	11	70
ZR324 0403	0.3	4	6	11	70
ZR324 0405S4	0.5	4	4	11	70
ZR324 0405	0.5	4	6	11	70
ZR324 0410S4	1	4	4	11	70
ZR324 0410	1	4	6	11	70
ZR324 0502	0.2	5	6	13	80
ZR324 0503	0.3	5	6	13	80
ZR324 0505	0.5	5	6	13	80
ZR324 0510	1	5	6	13	80
ZR324 0602	0.2	6	6	13	90
ZR324 0603	0.3	6	6	13	90
ZR324 0605	0.5	6	6	13	90

Designation	R	ØD	Ød	ℓ	L
ZR324 0610	1	6	6	13	90
ZR324 0803	0.3	8	8	19	100
ZR324 0805	0.5	8	8	19	100
ZR324 0810	1	8	8	19	100
ZR324 0815	1.5	8	8	19	100
ZR324 0820	2	8	8	19	100
ZR324 1003	0.3	10	10	22	100
ZR324 1005	0.5	10	10	22	100
ZR324 1010	1	10	10	22	100
ZR324 1015	1.5	10	10	22	100
ZR324 1020	2	10	10	22	100
ZR324 1025	2.5	10	10	22	100
ZR324 1205	0.5	12	12	26	110
ZR324 1210	1	12	12	26	110
ZR324 1215	1.5	12	12	26	110
ZR324 1220	2	12	12	26	110
ZR324 1225	2.5	12	12	26	110
ZR324 1230	3	12	12	26	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

G-Star Endmill

ZR324H

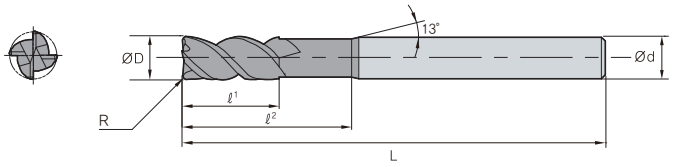
4 flutes 45° helix radius Endmill



FINE GRAIN | 4 | 45° HELIX | R ±0.02 (All sizes) | AlTiN | DATA (p.504)

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.03mm	h6



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
ZR324H 0605	0.5	6	6	9	20	90
ZR324H 0610	1	6	6	9	20	90
ZR324H 0805	0.5	8	8	12	25	100
ZR324H 0810	1	8	8	12	25	100
ZR324H 1005	0.5	10	10	15	32	100
ZR324H 1010	1	10	10	15	32	100
ZR324H 1015	1.5	10	10	15	32	100
ZR324H 1020	2	10	10	15	32	100
ZR324H 1205	0.5	12	12	18	38	110
ZR324H 1210	1	12	12	18	38	110
ZR324H 1215	1.5	12	12	18	38	110
ZR324H 1220	2	12	12	18	38	110

※ The above specifications are subject to change without prior notice for product quality improvement.

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
◎	◎	○							

◎: Excellent ○: Good

High efficient roughing Endmill

R+ Endmill

- Cost-effective cutting-edge design for rough machining
- Specifically designed corners as irregular flute spacing and lead angle



Features

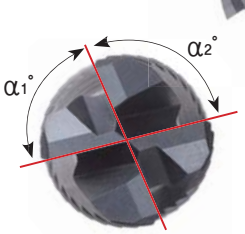
- Excellent machining efficiency - Special design for medium to rough cutting
- Longer cutting life - Extended tool cost thanks to newly applied grades
- Higher cutting performance - Blade design ideal for roughing



• **Lower cutting**
- Ideal for medium to rough cutting
- Special edge design

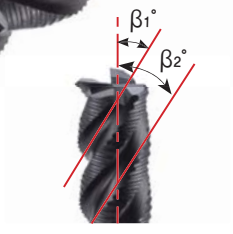


• **Soft cutting**
- Serrated cutting edges
- 3 Combo R



$(\alpha_1^\circ \neq \alpha_2^\circ)$

• Irregular flute spacing to prevent chattering



$(\beta_1^\circ \neq \beta_2^\circ)$

• Irregular lead angles to disperse cutting force

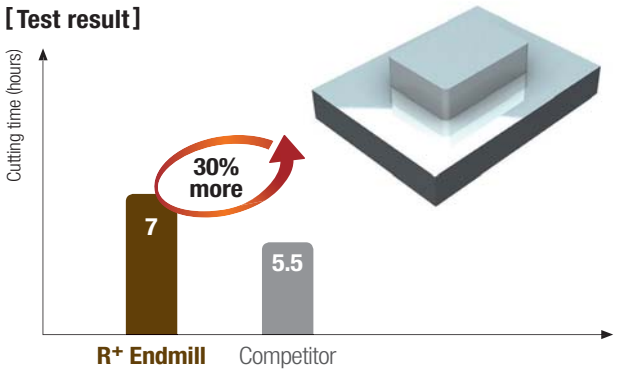
Grade system

Carbide roughing		HSS roughing	
FN30T	Carbide, uncoated	HN30T	HSS PM, uncoated
PC10T	Carbide, TiCN coated	HN20T	HSS, uncoated
PC20T	Carbide, TiN coated	HC10T	HSS, TiCN coated
PC30T	Carbide, TiAlN coated	HC20T	HSS, TiN coated
PC40T	Carbide, TiAlCrN coated	HC30T	HSS PM, TiAlN coated

Application examples

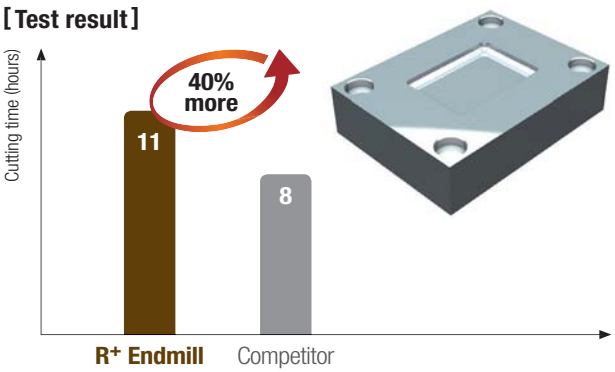
Workpiece	Mold
Cutting condition	vc (m/min) = 57, fz (mm/t) = 0.03
	ap (mm) = 8, dry
Tool	RPE4080-075-FF

[Test result]



Workpiece	Mold
Cutting condition	vc (m/min) = 68, fz (mm/t) = 0.06
	ap (mm) = 8, dry
Tool	RPE4080-063-FP-H

[Test result]



R+ Endmill

RPAE

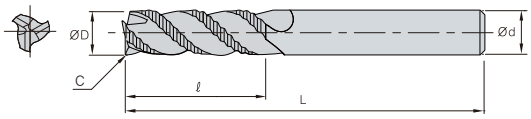
Wave roughing Endmill for Al



3 | 45° HELIX | Substrate FN30T | DATA p.508

• TOLERANCE

ØD		Ød
Ø6 ~ Ø25	0 ~ -0.05mm	h6



• Carbide

(mm)

Designation	ØD	Ød	ℓ	L	C
RPAE 3060-063	6	6	18	63	0.3
RPAE 3070-063	7	8	23	63	0.3
RPAE 3080-063	8	8	23	63	0.3
RPAE 3090-080	9	10	30	80	0.3
RPAE 3100-080	10	10	30	80	0.3
RPAE 3110-080	11	12	32	80	0.5
RPAE 3120-080	12	12	32	80	0.5
RPAE 3140-080	14	14	32	80	0.5
RPAE 3160-105	16	16	48	105	0.5
RPAE 3180-105	18	18	48	105	0.5
RPAE 3200-105	20	20	50	105	0.5
RPAE 3250-105	25	25	50	105	0.5

RPE-FP-H

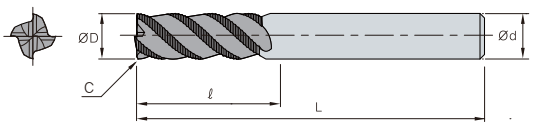
Fine pitch standard type roughing Endmill



4 | 40°/42° HELIX | Substrate PC30T | DATA p.508

• TOLERANCE

ØD		Ød
Ø5 ~ Ø20	0 ~ -0.05mm	h6



• Carbide, High helix angle, irregular flute spacing and lead

(mm)

Designation	ØD	Ød	ℓ	L	C
RPE 4050-057-FP-H	5	6	13	57	0.3
RPE 4060-057-FP-H	6	6	13	57	0.5
RPE 4080-063-FP-H	8	8	19	63	0.5
RPE 4100-072-FP-H	10	10	22	72	0.5
RPE 4120-082-FP-H	12	12	26	82	0.5
RPE 4140-082-FP-H	14	16	26	82	0.6
RPE 4160-092-FP-H	16	16	32	92	0.6
RPE 4180-092-FP-H	18	20	32	92	0.6
RPE 4200-0104-FP-H	20	20	38	104	0.6

RPLE-FP-H

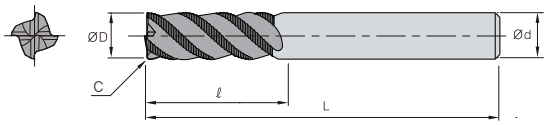
Fine pitch long type roughing Endmill



4 | 40°/42° HELIX | Substrate PC30T | DATA p.508

• TOLERANCE

ØD		Ød
Ø5 ~ Ø20	0 ~ -0.05mm	h6



• Carbide, High helix angle, irregular flute spacing and lead

(mm)

Designation	ØD	Ød	ℓ	L	C
RPLE 4050-063-FP-H	5	6	19	63	0.3
RPLE 4060-063-FP-H	6	8	19	63	0.5
RPLE 4080-072-FP-H	8	8	28	72	0.5
RPLE 4100-082-FP-H	10	10	34	82	0.5
RPLE 4120-097-FP-H	12	12	40	97	0.5
RPLE 4140-097-FP-H	14	16	40	97	0.6
RPLE 4160-108-FP-H	16	16	48	108	0.6
RPLE 4180-108-FP-H	18	20	48	108	0.6
RPLE 4200-122-FP-H	20	20	56	122	0.6

RPE-XG

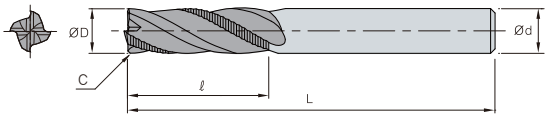
Endmill for finishing and roughing



4 | 30° HELIX | Substrate PC30T | DATA p.509

• TOLERANCE

ØD		Ød
Ø6 ~ Ø20	0 ~ -0.05mm	h6



• Carbide

(mm)

Designation	ØD	Ød	ℓ	L	C
RPE 4060-052-XG	6	6	14	52	0.25
RPE 4070-063-XG	7	8	18	63	0.3
RPE 4080-063-XG	8	8	18	63	0.3
RPE 4090-080-XG	9	10	22	80	0.3
RPE 4100-080-XG	10	10	22	80	0.3
RPE 4110-080-XG	11	12	26	80	0.4
RPE 4120-080-XG	12	12	26	80	0.4
RPE 4140-080-XG	14	14	30	80	0.4
RPE 4160-105-XG	16	16	34	105	0.6
RPE 4180-105-XG	18	18	38	105	0.6
RPE 4200-105-XG	20	20	42	105	0.6

R+ Endmill

RPE-FP-L

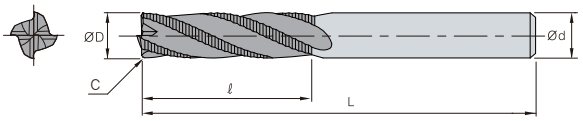
Roughing Endmill for fine pitches



4 | 18°/23° HELIX | Substrate PC30T | DATA p.509

• TOLERANCE

ØD		Ød
Ø5 ~ Ø20	0 ~ -0.05mm	h6



• Carbide, irregular flute spacing and lead

(mm)

Designation	ØD	Ød	ℓ	L	C
RPE 4050-060-FP-L	5	6	13	60	0.3
RPE 4060-080-FP-L	6	8	13	80	0.5
RPE 4080-080-FP-L	8	8	19	80	0.5
RPE 4100-080-FP-L	10	10	22	80	0.5
RPE 4120-080-FP-L	12	12	26	80	0.5
RPE 4140-085-FP-L	14	16	26	85	0.6
RPE 4160-100-FP-L	16	16	32	100	0.6
RPE 4180-100-FP-L	18	20	32	100	0.6
RPE 4200-105-FP-L	20	20	38	105	0.6

RPE-RG

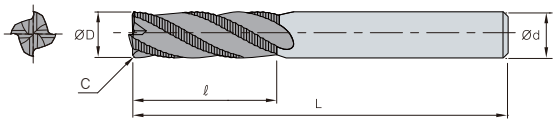
Standard roughing Endmill



4 | 30° HELIX | Substrate PC40T | DATA p.510

• TOLERANCE

ØD		Ød
Ø5 ~ Ø20	0 ~ -0.05mm	h6



• Carbide

(mm)

Designation	ØD	Ød	ℓ	L	C
RPE 4050-050-RG	5	6	13	50	0.3
RPE 4060-050-RG	6	6	16	50	0.3
RPE 4080-060-RG	8	8	20	60	0.3
RPE 4100-075-RG	10	10	25	75	0.3
RPE 4120-080-RG	12	12	30	80	0.4
RPE 4140-100-RG	14	16	35	100	0.6
RPE 4160-100-RG	16	16	40	100	0.6
RPE 4180-110-RG	18	20	40	110	0.6
RPE 4200-110-RG	20	20	45	110	0.6

RPE-RG

4F roughing Endmill

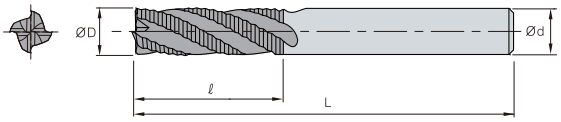


4 | 30° HELIX | HSS PM | Substrate HN30T HC30T | DATA

p.510

• TOLERANCE

ØD		Ød
Ø6 ~ Ø20	±0.1mm	h6



• HSS PM

(mm)

Designation	ØD	Ød	ℓ	L
RPE 4060-060-RG	6	6	20	60
RPE 4070-070-RG	7	10	20	70
RPE 4080-075-RG	8	10	25	75
RPE 4090-075-RG	9	10	30	75
RPE 4100-085-RG	10	10	35	85
RPE 4120-100-RG	12	12	40	100
RPE 4140-100-RG	14	16	40	100
RPE 4160-110-RG	16	16	50	110
RPE 4180-110-RG	18	20	50	110
RPE 4200-125-RG	20	20	60	125

RPE-FF

Roughing Endmill for fine pitches

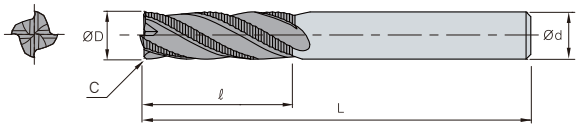


4 | 25°/30° HELIX | HSS PM | Substrate HC30T | DATA

p.510

• TOLERANCE

ØD		Ød
Ø6 ~ Ø20	±0.1mm	h6



• HSS PM, Irregular flute spacing

(mm)

Designation	ØD	Ød	ℓ	L	C
RPE 4060-060-FF	6	6	20	60	0.5
RPE 4070-070-FF	7	10	20	70	0.5
RPE 4080-075-FF	8	10	25	75	0.5
RPE 4090-075-FF	9	10	30	75	0.5
RPE 4100-085-FF	10	10	35	85	0.5
RPE 4120-100-FF	12	12	40	100	0.6
RPE 4140-100-FF	14	12	40	100	0.6
RPE 4160-110-FF	16	16	50	110	0.6
RPE 4180-110-FF	18	16	50	110	0.6
RPE 4200-125-FF	20	20	60	125	0.6

R+ Endmill

RPE-FP

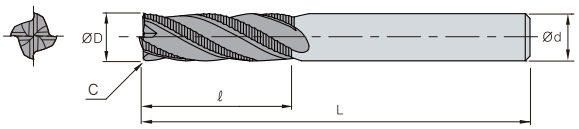
Roughing Endmill for fine pitches



4 | 25°/30° HELIX | HSS PM | Substrate HC30T | DATA p.510

• TOLERANCE

ØD		Ød
Ø6 ~ Ø12	0 ~ -0.05mm	h6
Ø12.1 ~ Ø20	0 ~ -0.1mm	



• HSS PM, irregular flute spacing and lead

(mm)

Designation	ØD	Ød	ℓ	L	C
RPE 4060-080-FP	6	6	13	80	0.5
RPE 4070-080-FP	7	10	16	80	0.5
RPE 4080-085-FP	8	10	19	85	0.5
RPE 4090-095-FP	9	10	19	95	0.5
RPE 4100-100-FP	10	10	22	100	0.5
RPE 4120-110-FP	12	12	26	110	0.6
RPE 4140-110-FP	14	12	26	110	0.6
RPE 4160-125-FP	16	16	32	125	0.6
RPE 4180-125-FP	18	16	32	125	0.6
RPE 4200-140-FP	20	20	38	140	0.6

RPE-RG

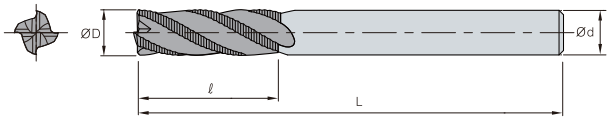
Roughing Endmill



4 | 30° HELIX | HSS Co 8% | Substrate HN20T HC20T HC10T | DATA p.511

• TOLERANCE

ØD		Ød
Ø6 ~ Ø50	±0.1mm	h6



• HSS

(mm)

Designation	ØD	Ød	ℓ	L
RPE 4060-060-RG	6	6	15	60
RPE 4070-065-RG	7	8	20	65
RPE 4080-065-RG	8	8	20	65
RPE 4090-075-RG	9	10	25	75
RPE 4100-075-RG	10	10	25	75
RPE 4110-080-RG	11	12	30	80
RPE 4120-080-RG	12	12	30	80
RPE 4130-090-RG	13	12	35	90
RPE 4140-090-RG	14	12	35	90
RPE 4150-095-RG	15	12	40	95
RPE 4160-095-RG	16	16	40	95
RPE 4170-095-RG	17	16	40	95
RPE 4180-105-RG	18	16	40	105
RPE 4190-110-RG	19	16	45	110
RPE 4200-110-RG	20	20	45	110
RPE 4210-110-RG	21	20	45	110
RPE 4220-110-RG	22	20	45	110
RPE 4230-110-RG	23	20	45	110
RPE 4240-120-RG	24	25	50	120
RPE 4250-120-RG	25	25	50	120
RPE 4260-120-RG	26	25	50	120
RPE 4270-125-RG	27	25	55	125
RPE 4280-125-RG	28	25	55	125
RPE 4300-125-RG	30	25	55	125
RPE 4320-145-RG	32	32	60	145
RPE 4340-145-RG	34	32	60	145
RPE 4350-145-RG	35	32	60	145
RPE 4360-145-RG	36	32	60	145
RPE 4380-150-RG	38	32	65	150
RPE 4400-150-RG	40	32	65	150
RPE 4420-155-RG	42	42	65	155
RPE 4440-155-RG	44	42	65	155
RPE 4450-160-RG	45	42	70	160
RPE 4460-160-RG	46	42	70	160
RPE 4500-160-RG	50	42	70	160

Endmill for Stainless steel machining

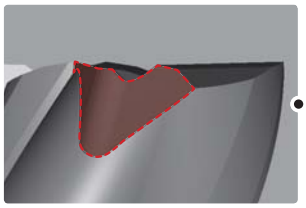
S-Star Endmill New

- 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

• Uneven flute spacing / R gash



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

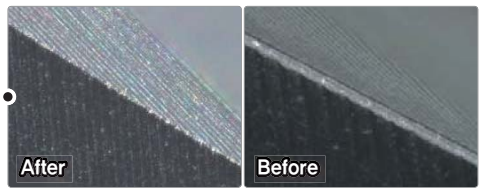
• Applying different width and size of AlCrN based layer



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



• Cutting edge treatment



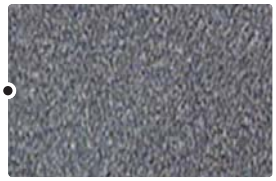
- Improved chipping resistance in the beginning of cutting
- Better wear resistance and stable cutting
- High quality of product from cutting edge treatment stabilization

• Additional finishing edge



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

• Applying high toughness substrate



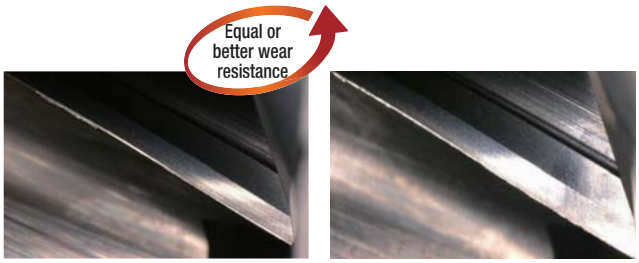
- Chipping resistance and stable cutting from applying high toughness substrate

Tool selection guide

P	K	M	S		H	N		
U-Star Endmill G-Star Endmill		S-Star Endmill Super Endmill For Ti	Super Endmill For HRSA	Super Endmill For Ti S-Star Endmill	H-Star Endmill	A-Star Endmill	D Endmill	Composite Router Endmill
Carbon steel, Alloy steel	Cast iron	Stainless steel	Inconel718, Waspaloy, Hastelloy	Titanium	High hardened alloy	Non-ferrous	Graphite	Composite materials (CFRP/GFRP)

Performance evaluation (Wear resistance)

Workpiece	STS304
Cutting condition	vc (m/min) = 60, fz (mm/t) = 0.03,
	ap (mm) = 9, ae (mm) = 0.6, wet
Tools	SE504060 (4F Ø6 Flat Endmill)



S-Star Endmill | Competitor

Code system

S	R	51	4	120	03	H
Type	Appearance	Length, Shank type	No. of flute	Cutting dia.	Corner radius	Helix
S : STS high performance	B : Ball type E : Flat type R : Radius type F : Roughing	50 : Standard 51 : Straight, Neck	2 : 2 flute 3 : 3 flute 4 : 4 flute 5 : 5 flute 6 : 6 flute 7 : 7 Flute	1 ~ 20 mm	0.1 ~ 2 mm	H : High helix

S-Star Endmill

EDP. NO	Appearance	Type	Range	Page
SE502		2 flutes flat Endmill	Ø1.0 ~ 20.0	231
SE503		3 flutes flat Endmill	Ø1.0 ~ 20.0	232
SE504		4 flutes flat Endmill	Ø1.0 ~ 20.0	233
SE506		6 flutes flat Endmill	Ø6.0 ~ 20.0	234
SR504		4 flutes radius Endmill	Ø1.0 ~ 20.0	235
SR505		5 flutes nick type radius Endmill	Ø6.0 ~ 20.0	236
SR507		7 flutes nick type radius Endmill	Ø6.0 ~ 20.0	237
SB502		2 flutes ball Endmill	Ø1.0 ~ 12.0	238
SB504		4 flutes ball Endmill	Ø3.0 ~ 20.0	239
SF51H		3~5 flutes roughing Endmill	Ø3.0 ~ 20.0	240

SE502

2 flutes flat Endmill

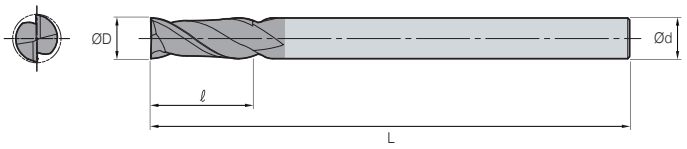


CARBIDE | 2 | 36° HELIX | AlCrN | DATA

p.512

• TOLERANCE

ØD		Ød
Ø1 ~ Ø5	0 ~ -0.015mm	h5
Ø6	0 ~ -0.02mm	
Ø8 ~ Ø20	0 ~ -0.03mm	



(mm)

Designation	ØD	Ød	ℓ	L
SE502010	1	6	2.5	50
SE502012	1.2	6	3	50
SE502015	1.5	6	4	50
SE502020	2	6	6	50
SE502025	2.5	6	7	50
SE502030	3	6	8	55
SE502040	4	6	10	55
SE502050	5	6	15	55
SE502060	6	6	15	60
SE502080	8	8	20	70
SE502100	10	10	25	75
SE502120	12	12	30	80
SE502140	14	16	35	90
SE502160	16	16	42	100
SE502180	18	16	45	100
SE502200	20	20	48	100

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: Excellent ○: Good

S-Star Endmill

SE503

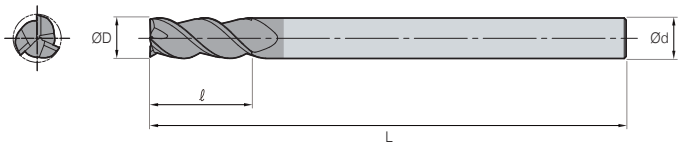
3 flutes flat Endmill

CARBIDE | 3 | 42° HELIX | 42.5° HELIX | 45° HELIX | AlCrN | DATA p.513



• TOLERANCE

ØD		Ød
Ø1 ~ Ø5	0 ~ -0.015mm	h5
Ø6	0 ~ -0.02mm	
Ø8 ~ Ø20	0 ~ -0.03mm	



(mm)

Designation	ØD	Ød	ℓ	L
SE503010	1	6	2.5	50
SE503012	1.2	6	3	50
SE503015	1.5	6	4	50
SE503020	2	6	6	50
SE503025	2.5	6	7	50
SE503030	3	6	8	55
SE50303010	3	6	10	60
SE503040	4	6	10	55
SE50304012	4	6	12	60
SE503050	5	6	13	55
SE503060	6	6	15	60
SE50306020	6	6	20	65
SE503080	8	8	20	70
SE50308030	8	8	30	80
SE503100	10	10	25	75
SE50310035	10	10	35	85
SE503120	12	12	30	80
SE50312040	12	12	40	90
SE503140	14	16	35	90
SE503160	16	16	42	100
SE503180	18	16	45	100
SE503200	20	20	48	100

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: Excellent ○: Good

SE504

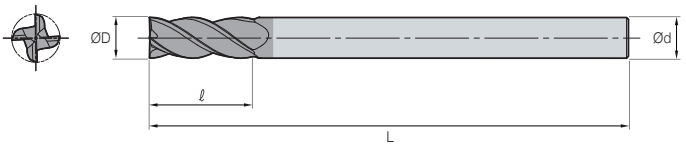
4 flutes flat Endmill



CARBIDE | 4 | 35° HELIX | 37° HELIX | AlCrN | DATA p.514

• TOLERANCE

ØD		Ød
Ø1 ~ Ø5.5	0 ~ -0.015mm	h5
Ø6 ~ Ø7	0 ~ -0.02mm	
Ø8 ~ Ø20	0 ~ -0.03mm	



(mm)

Designation	ØD	Ød	ℓ	L
SE504010	1	6	2.5	50
SE504012	1.2	6	3	50
SE504015	1.5	6	4	50
SE504020	2	6	6	50
SE504025	2.5	6	7	50
SE504030	3	6	8	55
SE50403010	3	6	10	60
SE504035	3.5	6	10	55
SE504040	4	6	10	55
SE50404012	4	6	12	60
SE504045	4.5	6	12	55
SE504050	5	6	15	55
SE504055	5.5	6	15	60
SE504060	6	6	15	60
SE50406020	6	6	20	65

Designation	ØD	Ød	ℓ	L
SE504065	6.5	8	15	60
SE504070	7	8	20	80
SE504080	8	8	20	70
SE50408025	8	8	25	70
SE50408030	8	8	30	80
SE504085	8.5	10	20	70
SE504090	9	10	25	80
SE504100	10	10	25	75
SE50410035	10	10	35	85
SE504120	12	12	30	80
SE50412040	12	12	40	90
SE504140	14	16	35	90
SE504160	16	16	42	100
SE504180	18	16	45	100
SE504200	20	20	48	100

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: Excellent ○: Good

S-Star Endmill

SE506

6 flutes flat Endmill

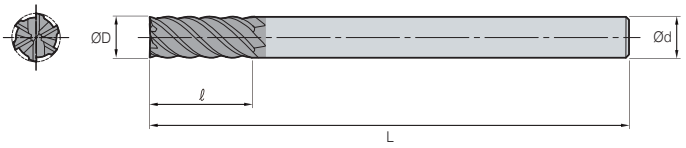


CARBIDE | 6 | 45° HELIX | AlCrN | DATA

p.515

• TOLERANCE

ØD		Ød
Ø6	0 ~ -0.02mm	h5
Ø8 ~ Ø20	0 ~ -0.03mm	



(mm)

Designation	ØD	Ød	ℓ	L
SE506060	6	6	15	60
SE506080	8	8	20	70
SE506100	10	10	25	75
SE506120	12	12	30	80
SE506160	16	16	42	100
SE506200	20	20	48	100

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: Excellent ○: Good

SR504

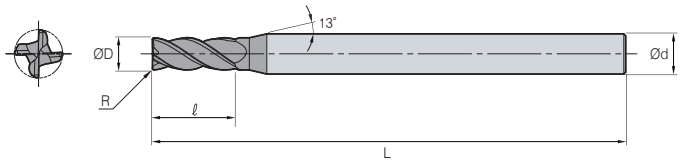
4 flutes radius Endmill



CARBIDE | 4 | 35° HELIX | 37° HELIX | R ±0.01 | AlCrN | DATA p.514

• TOLERANCE

ØD		Ød
Ø1 ~ Ø5	0 ~ -0.015mm	h5
Ø6 ~ Ø7	0 ~ -0.02mm	
Ø8 ~ Ø20	0 ~ -0.03mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
SR50401001	0.1	1	6	2.5	50
SR50401002	0.2	1	6	2.5	50
SR50401201	0.1	1.2	6	3	50
SR50401501	0.1	1.5	6	4	50
SR50401502	0.2	1.5	6	4	50
SR50402001	0.1	2	6	6	50
SR50402002	0.2	2	6	6	50
SR50402502	0.2	2.5	6	7	50
SR50403002	0.2	3	6	8	55
SR50403003	0.3	3	6	8	55
SR50403005	0.5	3	6	8	55
SR50404002	0.2	4	6	10	55
SR50404003	0.3	4	6	10	55
SR50404005	0.5	4	6	10	55
SR50405002	0.2	5	6	15	55
SR50405003	0.3	5	6	15	55
SR50405005	0.5	5	6	15	55
SR50406003	0.3	6	6	15	60
SR50406005	0.5	6	6	15	60
SR50406010	1	6	6	15	60
SR50407003	0.3	7	8	15	60
SR50408002	0.2	8	8	20	70
SR50408003	0.3	8	8	20	70

Designation	R	ØD	Ød	ℓ	L
SR50408005	0.5	8	8	20	70
SR50408010	1	8	8	20	70
SR50410003	0.3	10	10	25	75
SR50410005	0.5	10	10	25	75
SR50410010	1	10	10	25	75
SR50410015	1.5	10	10	25	75
SR50410020	2	10	10	25	75
SR50410030	3	10	10	25	75
SR50412003	0.3	12	12	30	80
SR50412005	0.5	12	12	30	80
SR50412010	1	12	12	30	80
SR50412015	1.5	12	12	30	80
SR50412020	2	12	12	30	80
SR50412030	3	12	12	30	80
SR50412040	4	12	12	30	80
SR50414005	0.5	14	16	35	90
SR50414010	1	14	16	35	90
SR50416005	0.5	16	16	42	100
SR50416010	1	16	16	42	100
SR50418005	0.5	18	16	45	100
SR50420005	0.5	20	20	48	100
SR50420010	1	20	20	48	100

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: Excellent ○: Good

S-Star Endmill

SR505

5 flutes nick type radius Endmill

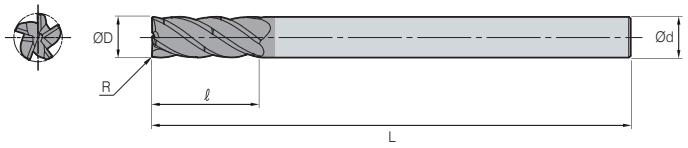
CARBIDE | 5 | 35° HELIX | 38° HELIX | R ±0.01 | AlCrN | DATA

p.516

• TOLERANCE

ØD		Ød
Ø6	0 ~ -0.02mm	h5
Ø8 ~ Ø20	0 ~ -0.03mm	





(mm)

Designation	R	ØD	Ød	ℓ	L
SR50506005	0.5	6	6	15	60
SR50508005	0.5	8	8	20	70
SR50510005	0.5	10	10	25	75
SR50512005	0.5	12	12	30	80
SR50516005	0.5	16	16	42	100
SR50520005	0.5	20	20	48	100

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: Excellent ○: Good

SR507

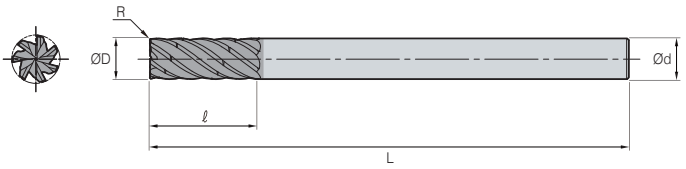
7 flutes nick type radius Endmill



CARBIDE | 7 | 38° HELIX | R ±0.01 | AlCrN | DATA p.516

• TOLERANCE

ØD		Ød
Ø6	0 ~ -0.02mm	h5
Ø8 ~ Ø20	0 ~ -0.03mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
SR50706005	0.5	6	6	15	60
SR50708005	0.5	8	8	20	70
SR50710005	0.5	10	10	25	75
SR50712005	0.5	12	12	30	80
SR50716005	0.5	16	16	42	100
SR50720005	0.5	20	20	48	100

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: Excellent ○: Good

S-Star Endmill

SB502

2 flutes ball Endmill

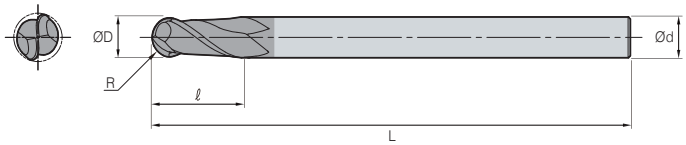
CARBIDE | 2 | 38° HELIX | R ±0.01 | AlCrN | DATA

p.516

• TOLERANCE

ØD		Ød
Ø1 ~ Ø5	0 ~ -0.015mm	h5
Ø6	0 ~ -0.02mm	
Ø8 ~ Ø20	0 ~ -0.03mm	





(mm)

Designation	R	ØD	Ød	ℓ	L
SB502010	0.5	1	6	3	50
SB502020	1	2	6	6	50
SB502030	1.5	3	6	8	50
SB502030L	1.5	3	6	8	70
SB502040	2	4	6	10	50
SB502040L	2	4	6	10	70
SB502050	2.5	5	6	13	50
SB502050L	2.5	5	6	13	80
SB502060	3	6	6	13	50
SB502060L	3	6	6	13	90
SB502080	4	8	8	19	60
SB502080L	4	8	8	19	100
SB502100	5	10	10	22	70
SB502100L	5	10	10	22	100
SB502120	6	12	12	26	75
SB502120L	6	12	12	26	110

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: Excellent ○: Good

SB504

4 flutes ball Endmill

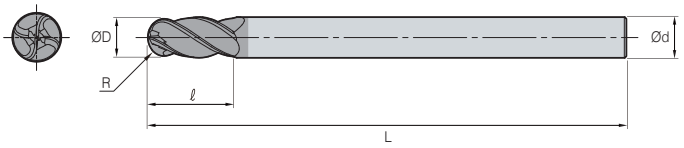


CARBIDE | 4 | 35° HELIX | 37° HELIX | R ±0.01 | AlCrN | DATA

p.517

• TOLERANCE

ØD		Ød
Ø1 ~ Ø5	0 ~ -0.015mm	h5
Ø6 ~ Ø7	0 ~ -0.02mm	
Ø8 ~ Ø20	0 ~ -0.03mm	



(mm)

Designation	R	ØD	Ød	ℓ	L
SB504030	1.5	3	6	8	60
SB504040	2	4	6	8	70
SB504050	2.5	5	6	12	80
SB504060	3	6	6	12	90
SB504080	4	8	8	16	100
SB504100	5	10	10	20	100
SB504120	6	12	12	25	100
SB504160	8	16	16	30	100
SB504200	10	20	20	38	100

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: Excellent ○: Good

S-Star Endmill

SF51H

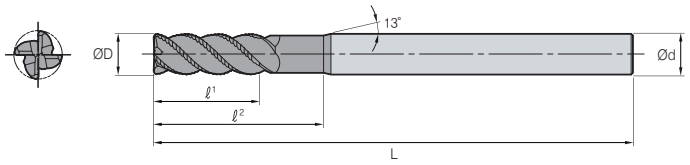
3~5 flutes roughing Endmill



CARBIDE | 3-5 | 45° HELIX | AlCrN | DATA p.518

• TOLERANCE

ØD		Ød
Ø3 ~ Ø20	0 ~ -0.05mm	h5



(mm)

Designation	C	ØD	Ød	ℓ1	ℓ2	L	z
SF51303002H	0.2	3	6	8	-	50	3
SF51304002H	0.2	4	6	10	-	50	3
SF51405002H	0.3	5	6	13	-	50	4
SF51406002H	0.3	6	6	13	-	60	4
SF51406002NH	0.3	6	6	10	20	60	4
SF51407002H	0.4	7	8	18	-	70	4
SF51408002H	0.4	8	8	19	-	70	4
SF51408002NH	0.4	8	8	12	25	70	4
SF51409003H	0.4	9	10	20	-	70	4
SF51410003H	0.4	10	10	22	-	75	4
SF51410003NH	0.4	10	10	15	30	75	4
SF51411003H	0.5	11	12	25	-	80	4
SF51412003H	0.5	12	12	26	-	80	4
SF51412003NH	0.5	12	12	20	35	80	4
SF51506002H	0.3	6	6	13	-	60	5
SF51508002H	0.4	8	8	19	-	65	5
SF51510003H	0.4	10	10	22	-	70	5
SF51512003H	0.5	12	12	26	-	80	5
SF51514005H	0.5	14	16	28	-	90	5
SF51516005H	0.5	16	16	32	-	100	5
SF5151600542H	0.5	16	16	42	-	100	5
SF51520005H	0.5	20	20	38	-	100	5
SF5152000545H	0.5	20	20	45	-	100	5

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron ~FCD500	Aluminum	Stainless steel	Ti-Alloy	Ni-Alloy
			SKD61~HRC55	SKD11 HRC55~					
○	○	○					◎	○	○

◎: Excellent ○: Good

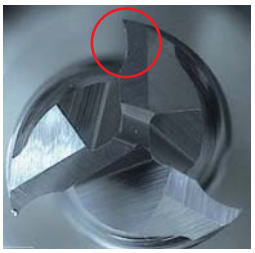
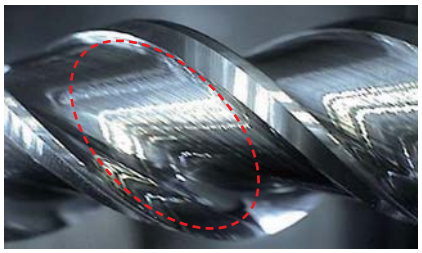
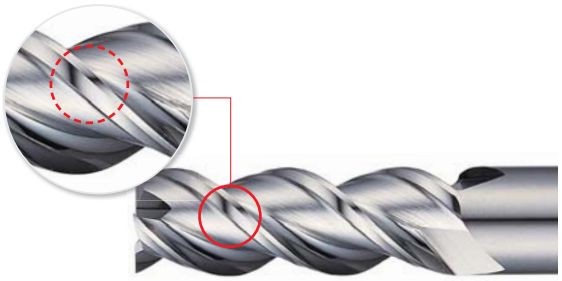
Endmill series for aluminum machining

A-Star Endmill

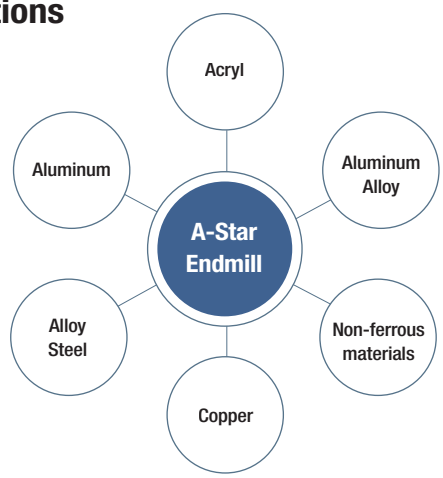
- Suitable for Aluminum, aluminum alloy and non-ferrous materials.
- Various specifications in the line such as Ball, single flute and roughing etc. for wide range in machining.

Features

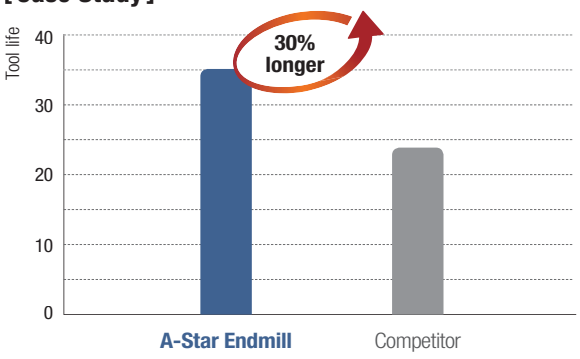
- Sharp cutting edge considered the characteristics of workpiece
- High deposition resistance and enhanced chip emission through the surface of a mirror in the groove.

Applications



[Case Study]



Code system

WA R 3 0 3 - 14 - 10

- **WA** — A-Star Endmill
- **R** — Appearance
  - B: Ball
  - E: Flat
  - R: Radius
  - F: Roughing
- **3** — Grade
  - 3: NON Coating
  - 5: D.L.C Coating
- **0** — Length, Shank type
  - 0: Stub Length
  - 1: Regula Length
  - 2: Long Length
- **3** — No. of flute
  - 1: 1 flutes
  - 2: 2 flutes
  - 3: 3 flutes
- **14** — Cutting dia.
  - 0.2 ~ 25 mm
- **10** — Corner radius
  - 0.05 ~ 5 mm

A-Star Endmill

EDP. NO	Appearance	Type	Range	Page
WAB312		2 flutes ball nose Endmill	Ø6.0 ~ 20.0	243
WAE301		1 flutes flat Endmill	Ø0.2 ~ 12.0	244
WAE302		2 flutes flat Endmill	Ø1.0 ~ 25.0	245
WAE30(2)3		3 flutes flat Endmill	Ø1.0 ~ 25.0	246~247
WAR302		2 flutes radius Endmill	Ø6.0 ~ 20.0	248
WAR303		3 flutes radius Endmill	Ø6.0 ~ 20.0	249
WAR502		2 flutes radius Endmill	Ø1.0 ~ 12.0	250
WAR503		3 flutes radius Endmill	Ø4.0 ~ 20.0	251
WAF303		3 flutes roughing Endmill	Ø6.0 ~ 20.0	252

WAB312

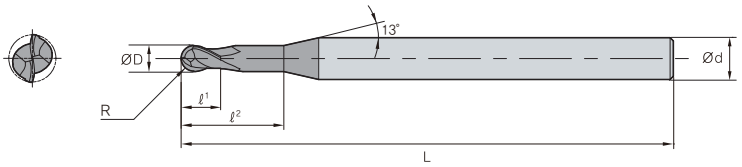
2 flutes ball nose Endmill



FINE GRAIN | 2 | 50° HELIX | R ±0.02 (All sizes) | Un-coated | DATA p.519

• TOLERANCE

ØD		Ød
All sizes	±0.02mm	h6



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
WAB312 060	3	6	6	5.5	25	55
WAB312 061	3	6	6	5.5	40	90
WAB312 080	4	8	8	7	30	65
WAB312 081	4	8	8	7	50	100
WAB312 100	5	10	10	8.5	35	75
WAB312 101	5	10	10	10	50	100
WAB312 102	5	10	10	10	60	150
WAB312 120	6	12	12	10.5	40	75
WAB312 121	6	12	12	12	50	110
WAB312 122	6	12	12	12	60	150
WAB312 160	8	16	16	14	50	90
WAB312 161	8	16	16	16	70	150
WAB312 162	8	16	16	16	90	200
WAB312 200	10	20	20	17	50	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

A-Star Endmill

WAE301

1 flutes flat Endmill

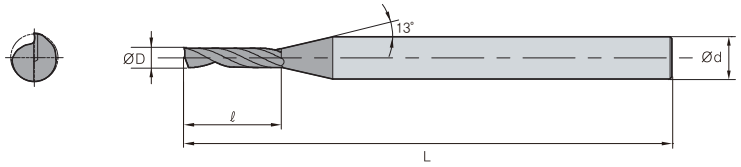


FINE GRAIN | 1 | 30° HELIX | Un-coated | DATA

p.519

• TOLERANCE

ØD		Ød
Ø0.2 ~ Ø5	0 ~ -0.02mm	h5
Ø6 ~ Ø12	0 ~ -0.03mm	



(mm)

Designation	ØD	Ød	ℓ	L
WAE301 002	0.2	4	0.3	40
WAE301 003	0.3	4	0.9	40
WAE301 004	0.4	4	1.2	40
WAE301 005	0.5	4	1.5	40
WAE301 006	0.6	4	1.8	40
WAE301 007	0.7	4	2.1	40
WAE301 008	0.8	4	2.4	40
WAE301 009	0.9	4	2.7	40
WAE301 010	1	6	3	45
WAE301 010-4.5	1	6	4.5	45
WAE301 010-6	1	6	6	50
WAE301 012	1.2	6	3	45
WAE301 012-5	1.2	6	5	45
WAE301 012-6	1.2	6	6	50
WAE301 015	1.5	6	4	45
WAE301 015-6	1.5	6	6	50
WAE301 015-8	1.5	6	8	50
WAE301 020	2	6	6	50
WAE301 020-8	2	6	8	50
WAE301 020-10	2	6	10	50
WAE301 025	2.5	6	7	50

Designation	ØD	Ød	ℓ	L
WAE301 025-8	2.5	6	8	50
WAE301 025-10	2.5	6	10	50
WAE301 025-12	2.5	6	12	50
WAE301 030	3	6	8	50
WAE301 030-12	3	6	12	50
WAE301 030-15	3	6	15	50
WAE301 040	4	6	10	50
WAE301 040-15	4	6	15	50
WAE301 040-20	4	6	20	60
WAE301 050	5	6	13	60
WAE301 050-20	5	6	20	60
WAE301 050-25	5	6	25	60
WAE301 060	6	6	15	60
WAE301 060-20	6	6	20	60
WAE301 060-25	6	6	25	60
WAE301 080	8	8	20	70
WAE301 080-25	8	8	25	75
WAE301 100	10	10	22	75
WAE301 100-30	10	10	30	80
WAE301 120	12	12	26	75
WAE301 120-35	12	12	35	90

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
					○			◎	

○: GOOD ◎: EXCELLENT

WAE302

2 flutes flat Endmill

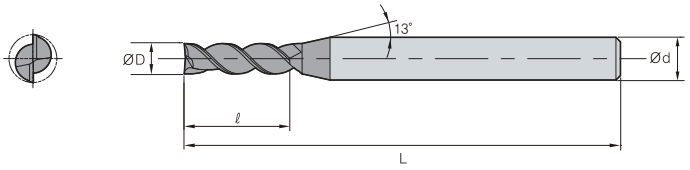


FINE GRAIN | 2 | 45° HELIX | SHARP EDGE | Un-coated | DATA

p.520

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6



(mm)

Designation	ØD	Ød	ℓ	L
WAE302 010	1	4	3	50
WAE302 010-6	1	6	6	60
WAE302 012	1.2	6	4	50
WAE302 015	1.5	6	6	50
WAE302 015-8	1.5	6	8	60
WAE302 020 S4	2	4	6	50
WAE302 020	2	6	6	50
WAE302 020-10	2	6	10	60
WAE302 025	2.5	6	12	55
WAE302 030	3	6	12	55
WAE302 030-15	3	6	15	65
WAE302 035	3.5	6	14	57
WAE302 040	4	6	14	55
WAE302 040-16	4	6	16	65
WAE302 050	5	6	17	55
WAE302 050-22	5	6	22	60
WAE302 060	6	6	17	60
WAE302 060-22	6	6	22	60
WAE302 070	7	8	20	63

Designation	ØD	Ød	ℓ	L
WAE302 080	8	8	23	70
WAE302 080-31	8	8	31	80
WAE302 090	9	10	25	72
WAE302 100	10	10	28	75
WAE302 100-36	10	10	36	90
WAE302 110	11	12	30	80
WAE302 120	12	12	33	80
WAE302 120-41	12	12	41	95
WAE302 122	12	12	45	100
WAE302 130	13	14	35	85
WAE302 140	14	14	38	90
WAE302 150	15	16	40	90
WAE302 160	16	16	45	100
WAE302 160-53	16	16	53	110
WAE302 180	18	18	49	100
WAE302 200	20	20	50	100
WAE302 200-55	20	20	55	110
WAE302 250	25	25	50	120

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
					○			◎	

○ : GOOD ◎: EXCELLENT

A-Star Endmill

WAE30(2)3

3 flutes flat Endmill

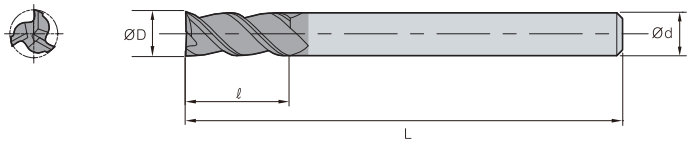
FINE GRAIN | 3 | 45° HELIX | SHARP EDGE | Un-coated | DATA

p.521

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6





(mm)

Designation	ØD	Ød	ℓ	L
WAE303 010-02	1	6	2	40
WAE303 010-025	1	6	2.5	40
WAE303 010	1	6	3	50
WAE303 010-04	1	6	4	60
WAE303 010-06	1	6	6	60
WAE303 012	1.2	6	4	50
WAE303 015-03	1.5	6	3	40
WAE303 015	1.5	6	5	50
WAE303 015-06	1.5	6	6	60
WAE303 015-08	1.5	6	8	60
WAE303 015-10	1.5	6	10	60
WAE303 020-03	2	6	3	40
WAE303 020	2	6	6	50
WAE303 020-08	2	6	8	60
WAE303 020-10	2	6	10	60
WAE303 020-12	2	6	12	60
WAE303 025	2.5	6	8	40
WAE303 025-10	2.5	6	10	55
WAE303 025-12	2.5	6	12	60
WAE303 030-04	3	6	4	45
WAE303 030-08	3	6	8	45
WAE303 030	3	6	12	55
WAE303 031	3	6	15	65
WAE323 030	3	6	20	70
WAE323 031	3	6	25	75
WAE323 032	3	6	30	80
WAE303 035	3.5	6	12	55
WAE303 040-05	4	6	5	45
WAE303 040-08	4	6	8	45
WAE303 040-11	4	6	11	45
WAE303 040	4	6	14	55
WAE303 040-16	4	6	16	65
WAE303 041	4	6	20	70
WAE323 040	4	6	26	75
WAE323 041	4	6	30	80
WAE303 045	4.5	6	15	55
WAE303 050-06	5	6	6	45

Designation	ØD	Ød	ℓ	L
WAE303 050	5	6	17	55
WAE303 051	5	6	22	60
WAE303 052	5	6	26	70
WAE323 050	5	6	31	75
WAE323 051	5	6	36	80
WAE323 052	5	6	41	85
WAE323 053	5	6	46	90
WAE303 055	5.5	6	17	55
WAE303 060-07	6	6	7	50
WAE303 060-13	6	6	13	50
WAE303 060	6	6	17	60
WAE303 061	6	6	22	60
WAE303 062	6	6	26	70
WAE303 063	6	6	31	75
WAE323 060	6	6	36	80
WAE323 061	6	6	43	90
WAE323 062	6	6	51	100
WAE303 070	7	8	23	65
WAE303 080-10	8	8	10	60
WAE303 080-20	8	8	20	60
WAE303 080	8	8	23	70
WAE303 080-29	8	8	29	80
WAE303 081	8	8	31	80
WAE303 082	8	8	36	85
WAE323 080	8	8	41	90
WAE323 081	8	8	46	95
WAE323 082	8	8	51	100
WAE323 083	8	8	56	105
WAE323 084	8	8	66	110
WAE303 090	9	10	28	70
WAE303 100-12	10	10	12	65
WAE303 100-23	10	10	23	65
WAE303 100	10	10	28	75
WAE303 100-33	10	10	33	90
WAE303 101	10	10	36	90
WAE303 100-41	10	10	41	90
WAE303 102	10	10	46	100

WAE30(2)3

3 flutes flat Endmill

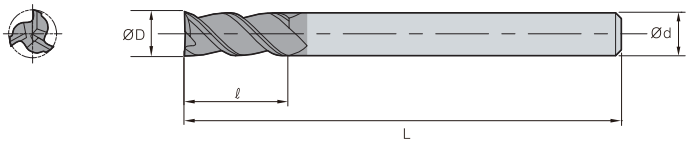
FINE GRAIN | 3 | 45° HELIX | SHARP EDGE | Un-coated | DATA

p.521

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6





(mm)

Designation	ØD	Ød	ℓ	L
WAE303 103	10	10	51	100
WAE323 100	10	10	56	110
WAE323 100-61	10	10	61	110
WAE323 101	10	10	66	120
WAE303 110	11	12	30	80
WAE303 120-14	12	12	14	70
WAE303 120-27	12	12	27	70
WAE303 120	12	12	33	80
WAE303 121	12	12	41	95
WAE303 122	12	12	46	100
WAE303 122-51	12	12	51	100
WAE303 123	12	12	56	110
WAE303 124-61	12	12	61	110
WAE323 120	12	12	66	120
WAE323 120-71	12	12	71	120
WAE323 121	12	12	76	135
WAE303 130	13	14	35	85
WAE303 140	14	14	38	90
WAE303 150	15	16	40	90
WAE303 160-19	16	16	19	90
WAE303 160-33	16	16	33	90
WAE303 160	16	16	45	100

Designation	ØD	Ød	ℓ	L
WAE303 160-53	16	16	53	105
WAE303 161	16	16	56	110
WAE303 162	16	16	66	130
WAE303 163	16	16	76	150
WAE323 160	16	16	86	160
WAE323 161	16	16	96	180
WAE323 162	16	16	106	190
WAE323 163	16	16	116	200
WAE303 180	18	18	49	100
WAE303 200-23	20	20	23	90
WAE303 200-39	20	20	39	90
WAE303 200	20	20	50	100
WAE303 201	20	20	60	110
WAE303 202	20	20	70	130
WAE303 203	20	20	76	150
WAE323 200	20	20	86	160
WAE323 201	20	20	96	180
WAE323 202	20	20	106	190
WAE323 203	20	20	116	200
WAE323 204	20	20	126	220
WAE303 250	25	25	50	120

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
					○			◎	

○ : GOOD ◎: EXCELLENT

A-Star Endmill

WAR302

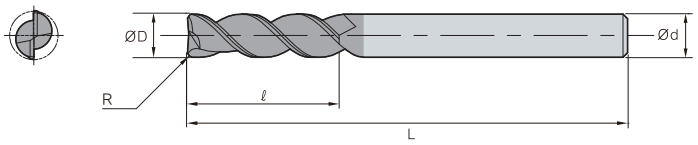
2 flutes radius Endmill

FINE GRAIN | 2 | 45° HELIX | R ±0.015 (All sizes) | Un-coated | DATA (p.521)

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6





(mm)

Designation	R	ØD	Ød	ℓ	L
WAR302 06 05	0.5	6	6	15	50
WAR302 06 10	1	6	6	15	50
WAR302 06 15	1.5	6	6	15	50
WAR302 06 20	2	6	6	15	50
WAR302 08 05	0.5	8	8	20	60
WAR302 08 10	1	8	8	20	60
WAR302 08 15	1.5	8	8	20	60
WAR302 08 20	2	8	8	20	60
WAR302 08 30	3	8	8	20	60
WAR302 10 05	0.5	10	10	25	70
WAR302 10 10	1	10	10	25	70
WAR302 10 15	1.5	10	10	25	70
WAR302 10 20	2	10	10	25	70
WAR302 10 30	3	10	10	25	70
WAR302 10 40	4	10	10	25	70
WAR302 12 10	1	12	12	30	75
WAR302 12 20	2	12	12	30	75

Designation	R	ØD	Ød	ℓ	L
WAR302 12 30	3	12	12	30	75
WAR302 12 40	4	12	12	30	75
WAR302 14 10	1	14	14	35	80
WAR302 14 20	2	14	14	35	80
WAR302 14 30	3	14	14	35	80
WAR302 14 40	4	14	14	35	80
WAR302 14 50	5	14	14	35	80
WAR302 16 10	1	16	16	40	90
WAR302 16 20	2	16	16	40	90
WAR302 16 30	3	16	16	40	90
WAR302 16 40	4	16	16	40	90
WAR302 16 50	5	16	16	40	90
WAR302 20 10	1	20	20	45	100
WAR302 20 20	2	20	20	45	100
WAR302 20 30	3	20	20	45	100
WAR302 20 40	4	20	20	45	100
WAR302 20 50	5	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

WAR303

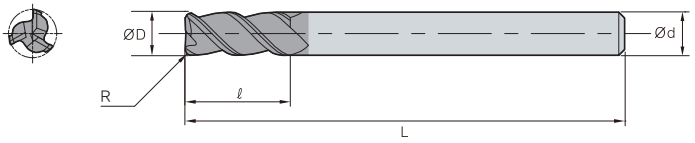
3 flutes radius Endmill



FINE GRAIN | 3 | 45° HELIX | R ±0.015 (All sizes) | Un-coated | DATA p.521

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6



(mm)

Designation	R	ØD	Ød	ℓ	L
WAR303 06 05	0.5	6	6	15	50
WAR303 06 10	1	6	6	15	50
WAR303 06 15	1.5	6	6	15	50
WAR303 06 20	2	6	6	15	50
WAR303 08 05	0.5	8	8	20	60
WAR303 08 10	1	8	8	20	60
WAR303 08 15	1.5	8	8	20	60
WAR303 08 20	2	8	8	20	60
WAR303 10 05	0.5	10	10	25	70
WAR303 10 10	1	10	10	25	70
WAR303 10 15	1.5	10	10	25	70
WAR303 10 20	2	10	10	25	70
WAR303 10 30	3	10	10	25	70
WAR303 10 40	4	10	10	25	70
WAR303 12 10	1	12	12	30	75
WAR303 12 20	2	12	12	30	75
WAR303 12 30	3	12	12	30	75

Designation	R	ØD	Ød	ℓ	L
WAR303 12 40	4	12	12	30	75
WAR303 14 10	1	14	14	35	80
WAR303 14 20	2	14	14	35	80
WAR303 14 30	3	14	14	35	80
WAR303 14 40	4	14	14	35	80
WAR303 14 50	5	14	14	35	80
WAR303 16 10	1	16	16	40	90
WAR303 16 20	2	16	16	40	90
WAR303 16 30	3	16	16	40	90
WAR303 16 40	4	16	16	40	90
WAR303 16 50	5	16	16	40	90
WAR303 20 10	1	20	20	45	100
WAR303 20 20	2	20	20	45	100
WAR303 20 30	3	20	20	45	100
WAR303 20 40	4	20	20	45	100
WAR303 20 50	5	20	20	45	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
					○			◎	

○ : GOOD ◎: EXCELLENT

A-Star Endmill

WAR502

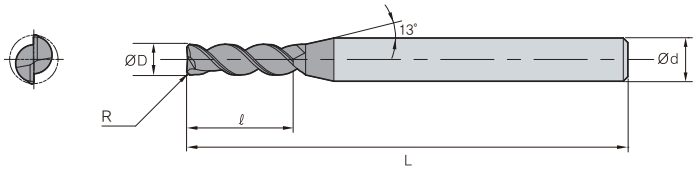
2 flutes radius Endmill



FINE GRAIN | 2 | 45° HELIX | R ±0.015 (All sizes) | D.L.C | DATA p.523

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6



(mm)

Designation	R	ØD	Ød	ℓ	L
WAR502 010	0.05	1	6	3	40
WAR502 015	0.05	1.5	6	5	40
WAR502 020	0.1	2	6	6	40
WAR502 021	0.1	2	6	12	50
WAR502 030	0.1	3	6	10	50
WAR502 031	0.1	3	6	20	60
WAR502 040	0.1	4	6	12	50
WAR502 041	0.1	4	6	20	60
WAR502 050	0.1	5	6	15	57
WAR502 060	0.1	6	6	15	57
WAR502 061	0.1	6	6	22	65
WAR502 070	0.1	7	8	20	63
WAR502 080	0.1	8	8	20	63
WAR502 081	0.1	8	8	28	70
WAR502 090	0.1	9	10	25	72
WAR502 100	0.2	10	10	28	72
WAR502 101	0.2	10	10	32	80
WAR502 110	0.2	11	12	30	80
WAR502 120	0.2	12	12	32	80
WAR502 121	0.2	12	12	40	100

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
					○			◎	

○: GOOD ◎: EXCELLENT

WAR503

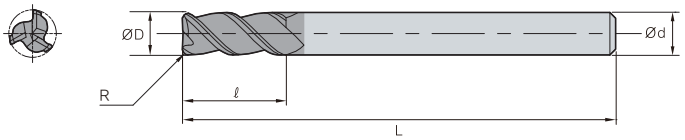
3 flutes radius Endmill



FINE GRAIN | 3 | 45° HELIX | R ±0.015 All sizes | D.L.C | DATA p.524~525

• TOLERANCE

ØD		Ød
All sizes	0 ~ -0.02mm	h6



(mm)

Designation	R	ØD	Ød	ℓ	L
WAR503 040	0.5	4	6	14	57
WAR503 041	1	4	6	25	62
WAR503 060	0.5	6	6	16	57
WAR503 061	1	6	6	25	62
WAR503 080	0.5	8	8	22	63
WAR503 081	1	8	8	35	80
WAR503 100	0.5	10	10	28	72
WAR503 101	1	10	10	45	100
WAR503 120	0.5	12	12	32	80
WAR503 121	1	12	12	45	100
WAR503 160	0.5	16	16	45	90
WAR503 161	1	16	16	65	125
WAR503 200	0.5	20	20	50	100
WAR503 201	1	20	20	70	130

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
					○			◎	

○ : GOOD ◎ : EXCELLENT

A-Star Endmill

WAF303

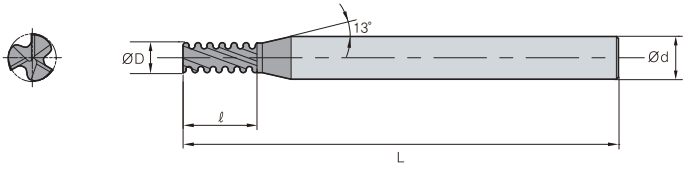
3 flutes roughing Endmill



FINE GRAIN | 3 | 38° HELIX | COARSE (Conventional Pitch) | DIN 6535HA | DIN 6535HB | Un-coated | DATA p.526

• TOLERANCE

ØD		Ød
Ø4 ~ Ø6	0 ~ -0.048mm	h6
Ø7 ~ Ø10	0 ~ -0.058mm	
Ø12 ~ Ø18	0 ~ -0.07mm	
Ø20 ~	0 ~ -0.084mm	



(mm)

Designation	ØD	Ød	ℓ	L
WAF303 040	4	6	10	55
WAF303 050	5	6	15	55
WAF303 060	6	6	16	60
WAF303 061	6	6	25	80
WAF303 070	7	8	16	63
WAF303 080	8	8	20	65
WAF303 081	8	8	30	90
WAF303 090	9	10	19	72
WAF303 100	10	10	25	75
WAF303 101	10	10	40	100
WAF303 120	12	12	30	80
WAF303 121	12	12	50	110
WAF303 140	14	14	35	90
WAF303 160	16	16	42	100
WAF303 161	16	16	52	150
WAF303 162	16	16	65	125
WAF303 180	18	18	32	92
WAF303 200	20	20	38	104
WAF303 201	20	20	55	160

※ Flat shank is available upon request
ex) WAF303100F: Flat shank

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
					○			◎	

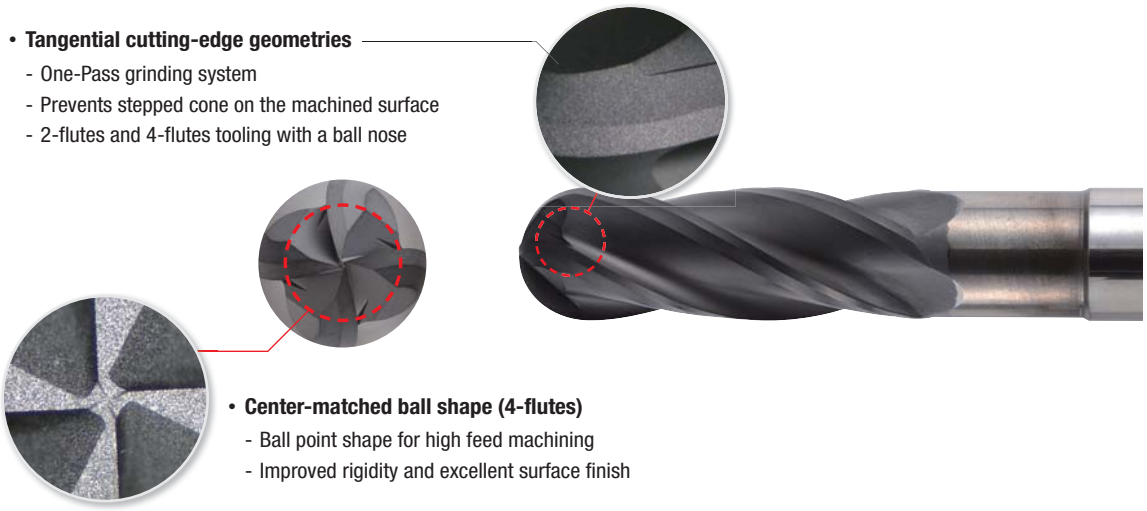
○ : GOOD ◎ : EXCELLENT

Diamond coated Endmill

D Endmill

- 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

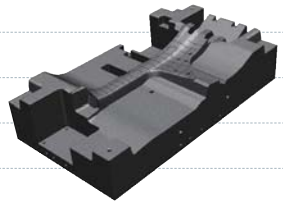
Features

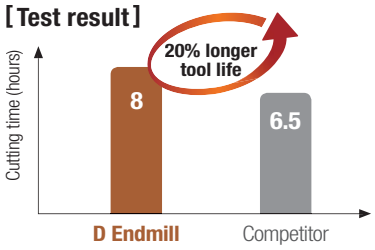


- **Tangential cutting-edge geometries**
  - One-Pass grinding system
  - Prevents stepped cone on the machined surface
  - 2-flutes and 4-flutes tooling with a ball nose
- **Center-matched ball shape (4-flutes)**
  - Ball point shape for high feed machining
  - Improved rigidity and excellent surface finish

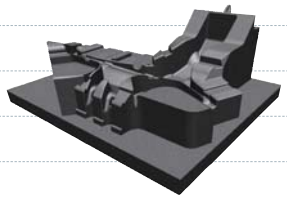
Application examples

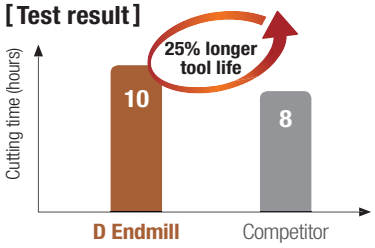
Workpiece	Graphite mold
Cutting condition	vc (m/min) = 100, fz (mm/t) = 0.11
	ap (mm) = 0.26, dry
Tool	DBE4060-110-N250S06





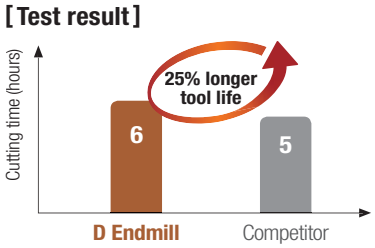
Workpiece	Graphite mold
Cutting condition	vc (m/min) = 180, fz (mm/t) = 0.1
	ap (mm) = 0.2, dry
Tool	DBE2060-110-N250S06





Workpiece	Graphite mold
Cutting condition	vc (m/min) = 300, fz (mm/t) = 0.1
	ap (mm) = 0.15, dry
Tool	DBE2060-080-N250S06





D Endmill

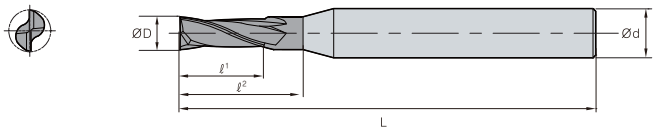
DFE2000 (Flat)



2 | 30° HELIX | Substrate ND3000 | DATA p.527

• TOLERANCE

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
DFE2002-045-N004S04	0.2	4	0.4	-	45
DFE2003-045-N006S04	0.3	4	0.6	-	45
DFE2004-045-N008S04	0.4	4	0.8	-	45
DFE2005-045-N010S04	0.5	4	1	-	45
DFE2006-045-N012S04	0.6	4	1.2	-	45
DFE2007-045-N015S04	0.7	4	1.5	-	45
DFE2008-045-N020S04	0.8	4	2	-	45
DFE2009-045-N025S04	0.9	4	2.5	-	45
DFE2010-045-N030S04	1	4	3	-	45
DFE2010-045-N050S04	1	4	3	5	45
DFE2010-060-N050S04	1	4	3	5	60
DFE2010-060-N100S04	1	4	3	10	60
DFE2010-060-N150S04	1	4	3	15	60
DFE2010-060-N200S04	1	4	3	20	60
DFE2010-060-N250S04	1	4	3	25	60
DFE2015-060-N050S04	1.5	4	4	5	60
DFE2015-060-N060S04	1.5	4	4	6	60
DFE2015-060-N100S04	1.5	4	4	10	60
DFE2015-060-N150S04	1.5	4	4	15	60
DFE2015-060-N200S04	1.5	4	4	20	60
DFE2015-060-N250S04	1.5	4	4	25	60
DFE2020-045-N060S04	2	4	6	-	45
DFE2020-045-N080S04	2	4	6	8	45
DFE2020-080-N080S04	2	4	6	8	80
DFE2020-080-N100S04	2	4	6	10	80
DFE2020-080-N120S04	2	4	6	12	80
DFE2020-080-N150S04	2	4	6	15	80
DFE2020-080-N200S04	2	4	6	20	80

Designation	ØD	Ød	ℓ1	ℓ2	L
DFE2020-080-N250S04	2	4	6	25	80
DFE2020-080-N300S04	2	4	6	30	80
DFE2020-080-N400S04	2	4	6	40	80
DFE2030-050-N100S06	3	6	9	10	50
DFE2030-080-N100S04	3	4	9	10	80
DFE2030-080-N120S04	3	4	9	12	80
DFE2030-080-N200S04	3	4	9	20	80
DFE2030-080-N250S04	3	4	9	25	80
DFE2030-080-N300S04	3	4	9	30	80
DFE2030-080-N400S04	3	4	9	40	80
DFE2040-050-N120S06	4	6	12	-	50
DFE2040-050-N160S06	4	6	12	16	50
DFE2040-080-N160S04	4	4	12	16	80
DFE2050-060-N150S06	5	6	15	-	60
DFE2050-060-N200S06	5	6	15	20	60
DFE2050-110-N200S06	5	6	15	20	110
DFE2060-060-N180S06	6	6	18	-	60
DFE2060-110-N250S06	6	6	18	25	110
DFE2060-150-N250S06	6	6	18	25	150
DFE2080-070-N250S08	8	8	25	-	70
DFE2080-150-N400S08	8	8	25	40	150
DFE2100-080-N300S10	10	10	30	-	80
DFE2100-150-N500S10	10	10	30	50	150
DFE2100-160-N500S10	10	10	30	50	160
DFE2120-080-N250S12	12	12	25	-	80
DFE2120-080-N350S12	12	12	35	-	80
DFE2120-150-N600S12	12	12	35	60	150
DFE2120-160-N600S12	12	12	35	60	160

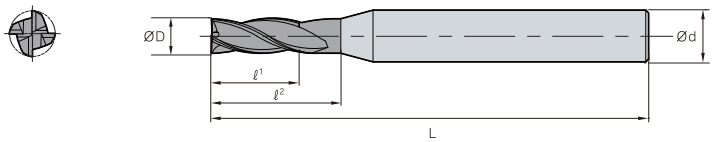
DFE4000 (Flat)



4 | 30° HELIX | Substrate ND3000 | DATA p.527

• TOLERANCE

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L
4020-045-N060S04	2	4	6	8	45
4020-060-N100S04	2	4	10	12	60
4030-050-N100S06	3	6	10	12	50
4030-060-N150S03	3	3	15	-	60
4030-060-N150S04	3	4	15	18	60
4040-050-N120S06	4	6	12	-	50
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
4120-110-N450S12	12	12	45	-	110
4120-150-N500S12	12	12	50	-	150
4120-150-N550S12	12	12	55	-	150

D Endmill

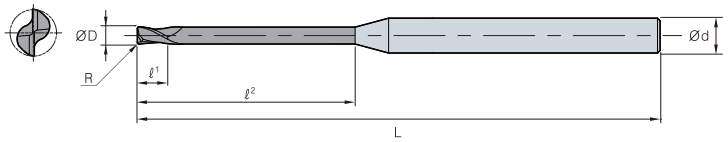
DRE2000 (Radius)



2 | 30° HELIX | Substrate ND3000 | DATA p.527

• TOLERANCE

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
DRE2005-060-N050S04-R005	0.05	0.5	4	1	5	60
DRE2005-060-N080S04-R005	0.05	0.5	4	1	8	60
DRE2005-060-N100S04-R005	0.05	0.5	4	1	10	60
DRE2006-060-N060S04-R005	0.05	0.6	4	1.2	6	60
DRE2006-060-N090S04-R005	0.05	0.6	4	1.2	9	60
DRE2006-060-N120S04-R005	0.05	0.6	4	1.2	12	60
DRE2008-060-N040S04-R005	0.05	0.8	4	1.6	4	60
DRE2008-060-N080S04-R005	0.05	0.8	4	1.6	8	60
DRE2008-060-N100S04-R005	0.05	0.8	4	1.6	10	60
DRE2010-060-N050S04-R005	0.05	1	4	2	5	60
DRE2010-060-N100S04-R005	0.05	1	4	2	10	60
DRE2010-060-N100S04-R02	0.2	1	4	2	10	60
DRE2010-060-N150S04-R02	0.2	1	4	2	15	60
DRE2010-060-N200S04-R005	0.05	1	4	2	20	60
DRE2010-060-N200S04-R02	0.2	1	4	2	20	60
DRE2015-060-N050S04-R005	0.05	1.5	4	3	5	60
DRE2015-060-N100S04-R005	0.05	1.5	4	3	10	60
DRE2015-060-N150S04-R005	0.05	1.5	4	3	15	60
DRE2015-060-N150S04-R02	0.2	1.5	4	3	15	60
DRE2015-060-N200S04-R005	0.05	1.5	4	3	20	60
DRE2015-060-N200S04-R02	0.2	1.5	4	3	20	60
DRE2020-060-N120S04-R02	0.2	2	4	3.5	12	60
DRE2020-060-N120S04-R03	0.3	2	4	3.5	12	60
DRE2020-060-N180S04-R03	0.3	2	4	3.5	18	60
DRE2020-060-N250S04-R02	0.2	2	4	3.5	25	60
DRE2020-060-N250S04-R03	0.3	2	4	3.5	25	60
DRE2020-060-N300S04-R02	0.2	2	4	3.5	30	60
DRE2020-060-N300S04-R03	0.3	2	4	3.5	30	60
DRE2030-080-N100S04-R02	0.2	3	4	4	10	80
DRE2030-080-N200S04-R02	0.2	3	4	4	20	80
DRE2030-080-N200S04-R03	0.3	3	4	4	20	80
DRE2030-080-N300S04-R02	0.2	3	4	4	30	80
DRE2030-080-N400S04-R02	0.2	3	4	4	40	80
DRE2030-080-N400S04-R03	0.3	3	4	4	40	80

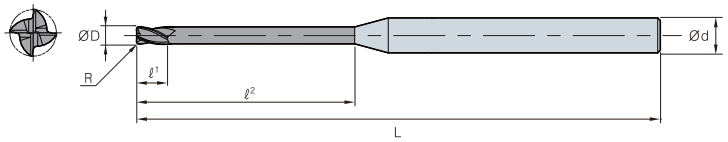
DRE4000 (Radius)



4 | 30° HELIX | Substrate ND3000 | DATA p.527

• TOLERANCE

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
DRE4020-060-N120S04-R03	0.3	2	4	3.5	12	60
DRE4020-060-N180S04-R02	0.2	2	4	3.5	18	60
DRE4020-060-N180S04-R03	0.3	2	4	3.5	18	60
DRE4020-060-N250S04-R02	0.2	2	4	3.5	25	60
DRE4020-060-N250S04-R03	0.3	2	4	3.5	25	60
DRE4020-060-N300S04-R02	0.2	2	4	3.5	30	60
DRE4020-060-N300S04-R03	0.3	2	4	3.5	30	60
DRE4030-080-N100S04-R05	0.5	3	4	4	10	80
DRE4030-080-N200S04-R03	0.3	3	4	4	20	80
DRE4030-080-N200S04-R05	0.5	3	4	4	20	80
DRE4030-080-N300S04-R03	0.3	3	4	4	30	80
DRE4030-080-N300S04-R05	0.5	3	4	4	30	80
DRE4030-080-N400S04-R03	0.3	3	4	4	40	80
DRE4030-080-N400S04-R05	0.5	3	4	4	40	80
DRE4040-100-N200S04-R03	0.3	4	4	6	20	100
DRE4060-110-N250S06-R03	0.3	6	6	9	25	110
DRE4060-110-N250S06-R05	0.5	6	6	9	25	110
DRE4060-150-N300S06-R05	0.5	6	6	9	30	150
DRE4080-110-N300S08-R03	0.3	8	8	12	30	110
DRE4080-110-N300S08-R05	0.5	8	8	12	30	110
DRE4080-150-N400S08-R05	0.5	8	8	12	40	150
DRE4100-110-N350S10-R05	0.5	10	10	15	35	110
DRE4100-160-N450S10-R05	0.5	10	10	15	45	160
DRE4120-110-N400S12-R05	0.5	12	12	18	40	110
DRE4120-160-N450S12-R05	0.5	12	12	18	45	160

D Endmill

DBE2000 (Ball)

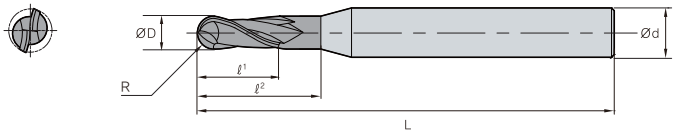


2 | 30° HELIX | Substrate ND3000 | DATA

p.527

• TOLERANCE

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
DBE2003-045-N012S04	0.15	0.3	4	1.2	-	45
DBE2003-045-N020S04	0.15	0.3	4	1.2	2	45
DBE2004-045-N015S04	0.2	0.4	4	1.5	-	45
DBE2004-045-N020S04	0.2	0.4	4	1.5	2	45
DBE2004-045-N030S04	0.2	0.4	4	1.5	3	45
DBE2004-045-N040S04	0.2	0.4	4	1.5	4	45
DBE2004-045-N050S04	0.2	0.4	4	1.5	5	45
DBE2005-045-N020S04	0.25	0.5	4	2	-	45
DBE2005-045-N030S04	0.25	0.5	4	2	3	45
DBE2005-045-N040S04	0.25	0.5	4	2	4	45
DBE2005-045-N050S04	0.25	0.5	4	2	5	45
DBE2005-045-N060S04	0.25	0.5	4	2	6	45
DBE2006-045-N020S04	0.3	0.6	4	2	2	45
DBE2006-045-N030S04	0.3	0.6	4	2	3	45
DBE2006-045-N040S04	0.3	0.6	4	2	4	45
DBE2006-045-N050S04	0.3	0.6	4	2	5	45
DBE2006-045-N060S04	0.3	0.6	4	2	6	45
DBE2006-045-N080S04	0.3	0.6	4	2	8	45
DBE2006-045-N100S04	0.3	0.6	4	2	10	45
DBE2008-045-N030S04	0.4	0.8	4	2.5	3	45
DBE2008-045-N040S04	0.4	0.8	4	2.5	4	45
DBE2008-045-N050S04	0.4	0.8	4	2.5	5	45
DBE2008-045-N060S04	0.4	0.8	4	2.5	6	45
DBE2008-045-N080S04	0.4	0.8	4	2.5	8	45
DBE2008-045-N100S04	0.4	0.8	4	2.5	10	45
DBE2010-060-N030S04	0.5	1	4	3	3	60
DBE2010-060-N040S04	0.5	1	4	3	4	60
DBE2010-060-N050S04	0.5	1	4	3	5	60
DBE2010-060-N060S04	0.5	1	4	3	6	60
DBE2010-060-N080S04	0.5	1	4	3	8	60
DBE2010-060-N100S04	0.5	1	4	3	10	60
DBE2010-060-N120S04	0.5	1	4	3	12	60
DBE2010-060-N150S04	0.5	1	4	3	15	60
DBE2010-060-N200S04	0.5	1	4	3	20	60
DBE2010-080-N250S04	0.5	1	4	3	25	80
DBE2010-080-N300S04	0.5	1	4	3	30	80
DBE2010-080-N350S04	0.5	1	4	3	35	80
DBE2010-080-N400S04	0.5	1	4	3	40	80
DBE2015-060-N050S04	0.75	1.5	4	4	5	60
DBE2015-060-N080S04	0.75	1.5	4	4	8	60
DBE2015-080-N100S04	0.75	1.5	4	4	10	80
DBE2015-080-N120S04	0.75	1.5	4	4	12	80
DBE2015-080-N150S04	0.75	1.5	4	4	15	80
DBE2015-080-N180S04	0.75	1.5	4	4	18	80
DBE2015-080-N200S04	0.75	1.5	4	4	20	80
DBE2015-080-N250S04	0.75	1.5	4	4	25	80
DBE2015-080-N300S04	0.75	1.5	4	4	30	80
DBE2015-080-N350S04	0.75	1.5	4	4	35	80
DBE2015-080-N400S04	0.75	1.5	4	4	40	80
DBE2020-060-N060S04	1	2	4	6	-	60
DBE2020-060-N080S04	1	2	4	6	8	60
DBE2020-080-N100S04	1	2	4	6	10	80
DBE2020-080-N150S04	1	2	4	6	15	80
DBE2020-080-N200S04	1	2	4	6	20	80
DBE2020-080-N250S04	1	2	4	6	25	80
DBE2020-080-N300S04	1	2	4	6	30	80
DBE2020-080-N350S04	1	2	4	6	35	80
DBE2020-100-N400S04	1	2	4	6	40	100
DBE2020-100-N450S04	1	2	4	6	45	100
DBE2020-100-N500S04	1	2	4	6	50	100
DBE2020-100-N600S04	1	2	4	6	60	100
DBE2030-060-N100S04	1.5	3	4	9	10	60
DBE2030-100-N150S04	1.5	3	4	9	15	100
DBE2030-100-N150S06	1.5	3	6	9	15	100
DBE2030-100-N200S04	1.5	3	4	9	20	100
DBE2030-100-N250S04	1.5	3	4	9	25	100
DBE2030-100-N300S04	1.5	3	4	9	30	100
DBE2030-100-N350S04	1.5	3	4	9	35	100
DBE2030-100-N400S04	1.5	3	4	9	40	100
DBE2030-100-N500S04	1.5	3	4	9	50	100
DBE2030-100-N600S04	1.5	3	4	9	60	100
DBE2040-060-N160S04	2	4	4	12	16	60

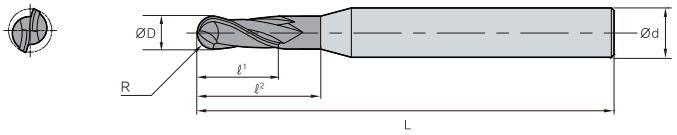
DBE2000 (Ball)



2 | 30° HELIX | Substrate ND3000 | DATA p.527

• TOLERANCE

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
DBE2040-080-N160S04	2	4	4	12	16	80
DBE2040-080-N300S04	2	4	4	12	30	80
DBE2040-100-N160S04	2	4	4	12	16	100
DBE2040-100-N400S04	2	4	4	12	40	100
DBE2040-130-N160S04	2	4	4	12	16	130
DBE2040-130-N400S04	2	4	4	12	40	130
DBE2040-150-N160S04	2	4	4	12	16	150
DBE2040-150-N500S04	2	4	4	12	50	150
DBE2050-110-N200S06	2.5	5	6	15	20	110
DBE2060-080-N250S06	3	6	6	20	25	80
DBE2060-110-N250S06	3	6	6	20	25	110
DBE2060-110-N400S06	3	6	6	20	40	110
DBE2060-150-N300S06	3	6	6	20	30	150
DBE2060-150-N500S06	3	6	6	20	50	150
DBE2080-080-N300S08	4	8	8	25	30	80

Designation	R	ØD	Ød	ℓ1	ℓ2	L
DBE2080-110-N300S08	4	8	8	25	30	110
DBE2080-110-N400S08	4	8	8	25	40	110
DBE2080-150-N500S08	4	8	8	25	50	150
DBE2080-200-N400S08	4	8	8	25	40	200
DBE2100-080-N400S10	5	10	10	30	40	80
DBE2100-110-N400S10	5	10	10	30	40	110
DBE2100-110-N500S10	5	10	10	30	50	110
DBE2100-150-N600S10	5	10	10	30	60	150
DBE2100-160-N600S10	5	10	10	30	60	160
DBE2100-200-N500S10	5	10	10	30	50	200
DBE2120-110-N500S12	6	12	12	35	50	110
DBE2120-150-N500S12	6	12	12	35	50	150
DBE2120-160-N500S12	6	12	12	35	50	160
DBE2120-200-N600S12	6	12	12	35	60	200

D Endmill

DBE4000 (Ball)

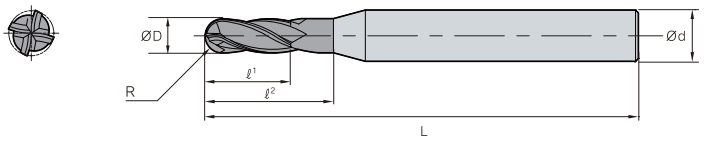


4 | 30° HELIX | Substrate ND3000 | DATA

p.527

• TOLERANCE

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



(mm)

Designation	R	ØD	Ød	ℓ1	ℓ2	L
DBE4010-060-N030S04	0.5	1	4	3	-	60
DBE4010-060-N050S04	0.5	1	4	3	5	60
DBE4010-060-N100S04	0.5	1	4	3	10	60
DBE4010-060-N150S04	0.5	1	4	3	15	60
DBE4010-060-N200S04	0.5	1	4	3	20	60
DBE4010-060-N250S04	0.5	1	4	3	25	60
DBE4015-045-N040S04	0.75	1.5	4	4	-	45
DBE4015-050-N040S04	0.75	1.5	4	4	-	50
DBE4015-060-N100S04	0.75	1.5	4	4	10	60
DBE4015-060-N150S04	0.75	1.5	4	4	15	60
DBE4015-060-N200S04	0.75	1.5	4	4	20	60
DBE4015-060-N250S04	0.75	1.5	4	4	25	60
DBE4020-060-N080S04	1	2	4	6	8	60
DBE4020-080-N100S04	1	2	4	6	10	80
DBE4020-080-N200S04	1	2	4	6	20	80
DBE4020-080-N300S04	1	2	4	6	30	80
DBE4020-080-N400S04	1	2	4	6	40	80
DBE4030-060-N100S04	1.5	3	4	9	10	60
DBE4030-100-N150S04	1.5	3	4	9	15	100
DBE4030-100-N200S04	1.5	3	4	9	20	100
DBE4030-100-N300S04	1.5	3	4	9	30	100
DBE4030-100-N400S04	1.5	3	4	9	40	100
DBE4030-100-N500S04	1.5	3	4	9	50	100
DBE4040-060-N160S04	2	4	4	12	16	60
DBE4040-080-N160S04	2	4	4	12	16	80
DBE4040-100-N160S04	2	4	4	12	16	100
DBE4040-130-N160S04	2	4	4	12	16	130
DBE4060-080-N250S06	3	6	6	20	25	80
DBE4060-110-N250S06	3	6	6	20	25	110
DBE4060-150-N300S06	3	6	6	20	30	150
DBE4080-080-N300S08	4	8	8	25	30	80
DBE4080-110-N300S08	4	8	8	25	30	110
DBE4080-150-N350S08	4	8	8	25	35	150
DBE4080-200-N400S08	4	8	8	25	40	200

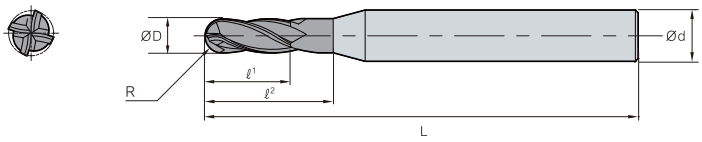
DBE4000 (Ball)



4 | 30° HELIX | Substrate ND3000 | DATA p.527

• TOLERANCE

ØD		Ød
~ Ø5.9	0 ~ -0.02mm	h6
Ø6.0 ~	0 ~ -0.03mm	



Designation	R	ØD	Ød	ℓ1	ℓ2	L
DBE4100-080-N350S10	5	10	10	30	35	80
DBE4100-110-N350S10	5	10	10	30	35	110
DBE4100-150-N400S10	5	10	10	30	40	150
DBE4100-160-N400S10	5	10	10	30	40	160
DBE4100-200-N500S10	5	10	10	30	50	200
DBE4120-110-N500S12	6	12	12	35	50	110
DBE4120-150-N500S12	6	12	12	35	50	150
DBE4120-200-N600S12	6	12	12	35	60	200

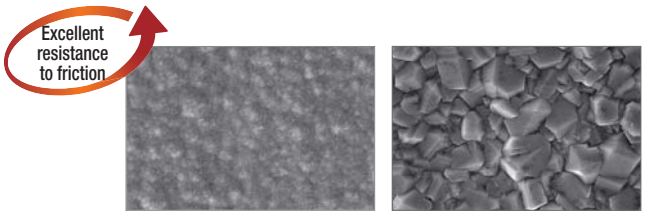
Router Endmill for machining composite materials

Composite Router Endmill

- 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



CCDR (Dual Helix Router Endmill)

- Dual helix design to inhibit flaking on upper and lower faces of workpieces
- Endmill for finishing, profiling, and grooving



CCHR (High-performance Router Endmill)

- Multi flute nick shaped for high efficient machining
- Endmill for shape contouring, grooving, roughing



CCR (Router Endmill)

- Down cut design for low vibrations and cutting force
- Endmill for roughing, 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



CCDR4000/6000 (Flat)



4 | 6 | 30°/-30° HELIX | Substrate ND2100

• TOLERANCE

ØD		Ød
Ø6 ~ Ø12	0 ~ -0.03mm	h5

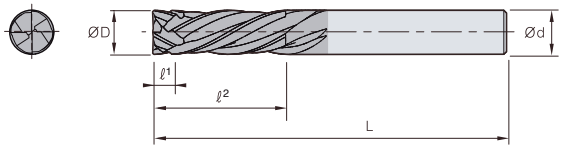


Fig. 1

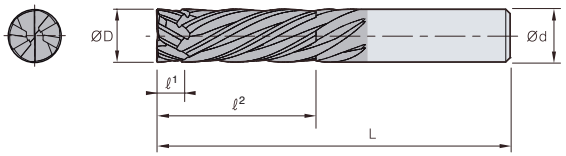


Fig. 2

(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L	Fig.
CCDR 4060-065	6	6	3	18	65	1
CCDR 4080-075	8	8	4	24	75	1
CCDR 6100-085	10	10	5	30	85	2
CCDR 6120-100	12	12	6	36	100	2

4 | 6 | 30°/-30° HELIX | Substrate ND2100

• TOLERANCE

ØD		Ød
Ø0.25 ~ Ø0.5	0 ~ -0.0012 (inch)	h5

(inch)

Designation	ØD	Ød	ℓ1	ℓ2	L	Fig.
CCDR 402500	1/4 0.250	0.25	0.125	0.75	2.5	1
CCDR 402500L	1/4 0.250	0.25	0.125	1.5	4	1
CCDR 603750	3/8 0.375	0.375	0.125	1	3.25	2
CCDR 603750L	3/8 0.375	0.375	0.125	1.5	4	2
CCDR 605000	1/2 0.500	0.5	0.125	1	3.25	2
CCDR 605000L	1/2 0.500	0.5	0.125	1.5	4	2

Endmill Composite Router Endmill

CCHR4000/6000 (Flat)



4 | 6 | 15° HELIX | Substrate ND2100

• TOLERANCE

ØD		Ød
Ø6 ~ Ø12	0 ~ -0.05mm	h5

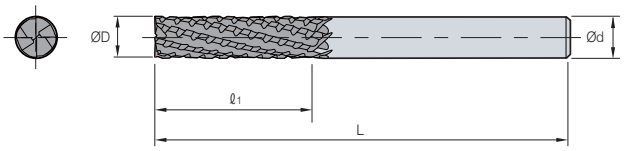


Fig. 1

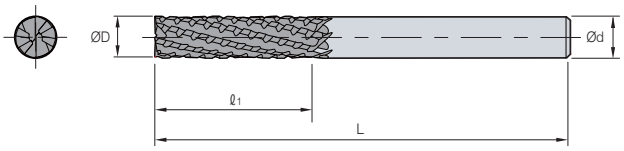


Fig. 2

(mm)

Designation	ØD	Ød	ℓ	L	Fig.
CCHR 4060-065	6	6	18	65	1
CCHR 4080-075	8	8	24	75	1
CCHR 6100-085	10	10	30	85	2
CCHR 6120-100	12	12	36	100	2

4 | 6 | 15° HELIX | Substrate ND2100

• TOLERANCE

ØD		Ød
Ø0.25 ~ Ø0.5	0 ~ -0.002 (inch)	h5

(inch)

Designation	ØD	Ød	ℓ	L	Fig.
CCHR 402500	1/4 0.250	0.25	0.75	2.5	1
CCHR 402500L	1/4 0.250	0.25	1.5	4	1
CCHR 603750	3/8 0.375	0.375	1	3.25	2
CCHR 603750L	3/8 0.375	0.375	1.5	4	2
CCHR 605000	1/2 0.500	0.5	1	3.25	2
CCHR 605000L	1/2 0.500	0.5	1.5	4	2

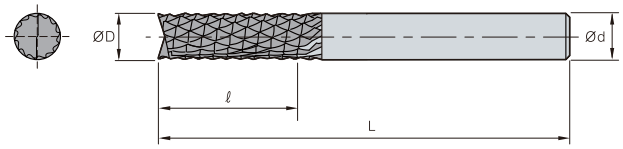
CCR2000 (Flat)



2 | -27° HELIX | Substrate ND2100

• TOLERANCE

ØD		Ød
Ø4 ~ Ø12	-0.02 ~ -0.08mm	h5



(mm)

Designation	ØD	Ød	ℓ	L
CCR 2040-050	4	4	12	50
CCR 2050-050	5	5	15	50
CCR 2060-065	6	6	18	65
CCR 2080-075	8	8	24	75
CCR 2100-085	10	10	30	85
CCR 2120-100	12	12	36	100

2 | -27° HELIX | Substrate ND2100

• TOLERANCE

ØD		Ød
Ø0.25 ~ Ø0.5	-0.0008 ~ -0.0032 (inch)	h5

(inch)

Designation	ØD	Ød	ℓ	L
CCR 202500	1/4 0.250	0.25	0.75	2.5
CCR 202500L	1/4 0.250	0.25	1.5	4
CCR 203750	3/8 0.375	0.375	1	3.25
CCR 203750L	3/8 0.375	0.375	1.5	4
CCR 205000	1/2 0.500	0.5	1	3.25
CCR 205000L	1/2 0.500	0.5	1.5	4

Endmill Composite Router Endmill

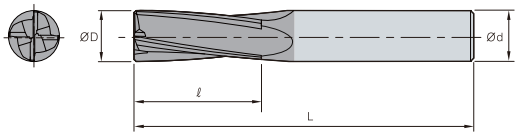
CCLR4000 (Flat)



4 | 15° HELIX | Substrate ND2100

• TOLERANCE

ØD		Ød
Ø4 ~ Ø12	0 ~ -0.03mm	h5



(mm)

Designation	ØD	Ød	ℓ	L
CCLR 4040-050	4	4	12	50
CCLR 4050-050	5	5	15	50
CCLR 4060-065	6	6	18	65
CCLR 4080-075	8	8	24	75
CCLR 4100-085	10	10	30	85
CCLR 4120-100	12	12	36	100

4 | 15° HELIX | Substrate ND2100

• TOLERANCE

ØD		Ød
Ø0.25 ~ Ø0.5	0 ~ -0.0012 (inch)	h5

(inch)

Designation	ØD	Ød	ℓ	L
CCLR 402500	1/4 0.250	0.25	0.75	2.5
CCLR 402500L	1/4 0.250	0.25	1.5	4
CCLR 403750	3/8 0.375	0.375	1	3.25
CCLR 403750L	3/8 0.375	0.375	1.5	4
CCLR 405000	1/2 0.500	0.5	1	3.25
CCLR 405000L	1/2 0.500	0.5	1.5	4

CCRR6000/8000 (Flat)



6 | 8 | -25° HELIX | Substrate ND2100

• TOLERANCE

ØD		Ød
Ø6 ~ Ø12	0 ~ -0.03mm	h5

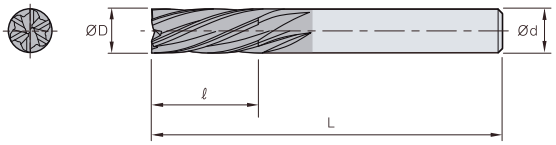


Fig. 1

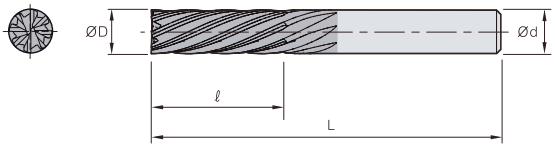


Fig. 2

(mm)

Designation	ØD	Ød	ℓ	L	Fig.
CCRR 6060-065	6	6	18	65	1
CCRR 6080-075	8	8	24	75	1
CCRR 8100-085	10	10	30	85	2
CCRR 8120-100	12	12	36	100	2

6 | 8 | -25° HELIX | Substrate ND2100

• TOLERANCE

ØD		Ød
Ø0.25 ~ Ø0.5	0 ~ -0.0012 (inch)	h5

(inch)

Designation	ØD	Ød	ℓ	L	Fig.
CCRR 602500	1/4 0.250	0.25	0.75	2.5	1
CCRR 602500L	1/4 0.250	0.25	1.5	4	1
CCRR 803750	3/8 0.375	0.375	1	3.25	2
CCRR 803750L	3/8 0.375	0.375	1.5	4	2
CCRR 805000	1/2 0.500	0.5	1	3.25	2
CCRR 805000L	1/2 0.500	0.5	1.5	4	2

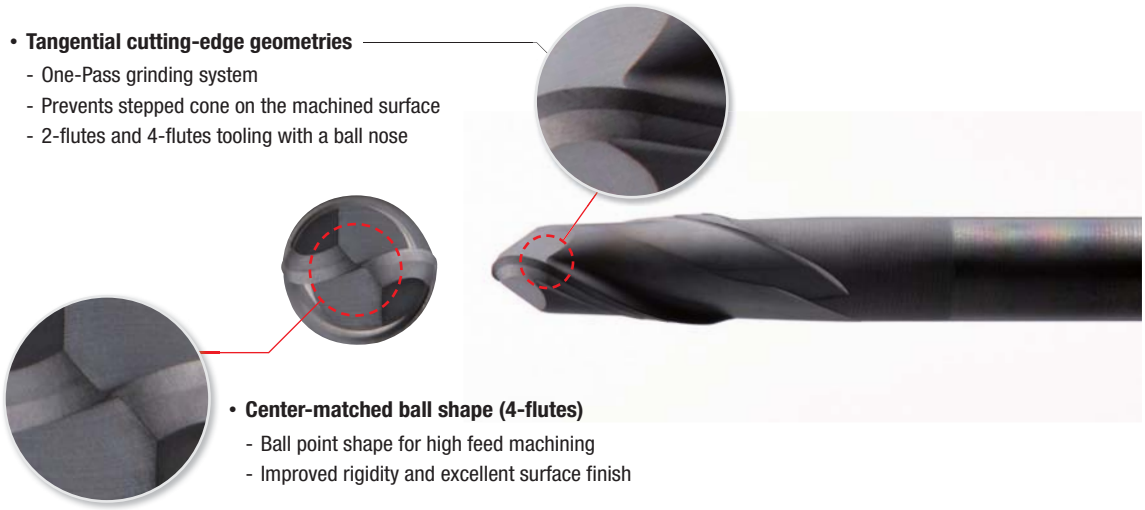
Endmill for machining dental prostheses

T Endmill

- 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

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 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

DATA
p.528

Code system

T	Z	BE	2	030	-	050	-	N100	S04	(Z-MATCH)
T Endmill	Workpiece	Type	No. of flutes	Drill dia.		Overall length		Neck length	Shank dia.	Machine Maker

Type
BE : Ball Endmill
FE : Flat Endmill
RE : Radius Endmill

Workpiece
Z : Zirconia
T : Ti/Co-Cr
W : Wax/PMMA

No. of flutes
2 : 2 flute

Drill dia.
030 : 3 mm

Overall length
050 : 50 mm

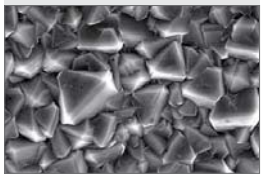
Neck length
N100 : 10 mm

Shank dia.
S04 : 4 mm

Grade solution for zirconia

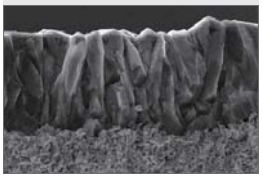
- **Development of ND3000 (Diamond-coated grade)**
  - High hardness diamond coating that is excellent in machining graphite and ceramic
  - Optimized for high speed and medium duty cutting thanks to its excellent grip to coated layers

Surface of ND3000



High hardness diamond coating (Hv 10,000) provides excellent wear resistance

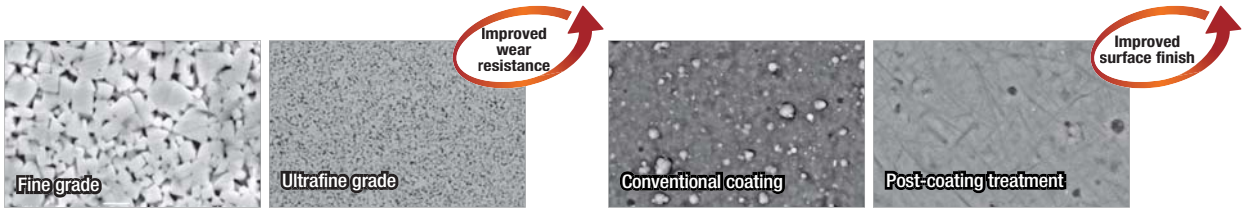
Cross section of coated layers



Specialized grade for Zirconia provides excellent adhesion

Grade solution for titanium

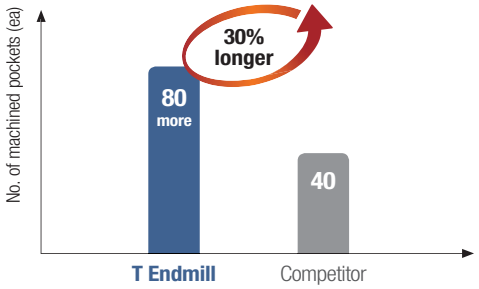
- **Development of PC2510 (Coated grade for high hardened steel)**
  - Post-coating treatment was applied to improve surface finish
  - A grade optimized for interrupted machining of high hardness steels and wet treatment accompanying high thermal shock. Its ultrafine substrate features high toughness which allows stable performance

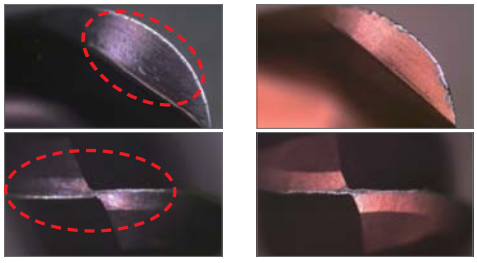


Performance evaluation

Workpiece	Co-Cr
Cutting condition	vc (m/min) = 150, fz (mm/t) = 0.08
	ap (mm) = 0.13, ae (mm) = 0.7, wet
Tool	TTBE2030-050

[Test result]





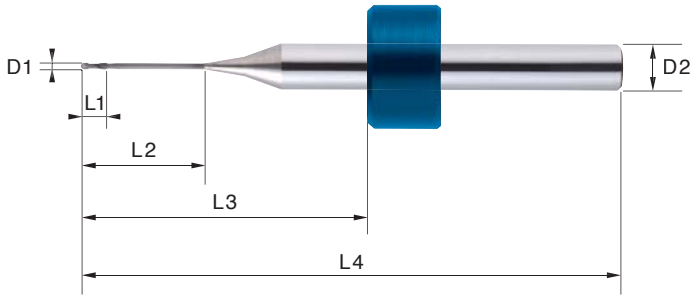
T Endmill | Competitor

Excellent resistance to toughness and wear thanks to the new grade PC2510

T Endmill

Special T Endmill order form

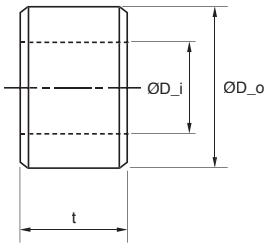
- Stop rings and other tool resources can be made to order



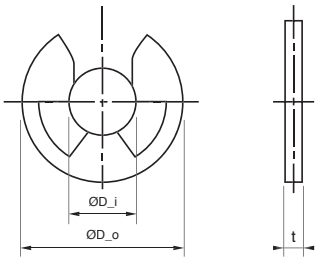
[Data Sheet]

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	

[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

Longer tool life and good surface finishes

PCD Endmill

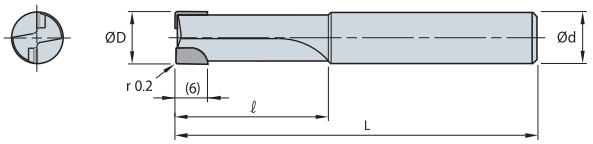
- Longer tool life and good surface roughness
- Reducing burrs at non-ferrous metals machining
- **1000 type**: Ultra finishing for non-ferrous metals
- **2000 type**: Optimal for aluminum alloy, carbon steel, graphite and reinforced Plastic machining

PDE1000/2000 (Flat)



1 | 2 | 0° HELIX | PCD | Substrate DP200 | DATA

p.528



(mm)

Designation	ØD	Ød	ℓ	L
PDE 1040	4	6	15	45
PDE 1050	5	6	15	50
PDE 1060	6	6	20	60
PDE 2060	6	8	20	60
PDE 2070	7	8	20	60
PDE 2080	8	8	20	60
PDE 2090	9	10	25	70
PDE 2100	10	10	25	70
PDE 2120	12	12	25	75

Special Endmill order form



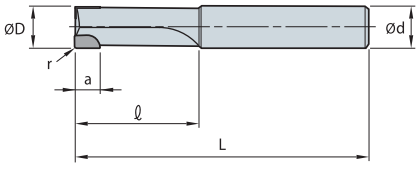


Fig. 1

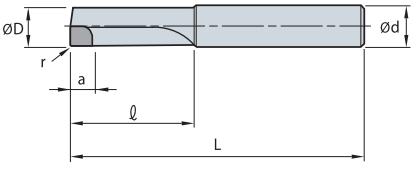
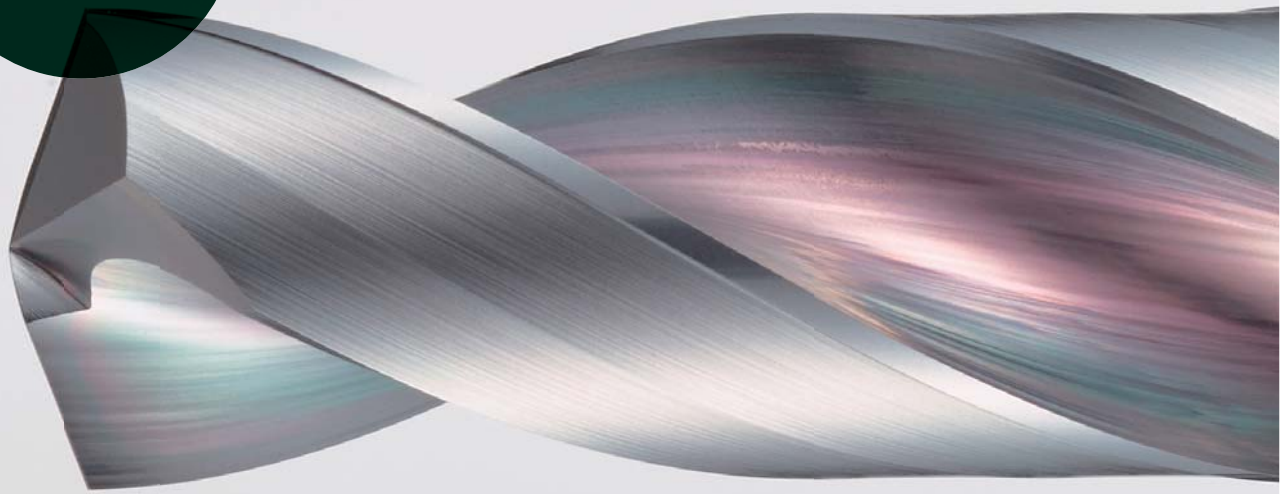


Fig. 2

Designation	Fig.	No. of flute	Dimension (mm)					
			ØD	Ød	r	a	ℓ	L
PDES								

※ Depending on customer requests, we can make special Endmill

PART 2



Drill

Product details

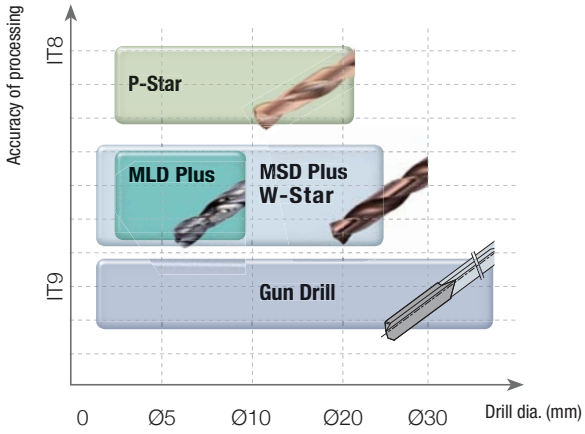


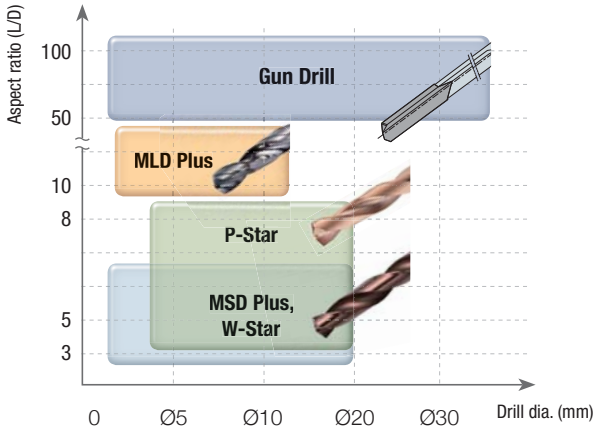
Technical information for Drill

MSD Plus 276
MSD Plus-S 282
MLD Plus 287
MSD Plus CFRP 290
MSFD 292
P-Star Drill 297
W-Star Drill 315
SSD-N 324
Burnishing Drill 327
Top Solid Drill 329
PCD Drill 330
Gun Drill 333

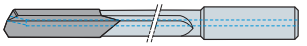
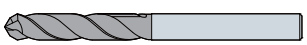
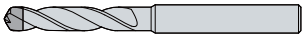
Solid Drill

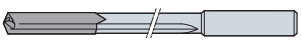
Application area





Solid drill Line-up and features

Work-piece	Use	Product name	Coolant	Drill dia. (tolerance)	Aspect ratio (L/D)	Geometries	Features
P M K	Medium hardness	P-Star	Central/ peripheral	Ø3.0~20.0 (h7)	3D~8D		• The optimal international standard for high speed machining with ~ HRC50
P M K	General	MSD Plus	Central/ peripheral	Ø1.0~20.0 (h7)	3D~7D		• High efficiency machining for various workpiece machining such as automobile components
P M K	General	MLD Plus (Long drill)	Central	Ø3.0~10.0 (h7)	10D~25D		• For deep drilling with high efficiency and high quality
P M K	General	W-Star	Peripheral	Ø1.0~20.0 (h7)	5D~7D		• High efficient and economic endmill
P M K	General	MSFD	Central/ peripheral	Ø2.5~12.0 (h7)	2D~3D		• Flat drill for various types of drilling such as helical machining, curved surface machining, flat surface machining, etc.
P M K	General	Gun Drill	–	Ø3.0~33.0 (h7)	50D ~ 100D		• High efficient drilling of deep hole (50D~100D) • Availability of special types
S	HRSA	MSD Plus-S	Central	Ø3.0~16.0 (h7)	3D~5D		• For HRSA machining • For hard-to-cut material machining of aerospace, energy, power generation, automobile, etc.
N	CFRP	MSD Plus CFRP	Peripheral	Ø3.0~12.7 (m7)	5D		• Machining for CFRP workpiece
N	Non-ferrous metal, Aluminum	SSD-N	Peripheral	Ø1.0~13.0 (h7)	–		• Non-coated drill for non-ferrous steel and mild steel
N	Non-ferrous metal, Aluminum	PCD Drill	Peripheral	Ø2.0~12.0 (h7)	–		• High precision and surface finish • Cone/Sandwich type

Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Solid Drills	Mach Solid Drill Plus	MSDPH		Ø2.5 ~ Ø20.0	3D ~ 7D	277
	Mach Solid Drill Plus-S	MSDPH-S		Ø3.0 ~ Ø16.0	3D ~ 5D	283
	Mach Long Drill Plus	MLD		Ø3.0 ~ Ø10.0	10D ~ 25D	288
	Mach Solid Drill Plus CFRP	MSDP-C		Ø3.0 ~ Ø12.7	5D	291
	Mach Solid Flat Drill	MSFD		Ø2.5 ~ Ø16.0	2D	293
		MSFDH		Ø2.5 ~ Ø16.0	3D	295
	P-Star Drill	HP503		Ø3.0 ~ Ø16.0	3D	299
		HPI503		Ø3.0 ~ Ø20.0	3D	301
		HPI505		Ø3.0 ~ Ø20.0	5D	304
		HPI508-N		Ø3.0 ~ Ø20.0	8D	307
		P503A(F)		Ø3.0 ~ Ø20.0	3D	309
		PI503A(F)		Ø3.0 ~ Ø20.0	3D	311
		PI505A(F)		Ø4.0 ~ Ø20.0	5D	313
	W-Star Drill	NDPG503		Ø1.0 ~ Ø13.0	3D	316
		NDPG504		Ø1.0 ~ Ø20.0	4D	318
		NDPG507		Ø3.0 ~ Ø20.0	7D	321
	Carbide Drill	SSD-N		Ø1.0 ~ Ø13.0	-	325
	Burnishing Drill	BDS		Ø4.0 ~ Ø16.0	5D ~ 7D	327
		BDT		Ø4.2 ~ Ø10.3	2D ~ 4D	328
	Top solid Drill	TSDM		Ø8.0 ~ Ø25.0	5D ~ 8D	329
	PCD Drill	PDD		Ø5.0 ~ Ø12.0	5D	330
		CPD		Ø2.0 ~ Ø8.0	3D ~ 5D	331
		CPDL		Ø2.0 ~ Ø8.0	12D ~ 45D	331
		SPD		Ø4.0 ~ Ø16.0	4D ~ 5D	332
	Gun Drill	KGDS		Ø3.0 ~ Ø33.0	50D ~ 100D	334
		KGDT		Ø6.0 ~ Ø26.5	50D ~ 100D	335

Highly efficient hole making for various workpieces including components

MSD Plus

Mach Solid Drill Plus

Code system

Special type

MSDPH 040 - 5 P - 100L - 5S

Oil hole
None: MSDP
With oil hole: MSDPH

Drill dia.(ØD)
040: Ø4.0 mm
(One decimal place marked)

Standard type
Aspect ratio (L/D)
3D, 5D, 7D

Special type
Flute length
100: 100 mm

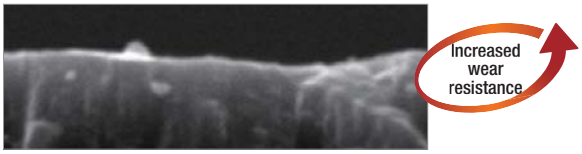
Machining area
P: Carbon steel, alloy steel
M: Stainless steel
K: Cast iron
N: Aluminum, copper alloy

Overall length
100L: 100 mm

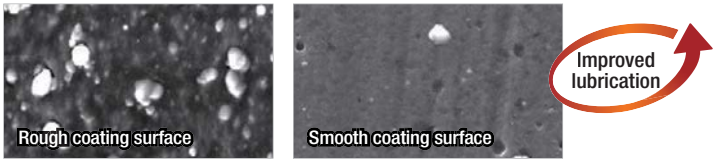
Shank dia.
5S: Ø5 mm

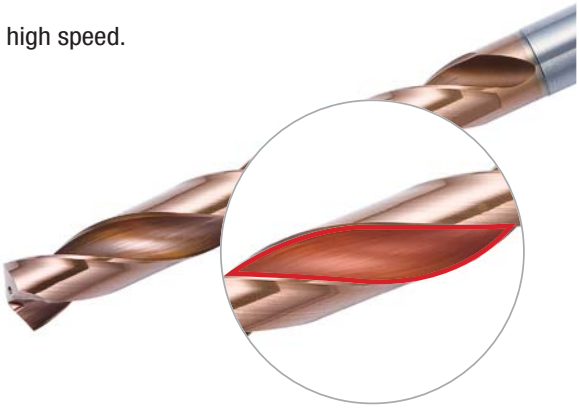
Features

- **New grade (PC325U)**
  - Lubricative coating layer improves welding resistance at middle to high speed.
  - Increase wear resistance in machining carbon steel



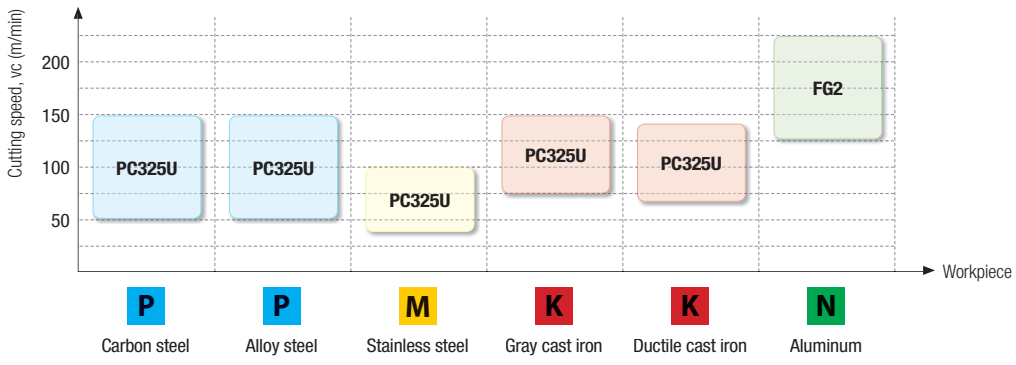
- **Surface of coating layer**
  - Increased welding resistance and lower cutting load
  - Reduced frictional resistance at cutting edges and on the flute





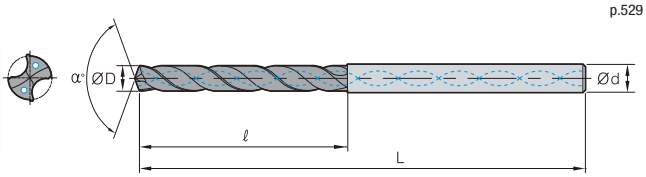
- **Flute shape**
  - Improved chip evacuation thanks to wider chip pocket

Application area



MSDPH - □(P/M/K/N)





DATA
p.529

• TOLERANCE

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

(mm)

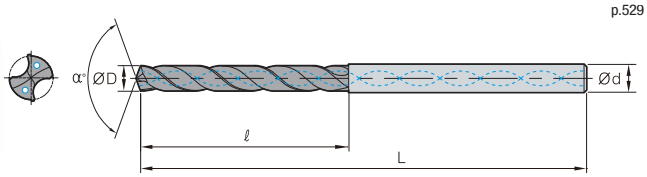
Designation	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDPH 025 - □P,M,K,N	2.5	3	14	53	20	66	30	70
MSDPH 026 - □P,M,K,N	2.6	3	17	53	20	66	30	70
MSDPH 027 - □P,M,K,N	2.7	3	17	53	20	66	30	70
MSDPH 028 - □P,M,K,N	2.8	3	17	53	20	66	30	70
MSDPH 029 - □P,M,K,N	2.9	3	17	53	20	66	30	70
MSDPH 030 - □P,M,K,N	3	3	17	53	20	66	30	70
MSDPH 031 - □P,M,K,N	3.1	4	20	58	28	74	30	70
MSDPH 032 - □P,M,K,N	3.2	4	20	58	28	74	30	70
MSDPH 033 - □P,M,K,N	3.3	4	20	58	28	74	30	70
MSDPH 034 - □P,M,K,N	3.4	4	20	58	28	74	37.5	75
MSDPH 035 - □P,M,K,N	3.5	4	20	58	28	74	37.5	75
MSDPH 036 - □P,M,K,N	3.6	4	22	58	32	74	37.5	75
MSDPH 037 - □P,M,K,N	3.7	4	22	58	32	74	37.5	75
MSDPH 038 - □P,M,K,N	3.8	4	22	58	32	74	37.5	75
MSDPH 039 - □P,M,K,N	3.9	4	22	58	32	74	37.5	75
MSDPH 040 - □P,M,K,N	4	4	22	58	32	74	37.5	75
MSDPH 041 - □P,M,K,N	4.1	5	24	62	36	82	37.5	75
MSDPH 042 - □P,M,K,N	4.2	5	24	62	36	82	37.5	75
MSDPH 043 - □P,M,K,N	4.3	5	24	62	36	82	45	85
MSDPH 044 - □P,M,K,N	4.4	5	24	62	36	82	45	85
MSDPH 045 - □P,M,K,N	4.5	5	24	62	36	82	45	85
MSDPH 046 - □P,M,K,N	4.6	5	26	62	38	82	45	85
MSDPH 047 - □P,M,K,N	4.7	5	26	62	38	82	45	85
MSDPH 048 - □P,M,K,N	4.8	5	26	62	38	82	50	90
MSDPH 049 - □P,M,K,N	4.9	5	26	62	38	82	50	90
MSDPH 050 - □P,M,K,N	5	5	26	62	38	82	50	90
MSDPH 051 - □P,M,K,N	5.1	6	28	66	44	82	50	90
MSDPH 052 - □P,M,K,N	5.2	6	28	66	44	82	50	90
MSDPH 053 - □P,M,K,N	5.3	6	28	66	44	82	50	90
MSDPH 054 - □P,M,K,N	5.4	6	28	66	44	82	50	90
MSDPH 055 - □P,M,K,N	5.5	6	28	66	44	82	57	97
MSDPH 056 - □P,M,K,N	5.6	6	28	66	44	82	57	97
MSDPH 057 - □P,M,K,N	5.7	6	28	66	44	82	57	97
MSDPH 058 - □P,M,K,N	5.8	6	28	66	44	82	57	97
MSDPH 059 - □P,M,K,N	5.9	6	28	66	44	82	57	97
MSDPH 060 - □P,M,K,N	6	6	28	66	44	82	57	97
MSDPH 061 - □P,M,K,N	6.1	7	34	74	50	91	66	106

Drill

MSD Plus

MSDPH - □(P/M/K/N)





DATA
p.529

• TOLERANCE

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			

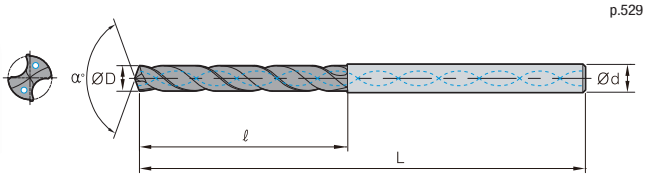
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDPH 062 - □P,M,K,N	6.2	7	34	74	50	91	66	106
MSDPH 063 - □P,M,K,N	6.3	7	34	74	50	91	66	106
MSDPH 064 - □P,M,K,N	6.4	7	34	74	50	91	66	106
MSDPH 065 - □P,M,K,N	6.5	7	34	74	50	91	66	106
MSDPH 066 - □P,M,K,N	6.6	7	34	74	50	91	66	106
MSDPH 067 - □P,M,K,N	6.7	7	34	74	50	91	66	106
MSDPH 068 - □P,M,K,N	6.8	7	34	74	50	91	66	106
MSDPH 069 - □P,M,K,N	6.9	7	34	74	50	91	76	116
MSDPH 070 - □P,M,K,N	7	7	34	74	50	91	76	116
MSDPH 071 - □P,M,K,N	7.1	8	41	79	53	91	76	116
MSDPH 072 - □P,M,K,N	7.2	8	41	79	53	91	76	116
MSDPH 073 - □P,M,K,N	7.3	8	41	79	53	91	76	116
MSDPH 074 - □P,M,K,N	7.4	8	41	79	53	91	76	116
MSDPH 075 - □P,M,K,N	7.5	8	41	79	53	91	76	116
MSDPH 076 - □P,M,K,N	7.6	8	41	79	53	91	76	116
MSDPH 077 - □P,M,K,N	7.7	8	41	79	53	91	76	116
MSDPH 078 - □P,M,K,N	7.8	8	41	79	53	91	76	116
MSDPH 079 - □P,M,K,N	7.9	8	41	79	53	91	76	116
MSDPH 080 - □P,M,K,N	8	8	43	84	58	98	87	131
MSDPH 081 - □P,M,K,N	8.1	9	43	84	58	98	87	131
MSDPH 082 - □P,M,K,N	8.2	9	43	84	58	98	87	131
MSDPH 083 - □P,M,K,N	8.3	9	43	84	58	98	87	131
MSDPH 084 - □P,M,K,N	8.4	9	43	84	58	98	87	131
MSDPH 085 - □P,M,K,N	8.5	9	43	84	58	98	87	131
MSDPH 086 - □P,M,K,N	8.6	9	43	84	58	98	87	131
MSDPH 087 - □P,M,K,N	8.7	9	43	84	58	98	87	131
MSDPH 088 - □P,M,K,N	8.8	9	43	84	58	98	87	131
MSDPH 089 - □P,M,K,N	8.9	9	43	84	58	98	87	131
MSDPH 090 - □P,M,K,N	9	9	43	84	58	98	87	131
MSDPH 091 - □P,M,K,N	9.1	10	47	89	61	105	95	139
MSDPH 092 - □P,M,K,N	9.2	10	47	89	61	105	95	139
MSDPH 093 - □P,M,K,N	9.3	10	47	89	61	105	95	139
MSDPH 094 - □P,M,K,N	9.4	10	47	89	61	105	95	139
MSDPH 095 - □P,M,K,N	9.5	10	47	89	61	105	95	139
MSDPH 096 - □P,M,K,N	9.6	10	47	89	61	105	95	139
MSDPH 097 - □P,M,K,N	9.7	10	47	89	61	105	95	139
MSDPH 098 - □P,M,K,N	9.8	10	47	89	61	105	95	139

MSDPH - □(P/M/K/N)





DATA
p.529

• TOLERANCE

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

(mm)

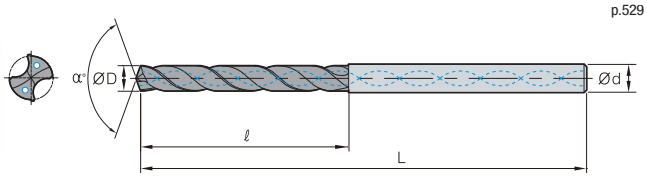
Designation	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDPH 099 - □P,M,K,N	9.9	10	47	89	61	105	95	139
MSDPH 100 - □P,M,K,N	10	10	47	89	61	105	95	139
MSDPH 101 - □P,M,K,N	10.1	11	55	95	68	114	106	155
MSDPH 102 - □P,M,K,N	10.2	11	55	95	68	114	106	155
MSDPH 103 - □P,M,K,N	10.3	11	55	95	68	114	106	155
MSDPH 104 - □P,M,K,N	10.4	11	55	95	68	114	106	155
MSDPH 105 - □P,M,K,N	10.5	11	55	95	68	114	106	155
MSDPH 106 - □P,M,K,N	10.6	11	55	95	68	114	106	155
MSDPH 107 - □P,M,K,N	10.7	11	55	95	68	114	106	155
MSDPH 108 - □P,M,K,N	10.8	11	55	95	68	114	106	155
MSDPH 109 - □P,M,K,N	10.9	11	55	95	68	114	106	155
MSDPH 110 - □P,M,K,N	11	11	55	95	68	114	106	155
MSDPH 111 - □P,M,K,N	11.1	12	55	102	71	120	114	163
MSDPH 112 - □P,M,K,N	11.2	12	55	102	71	120	114	163
MSDPH 113 - □P,M,K,N	11.3	12	55	102	71	120	114	163
MSDPH 114 - □P,M,K,N	11.4	12	55	102	71	120	114	163
MSDPH 115 - □P,M,K,N	11.5	12	55	102	71	120	114	163
MSDPH 116 - □P,M,K,N	11.6	12	55	102	71	120	114	163
MSDPH 117 - □P,M,K,N	11.7	12	55	102	71	120	114	163
MSDPH 118 - □P,M,K,N	11.8	12	55	102	71	120	114	163
MSDPH 119 - □P,M,K,N	11.9	12	55	102	71	120	114	163
MSDPH 120 - □P,M,K,N	12	12	55	102	71	120	114	163
MSDPH 121 - □P,M,K,N	12.1	13	60	107	77	124	133	182
MSDPH 122 - □P,M,K,N	12.2	13	60	107	77	124	133	182
MSDPH 123 - □P,M,K,N	12.3	13	60	107	77	124	133	182
MSDPH 124 - □P,M,K,N	12.4	13	60	107	77	124	133	182
MSDPH 125 - □P,M,K,N	12.5	13	60	107	77	124	133	182
MSDPH 126 - □P,M,K,N	12.6	13	60	107	77	124	133	182
MSDPH 127 - □P,M,K,N	12.7	13	60	107	77	124	133	182
MSDPH 128 - □P,M,K,N	12.8	13	60	107	77	124	133	182
MSDPH 129 - □P,M,K,N	12.9	13	60	107	77	124	133	182
MSDPH 130 - □P,M,K,N	13	13	60	107	77	124	133	182
MSDPH 131 - □P,M,K,N	13.1	14	62	107	80	133	133	182
MSDPH 132 - □P,M,K,N	13.2	14	62	107	80	133	133	182
MSDPH 133 - □P,M,K,N	13.3	14	62	107	80	133	133	182
MSDPH 134 - □P,M,K,N	13.4	14	62	107	80	133	133	182
MSDPH 135 - □P,M,K,N	13.5	14	62	107	80	133	133	182

Drill

MSD Plus

MSDPH - □(P/M/K/N)





DATA
p.529

• TOLERANCE

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			

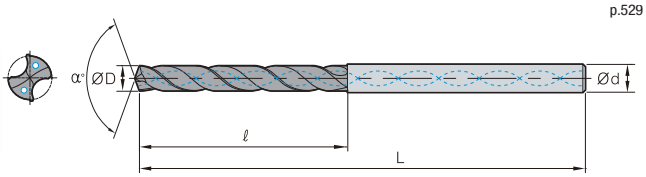
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDPH 136 - □P,M,K,N	13.6	14	62	107	80	133	133	182
MSDPH 137 - □P,M,K,N	13.7	14	62	107	80	133	133	182
MSDPH 138 - □P,M,K,N	13.8	14	62	107	80	133	133	182
MSDPH 139 - □P,M,K,N	13.9	14	62	107	80	133	133	182
MSDPH 140 - □P,M,K,N	14	14	62	107	80	133	133	182
MSDPH 141 - □P,M,K,N	14.1	15	65	115	85	143	152	204
MSDPH 142 - □P,M,K,N	14.2	15	65	115	85	143	152	204
MSDPH 143 - □P,M,K,N	14.3	15	65	115	85	143	152	204
MSDPH 144 - □P,M,K,N	14.4	15	65	115	85	143	152	204
MSDPH 145 - □P,M,K,N	14.5	15	65	115	85	143	152	204
MSDPH 146 - □P,M,K,N	14.6	15	65	115	85	143	152	204
MSDPH 147 - □P,M,K,N	14.7	15	65	115	85	143	152	204
MSDPH 148 - □P,M,K,N	14.8	15	65	115	85	143	152	204
MSDPH 149 - □P,M,K,N	14.9	15	65	115	85	143	152	204
MSDPH 150 - □P,M,K,N	15	15	65	115	85	143	152	204
MSDPH 151 - □P,M,K,N	15.1	16	68	115	88	143	152	204
MSDPH 152 - □P,M,K,N	15.2	16	68	115	88	143	152	204
MSDPH 153 - □P,M,K,N	15.3	16	68	115	88	143	152	204
MSDPH 154 - □P,M,K,N	15.4	16	68	115	88	143	152	204
MSDPH 155 - □P,M,K,N	15.5	16	68	115	88	143	152	204
MSDPH 156 - □P,M,K,N	15.6	16	68	115	88	143	152	204
MSDPH 157 - □P,M,K,N	15.7	16	68	115	88	143	152	204
MSDPH 158 - □P,M,K,N	15.8	16	68	115	88	143	152	204
MSDPH 159 - □P,M,K,N	15.9	16	68	115	88	143	152	204
MSDPH 160 - □P,M,K,N	16	16	68	115	88	143	152	204
MSDPH 161 - □P,M,K,N	16.1	17	73	123	93	153	171	223
MSDPH 162 - □P,M,K,N	16.2	17	73	123	93	153	171	223
MSDPH 163 - □P,M,K,N	16.3	17	73	123	93	153	171	223
MSDPH 164 - □P,M,K,N	16.4	17	73	123	93	153	171	223
MSDPH 165 - □P,M,K,N	16.5	17	73	123	93	153	171	223
MSDPH 166 - □P,M,K,N	16.6	17	73	123	93	153	171	223
MSDPH 167 - □P,M,K,N	16.7	17	73	123	93	153	171	223
MSDPH 168 - □P,M,K,N	16.8	17	73	123	93	153	171	223
MSDPH 169 - □P,M,K,N	16.9	17	73	123	93	153	171	223
MSDPH 170 - □P,M,K,N	17	17	73	123	93	153	171	223
MSDPH 171 - □P,M,K,N	17.1	18	73	123	98	153	171	223
MSDPH 172 - □P,M,K,N	17.2	18	73	123	98	153	171	223

MSDPH - □(P/M/K/N)





DATA
p.529

• TOLERANCE

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

(mm)

Designation	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDPH 173 - □P,M,K,N	17.3	18	73	123	98	153	171	223
MSDPH 174 - □P,M,K,N	17.4	18	73	123	98	153	171	223
MSDPH 175 - □P,M,K,N	17.5	18	73	123	98	153	171	223
MSDPH 176 - □P,M,K,N	17.6	18	73	123	98	153	171	223
MSDPH 177 - □P,M,K,N	17.7	18	73	123	98	153	171	223
MSDPH 178 - □P,M,K,N	17.8	18	73	123	98	153	171	223
MSDPH 179 - □P,M,K,N	17.9	18	73	123	98	153	171	223
MSDPH 180 - □P,M,K,N	18	18	73	123	98	153	171	223
MSDPH 181 - □P,M,K,N	18.1	19	79	131	103	153	190	244
MSDPH 182 - □P,M,K,N	18.2	19	79	131	103	153	190	244
MSDPH 183 - □P,M,K,N	18.3	19	79	131	103	153	190	244
MSDPH 184 - □P,M,K,N	18.4	19	79	131	103	153	190	244
MSDPH 185 - □P,M,K,N	18.5	19	79	131	103	153	190	244
MSDPH 186 - □P,M,K,N	18.6	19	79	131	103	153	190	244
MSDPH 187 - □P,M,K,N	18.7	19	79	131	103	153	190	244
MSDPH 188 - □P,M,K,N	18.8	19	79	131	103	153	190	244
MSDPH 189 - □P,M,K,N	18.9	19	79	131	103	153	190	244
MSDPH 190 - □P,M,K,N	19	19	79	131	103	153	190	244
MSDPH 191 - □P,M,K,N	19.1	20	79	131	107	153	190	244
MSDPH 192 - □P,M,K,N	19.2	20	79	131	107	153	190	244
MSDPH 193 - □P,M,K,N	19.3	20	79	131	107	153	190	244
MSDPH 194 - □P,M,K,N	19.4	20	79	131	107	153	190	244
MSDPH 195 - □P,M,K,N	19.5	20	79	131	107	153	190	244
MSDPH 196 - □P,M,K,N	19.6	20	79	131	107	153	190	244
MSDPH 197 - □P,M,K,N	19.7	20	79	131	107	153	190	244
MSDPH 198 - □P,M,K,N	19.8	20	79	131	107	153	190	244
MSDPH 199 - □P,M,K,N	19.9	20	79	131	107	153	190	244
MSDPH 200 - □P,M,K,N	20	20	79	131	107	153	190	244

Specialized for heat-resistant alloys used in the aerospace, energy, power generation and automotive industries

MSD Plus-S

Mach Solid Drill Plus-S

- Improved Productivity and Excellent Machinability - Ensuring machinability with optimized blade design and chip pockets
- Stronger Resistance to Wear - Extended tool life due to excellent high temp resistance to chipping

Code system

Special type

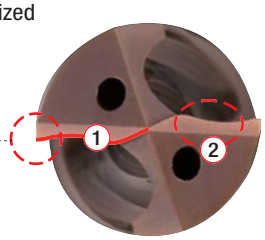
MSDP(H) 060 - 5 S - 100L - 5S

Oil hole	Drill dia.(ØD)	Standard type	Special type	Machining area	Overall length	Shank dia.
None: MSDP With oil hole: MSDPH	060: Ø6.0 mm	Aspect ratio (L/D) 3D, 5D	Flute length 50: 50 mm	S: HRSA	100L: 100 mm	5S: Ø5 mm

Features

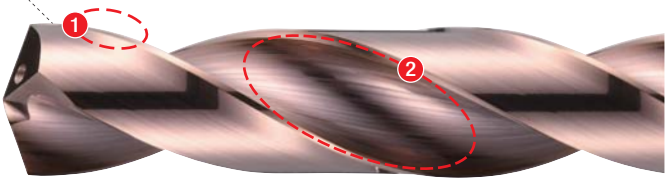
- Notch-controlled blade design and specially treated cutting edges prevent chipping and breakage

① Cutting edges designed for low cutting resistance
② Tip relief angle and shape optimized for heat evacuation

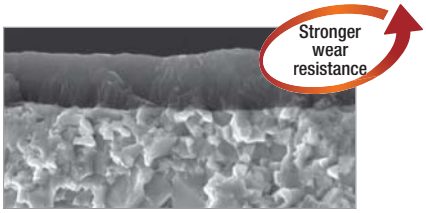


- Optimized margin and back-tapered design

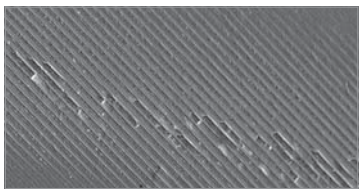
❶ Reduced friction resistance and cutting temperature
❷ Wider chip pockets improve chip evacuation



- Improved resistance to heat and oxidation thanks to the newly applied grade, PC325T
- Reduced friction resistance and improved chip evacuation due to excellent surface finish
- Exceptional wear resistance when machining heat-resistant alloys at high temperatures



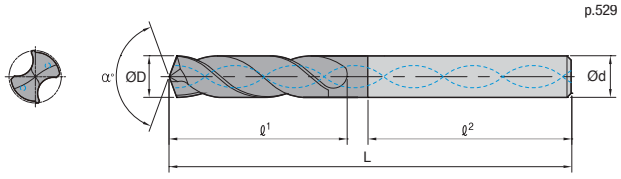
PC325T



Smooth coating surface

MSDPH-S





DATA
p.529

• TOLERANCE

Terminology	S
Grade	PC325T
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle	140°
Twist angle	30°
Thinning	X type
Coolant	Through
International standard	DIN 6537
Shank type	DIN 6535 HA

S Heat resistant alloy, Titanium alloy

(mm)

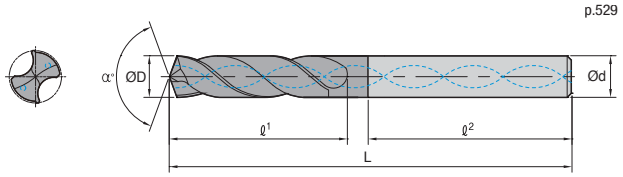
Designation	ØD		Ød	3S		5S		ℓ2
	mm	inch		ℓ1	L	ℓ1	L	
MSDPH 030 - □S	3.00	-	6	20	62	28	66	36
MSDPH 031 - □S	3.10	-	6	20	62	28	66	36
MSDPH 0318 - □S	3.18	1/8	6	20	62	28	66	36
MSDPH 032 - □S	3.20	-	6	20	62	28	66	36
MSDPH 033 - □S	3.30	-	6	20	62	28	66	36
MSDPH 034 - □S	3.40	-	6	20	62	28	66	36
MSDPH 035 - □S	3.50	-	6	20	62	28	66	36
MSDPH 0357 - □S	3.57	9/64	6	20	62	28	66	36
MSDPH 036 - □S	3.60	-	6	20	62	28	66	36
MSDPH 037 - □S	3.70	-	6	20	62	28	66	36
MSDPH 038 - □S	3.80	-	6	24	66	36	74	36
MSDPH 039 - □S	3.90	-	6	24	66	36	74	36
MSDPH 0397 - □S	3.97	5/32	6	24	66	36	74	36
MSDPH 040 - □S	4.00	-	6	24	66	36	74	36
MSDPH 041 - □S	4.10	-	6	24	66	36	74	36
MSDPH 042 - □S	4.20	-	6	24	66	36	74	36
MSDPH 043 - □S	4.30	-	6	24	66	36	74	36
MSDPH 0437 - □S	4.37	11/64	6	24	66	36	74	36
MSDPH 044 - □S	4.40	-	6	24	66	36	74	36
MSDPH 045 - □S	4.50	-	6	24	66	36	74	36
MSDPH 046 - □S	4.60	-	6	24	66	36	74	36
MSDPH 047 - □S	4.70	-	6	24	66	36	74	36
MSDPH 0476 - □S	4.76	3/16	6	28	66	44	82	36
MSDPH 048 - □S	4.80	-	6	28	66	44	82	36
MSDPH 049 - □S	4.90	-	6	28	66	44	82	36
MSDPH 050 - □S	5.00	-	6	28	66	44	82	36
MSDPH 051 - □S	5.10	-	6	28	66	44	82	36
MSDPH 0516 - □S	5.16	13/64	6	28	66	44	82	36
MSDPH 052 - □S	5.20	-	6	28	66	44	82	36
MSDPH 053 - □S	5.30	-	6	28	66	44	82	36
MSDPH 054 - □S	5.40	-	6	28	66	44	82	36
MSDPH 055 - □S	5.50	-	6	28	66	44	82	36
MSDPH 0556 - □S	5.56	7/32	6	28	66	44	82	36
MSDPH 056 - □S	5.60	-	6	28	66	44	82	36
MSDPH 057 - □S	5.70	-	6	28	66	44	82	36
MSDPH 058 - □S	5.80	-	6	28	66	44	82	36
MSDPH 059 - □S	5.90	-	6	28	66	44	82	36
MSDPH 0595 - □S	5.95	15/64	6	28	66	44	82	36
MSDPH 060 - □S	6.00	-	6	28	66	44	82	36

Drill

MSD Plus-S

MSDPH-S





DATA
p.529

• TOLERANCE

Terminology	S
Grade	PC325T
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle	140°
Twist angle	30°
Thinning	X type
Coolant	Through
International standard	DIN 6537
Shank type	DIN 6535 HA

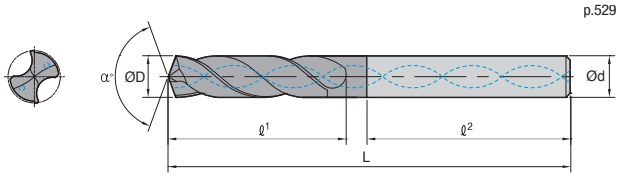
S Heat resistant alloy, Titanium alloy

(mm)

Designation	ØD		Ød	3S		5S		ℓ2
	mm	inch		ℓ1	L	ℓ1	L	
MSDPH 061 - □S	6.10	-	8	34	79	53	91	36
MSDPH 062 - □S	6.20	-	8	34	79	53	91	36
MSDPH 063 - □S	6.30	-	8	34	79	53	91	36
MSDPH 0635 - □S	6.35	1/4	8	34	79	53	91	36
MSDPH 064 - □S	6.40	-	8	34	79	53	91	36
MSDPH 065 - □S	6.50	-	8	34	79	53	91	36
MSDPH 066 - □S	6.60	-	8	34	79	53	91	36
MSDPH 067 - □S	6.70	-	8	34	79	53	91	36
MSDPH 0675 - □S	6.75	17/64	8	34	79	53	91	36
MSDPH 068 - □S	6.80	-	8	34	79	53	91	36
MSDPH 069 - □S	6.90	-	8	34	79	53	91	36
MSDPH 070 - □S	7.00	-	8	34	79	53	91	36
MSDPH 071 - □S	7.10	-	8	41	79	53	91	36
MSDPH 0714 - □S	7.14	9/32	8	41	79	53	91	36
MSDPH 072 - □S	7.20	-	8	41	79	53	91	36
MSDPH 073 - □S	7.30	-	8	41	79	53	91	36
MSDPH 074 - □S	7.40	-	8	41	79	53	91	36
MSDPH 075 - □S	7.50	-	8	41	79	53	91	36
MSDPH 0754 - □S	7.54	19/64	8	41	79	53	91	36
MSDPH 076 - □S	7.60	-	8	41	79	53	91	36
MSDPH 077 - □S	7.70	-	8	41	79	53	91	36
MSDPH 078 - □S	7.80	-	8	41	79	53	91	36
MSDPH 079 - □S	7.90	-	8	41	79	53	91	36
MSDPH 0794 - □S	7.94	5/16	8	41	79	53	91	36
MSDPH 080 - □S	8.00	-	8	41	79	53	91	36
MSDPH 081 - □S	8.10	-	10	47	89	61	103	40
MSDPH 082 - □S	8.20	-	10	47	89	61	103	40
MSDPH 083 - □S	8.30	-	10	47	89	61	103	40
MSDPH 0833 - □S	8.33	21/64	10	47	89	61	103	40
MSDPH 084 - □S	8.40	-	10	47	89	61	103	40
MSDPH 085 - □S	8.50	-	10	47	89	61	103	40
MSDPH 086 - □S	8.60	-	10	47	89	61	103	40
MSDPH 087 - □S	8.70	-	10	47	89	61	103	40
MSDPH 0873 - □S	8.73	11/32	10	47	89	61	103	40
MSDPH 088 - □S	8.80	-	10	47	89	61	103	40
MSDPH 089 - □S	8.90	-	10	47	89	61	103	40
MSDPH 090 - □S	9.00	-	10	47	89	61	103	40
MSDPH 091 - □S	9.10	-	10	47	89	61	103	40
MSDPH 0913 - □S	9.13	23/64	10	47	89	61	103	40

MSDPH-S





DATA
p.529

• TOLERANCE

Terminology	S
Grade	PC325T
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle	140°
Twist angle	30°
Thinning	X type
Coolant	Through
International standard	DIN 6537
Shank type	DIN 6535 HA

S Heat resistant alloy, Titanium alloy

(mm)

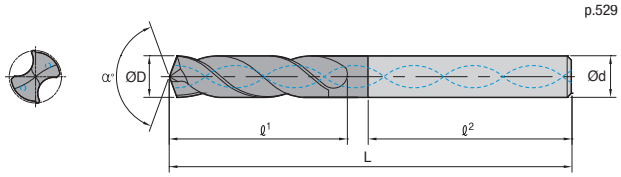
Designation	ØD		Ød	3S		5S		ℓ2
	mm	inch		ℓ1	L	ℓ1	L	
MSDPH 092 - □S	9.20	-	10	47	89	61	103	40
MSDPH 093 - □S	9.30	-	10	47	89	61	103	40
MSDPH 094 - □S	9.40	-	10	47	89	61	103	40
MSDPH 095 - □S	9.50	-	10	47	89	61	103	40
MSDPH 0953 - □S	9.53	3/8	10	47	89	61	103	40
MSDPH 096 - □S	9.60	-	10	47	89	61	103	40
MSDPH 097 - □S	9.70	-	10	47	89	61	103	40
MSDPH 098 - □S	9.80	-	10	47	89	61	103	40
MSDPH 099 - □S	9.90	-	10	47	89	61	103	40
MSDPH 0992 - □S	9.92	25/64	10	47	89	61	103	40
MSDPH 100 - □S	10.00	-	10	47	89	61	103	40
MSDPH 101 - □S	10.10	-	12	55	102	71	118	45
MSDPH 102 - □S	10.20	-	12	55	102	71	118	45
MSDPH 103 - □S	10.30	-	12	55	102	71	118	45
MSDPH 1032 - □S	10.32	13/32	12	55	102	71	118	45
MSDPH 104 - □S	10.40	-	12	55	102	71	118	45
MSDPH 105 - □S	10.50	-	12	55	102	71	118	45
MSDPH 106 - □S	10.60	-	12	55	102	71	118	45
MSDPH 107 - □S	10.70	-	12	55	102	71	118	45
MSDPH 1072 - □S	10.72	27/64	12	55	102	71	118	45
MSDPH 108 - □S	10.80	-	12	55	102	71	118	45
MSDPH 109 - □S	10.90	-	12	55	102	71	118	45
MSDPH 110 - □S	11.00	-	12	55	102	71	118	45
MSDPH 111 - □S	11.10	-	12	55	102	71	118	45
MSDPH 1111 - □S	11.11	7/16	12	55	102	71	118	45
MSDPH 112 - □S	11.20	-	12	55	102	71	118	45
MSDPH 113 - □S	11.30	-	12	55	102	71	118	45
MSDPH 114 - □S	11.40	-	12	55	102	71	118	45
MSDPH 115 - □S	11.50	-	12	55	102	71	118	45
MSDPH 1151 - □S	11.51	29/64	12	55	102	71	118	45
MSDPH 116 - □S	11.60	-	12	55	102	71	118	45
MSDPH 117 - □S	11.70	-	12	55	102	71	118	45
MSDPH 118 - □S	11.80	-	12	55	102	71	118	45
MSDPH 119 - □S	11.90	-	12	55	102	71	118	45
MSDPH 1191 - □S	11.91	15/32	12	55	102	71	118	45
MSDPH 120 - □S	12.00	-	12	55	102	71	118	45
MSDPH 121 - □S	12.10	-	14	60	107	77	124	45
MSDPH 122 - □S	12.20	-	14	60	107	77	124	45
MSDPH 123 - □S	12.30	31/64	14	60	107	77	124	45
MSDPH 124 - □S	12.40	-	14	60	107	77	124	45

Drill

MSD Plus-S

MSDPH-S





DATA
p.529

• TOLERANCE

Terminology	S
Grade	PC325T
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle	140°
Twist angle	30°
Thinning	X type
Coolant	Through
International standard	DIN 6537
Shank type	DIN 6535 HA

S Heat resistant alloy, Titanium alloy

(mm)

Designation	ØD		Ød	3S		5S		ℓ2
	mm	inch		ℓ1	L	ℓ1	L	
MSDPH 125 - □S	12.50	-	14	60	107	77	124	45
MSDPH 126 - □S	12.60	-	14	60	107	77	124	45
MSDPH 127 - □S	12.70	1/2	14	60	107	77	124	45
MSDPH 128 - □S	12.80	-	14	60	107	77	124	45
MSDPH 129 - □S	12.90	-	14	60	107	77	124	45
MSDPH 130 - □S	13.00	-	14	60	107	77	124	45
MSDPH 131 - □S	13.10	-	14	60	107	77	124	45
MSDPH 132 - □S	13.20	-	14	60	107	77	124	45
MSDPH 133 - □S	13.30	-	14	60	107	77	124	45
MSDPH 134 - □S	13.40	-	14	60	107	77	124	45
MSDPH 1349 - □S	13.49	17/32	14	60	107	77	124	45
MSDPH 135 - □S	13.50	-	14	60	107	77	124	45
MSDPH 136 - □S	13.60	-	14	60	107	77	124	45
MSDPH 137 - □S	13.70	-	14	60	107	77	124	45
MSDPH 138 - □S	13.80	-	14	60	107	77	124	45
MSDPH 139 - □S	13.90	-	14	60	107	77	124	45
MSDPH 140 - □S	14.00	-	14	60	107	77	124	45
MSDPH 141 - □S	14.10	-	16	65	115	83	133	48
MSDPH 142 - □S	14.20	-	16	65	115	83	133	48
MSDPH 1429 - □S	14.29	9/16	16	65	115	83	133	48
MSDPH 143 - □S	14.30	-	16	65	115	83	133	48
MSDPH 144 - □S	14.40	-	16	65	115	83	133	48
MSDPH 145 - □S	14.50	-	16	65	115	83	133	48
MSDPH 146 - □S	14.60	-	16	65	115	83	133	48
MSDPH 147 - □S	14.70	-	16	65	115	83	133	48
MSDPH 148 - □S	14.80	-	16	65	115	83	133	48
MSDPH 149 - □S	14.90	-	16	65	115	83	133	48
MSDPH 150 - □S	15.00	-	16	65	115	83	133	48
MSDPH 151 - □S	15.10	-	16	65	115	83	133	48
MSDPH 152 - □S	15.20	-	16	65	115	83	133	48
MSDPH 153 - □S	15.30	-	16	65	115	83	133	48
MSDPH 154 - □S	15.40	-	16	65	115	83	133	48
MSDPH 155 - □S	15.50	-	16	65	115	83	133	48
MSDPH 156 - □S	15.60	-	16	65	115	83	133	48
MSDPH 157 - □S	15.70	-	16	65	115	83	133	48
MSDPH 158 - □S	15.80	-	16	65	115	83	133	48
MSDPH 1587 - □S	15.87	5/8	16	65	115	83	133	48
MSDPH 159 - □S	15.90	-	16	65	115	83	133	48
MSDPH 160 - □S	16.00	-	16	65	115	83	133	48

High precision results when machining deep holes

MLD Plus

Mach Long Solid Drill Plus

Code system

Special type

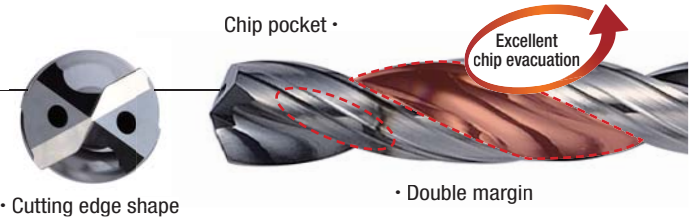
MLD 0600N - 10 P - 100L - 10S

- **MLD** — Mach Long Solid Drill Plus (MLD Plus)
- **0600N** — Drill dia. (ØD)
  - 0600: Ø6.00 mm (Two decimal place marked)
- **10** — Standard type
  - Aspect ratio (L/D)
  - 10D, 15D, 20D, 25D
- **P** — Machining area
  - P: Carbon steel, alloy steel
  - K: Cast iron
  - N: Aluminum, copper alloy
- **100L** — Overall length
  - 100L: 100 mm
- **10S** — Shank dia.
  - 10S: Ø10 mm

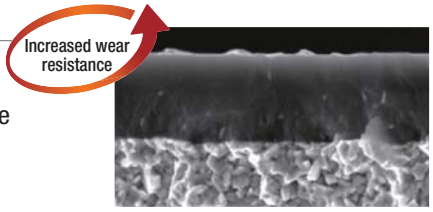
Special type
- Flute length
- 100: 100 mm

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



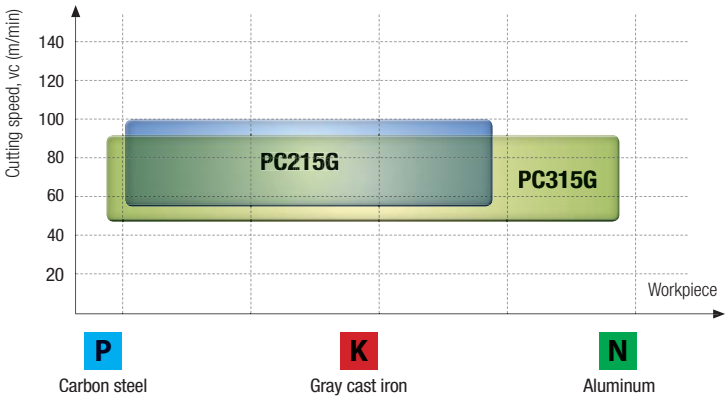
- **New grade (PC315G)**
  - Ultra-fine substrate and new coating applied
  - Lubricative coating layer improves chip evacuation with lower frictional resistance
  - Longer tool life due to higher wear resistance



PC315G

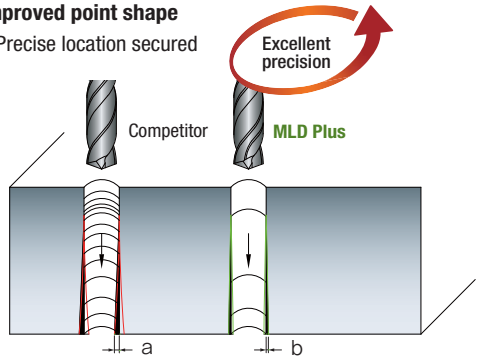
Application area

- **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



[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



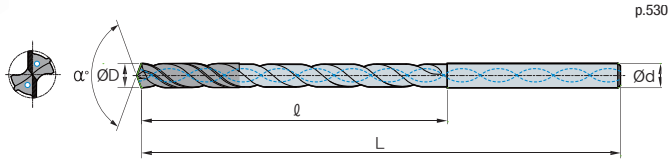
Reduced bent holes compared to competitors (a > b)

Drill

MSD Plus

MLD - □□(P/K/N)





DATA
p.530

• TOLERANCE

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		

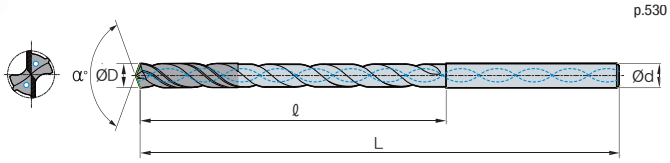
P Steel K Cast iron N Non-ferrous metal

(mm)

Designation	ØD	Ød	10 P,M,K		15 P,M,K		20 P,M,K		25 P,M,K	
			ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD 0300N - □□P,K,N	3.0	3	40	90	55	105	70	120	-	-
MLD 0310N - □□P,K,N	3.1	4	45	100	60	125	80	140	-	-
MLD 0320N - □□P,K,N	3.2	4	45	100	60	125	80	140	-	-
MLD 0330N - □□P,K,N	3.3	4	45	100	60	125	80	140	-	-
MLD 0340N - □□P,K,N	3.4	4	50	100	65	125	85	140	-	-
MLD 0350N - □□P,K,N	3.5	4	50	100	65	125	85	140	-	-
MLD 0360N - □□P,K,N	3.6	4	50	100	65	125	85	140	-	-
MLD 0370N - □□P,K,N	3.7	4	50	100	65	125	85	140	-	-
MLD 0380N - □□P,K,N	3.8	4	50	100	75	125	90	140	-	-
MLD 0390N - □□P,K,N	3.9	4	50	100	75	125	90	140	-	-
MLD 0400N - □□P,K,N	4.0	4	50	100	75	125	90	140	115	165
MLD 0410N - □□P,K,N	4.1	5	55	115	75	140	100	165	120	190
MLD 0420N - □□P,K,N	4.2	5	55	115	75	140	100	165	120	190
MLD 0430N - □□P,K,N	4.3	5	60	115	85	140	110	165	135	190
MLD 0440N - □□P,K,N	4.4	5	60	115	85	140	110	165	135	190
MLD 0450N - □□P,K,N	4.5	5	60	115	85	140	110	165	135	190
MLD 0460N - □□P,K,N	4.6	5	60	115	85	140	110	165	135	190
MLD 0470N - □□P,K,N	4.7	5	60	115	85	140	110	165	135	190
MLD 0480N - □□P,K,N	4.8	5	65	115	90	140	115	165	140	190
MLD 0490N - □□P,K,N	4.9	5	65	115	90	140	115	165	140	190
MLD 0500N - □□P,K,N	5	5	65	115	90	140	115	165	140	190
MLD 0510N - □□P,K,N	5.1	6	70	128	95	160	120	190	150	220
MLD 0520N - □□P,K,N	5.2	6	70	128	95	160	120	190	150	220
MLD 0530N - □□P,K,N	5.3	6	70	128	95	160	120	190	150	220
MLD 0540N - □□P,K,N	5.4	6	78	128	110	160	140	190	170	220
MLD 0550N - □□P,K,N	5.5	6	78	128	110	160	140	190	170	220
MLD 0560N - □□P,K,N	5.6	6	78	128	110	160	140	190	170	220
MLD 0570N - □□P,K,N	5.7	6	78	128	110	160	140	190	170	220
MLD 0580N - □□P,K,N	5.8	6	78	128	110	160	140	190	170	220
MLD 0590N - □□P,K,N	5.9	6	78	128	110	160	140	190	170	220
MLD 0600N - □□P,K,N	6	6	78	128	110	160	140	190	170	220
MLD 0610N - □□P,K,N	6.1	7	87	140	120	175	155	210	190	250
MLD 0620N - □□P,K,N	6.2	7	87	140	120	175	155	210	190	250
MLD 0630N - □□P,K,N	6.3	7	87	140	120	175	155	210	190	250
MLD 0640N - □□P,K,N	6.4	7	87	140	120	175	155	210	190	250
MLD 0650N - □□P,K,N	6.5	7	87	140	120	175	155	210	190	250

MLD - □□(P/K/N)





DATA
p.530

• TOLERANCE

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

(mm)

Designation	ØD	Ød	10 P,M,K		15 P,M,K		20 P,M,K		25 P,M,K	
			ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD 0660N - □□P,K,N	6.6	7	87	140	120	175	155	210	190	250
MLD 0670N - □□P,K,N	6.7	7	87	140	120	175	155	210	190	250
MLD 0680N - □□P,K,N	6.8	7	90	140	125	175	160	210	200	250
MLD 0690N - □□P,K,N	6.9	7	90	140	125	175	160	210	200	250
MLD 0700N - □□P,K,N	7	7	90	140	125	175	160	210	200	250
MLD 0710N - □□P,K,N	7.1	8	100	155	135	195	170	230	-	-
MLD 0720N - □□P,K,N	7.2	8	100	155	135	195	170	230	-	-
MLD 0730N - □□P,K,N	7.3	8	100	155	135	195	170	230	-	-
MLD 0740N - □□P,K,N	7.4	8	100	155	135	195	170	230	-	-
MLD 0750N - □□P,K,N	7.5	8	100	155	135	195	170	230	-	-
MLD 0760N - □□P,K,N	7.6	8	105	155	145	195	180	230	-	-
MLD 0770N - □□P,K,N	7.7	8	105	155	145	195	180	230	-	-
MLD 0780N - □□P,K,N	7.8	8	105	155	145	195	180	230	-	-
MLD 0790N - □□P,K,N	7.9	8	105	155	145	195	180	230	-	-
MLD 0800N - □□P,K,N	8	8	105	155	145	195	180	230	-	-
MLD 0810N - □□P,K,N	8.1	9	110	165	155	210	195	260	-	-
MLD 0820N - □□P,K,N	8.2	9	110	165	155	210	195	260	-	-
MLD 0830N - □□P,K,N	8.3	9	110	165	155	210	195	260	-	-
MLD 0840N - □□P,K,N	8.4	9	110	165	155	210	195	260	-	-
MLD 0850N - □□P,K,N	8.5	9	110	165	155	210	195	260	-	-
MLD 0860N - □□P,K,N	8.6	9	115	165	160	210	210	260	-	-
MLD 0870N - □□P,K,N	8.7	9	115	165	160	210	210	260	-	-
MLD 0880N - □□P,K,N	8.8	9	115	165	160	210	210	260	-	-
MLD 0890N - □□P,K,N	8.9	9	115	165	160	210	210	260	-	-
MLD 0900N - □□P,K,N	9	9	115	165	160	210	210	260	-	-
MLD 0910N - □□P,K,N	9.1	10	125	190	170	240	-	-	-	-
MLD 0920N - □□P,K,N	9.2	10	125	190	170	240	-	-	-	-
MLD 0930N - □□P,K,N	9.3	10	125	190	170	240	-	-	-	-
MLD 0940N - □□P,K,N	9.4	10	125	190	170	240	-	-	-	-
MLD 0950N - □□P,K,N	9.5	10	125	190	170	240	-	-	-	-
MLD 0960N - □□P,K,N	9.6	10	130	190	180	240	-	-	-	-
MLD 0970N - □□P,K,N	9.7	10	130	190	180	240	-	-	-	-
MLD 0980N - □□P,K,N	9.8	10	130	190	180	240	-	-	-	-
MLD 0990N - □□P,K,N	9.9	10	130	190	180	240	-	-	-	-
MLD 1000N - □□P,K,N	10	10	130	190	180	240	-	-	-	-

Optimized tool for hole making of CFRP

MSD Plus CFRP

Mach Solid Drill Plus CFRP

- KORLOY's new diamond coated grade ND2110 offers excellent wear resistance
- The optimal cutting edge reduces burrs.

Code system

Special type

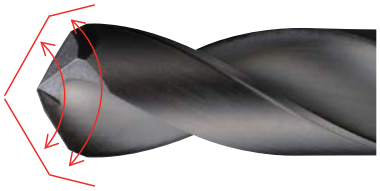
MSDP 060 - 5 C - 100L - 6S

- **MSDP** — Mach Solid Drill Plus
- **060** — Drill dia. (ØD): 060: Ø6.0 mm (One decimal place marked)
- **5** — Standard type: Aspect ratio (L/D); Special type: Flute length 100: 100 mm
- **C** — Machining area: C: CFRP
- **100L** — Overall length: 100L: 100 mm
- **6S** — Shank dia.: 6S: Ø6 mm

Features

- The cutting edge with a 2 step shape reduces the cutting load
- The optimal point angle of cutting edge reduces burrs
- Higher hardness of cutting edge increases wear resistance



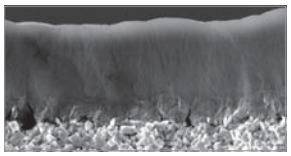


ND2110

- Diamond coating specialized in CFRP machining
- Diamond-coated substrate optimized for CFRP cutting

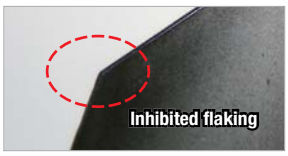


High hardness diamond coating maintains well-cut shapes

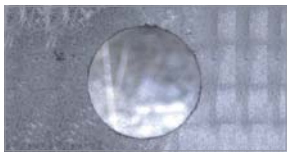


Diamond coating's strong grip to the substrate

- Inhibited burr creation by keeping cutting edges in good shape



Less wear and flaking on the rake surface

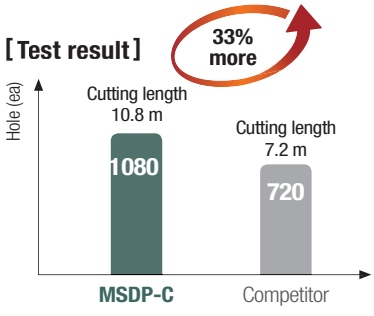


Fewer burrs on workpieces

Application examples

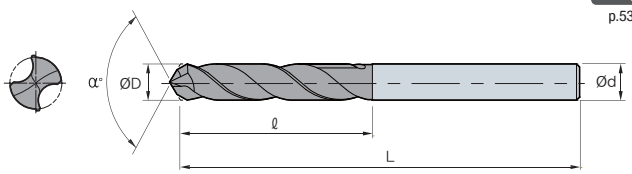
Workpiece	CFRP (Wing Tail)
Cutting condition	vc (m/min) = 100, fz (mm/t) = 0.05
	ap (mm) = 10, Air
Tool	MSDP060-5C (ND2110)





MSDP-5C





DATA
p.530

• TOLERANCE

Terminology	C
Grade	ND2100
Tolerance (drill Dia.)	m7
Tolerance (shank Dia.)	h6
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

C CFRP

(mm)

Designation	ØD	Ød	5C	
			ℓ	L
MSDP 030-5C	3.00	6	28	66
MSDP 040-5C	4.00	6	36	74
MSDP 0476-5C	4.76	6	44	82
MSDP 050-5C	5.00	6	44	82
MSDP 060-5C	6.00	6	44	82
MSDP 0635-5C	6.35	8	53	91
MSDP 070-5C	7.00	8	53	91
MSDP 0794-5C	7.94	8	53	91
MSDP 080-5C	8.00	8	53	91
MSDP 090-5C	9.00	10	61	103
MSDP 0952-5C	9.52	10	61	103
MSDP 100-5C	10.00	10	61	103
MSDP 110-5C	11.00	12	71	118
MSDP 1111-5C	11.11	12	71	118
MSDP 120-5C	12.00	12	71	118
MSDP 127-5C	12.70	14	71	124

The best tool for ramped, curved or flat workpieces

MSFD

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

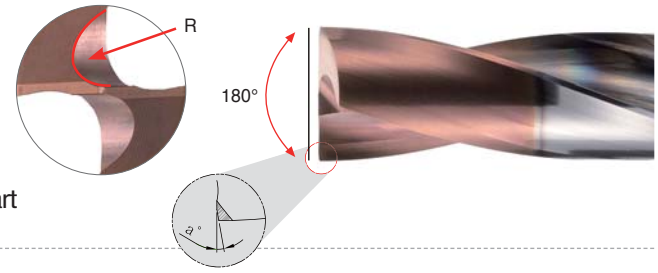
Special type

MSFD(H) 060 - 2 P - 100L - 6S

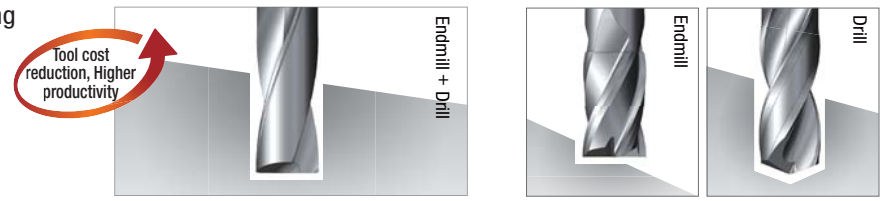
- **Oil hole**: None: MSFD; With oil holes: MSFDH
- **Drill dia. (ØD)**: 060: Ø6.0 mm (One decimal place marked)
- **Standard type**: Aspect ratio (L/D) 2D, 3D
- **Special type**: Flute length 100: 100 mm
- **Machining area**: P: General - Carbon steel, alloy steel
- **Overall length**: 100L: 100 mm
- **Shank dia.**: 6S: Ø6 mm

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

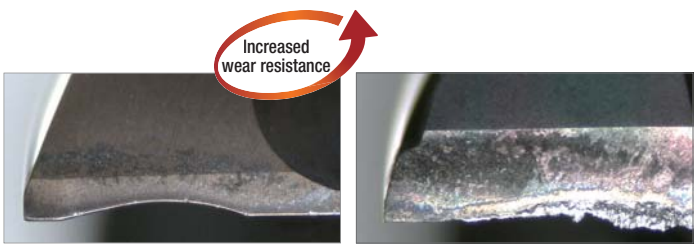


MSFD

Conventional tools used and their application

Performance evaluation

Workpiece	SM48C
Cutting condition	vc (m/min) = 80, fz (mm/min) = 0.10
Cutting length	7.2 m (600 holes)
Tool	MSFD060-2P (PC325U)

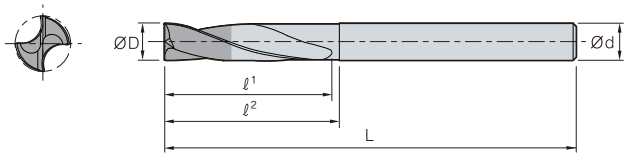


MSFD
Prolongs tool life

Competitor

MSFD-2P





DATA
p.530

• TOLERANCE

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

(mm)

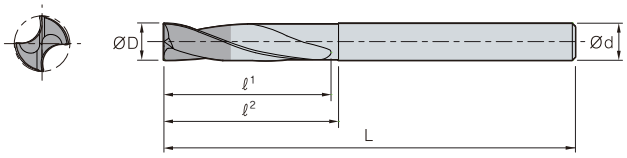
Designation	ØD	Ød	2P		
			ℓ1	ℓ2	L
MSFD 025-2P	2.5	4	10.5	11.5	50
MSFD 026-2P	2.6	4	10.9	11.9	50
MSFD 027-2P	2.7	4	11.3	12.3	50
MSFD 028-2P	2.8	4	11.8	12.8	50
MSFD 029-2P	2.9	4	12.2	13.2	50
MSFD 030-2P	3.0	6	12.6	13.6	50
MSFD 031-2P	3.1	6	13.0	14.0	50
MSFD 032-2P	3.2	6	13.4	14.4	50
MSFD 033-2P	3.3	6	13.9	14.9	50
MSFD 034-2P	3.4	6	14.3	15.3	50
MSFD 035-2P	3.5	6	14.7	15.7	50
MSFD 036-2P	3.6	6	15.1	16.1	50
MSFD 037-2P	3.7	6	15.5	16.5	50
MSFD 038-2P	3.8	6	16.0	17.0	50
MSFD 039-2P	3.9	6	16.4	17.4	50
MSFD 040-2P	4.0	6	16.8	17.8	50
MSFD 041-2P	4.1	6	17.2	18.2	60
MSFD 042-2P	4.2	6	17.6	18.6	60
MSFD 043-2P	4.3	6	18.1	19.1	60
MSFD 044-2P	4.4	6	18.5	19.5	60
MSFD 045-2P	4.5	6	18.9	19.9	60
MSFD 046-2P	4.6	6	19.3	20.3	60
MSFD 047-2P	4.7	6	19.7	20.7	60
MSFD 048-2P	4.8	6	20.2	21.2	60
MSFD 049-2P	4.9	6	20.6	21.6	60
MSFD 050-2P	5.0	6	21.0	22.0	60
MSFD 051-2P	5.1	6	21.4	22.4	60
MSFD 052-2P	5.2	6	21.8	22.8	60
MSFD 053-2P	5.3	6	22.3	23.3	60
MSFD 054-2P	5.4	6	22.7	23.7	60
MSFD 055-2P	5.5	6	23.1	24.1	60
MSFD 056-2P	5.6	6	23.5	24.5	60
MSFD 057-2P	5.7	6	23.9	24.9	60
MSFD 058-2P	5.8	6	24.4	25.4	60
MSFD 059-2P	5.9	6	24.8	25.8	60
MSFD 060-2P	6.0	6	25.2	26.2	60
MSFD 061-2P	6.1	8	25.6	26.6	70

Designation	ØD	Ød	2P		
			ℓ1	ℓ2	L
MSFD 062-2P	6.2	8	26.0	27.0	70
MSFD 063-2P	6.3	8	26.5	27.5	70
MSFD 064-2P	6.4	8	26.9	27.9	70
MSFD 065-2P	6.5	8	27.3	28.3	70
MSFD 066-2P	6.6	8	27.7	28.7	70
MSFD 067-2P	6.7	8	28.1	29.1	70
MSFD 068-2P	6.8	8	28.6	29.6	70
MSFD 069-2P	6.9	8	29.0	30.0	70
MSFD 070-2P	7.0	8	29.4	30.4	70
MSFD 071-2P	7.1	8	29.8	30.8	70
MSFD 072-2P	7.2	8	30.2	31.2	70
MSFD 073-2P	7.3	8	30.7	31.7	70
MSFD 074-2P	7.4	8	31.1	32.1	70
MSFD 075-2P	7.5	8	31.5	32.5	70
MSFD 076-2P	7.6	8	31.9	32.9	70
MSFD 077-2P	7.7	8	32.3	33.3	70
MSFD 078-2P	7.8	8	32.8	33.8	70
MSFD 079-2P	7.9	8	33.2	34.2	70
MSFD 080-2P	8.0	8	33.6	34.6	70
MSFD 081-2P	8.1	10	34.0	35.0	80
MSFD 082-2P	8.2	10	34.4	35.4	80
MSFD 083-2P	8.3	10	34.9	35.9	80
MSFD 084-2P	8.4	10	35.3	36.3	80
MSFD 085-2P	8.5	10	35.7	36.7	80
MSFD 086-2P	8.6	10	36.1	37.1	80
MSFD 087-2P	8.7	10	36.5	37.5	80
MSFD 088-2P	8.8	10	37.0	38.0	80
MSFD 089-2P	8.9	10	37.4	38.4	80
MSFD 090-2P	9.0	10	37.8	38.8	80
MSFD 091-2P	9.1	10	38.2	39.2	80
MSFD 092-2P	9.2	10	38.6	39.6	80
MSFD 093-2P	9.3	10	39.1	40.1	80
MSFD 094-2P	9.4	10	39.5	40.5	80
MSFD 095-2P	9.5	10	39.9	40.9	80
MSFD 096-2P	9.6	10	40.3	41.3	80
MSFD 097-2P	9.7	10	40.7	41.7	80
MSFD 098-2P	9.8	10	41.2	42.2	80

Drill **MSFD**

MSFD-2P





DATA
p.530

• TOLERANCE

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

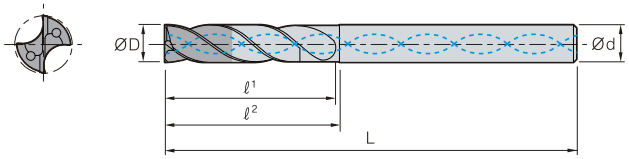
(mm)

Designation	ØD	Ød	2P		
			ℓ1	ℓ2	L
MSFD 099-2P	9.9	10	41.6	42.6	80
MSFD 100-2P	10.0	10	42.0	43.0	80
MSFD 101-2P	10.1	12	42.4	43.4	90
MSFD 102-2P	10.2	12	42.8	43.8	90
MSFD 103-2P	10.3	12	43.3	44.3	90
MSFD 104-2P	10.4	12	43.7	44.7	90
MSFD 105-2P	10.5	12	44.1	45.1	90
MSFD 106-2P	10.6	12	44.5	45.5	90
MSFD 107-2P	10.7	12	44.9	45.9	90
MSFD 108-2P	10.8	12	45.4	46.4	90
MSFD 109-2P	10.9	12	45.8	46.8	90
MSFD 110-2P	11.0	12	46.2	47.2	90
MSFD 111-2P	11.1	12	46.6	47.6	90
MSFD 112-2P	11.2	12	47.0	48.0	90
MSFD 113-2P	11.3	12	47.5	48.5	90
MSFD 114-2P	11.4	12	47.9	48.9	90
MSFD 115-2P	11.5	12	48.3	49.3	90
MSFD 116-2P	11.6	12	48.7	49.7	90
MSFD 117-2P	11.7	12	49.1	50.1	90
MSFD 118-2P	11.8	12	49.6	50.6	90
MSFD 119-2P	11.9	12	50.0	51.0	90
MSFD 120-2P	12.0	12	50.4	51.4	90
MSFD 121-2P	12.1	14	50.8	51.8	100
MSFD 122-2P	12.2	14	51.2	52.2	100
MSFD 123-2P	12.3	14	51.7	52.7	100
MSFD 124-2P	12.4	14	52.1	53.1	100
MSFD 125-2P	12.5	14	52.5	53.5	100
MSFD 126-2P	12.6	14	52.9	53.9	100
MSFD 127-2P	12.7	14	53.3	54.3	100
MSFD 128-2P	12.8	14	53.8	54.8	100
MSFD 129-2P	12.9	14	54.2	55.2	100

Designation	ØD	Ød	2P		
			ℓ1	ℓ2	L
MSFD 130-2P	13.0	14	54.6	55.6	100
MSFD 131-2P	13.1	14	55.0	56.0	100
MSFD 132-2P	13.2	14	55.4	56.4	100
MSFD 133-2P	13.3	14	55.9	56.9	100
MSFD 134-2P	13.4	14	56.3	57.3	100
MSFD 135-2P	13.5	14	56.7	57.7	110
MSFD 136-2P	13.6	14	57.1	58.1	110
MSFD 137-2P	13.7	14	57.5	58.5	110
MSFD 138-2P	13.8	14	58.0	59.0	110
MSFD 139-2P	13.9	14	58.4	59.4	110
MSFD 140-2P	14.0	14	58.8	59.8	110
MSFD 141-2P	14.1	16	59.2	60.2	110
MSFD 142-2P	14.2	16	59.6	60.6	110
MSFD 143-2P	14.3	16	60.1	61.1	110
MSFD 144-2P	14.4	16	60.5	61.5	110
MSFD 145-2P	14.5	16	60.9	61.9	110
MSFD 146-2P	14.6	16	61.3	62.3	110
MSFD 147-2P	14.7	16	61.7	62.7	110
MSFD 148-2P	14.8	16	62.2	63.2	110
MSFD 149-2P	14.9	16	62.6	63.6	110
MSFD 150-2P	15.0	16	63.0	64.0	110
MSFD 151-2P	15.1	16	65.0	66.0	115
MSFD 152-2P	15.2	16	65.0	66.0	115
MSFD 153-2P	15.3	16	65.1	66.1	115
MSFD 154-2P	15.4	16	65.1	66.1	115
MSFD 155-2P	15.5	16	65.1	66.1	115
MSFD 156-2P	15.6	16	67.1	68.1	115
MSFD 157-2P	15.7	16	67.1	68.1	115
MSFD 158-2P	15.8	16	67.2	68.2	115
MSFD 159-2P	15.9	16	67.2	68.2	115
MSFD 160-2P	16.0	16	67.2	68.2	115

MSFDH-3P





DATA
p.530

• TOLERANCE

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

(mm)

Designation	ØD	Ød	3P		
			ℓ1	ℓ2	L
MSFDH 025-3P	2.5	3	17	18	58
MSFDH 026-3P	2.6	3	17	18	58
MSFDH 027-3P	2.7	3	17	18	58
MSFDH 028-3P	2.8	3	17	18	58
MSFDH 029-3P	2.9	3	17	18	58
MSFDH 030-3P	3.0	6	20	21	62
MSFDH 031-3P	3.1	6	20	21	62
MSFDH 032-3P	3.2	6	20	21	62
MSFDH 033-3P	3.3	6	20	21	62
MSFDH 034-3P	3.4	6	20	21	62
MSFDH 035-3P	3.5	6	20	21	62
MSFDH 036-3P	3.6	6	20	21	62
MSFDH 037-3P	3.7	6	20	21	62
MSFDH 038-3P	3.8	6	24	25	66
MSFDH 039-3P	3.9	6	24	25	66
MSFDH 040-3P	4.0	6	24	25	66
MSFDH 041-3P	4.1	6	24	25	66
MSFDH 042-3P	4.2	6	24	25	66
MSFDH 043-3P	4.3	6	24	25	66
MSFDH 044-3P	4.4	6	24	25	66
MSFDH 045-3P	4.5	6	24	25	66
MSFDH 046-3P	4.6	6	24	25	66
MSFDH 047-3P	4.7	6	24	25	66
MSFDH 048-3P	4.8	6	28	29	66
MSFDH 049-3P	4.9	6	28	29	66
MSFDH 050-3P	5.0	6	28	29	66
MSFDH 051-3P	5.1	6	28	29	66
MSFDH 052-3P	5.2	6	28	29	66
MSFDH 053-3P	5.3	6	28	29	66
MSFDH 054-3P	5.4	6	28	29	66
MSFDH 055-3P	5.5	6	28	29	66
MSFDH 056-3P	5.6	6	28	29	66
MSFDH 057-3P	5.7	6	28	29	66
MSFDH 058-3P	5.8	6	28	29	66
MSFDH 059-3P	5.9	6	28	29	66
MSFDH 060-3P	6.0	6	28	29	66
MSFDH 061-3P	6.1	8	34	35	79

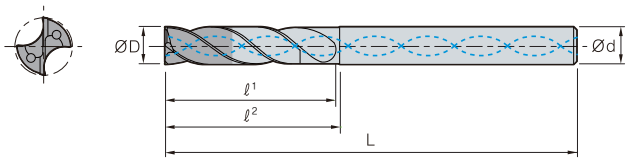
Designation	ØD	Ød	3P		
			ℓ1	ℓ2	L
MSFDH 062-3P	6.2	8	34	35	79
MSFDH 063-3P	6.3	8	34	35	79
MSFDH 064-3P	6.4	8	34	35	79
MSFDH 065-3P	6.5	8	34	35	79
MSFDH 066-3P	6.6	8	34	35	79
MSFDH 067-3P	6.7	8	34	35	79
MSFDH 068-3P	6.8	8	34	35	79
MSFDH 069-3P	6.9	8	34	35	79
MSFDH 070-3P	7.0	8	34	35	79
MSFDH 071-3P	7.1	8	41	42	79
MSFDH 072-3P	7.2	8	41	42	79
MSFDH 073-3P	7.3	8	41	42	79
MSFDH 074-3P	7.4	8	41	42	79
MSFDH 075-3P	7.5	8	41	42	79
MSFDH 076-3P	7.6	8	41	42	79
MSFDH 077-3P	7.7	8	41	42	79
MSFDH 078-3P	7.8	8	41	42	79
MSFDH 079-3P	7.9	8	41	42	79
MSFDH 080-3P	8.0	8	41	42	79
MSFDH 081-3P	8.1	10	47	48	89
MSFDH 082-3P	8.2	10	47	48	89
MSFDH 083-3P	8.3	10	47	48	89
MSFDH 084-3P	8.4	10	47	48	89
MSFDH 085-3P	8.5	10	47	48	89
MSFDH 086-3P	8.6	10	47	48	89
MSFDH 087-3P	8.7	10	47	48	89
MSFDH 088-3P	8.8	10	47	48	89
MSFDH 089-3P	8.9	10	47	48	89
MSFDH 090-3P	9.0	10	47	48	89
MSFDH 091-3P	9.1	10	47	48	89
MSFDH 092-3P	9.2	10	47	48	89
MSFDH 093-3P	9.3	10	47	48	89
MSFDH 094-3P	9.4	10	47	48	89
MSFDH 095-3P	9.5	10	47	48	89
MSFDH 096-3P	9.6	10	47	48	89
MSFDH 097-3P	9.7	10	47	48	89
MSFDH 098-3P	9.8	10	47	48	89

Drill

MSFD

MSFDH-3P





DATA
p.530

• TOLERANCE

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

(mm)

Designation	ØD	Ød	3P		
			ℓ1	ℓ2	L
MSFDH 099-3P	9.9	10	47	48	89
MSFDH 100-3P	10.0	10	47	48	89
MSFDH 101-3P	10.1	12	55	56	102
MSFDH 102-3P	10.2	12	55	56	102
MSFDH 103-3P	10.3	12	55	56	102
MSFDH 104-3P	10.4	12	55	56	102
MSFDH 105-3P	10.5	12	55	56	102
MSFDH 106-3P	10.6	12	55	56	102
MSFDH 107-3P	10.7	12	55	56	102
MSFDH 108-3P	10.8	12	55	56	102
MSFDH 109-3P	10.9	12	55	56	102
MSFDH 110-3P	11.0	12	55	56	102
MSFDH 111-3P	11.1	12	55	56	102
MSFDH 112-3P	11.2	12	55	56	102
MSFDH 113-3P	11.3	12	55	56	102
MSFDH 114-3P	11.4	12	55	56	102
MSFDH 115-3P	11.5	12	55	56	102
MSFDH 116-3P	11.6	12	55	56	102
MSFDH 117-3P	11.7	12	55	56	102
MSFDH 118-3P	11.8	12	55	56	102
MSFDH 119-3P	11.9	12	55	56	102
MSFDH 120-3P	12.0	12	55	56	102
MSFDH 121-3P	12.1	14	60	61	107
MSFDH 122-3P	12.2	14	60	61	107
MSFDH 123-3P	12.3	14	60	61	107
MSFDH 124-3P	12.4	14	60	61	107
MSFDH 125-3P	12.5	14	60	61	107
MSFDH 126-3P	12.6	14	60	61	107
MSFDH 127-3P	12.7	14	60	61	107
MSFDH 128-3P	12.8	14	60	61	107
MSFDH 129-3P	12.9	14	60	61	107

Designation	ØD	Ød	3P		
			ℓ1	ℓ2	L
MSFDH 130-3P	13.0	14	60	61	107
MSFDH 131-3P	13.1	14	60	61	107
MSFDH 132-3P	13.2	14	60	61	107
MSFDH 133-3P	13.3	14	60	61	107
MSFDH 134-3P	13.4	14	60	61	107
MSFDH 135-3P	13.5	14	60	61	107
MSFDH 136-3P	13.6	14	60	61	107
MSFDH 137-3P	13.7	14	60	61	107
MSFDH 138-3P	13.8	14	60	61	107
MSFDH 139-3P	13.9	14	60	61	107
MSFDH 140-3P	14.0	14	60	61	107
MSFDH 141-3P	14.1	16	65	66	115
MSFDH 142-3P	14.2	16	65	66	115
MSFDH 143-3P	14.3	16	65	66	115
MSFDH 144-3P	14.4	16	65	66	115
MSFDH 145-3P	14.5	16	65	66	115
MSFDH 146-3P	14.6	16	65	66	115
MSFDH 147-3P	14.7	16	65	66	115
MSFDH 148-3P	14.8	16	65	66	115
MSFDH 149-3P	14.9	16	65	66	115
MSFDH 150-3P	15.0	16	65	66	115
MSFDH 151-3P	15.1	16	65	66	115
MSFDH 152-3P	15.2	16	65	66	115
MSFDH 153-3P	15.3	16	65	66	115
MSFDH 154-3P	15.4	16	65	66	115
MSFDH 155-3P	15.5	16	65	66	115
MSFDH 156-3P	15.6	16	65	66	115
MSFDH 157-3P	15.7	16	65	66	115
MSFDH 158-3P	15.8	16	65	66	115
MSFDH 159-3P	15.9	16	65	66	115
MSFDH 160-3P	16.0	16	65	66	115

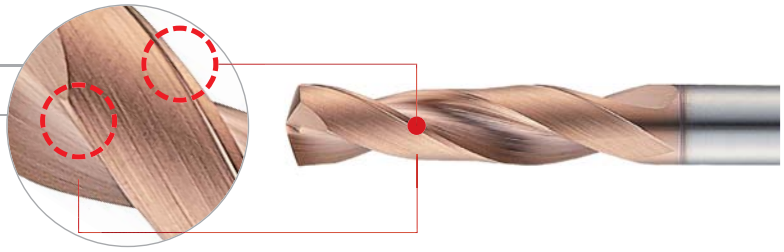
General use drill with DIN standard

P-Star Drill

DIN standardized drill suitable for (~HRC50) high speed machining

- Applicable for high speed and high feed machining with high toughness substrate
- Enhanced surface hardness and heat resistance with new coating implementation
- Internal coolant types are also available with improved machinability and reduced friction heat

Features

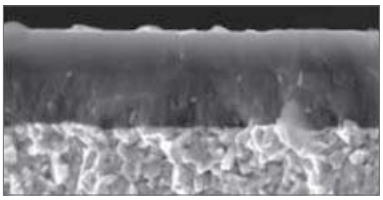


Features of drill

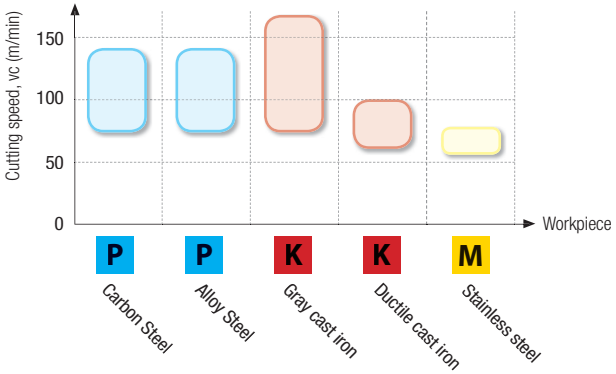
- Excellent straightness with its 180° - point angle when drilling on ramped surface
- Stronger resistance to chipping through corner chamfering
- Widened chip pockets by the use of 'R' shape on the thinning part

Features of substrate/grade

- Enhanced surface hardness and heat resistance with TiAlN coating implementation
- Excellent chipping resistance in high speed and high feed machining with high toughness substrate
- Applicable for various workpieces such as alloy steel, cast iron, stainless steel and pre-hardened steel
- Recommended for (~HRC50) high speed cutting



Application area



Code system

P	I	505	A	-	040
P-Star Drill	Appearance	Drilling depth	Shank type		Cutting dia.
P: P-Star Drill S: Spiral Coolant HP: High Precision	F: Facet Point I: Internal Coolant	503: 3×D 505: 5×D 508: 8×D 510: 10×D 520: 20×D	A: Plane F: DIN 6535 HE		3 ~ 20 mm

P-Star Drill

EDP. NO.		Flute	Feature		Length					Internal Coolant	Margin Type	Tolerance D	Diameter range (Ø)	
INCH : ◆ METRIC : ◇			Relief	Facet	3×D	5×D	8×D	10×D	20×D				Min.	Max.
HP503	◆ ◇	2		○	○						Double	m7	3	16
HPI503	◇	2		○	○					○	Double	m7	3	20
HPI505	◆ ◇	2		○		○				○	Double	m7	3	20
HPI508-N	◆ ◇	2		○			○			○	Double	m7	3	20
P503A(F)	◇	2	○		○						Single	m7	3	20
PI503A(F	◇	2		○	○					○	Single	m7	3	20
PI505A(F)	◇	2		○		○				○	Single	m7	4	20

EDP. NO	Appearance	Type	Drills dia.	Page
HP503		DIN 6537K Double margin drill - 3×D	Ø3.0 ~ Ø16.0	299~300
HPI503		DIN 6537K Double margin internal coolant drill - 3×D	Ø3.0 ~ Ø20.0	301~303
HPI505		DIN 6537L Double margin internal coolant drill - 5×D	Ø3.0 ~ Ø20.0	304~306
HPI508-N		Double margin internal coolant drill - 8×D	Ø3.0 ~ Ø20.0	307~308
P503A(F)		DIN 6537K type drill	Ø3.0 ~ Ø20.0	309~310
PI503A(F)		DIN 6537K type internal coolant drill	Ø3.0 ~ Ø20.0	311~312
PI505A(F)		DIN 6537L type internal coolant drill	Ø4.0 ~ Ø20.0	313~314

HP503

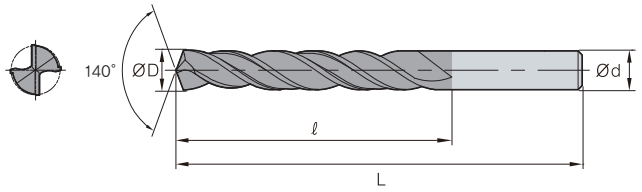
DIN 6537K Double margin drill - 3×D



DIN 6537K | ULTRA FINE | 30° HELIX | TiAlN | 3×D | 140° | DATA p.531

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø16	+0.025 ~ +0.007mm	



(mm)

Designation	ØD		Ød	ℓ	L
	mm	inch			
HP503 030	3	0.1181	6	20	62
HP503 031	3.1	0.1220	6	20	62
HP503 032	3.2	0.1260	6	20	62
HP503 033	3.3	0.1299	6	20	62
HP503 034	3.4	0.1339	6	20	62
HP503 035	3.5	0.1378	6	20	62
HP503 036	3.6	0.1417	6	20	62
HP503 037	3.7	0.1457	6	20	62
HP503 038	3.8	0.1496	6	24	66
HP503 039	3.9	0.1535	6	24	66
HP503 040	4	0.1575	6	24	66
HP503 041	4.1	0.1614	6	24	66
HP503 042	4.2	0.1654	6	24	66
HP503 043	4.3	0.1693	6	24	66
HP503 044	4.4	0.1732	6	24	66
HP503 045	4.5	0.1772	6	24	66
HP503 046	4.6	0.1811	6	24	66
HP503 047	4.7	0.1850	6	24	66
HP503 048	4.8	0.1890	6	28	66
HP503 049	4.9	0.1929	6	28	66
HP503 050	5	0.1969	6	28	66
HP503 051	5.1	0.2008	6	28	66
HP503 052	5.2	0.2047	6	28	66
HP503 053	5.3	0.2087	6	28	66
HP503 054	5.4	0.2126	6	28	66
HP503 055	5.5	0.2165	6	28	66
HP503 056	5.6	0.2205	6	28	66
HP503 057	5.7	0.2244	6	28	66
HP503 058	5.8	0.2283	6	28	66
HP503 059	5.9	0.2322	6	28	66
HP503 060	6	0.2362	6	28	66
HP503 061	6.1	0.2402	8	34	79
HP503 062	6.2	0.2441	8	34	79
HP503 063	6.3	0.2480	8	34	79
HP503 064	6.4	0.2520	8	34	79
HP503 065	6.5	0.2559	8	34	79
HP503 066	6.6	0.2598	8	34	79

Designation	ØD		Ød	ℓ	L
	mm	inch			
HP503 067	6.7	0.2638	8	34	79
HP503 068	6.8	0.2677	8	34	79
HP503 069	6.9	0.2717	8	34	79
HP503 070	7	0.2756	8	34	79
HP503 071	7.1	0.2795	8	41	79
HP503 072	7.2	0.2835	8	41	79
HP503 073	7.3	0.2874	8	41	79
HP503 074	7.4	0.2913	8	41	79
HP503 075	7.5	0.2953	8	41	79
HP503 076	7.6	0.2992	8	41	79
HP503 077	7.7	0.3031	8	41	79
HP503 078	7.8	0.3071	8	41	79
HP503 079	7.9	0.3110	8	41	79
HP503 080	8	0.3150	8	41	79
HP503 081	8.1	0.3189	10	47	89
HP503 082	8.2	0.3228	10	47	89
HP503 083	8.3	0.3268	10	47	89
HP503 084	8.4	0.3307	10	47	89
HP503 085	8.5	0.3346	10	47	89
HP503 086	8.6	0.3386	10	47	89
HP503 087	8.7	0.3425	10	47	89
HP503 088	8.8	0.3465	10	47	89
HP503 089	8.9	0.3504	10	47	89
HP503 090	9	0.3543	10	47	89
HP503 091	9.1	0.3583	10	47	89
HP503 092	9.2	0.3622	10	47	89
HP503 093	9.3	0.3661	10	47	89
HP503 094	9.4	0.3701	10	47	89
HP503 095	9.5	0.3740	10	47	89
HP503 096	9.6	0.3780	10	47	89
HP503 097	9.7	0.3819	10	47	89
HP503 098	9.8	0.3858	10	47	89
HP503 099	9.9	0.3898	10	47	89
HP503 100	10	0.3937	10	47	89
HP503 101	10.1	0.3976	12	55	102
HP503 102	10.2	0.4016	12	55	102
HP503 103	10.3	0.4055	12	55	102

P-Star Drill

HP503

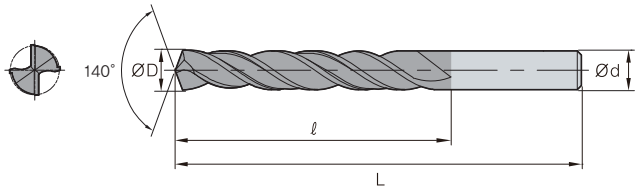
DIN 6537K Double margin drill - 3×D



DIN 6537K | ULTRA FINE | 30° HELIX | TiAlN | 3×D | 140° | DATA p.531

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø16	+0.025 ~ +0.007mm	



(mm)

Designation	ØD		Ød	ℓ	L
	mm	inch			
HP503 104	10.4	0.4094	12	55	102
HP503 105	10.5	0.4134	12	55	102
HP503 106	10.6	0.4173	12	55	102
HP503 107	10.7	0.4213	12	55	102
HP503 108	10.8	0.4252	12	55	102
HP503 109	10.9	0.4291	12	55	102
HP503 110	11	0.4331	12	55	102
HP503 111	11.1	0.4370	12	55	102
HP503 112	11.2	0.4409	12	55	102
HP503 113	11.3	0.4449	12	55	102
HP503 114	11.4	0.4488	12	55	102
HP503 115	11.5	0.4528	12	55	102
HP503 116	11.6	0.4567	12	55	102
HP503 117	11.7	0.4606	12	55	102
HP503 118	11.8	0.4646	12	55	102
HP503 119	11.9	0.4685	12	55	102
HP503 120	12	0.4724	12	55	102
HP503 121	12.1	0.4764	14	60	107
HP503 122	12.2	0.4803	14	60	107
HP503 123	12.3	0.4843	14	60	107
HP503 124	12.4	0.4882	14	60	107

Designation	ØD		Ød	ℓ	L
	mm	inch			
HP503 125	12.5	0.4921	14	60	107
HP503 126	12.6	0.4961	14	60	107
HP503 127	12.7	0.5000	14	60	107
HP503 128	12.8	0.5039	14	60	107
HP503 129	12.9	0.5079	14	60	107
HP503 130	13	0.5118	14	60	107
HP503 131	13.1	0.5157	14	60	107
HP503 132	13.2	0.5157	14	60	107
HP503 133	13.3	0.5236	14	60	107
HP503 135	13.5	0.5315	14	60	107
HP503 137	13.7	0.5394	14	60	107
HP503 140	14	0.5512	14	60	107
HP503 142	14.2	0.5591	16	65	115
HP503 143	14.3	0.5630	16	65	115
HP503 145	14.5	0.5709	16	65	115
HP503 146	14.6	0.5787	16	65	115
HP503 148	14.8	0.5827	16	65	115
HP503 150	15	0.5906	16	65	115
HP503 155	15.5	0.6102	16	65	115
HP503 157	15.7	0.6181	16	65	115
HP503 160	16	0.6299	16	65	115

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy Steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

HPI503

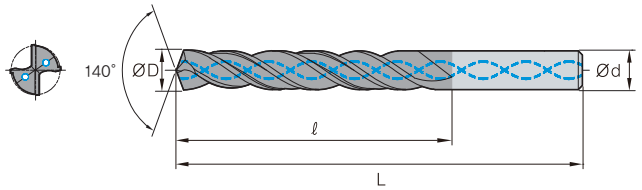
DIN 6537K type Double margin internal coolant drill - 3×D

DIN 6537K | ULTRA FINE | 30° HELIX | TiAlN | 3×D | 140° | DATA p.531



• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI503 030	3	-	0.1181	6	20	62
HPI503 031	3.1	-	0.1120	6	20	62
HPI503 03175	3.175	1/8	0.1250	6	20	62
HPI503 032	3.2	-	0.1260	6	20	62
HPI503 03264	3.264	-	0.1285	6	20	62
HPI503 033	3.3	-	0.1299	6	20	62
HPI503 034	3.4	-	0.1339	6	20	62
HPI503 035	3.5	-	0.1378	6	20	62
HPI503 03572	3.572	9/64	0.1406	6	20	62
HPI503 036	3.6	-	0.1417	6	20	62
HPI503 037	3.7	-	0.1457	6	20	62
HPI503 038	3.8	-	0.1496	6	24	66
HPI503 039	3.9	-	0.1535	6	24	66
HPI503 0397	3.97	5/32	0.1563	6	24	66
HPI503 040	4	-	0.1575	6	24	66
HPI503 04039	4.039	-	0.1590	6	24	66
HPI503 041	4.1	-	0.1614	6	24	66
HPI503 042	4.2	-	0.1654	6	24	66
HPI503 043	4.3	-	0.1693	6	24	66
HPI503 04366	4.366	-	0.1719	6	24	66
HPI503 044	4.4	-	0.1732	6	24	66
HPI503 045	4.5	-	0.1772	6	24	66
HPI503 046	4.6	-	0.1811	6	24	66
HPI503 047	4.7	-	0.1850	6	24	66
HPI503 04763	4.763	3/16	0.1875	6	28	66
HPI503 048	4.8	-	0.1890	6	28	66
HPI503 049	4.9	-	0.1929	6	28	66
HPI503 050	5	-	0.1969	6	28	66
HPI503 051	5.1	-	0.2008	6	28	66
HPI503 05159	5.159	13/64	0.2031	6	28	66
HPI503 052	5.2	-	0.2047	6	28	66
HPI503 053	5.3	-	0.2087	6	28	66
HPI503 054	5.4	-	0.2126	6	28	66
HPI503 055	5.5	-	0.2165	6	28	66
HPI503 05558	5.558	7/32	0.2188	6	28	66

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI503 056	5.6	-	0.2205	6	28	66
HPI503 057	5.7	-	0.2244	6	28	66
HPI503 058	5.8	-	0.2283	6	28	66
HPI503 059	5.9	-	0.2323	6	28	66
HPI503 05953	5.953	15/64	0.2344	6	28	66
HPI503 060	6	-	0.2362	6	28	66
HPI503 061	6.1	-	0.2402	8	34	79
HPI503 062	6.2	-	0.2441	8	34	79
HPI503 063	6.3	-	0.2480	8	34	79
HPI503 0635	6.35	1/4	0.2500	8	34	79
HPI503 064	6.4	-	0.2520	8	34	79
HPI503 065	6.5	-	0.2559	8	34	79
HPI503 066	6.6	-	0.2598	8	34	79
HPI503 067	6.7	-	0.2638	8	34	79
HPI503 06747	6.747	17/64	0.2656	8	34	79
HPI503 068	6.8	-	0.2677	8	34	79
HPI503 069	6.9	-	0.2717	8	34	79
HPI503 070	7	-	0.2756	8	34	79
HPI503 071	7.1	-	0.2795	8	41	79
HPI503 07145	7.145	9/32	0.2813	8	41	79
HPI503 072	7.2	-	0.2835	8	41	79
HPI503 073	7.3	-	0.2874	8	41	79
HPI503 074	7.4	-	0.2913	8	41	79
HPI503 075	7.5	-	0.2953	8	41	79
HPI503 07541	7.541	19/64	0.2969	8	41	79
HPI503 076	7.6	-	0.2992	8	41	79
HPI503 077	7.7	-	0.3031	8	41	79
HPI503 078	7.8	-	0.0371	8	41	79
HPI503 079	7.9	-	0.3110	8	41	79
HPI503 07938	7.938	5/16	0.3125	8	41	79
HPI503 080	8	-	0.3150	8	41	79
HPI503 081	8.1	-	0.3189	10	47	89
HPI503 082	8.2	-	0.3228	10	47	89
HPI503 083	8.3	-	0.3268	10	47	89
HPI503 08334	8.334	21/64	0.3281	10	47	89

P-Star Drill

HPI503

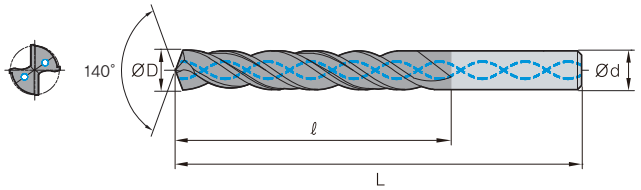
DIN 6537K type Double margin internal coolant drill - 3×D



DIN 6537K | ULTRA FINE | 30° HELIX | TiAlN | ▸3×D | 140° | DATA p.531

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI503 0834	8.34	-	0.3283	10	47	89
HPI503 084	8.4	-	0.3307	10	47	89
HPI503 085	8.5	-	0.3346	10	47	89
HPI503 086	8.6	-	0.3386	10	47	89
HPI503 087	8.7	-	0.3425	10	47	89
HPI503 08733	8.733	11/32	0.3438	10	47	89
HPI503 088	8.8	-	0.3465	10	47	89
HPI503 089	8.9	-	0.6504	10	47	89
HPI503 090	9	-	0.3543	10	47	89
HPI503 091	9.1	-	0.3583	10	47	89
HPI503 09129	9.129	23/64	0.3594	10	47	89
HPI503 092	9.2	-	0.3622	10	47	89
HPI503 093	9.3	-	0.3661	10	47	89
HPI503 094	9.4	-	0.3680	10	47	89
HPI503 095	9.5	-	0.3740	10	47	89
HPI503 09525	9.525	3/8	0.3750	10	47	89
HPI503 096	9.6	-	0.3780	10	47	89
HPI503 097	9.7	-	0.3819	10	47	89
HPI503 098	9.8	-	0.3858	10	47	89
HPI503 099	9.9	-	0.3898	10	47	89
HPI503 09921	9.9921	25/64	0.3906	10	47	89
HPI503 100	10	-	0.3937	10	47	89
HPI503 101	10.1	-	0.3976	12	55	105
HPI503 102	10.2	-	0.4016	12	55	105
HPI503 103	10.3	-	0.4055	12	55	105
HPI503 1032	10.32	13/32	0.4063	12	55	105
HPI503 104	10.4	-	0.4094	12	55	105
HPI503 105	10.5	-	0.4134	12	55	105
HPI503 106	10.6	-	0.4173	12	55	105
HPI503 107	10.7	-	0.4213	12	55	105
HPI503 10716	10.716	27/64	0.4219	12	55	105
HPI503 108	10.8	-	0.4252	12	55	105
HPI503 109	10.9	-	0.4291	12	55	105
HPI503 110	11	-	0.4331	12	55	105
HPI503 111	11.1	-	0.4370	12	55	105

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI503 11113	11.113	7/16	0.4375	12	55	105
HPI503 112	11.2	-	0.4409	12	55	105
HPI503 113	11.3	-	0.4449	12	55	105
HPI503 114	11.4	-	0.4488	12	55	105
HPI503 115	11.5	-	0.4528	12	55	105
HPI503 11509	11.509	29/64	0.4531	12	55	105
HPI503 116	11.6	-	0.4567	12	55	105
HPI503 117	11.7	-	0.4606	12	55	105
HPI503 118	11.8	-	0.4646	12	55	105
HPI503 119	11.9	-	0.4685	12	55	105
HPI503 11908	11.908	15/32	0.4688	12	55	105
HPI503 120	12	-	0.4724	12	55	105
HPI503 121	12.1	-	0.4764	14	60	107
HPI503 122	12.2	-	0.4803	14	60	107
HPI503 123	12.3	-	0.4843	14	60	107
HPI503 12304	12.304	31/64	0.4844	14	60	107
HPI503 124	12.4	-	0.4882	14	60	107
HPI503 125	12.5	-	0.4921	14	60	107
HPI503 126	12.6	-	0.4961	14	60	107
HPI503 127	12.7	1/2	0.5000	14	60	107
HPI503 128	12.8	-	0.5039	14	60	107
HPI503 129	12.9	-	0.5079	14	60	107
HPI503 130	13	-	0.5118	14	60	107
HPI503 132	13.2	-	0.5197	14	60	107
HPI503 133	13.3	-	0.5236	14	60	107
HPI503 13494	13.494	17/32	0.5313	14	60	107
HPI503 135	13.5	-	0.5315	14	60	107
HPI503 137	13.7	-	0.5394	14	60	107
HPI503 13891	13.891	35/64	0.5469	14	60	107
HPI503 140	14	-	0.5512	14	60	107
HPI503 141	14.1	-	0.5551	16	65	115
HPI503 142	14.2	-	0.5591	16	65	115
HPI503 14288	14.288	9/16	0.5625	16	65	115
HPI503 145	14.5	-	0.5709	16	65	115
HPI503 146	14.6	-	0.5746	16	65	115

HPI503

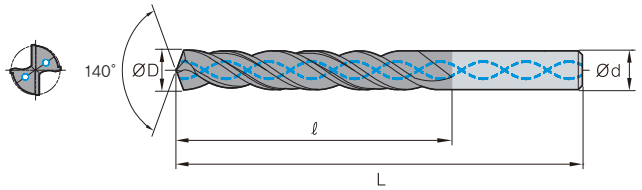
DIN 6537K type Double margin internal coolant drill - 3×D

DIN 6537K | ULTRA FINE | 30° HELIX | TiAlN | 3×D | 140° | DATA p.531



• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI503 147	14.7	-	0.5787	16	65	115
HPI503 150	15	-	0.5906	16	65	115
HPI503 15081	15.081	19/32	0.5937	16	65	115
HPI503 155	15.5	-	0.6102	16	65	115
HPI503 157	15.7	-	0.6181	16	65	115
HPI503 158	15.8	-	0.6220	16	65	115
HPI503 15875	15.875	5/8	0.6250	16	65	115
HPI503 160	16	-	0.6299	16	65	115
HPI503 162	16.2	-	0.6378	18	73	123
HPI503 163	16.3	-	0.6417	18	73	123
HPI503 165	16.5	-	0.6496	18	73	123
HPI503 167	16.7	-	0.6575	18	73	123

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI503 168	16.8	-	0.6614	18	73	123
HPI503 170	17	-	0.6693	18	73	123
HPI503 171	17.1	-	0.6732	18	73	123
HPI503 17463	17.463	11/16	0.6875	18	73	123
HPI503 175	17.5	-	0.6890	18	73	123
HPI503 180	18	-	0.7087	18	73	123
HPI503 185	18.5	-	0.7883	20	79	131
HPI503 190	19	-	0.7480	20	79	131
HPI503 1905	19.05	3/4	0.7500	20	79	131
HPI503 197	19.7	-	0.7756	20	79	131
HPI503 200	20	-	0.7874	20	79	131

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

P-Star Drill

HPI505

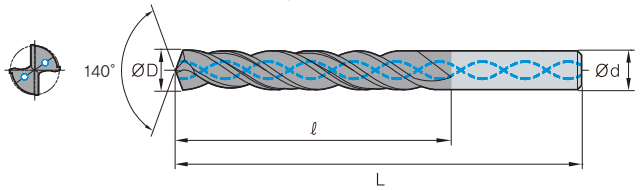
DIN 6537L type Double margin internal coolant drill - 5×D



DIN 6537L | ULTRA FINE | 30° HELIX | TiAlN | ▸5×D | 140° | DATA p.531

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI505 030	3	-	0.1181	6	30	66
HPI505 031	3.1	-	0.1120	6	30	66
HPI505 03175	3.175	-	0.1250	6	30	66
HPI505 032	3.2	-	0.1260	6	30	66
HPI505 03264	3.264	1/8	0.1285	6	30	66
HPI505 033	3.3	-	0.1299	6	30	66
HPI505 034	3.4	-	0.1339	6	30	66
HPI505 035	3.5	-	0.1378	6	30	66
HPI505 03572	3.572	9/64	0.1406	6	30	66
HPI505 036	3.6	-	0.1417	6	30	66
HPI505 037	3.7	-	0.1457	6	30	66
HPI505 038	3.8	-	0.1496	6	36	74
HPI505 039	3.9	-	0.1535	6	36	74
HPI505 0397	3.97	5/32	0.1563	6	36	74
HPI505 040	4	-	0.1575	6	36	74
HPI505 04039	4.039	-	0.1590	6	36	74
HPI505 041	4.1	-	0.1614	6	36	74
HPI505 042	4.2	-	0.1654	6	36	74
HPI505 043	4.3	-	0.1693	6	36	74
HPI505 04366	4.366	-	0.1719	6	36	74
HPI505 044	4.4	-	0.1732	6	36	74
HPI505 045	4.5	-	0.1772	6	36	74
HPI505 0458	4.58	-	0.1803	6	36	74
HPI505 046	4.6	-	0.1811	6	36	74
HPI505 04623	4.623	-	0.1820	6	36	74
HPI505 047	4.7	-	0.1850	6	36	74
HPI505 04763	4.763	3/16	0.1875	6	44	82
HPI505 048	4.8	-	0.1890	6	44	82
HPI505 049	4.9	-	0.1929	6	44	82
HPI505 050	5	-	0.1969	6	44	82
HPI505 051	5.1	-	0.2008	6	44	82
HPI505 05159	5.159	13/64	0.2031	6	44	82
HPI505 052	5.2	-	0.2047	6	44	82
HPI505 053	5.3	-	0.2087	6	44	82
HPI505 054	5.4	-	0.2126	6	44	82
HPI505 0541	5.41	-	0.2130	6	44	82
HPI505 055	5.5	-	0.2165	6	44	82

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI505 05558	5.558	7/32	0.2188	6	44	82
HPI505 056	5.6	-	0.2205	6	44	82
HPI505 057	5.7	-	0.2244	6	44	82
HPI505 058	5.8	-	0.2283	6	44	82
HPI505 059	5.9	-	0.2323	6	44	82
HPI505 05953	5.953	15/64	0.2344	6	44	82
HPI505 060	6	-	0.2362	6	44	82
HPI505 061	6.1	-	0.2402	8	53	91
HPI505 062	6.2	-	0.2441	8	53	91
HPI505 063	6.3	-	0.2480	8	53	91
HPI505 0635	6.35	1/4	0.2500	8	53	91
HPI505 064	6.4	-	0.2520	8	53	91
HPI505 065	6.5	-	0.2559	8	53	91
HPI505 06528	6.528	-	0.2570	8	53	91
HPI505 066	6.6	-	0.2598	8	53	91
HPI505 067	6.7	-	0.2638	8	53	91
HPI505 06747	6.747	17/64	0.2656	8	53	91
HPI505 068	6.8	-	0.2677	8	53	91
HPI505 069	6.9	-	0.2717	8	53	91
HPI505 06909	6.909	-	0.2720	8	53	91
HPI505 070	7	-	0.2756	8	53	91
HPI505 071	7.1	-	0.2795	8	53	91
HPI505 07145	7.145	9/32	0.2813	8	53	91
HPI505 072	7.2	-	0.2835	8	53	91
HPI505 073	7.3	-	0.2874	8	53	91
HPI505 074	7.4	-	0.2913	8	53	91
HPI505 075	7.5	-	0.2953	8	53	91
HPI505 07541	7.541	19/64	0.2969	8	53	91
HPI505 076	7.6	-	0.2992	8	53	91
HPI505 077	7.7	-	0.3031	8	53	91
HPI505 078	7.8	-	0.3071	8	53	91
HPI505 079	7.9	-	0.3110	8	53	91
HPI505 07938	7.938	5/16	0.3125	8	53	91
HPI505 080	8	-	0.3150	8	53	91
HPI505 081	8.1	-	0.3189	10	61	103
HPI505 082	8.2	-	0.3228	10	61	103
HPI505 083	8.3	-	0.3268	10	61	103

HPI505

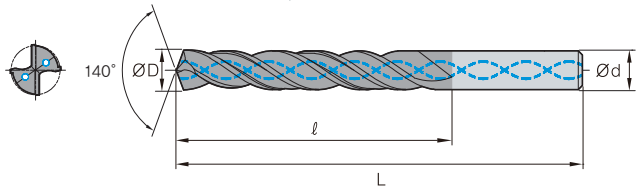
DIN 6537L type Double margin internal coolant drill - 5×D



DIN 6537L | ULTRA FINE | 30° HELIX | TiAlN | 5×D | 140° | DATA p.531

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI505 08334	8.334	21/64	0.3281	10	61	103
HPI505 084	8.4	-	0.3307	10	61	103
HPI505 08433	8.433	-	0.3320	10	61	103
HPI505 085	8.5	-	0.3346	10	61	103
HPI505 086	8.6	-	0.3386	10	61	103
HPI505 087	8.7	-	0.3425	10	61	103
HPI505 08733	8.733	11/32	0.3438	10	61	103
HPI505 088	8.8	-	0.3465	10	61	103
HPI505 089	8.9	-	0.3504	10	61	103
HPI505 090	9	-	0.3543	10	61	103
HPI505 091	9.1	-	0.3583	10	61	103
HPI505 09129	9.129	23/64	0.3594	10	61	103
HPI505 092	9.2	-	0.3622	10	61	103
HPI505 093	9.3	-	0.3661	10	61	103
HPI505 09347	9.347	-	0.3680	10	61	103
HPI505 094	9.4	-	0.3701	10	61	103
HPI505 095	9.5	-	0.3740	10	61	103
HPI505 09525	9.525	3/8	0.3750	10	61	103
HPI505 096	9.6	-	0.3780	10	61	103
HPI505 097	9.7	-	0.3819	10	61	103
HPI505 09703	9.703	-	0.3820	10	61	103
HPI505 09746	9.746	-	0.3837	10	61	103
HPI505 098	9.8	-	0.3858	10	61	103
HPI505 099	9.9	-	0.3898	10	61	103
HPI505 09921	9.921	25/64	0.3906	10	61	103
HPI505 100	10	-	0.3937	10	61	103
HPI505 101	10.1	-	0.3976	12	71	118
HPI505 102	10.2	-	0.4016	12	71	118
HPI505 103	10.3	-	0.4055	12	71	118
HPI505 1032	10.32	13/32	0.4063	12	71	118
HPI505 104	10.4	-	0.4074	12	71	118
HPI505 105	10.5	-	0.4134	12	71	118
HPI505 106	10.6	-	0.4173	12	71	118
HPI505 107	10.7	-	0.4213	12	71	118
HPI505 10716	10.716	27/64	0.4219	12	71	118
HPI505 108	10.8	-	0.4252	12	71	118
HPI505 109	10.9	-	0.4291	12	71	118

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI505 110	11	-	0.4331	12	71	118
HPI505 111	11.1	-	0.4370	12	71	118
HPI505 11113	11.113	7/16	0.4375	12	71	118
HPI505 112	11.2	-	0.4409	12	71	118
HPI505 113	11.3	-	0.4449	12	71	118
HPI505 114	11.4	-	0.4488	12	71	118
HPI505 115	11.5	-	0.4528	12	71	118
HPI505 11509	11.509	29/64	0.4531	12	71	118
HPI505 116	11.6	-	0.4567	12	71	118
HPI505 117	11.7	-	0.4606	12	71	118
HPI505 118	11.8	-	0.4646	12	71	118
HPI505 119	11.9	-	0.4685	12	71	118
HPI505 11908	11.908	15/32	0.4688	12	71	118
HPI505 120	12	-	0.4724	12	71	118
HPI505 121	12.1	-	0.4764	14	77	124
HPI505 122	12.2	-	0.4803	14	77	124
HPI505 123	12.3	-	0.4843	14	77	124
HPI505 12304	12.304	31/64	0.4844	14	77	124
HPI505 124	12.4	-	0.4882	14	77	124
HPI505 125	12.5	-	0.4921	14	77	124
HPI505 126	12.6	-	0.4961	14	77	124
HPI505 127	12.7	1/2	0.5000	14	77	124
HPI505 128	12.8	-	0.5039	14	77	124
HPI505 129	12.9	-	0.5079	14	77	124
HPI505 12903	12.903	-	0.5080	14	77	124
HPI505 130	13	-	0.5118	14	77	124
HPI505 13096	13.096	33/64	0.5156	14	77	124
HPI505 131	13.1	-	0.5157	14	77	124
HPI505 132	13.2	-	0.5197	14	77	124
HPI505 133	13.3	-	0.5236	14	77	124
HPI505 134	13.4	-	0.5276	14	77	124
HPI505 13494	13.494	17/32	0.5313	14	77	124
HPI505 135	13.5	-	0.5315	14	77	124
HPI505 137	13.7	-	0.5394	14	77	124
HPI505 138	13.8	-	0.5433	14	77	124
HPI505 13891	13.981	35/64	0.5504	14	77	124
HPI505 140	14	-	0.5512	14	77	124

P-Star Drill

HPI505

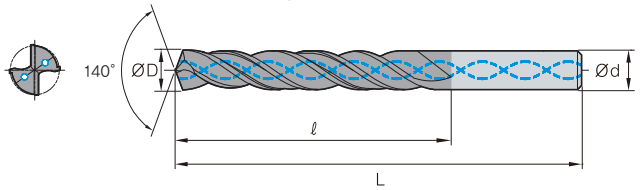
DIN 6537L type Double margin internal coolant drill - 5×D



DIN 6537L | ULTRA FINE | 30° HELIX | TiAlN | ▸5×D | 140° | DATA p.531

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI505 141	14.1	-	0.5551	16	83	133
HPI505 142	14.2	-	0.5591	16	83	133
HPI505 14288	14.288	9/16	0.5625	16	83	133
HPI505 145	14.5	-	0.5709	16	83	133
HPI505 146	14.6	-	0.5748	16	83	133
HPI505 147	14.7	-	0.5787	16	83	133
HPI505 148	14.8	-	0.5827	16	83	133
HPI505 149	14.9	-	0.5866	16	83	133
HPI505 150	15	-	0.5906	16	83	133
HPI505 15081	15.081	19/32	0.5937	16	83	133
HPI505 151	15.1	-	0.5945	16	83	133
HPI505 152	15.2	-	0.5984	16	83	133
HPI505 155	15.5	-	0.6102	16	83	133
HPI505 156	15.6	-	0.6142	16	83	133
HPI505 157	15.7	-	0.6181	16	83	133
HPI505 158	15.8	-	0.6220	16	83	133
HPI505 15875	15.875	5/8	0.6250	16	83	133
HPI505 159	15.9	-	0.6260	16	83	133
HPI505 160	16	-	0.6299	16	83	133
HPI505 16078	16.078	-	0.6330	18	93	143
HPI505 162	16.2	-	0.6378	18	93	143
HPI505 164	16.4	-	0.6457	18	93	143
HPI505 165	16.5	-	0.6496	18	93	143
HPI505 166	16.6	-	0.6535	18	93	143
HPI505 16667	16.667	21/32	0.6562	18	93	143
HPI505 167	16.7	-	0.6575	18	93	143

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI505 170	17	-	0.6693	18	93	143
HPI505 171	17.1	-	0.6732	18	93	143
HPI505 172	17.2	-	0.6772	18	93	143
HPI505 173	17.3	-	0.6811	18	93	143
HPI505 17463	17.463	11/16	0.6875	18	93	143
HPI505 175	17.5	-	0.6890	18	93	143
HPI505 176	17.6	-	0.6929	18	93	143
HPI505 177	17.7	-	0.6969	18	93	143
HPI505 178	17.8	-	0.7008	18	93	143
HPI505 179	17.9	-	0.7047	18	93	143
HPI505 180	18	-	0.7087	18	93	143
HPI505 184	18.4	-	0.7244	20	101	153
HPI505 185	18.5	-	0.7283	20	101	153
HPI505 186	18.6	-	0.7323	20	101	153
HPI505 188	18.8	-	0.7402	20	101	153
HPI505 189	18.9	-	0.7441	20	101	153
HPI505 190	19	-	0.7480	20	101	153
HPI505 1905	19.05	3/4	0.7500	20	101	153
HPI505 192	19.2	-	0.7559	20	101	153
HPI505 19253	19.253	-	0.7580	20	101	153
HPI505 19446	19.446	49/64	0.7656	20	101	153
HPI505 195	19.5	-	0.7677	20	101	153
HPI505 197	19.7	-	0.7756	20	101	153
HPI505 19844	19.844	25/32	0.7813	20	101	153
HPI505 200	20	-	0.7874	20	101	153

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

HPI508-N

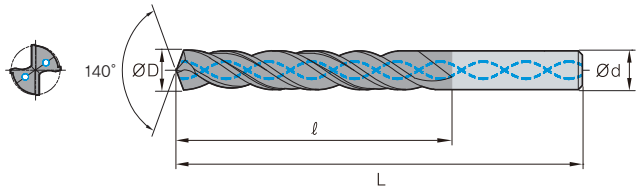
Double margin internal coolant drill - 8×D



ULTRA FINE | 30° HELIX | TiAlN | 8×D | 140° | DATA p.531

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI508 030N	3	-	0.1181	6	43	80
HPI508 031N	3.1	-	0.1220	6	43	80
HPI508 03175N	3.175	1/8	0.1250	6	43	80
HPI508 032N	3.2	-	0.1260	6	43	80
HPI508 03264N	3.264	-	0.1285	6	43	80
HPI508 033N	3.3	-	0.1299	6	43	80
HPI508 034N	3.4	-	0.1339	6	43	80
HPI508 035N	3.5	-	0.1378	6	43	80
HPI508 03572N	3.572	9/64	0.1406	6	43	80
HPI508 036N	3.6	-	0.1417	6	43	80
HPI508 037N	3.7	-	0.1457	6	43	80
HPI508 038N	3.8	-	0.1496	6	49	87
HPI508 039N	3.9	-	0.1535	6	49	87
HPI508 0397N	3.97	5/32	0.1563	6	49	87
HPI508 040N	4	-	0.1575	6	49	87
HPI508 04039N	4.039	-	0.1590	6	49	87
HPI508 041N	4.1	-	0.1614	6	49	87
HPI508 042N	4.2	-	0.1654	6	49	87
HPI508 043N	4.3	-	0.1693	6	49	87
HPI508 04366N	4.366	-	0.1719	6	49	87
HPI508 044N	4.4	-	0.1732	6	49	87
HPI508 045N	4.5	-	0.1772	6	49	87
HPI508 046N	4.6	-	0.1811	6	49	87
HPI508 047N	4.7	-	0.1850	6	49	87
HPI508 04763N	4.763	3/16	0.1875	6	56	94
HPI508 048N	4.8	-	0.1890	6	56	94
HPI508 049N	4.9	-	0.1929	6	56	94
HPI508 050N	5	-	0.1969	6	56	94
HPI508 051N	5.1	-	0.2008	6	56	94
HPI508 05159N	5.159	13/64	0.2031	6	56	94
HPI508 052N	5.2	-	0.2047	6	56	94
HPI508 053N	5.3	-	0.2087	6	56	94
HPI508 054N	5.4	-	0.2126	6	56	94
HPI508 055N	5.5	-	0.2165	6	56	94
HPI508 05558N	5.558	7/32	0.2188	6	56	94
HPI508 056N	5.6	-	0.2205	6	56	94
HPI508 057N	5.7	-	0.2244	6	56	94
HPI508 058N	5.8	-	0.2283	6	56	94
HPI508 059N	5.9	-	0.2323	6	56	94

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI508 05953N	5.953	15/64	0.2344	6	56	94
HPI508 060N	6	-	0.2362	6	65	94
HPI508 061N	6.1	-	0.2402	8	67	105
HPI508 062N	6.2	-	0.2441	8	67	105
HPI508 063N	6.3	-	0.2480	8	67	105
HPI508 0635N	6.35	1/4	0.2500	8	67	105
HPI508 064N	6.4	-	0.2520	8	67	105
HPI508 065N	6.5	-	0.2559	8	67	105
HPI508 066N	6.6	-	0.2598	8	67	105
HPI508 067N	6.7	-	0.2638	8	67	105
HPI508 06747N	6.747	17/64	0.2656	8	67	105
HPI508 068N	6.8	-	0.2677	8	67	105
HPI508 069N	6.9	-	0.2717	8	67	105
HPI508 070N	7	-	0.2756	8	76	116
HPI508 071N	7.1	-	0.2795	8	76	116
HPI508 07145N	7.145	9/32	0.2813	8	76	116
HPI508 072N	7.2	-	0.2835	8	76	116
HPI508 073N	7.3	-	0.2874	8	76	116
HPI508 074N	7.4	-	0.2913	8	76	116
HPI508 075N	7.5	-	0.2953	8	76	116
HPI508 07541N	7.541	19/64	0.2969	8	76	116
HPI508 076N	7.6	-	0.2992	8	76	116
HPI508 077N	7.7	-	0.3031	8	76	116
HPI508 078N	7.8	-	0.3071	8	76	116
HPI508 079N	7.9	-	0.3110	8	76	116
HPI508 07938N	7.938	5/16	0.3125	8	76	116
HPI508 080N	8	-	0.3150	8	76	116
HPI508 081N	8.1	-	0.3189	10	87	131
HPI508 082N	8.2	-	0.3228	10	87	131
HPI508 083N	8.3	-	0.3268	10	87	131
HPI508 08334N	8.334	21/64	0.3281	10	87	131
HPI508 084N	8.4	-	0.3307	10	87	131
HPI508 085N	8.5	-	0.3346	10	87	131
HPI508 086N	8.6	-	0.3386	10	87	131
HPI508 087N	8.7	-	0.3425	10	87	131
HPI508 08733N	8.733	11/32	0.3438	10	87	131
HPI508 088N	8.8	-	0.3465	10	87	131
HPI508 089N	8.9	-	0.3504	10	87	131
HPI508 090N	9	-	0.3543	10	87	131

P-Star Drill

HPI508-N

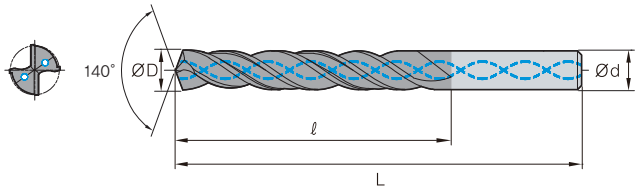
Double margin internal coolant drill - 8×D



ULTRA FINE | 30° HELIX | TiAlN | 8×D | 140° | DATA p.531

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI508 091N	9.1	-	0.3583	10	95	139
HPI508 09129N	9.129	23/64	0.3594	10	95	139
HPI508 092N	9.2	-	0.3622	10	95	139
HPI508 093N	9.3	-	0.3661	10	95	139
HPI508 094N	9.4	-	0.3701	10	95	139
HPI508 095N	9.5	-	0.3740	10	95	139
HPI508 09525N	9.525	3/8	0.3750	10	95	139
HPI508 096N	9.6	-	0.3780	10	95	139
HPI508 097N	9.7	-	0.3819	10	95	139
HPI508 098N	9.8	-	0.3858	10	95	139
HPI508 099N	9.9	-	0.3898	10	95	139
HPI508 09921N	9.921	25/64	0.3906	10	95	139
HPI508 100N	10	-	0.3937	10	95	139
HPI508 101N	10.1	-	0.3976	12	106	155
HPI508 102N	10.2	-	0.4016	12	106	155
HPI508 103N	10.3	-	0.4055	12	106	155
HPI508 1032N	10.32	13/32	0.4063	12	106	155
HPI508 104N	10.4	-	0.4094	12	106	155
HPI508 105N	10.5	-	0.4134	12	106	155
HPI508 107N	10.7	-	0.4213	12	106	155
HPI508 10716N	10.716	27/64	0.4219	12	106	155
HPI508 108N	10.8	-	0.4252	12	106	155
HPI508 109N	10.9	-	0.4291	12	106	155
HPI508 110N	11	-	0.4331	12	106	155
HPI508 111N	11.1	-	0.4370	12	114	163
HPI508 11113N	11.113	7/16	0.4375	12	114	163
HPI508 112N	11.2	-	0.4409	12	114	163
HPI508 113N	11.3	-	0.4449	12	114	163
HPI508 114N	11.4	-	0.4488	12	114	163
HPI508 115N	11.5	-	0.4528	12	114	163
HPI508 11509N	11.509	29/64	0.4531	12	114	163
HPI508 116N	11.6	-	0.4567	12	114	163
HPI508 117N	11.7	-	0.4606	12	114	163
HPI508 118N	11.8	-	0.4646	12	114	163

Designation	ØD			Ød	ℓ	L
	mm	fraction	inch			
HPI508 119N	11.9	-	0.4685	12	114	163
HPI508 11908N	11.908	15/32	0.4688	12	114	163
HPI508 120N	12	-	0.4724	12	114	163
HPI508 12304N	12.304	31/64	0.4844	14	133	182
HPI508 125N	12.5	-	0.4921	14	133	182
HPI508 127N	12.7	1/2	0.5000	14	133	182
HPI508 128N	12.8	-	0.5039	14	133	182
HPI508 130N	13	-	0.5118	14	133	182
HPI508 13494N	13.494	-	0.5313	14	133	182
HPI508 135N	13.5	-	0.5315	14	133	182
HPI508 140N	14	-	0.5512	14	133	182
HPI508 14288N	14.288	9/16	0.5625	16	152	204
HPI508 145N	14.5	-	0.5709	16	152	204
HPI508 150N	15	-	0.5906	16	152	204
HPI508 151N	15.1	-	0.5945	16	152	204
HPI508 152N	15.2	-	0.5984	16	152	204
HPI508 153N	15.3	-	0.6024	16	152	204
HPI508 155N	15.5	-	0.6102	16	152	204
HPI508 158N	15.8	-	0.6220	16	152	204
HPI508 15875N	15.875	5/8	0.6250	16	152	204
HPI508 160N	16	-	0.6299	16	152	204
HPI508 16078N	16.078	-	0.6330	18	171	223
HPI508 162N	16.2	-	0.6378	18	171	223
HPI508 165N	16.5	-	0.6496	18	171	223
HPI508 170N	17	-	0.6693	18	171	223
HPI508 17463N	17.463	11/16	0.6875	18	171	223
HPI508 175N	17.5	-	0.6890	18	171	223
HPI508 180N	18	-	0.7087	18	171	223
HPI508 185N	18.5	-	0.7283	20	191	244
HPI508 190N	19	-	0.7480	20	191	244
HPI508 1905N	19.05	3/4	0.7500	20	191	244
HPI508 19253N	19.253	-	0.7580	20	191	244
HPI508 198N	19.8	-	0.7795	20	191	244
HPI508 200N	20	-	0.7874	20	191	244

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

P503A(F)

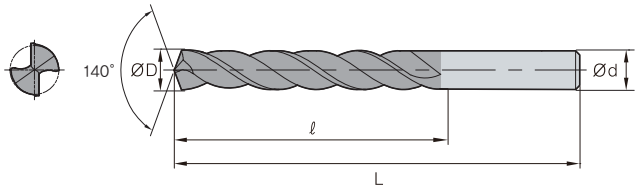
DIN 6537K type drill



DIN 6537K | ULTRA FINE | 30° HELIX | TiAlN | ▸3×D | 140° | DATA p.532

• TOLERANCE

D		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
P503A 030	P503F 030	3	6	20	62
P503A 031	P503F 031	3.1	6	20	62
P503A 032	P503F 032	3.2	6	20	62
P503A 033	P503F 033	3.3	6	20	62
P503A 034	P503F 034	3.4	6	20	62
P503A 035	P503F 035	3.5	6	20	62
P503A 036	P503F 036	3.6	6	20	62
P503A 037	P503F 037	3.7	6	20	62
P503A 038	P503F 038	3.8	6	24	66
P503A 039	P503F 039	3.9	6	24	66
P503A 040	P503F 040	4	6	24	66
P503A 041	P503F 041	4.1	6	24	66
P503A 042	P503F 042	4.2	6	24	66
P503A 043	P503F 043	4.3	6	24	66
P503A 044	P503F 044	4.4	6	24	66
P503A 045	P503F 045	4.5	6	24	66
P503A 046	P503F 046	4.6	6	24	66
P503A 047	P503F 047	4.7	6	24	66
P503A 048	P503F 048	4.8	6	28	66
P503A 049	P503F 049	4.9	6	28	66
P503A 050	P503F 050	5	6	28	66
P503A 051	P503F 051	5.1	6	28	66
P503A 052	P503F 052	5.2	6	28	66
P503A 053	P503F 053	5.3	6	28	66
P503A 054	P503F 054	5.4	6	28	66
P503A 055	P503F 055	5.5	6	28	66
P503A 056	P503F 056	5.6	6	28	66
P503A 057	P503F 057	5.7	6	28	66
P503A 058	P503F 058	5.8	6	28	66
P503A 059	P503F 059	5.9	6	28	66
P503A 060	P503F 060	6	6	28	66
P503A 061	P503F 061	6.1	8	34	79
P503A 062	P503F 062	6.2	8	34	79
P503A 063	P503F 063	6.3	8	34	79
P503A 064	P503F 064	6.4	8	34	79
P503A 065	P503F 065	6.5	8	34	79
P503A 066	P503F 066	6.6	8	34	79
P503A 067	P503F 067	6.7	8	34	79
P503A 068	P503F 068	6.8	8	34	79
P503A 069	P503F 069	6.9	8	34	79
P503A 070	P503F 070	7	8	34	79

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
P503A 071	P503F 071	7.1	8	41	79
P503A 072	P503F 072	7.2	8	41	79
P503A 073	P503F 073	7.3	8	41	79
P503A 074	P503F 074	7.4	8	41	79
P503A 075	P503F 075	7.5	8	41	79
P503A 076	P503F 076	7.6	8	41	79
P503A 077	P503F 077	7.7	8	41	79
P503A 078	P503F 078	7.8	8	41	79
P503A 079	P503F 079	7.9	8	41	79
P503A 080	P503F 080	8	8	41	79
P503A 081	P503F 081	8.1	10	47	89
P503A 082	P503F 082	8.2	10	47	89
P503A 083	P503F 083	8.3	10	47	89
P503A 084	P503F 084	8.4	10	47	89
P503A 085	P503F 085	8.5	10	47	89
P503A 086	P503F 086	8.6	10	47	89
P503A 087	P503F 087	8.7	10	47	89
P503A 088	P503F 088	8.8	10	47	89
P503A 089	P503F 089	8.9	10	47	89
P503A 090	P503F 090	9	10	47	89
P503A 091	P503F 091	9.1	10	47	89
P503A 092	P503F 092	9.2	10	47	89
P503A 093	P503F 093	9.3	10	47	89
P503A 094	P503F 094	9.4	10	47	89
P503A 095	P503F 095	9.5	10	47	89
P503A 096	P503F 096	9.6	10	47	89
P503A 097	P503F 097	9.7	10	47	89
P503A 098	P503F 098	9.8	10	47	89
P503A 099	P503F 099	9.9	10	47	89
P503A 100	P503F 100	10	10	47	89
P503A 101	P503F 101	10.1	12	55	102
P503A 102	P503F 102	10.2	12	55	102
P503A 103	P503F 103	10.3	12	55	102
P503A 104	P503F 104	10.4	12	55	102
P503A 105	P503F 105	10.5	12	55	102
P503A 106	P503F 106	10.6	12	55	102
P503A 107	P503F 107	10.7	12	55	102
P503A 108	P503F 108	10.8	12	55	102
P503A 109	P503F 109	10.9	12	55	102
P503A 110	P503F 110	11	12	55	102
P503A 111	P503F 111	11.1	12	55	102

P-Star Drill

P503A(F)

DIN 6537K type drill

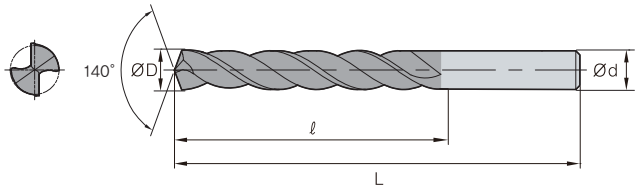


DIN 6537K | ULTRA FINE | 30° HELIX | TiAlN | 3×D | 140° | DATA

p.532

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
P503A 112	P503F 112	11.2	12	55	102
P503A 113	P503F 113	11.3	12	55	102
P503A 114	P503F 114	11.4	12	55	102
P503A 115	P503F 115	11.5	12	55	102
P503A 116	P503F 116	11.6	12	55	102
P503A 117	P503F 117	11.7	12	55	102
P503A 118	P503F 118	11.8	12	55	102
P503A 119	P503F 119	11.9	12	55	102
P503A 120	P503F 120	12	12	55	102
P503A 121	P503F 121	12.1	14	60	107
P503A 122	P503F 122	12.2	14	60	107
P503A 123	P503F 123	12.3	14	60	107
P503A 124	P503F 124	12.4	14	60	107
P503A 125	P503F 125	12.5	14	60	107
P503A 126	P503F 126	12.6	14	60	107
P503A 127	P503F 127	12.7	14	60	107
P503A 128	P503F 128	12.8	14	60	107
P503A 129	P503F 129	12.9	14	60	107
P503A 130	P503F 130	13	14	60	107
P503A 131	P503F 131	13.1	14	60	107
P503A 132	P503F 132	13.2	14	60	107
P503A 133	P503F 133	13.3	14	60	107
P503A 134	P503F 134	13.4	14	60	107
P503A 135	P503F 135	13.5	14	60	107
P503A 136	P503F 136	13.6	14	60	107
P503A 137	P503F 137	13.7	14	60	107
P503A 138	P503F 138	13.8	14	60	107
P503A 139	P503F 139	13.9	14	60	107
P503A 140	P503F 140	14	14	60	107
P503A 141	P503F 141	14.1	16	65	115
P503A 142	P503F 142	14.2	16	65	115
P503A 143	P503F 143	14.3	16	65	115
P503A 144	P503F 144	14.4	16	65	115
P503A 145	P503F 145	14.5	16	65	115

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
P503A 146	P503F 146	14.6	16	65	115
P503A 147	P503F 147	14.7	16	65	115
P503A 148	P503F 148	14.8	16	65	115
P503A 149	P503F 149	14.9	16	65	115
P503A 150	P503F 150	15	16	65	115
P503A 151	P503F 151	15.1	16	65	115
P503A 152	P503F 152	15.2	16	65	115
P503A 153	P503F 153	15.3	16	65	115
P503A 154	P503F 154	15.4	16	65	115
P503A 155	P503F 155	15.5	16	65	115
P503A 156	P503F 156	15.6	16	65	115
P503A 157	P503F 157	15.7	16	65	115
P503A 158	P503F 158	15.8	16	65	115
P503A 159	P503F 159	15.9	16	65	115
P503A 160	P503F 160	16	16	65	115
P503A 161	P503F 161	16.1	18	73	123
P503A 163	P503F 163	16.3	18	73	123
P503A 165	P503F 165	16.5	18	73	123
P503A 170	P503F 170	17	18	73	123
P503A 171	P503F 171	17.1	18	73	123
P503A 172	P503F 172	17.2	18	73	123
P503A 175	P503F 175	17.5	18	73	123
P503A 177	P503F 177	17.7	18	73	123
P503A 178	P503F 178	17.8	18	73	123
P503A 180	P503F 180	18	18	73	123
P503A 181	P503F 181	18.1	20	79	131
P503A 182	P503F 182	18.2	20	79	131
P503A 185	P503F 185	18.5	20	79	131
P503A 190	P503F 190	19	20	79	131
P503A 191	P503F 191	19.1	20	79	131
P503A 195	P503F 195	19.5	20	79	131
P503A 197	P503F 197	19.7	20	79	131
P503A 200	P503F 200	20	20	79	131

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

PI503A(F)

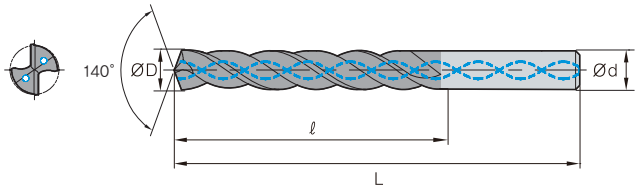
DIN 6537K type internal coolant drill



DIN 6537K | ULTRA FINE | 30° HELIX | TiAlN | ▸3×D | 140° | DATA p.532

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
PI503A 030	PI503F 030	3	6	20	62
PI503A 031	PI503F 031	3.1	6	20	62
PI503A 032	PI503F 032	3.2	6	20	62
PI503A 033	PI503F 033	3.3	6	20	62
PI503A 034	PI503F 034	3.4	6	20	62
PI503A 035	PI503F 035	3.5	6	20	62
PI503A 036	PI503F 036	3.6	6	20	62
PI503A 037	PI503F 037	3.7	6	20	62
PI503A 038	PI503F 038	3.8	6	24	66
PI503A 039	PI503F 039	3.9	6	24	66
PI503A 040	PI503F 040	4	6	24	66
PI503A 041	PI503F 041	4.1	6	24	66
PI503A 042	PI503F 042	4.2	6	24	66
PI503A 043	PI503F 043	4.3	6	24	66
PI503A 044	PI503F 044	4.4	6	24	66
PI503A 045	PI503F 045	4.5	6	24	66
PI503A 046	PI503F 046	4.6	6	24	66
PI503A 047	PI503F 047	4.7	6	24	66
PI503A 048	PI503F 048	4.8	6	28	66
PI503A 049	PI503F 049	4.9	6	28	66
PI503A 050	PI503F 050	5	6	28	66
PI503A 051	PI503F 051	5.1	6	28	66
PI503A 052	PI503F 052	5.2	6	28	66
PI503A 053	PI503F 053	5.3	6	28	66
PI503A 054	PI503F 054	5.4	6	28	66
PI503A 055	PI503F 055	5.5	6	28	66
PI503A 056	PI503F 056	5.6	6	28	66
PI503A 057	PI503F 057	5.7	6	28	66
PI503A 058	PI503F 058	5.8	6	28	66
PI503A 059	PI503F 059	5.9	6	28	66
PI503A 060	PI503F 060	6	6	28	66
PI503A 061	PI503F 061	6.1	8	34	79
PI503A 062	PI503F 062	6.2	8	34	79
PI503A 063	PI503F 063	6.3	8	34	79
PI503A 064	PI503F 064	6.4	8	34	79
PI503A 065	PI503F 065	6.5	8	34	79
PI503A066	PI503F 066	6.6	8	34	79
PI503A067	PI503F 067	6.7	8	34	79
PI503A068	PI503F 068	6.8	8	34	79
PI503A069	PI503F 069	6.9	8	34	79
PI503A070	PI503F 070	7	8	34	79

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
PI503A071	PI503F 071	7.1	8	41	79
PI503A072	PI503F 072	7.2	8	41	79
PI503A073	PI503F 073	7.3	8	41	79
PI503A074	PI503F 074	7.4	8	41	79
PI503A075	PI503F 075	7.5	8	41	79
PI503A076	PI503F 076	7.6	8	41	79
PI503A077	PI503F 077	7.7	8	41	79
PI503A078	PI503F 078	7.8	8	41	79
PI503A079	PI503F 079	7.9	8	41	79
PI503A080	PI503F 080	8	8	41	79
PI503A081	PI503F 081	8.1	10	47	89
PI503A082	PI503F 082	8.2	10	47	89
PI503A083	PI503F 083	8.3	10	47	89
PI503A084	PI503F 084	8.4	10	47	89
PI503A085	PI503F 085	8.5	10	47	89
PI503A086	PI503F 086	8.6	10	47	89
PI503A087	PI503F 087	8.7	10	47	89
PI503A088	PI503F 088	8.8	10	47	89
PI503A089	PI503F 089	8.9	10	47	89
PI503A090	PI503F 090	9	10	47	89
PI503A091	PI503F 091	9.1	10	47	89
PI503A092	PI503F 092	9.2	10	47	89
PI503A093	PI503F 093	9.3	10	47	89
PI503A094	PI503F 094	9.4	10	47	89
PI503A095	PI503F 095	9.5	10	47	89
PI503A096	PI503F 096	9.6	10	47	89
PI503A097	PI503F 097	9.7	10	47	89
PI503A098	PI503F 098	9.8	10	47	89
PI503A099	PI503F 099	9.9	10	47	89
PI503A100	PI503F 100	10	10	47	89
PI503A101	PI503F 101	10.1	12	55	102
PI503A 102	PI503F 102	10.2	12	55	102
PI503A 103	PI503F 103	10.3	12	55	102
PI503A 104	PI503F 104	10.4	12	55	102
PI503A 105	PI503F 105	10.5	12	55	102
PI503A 106	PI503F 106	10.6	12	55	102
PI503A 107	PI503F 107	10.7	12	55	102
PI503A 108	PI503F 108	10.8	12	55	102
PI503A 109	PI503F 109	10.9	12	55	102
PI503A 110	PI503F 110	11	12	55	102
PI503A 111	PI503F 111	11.1	12	55	102

P-Star Drill

PI503A(F)

DIN 6537K type internal coolant drill

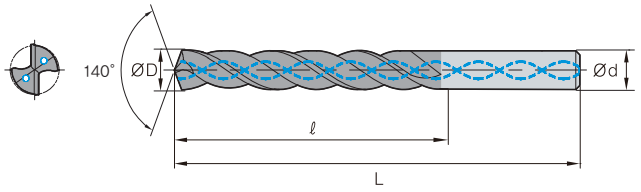


DIN 6537K | ULTRA FINE | 30° HELIX | TiAlN | ▸3×D | 140° | DATA

p.532

• TOLERANCE

ØD		Ød
Ø3	+0.012 ~ +0.002mm	h6
Ø3.1 ~ Ø6	+0.016 ~ +0.004mm	
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
PI503A 112	PI503F 112	11.2	12	55	102
PI503A 113	PI503F 113	11.3	12	55	102
PI503A 114	PI503F 114	11.4	12	55	102
PI503A 115	PI503F 115	11.5	12	55	102
PI503A 116	PI503F 116	11.6	12	55	102
PI503A 117	PI503F 117	11.7	12	55	102
PI503A 118	PI503F 118	11.8	12	55	102
PI503A 119	PI503F 119	11.9	12	55	102
PI503A 120	PI503F 120	12	12	55	102
PI503A 121	PI503F 121	12.1	14	60	107
PI503A 122	PI503F 122	12.2	14	60	107
PI503A 123	PI503F 123	12.3	14	60	107
PI503A 124	PI503F 124	12.4	14	60	107
PI503A 125	PI503F 125	12.5	14	60	107
PI503A 126	PI503F 126	12.6	14	60	107
PI503A 127	PI503F 127	12.7	14	60	107
PI503A 128	PI503F 128	12.8	14	60	107
PI503A 129	PI503F 129	12.9	14	60	107
PI503A 130	PI503F 130	13	14	60	107
PI503A 131	PI503F 131	13.1	14	60	107
PI503A 132	PI503F 132	13.2	14	60	107
PI503A 133	PI503F 133	13.3	14	60	107
PI503A 134	PI503F 134	13.4	14	60	107
PI503A 135	PI503F 135	13.5	14	60	107
PI503A 136	PI503F 136	13.6	14	60	107
PI503A 137	PI503F 137	13.7	14	60	107
PI503A 138	PI503F 138	13.8	14	60	107
PI503A 139	PI503F 139	13.9	14	60	107
PI503A 140	PI503F 140	14	14	60	107
PI503A 141	PI503F 141	14.1	16	65	115
PI503A 142	PI503F 142	14.2	16	65	115
PI503A 143	PI503F 143	14.3	16	65	115
PI503A 144	PI503F 144	14.4	16	65	115
PI503A 145	PI503F 145	14.5	16	65	115

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
PI503A 146	PI503F 146	14.6	16	65	115
PI503A 147	PI503F 147	14.7	16	65	115
PI503A 148	PI503F 148	14.8	16	65	115
PI503A 149	PI503F 149	14.9	16	65	115
PI503A 150	PI503F 150	15	16	65	115
PI503A 151	PI503F 151	15.1	16	65	115
PI503A 152	PI503F 152	15.2	16	65	115
PI503A 153	PI503F 153	15.3	16	65	115
PI503A 154	PI503F 154	15.4	16	65	115
PI503A 155	PI503F 155	15.5	16	65	115
PI503A 156	PI503F 156	15.6	16	65	115
PI503A 157	PI503F 157	15.7	16	65	115
PI503A 158	PI503F 158	15.8	16	65	115
PI503A 159	PI503F 159	15.9	16	65	115
PI503A 160	PI503F 160	16	16	65	115
PI503A 161	PI503F 161	16.1	18	73	123
PI503A 163	PI503F 163	16.3	18	73	123
PI503A 165	PI503F 165	16.5	18	73	123
PI503A 170	PI503F 170	17	18	73	123
PI503A 171	PI503F 171	17.1	18	73	123
PI503A 172	PI503F 172	17.2	18	73	123
PI503A 175	PI503F 175	17.5	18	73	123
PI503A 177	PI503F 177	17.7	18	73	123
PI503A 178	PI503F 178	17.8	18	73	123
PI503A 180	PI503F 180	18	18	73	123
PI503A 181	PI503F 181	18.1	20	79	131
PI503A 182	PI503F 182	18.2	20	79	131
PI503A 185	PI503F 185	18.5	20	79	131
PI503A 190	PI503F 190	19	20	79	131
PI503A 191	PI503F 191	19.1	20	79	131
PI503A 195	PI503F 195	19.5	20	79	131
PI503A 197	PI503F 197	19.7	20	79	131
PI503A 200	PI503F 200	20	20	79	131

※ The above specifications are subject to change without prior notice for product quality improvement.

• Applicable Workpiece

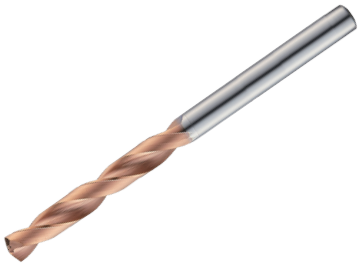
Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		○

◎: Excellent ○: Good

PI505A(F)

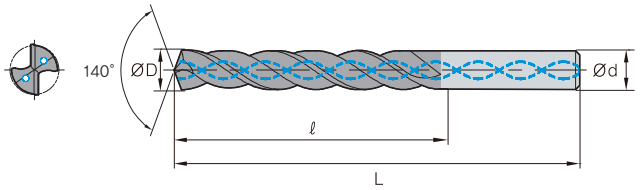
DIN 6537L type internal coolant drill

DIN 6537L | ULTRA FINE | 30° HELIX | TiAlN | ▸5×D | 140° | DATA p.532



• TOLERANCE

ØD		Ød
Ø4 ~ Ø6	+0.016 ~ +0.004mm	h6
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

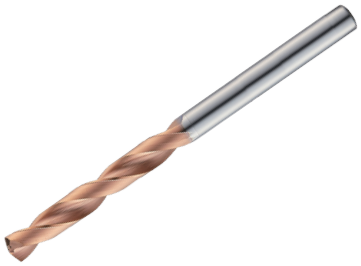
Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
PI505A 040	PI505F 040	4	6	36	74
PI505A 041	PI505F 041	4.1	6	36	74
PI505A 042	PI505F 042	4.2	6	36	74
PI505A 043	PI505F 043	4.3	6	36	74
PI505A 044	PI505F 044	4.4	6	36	74
PI505A 045	PI505F 045	4.5	6	36	74
PI505A 046	PI505F 046	4.6	6	36	74
PI505A 047	PI505F 047	4.7	6	36	74
PI505A 048	PI505F 048	4.8	6	44	82
PI505A 049	PI505F 049	4.9	6	44	82
PI505A 050	PI505F 050	5	6	44	82
PI505A 051	PI505F 051	5.1	6	44	82
PI505A 052	PI505F 052	5.2	6	44	82
PI505A 053	PI505F 053	5.3	6	44	82
PI505A 054	PI505F 054	5.4	6	44	82
PI505A 055	PI505F 055	5.5	6	44	82
PI505A 056	PI505F 056	5.6	6	44	82
PI505A 057	PI505F 057	5.7	6	44	82
PI505A 058	PI505F 058	5.8	6	44	82
PI505A 059	PI505F 059	5.9	6	44	82
PI505A 060	PI505F 060	6	6	44	82
PI505A 061	PI505F 061	6.1	8	53	91
PI505A 062	PI505F 062	6.2	8	53	91
PI505A 063	PI505F 063	6.3	8	53	91
PI505A 064	PI505F 064	6.4	8	53	91
PI505A 065	PI505F 065	6.5	8	53	91
PI505A 066	PI505F 066	6.6	8	53	91
PI505A 067	PI505F 067	6.7	8	53	91
PI505A 068	PI505F 068	6.8	8	53	91
PI505A 069	PI505F 069	6.9	8	53	91
PI505A 070	PI505F 070	7	8	53	91
PI505A 071	PI505F 071	7.1	8	53	91
PI505A 072	PI505F 072	7.2	8	53	91
PI505A 073	PI505F 073	7.3	8	53	91
PI505A 074	PI505F 074	7.4	8	53	91
PI505A 075	PI505F 075	7.5	8	53	91
PI505A 076	PI505F 076	7.6	8	53	91
PI505A 077	PI505F 077	7.7	8	53	91

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
PI505A 078	PI505F 078	7.8	8	53	91
PI505A 079	PI505F 079	7.9	8	53	91
PI505A 080	PI505F 080	8	8	53	91
PI505A 081	PI505F 081	8.1	10	61	103
PI505A 082	PI505F 082	8.2	10	61	103
PI505A 083	PI505F 083	8.3	10	61	103
PI505A 084	PI505F 084	8.4	10	61	103
PI505A 085	PI505F 085	8.5	10	61	103
PI505A 086	PI505F 086	8.6	10	61	103
PI505A 087	PI505F 087	8.7	10	61	103
PI505A 088	PI505F 088	8.8	10	61	103
PI505A 089	PI505F 089	8.9	10	61	103
PI505A 090	PI505F 090	9	10	61	103
PI505A 091	PI505F 091	9.1	10	61	103
PI505A 092	PI505F 092	9.2	10	61	103
PI505A 093	PI505F 093	9.3	10	61	103
PI505A 094	PI505F 094	9.4	10	61	103
PI505A 095	PI505F 095	9.5	10	61	103
PI505A 096	PI505F 096	9.6	10	61	103
PI505A 097	PI505F 097	9.7	10	61	103
PI505A 098	PI505F 098	9.8	10	61	103
PI505A 099	PI505F 099	9.9	10	61	103
PI505A 100	PI505F 100	10	10	61	103
PI505A 101	PI505F 101	10.1	12	71	118
PI505A 102	PI505F 102	10.2	12	71	118
PI505A 103	PI505F 103	10.3	12	71	118
PI505A 104	PI505F 104	10.4	12	71	118
PI505A 105	PI505F 105	10.5	12	71	118
PI505A 106	PI505F 106	10.6	12	71	118
PI505A 107	PI505F 107	10.7	12	71	118
PI505A 108	PI505F 108	10.8	12	71	118
PI505A 109	PI505F 109	10.9	12	71	118
PI505A 110	PI505F 110	11	12	71	118
PI505A 111	PI505F 111	11.1	12	71	118
PI505A 112	PI505F 112	11.2	12	71	118
PI505A 113	PI505F 113	11.3	12	71	118
PI505A 114	PI505F 114	11.4	12	71	118
PI505A 115	PI505F 115	11.5	12	71	118

P-Star Drill

PI505A(F)

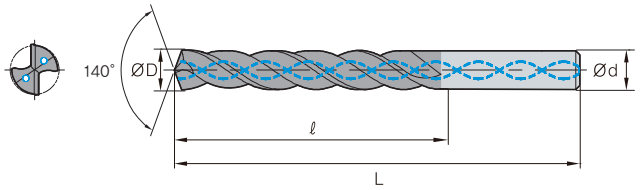
DIN 6537L type internal coolant drill



DIN 6537L | ULTRA FINE | 30° HELIX | TiAlN | ▸5×D | 140° | DATA p.532

• TOLERANCE

ØD		Ød
Ø4 ~ Ø6	+0.016 ~ +0.004mm	h6
Ø6.1 ~ Ø10	+0.021 ~ +0.006mm	
Ø10.1 ~ Ø18	+0.025 ~ +0.007mm	
Ø18.1 ~	+0.029 ~ +0.008mm	



(mm)

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
PI505A 116	PI505F 116	11.6	12	71	118
PI505A 117	PI505F 117	11.7	12	71	118
PI505A 118	PI505F 118	11.8	12	71	118
PI505A 119	PI505F 119	11.9	12	71	118
PI505A 120	PI505F 120	12	12	71	118
PI505A 121	PI505F 121	12.1	14	77	124
PI505A 122	PI505F 122	12.2	14	77	124
PI505A 123	PI505F 123	12.3	14	77	124
PI505A 124	PI505F 124	12.4	14	77	124
PI505A 125	PI505F 125	12.5	14	77	124
PI505A 126	PI505F 126	12.6	14	77	124
PI505A 127	PI505F 127	12.7	14	77	124
PI505A 128	PI505F 128	12.8	14	77	124
PI505A 129	PI505F 129	12.9	14	77	124
PI505A 130	PI505F 130	13	14	77	124
PI505A 131	PI505F 131	13.1	14	77	124
PI505A 132	PI505F 132	13.2	14	77	124
PI505A 133	PI505F 133	13.3	14	77	124
PI505A 134	PI505F 134	13.4	14	77	124
PI505A 135	PI505F 135	13.5	14	77	124
PI505A 136	PI505F 136	13.6	14	77	124
PI505A 137	PI505F 137	13.7	14	77	124
PI505A 138	PI505F 138	13.8	14	77	124
PI505A 139	PI505F 139	13.9	14	77	124
PI505A 140	PI505F 140	14	14	77	124
PI505A 141	PI505F 141	14.1	16	83	133
PI505A 142	PI505F 142	14.2	16	83	133
PI505A 143	PI505F 143	14.3	16	83	133
PI505A 144	PI505F 144	14.4	16	83	133
PI505A 145	PI505F 145	14.5	16	83	133
PI505A 146	PI505F 146	14.6	16	83	133
PI505A 147	PI505F 147	14.7	16	83	133

Designation	Designation (Weldon shank)	ØD	Ød	ℓ	L
PI505A 148	PI505F 148	14.8	16	83	133
PI505A 149	PI505F 149	14.9	16	83	133
PI505A 150	PI505F 150	15	16	83	133
PI505A 151	PI505F 151	15.1	16	83	133
PI505A 152	PI505F 152	15.2	16	83	133
PI505A 153	PI505F 153	15.3	16	83	133
PI505A 154	PI505F 154	15.4	16	83	133
PI505A 155	PI505F 155	15.5	16	83	133
PI505A 156	PI505F 156	15.6	16	83	133
PI505A 157	PI505F 157	15.7	16	83	133
PI505A 158	PI505F 158	15.8	16	83	133
PI505A 159	PI505F 159	15.9	16	83	133
PI505A 160	PI505F 160	16	16	83	133
PI505A 161	PI505F 161	16.1	18	93	143
PI505A 163	PI505F 163	16.3	18	93	143
PI505A 165	PI505F 165	16.5	18	93	143
PI505A 170	PI505F 170	17	18	93	143
PI505A 171	PI505F 171	17.1	18	93	143
PI505A 172	PI505F 172	17.2	18	93	143
PI505A 175	PI505F 175	17.5	18	93	143
PI505A 177	PI505F 177	17.7	18	93	143
PI505A 178	PI505F 178	17.8	18	93	143
PI505A 180	PI505F 180	18	18	93	143
PI505A 181	PI505F 181	18.1	20	101	153
PI505A 182	PI505F 182	18.2	20	101	153
PI505A 185	PI505F 185	18.5	20	101	153
PI505A 190	PI505F 190	19	20	101	153
PI505A 191	PI505F 191	19.1	20	101	153
PI505A 195	PI505F 195	19.5	20	101	153
PI505A 197	PI505F 197	19.7	20	101	153
PI505A 200	PI505F 200	20	20	101	153

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Copper	Graphite	Cast iron ~FCD500	Aluminum	Stainless steel
			SKD61~HRC55	SKD11 HRC55~					
○	◎	◎	○	○			◎		◎

◎: Excellent ○: Good

Economical carbide coated solid drill

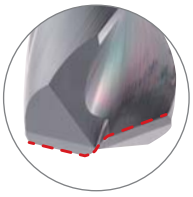
W-Star Drill

- Better cutting performance with an improved thinning shape which lessens cutting load
- High rigidity and good chip evacuation from the optimal designed flute
- Excellent cutting performance in stainless machining

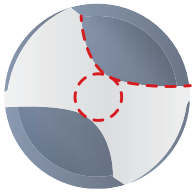
Code system

NDP	G	5	04	-	100
W-Star Drill	Appearance	Grade	Length		Diameter
	G: General	5: Grade	03: 3D 04: 4D 07: 7D		010: Ø1.0 mm 060: Ø6.0 mm 065: Ø6.5 mm 100: Ø10.0 mm

Features



- **XR Thinning shape**
  - Reduced cutting load on the cutting edge with a streamlined thinning
  - Improved chip breaking

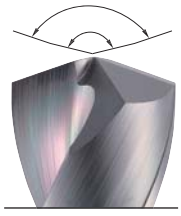


SECTION A-A'

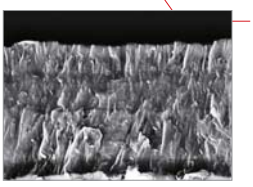
- **Optimal flute**
  - Good chip evacuation due to applying the larger chip pocket



Multi Point angle



- **Multi Point angle**
  - Separated cutting load by optimal point angle
  - Streamlined 1st point angle



- **New AlCrN coating**
  - Improved chip evacuation with enhanced flute lubrication
  - Enhanced wear resistance and oxidation resistance by multi-layer coating

EDP. NO	Appearance	Type	Drills dia.	Page
NDPG503		General purpose drill	Ø1.0 ~ Ø13.0	316~317
NDPG504		General purpose drill	Ø1.0 ~ Ø20.0	318~320
NDPG507		General purpose drill	Ø3.0 ~ Ø20.0	321~323

W-Star Drill

NDPG503

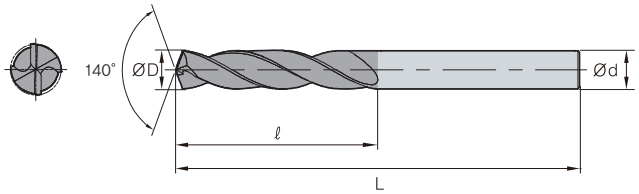
General purpose drill

ULTRA FINE | 30° HELIX | AlTiN | ▸3×D | 140° | DATA p.533



• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	0 ~ -0.010mm	h6
Ø3.1 ~ Ø6	0 ~ -0.012mm	
Ø6.1 ~ Ø10	0 ~ -0.015mm	
Ø10.1 ~ Ø13	0 ~ -0.018mm	



(mm)

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG503010	1	3	5	38	-	-
NDPG503011	1.1	3	6	42	-	-
NDPG503012	1.2	3	6	42	-	-
NDPG503013	1.3	3	6	42	-	-
NDPG503014	1.4	3	7	42	-	-
NDPG503015	1.5	3	7	42	-	-
NDPG503016	1.6	3	8	42	-	-
NDPG503017	1.7	3	8	42	-	-
NDPG503018	1.8	3	9	42	-	-
NDPG503019	1.9	3	9	42	-	-
NDPG503020	2	3	10	50	-	-
NDPG503021	2.1	3	10	50	-	-
NDPG503022	2.2	3	11	50	-	-
NDPG503023	2.3	3	11	50	-	-
NDPG503024	2.4	3	12	50	-	-
NDPG503025	2.5	3	12	50	M3x0.5	WH1~4
NDPG503026	2.6	3	12	50	M3x0.5	WH5~6
NDPG503027	2.7	3	14	50	-	-
NDPG503028	2.8	3	14	50	-	-
NDPG503029	2.9	3	14	50	-	-
NDPG503030	3	3	14	55	-	-
NDPG503031	3.1	4	16	55	-	-
NDPG50303175	3.175	4	16	55	-	-
NDPG503032	3.2	4	16	55	-	-
NDPG50303264	3.264	4	16	55	-	-
NDPG503033	3.3	4	16	55	M4x0.7	WH1~4
NDPG503034	3.4	4	16	55	M4x0.7	WH5~6
NDPG503035	3.5	4	16	55	-	-
NDPG50303572	3.572	4	18	55	-	-
NDPG503036	3.6	4	18	55	-	-
NDPG503037	3.7	4	18	55	-	-
NDPG503038	3.8	4	20	55	-	-
NDPG503039	3.9	4	20	55	-	-
NDPG503040	4	4	20	55	-	-
NDPG50304039	4.039	5	20	55	-	-
NDPG503041	4.1	5	20	55	-	-
NDPG503042	4.2	5	20	62	M5x0.8	WH1~4
NDPG503043	4.3	5	22	62	M5x0.8	WH5~6

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG503044	4.4	5	22	62	-	-
NDPG503045	4.5	5	22	62	-	-
NDPG503046	4.6	5	22	62	-	-
NDPG503047	4.7	5	22	62	-	-
NDPG50304763	4.763	5	24	62	-	-
NDPG503048	4.8	5	24	62	-	-
NDPG503049	4.9	5	24	62	-	-
NDPG503050	5	5	24	62	M6x1.0	WH1~4
NDPG503051	5.1	6	24	62	M6x1.0	WH5~6
NDPG50305159	5.159	6	28	66	-	-
NDPG503052	5.2	6	28	66	-	-
NDPG503053	5.3	6	28	66	-	-
NDPG503054	5.4	6	28	66	-	-
NDPG503055	5.5	6	28	66	-	-
NDPG50305556	5.556	6	28	66	-	-
NDPG503056	5.6	6	28	66	-	-
NDPG503057	5.7	6	28	66	-	-
NDPG503058	5.8	6	28	66	-	-
NDPG503059	5.9	6	28	66	-	-
NDPG50305953	5.953	6	28	66	-	-
NDPG503060	6	6	28	66	-	-
NDPG503061	6.1	7	30	66	-	-
NDPG503062	6.2	7	34	74	-	-
NDPG503063	6.3	7	34	74	-	-
NDPG5030635	6.35	7	34	74	-	-
NDPG503064	6.4	7	34	74	-	-
NDPG503065	6.5	7	34	74	-	-
NDPG503066	6.6	7	34	74	-	-
NDPG503067	6.7	7	37	74	-	-
NDPG50306747	6.747	7	37	74	-	-
NDPG503068	6.8	7	37	74	M8x1.25	WH1~4
NDPG503069	6.9	7	37	74	M8x1.25	WH5~6
NDPG503070	7	7	37	74	M8x1.0	WH1~4
NDPG503071	7.1	8	37	74	M8x1.0	WH5~6
NDPG50307144	7.144	8	40	79	-	-
NDPG503072	7.2	8	40	79	-	-
NDPG503073	7.3	8	40	79	-	-
NDPG503074	7.4	8	40	79	-	-

NDPG503

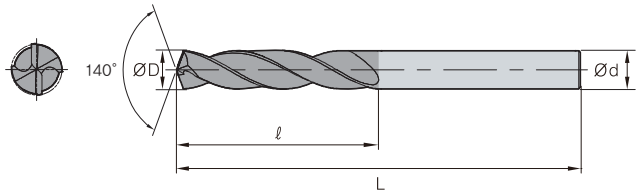
General purpose drill



ULTRA FINE | 30° HELIX | AlTiN | ▸3×D | 140° | DATA p.533

• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	0 ~ -0.010mm	h6
Ø3.1 ~ Ø6	0 ~ -0.012mm	
Ø6.1 ~ Ø10	0 ~ -0.015mm	
Ø10.1 ~ Ø13	0 ~ -0.018mm	



(mm)

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG503075	7.5	8	40	79	-	-
NDPG50307541	7.541	8	40	79	-	-
NDPG503076	7.6	8	40	79	-	-
NDPG503077	7.7	8	40	79	-	-
NDPG503078	7.8	8	40	79	-	-
NDPG503079	7.9	8	40	79	-	-
NDPG50307938	7.938	8	40	79	-	-
NDPG503080	8	8	40	79	-	-
NDPG503081	8.1	9	40	79	-	-
NDPG503082	8.2	9	43	84	-	-
NDPG503083	8.3	9	43	84	-	-
NDPG503084	8.4	9	43	84	-	-
NDPG503085	8.5	9	43	84	M10x1.5	WH1~4
NDPG503086	8.6	9	43	84	M10x1.5	WH5~6
NDPG503087	8.7	9	43	84	-	-
NDPG50308731	8.731	9	43	84	-	-
NDPG503088	8.8	9	43	84	M10x1.25	WH1~4
NDPG503089	8.9	9	43	84	M10x1.25	WH5~6
NDPG503090	9	9	43	84	M10x1.0	WH1~4
NDPG503091	9.1	10	43	84	M10x1.0	WH5~6
NDPG503092	9.2	10	47	89	-	-
NDPG503093	9.3	10	47	89	-	-
NDPG503094	9.4	10	47	89	-	-
NDPG503095	9.5	10	47	89	-	-
NDPG50309525	9.525	10	47	89	-	-
NDPG503096	9.6	10	47	89	-	-
NDPG503097	9.7	10	47	89	-	-
NDPG503098	9.8	10	47	89	-	-
NDPG503099	9.9	10	47	89	-	-
NDPG503100	10	10	47	89	-	-
NDPG503101	10.1	11	47	89	-	-
NDPG503102	10.2	11	51	95	-	-

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG503103	10.3	11	51	95	M12x1.75	WH1~2
NDPG50310319	10.319	11	51	95	M12x1.75	WH3~4
NDPG503104	10.4	11	51	95	M12x1.75	WH5~6
NDPG503105	10.5	11	51	95	M12x1.5	WH1~4
NDPG503106	10.6	11	51	95	M12x1.5	WH5~6
NDPG503107	10.7	11	51	95	-	-
NDPG50310716	10.716	11	51	95	-	-
NDPG503108	10.8	11	51	95	M12x1.25	WH1~4
NDPG503109	10.9	11	51	95	M12x1.25	WH5~6
NDPG503110	11	11	51	95	M12x1.0	WH1~4
NDPG503111	11.1	12	51	95	M12x1.0	WH5~6
NDPG50311113	11.113	12	54	102	-	-
NDPG503112	11.2	12	54	102	-	-
NDPG503113	11.3	12	54	102	-	-
NDPG503114	11.4	12	54	102	-	-
NDPG503115	11.5	12	54	102	-	-
NDPG503116	11.6	12	54	102	-	-
NDPG503117	11.7	12	54	102	-	-
NDPG503118	11.8	12	54	102	-	-
NDPG503119	11.9	12	54	102	-	-
NDPG503120	12	12	54	102	M14x2	WH1~4
NDPG503121	12.1	13	54	102	M14x2	WH5~6
NDPG503122	12.2	13	57	102	-	-
NDPG503123	12.3	13	57	102	-	-
NDPG503124	12.4	13	57	102	-	-
NDPG503125	12.5	13	57	102	M14x1.5	WH1~4
NDPG503126	12.6	13	57	102	M14x1.5	WH5~6
NDPG503127	12.7	13	57	102	-	-
NDPG503128	12.8	13	57	102	-	-
NDPG503129	12.9	13	57	102	-	-
NDPG503130	13	13	57	102	-	-

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron	Stainless steels	Nonferrous steels & Aluminum
			SKD61~HRC55	SKD11 HRC55~			
◎	◎	○			○	◎	

◎: Excellent ○: Good

Drill

W-Star Drill

NDPG504

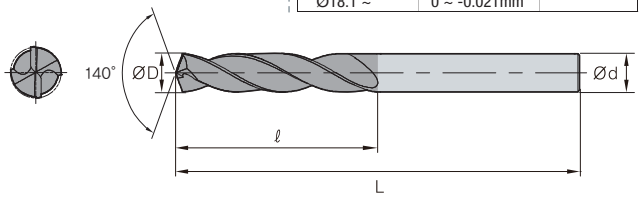
General purpose drill



ULTRA FINE | 30° HELIX | AlTiN | ▸4×D | 140° | DATA p.533

• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	0 ~ -0.010mm	h6
Ø3.1 ~ Ø6	0 ~ -0.012mm	
Ø6.1 ~ Ø10	0 ~ -0.015mm	
Ø10.1 ~ Ø18	0 ~ -0.018mm	
Ø18.1 ~	0 ~ -0.021mm	



(mm)

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG504010	1	3	8	38	-	-
NDPG504011	1.1	3	9	42	-	-
NDPG504012	1.2	3	10	42	-	-
NDPG504013	1.3	3	10	42	-	-
NDPG504014	1.4	3	11	42	-	-
NDPG504015	1.5	3	11	42	-	-
NDPG504016	1.6	3	12	42	-	-
NDPG504017	1.7	3	12	42	-	-
NDPG504018	1.8	3	13	42	-	-
NDPG504019	1.9	3	13	42	-	-
NDPG504020	2	3	18	50	-	-
NDPG504021	2.1	3	18	50	-	-
NDPG504022	2.2	3	18	50	-	-
NDPG504023	2.3	3	18	50	-	-
NDPG504024	2.4	3	18	50	-	-
NDPG504025	2.5	3	18	50	M3x0.5	WH1~4
NDPG504026	2.6	3	18	50	M3x0.5	WH5~6
NDPG504027	2.7	3	18	50	-	-
NDPG504028	2.8	3	18	50	-	-
NDPG504029	2.9	3	18	50	-	-
NDPG504030	3	3	20	55	-	-
NDPG504031	3.1	4	20	55	-	-
NDPG50403175	3.175	4	20	55	-	-
NDPG504032	3.2	4	20	55	-	-
NDPG50403264	3.264	4	20	55	-	-
NDPG504033	3.3	4	20	55	M3x0.7	WH1~4
NDPG504034	3.4	4	20	55	M4x0.7	WH 5~6
NDPG504035	3.5	4	20	55	-	-
NDPG50403572	3.572	4	25	55	-	-
NDPG504036	3.6	4	25	55	-	-
NDPG504037	3.7	4	25	55	-	-
NDPG504038	3.8	4	25	55	-	-
NDPG504039	3.9	4	25	55	-	-
NDPG504040	4	4	25	55	-	-
NDPG50404039	4.039	5	25	55	-	-
NDPG504041	4.1	5	25	55	-	-
NDPG504042	4.2	5	33	63	-	-

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG504043	4.3	5	33	63	M5x0.8	WH1~4
NDPG504044	4.4	5	33	63	M5x0.8	WH5~6
NDPG504045	4.5	5	33	63	-	-
NDPG504046	4.6	5	33	63	-	-
NDPG504047	4.7	5	33	63	-	-
NDPG50404763	4.763	5	33	63	-	-
NDPG504048	4.8	5	33	63	-	-
NDPG504049	4.9	5	33	63	-	-
NDPG504050	5	5	33	63	M6x1.0	WH1~4
NDPG504051	5.1	6	33	63	M6x1.0	WH5~6
NDPG50405159	5.159	6	36	66	-	-
NDPG504052	5.2	6	36	66	-	-
NDPG504053	5.3	6	36	66	-	-
NDPG504054	5.4	6	36	66	-	-
NDPG504055	5.5	6	36	66	-	-
NDPG50405556	5.556	6	36	66	-	-
NDPG504056	5.6	6	36	66	-	-
NDPG504057	5.7	6	36	66	-	-
NDPG504058	5.8	6	36	66	-	-
NDPG504059	5.9	6	36	66	-	-
NDPG50405953	5.953	6	36	66	-	-
NDPG504060	6	6	36	66	-	-
NDPG504061	6.1	7	36	66	-	-
NDPG504062	6.2	7	42	75	-	-
NDPG504063	6.3	7	42	75	-	-
NDPG5040635	6.35	7	42	75	-	-
NDPG504064	6.4	7	42	75	-	-
NDPG504065	6.5	7	42	75	-	-
NDPG504066	6.6	7	42	75	-	-
NDPG504067	6.7	7	42	75	-	-
NDPG50406747	6.747	7	42	75	-	-
NDPG504068	6.8	7	42	75	M8x1.25	WH1~4
NDPG504069	6.9	7	42	75	M8x1.25	WH5~6
NDPG504070	7	7	42	75	M8x1.0	WH1~4
NDPG504071	7.1	8	42	75	M8x1.0	WH5~6
NDPG50407144	7.144	8	46	80	-	-
NDPG504072	7.2	8	46	80	-	-

NDPG504

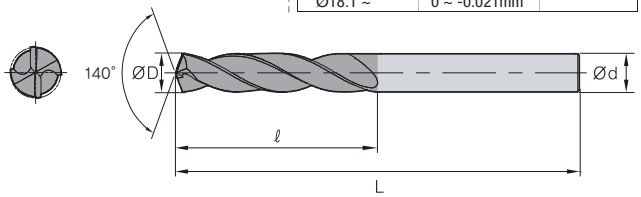
General purpose drill



ULTRA FINE | 30° HELIX | AlTiN | 4×D | 140° | DATA p.533

• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	0 ~ -0.010mm	h6
Ø3.1 ~ Ø6	0 ~ -0.012mm	
Ø6.1 ~ Ø10	0 ~ -0.015mm	
Ø10.1 ~ Ø18	0 ~ -0.018mm	
Ø18.1 ~	0 ~ -0.021mm	



(mm)

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG504073	7.3	8	46	80	-	-
NDPG504074	7.4	8	46	80	-	-
NDPG504075	7.5	8	46	80	-	-
NDPG50407541	7.541	8	46	80	-	-
NDPG504076	7.6	8	46	80	-	-
NDPG504077	7.7	8	46	80	-	-
NDPG504078	7.8	8	46	80	-	-
NDPG504079	7.9	8	46	80	-	-
NDPG50407938	7.938	8	46	80	-	-
NDPG504080	8	8	46	80	-	-
NDPG504081	8.1	9	46	80	-	-
NDPG504082	8.2	9	50	85	-	-
NDPG504083	8.3	9	50	85	-	-
NDPG504084	8.4	9	50	85	-	-
NDPG504085	8.5	9	50	85	M10x1.5	WH1~4
NDPG504086	8.6	9	50	85	M10x1.5	WH5~6
NDPG504087	8.7	9	50	85	-	-
NDPG50408731	8.731	9	50	85	-	-
NDPG504088	8.8	9	50	85	M10x1.25	WH1~4
NDPG504089	8.9	9	50	85	M10x1.25	WH5~6
NDPG504090	9	9	50	85	M10x1.0	WH1~4
NDPG504091	9.1	10	50	85	M10x1.0	WH5~6
NDPG504092	9.2	10	55	90	-	-
NDPG504093	9.3	10	55	90	-	-
NDPG504094	9.4	10	55	90	-	-
NDPG504095	9.5	10	55	90	-	-
NDPG50409525	9.525	10	55	90	-	-
NDPG504096	9.6	10	55	90	-	-
NDPG504097	9.7	10	55	90	-	-
NDPG504098	9.8	10	55	90	-	-
NDPG504099	9.9	10	55	90	-	-
NDPG504100	10	10	55	90	-	-
NDPG504101	10.1	11	55	90	-	-
NDPG504102	10.2	11	57	95	-	-
NDPG504103	10.3	11	57	95	M12x1.75	WH1~2
NDPG50410319	10.319	11	57	95	M12x1.75	WH3~4
NDPG504104	10.4	11	57	95	M12x1.75	WH5~6

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG504105	10.5	11	57	95	M12x1.5	WH1~4
NDPG504106	10.6	11	57	95	M12x1.5	WH5~6
NDPG504107	10.7	11	57	95	-	-
NDPG50410716	10.716	11	57	95	-	-
NDPG504108	10.8	11	57	95	M12x1.25	WH1~4
NDPG504109	10.9	11	57	95	M12x1.25	WH5~6
NDPG504110	11	11	57	95	M12x1.0	WH1~4
NDPG504111	11.1	12	57	95	M12x1.0	WH5~6
NDPG50411113	11.113	12	63	102	-	-
NDPG504112	11.2	12	63	102	-	-
NDPG504113	11.3	12	63	102	-	-
NDPG504114	11.4	12	63	102	-	-
NDPG504115	11.5	12	63	102	-	-
NDPG504116	11.6	12	63	102	-	-
NDPG504117	11.7	12	63	102	-	-
NDPG504118	11.8	12	63	102	-	-
NDPG504119	11.9	12	63	102	-	-
NDPG504120	12	12	63	102	M14x2.0	WH1~4
NDPG504121	12.1	13	63	102	M14x2.0	WH5~6
NDPG504122	12.2	13	63	102	-	-
NDPG504123	12.3	13	63	102	-	-
NDPG504124	12.4	13	63	102	-	-
NDPG504125	12.5	13	63	102	M14x1.5	WH1~4
NDPG504126	12.6	13	63	102	M14x1.5	WH5~6
NDPG504127	12.7	13	63	102	-	-
NDPG504128	12.8	13	63	102	-	-
NDPG504129	12.9	13	63	102	-	-
NDPG504130	13	13	63	102	-	-
NDPG504131	13.1	14	63	102	-	-
NDPG504132	13.2	14	65	107	-	-
NDPG504133	13.3	14	65	107	-	-
NDPG504134	13.4	14	65	107	-	-
NDPG50413494	13.494	14	65	107	-	-
NDPG504135	13.5	14	65	107	-	-
NDPG504136	13.6	14	65	107	-	-
NDPG504137	13.7	14	65	107	-	-
NDPG504138	13.8	14	65	107	-	-

W-Star Drill

NDPG504

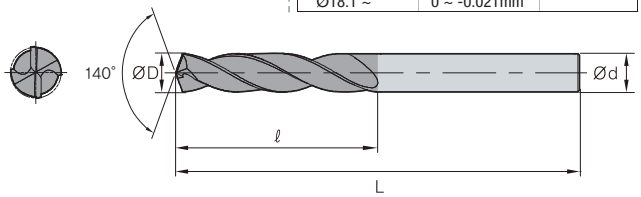
General purpose drill

ULTRA FINE | 30° HELIX | AlTiN | ▸4×D | 140° | DATA p.533



• TOLERANCE

ØD		Ød
Ø1 ~ Ø3	0 ~ -0.010mm	h6
Ø3.1 ~ Ø6	0 ~ -0.012mm	
Ø6.1 ~ Ø10	0 ~ -0.015mm	
Ø10.1 ~ Ø18	0 ~ -0.018mm	
Ø18.1 ~	0 ~ -0.021mm	



(mm)

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG504139	13.9	14	65	107	-	-
NDPG504140	14	14	65	107	M16x2.0	WH1~4
NDPG504141	14.1	15	65	107	M16x2.0	WH5~6
NDPG504142	14.2	15	67	111	-	-
NDPG504143	14.3	15	67	111	-	-
NDPG504144	14.4	15	67	111	-	-
NDPG504145	14.5	15	67	111	M16x1.5	WH1~4
NDPG504146	14.6	15	67	111	M16x1.5	WH5~6
NDPG504147	14.7	15	67	111	-	-
NDPG504148	14.8	15	67	111	-	-
NDPG504149	14.9	15	67	111	-	-
NDPG504150	15	15	67	111	-	-
NDPG504151	15.1	16	67	111	-	-
NDPG504152	15.2	16	69	115	-	-
NDPG504154	15.4	16	69	115	-	-
NDPG504155	15.5	16	69	115	M18x2.5	WH1~4
NDPG504156	15.6	16	69	115	M18x2.5	WH5~6
NDPG504157	15.7	16	69	115	-	-
NDPG504158	15.8	16	69	115	-	-
NDPG50415875	15.875	16	69	115	-	-

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG504160	16	16	69	115	-	-
NDPG504161	16.1	17	69	115	-	-
NDPG504163	16.3	17	71	119	-	-
NDPG504165	16.5	17	71	119	M18x1.5	WH1~6
NDPG50416669	16.669	17	71	119	-	-
NDPG504170	17	17	71	119	-	-
NDPG504171	17.1	18	71	119	-	-
NDPG504172	17.2	18	74	123	-	-
NDPG504175	17.5	18	74	123	M20x2.5	WH1~6
NDPG504177	17.7	18	74	123	-	-
NDPG504178	17.8	18	74	123	-	-
NDPG504180	18	18	74	123	-	-
NDPG504181	18.1	19	74	123	-	-
NDPG504182	18.2	19	76	127	-	-
NDPG504185	18.5	19	76	127	M20x1.5	WH1~6
NDPG504190	19	19	76	127	-	-
NDPG504191	19.1	20	76	127	-	-
NDPG504195	19.5	20	80	131	M22x2.5	WH1~6
NDPG504197	19.7	20	80	131	-	-
NDPG504200	20	20	80	131	-	-

• **Applicable Workpiece**

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron	Stainless steels	Nonferrous steels & Aluminum
			SKD61~HRC55	SKD11 HRC55~			
◎	◎	○			○	◎	

◎: Excellent ○: Good

NDPG507

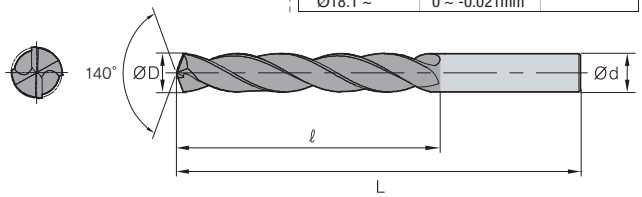
General purpose drill



ULTRA FINE | 30° HELIX | AlTiN | 7×D | 140° | DATA p.533

• TOLERANCE

ØD		Ød
Ø3	0 ~ -0.010mm	h6
Ø3.1 ~ Ø6	0 ~ -0.012mm	
Ø6.1 ~ Ø10	0 ~ -0.015mm	
Ø10.1 ~ Ø18	0 ~ -0.018mm	
Ø18.1 ~	0 ~ -0.021mm	



(mm)

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG507030	3	3	45	80	-	-
NDPG507031	3.1	4	45	80	-	-
NDPG50703175	3.175	4	45	80	-	-
NDPG507032	3.2	4	45	80	-	-
NDPG50703264	3.264	4	45	80	-	-
NDPG507033	3.3	4	45	80	M4x0.7	WH1~4
NDPG507034	3.4	4	45	80	M4x0.7	WH5~6
NDPG507035	3.5	4	45	80	-	-
NDPG50703572	3.572	4	45	80	-	-
NDPG507036	3.6	4	45	80	-	-
NDPG507037	3.7	4	45	80	-	-
NDPG507038	3.8	4	45	80	-	-
NDPG507039	3.9	4	45	80	-	-
NDPG507040	4	4	45	80	-	-
NDPG507041	4.1	5	45	80	-	-
NDPG507042	4.2	5	45	80	M5x0.8	WH1~4
NDPG507043	4.3	5	45	80	M5x0.8	WH5~6
NDPG507044	4.4	5	45	80	-	-
NDPG507045	4.5	5	45	80	-	-
NDPG507046	4.6	5	45	80	-	-
NDPG507047	4.7	5	45	80	-	-
NDPG50704763	4.763	5	45	80	-	-
NDPG507048	4.8	5	45	80	-	-
NDPG507049	4.9	5	45	80	-	-
NDPG507050	5	5	45	80	M6x1.0	WH1~4
NDPG507051	5.1	6	45	80	M6x1.0	WH5~6
NDPG50705159	5.159	6	50	83	-	-
NDPG507052	5.2	6	50	83	-	-
NDPG507053	5.3	6	50	83	-	-
NDPG507054	5.4	6	50	83	-	-
NDPG507055	5.5	6	50	83	-	-
NDPG50705556	5.556	6	50	83	-	-
NDPG507056	5.6	6	50	83	-	-
NDPG507057	5.7	6	50	83	-	-
NDPG507058	5.8	6	50	83	-	-

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG507059	5.9	6	50	83	-	-
NDPG507060	6	6	50	83	-	-
NDPG507061	6.1	7	50	83	-	-
NDPG507062	6.2	7	53	85	-	-
NDPG507063	6.3	7	53	85	-	-
NDPG5070635	6.35	7	53	85	-	-
NDPG507064	6.4	7	53	85	-	-
NDPG507065	6.5	7	53	85	-	-
NDPG507066	6.6	7	53	85	-	-
NDPG507067	6.7	7	53	85	-	-
NDPG50706747	6.747	7	53	85	-	-
NDPG507068	6.8	7	53	85	M8x1.25	WH1~4
NDPG507069	6.9	7	53	85	M8x1.25	WH5~6
NDPG507070	7	7	53	85	M8x1.0	WH1~4
NDPG507071	7.1	8	53	85	M8x1.0	WH5~6
NDPG50707144	7.144	8	58	90	-	-
NDPG507072	7.2	8	58	90	-	-
NDPG507073	7.3	8	58	90	-	-
NDPG507074	7.4	8	58	90	-	-
NDPG507075	7.5	8	58	90	-	-
NDPG507076	7.6	8	58	90	-	-
NDPG507077	7.7	8	58	90	-	-
NDPG507078	7.8	8	58	90	-	-
NDPG507079	7.9	8	58	90	-	-
NDPG50707938	7.938	8	58	90	-	-
NDPG507080	8	8	58	90	-	-
NDPG507081	8.1	9	58	90	-	-
NDPG507082	8.2	9	64	98	-	-
NDPG507083	8.3	9	64	98	-	-
NDPG507084	8.4	9	64	98	-	-
NDPG507085	8.5	9	64	98	M10x1.5	WH1~4
NDPG507086	8.6	9	64	98	M10x1.5	WH5~6
NDPG507087	8.7	9	64	98	-	-
NDPG50708731	8.731	9	64	98	-	-
NDPG507088	8.8	9	64	98	M10x1.25	WH1~4

W-Star Drill

NDPG507

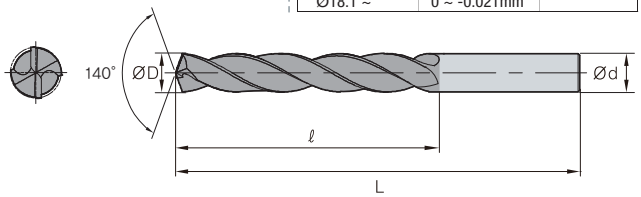
General purpose drill



ULTRA FINE | 30° HELIX | AlTiN | ▸7×D | 140° | DATA p.533

• TOLERANCE

ØD		Ød
Ø3	0 ~ -0.010mm	h6
Ø3.1 ~ Ø6	0 ~ -0.012mm	
Ø6.1 ~ Ø10	0 ~ -0.015mm	
Ø10.1 ~ Ø18	0 ~ -0.018mm	
Ø18.1 ~	0 ~ -0.021mm	



(mm)

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG507089	8.9	9	64	98	M10x1.25	WH5~6
NDPG507090	9	9	64	98	M10x1.0	WH1~4
NDPG507091	9.1	10	64	98	M10x1.0	WH5~6
NDPG507092	9.2	10	68	105	-	-
NDPG507093	9.3	10	68	105	-	-
NDPG507094	9.4	10	68	105	-	-
NDPG507095	9.5	10	68	105	-	-
NDPG50709525	9.525	10	68	105	-	-
NDPG507096	9.6	10	68	105	-	-
NDPG507097	9.7	10	68	105	-	-
NDPG507098	9.8	10	68	105	-	-
NDPG507099	9.9	10	68	105	-	-
NDPG507100	10	10	68	105	-	-
NDPG507101	10.1	11	68	105	-	-
NDPG507102	10.2	11	73	110	-	-
NDPG507103	10.3	11	73	110	M12x1.75	WH1~2
NDPG50710319	10.319	11	73	110	M12x1.75	WH3~4
NDPG507104	10.4	11	73	110	M12x1.75	WH5~6
NDPG507105	10.5	11	73	110	M12x1.5	WH1~4
NDPG507106	10.6	11	73	110	M12x1.5	WH5~6
NDPG507107	10.7	11	73	110	-	-
NDPG50710716	10.716	11	73	110	-	-
NDPG507108	10.8	11	73	110	M12x1.25	WH1~4
NDPG507109	10.9	11	73	110	M12x1.25	WH5~6
NDPG507110	11	11	73	110	M12x1.0	WH1~4
NDPG507111	11.1	12	73	110	M12x1.0	WH5~6
NDPG50711113	11.113	12	80	120	-	-
NDPG507112	11.2	12	80	120	-	-
NDPG507113	11.3	12	80	120	-	-
NDPG507114	11.4	12	80	120	-	-
NDPG507115	11.5	12	80	120	-	-
NDPG507116	11.6	12	80	120	-	-
NDPG507117	11.7	12	80	120	-	-
NDPG507118	11.8	12	80	120	-	-
NDPG507119	11.9	12	80	120	-	-

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG507120	12	12	80	120	M14x2.0	WH1~4
NDPG507121	12.1	13	80	120	M14x2.0	WH5~6
NDPG507122	12.2	13	90	137	-	-
NDPG507123	12.3	13	90	137	-	-
NDPG507124	12.4	13	90	137	-	-
NDPG507125	12.5	13	90	137	M14x1.5	WH1~4
NDPG507126	12.6	13	90	137	M14x1.5	WH5~6
NDPG507127	12.7	13	90	137	-	-
NDPG507128	12.8	13	90	137	-	-
NDPG507129	12.9	13	90	137	-	-
NDPG507130	13	13	90	137	-	-
NDPG507131	13.1	14	90	137	-	-
NDPG507133	13.3	14	96	147	-	-
NDPG507134	13.4	14	96	147	-	-
NDPG50713494	13.494	14	96	147	-	-
NDPG507135	13.5	14	96	147	-	-
NDPG507136	13.6	14	96	147	-	-
NDPG507137	13.7	14	96	147	-	-
NDPG507138	13.8	14	96	147	-	-
NDPG50713891	13.891	14	96	147	-	-
NDPG507139	13.9	14	96	147	-	-
NDPG507140	14	14	96	147	M16x2.0	WH1~4
NDPG507141	14.1	15	96	147	M16x2.0	WH5~6
NDPG507142	14.2	15	100	153	-	-
NDPG50714288	14.288	15	100	153	-	-
NDPG507143	14.3	15	100	153	-	-
NDPG507145	14.5	15	100	153	M16x1.5	WH1~4
NDPG507146	14.6	15	100	153	M16x1.5	WH5~6
NDPG507147	14.7	15	100	153	-	-
NDPG507148	14.8	15	100	153	-	-
NDPG507149	14.9	15	100	153	-	-
NDPG507150	15	15	100	153	-	-
NDPG507151	15.1	16	100	153	-	-
NDPG507154	15.4	16	112	160	-	-
NDPG507155	15.5	16	112	160	M18x2.5	WH1~4

NDPG507

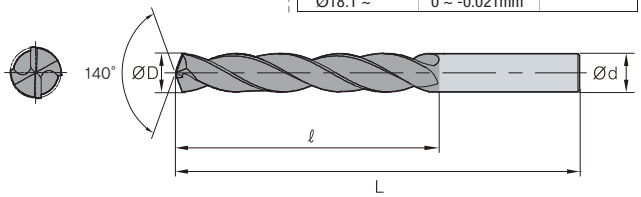
General purpose drill

ULTRA FINE | 30° HELIX | AlTiN | ▸7×D | 140° | DATA p.533



• TOLERANCE

ØD		Ød
Ø3	0 ~ -0.010mm	h6
Ø3.1 ~ Ø6	0 ~ -0.012mm	
Ø6.1 ~ Ø10	0 ~ -0.015mm	
Ø10.1 ~ Ø18	0 ~ -0.018mm	
Ø18.1 ~	0 ~ -0.021mm	



(mm)

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG507156	15.6	16	112	160	M18x2.5	WH5~6
NDPG507157	15.7	16	112	160	-	-
NDPG507158	15.8	16	112	160	-	-
NDPG50715875	15.875	16	112	160	-	-
NDPG507160	16	16	112	160	-	-
NDPG507161	16.1	17	112	160	-	-
NDPG507163	16.3	17	112	160	-	-
NDPG507165	16.5	17	112	160	M18x1.5	WH1~6
NDPG50716669	16.669	17	112	160	-	-
NDPG507170	17	17	112	160	-	-
NDPG507171	17.1	18	112	160	-	-
NDPG507172	17.2	18	112	160	-	-

Designation	Description (mm)				TAP	
	ØD	Ød	ℓ	L	Size	Limit
NDPG50717463	17.463	18	112	160	-	-
NDPG507175	17.5	18	112	160	M20x2.5	WH1~6
NDPG507177	17.7	18	112	160	-	-
NDPG507178	17.8	18	112	160	-	-
NDPG507180	18	18	112	160	-	-
NDPG507182	18.2	19	112	160	-	-
NDPG507185	18.5	19	112	160	M20x1.5	WH1~6
NDPG507190	19	19	112	160	-	-
NDPG507195	19.5	20	112	160	M22x2.5	WH1~6
NDPG507197	19.7	20	112	160	-	-
NDPG507200	20	20	112	160	-	-

• Applicable Workpiece

Carbon steel ~ HB225	Alloy steel HB225~325	Pre-hardened steel HRC30~50	Hardened steel		Cast iron	Stainless steels	Nonferrous steels & Aluminum
			SKD61~HRC55	SKD11 HRC55~			
◎	◎	○			○	◎	

◎: Excellent ○: Good

Carbide solid drill for non-ferrous metals and mild steel machining

SSD-N

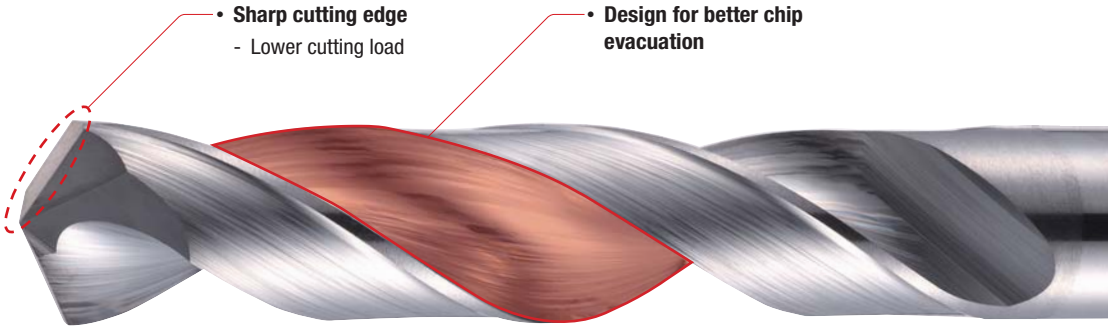
- Stable drilling for high productivity
- Available for various workpieces such as mild steel and non-ferrous metals

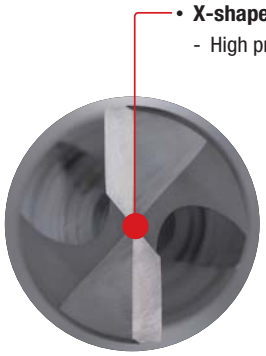
Code system

Special type

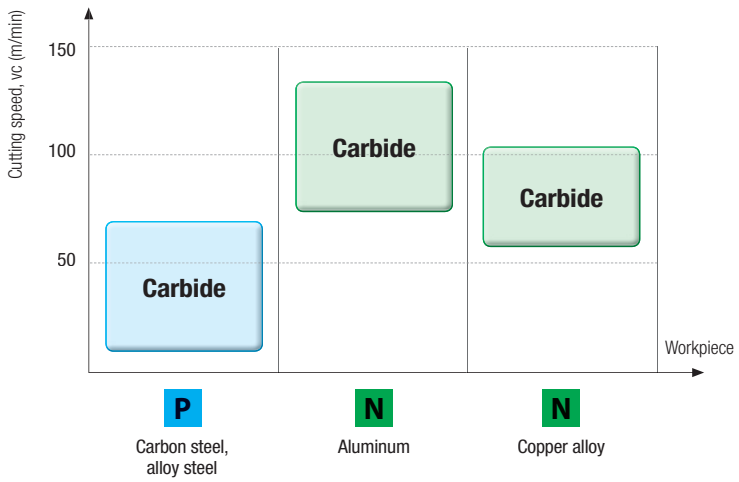
SSD	010	-	N	-	10	-	60L	-	6S
Solid Spiral Drill	Drill dia. (ØD) 010: Ø1.0 mm		Nonferrous		Flute length 10: 10 mm		Overall length 60L: 60 mm		Shank dia. 6S: Ø6.0 mm

Features



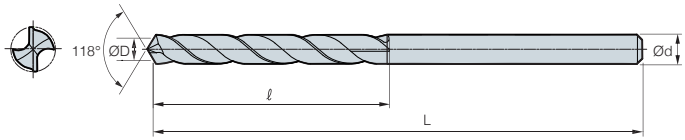


Application range



SSD-N





DATA
p.533

• TOLERANCE

Coating	×
Tolerance (drill Dia.)	h8
Tolerance (shank Dia.)	h7
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

(mm)

Designation	ØD	Ød	ℓ	L
SSD 010-N	1.0	1.0	10	38
SSD 011-N	1.1	1.1	10	38
SSD 012-N	1.2	1.2	10	38
SSD 013-N	1.3	1.3	13	38
SSD 014-N	1.4	1.4	13	38
SSD 015-N	1.5	1.5	13	38
SSD 016-N	1.6	1.6	13	38
SSD 017-N	1.7	1.7	13	38
SSD 018-N	1.8	1.8	13	38
SSD 019-N	1.9	1.9	13	38
SSD 020-N	2.0	2.0	16	45
SSD 021-N	2.1	2.1	16	45
SSD 022-N	2.2	2.2	16	45
SSD 023-N	2.3	2.3	16	45
SSD 024-N	2.4	2.4	18	50
SSD 025-N	2.5	2.5	20	50
SSD 026-N	2.6	2.6	20	50
SSD 027-N	2.7	2.7	22	50
SSD 028-N	2.8	2.8	22	50
SSD 029-N	2.9	2.9	22	50
SSD 030-N	3.0	3.0	22	50
SSD 031-N	3.1	3.1	25	50
SSD 032-N	3.2	3.2	25	50
SSD 033-N	3.3	3.3	25	50
SSD 034-N	3.4	3.4	25	50
SSD 035-N	3.5	3.5	25	50
SSD 036-N	3.6	3.6	28	55
SSD 037-N	3.7	3.7	28	55
SSD 038-N	3.8	3.8	28	55
SSD 039-N	3.9	3.9	28	55
SSD 040-N	4.0	4.0	28	55
SSD 041-N	4.1	4.1	30	60
SSD 042-N	4.2	4.2	30	60
SSD 043-N	4.3	4.3	30	60
SSD 044-N	4.4	4.4	30	60
SSD 045-N	4.5	4.5	30	60
SSD 046-N	4.6	4.6	33	65

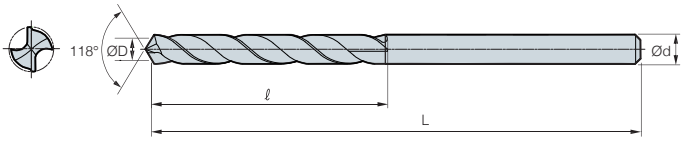
Designation	ØD	Ød	ℓ	L
SSD 047-N	4.7	4.7	33	65
SSD 048-N	4.8	4.8	35	65
SSD 049-N	4.9	4.9	35	65
SSD 050-N	5.0	5.0	35	65
SSD 051-N	5.1	5.1	35	65
SSD 052-N	5.2	5.2	35	65
SSD 053-N	5.3	5.3	35	65
SSD 054-N	5.4	5.4	35	65
SSD 055-N	5.5	5.5	35	65
SSD 056-N	5.6	5.6	38	75
SSD 057-N	5.7	5.7	38	75
SSD 058-N	5.8	5.8	38	75
SSD 059-N	5.9	5.9	38	75
SSD 060-N	6.0	6.0	38	75
SSD 061-N	6.1	6.1	38	75
SSD 062-N	6.2	6.2	38	75
SSD 063-N	6.3	6.3	38	75
SSD 064-N	6.4	6.4	38	75
SSD 065-N	6.5	6.5	38	75
SSD 066-N	6.6	6.6	45	80
SSD 067-N	6.7	6.7	45	80
SSD 068-N	6.8	6.8	45	80
SSD 069-N	6.9	6.9	45	80
SSD 070-N	7.0	7.0	45	80
SSD 071-N	7.1	7.1	45	80
SSD 072-N	7.2	7.2	45	80
SSD 073-N	7.3	7.3	45	80
SSD 074-N	7.4	7.4	45	80
SSD 075-N	7.5	7.5	45	80
SSD 076-N	7.6	7.6	50	85
SSD 077-N	7.7	7.7	50	85
SSD 078-N	7.8	7.8	50	85
SSD 079-N	7.9	7.9	50	85
SSD 080-N	8.0	8.0	50	85
SSD 081-N	8.1	8.1	50	85
SSD 082-N	8.2	8.2	50	85
SSD 083-N	8.3	8.3	50	85

Drill

SSD-N

SSD-N





DATA
p.533

• TOLERANCE

Coating	×
Tolerance (drill Dia.)	h8
Tolerance (shank Dia.)	h7
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

(mm)

Designation	ØD	Ød	ℓ	L
SSD 084-N	8.4	8.4	50	85
SSD 085-N	8.5	8.5	50	85
SSD 086-N	8.6	8.6	50	95
SSD 087-N	8.7	8.7	50	95
SSD 088-N	8.8	8.8	50	95
SSD 089-N	8.9	8.9	50	95
SSD 090-N	9.0	9.0	50	95
SSD 091-N	9.1	9.1	50	95
SSD 092-N	9.2	9.2	50	95
SSD 093-N	9.3	9.3	50	95
SSD 094-N	9.4	9.4	50	95
SSD 095-N	9.5	9.5	50	95
SSD 096-N	9.6	9.6	50	95
SSD 097-N	9.7	9.7	50	95
SSD 098-N	9.8	9.8	50	95
SSD 099-N	9.9	9.9	55	100
SSD 100-N	10.0	10.0	55	100
SSD 101-N	10.1	10.1	55	115
SSD 102-N	10.2	10.2	55	115

Designation	ØD	Ød	ℓ	L
SSD 103-N	10.3	10.3	55	115
SSD 104-N	10.4	10.4	55	115
SSD 105-N	10.5	10.5	55	115
SSD 106-N	10.6	10.6	60	115
SSD 107-N	10.7	10.7	60	115
SSD 108-N	10.8	10.8	60	115
SSD 109-N	10.9	10.9	60	115
SSD 110-N	11.0	11.0	60	115
SSD 111-N	11.1	11.1	65	120
SSD 112-N	11.2	11.2	65	120
SSD 113-N	11.3	11.3	65	120
SSD 115-N	11.5	11.5	65	120
SSD 118-N	11.8	11.8	65	120
SSD 119-N	11.9	11.9	65	120
SSD 120-N	12.0	12.0	65	120
SSD 124-N	12.4	12.4	70	125
SSD 125-N	12.5	12.5	70	125
SSD 130-N	13.0	13.0	75	130

Burnishing Drill

BDS



DATA
p.534

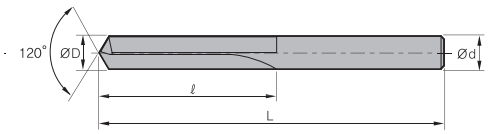


Fig 1

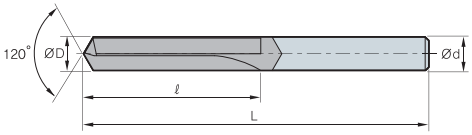


Fig 2

(mm)

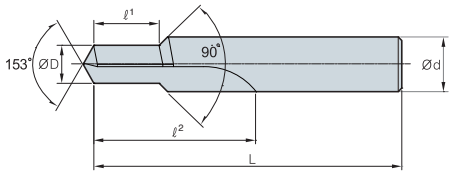
Designation	ØD	Ød	ℓ	L	Fig.
BDS 040S	4.0	4	35	80	1
BDS 050S	5.0	5	40	85	1
BDS 060S	6.0	6	50	95	1
BDS 070S	7.0	7	55	100	1
BDS 080S	8.0	8	65	110	1
BDS 090S	9.0	9	70	120	1
BDS 100S	10.0	10	80	130	1
BDS 110S	11.0	11	90	140	1
BDS 120B	12.0	12	95	150	2
BDS 130B	13.0	16	105	160	2
BDS 140B	14.0	16	110	170	2
BDS 150B	15.0	16	120	185	2
BDS 160B	16.0	16	125	190	2

Drill Burnishing Drill

BDT (Step)

For tapping a foundation hole





DATA
p.534

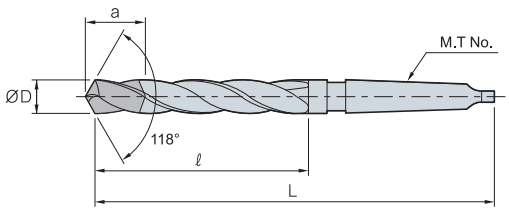
(mm)

Designation	ØD	Ød	ℓ1	ℓ2	L	Tap
BDT M05080 - ℓ1	4.2	6	35	9~15	90	M5XP0.8
BDT M06100 - ℓ1	5.0	7	40	11~18	95	M6XP1.0
BDT M08125 - ℓ1	6.8	10	50	15~24	105	M8XP1.25
BDT M10125 - ℓ1	8.8	12	55	17~30	110	M10XP1.25
BDT M10150 - ℓ1	8.5	12	55	17~30	110	M10XP1.5
BDT M12125 - ℓ1	10.8	14	60	19~36	120	M12XP1.25
BDT M12150 - ℓ1	10.5	14	60	19~36	120	M12XP1.5
BDT M12175 - ℓ1	10.3	14	60	19~36	120	M12XP1.75

Top Solid Drill

TSDM





DATA
p.534

Designation	ØD	ℓ	L	a	M.T No
TSDM 080~085	8.0~8.5	85	168	25	1
TSDM 086~090	8.6~9.0	88	172	25	1
TSDM 091~095	9.1~9.5	92	175	26	1
TSDM 096~100	9.6~10.0	95	178	26	1
TSDM 101~105	10.1~10.5	98	182	26	1
TSDM 106~110	10.6~11.0	102	185	26	1
TSDM 111~115	11.1~11.5	105	188	26	1
TSDM 116~120	11.6~12.0	108	192	26	1
TSDM 121~125	12.1~12.5	112	195	26	1
TSDM 126~130	12.6~13.0	115	198	26	2
TSDM 131~135	13.1~13.5	118	202	27	2
TSDM 136~140	13.6~14.0	122	205	27	2
TSDM 141~145	14.1~14.5	122	222	27	2
TSDM 146~150	14.6~15.0	125	225	27	2
TSDM 151~155	15.1~15.5	125	228	27	2
TSDM 156~160	15.6~16.0	130	230	27	2
TSDM 161~165	16.1~16.5	132	232	27	2
TSDM 166~170	16.6~17.0	135	234	27	2
TSDM 171~180	17.1~18.0	140	240	27	2
TSDM 181~190	18.1~19.0	145	245	27	2
TSDM 191~200	19.1~20.0	150	250	30	2
TSDM 201~210	20.1~21.0	155	255	30	2
TSDM 211~220	21.1~22.0	160	260	30	2
TSDM 221~230	22.1~23.0	165	265	30	2
TSDM 231~250	23.1~25.0	165	285	34	3

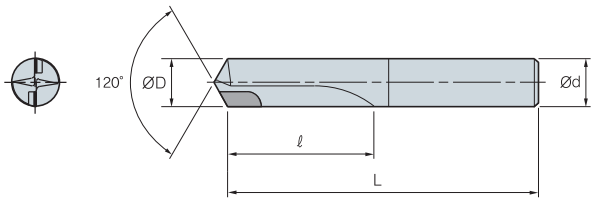
PCD Drill

PDD

Brazing type



DATA
p.535



(mm)

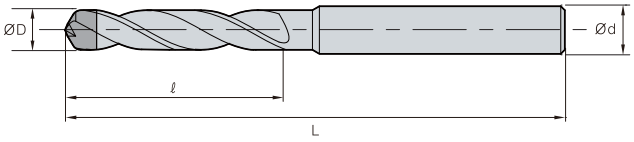
Designation	ØD	Ød	ℓ	L
PDD 0500	5.0	5.0	30	80
PDD 0550	5.5	5.5	30	80
PDD 0600	6.0	6.0	30	80
PDD 0650	6.5	6.5	40	95
PDD 0700	7.0	7.0	40	95
PDD 0750	7.5	7.5	45	100
PDD 0800	8.0	8.0	45	100
PDD 0850	8.5	8.5	50	110
PDD 0900	9.0	9.0	50	110
PDD 0950	9.5	9.5	55	115
PDD 1000	10.0	10.0	55	115
PDD 1050	10.5	10.5	60	120
PDD 1100	11.0	11.0	60	120
PDD 1150	11.5	11.5	65	125
PDD 1200	12.0	12.0	65	125

CPD (Standard)

Cone type

DATA
p.535





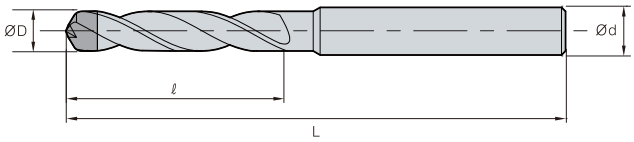
Designation	ØD	Ød	ℓ	L
CPD 020~030	2.0~3.0	4	10	43
CPD 031~035	3.1~3.5	4	15	43
CPD 036~040	3.6~4.0	4	15	43
CPD 041~050	4.1~5.0	6	20	53
CPD 051~060	5.1~6.0	6	25	63
CPD 061~070	6.1~7.0	8	30	79
CPD 071~080	7.1~8.0	8	35	79

CPDL (Long)

Cone type

DATA
p.535





Designation	ØD	Ød	ℓ	L
CPDL 020~030	2.0~3.0	4	90	160
CPDL 031~035	3.1~3.5	4	90	160
CPDL 036~040	3.6~4.0	4	90	160
CPDL 041~050	4.1~5.0	6	90	160
CPDL 051~060	5.1~6.0	6	90	160
CPDL 061~070	6.1~7.0	8	90	160
CPDL 071~080	7.1~8.0	8	90	160

Notice

- High functional drill for machining in various cutting range : Cone type drill(CPD)
- Realizing excellent accuracy and surface finish
- High precision premium PCD drill

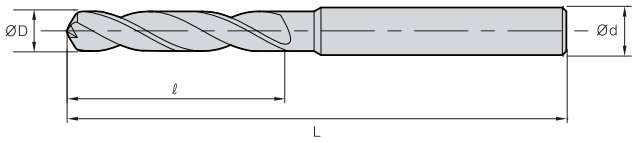
PCD Drill

SPD (Standard)

Sandwich type

DATA
p.535





(mm)

Designation	ØD	Ød	ℓ	L
SPD 040	4.0	4	20	43
SPD 045	4.5	6	20	53
SPD 050	5.0	6	25	63
SPD 055	5.5	6	25	63
SPD 060	6.0	6	25	63
SPD 065	6.5	8	30	79
SPD 070	7.0	8	35	79
SPD 075	7.5	8	35	79
SPD 080	8.0	8	35	79
SPD 085	8.5	10	60	110
SPD 090	9.0	10	60	110
SPD 095	9.5	10	60	110
SPD 100	10.0	10	60	110
SPD 105	10.5	10	60	110
SPD 110	11.0	12	70	110
SPD 115	11.5	12	70	110
SPD 120	12.0	12	80	150
SPD 125	12.5	12	80	150
SPD 130	13.0	14	80	150
SPD 135	13.5	14	80	150
SPD 140	14.0	14	80	150
SPD 145	14.5	14	80	150
SPD 150	15.0	16	80	150
SPD 160	16.0	16	80	150

Notice

- High functional drill for machining in various cutting range : Sandwich type drill(SPD)
- Realizing excellent accuracy and surface finish
- High precision premium PCD drill

Stable performance and hole quality with our unique cutting edge and guide pad available regrinding

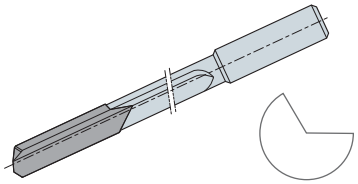
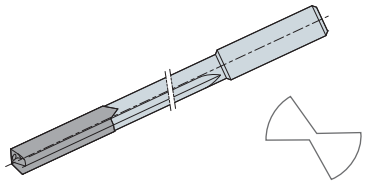
Gun Drill

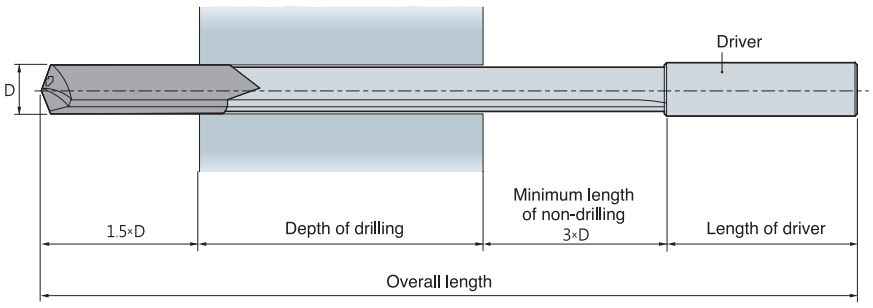
- High efficiency in deep hole machining
- High accuracy (Hole tolerance: IT9, surface finish: Ra0.1~3.0S)
- Stable Quality due to unique cutting edge and guide pad available regrinding
- Used drill can be recycled by exchanging the carbide part
- Depending on request, the drills can change geometry of cutting edge and drive specification
- For ordering, please check length of drill

Code system

KGD	S	-	12.05	-	1500	/	D30
KORLOY Gun Drill	Lib type S : Single T : Twin		Drill dia. (ØD) Ø12.05		Length of drill 1500 mm		Drive no. D30

Features

	Single lip type	Twin lip type
Shape		
Drill Dia.	Ø3.0 ~ Ø33.0	Ø8.0 ~ Ø24.0
Depth of drilling	≥ 2,000 mm	≥ 1,000 mm
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
- The overall length can be chosen by order

Gun Drill

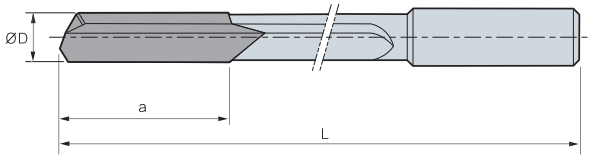
KGDS

Single lip type

DATA p.535

• TOLERANCE

Designation description	
○.○○	Diameter
□□□□	Length
D□□	Driver code no.



(mm)

Designation	ØD	a
KGDS ○.○○ – □□□□/**D**□□	3.00~3.49	19
KGDS ○.○○ – □□□□/**D**□□	3.50~3.99	19
KGDS ○.○○ – □□□□/**D**□□	4.00~4.49	23
KGDS ○.○○ – □□□□/**D**□□	4.50~4.99	23
KGDS ○.○○ – □□□□/**D**□□	5.00~5.49	24
KGDS ○.○○ – □□□□/**D**□□	5.50~5.99	26
KGDS ○.○○ – □□□□/**D**□□	6.00~6.49	27
KGDS ○.○○ – □□□□/**D**□□	6.50~6.99	28
KGDS ○.○○ – □□□□/**D**□□	7.00~7.49	29
KGDS ○.○○ – □□□□/**D**□□	7.50~7.99	30
KGDS ○.○○ – □□□□/**D**□□	8.00~8.49	31
KGDS ○.○○ – □□□□/**D**□□	8.50~8.99	31
KGDS ○.○○ – □□□□/**D**□□	9.00~8.49	31
KGDS ○.○○ – □□□□/**D**□□	9.50~9.99	31
KGDS ○.○○ – □□□□/**D**□□	10.00~10.49	31
KGDS ○.○○ – □□□□/**D**□□	10.50~10.99	32
KGDS ○.○○ – □□□□/**D**□□	11.00~11.49	35
KGDS ○.○○ – □□□□/**D**□□	11.50~11.99	35
KGDS ○.○○ – □□□□/**D**□□	12.00~12.49	38
KGDS ○.○○ – □□□□/**D**□□	12.50~12.99	38

Designation	ØD	a
KGDS ○.○○ – □□□□/**D**□□	13.00~13.99	38
KGDS ○.○○ – □□□□/**D**□□	14.00~14.99	38
KGDS ○.○○ – □□□□/**D**□□	15.00~15.99	39
KGDS ○.○○ – □□□□/**D**□□	16.00~16.99	39
KGDS ○.○○ – □□□□/**D**□□	17.00~17.99	40
KGDS ○.○○ – □□□□/**D**□□	18.00~18.99	41
KGDS ○.○○ – □□□□/**D**□□	19.00~19.99	41
KGDS ○.○○ – □□□□/**D**□□	20.00~20.99	44
KGDS ○.○○ – □□□□/**D**□□	21.00~21.99	46
KGDS ○.○○ – □□□□/**D**□□	22.00~22.99	49
KGDS ○.○○ – □□□□/**D**□□	23.00~23.99	51
KGDS ○.○○ – □□□□/**D**□□	24.00~24.99	52
KGDS ○.○○ – □□□□/**D**□□	25.00~25.99	54
KGDS ○.○○ – □□□□/**D**□□	26.00~26.99	54
KGDS ○.○○ – □□□□/**D**□□	27.00~27.99	54
KGDS ○.○○ – □□□□/**D**□□	28.00~28.99	54
KGDS ○.○○ – □□□□/**D**□□	29.00~29.99	56
KGDS ○.○○ – □□□□/**D**□□	30.00~30.99	59
KGDS ○.○○ – □□□□/**D**□□	31.00~31.99	61
KGDS ○.○○ – □□□□/**D**□□	32.00~32.99	61

※ When ordering, please mark the overall length(L) and driver number(or drawing)

Available overall length

Designation	Drill dia.	Overall length				
		250 mm	500 mm	1000 mm	1500 mm	2000 mm
KGDS	3.00 ~ 3.49	○	○	○		
	3.50 ~ 32.99	○	○	○	○	○

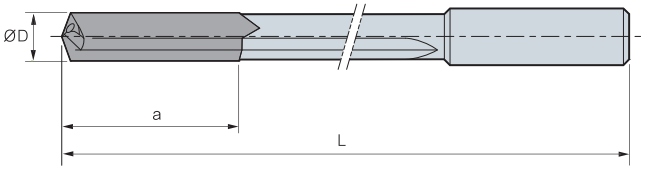
KGDT

Twin lip type

DATA p.535

• TOLERANCE

Designation description	
○.○○	Diameter
□□□□	Length
D□□	Driver code no.



(mm)

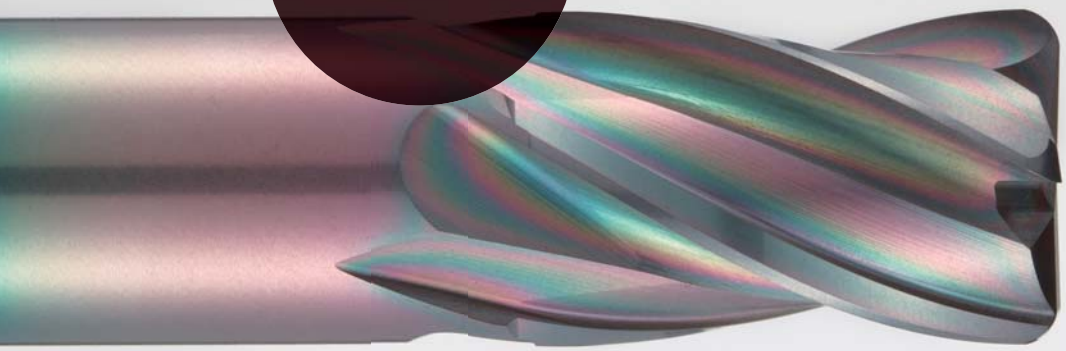
Designation	ØD	a
KGDT ○.○○ – □□□□ / **D**□□	8.00~8.49	38
KGDT ○.○○ – □□□□ / **D**□□	8.50~8.99	38
KGDT ○.○○ – □□□□ / **D**□□	9.00~8.49	40
KGDT ○.○○ – □□□□ / **D**□□	9.50~9.99	40
KGDT ○.○○ – □□□□ / **D**□□	10.00~10.49	40
KGDT ○.○○ – □□□□ / **D**□□	10.50~10.99	40
KGDT ○.○○ – □□□□ / **D**□□	11.00~11.49	45
KGDT ○.○○ – □□□□ / **D**□□	11.50~11.99	45
KGDT ○.○○ – □□□□ / **D**□□	12.00~12.49	45
KGDT ○.○○ – □□□□ / **D**□□	12.50~12.99	48
KGDT ○.○○ – □□□□ / **D**□□	13.00~13.99	48
KGDT ○.○○ – □□□□ / **D**□□	14.00~14.99	48
KGDT ○.○○ – □□□□ / **D**□□	15.00~15.99	48
KGDT ○.○○ – □□□□ / **D**□□	16.00~16.99	50
KGDT ○.○○ – □□□□ / **D**□□	17.00~17.99	50
KGDT ○.○○ – □□□□ / **D**□□	18.00~18.99	50
KGDT ○.○○ – □□□□ / **D**□□	19.00~19.99	50
KGDT ○.○○ – □□□□ / **D**□□	20.00~20.99	55
KGDT ○.○○ – □□□□ / **D**□□	21.00~21.99	55
KGDT ○.○○ – □□□□ / **D**□□	22.00~22.99	55
KGDT ○.○○ – □□□□ / **D**□□	23.00~23.99	60

※ When ordering, please mark the overall length(L) and driver number(or drawing)

Available overall length

Designation	Drill dia.	Overall length				
		250 mm	500 mm	1000 mm	1500 mm	2000 mm
KGDT	8.00 ~ 23.99	○	○	○		

PART 3



• Reamer
• Chamfer
• Thread

Product details

Technical information for Reamer / Chamfer / Thread

Reamer

Chucking / Machine Reamer 340

PCD Reamer 342

Cermet Reamer 343

Broach Reamer 344

Chamfer

Chamfer Tool 345

Counter Sink 348

Thread

Thread Mill 352

TAP 374





Reamer / Chamfer / Thread

Reamer / Chamfer

Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Reamer	Chucking / Machine Reamer	SCRS		Ø5.0 ~ Ø20.0	2D ~ 3D	340
		SCRH		Ø5.0 ~ Ø20.0	2D ~ 3D	340
		TCRS		Ø7.0 ~ Ø30.0	2D ~ 3D	341
		TMRS		Ø7.0 ~ Ø30.0	3D ~ 5D	341
	PCD Reamer	PDR		Ø5.0 ~ Ø20.0	3D ~ 5D	342
	Cermet Reamer	KCR		Ø6.0 ~ Ø30.0	3D ~ 7D	343
	Broach Reamer	HBRE		Ø3.0 ~ Ø25.0	3D ~ 7D	344
Chamfer	Chamfer Tool	CET		Ø3.0 ~ Ø16.0	-	345
		CCT		Ø3.0 ~ Ø12.0	-	346
	Counter Sink	CSPC		Ø6.0 ~ Ø20.0	-	348
		CSNC		Ø10.0 ~ Ø30.0	-	348
		CSNC		Ø10.0 ~ Ø30.0	-	349
		CSHC		Ø10.0 ~ Ø30.0	-	349
		CSPH		Ø6.3 ~ Ø25.0	-	350
		CSNH		Ø10.0 ~ Ø50.0	-	350
		CSNH		Ø10.0 ~ Ø50.0	-	351
		CSHH		Ø10.0 ~ Ø50.0	-	351

Tap

Type		Designation		Shape	Surface treatment		Size range	Page
					Coating	Uncoated		
HSSE TAP	JIS	Spiral Tap	VPOM		-	○	M3 ~ M24	376
			VPTM		TiN	-	M3 ~ M24	377
			VPCM		TiCN	-	M3 ~ M24	378
			VPHM		HOMO	-	M3 ~ M24	379
		Spiral Point Tap	VNOM		-	○	M3 ~ M24	380
			VNTM		TiN	-	M3 ~ M24	381

Type		Designation		Shape	Surface treatment		Size range	Page
					Coating	Uncoated		
HSSE TAP	JIS	Spiral Point Tap	VNCM		TiCN	-	M3~M24	382
			VNHM		HOMO	-	M3~M24	383
		Straight Flute Tap	VSOM		-	○	M3~M24	384
			VSTM		TiN	-	M3~M24	385
			VSCM		TiCN	-	M3~M24	386
			VSHM		HOMO	-	M3~M24	387
		Roll Tap	VROM		-	○	M3~M12	388
			VRTM		TiN	-	M3~M12	389
			VRCM		TiCN	-	M3~M12	390
		Spiral Roll Tap	VFOM		-	○	M3~M6	391
			VFTM		TiN	-	M3~M6	392
			VFCM		TiCN	-	M3~M6	393
	DIN	Spiral Flute Tap	VQOM		-	○	M3~M24	394
			VQTM		TiN	-	M3~M24	395
			VQCM		TiCN	-	M3~M24	396
			VQHM		HOMO	-	M3~M24	397
		Spiral Point Tap	VDOM		-	○	M3~M24	398
			VDTM		TiN	-	M3~M24	399
			VDCM		TiCN	-	M3~M24	400
			VDHM		HOMO	-	M3~M24	401
		Straight Flute Tap	VGOM		-	○	M3~M24	402
			VGTM		TiN	-	M3~M24	403
			VGCM		TiCN	-	M3~M24	404
			VGHM		HOMO	-	M3~M24	405
		Roll Tap	VMOM		-	○	M3~M12	406
			VMTM		TiN	-	M3~M12	407
			VMCM		TiCN	-	M3~M12	408

Chucking / Machine Reamer

SCRS

Chucking reamer



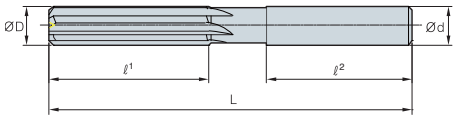


Fig. 1

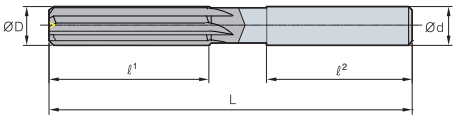


Fig. 2

(mm)

Designation	No. of flute	ØD	Ød	ℓ1	ℓ2	L	Fig.
SCRS 050S	4	5.0	6	20	40	100	1
SCRS 060S	4	6.0	6	20	40	115	1
SCRS 070S	4	7.0	8	20	40	125	1
SCRS 080S	4	8.0	8	20	40	135	1
SCRS 090S	4	9.0	10	20	45	140	1
SCRS 100B	4	10.0	10	25	50	145	2
SCRS 110B	4	11.0	12	25	50	150	2
SCRS 120B	4	12.0	12	25	50	160	2
SCRS 130B	4	13.0	16	25	50	165	2
SCRS 140B	6	14.0	16	25	50	170	2
SCRS 150B	6	15.0	16	30	50	180	2
SCRS 160B	6	16.0	16	30	50	190	2
SCRS 180B	6	18.0	20	30	55	210	2
SCRS 200B	6	20.0	20	40	60	230	2

※ SCRS___S : Solid type, SCRS___B : Brazing type

SCRH

Chucking reamer



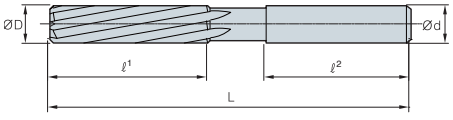


Fig. 1

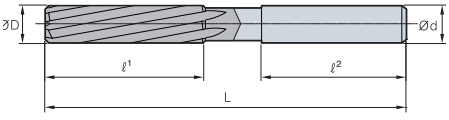


Fig. 2

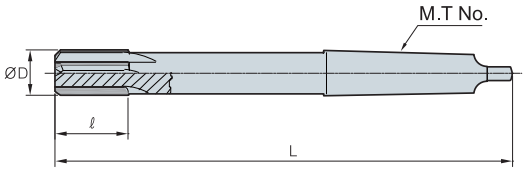
Designation	No. of flute	ØD	Ød	ℓ1	ℓ2	L	Fig.
SCRH 050S	4	5.0	6	20	40	100	1
SCRH 060S	4	6.0	6	20	40	115	1
SCRH 070S	4	7.0	8	20	40	125	1
SCRH 080S	4	8.0	8	20	40	135	1
SCRH 090S	4	9.0	10	20	45	140	1
SCRH 100B	4	10.0	10	25	50	145	2
SCRH 110B	4	11.0	12	25	50	150	2
SCRH 120B	4	12.0	12	25	50	160	2
SCRH 130B	4	13.0	16	25	50	165	2
SCRH 140B	6	14.0	16	25	50	170	2
SCRH 150B	6	15.0	16	30	50	180	2
SCRH 160B	6	16.0	16	30	50	190	2
SCRH 180B	6	18.0	20	30	55	210	2
SCRH 200B	6	20.0	20	40	60	230	2

※ SCRS___S : Solid type, SCRS___B : Brazing type

TCRS

Chucking reamer





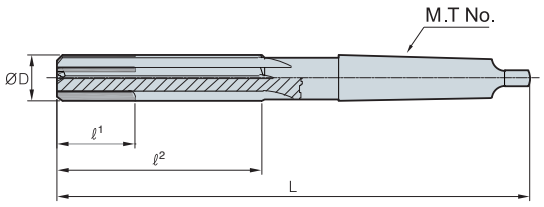
(mm)

Designation	No. of flute	ØD	ℓ	L	M.T No.
TCRS 070	4	7.0	20	150	1
TCRS 080	4	8.0	20	150	1
TCRS 090	4	9.0	20	160	1
TCRS 100	4	10.0	25	160	1
TCRS 110	4	11.0	25	170	1
TCRS 120	4	12.0	25	170	1
TCRS 130	4	13.0	25	180	1
TCRS 140	6	14.0	25	190	1
TCRS 150	6	15.0	30	200	2
TCRS 160	6	16.0	30	200	2
TCRS 180	6	18.0	30	220	2
TCRS 200	6	20.0	40	230	2
TCRS 250	6	25.0	40	260	3
TCRS 280	8	28.0	40	270	3
TCRS 300	8	30.0	50	290	3

TMRS

Machine reamer





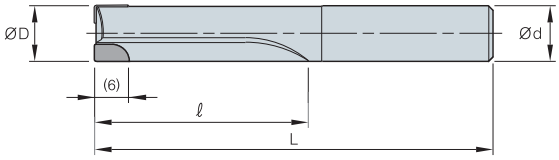
Designation	No. of flute	ØD	ℓ^1	ℓ^2	L	M.T No.
TMRS 070	4	7.0	60	60	150	1
TMRS 080	4	8.0	70	70	150	1
TMRS 090	4	9.0	70	70	160	1
TMRS 100	4	10.0	75	75	170	1
TMRS 110	4	11.0	75	75	170	1
TMRS 120	4	12.0	80	40	180	1
TMRS 130	4	13.0	85	40	190	1
TMRS 140	6	14.0	90	45	210	1
TMRS 150	6	15.0	90	45	215	2
TMRS 160	6	16.0	100	50	220	2
TMRS 180	6	18.0	105	50	225	2
TMRS 200	6	20.0	120	50	240	2
TMRS 250	6	25.0	130	50	270	3
TMRS 280	8	28.0	140	50	280	3
TMRS 300	8	30.0	150	50	290	3

PCD Reamer

PDR



DATA
p.536



(mm)

Designation	No. of flute	ØD	Ød	ℓ	L
PDR 2050	2	5.0	6	30	65
PDR 2060	2	6.0	6	40	75
PDR 2070	2	7.0	8	40	75
PDR 2080	2	8.0	8	40	75
PDR 2090	2	9.0	10	40	85
PDR 2100	2	10.0	10	40	85
PDR 2120	2	12.0	12	50	95
PDR 2140	2	14.0	16	50	95
PDR 2150	2	15.0	16	50	100
PDR 4160	4	16.0	16	50	100
PDR 4180	4	18.0	20	60	110
PDR 4200	4	20.0	20	60	110

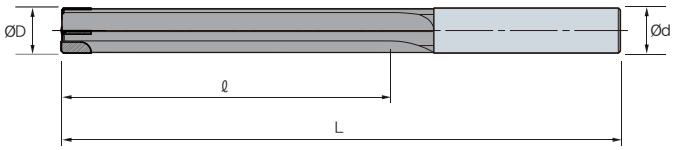
Cermet Reamer

KCR

Standard type

DATA
p.537



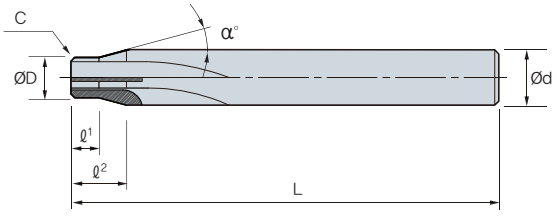


(mm)

Designation	No. of flute	ØD	Ød	ℓ	L
KCR 060~079-25-70L	2	6.0~7.9	8	25	70
KCR 080~099-035-90L	2	8.0~9.9	10	35	90
KCR 100~119-050-100L	4	10.0~11.9	12	50	100
KCR 120~159-060-110L	4	12.0~15.9	12	60	110
KCR 160~199-060-110L	4	16.0~19.9	16	60	110
KCR 200~259-060-110L	4	20.0~25.9	20	60	110
KCR 260~300-070-130L	4	26.0~30.0	25	70	130

※ Customizing tools are available
(Maximum overhang length should be less than 150mm.)

Special type



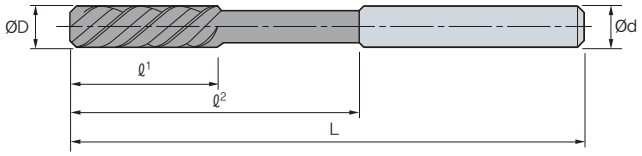
(mm)

Designation	No. of flute	ØD	Ød	ℓ1	ℓ2	L	α°
KCR□□□~□□□-□□□L	2~4	8.0~25.9	12~30	7~18	2~15	70	10°~ 60°

Broach Reamer

HBRE





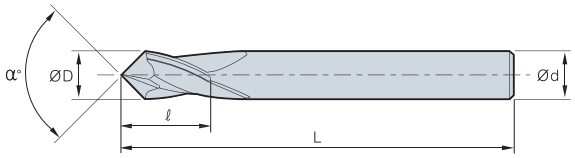
(mm)

Designation	No. of flute	ØD	Ød	ℓ1	ℓ2	L	Type
HBRE 030	3	3.0	3	20	40	70	Solid
HBRE 040	3	4.0	4	25	40	70	Solid
HBRE 060	4	6.0	6	30	50	80	Solid
HBRE 080	4	8.0	8	30	60	100	Solid
HBRE 100	4	10.0	10	30	60	100	Solid
HBRE 120	4	12.0	12	40	70	120	Top Solid
HBRE 160	6	16.0	16	40	80	130	Top Solid
HBRE 200	6	20.0	20	50	90	150	Top Solid
HBRE 250	6	25.0	25	50	90	150	Top Solid

Chamfer Tool

CET





(mm)

Designation	ØD	Ød	ℓ	L	α°
CET060 030	3.0	3	5.5	50	60°
CET060 040	4.0	4	7	50	
CET060 060	6.0	6	10	60	
CET060 080	8.0	8	13	70	
CET060 100	10.0	10	16	70	
CET060 120	12.0	12	18	80	
CET060 160	16.0	16	24	100	
CET090 030	3.0	3	5.5	50	90°
CET090 040	4.0	4	7	50	
CET090 060	6.0	6	10	60	
CET090 080	8.0	8	13	70	
CET090 100	10.0	10	16	70	
CET090 120	12.0	12	18	80	
CET090 160	16.0	16	24	100	
CET120 030	3.0	3	5.5	50	120°
CET120 040	4.0	4	7	50	
CET120 060	6.0	6	10	60	
CET120 080	8.0	8	13	70	
CET120 100	10.0	10	16	70	
CET120 120	12.0	12	18	80	
CET120 160	16.0	16	24	100	

Chamfer Tool

CCT



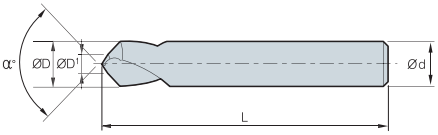


Fig 1

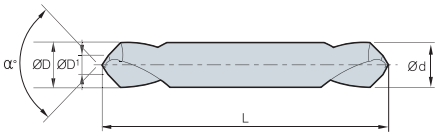


Fig 2

(mm)

Designation	ØD = Ød	ØD¹	L	α°	Fig.
CCT060 030	3.0	1.0	40	60°	1
CCT060 040	4.0	1.5	40		
CCT060 060	6.0	2.0	50		
CCT060 080	8.0	2.5	60		
CCT060 100	10.0	3.0	70		
CCT060 120	12.0	4.0	80		
CCT060 160	16.0	5.0	100		
CCT060T 030	3.0	1.0	40		2
CCT060T 040	4.0	1.5	40		
CCT060T 060	6.0	2.0	50		
CCT060T 080	8.0	2.5	60		
CCT060T 100	10.0	3.0	70		
CCT060T 120	12.0	4.0	80		
CCT060T 160	16.0	5.0	100		
CCT060T 030L	3.0	1.0	100		
CCT060T 040L	4.0	1.5	100		
CCT060T 060L	6.0	2.0	100		
CCT060T 080L	8.0	2.5	120		
CCT060T 100L	10.0	3.0	120		
CCT060T 120L	12.0	4.0	150		
CCT090 030	3.0	1.0	40	90°	1
CCT090 040	4.0	1.5	40		
CCT090 060	6.0	2.0	50		
CCT090 080	8.0	2.5	60		
CCT090 100	10.0	3.0	70		
CCT090 120	12.0	4.0	80		
CCT090 160	16.0	5.0	100		
CCT090T 030	3.0	1.0	40		2
CCT090T 040	4.0	1.5	40		
CCT090T 060	6.0	2.0	50		
CCT090T 080	8.0	2.5	60		
CCT090T 100	10.0	3.0	70		
CCT090T 120	12.0	4.0	80		
CCT090T 160	16.0	5.0	100		
CCT090T 030L	3.0	1.0	100		
CCT090T 040L	4.0	1.5	100		
CCT090T 060L	6.0	2.0	100		
CCT090T 080L	8.0	2.5	120		
CCT090T 100L	10.0	3.0	120		
CCT090T 120L	12.0	4.0	150		
CCT120 030	3.0	1.0	40	120°	1
CCT120 040	4.0	1.5	40		
CCT120 060	6.0	2.0	50		
CCT120 080	8.0	2.5	60		

CCT



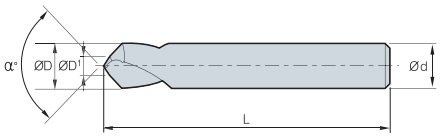


Fig 1

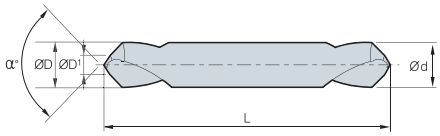
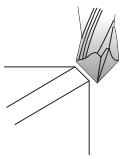
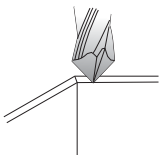
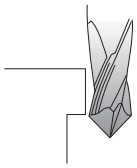
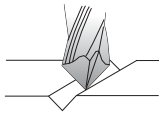
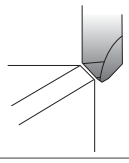
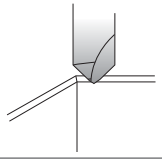
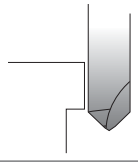
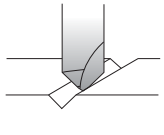


Fig 2

(mm)

Designation	ØD = Ød	ØD¹	L	α°	Fig.
CCT120 100	10.0	3.0	70	120°	1
CCT120 120	12.0	4.0	80		
CCT120 160	16.0	5.0	100		
CCT120T 030	3.0	1.0	40	120°	2
CCT120T 040	4.0	1.5	40		
CCT120T 060	6.0	2.0	50		
CCT120T 080	8.0	2.5	60		
CCT120T 100	10.0	3.0	70		
CCT120T 120	12.0	4.0	80		
CCT120T 160	16.0	5.0	100		
CCT120T 030L	3.0	1.0	100		
CCT120T 040L	4.0	1.5	100		
CCT120T 060L	6.0	2.0	100		
CCT120T 080L	8.0	2.5	120		
CCT120T 100L	10.0	3.0	120		
CCT120T 120L	12.0	4.0	150		

CET/CCT Application example

	Centering	Hole Chamfering	Chamfering (External)	Chamfering (Internal)	Side milling	Slot milling
Application (CET)						
60°	×	●	●	● ~ ▲	●	×
90°	▲	●	●	●	●	● ~ ▲
120°	●	●	●	●	●	●
Application (CCT)						
60°	●	●	● ~ ▲	▲ ~ ×	×	×
90°	●	●	● ~ ▲	▲ ~ ×	×	×
120°	●	●	●	●	×	●

Counter Sink

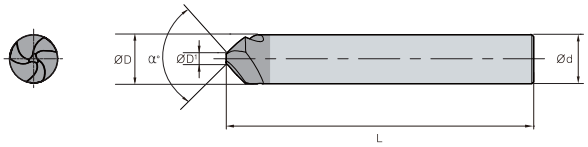
CSPC 3000



3 | Unequal Division /Lead | Substrate PC40T | DATA p.537

• TOLERANCE

ØD		Ød
All sizes	±0.5mm	h6



(mm)

Designation	ØD	Ød	ØD1	L	α°
CSPC 3060-050	6.0	6	1.5	50	90°
CSPC 3080-060	8.0	8	2	60	90°
CSPC 3100-070	10.0	10	2.5	70	90°
CSPC 3120-075	12.0	12	2.8	75	90°
CSPC 3160-080	16.0	16	3.2	80	90°
CSPC 3200-090	20.0	20	3.5	90	90°

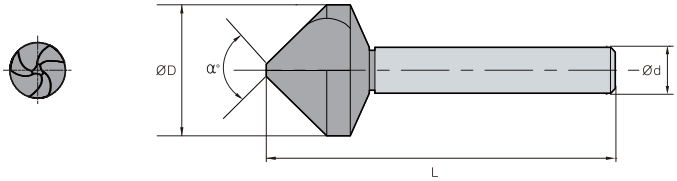
CSNC 3000



3 | Straight Type | Substrate PC20T | DATA p.537

• TOLERANCE

ØD		Ød
All sizes	±1.0mm	h9



(mm)

Designation	ØD	Ød	Range of dia	L	α°
CSNC 3100-047	10.0	6	2.0~9.0	47	90°
CSNC 3150-053	15.0	8	3.0~14.0	53	90°
CSNC 3200-057	20.0	10	4.0~19.0	57	90°
CSNC 3250-067	25.0	12	5.0~24.0	67	90°
CSNC 3300-075	30.0	12	6.0~29.0	75	90°

※ Order made available

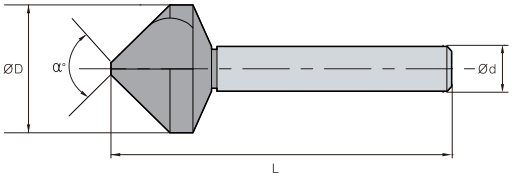
CSNC 1000



1 | Straight Type | Substrate PC20T | DATA p.537

• TOLERANCE

ØD		Ød
All sizes	±1.0mm	h9



(mm)

Designation	ØD	Ød	Range of dia	L	α°
CSNC 1100-048	10.0	6	2.0~9.0	48	90°
CSNC 1150-054	15.0	8	2.0~14.0	54	90°
CSNC 1200-059	20.0	10	2.0~19.0	59	90°
CSNC 1250-069	25.0	12	3.0~24.0	69	90°
CSNC 1300-077	30.0	12	4.0~29.0	77	90°

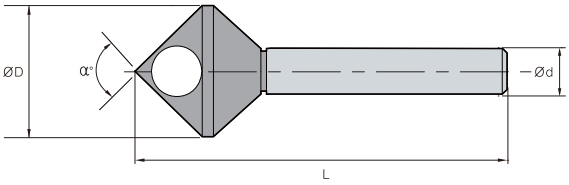
CSHC 1000



1 | Hole Type | Substrate PC20T | DATA p.537

• TOLERANCE

ØD		Ød
All sizes	±1.0mm	h9



(mm)

Designation	ØD	Ød	Range of dia	L	α°
CSHC 1100-045	10.0	6	4.0~8.0	45	90°
CSHC 1150-055	15.0	8	5.0~12.0	55	90°
CSHC 1200-070	20.0	10	8.0~15.0	70	90°
CSHC 1250-075	25.0	12	10.0~20.0	75	90°
CSHC 1300-085	30.0	12	12.0~25.0	85	90°

※ Order made available

Chamfer Counter Sink

CSPH3000

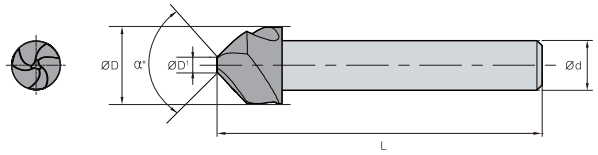


3 | Unequal Division /Lead | Substrate HC40T | DATA

p.537

• TOLERANCE

ØD		Ød
All sizes	±0.5mm	h8



(mm)

Designation	ØD	Ød	ØD1	L	α°
CSPH 3060-045	6.3	5	1.5	45	90°
CSPH 3080-050	8.3	6	2.0	50	90°
CSPH 3100-050	10.4	6	2.5	50	90°
CSPH 3120-056	12.4	8	2.8	56	90°
CSPH 3160-060	16.5	10	3.2	60	90°
CSPH 3200-063	20.5	10	3.5	63	90°
CSPH 3250-068	25.0	10	3.8	68	90°

CSNH 3000

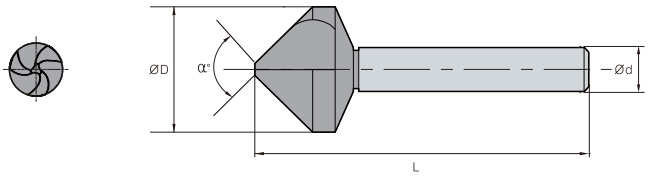


3 | Straight Type | Substrate HC10T HC20T | DATA

p.538

• TOLERANCE

ØD		Ød
All sizes	±1.0mm	h9
	±1°	



Designation	ØD	Ød	Range of dia	L	α°
CSNH 3100-050	10	6	3~9	50	90°
CSNH 3150-055	15	8	3~14	55	90°
CSNH 3200-060	20	10	4~19	60	90°
CSNH 3250-068	25	12	5~24	68	90°
CSNH 3300-079	30	12	6~29	79	90°
CSNH 3350-085	35	12	7~34	85	90°
CSNH 3400-090	40	12	8~39	90	90°
CSNH 3450-095	45	16	9~44	95	90°
CSNH 3500-100	50	16	12~49	100	90°

CSNH 1000

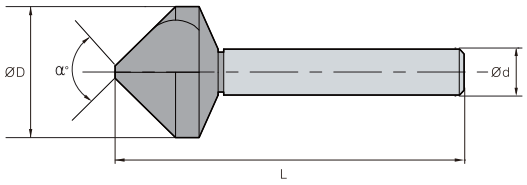


1 | Straight Type | Substrate HC10T HC20T | DATA

p.538

• TOLERANCE

ØD		Ød
All sizes	±1.0mm	h9



(mm)

Designation	ØD	Ød	Range of dia	L	α°
CSNH 1100-070	10	6	2~9	50	90°
CSNH 1150-075	15	8	2~14	55	90°
CSNH 1200-090	20	10	2~19	60	90°
CSNH 1250-080	25	12	2~24	70	90°
CSNH 1300-090	30	12	6~29	75	90°
CSNH 1350-080	35	12	7~34	80	90°
CSNH 1400-085	40	12	8~39	85	90°
CSNH 1450-087	45	12	9~44	87	90°
CSNH 1500-090	50	12	12~49	90	90°

CSHH 1000

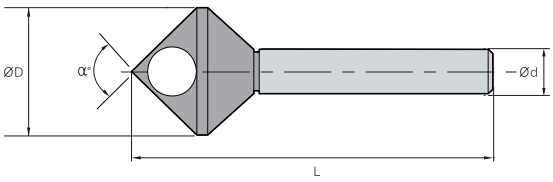


1 | Hole Type | Substrate HC10T HC20T | DATA

p.538

• TOLERANCE

ØD		Ød
All sizes	±1.0mm	h9

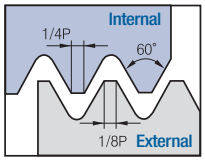


Designation	ØD	Ød	Range of dia	L	α°
CSHH 1100-070	10	6	3~9	50	90°
CSHH 1150-075	15	8	5~12	60	90°
CSHH 1200-090	20	10	8~15	65	90°
CSHH 1250-080	25	12	10~20	74	90°
CSHH 1300-090	30	12	12~25	85	90°
CSHH 1350-095	35	16	14~30	95	90°
CSHH 1400-105	40	16	16~35	105	90°
CSHH 1450-120	45	16	18~40	120	90°
CSHH 1500-130	50	16	20~45	130	90°

Thread Mill

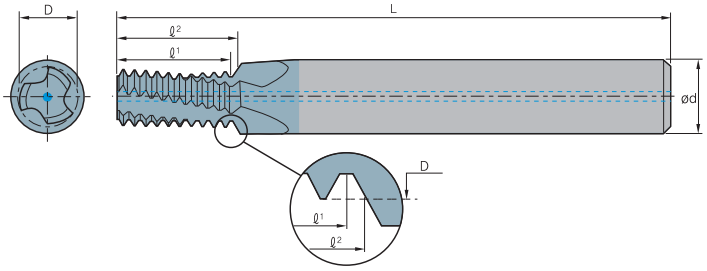
ISO Metric

Helical flutes with thru-hole coolant



Internal

Defined by : R262 (DIN 13)
Tolerance class : 6H



($\ell^2 \leq 1.5 \times$ Thread diameter)

Thread		Pitch (mm)		Designation	PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					Ød	D	L	ℓ1	ℓ2	z	zt	mm
M3×0.5	M3.5~M16×0.5	0.50	STMHC	04024L04-I0.50ISO		4	2.40	45	4.5	4.7	3	9	2.5
M4×0.7	-	0.70		04031L06-I0.70ISO		4	3.15	45	6.3	6.6	3	9	3.3
M5×0.8	-	0.80		04039L07-I0.80ISO		4	3.90	45	7.2	7.6	3	9	4.2
M6×1.0	M8~M40×1.0	1.00		06048L09-I1.00ISO	●	6	4.80	57	9.0	9.5	3	9	5.0
M8×1.25	-	1.25		08065L13-I1.25ISO		8	6.50	61	12.5	13.1	3	10	6.8
M10×1.5	M12~M48×1.5	1.50		10082L15-I1.50ISO		10	8.20	73	15.0	15.7	3	10	8.5
M12×1.75	-	1.75		10099L18-I1.75ISO		10	9.90	73	17.5	18.4	4	10	10.2
M14×2.0	M17~M80×2.0	2.00		12116L21-I2.00ISO		12	11.60	73	20.0	21.0	4	10	12.0
M16×2.0	M17~M80×2.0	2.00		14136L25-I2.00ISO		14	13.60	92	24.0	25.0	4	12	14.0

($\ell^2 \leq 2 \times$ Thread diameter)

Thread		Pitch (mm)		Designation	PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					Ød	D	L	ℓ1	ℓ2	z	zt	mm
M3×0.5	M3.5~M16×0.5	0.50	STMHC	04024L06-I0.50ISO		4	2.40	45	6.0	6.2	3	12	2.5
-	M4×0.5	0.50		04032L08-I0.50ISO		4	3.20	45	8.0	8.2	3	16	3.5
-	M5×0.5	0.50		06042L10-I0.50ISO		6	4.20	57	10.0	10.2	3	20	4.5
M4×0.7	-	0.70		04031L08-I0.70ISO		4	3.15	45	8.4	8.7	3	12	3.3
-	M6×0.75	0.75		06050L12-I0.75ISO		6	5.00	57	12.0	12.4	3	16	5.3
M5×0.8	-	0.80		04039L10-I0.80ISO		4	3.90	45	10.4	10.8	3	13	4.2
M6×1.0	M8~M40×1.0	1.00		06048L12-I1.00ISO	●	6	4.80	57	12.0	12.5	3	12	5.0
-	M8×1.0	1.00		08067L16-I1.00ISO		8	6.70	61	16.0	16.5	3	16	7.0
-	M10×1.0	1.00		10087L20-I1.00ISO		10	8.70	73	20.0	20.5	3	20	9.0
-	M12×1.0	1.00		12107L24-I1.00ISO	●	12	10.70	73	24.0	24.5	4	24	11.0
M8×1.25	-	1.25		08065L16-I1.25ISO	●	8	6.50	61	16.2	16.9	3	13	6.8
-	M10×1.25	1.25		10085L20-I1.25ISO	●	10	8.50	73	20.0	20.6	3	16	8.8
M10×1.5	M12~M48×1.5	1.50		10082L20-I1.50ISO	●	10	8.20	73	19.5	20.2	3	13	8.5
-	M12×1.5	1.50		10099L24-I1.50ISO	●	10	9.90	73	24.0	24.7	4	16	10.5
-	M14×1.5	1.50		12119L29-I1.50ISO		12	11.90	80	28.5	29.2	4	19	12.5
-	M16×1.5	1.50		14139L32-I1.50ISO	●	14	13.90	92	31.5	32.2	4	21	14.5
M12×1.75	-	1.75		10099L25-I1.75ISO		10	9.90	73	24.5	25.4	4	14	10.2
M14×2.0	M17~M80×2.0	2.00		12116L29-I2.00ISO		12	11.60	80	28.0	29.0	4	14	12.0
M16×2.0	M17~M80×2.0	2.00		14136L33-I2.00ISO		14	13.60	92	32.0	33.0	4	16	14.0
M18×2.5	-	2.50		16148L36-I2.50ISO		16	14.80	92	35.0	36.2	4	14	15.5
M 20×2.5	-	2.50		18171L41-I2.50ISO		18	17.10	102	40.0	41.2	4	16	17.5
M 24×3.0	-	3.00		20199L49-I3.00ISO		20	19.90	102	48.0	49.5	4	16	21.0

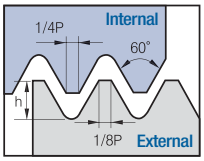
* Bore Diameter applies to smallest thread dia

* Maximum thread length = $\ell^2 - \frac{\text{Pitch}}{4}$

● : Stock item

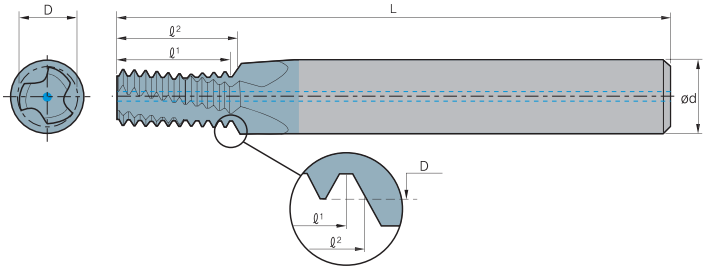
American UN (UNC,UNF,UNEF)

Helical flutes with thru-hole coolant



Internal

Defined by : ANSI B1.1.74
Tolerance class : 2B



($\ell^2 \leq 1.5 \times$ Thread diameter)

Thread UNC	Thread UNF	Thread UNEF	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
No.10~24	5/16″,3/8″×24	9/16″~11/16″×24	24	STMHC	04035L07-I24UNC		4	3.58	45	7.4	7.9	3	7	3.8
No.10~24	5/16″,3/8″×24	9/16″~11/16″×24	24		06041L08-I24UNC		6	4.15	57	8.5	9.0	3	8	4.5
1/4″×20	7/16″,1/2″×20	3/4″~1″×20	20		06048L09-I20UNC		6	4.88	57	8.9	9.5	3	7	5.2
5/16″×18	9/16″,5/8″×18	11/16″~1 11/16″×18	18		08061L11-I18UNC		8	6.15	61	11.3	12.0	3	8	6.5
3/8″×16	3/4″×16	-	16		08076L15-I16UNC		8	7.65	61	14.3	15.1	3	9	8.0
7/16″×14	7/8″×14	-	14		10090L17-I14UNC		10	9.00	73	16.3	17.2	3	9	9.3
1/2″×13	-	-	13		12104L20-I13UNC		12	10.35	73	19.5	20.5	4	10	10.8
9/16″×12	1″~1 1/2″×12	-	12		12118L22-I12UNC		12	11.80	73	21.2	22.2	4	10	12.3

($\ell^2 \leq 2 \times$ Thread diameter)

Thread UNC	Thread UNF	Thread UNEF	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
-	No.10~32	No. 12~3/8″×32	32	STMHC	04038L09-I32UNF		4	3.80	45	9.5	9.9	3	12	4.0
-	-	No. 12~3/8″×32	32		06044L11-I32UNEF		6	4.40	57	11.1	11.5	3	14	4.7
-	No.12, 1/4″×28	7/16″; 1/2″×28	28		06043L11-I28UNF		6	4.30	57	10.9	11.3	3	12	4.6
-	1/4″×28	7/16″; 1/2″×28	28		06052L13-I28UNF		6	5.15	57	12.7	13.1	3	14	5.5
-	-	7/16″; 1/2″×28	28		10099L22-I28UNEF		10	9.90	73	21.8	22.2	3	24	10.2
No.10~24	5/16″, 3/8″×24	9/16″~11/16″×24	24		04035L10-I24UNC		4	3.58	45	9.5	10.0	3	9	3.8
No.12~24	5/16″, 3/8″×24	9/16″~11/16″×24	24		06041L11-I24UNC		6	4.15	57	10.6	11.1	3	10	4.5
-	5/16″, 3/8″×24	9/16″~11/16″×24	24		08066L16-I24UNF		8	6.68	61	15.9	16.4	3	15	6.8
-	3/8″×24	9/16″~11/16″×24	24		10082L19-I24UNF		10	8.20	73	19.0	19.6	3	18	8.5
-	-	9/16″~11/16″×24	24		14129L29-I24UNEF		14	12.90	92	28.6	29.1	4	27	13.2
1/4″×20	7/16″, 1/2″×20	3/4″~1″×20	20		06048L13-I20UNC		6	4.88	57	12.7	13.3	3	10	5.2
-	7/16″, 1/2″×20	3/4″~1″×20	20		10096L22-I20UNF		10	9.60	73	21.6	22.2	3	17	9.8
-	1/2″×20	3/4″~1″×20	20		12111L26-I20UNF		12	11.10	80	25.4	26.0	3	20	11.5
-	-	3/4″~1″×20	20		18174L38-I20UNEF		18	17.40	102	38.1	38.7	4	30	17.8
5/16″×18	9/16″, 5/8″×18	11/16″~1 11/16″×18	18		08061L16-I18UNC		8	6.15	61	15.5	16.2	3	11	6.5
-	9/16″, 5/8″×18	11/16″~1 11/16″×18	18		14125L28-I18UNF		14	12.50	92	28.2	28.9	4	20	12.8
-	5/8″×18	11/16″~1 11/16″×18	18		16141L31-I18UNF		16	14.10	92	31.0	31.7	4	22	14.5
3/8″×16	3/4″×16	-	16		08076L19-I16UNC		8	7.65	61	19.0	19.8	3	12	8.0
-	3/4″×16	-	16		18170L38-I16UNF		18	17.00	102	38.1	38.8	4	24	17.5
7/16″×14	7/8″×14	-	14		10090L22-I14UNC		10	9.00	73	21.8	22.7	3	12	9.3
-	7/8″×14	-	14		20199L44-I14UNF		20	19.90	102	43.5	44.4	4	24	20.5
1/2″×13	-	-	13		12104L26-I13UNC		12	10.35	80	25.4	26.4	4	13	10.8
9/16″×12	1″~1 1/2″×12	-	12		12118L28-I12UNC		12	11.80	80	27.5	28.6	4	13	12.3
-	1″~1 1/2″×12	-	12		20199L51-I12UNF		20	19.90	102	50.8	51.9	4	24	23.5
5/8″×11	-	-	11		14131L33-I11UNC		14	13.10	92	32.3	33.5	4	14	13.5
3/4″×10	-	-	10		16159L39-I10UNC		16	15.90	92	38.1	39.4	4	15	16.5
7/8″×9	-	-	9		20190L46-I9UNC		20	19.00	102	45.2	46.6	4	16	19.5
1″×8	-	-	8		20199L52-I8UNC		20	19.90	102	50.8	52.4	4	16	22.0

* Bore Diameter applies to smallest thread dia

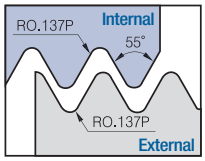
* Maximum thread length = $\ell^2 - \frac{\text{Pitch}}{4}$

● : Stock item

Thread Mill

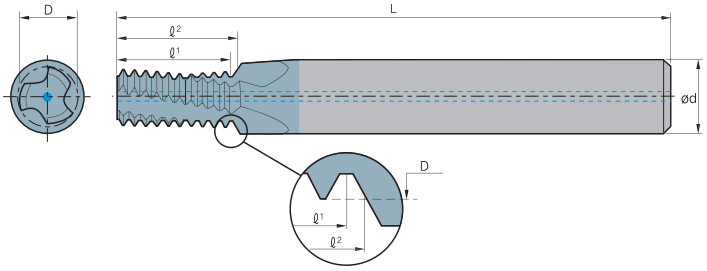
Whitworth (BSW,BSF)

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 BSW	Thread BSF	Pitch (tpi)		Designation	PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
-	1/4″×26	26	STMHC	06050L13-EI26BSF		6	5.00	57	12.7	13.2	3	13	5.3
-	5/16″×22	22		08063L16-EI22BSF		8	6.35	61	16.2	16.7	3	14	6.7
1/4″×20	3/8″×20	20		06044L13-EI20BSW		6	4.45	57	12.7	13.3	3	10	5.0
-	3/8″×20	20		08076L19-EI20BSF		8	7.65	61	19.0	19.7	3	15	8.2
5/16″×18	7/16″×18	18		06058L16-EI18BSW		6	5.85	57	15.5	16.2	3	11	6.5
-	7/16″×18	18		10092L23-EI18BSF		10	9.20	73	22.6	23.3	3	16	9.7
3/8″×16	1/2″, 9/16″×16	16		08072L19-EI16BSW		8	7.20	61	19.0	19.8	3	12	7.9
-	1/2″, 9/16″×16	16		12105L26-EI16BSF		12	10.50	80	25.4	26.2	4	16	11.1
-	9/16″×16	16		14122L29-EI16BSF		14	12.15	92	28.6	29.4	4	18	12.6
7/16″×14	5/8″, 11/16″×14	14		10085L22-EI14BSW		10	8.50	73	21.8	22.7	3	12	9.2
-	5/8″, 11/16″×14	14		14134L31-EI14BSF		14	13.40	92	30.8	31.7	4	17	14.0
-	11/16″×14	14		16150L35-EI14BSF		16	15.00	92	34.5	35.4	4	19	15.6
1/2″×12	3/4″×12	12		10096L26-EI12BSW		10	9.65	73	25.4	26.5	3	12	10.5
9/16″×12	3/4″×12	12		12113L28-EI12BSW		12	11.25	80	27.5	28.6	4	13	12.1
-	3/4″×12	12		18162L39-EI12BSF		18	16.20	102	38.1	39.2	4	18	16.8
5/8″×11	7/8″×11	11		14126L33-EI11BSW		14	12.60	92	32.3	33.5	4	14	13.4
11/16″×11	-	11		16142L35-EI11BSW		16	14.20	92	34.6	35.8	4	15	15.0

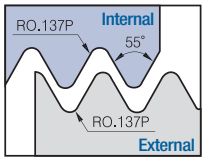
* Bore Diameter applies to smallest thread dia

* Maximum thread length = $\ell^2 - \frac{\text{Pitch}}{4}$

● : Stock item

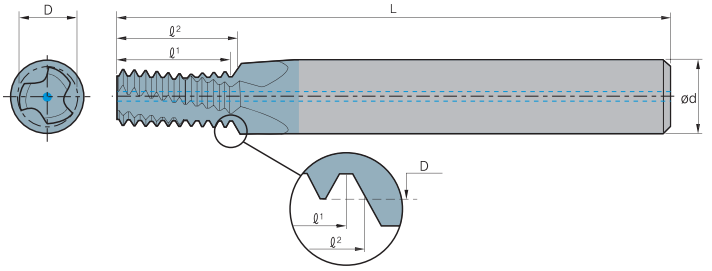
BSP(G)

Helical flutes with thru-hole coolant



External / Internal

Defined by : B.S.2779:1956
Tolerance class : Medium class



($\ell^2 \leq 1.5 \times$ Thread diameter)

Thread Standard	Pitch (tpi)		Designation	PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
1/16″, 1/8″x28	28	STMHC	08064L12-EI28BSP		8	6.4	61	11.8	12.2	3	13	6.7
1/8″x28	28		10082L15-EI28BSP		10	8.2	73	14.5	15.0	3	16	8.7
1/4″, 3/8″x19	19		12110L20-EI19BSP		12	11.0	80	20.1	20.7	4	15	11.8
3/8″x19	19		16145L26-EI19BSP		16	15.2	92	25.4	26.1	4	19	15.2
1″-4″x11	11		20199L42-EI11BSP		20	30.7	102	41.6	42.7	4	18	30.7

($\ell^2 \leq 2 \times$ Thread Diameter)

Thread Standard	Pitch (tpi)		Designation	PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
1/16″, 1/8″x28	28	STMHC	08064L15-EI28BSP		8	6.4	61	11.8	15.9	3	13	6.7
1/8″x28	28		10082L19-EI28BSP		10	8.2	73	14.5	19.5	3	16	8.7
1/4″, 3/8″x19	19		12110L27-EI19BSP		12	11.0	80	20.1	27.4	4	15	11.8
3/8″x19	19		16145L34-EI19BSP		16	15.2	92	33.4	34.1	4	25	15.2
1/2″-7/8″x14	14		18179L42-EI14BSP		18	19.0	102	41.7	42.6	4	23	19.0

* Bore Diameter applies to smallest thread dia

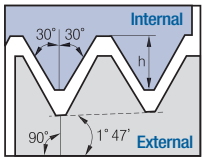
* Maximum thread length = $\ell^2 - \frac{\text{Pitch}}{4}$

● : Stock item

Thread Mill

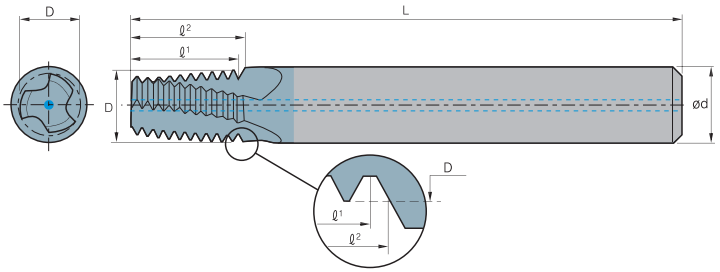
NPT

Helical flutes with thru-hole coolant



External / Internal

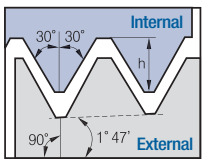
Defined by : USAS B2.1:1968
Tolerance class : Standard NPT



Thread Standard	Pitch (tpi)		Designation	PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
1/16″×27	27.0	STMHC	06059L09-EI27NPT		6	5.90	57	9.4	9.9	3	10	6.3
1/8″×27	27.0		08076L09-EI27NPT		8	7.65	61	9.4	9.9	3	10	8.5
1/4″×18	18.0		10099L14-EI18NPT	●	10	9.90	73	14.1	14.8	3	10	11.1
3/8″×18	18.0		12111L14-EI18NPT		12	11.15	73	14.1	14.8	4	10	14.5
1/2″, 3/4″×14	14.0		16142L19-EI14NPT		16	14.25	92	18.1	19.0	4	10	17.7, 23.0
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		20196L23-EI11.5NPT		20	19.60	102	22.1	23.2	4	10	29.0, 37.7, 44.0, 56.0
2 1/2″×8 ; 3″×8	8.0		20196L33-EI8NPT		20	19.60	102	31.7	33.3	4	10	66.5, 82.1

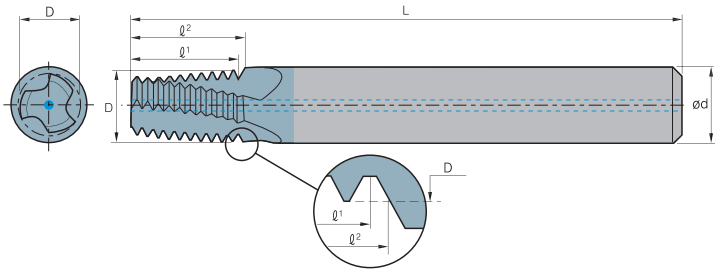
NPTF

Helical flutes with thru-hole coolant



External / Internal

Defined by : ANSI 1.20.3-1976
Tolerance class : Standard NPTF



Thread Standard	Pitch (tpi)		Designation	PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
1/16″×27	27.0	STMHC	06059L09-EI27NPTF	●	6	5.90	57	9.4	9.9	3	10	6.3
1/8″×27	27.0		08076L09-EI27NPTF		8	7.65	61	9.4	9.9	3	10	8.5
1/4″×18	18.0		10099L14-EI18NPTF		10	9.90	73	14.1	14.8	3	10	11.1
3/8″×18	18.0		12111L14-EI18NPTF		12	11.15	73	14.1	14.8	4	10	14.5
1/2″, 3/4″×14	14.0		16142L19-EI14NPTF		16	14.25	92	18.1	19.0	4	10	17.7, 23.4
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		20196L23-EI11.5NPTF		20	19.60	102	22.1	23.2	4	10	29.0, 37.7, 43.7, 55.6
2 1/2″×8 ; 3″×8	8.0		20196L33-EI8NPTF		20	19.60	102	31.7	33.3	4	10	66.3, 82.1

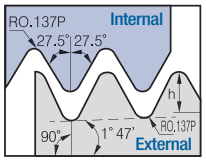
* Bore Diameter applies to smallest thread dia

* Maximum thread length = $\ell^2 - \frac{\text{Pitch}}{4}$

● : Stock item

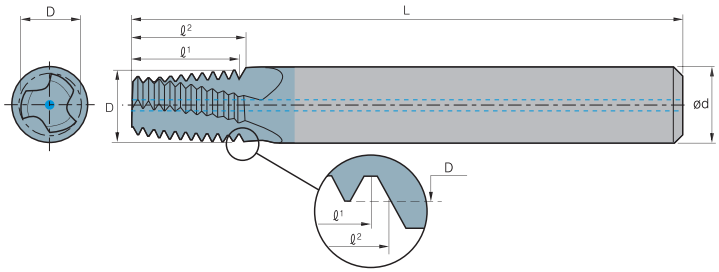
BSPT

Helical flutes with thru-hole coolant



External / Internal

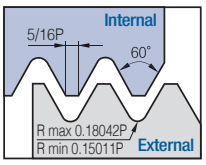
Defined by : B.S.21:1985
Tolerance class : Standard BSPT



Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
1/16″×28	28	STMHC	06059L10-EI28BSPT		6	5.90	57	10.0	10.2	3	11	6.7
1/8″×28	28		08076L10-EI28BSPT		8	7.65	61	10.0	10.2	3	11	8.7
1/4″×19	19		10099L15-EI19BSPT		10	9.90	73	14.7	15.4	3	11	11.8
3/8″×19	19		12111L15-EI19BSPT		12	11.15	73	14.7	15.4	4	11	15.2
1/2″, 3/4″×14	14		16142L22-EI14BSPT		16	14.25	92	21.8	22.7	4	12	19.0
1″, 1 1/2″, 2″, 2 1/2″×11	11		20196L28-EI11BSPT		20	19.60	102	27.7	28.9	4	12	30.7

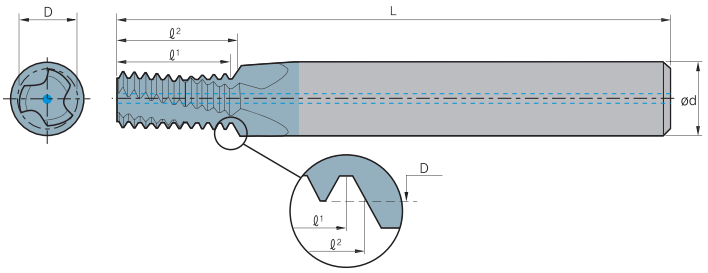
UNJ

Helical flutes with thru-hole coolant



Internal

Defined by : MIL-S-8879C
Tolerance class : 3B



Thread UNJC	UNJF	UNFEF/UNJ	Pitch (tpi)		Designation	PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
0.138″(#6)	0.190″(#10)	0.216(#12)/0.4375(7/16″)	32	STMHC	04027L07-I32UNJ		4	2.7	45	7.1	7.5	3	9	2.80
-	0.250″(1/4″)	0.4375″(7/16″)/0.5625″(9/16″)	28		06054L13-I28UNJ		6	5.4	57	12.7	13.1	3	14	5.60
0.190″(#10)	0.3125″(5/16″)	0.5625″(9/16″)/-	24		04037L09-I24UNJ		4	3.7	45	9.5	10.0	3	9	4.00
-	0.3125″(5/16″)	0.5625″(9/16″)/-	24		08067L15-I24UNJ		8	6.7	61	15.9	16.4	3	15	7.00
0.250″(1/4″)	0.4375″(7/16″)	0.750″(3/4″)/0.3125″(5/16″)	20		06050L12-I20UNJ		6	5.0	57	12.7	13.3	3	10	5.30
-	0.4375″(7/16″)	0.750″(3/4″)/0.5625″(9/16″)	20		10096L21-I20UNJ		10	9.6	73	21.6	22.2	4	17	10.00
0.3125″(5/16″)	0.5625″(9/16″)	1.0625″(1 1/16″)/-	18		08064L15-I18UNJ		8	6.4	61	15.5	16.2	3	11	6.75
0.375″(3/8″)	0.750″(3/4″)	-/0.4375″(7/16″)	16		08077L19-I16UNJ		8	7.7	61	19.1	19.8	3	12	8.10
0.4375″(7/16″)	0.875″(7/8″)	-	14		10092L21-I14UNJ		10	9.2	73	21.8	22.7	4	12	9.50
0.500″(1/2″)	-	-	13		10099L25-I13UNJ		10	9.9	73	25.4	26.4	4	13	11.00

* Bore Diameter applies to smallest thread dia

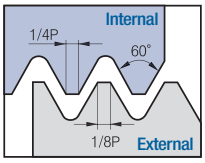
* Maximum thread length = $\ell^2 - \frac{\text{Pitch}}{4}$

● : Stock item

Thread Mill

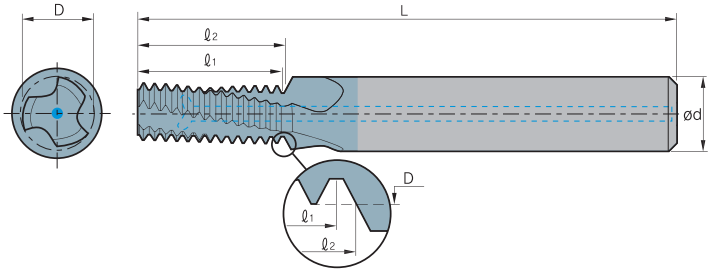
ISO Metric

Helical flutes with radial cooling



Internal

Defined by : R262 (DIN 13)
Tolerance class : 6H

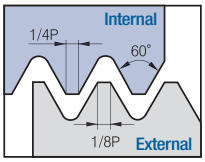


(ℓ ≤ 2 × Thread diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					Ød	D	L	ℓ1	ℓ2	z	zt	mm
M6×1.0	M8~M40×1.0	1.0	STMHCR	06048L12-I1.00ISO		6	4.8	57	12.0	12.5	3	12	5.0
	M10×1.0	1.0		10087L20-I1.00ISO		10	8.7	73	20.0	20.5	3	20	9.0
	M12×1.0	1.0		12107L24-I1.00ISO		12	10.7	73	24.0	24.5	4	24	11.0
M8×1.25		1.25		08065L16-I1.25ISO		8	6.5	64	16.3	16.9	3	13	6.8
M10×1.5	M12~M48×1.5	1.5		10082L20-I1.50ISO		10	8.2	73	19.5	20.3	3	13	8.5
	M12×1.5	1.5		10099L24-I1.50ISO		10	9.9	73	24.0	24.8	4	16	10.5
	M14×1.5	1.5		12119L29-I1.50ISO		12	11.9	84	28.5	29.3	4	19	12.5
	M16×1.5	1.5		14139L32-I1.50ISO		14	13.9	84	31.5	32.3	4	21	14.5
M12×1.75		1.75		10099L25-I1.75ISO		10	9.9	73	24.5	25.4	4	14	10.2

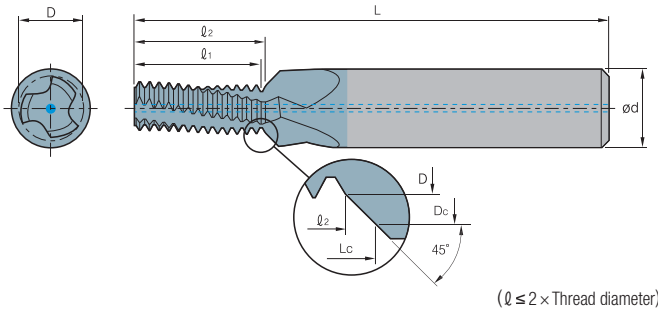
ISO Metric

Helical flutes with thru-hole coolant-thru & Chamfer



Internal

Defined by : R262 (DIN 13)
Tolerance class : 6H



(ℓ ≤ 2 × Thread diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)							No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					Ød	D	Dc	L	ℓ1	ℓ2	Lc	z	zt	mm
M6×1.0	M8~M40×1.0	1.0	STMHCC	08048L12-I1.00ISO		8	4.8	6.3	61	12.0	12.5	13.3	3	12	5.0
	M10×1.0	1.0		12087L20-I1.00ISO		12	8.7	10.3	73	20.0	20.5	21.3	3	20	9.0
	M12×1.0	1.0		14107L24-I1.00ISO		14	10.7	12.3	80	24.0	24.5	25.3	4	24	11.0
M8×1.25		1.25		10065L16-I1.25ISO		10	6.5	8.3	73	16.3	16.9	17.8	3	13	6.8
M10×1.5	M12~M48×1.5	1.5		12082L20-I1.50ISO		12	8.2	10.3	80	19.5	20.3	21.3	3	13	8.5
	M12×1.5	1.5		14099L24-I1.50ISO		14	9.9	12.3	80	24.0	24.8	26.0	4	16	10.5
	M14×1.5	1.5		16119L29-I1.50ISO		16	11.9	14.3	92	28.5	29.3	30.5	4	19	12.5
	M16×1.5	1.5		18139L32-I1.50ISO		18	13.9	16.3	92	31.5	32.3	33.5	4	21	14.5
M12×1.75		1.75		14099L25-I1.75ISO		14	9.9	12.3	80	24.5	25.4	26.6	4	14	10.2

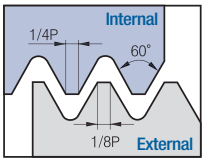
* Bore Diameter applies to smallest thread dia

* Maximum thread length = $\ell^2 - \frac{\text{Pitch}}{4}$

● : Stock item

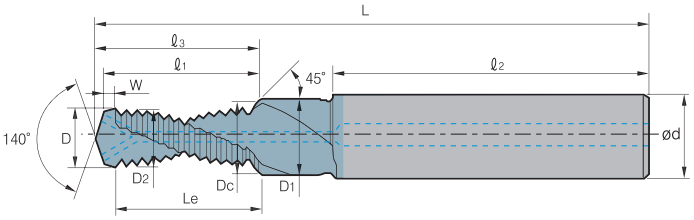
ISO Metric

Drill, Chamfer & Thread with thru-hole coolant



Internal

Defined by : R262 (DIN 13)
Tolerance class : 6H



Thread ISO 2D M Coarse	Pitch (mm)	Designation		PC9070M	Dimensions (mm) L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	No.of flute z	Tooth zt
M6×1.0	1.0	STMHCD	IM6×1.0ISO-2D		62.0	14.5	13.7	36	1.0	12.7	5.0	8	6.6	6.3	4.85	2	11
M8×1.25	1.25		IM8×1.25ISO-2D		74.0	18.2	17.1	40	1.3	15.8	6.8	10	9.0	8.3	6.45	2	11
M10×1.5	1.5		IM10×1.5ISO-2D		79.0	23.4	22.1	45	1.5	20.6	8.5	12	11.0	10.3	8.08	2	12
M12×1.75	1.75		IM12×1.75ISO-2D		89.0	27.1	25.5	45	1.5	24.0	10.3	14	13.5	12.3	9.74	2	12

Thread ISO 2.5D M Coarse	Pitch (mm)	Designation		PC9070M	Dimensions (mm) L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	No.of flute z	Tooth zt
M6×1.0	1.0	STMHCD	IM6×1.0ISO-2.5D		62.0	16.5	15.7	36	1.0	14.7	5.0	8	6.6	6.3	4.85	2	13
M8×1.25	1.25		IM8×1.25ISO-2.5D		74.0	23.2	22.1	40	1.3	20.8	6.8	10	9.0	8.3	6.45	2	15
M10×1.5	1.5		IM10×1.5ISO-2.5D		79.0	27.9	26.6	45	1.5	25.1	8.5	12	11.0	10.3	8.08	2	15

* Bore Diameter applies to smallest thread Dia

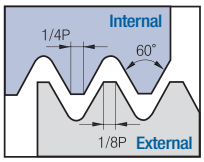
* Maximum thread length = $\ell^2 - \frac{\text{Pitch}}{4}$

● : Stock item

Thread Mill

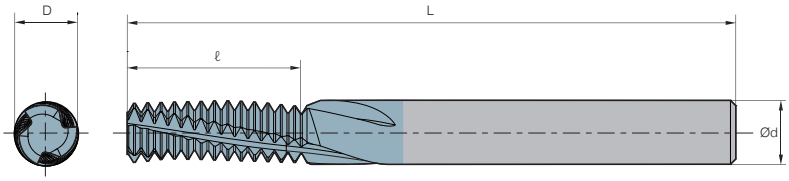
ISO Metric

Helical flutes



External / Internal

Defined by : R262 (DIN 13)
Tolerance class : 6g/6H



External

(ℓ ≤ 2 × Thread diameter)

Thread		Pitch (mm)		Designation	PC9070M	Dimensions (mm)				No.of flute	Tooth
M Coarse	M Fine					Ød	D	L	ℓ	z	zt
M3x0.5	-	0.50	STMH	04039L06-E0.50ISO		4	3.9	45	6	3	12
M4.5x0.7	-	0.75		04039L09-E0.75ISO		4	3.9	45	9	3	12
M6x1.0	-	1.00		04039L12-E1.00ISO		4	3.9	45	12	3	12
M8x1.25	-	1.25		06059L16-E1.25ISO		6	5.9	57	16.25	3	13
M10x1.5	-	1.50		08079L21-E1.50ISO	●	8	7.9	63	21	3	14
M14x2.0	-	2.00		10099L28-E2.00ISO		10	9.9	73	28	4	14

Internal

(ℓ ≤ 2 × Thread diameter)

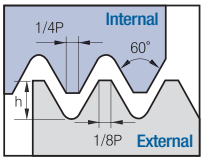
Thread		Pitch (mm)		Designation	PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					Ød	D	L	ℓ	z	zt	mm
M3x0.5	M3.5-M16x0.5	0.50	STMH	04022L06-I0.50ISO		4	2.2	45	6.0	3	12	2.5
-	M4x0.5	0.50		04030L08-I0.50ISO		4	3.0	45	8.0	3	16	3.5
-	M3x0.5	0.50		04039L10-I0.50ISO		4	3.9	45	6.0	3	12	4.5
M4x0.7	-	0.70		04028L08-I0.70ISO		4	2.8	45	8.4	3	12	3.3
-	M6x0.75	0.75		04039L12-I0.75ISO		4	3.9	45	9.0	3	12	5.3
M5x0.8	-	0.80		04035L10-I0.80ISO		4	3.5	45	10.4	3	13	4.2
M6x1.0	M8-M40x1.0	1.00		04039L12-I1.00ISO		4	3.9	45	12.0	3	12	5.0
-	M8x1.0	1.00		06059L16-I1.00ISO		6	5.9	57	16.0	3	16	7.0
-	M10x1.0	1.00		08079L20-I1.00ISO	●	8	7.9	63	20.0	3	20	9.0
-	M12x1.0	1.00		10099L24-I1.00ISO	●	10	3.9	45	12.0	3	12	11.0
M8x1.25	-	1.25		06058L16-I1.25ISO		6	5.8	57	16.25	3	13	6.8
-	M10x1.25	1.25		08077L20-I1.25ISO	●	6	5.9	57	16.25	3	13	8.8
M10x1.5	M12-M48x1.5	1.50		08077L21-I1.50ISO	●	8	7.7	63	21.0	3	14	8.5
-	M12x1.5	1.50		10094L24-I1.50ISO	●	8	7.9	63	21.0	3	14	10.5
-	M14x1.5	1.50		12112L28-I1.50ISO	●	10	9.4	73	24.0	4	16	12.5
-	M16x1.5	1.50		12119L33-I1.50ISO	●	12	11.2	83	28.5	4	19	14.5
M12x1.75	-	1.75		10087L24-I1.75ISO	●	10	8.7	73	24.5	4	14	10.2
M14x2.0	M17-M80x2.0	2.00		10099L28-I2.00ISO	●	10	9.9	73	28.0	4	14	12.0
M16x2.0	M17-M80x2.0	2.00		12119L32-I2.00ISO	●	10	9.9	73	28.0	4	14	14.0
M18-M22x2.5	-	2.50		16139L40-I2.50ISO		16	13.9	92	40.0	5	16	15.5
M24x3.0	-	3.00		16159L42-I3.00ISO		16	15.9	92	42.0	4	14	21.0

* Bore Diameter applies to smallest thread dia

● : Stock item

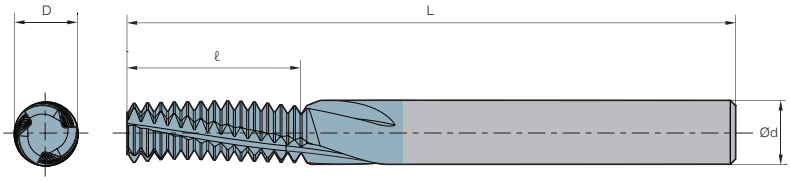
American UN (UNC,UNF,UNEF)

Helical flutes



External / Internal

Defined by : ANSI B1.1.74
Tolerance class : 2A/2B



External

(ℓ ≤ 2 × Thread diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth
UNC	UNF					Ød	D	L	ℓ	z	zt
No.8-32	-	32	STMH	04039L09-E32UNC		4	3.9	45	8.7	3	11
-	No.12-28	28		04039L12-E28UNF		4	3.9	45	11.8	3	13
No.12-24	-	24		04039L12-E24UNC		4	3.9	45	11.6	3	11
1/4″x20	-	20		04039L13-E20UNC		4	3.9	45	12.7	3	10
5/16″x18	-	18		06059L17-E18UNC		6	5.9	57	16.9	3	12
3/8″x16	-	16		08079L19-E16UNC		8	7.9	63	19.1	3	12
9/16″x12	-	12		12119L30-E12UNC		12	11.9	83	29.6	4	14

Internal

(ℓ ≤ 2 × Thread diameter)

Thread			Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF					Ød	D	L	ℓ	z	zt	mm
-	No.8-36		36	STMH	04030L09-I36UNF		4	3.0	45	8.5	3	12	3.5
-	No.10-32	No.12-3/8″x32	32		04033L11-I32UNF		4	3.3	45	11.1	3	14	4.0
-	No.12-28,1/4″x28	7/16″,1/2″x28	28		04038L12-I28UNF		4	3.8	45	11.8	3	13	4.6
-	1/4″x28	7/16″,1/2″x28	28		06046L13-I28UNF		6	4.6	57	12.7	3	14	5.5
-	-	7/16″,1/2″x28	28		10092L23-I28UNEF		10	9.2	73	22.7	4	25	10.2
No.10-24	5/16″,3/8″x24	9/16″-11/16″x24	24		04029L11-I24UNC		4	2.9	45	10.6	3	10	3.8
No.12-24	5/16″,3/8″x24	9/16″-11/16″x24	24		04035L12-I24UNC		4	3.5	45	11.6	3	11	4.5
5/16″,	3/8″x24	9/16″-11/16″x24	24		06057L16-I24UNF		6	5.7	57	15.9	3	15	6.8
-	3/8″x24	9/16″-11/16″x24	24		08074L19-I24UNF		8	7.4	63	19.1	3	18	8.5
-	-	9/16″-11/16″x24	24		12119L29-I24UNEF		12	11.9	83	28.6	4	27	13.2
1/4″x20	7/16″,1/2″x20	3/4″-1″x20	20		04039L13-I20UNC		4	3.9	45	12.7	3	10	5.2
7/16″,	1/2″x20	3/4″-1″x20	20		10085L23-I20UNF		10	8.5	73	22.9	4	18	9.8
-	1/2″x20	3/4″-1″x20	20		10099L26-I20UNF		10	9.9	73	25.4	4	20	11.5
-	-	3/4″-1″x20	20		16159L38-I20UNEF		16	15.9	92	38.1	5	30	17.8
5/16″x18	9/16″,5/8″x18	11/16″-1 11/16″x18	18		06052L17-I18UNC		6	5.2	57	16.9	3	12	6.5
9/16″,	5/8″x18	11/16″-1 11/16″x18	18		12113L30-I18UNF		12	11.3	83	29.6	4	21	12.8
5/8″x18	11/16″-1	11/16″x18	18		12119L33-I18UNF		12	11.9	83	32.5	4	23	14.5
3/8″x16	3/4″x16	-	16		08067L19-I16UNC		8	6.7	63	19.1	3	12	8.0
-	3/4″x16	-	16		16159L38-I16UNF		16	15.9	92	38.1	4	24	17.5
7/16″x14	7/8″x14	-	14		08076L24-I14UNC		8	7.6	63	23.6	4	13	9.3
-	7/8″x14	-	14		20187L44-I14UNF		20	18.7	104	43.5	4	24	20.5
1/2″x13	-	-	13		10089L26-I13UNC		10	8.9	73	25.4	4	13	10.8
9/16″x12	1″-1 1/2″x12	-	12		12103L30-I12UNC		12	10.3	83	29.6	4	14	12.3
-	1″-1 1/2″x12	-	12		20199L51-I12UNF		20	19.9	104	50.8	5	24	23.5
5/8″x11	-	-	11		12110L32-I11UNC		12	11.0	83	32.3	4	14	13.5
3/4″x10	-	-	10		16135L38-I10UNC		16	13.5	92	38.1	5	15	16.5
7/8″x9	-	-	9		16152L45-I9UNC		16	15.2	92	45.2	4	16	19.5
1″x8	-	-	8		20170L51-I8UNC		20	17.0	104	50.8	4	16	22.0

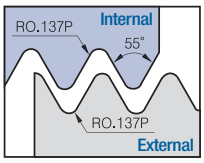
* Bore Diameter applies to smallest thread dia

● : Stock item

Thread Mill

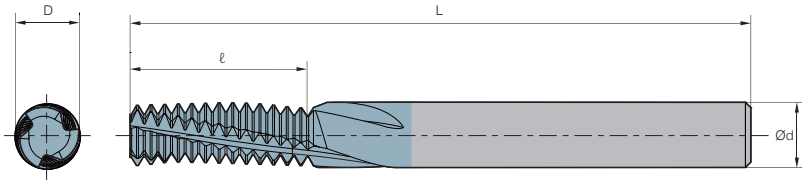
BSP

Helical flutes



External / Internal

Defined by : B.S.2779 : 1956
Tolerance class : Medium class

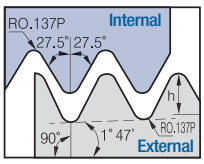


(ℓ ≤ 2 × Thread diameter)

Thread Standard	Pitch (tpi)		Designation	PC9070M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
1/16″x28,1/8″x28	28	STMH	06058L16-EI28BSP		6	5.8	57	16.3	3	18	6.7
1/8″x28	28		08077L20-EI28BSP		8	7.7	63	20.0	3	22	8.7
1/4″x19, 3/8″x19	19		10099L27-EI19BSP		10	9.9	73	26.7	4	20	11.8
3/8″x19	19		16134L33-EI19BSP		16	13.4	92	33.4	4	25	15.2
1/2″, 3/4″x14	14		16157L44-EI14BSP		16	15.7	92	43.5	5	24	19.0
1″, 1 1/2″, 2″, 2 1/2″x11	11		20199L42-EI11BSP		20	19.9	104	41.6	5	18	30.7

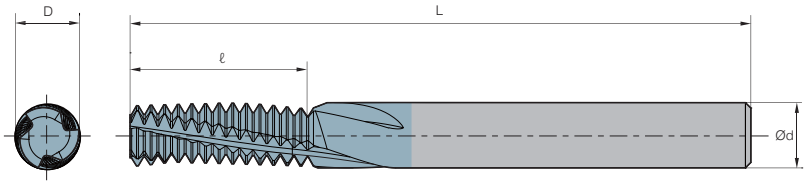
BSPT

Helical flutes



External / Internal

Defined by : B.S.21 : 1985
Tolerance class : Standard BSPT



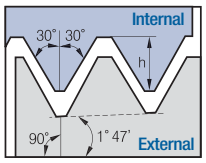
Thread Standard	Pitch (tpi)		Designation	PC9070M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
1/16″x28	28	STMH	06058L16-EI28BSPT		6	5.8	57	16.3	3	18	6.7
1/8″x28	28		08077L20-EI28BSPT		8	7.7	63	20.0	3	22	8.7
1/4″x19	19		10099L27-EI19BSPT		10	9.9	73	26.7	4	20	11.8
3/8″x19	19		16134L33-EI19BSPT		16	13.4	92	33.4	4	25	15.2
1/2″, 3/4″x14	14		16157L44-EI14BSPT		16	15.7	92	43.5	5	24	19.0
1″, 1 1/2″, 2″, 2 1/2″x11	11		20199L42-EI11BSPT		20	19.9	104	41.6	5	18	30.7

* Bore Diameter applies to smallest thread dia

● : Stock item

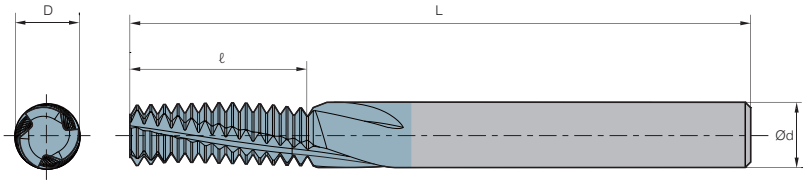
NPT

Helical flutes



External / Internal

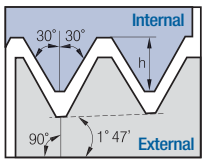
Defined by : USAS B2.1 : 1968
Tolerance class : Standard NPT



Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
1/16"x27	27.0	STMH	06053L09-EI27NPT		6	5.3	57	9.4	3	10	6.3
1/8"x27	27.0		08075L09-EI27NPT		8	7.5	63	9.4	4	10	8.5
1/4"x18	18.0		10094L14-EI18NPT		10	9.4	73	14.1	4	10	11.1
3/8"x18	18.0		12119L14-EI18NPT		12	11.9	83	14.1	4	10	14.5
1/2", 3/4"x14	14.0		16155L25-EI14NPT		16	15.5	92	25.4	5	14	17.7, 23.0
1"-2"x11.5	11.5		20199L33-EI11.5NPT		20	19.9	104	33.1	5	15	29.0-56.0
2 1/2", 3"x8	8.0		20199L38-EI8NPT		20	19.9	104	38.1	4	12	66.0

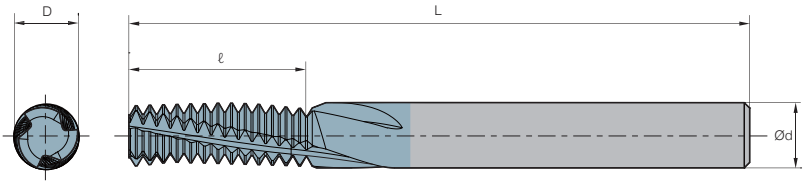
NPTF

Helical flutes



External / Internal

Defined by : ANSI 1.20.3-1976
Tolerance class : Standard NPTF



Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
1/16"x27	27.0	STMH	06053L09-EI27NPTF		6	5.3	57	9.4	3	10	6.3
1/8"x27	27.0		08075L09-EI27NPTF		8	7.5	63	9.4	4	10	8.4
1/4"x18	18.0		10094L14-EI18NPTF		10	9.4	73	14.1	4	10	11.1
3/8"x18	18.0		12119L14-EI18NPTF		12	11.9	83	14.1	4	10	14.7
1/2", 3/4"x14	14.0		16155L25-EI14NPTF		16	15.5	92	25.4	5	14	17.9, 23.4
1"-2"x11.5	11.5		20199L33-EI11.5NPTF		20	19.9	104	33.1	5	15	29.4-56.2
2 1/2", 3"x8	8.0		20199L38-EI8NPTF		20	19.9	104	38.1	4	12	67.0

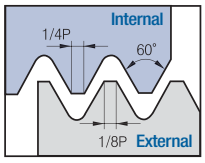
* Bore Diameter applies to smallest thread dia

● : Stock item

Thread Mill

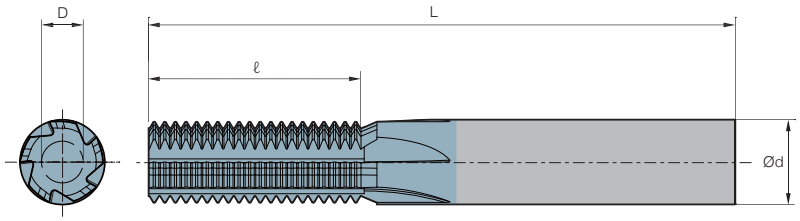
ISO Metric

Straight flutes



External / Internal

Defined by : R262 (DIN 13)
Tolerance class : 6g/6H



External

Thread Standard	Pitch (mm)		Designation	PC9060M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
M3	0.50	STMS	06059-E0.50ISO		6	5.9	57	15	3	30	0.31
M4.5	0.75		08079-E0.75ISO		8	7.9	63	19.5	3	26	0.46
M4.5	0.75		08079-E0.75ISO-TM5		8	7.9	63	19.5	5	26	0.46
M6	1.00		10099-E1.00ISO		10	9.9	72	24	5	24	0.61
M10	1.50		12119-E1.50ISO		12	11.9	83	30	5	20	0.92
M14	2.00		12119-E2.00ISO		12	11.9	83	30	5	15	1.23
M24	3.00		16159-E3.00ISO		16	15.9	92	36	5	12	1.84
M36	4.00		16159-E4.00ISO		16	15.9	92	40	5	10	2.45
M64	6.00		20199-E6.00ISO		20	19.9	104	36	5	6	3.68

Internal

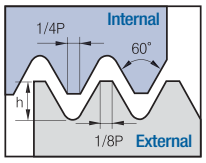
Thread Standard	Pitch (mm)		Designation	PC9060M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
M4.5	0.75	STMS	04030-I0.75ISO		4	3	42	6.75	3	9	0.43
M8	0.75		06059-I0.75ISO		6	5.9	57	15.0	3	20	0.43
M5	0.80		04036-I0.80ISO		4	3.6	42	8.0	3	10	0.46
M6	1.00		06040-I1.00ISO		6	4	57	9.0	3	9	0.58
M12	1.00		08079-I1.00ISO		8	7.9	63	20.0	3, 5	20	0.58
M12	1.00		08079-I1.00ISO-TM5		8	7.9	63	20.0	3, 5	20	0.58
M8	1.25		06050-I1.25ISO		6	5	57	12.5	3	10	0.72
M10	1.50		06059-I1.50ISO		6	5.9	57	15.0	3	10	0.87
M14	1.50		10099-I1.50ISO		10	9.9	72	24.0	5	16	0.87
M18	1.50		12119-I1.50ISO		12	11.9	83	30.0	5	20	0.87
M12	1.75		08079-I1.75ISO		8	7.9	63	19.25	3, 5	11	1.01
M12	1.75		08079-I1.75ISO-TM5		8	7.9	63	19.25	3, 5	11	1.01
M16	2.00		10099-I2.00ISO		10	9.9	72	24.0	5	12	1.15
M18	2.00		12119-I2.00ISO		12	11.9	83	30.0	5	15	1.15
M20	2.50		12119-I2.50ISO		12	11.9	83	30.0	5	12	1.44
M24	3.00		16159-I3.00ISO		16	15.9	92	36.0	5	12	1.73
M30	3.50		16159-I3.50ISO		16	15.9	92	38.5	5	11	2.02
M36	4.00		16159-I4.00ISO		16	15.9	92	40.0	5	10	2.31
M48	5.00		20199-I5.00ISO		20	19.9	104	40.0	5	8	2.89
M64	6.00		20199-I6.00ISO		20	19.9	104	36.0	5	6	3.46

* Bore Diameter applies to smallest thread dia

● : Stock item

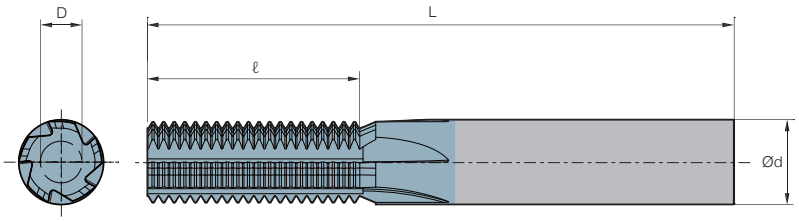
BSP

Straight flutes



External / Internal

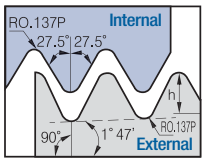
Defined by : B.S.2779:1956
Tolerance class : Medium class



Thread Standard	Pitch (tpi)		Designation	PC9060M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
1/16″	28	STMS	06059-EI28BSP		6	5.9	57	14.51	3	16	0.58
1/4″	19		08079-EI19BSP		8	7.9	63	18.72	3	14	0.86
1/4″	19		08079-EI19BSP-TM5		8	7.9	63	18.72	5	14	0.86
1/2″	14		12119-EI14BSP		12	11.9	83	29.03	5	16	1.16
1″	11		16159-EI11BSP		16	15.9	92	34.64	5	15	1.48

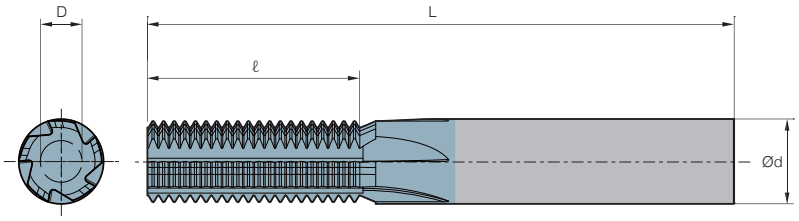
BSPT

Straight flutes



External / Internal

Defined by : B.S.21 : 1985
Tolerance class : Standard BSPT



Thread Standard	Pitch (tpi)		Designation	PC9060M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
1/16″	28	STMS	06059-EI28BSPT		6	5.9	57	9.98	3	11	0.58
1/4″	19		08079-EI19BSPT		8	7.9	63	14.71	3	11	0.86
1/4″	19		08079-EI19BSPT-TM5		8	7.9	63	14.71	5	11	0.86
1/2″	14		12119-EI14BSPT		12	11.9	83	19.96	5	11	1.16
1″	11		16159-EI11BSPT		16	15.9	92	39.25	5	17	1.48

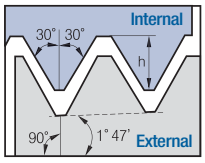
* Bore Diameter applies to smallest thread dia

● : Stock item

Thread Mill

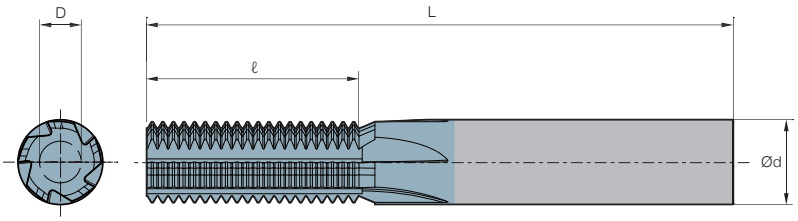
NPT

Straight flutes



External / Internal

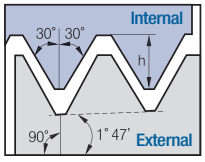
Defined by : USAS B2.1:1968
Tolerance class : Standard NPT



Thread Standard	Pitch (tpi)		Designation	PC9060M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
1/16″	27.0	STMS	06059-EI27NPT		6	5.9	57	9.41	3.0	10	0.66
1/4″	18.0		08079-EI18NPT		8	7.9	63	14.11	3, 5	10	1.01
1/4″	18.0		08079-EI18NPT-TM5		8	7.9	63	14.11	3, 5	10	1.01
1/2″	14.0		12119-EI14NPT		12	11.9	83	19.96	5.0	11	1.33
1″	11.5		16159-EI11.5NPT		16	15.9	92	26.50	5.0	12	1.64
2 1/2″	8.0		16159-EI8NPT		16	15.9	92	38.10	5.0	12	2.42

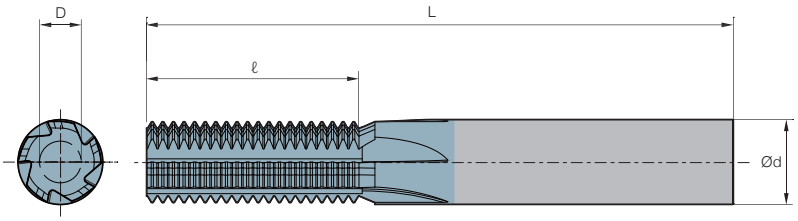
NPTF

Straight flutes



External / Internal

Defined by : ANSI 1.20.3-1976
Tolerance class : Standard NPTF



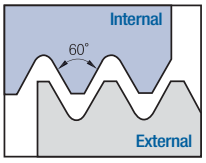
Thread Standard	Pitch (tpi)		Designation	PC9060M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
1/16″	27.0	STMS	06059-EI27NPTF		6	5.9	57	9.41	3	10	0.64
1/4″	18.0		08079-EI18NPTF		8	7.9	63	14.11	3, 5	10	1.00
1/2″	14.0		12119-EI14NPTF		12	11.9	83	19.96	5	11	1.35
1″	11.5		16159-EI11.5NPTF		16	15.9	92	26.50	5	12	1.63
2 1/2″	8.0		16159-EI8NPTF		16	15.9	92	38.10	5	12	2.38

* Bore Diameter applies to smallest thread dia

● : Stock item

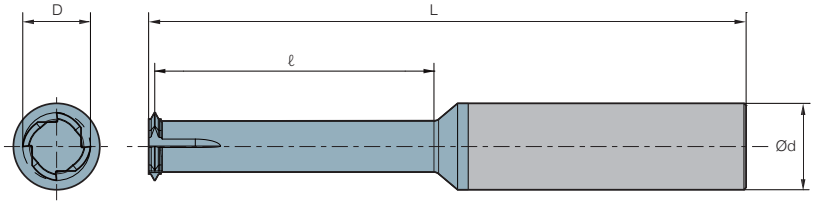
ISO Metric

Deep threading / Long-type tool



Internal

Defined by : R262 (DIN 13)
Tolerance class : 6H

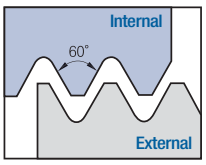


(ℓ1 ≤ 3 × Thread diameter)

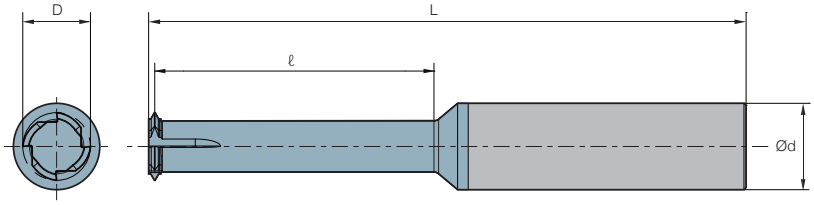
Thread Standard	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt	*Bore dia. mm
M6x1	1.00	STMD1T	08041-I1.00ISO		8	4.1	63	19	3	1	5.0
M8x1.25	1.25		10058-I1.25ISO		10	5.8	73	26	3	1	6.8
M10x1.5	1.50		10077-I1.50ISO		10	7.7	73	32	3	1	8.5
M12x1.5	1.50		12094-I1.50ISO		12	9.4	83	38	4	1	10.5
M12x1.75	1.75		12087-I1.75ISO		12	8.7	83	38	4	1	10.2
M14x2	2.00		16102-I2.00ISO		16	10.2	92	44	4	1	12.0
M16x2	2.00		16122-I2.00ISO		16	12.2	100	50	4	1	14.0
M18x2.5	2.50		16129-I2.50ISO		16	12.9	108	57	5	1	15.5
M20x2.5	2.50		16148-I2.50ISO		16	14.8	114	63	5	1	17.5

TP60

Deep threading / Long-type tool



Internal



Thread M Coarse	Thread M Fine	Min. Thread UN, UNF, UNEF	Pitch (mm)	Pitch (tpi)	Designation		PC9070M	Dimensions (mm) Ød	D	L	ℓ	No.of flute z	Tooth zt
M5x0.8	M5x0.5, M5X0.75	No.10-56UNS, No.10-48UNS, No.10-40UNS, No.10-36UNS, No.10-32UNF	0.5 ~0.8	32 ~56	STMD1T	04390L160-ITA60		4	3.90	45	16	4	1
M6x1.0	M6x0.5, M6X0.75	No.12-56UNS, No.12-48UNS, 1/4 -40UNS, 1/4 -36UNS, 1/4 -32UNEF, 1/4 -28UNF, 1/4 -27UNS, 1/4 -24UNS	0.5 ~1.0	24 ~56		06485L200-ITB60		6	4.85	51	20	5	1
M8x1.25	M7x0.5, M7x0.75, M7.5x1.0	5/16 -48UNS, 5/16 -40UNS, 5/16 -36UNS, 5/16 -32UNEF, 5/16 -28UN, 5/16 -27UNS, 5/16 -24UNS, 5/16 -20UN	0.5 ~1.25	20 ~48		06590L250-ITF60		6	5.90	64	25	5	1
	M10.5x0.5, M11x0.75, M11x1.0	7/16 -32UN, 7/16 -28UNEF, 7/16 -27UNS, 7/16 -24UNS	0.5 ~1.0	24 ~56		10990L350-ITB60		10	9.90	73	35	6	1
M10x1.5	M10x1.0, M10X1.25	3/8 -24UNF, 3/8 -20UN, 7/16 -18UNS, 7/16 -16UN	1.0 ~1.50	16 ~24		08790L320-ITC60		8	7.90	63	32	6	1
M12x1.75	M12x1.0, M12X1.25, M12x1.5	1/2 -24UNS, 1/2 -20UNS, 1/2 -18UNS, 1/2 -16UNS, 1/2 -14UNS	1.0 ~1.75	14 ~24		10990L380-ITD60		10	9.90	73	38	6	1
-	M13.5x1.0, M14x1.25, M14x1.5	9/16 -24UNEF	1.0 ~1.75	14 ~24		12119L450-ITD60		12	11.90	83	45	6	1

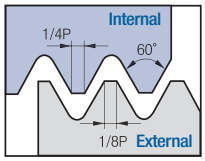
* Bore Diameter applies to smallest thread dia

● : Stock item

Thread Mill

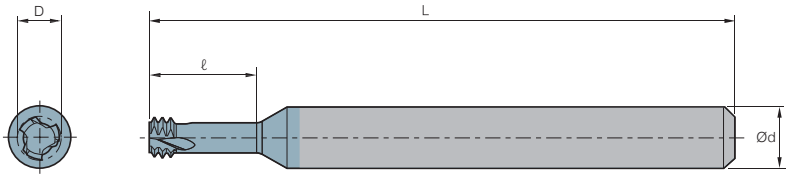
ISO Metric

Deep threading



Internal

Defined by : R262 (DIN 13)
Tolerance class : 6H



(ℓ ≤ 2 × Thread diameter)

Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					Ød	D	L	ℓ	z	zt	mm
M1.6x0.35	-	0.35	STMD3T	03012L034-I0.35ISO		3	1.20	30	3.4	3	3	1.25
M2x0.4	-	0.40		06015L042-I0.40ISO		6	1.55	57	4.2	3	3	1.60
M2.2x0.45	-	0.45		06016L046-I0.45ISO		6	1.65	57	4.6	3	3	1.75
M2.5x0.45	-	0.45		06019L052-I0.45ISO		6	1.95	57	5.2	3	3	2.05
M3x0.5	M3.5-M16x0.5	0.50		06024L062-I0.50ISO		6	2.40	57	6.2	3	3	2.50
M3.5x0.6	-	0.60		06027L073-I0.60ISO		6	2.75	57	7.3	3	3	2.90
M4x0.7	-	0.70		06031L083-I0.70ISO		6	3.15	57	8.3	3	3	3.30
M5x0.8	-	0.80		06040L104-I0.80ISO		6	4.05	57	10.4	3	3	4.20
M6x1.0	M8-M40x1.0	1.00		06048L125-I1.00ISO		6	4.80	57	12.5	3	3	5.00
M8x1.25	-	1.25		08065L166-I1.25ISO		8	6.50	63	16.6	3	3	6.80
M10x1.5	M12-M48x1.50	1.50		10082L208-I1.50ISO		10	8.20	73	20.8	3	3	8.50
M12x1.75	-	1.75		10099L250-I1.75ISO		10	9.90	73	25.0	3	3	10.30
M16x2.0	-	2.00		12119L330-I2.00ISO		12	11.90	83	33.0	3	3	14.00
M20x2.5	-	2.50		16159L413-I2.50ISO		16	15.90	92	41.3	3	3	17.50

(ℓ ≤ 3 × Thread diameter)

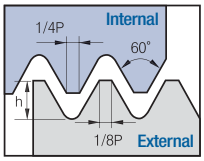
Thread		Pitch (mm)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					Ød	D	L	ℓ	z	zt	mm
M1.6X0.35	-	0.35	STMD3T	03012L050-I0.35ISO		3	1.20	30	5.0	3	3	1.25
M2x0.4	-	0.40		03015L062-I0.40IS0		3	1.55	30	6.2	3	3	1.60
M2X0.4	-	0.40		06015L062-I0.40ISO		6	1.55	57	6.2	3	3	1.60
M2.5x0.45	-	0.45		03019L077-I0.45ISO		3	1.95	30	7.7	3	3	2.05
M2.5x0.45	-	0.45		06019L077-I0.45ISO		6	1.95	57	7.7	3	3	2.05
M3X0.5	M3.5-M16x0.5	0.50		03024L092-I0.50ISO		3	2.40	30	9.2	3	3	2.50
M3x0.5	M3.5-M16x0.5	0.50		06024L092-I0.50ISO		6	2.40	57	9.2	3	3	2.50
M4x0.7	-	0.70		06031L123-I0.70ISO		6	3.15	57	12.3	3	3	3.30
M5x0.8	-	0.80		06040L154-I0.80ISO		6	4.05	57	15.4	3	3	4.20
M6x1.0	M8-M40x1.0	1.00		06048L185-I1.00ISO		6	4.80	57	18.5	3	3	5.00
M8x1.25	-	1.25		08065L246-I1.25ISO		8	6.50	63	24.6	3	3	6.80

* Bore Diameter applies to smallest thread dia

● : Stock item

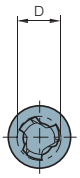
American UN (UNC,UNF)

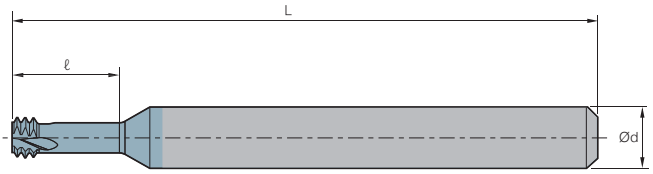
Deep threading



External / Internal

Defined by : ANSI B1.1.74
Tolerance class : 2B





(ℓ ≤ 2 × Thread diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF					Ød	D	L	ℓ	z	zt	mm
-	No.1-72	72	STMD3T	06014L039-I72UN		6	1.45	57	3.9	3	3	1.6
No.1-64	No.2-64	64		06014L042-I64UN		6	1.40	57	4.2	3	3	1.5
No.2-56	No.3-56	56		06016L050-I56UN		6	1.65	57	5.0	3	3	1.8
No.3-48	No.4-48	48		06019L060-I48UN		6	1.90	57	6.0	3	3	2.1
No.4,No.5-40	No.6-40	40		06021L060-I40UN		6	2.10	57	6.0	3	3	2.3
No.5-40	No.6-40	40		06024L072-I40UN		6	2.45	57	7.2	3	3	2.6
-	No.8-36	36		06033L087-I36UN		6	3.30	57	8.7	3	3	3.5
No.6,No.8-32	No.10-32	32		06025L074-I32UN		6	2.55	57	7.4	3	3	2.8
No.8-32	No.10-32	32		06032L100-I32UN		6	3.20	57	10.0	3	3	3.5
-	No.10-32	32		06038L103-I32UN		6	3.80	57	10.3	3	3	4.0
-	1/4˝x28	28		06052L132-I28UN		6	5.25	57	13.2	3	3	5.5
No.10-24	5/16˝x24	24		06035L102-I24UN		6	3.58	57	10.2	3	3	3.9
-	5/16˝x24	24		08066L165-I24UN		8	6.68	63	16.5	3	3	6.9
1/4˝x20	7/16˝x20	20		06048L134-I20UN		6	4.88	57	13.4	3	3	5.2
-	7/16˝x20	20		10095L230-I20UN		10	9.55	73	23.0	3	3	9.9
5/16˝x18	-	18		08061L169-I18UN		8	6.15	63	16.9	3	3	6.6
3/8˝x16	-	16		08067L191-I16UN		8	6.70	63	19.1	3	3	8.0
7/16˝x14	-	14		10090L233-I14UN		10	9.00	73	23.3	3	3	9.4

(ℓ ≤ 3 × Thread diameter)

Thread		Pitch (tpi)	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine					Ød	D	L	ℓ	z	zt	mm
-	No.1-72	72	STMD3T	03014L057-I72UN		3	1.45	30	5.75	3	3	1.6
-	No.1-72	72		06014L057-I72UN		6	1.45	57	5.75	3	3	1.6
No.2-56	No.3-56	56		03016L070-I56UN		3	1.65	30	7.00	3	3	1.8
No.4, No.5-40	No.6-40	40		03021L090-I40UN		3	2.10	30	9.00	3	3	2.3
No.4, No.5-40	No.6-40	40		06021L090-I40UN		6	2.10	57	9.00	3	3	2.3
No.5-40	No.6-40	40		06024L100-I40UN		6	2.45	57	10.00	3	3	2.6
No.6, No.8-32	No.10-32	32		03025L110-I32UN		3	2.55	30	11.00	3	3	2.8
No.6, No.8-32	No.10-32	32		06025L110-I32UN		6	2.55	57	11.00	3	3	2.8
No.8-32	No.10-32	32		06032L130-I32UN		6	3.20	57	13.00	3	3	3.4
-	No.10-32	32		06038L150-I32UN		6	3.80	57	15.10	3	3	4.0
-	1/4˝x28	28		06052L196-I28UN		6	5.25	57	19.60	3	3	5.5
-	5/16˝x24	24		08066L245-I24UN		8	6.68	63	24.50	3	3	6.9
1/4˝x20	7/16˝x20	20		06048L198-I20UN		6	4.88	57	19.80	3	3	5.1
5/16˝x18	-	18		08061L239-I18UN		8	6.15	63	24.00	3	3	6.6

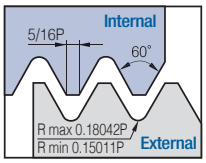
* Bore Diameter applies to smallest thread dia

● : Stock item

Thread Mill

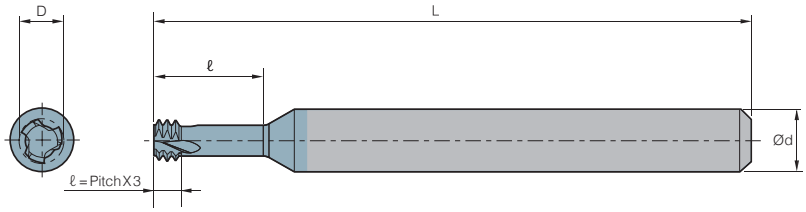
UNJ

Deep threading



Internal

Defined by : MIL-S-8879C
Tolerance class : 3B

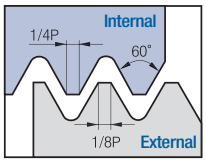


(ℓ ≤ 3 × Thread diameter)

Thread		Pitch (tpi)		Designation	PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNJC	UNJF					Ød	D	L	ℓ	z	zt	mm
0.138″(#6)	0.190″(#10)	32	STMD3T	06027L110-I32UNJ		6	2.7	57	11.0	3	3	2.80
-	0.250″(1/4″)	28		06054L195-I28UNJ		6	5.4	57	19.5	3	3	5.60
0.190″(#10)	-	24		06037L149-I24UNJ		6	3.7	57	14.9	3	3	4.00
-	0.3125″(5/16″)	24		08067L241-I24UNJ		8	6.7	63	24.1	3	3	7.00
0.250″(1/4″)	-	20		06050L195-I20UNJ		6	5	57	19.5	3	3	5.30
-	0.4375″(7/16″)	20		10096L335-I20UNJ		10	9.6	73	33.5	3	3	10.00
0.3125″(5/16″)	0.5625″(9/16″)	18		08064L241-I18UNJ		8	6.4	63	24.1	3	3	6.75
0.375″(3/8″)	0.750″(3/4″)	16		08077L290-I16UNJ		8	7.7	63	29.0	3	3	8.10
0.4375″(7/16″)	0.875″(7/8″)	14		10092L335-I14UNJ		10	9.2	73	33.5	3	3	9.50
0.500″(1/2″)	-	13		10099L385-I13UNJ		10	9.9	73	38.5	3	3	11.00

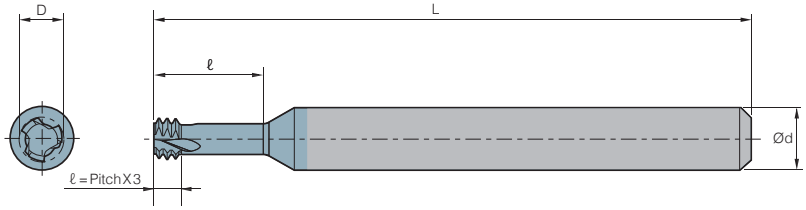
MJ

Deep threading



Internal

Defined by : ISO 5855
Tolerance class : 4h/6h-4H/5H



(ℓ ≤ 3 × Thread diameter)

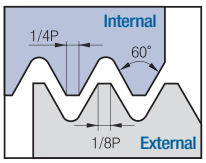
Thread	Pitch (mm)		Designation	PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
Standard					Ød	D	L	ℓ	z	zt	mm
MJ3x0.5	0.50	STMD3T	06024L092-I0.5MJ		6	2.40	57	9.2	3	3	2.60
MJ3.5x0.6	0.60		06028L110-I0.6MJ		6	2.85	57	11.0	3	3	3.00
MJ4x0.7	0.70		06031L123-I0.7MJ		6	3.15	57	12.3	3	3	3.40
MJ5x0.8	0.80		06040L154-I0.8MJ		6	4.05	57	15.4	3	3	4.30
MJ6x1.0	1.00		06048L185-I1.0MJ		6	4.80	57	18.5	3	3	5.10
MJ8x1.25	1.25		08065L246-I1.25MJ		8	6.50	63	24.6	3	3	6.90
MJ10x1.5	1.50		10082L308-I1.50MJ		10	8.20	73	30.8	3	3	8.70
MJ12x1.75	1.75		10099L370-I1.75MJ		10	9.90	73	37.0	3	3	10.40
MJ14x2	2.00		12119L425-I2.0MJ		12	11.90	83	42.5	3	3	12.25

* Bore Diameter applies to smallest thread dia

● : Stock item

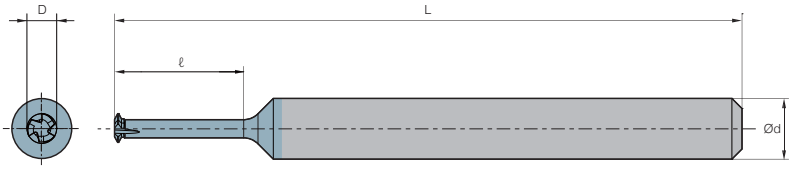
ISO Metric

Deep threading for dental



Internal

Defined by : R262 (DIN 13)
Tolerance class : 6H

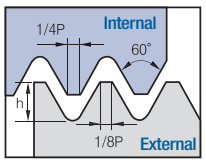


(ℓ ≤ 3 × Thread diameter)

Thread		Pitch		Designation	PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine	(mm)				Ød	D	L	ℓ	z	zt	mm
M1.0x0.25	M1.4x0.25	0.25	STMD1T	03007L031-I0.25ISO		3	0.70	31	3.1	3	1	0.75
M1.2x0.25	M1.4x0.25	0.25		03009L038-I0.25ISO		3	0.90	31	3.8	3	1	0.95
M1.4x0.3	-	0.30		03011L044-I0.30ISO		3	1.05	31	4.4	3	1	1.15
M1.6x0.35	-	0.35		03012L050-I0.35ISO		3	1.20	31	5.0	3	1	1.30
M1.8x0.35	M2.0x0.35	0.35		03014L056-I0.35ISO		3	1.40	31	5.6	3	1	1.50
M2.0x0.4	-	0.40		03015L062-I0.40ISO		3	1.50	31	6.2	3	1	1.65
M2.5x0.45	-	0.45		03019L077-I0.45ISO		3	1.95	31	7.7	3	1	2.10

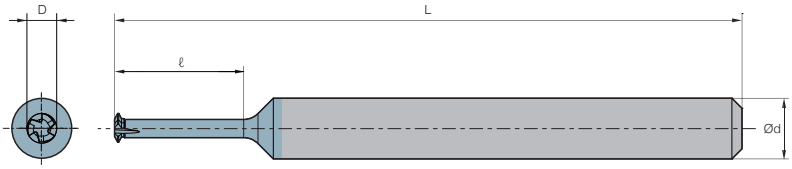
American UNF

Deep threading for dental



Internal

Defined by : ANSI B1.1.74
Tolerance class : 2B



(ℓ ≤ 3 × Thread diameter)

Thread	Pitch		Designation	PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNF	(tpi)				Ød	D	L	ℓ	z	zt	mm
0-80	80	STMD1T	03011L046-I80UN		3	1.15	31	4.6	3	1	1.3
1-72	72		03014L065-I72UN		3	1.45	31	6.5	3	1	1.6

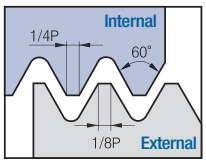
* Bore Diameter applies to smallest thread dia

● : Stock item

Thread Mill

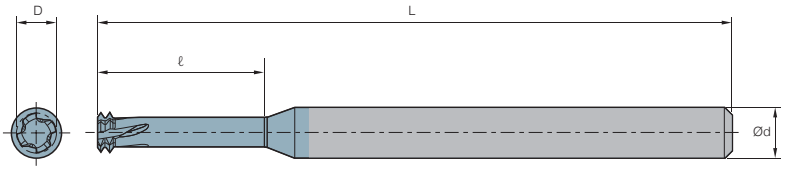
ISO Metric

Deep threading for hard materials



Internal

Defined by : R262 (DIN 13)
Tolerance class : 6H

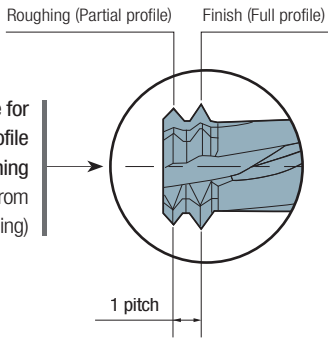


(ℓ ≤ 2 × Thread diameter)

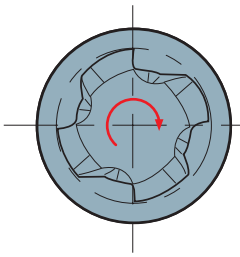
Thread		Pitch	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine	(mm)				Ød	D	L	ℓ	z	zt	mm
M2x0.4	-	0.40	STMD2L	06015L042-I0.40ISO		6	1.55	76	4.60	4	2	1.60
M2.2x0.45	-	0.45		06016L046-I0.45ISO		6	1.65	76	5.05	4	2	1.80
M2.5x0.45	-	0.45		06019L052-I0.45ISO		6	1.95	76	5.65	4	2	2.05
M3x0.5	M3.5-M16x0.5	0.50		06024L062-I0.50ISO		6	2.40	76	6.75	4	2	2.55
M3.5x0.6	-	0.60		06027L073-I0.60ISO		6	2.75	76	7.90	4	2	2.95
M4x0.7	-	0.70		06031L083-I0.70ISO		6	3.15	76	9.05	4	2	3.35
M5x0.8	-	0.80		06040L104-I0.80ISO		6	4.05	76	11.20	4	2	4.30
M6x1.0	M8-M40x1.0	1.00		06048L125-I1.00ISO		6	4.80	76	13.50	5	2	5.10
M8x1.25	-	1.25		08065L166-I1.25ISO		8	6.50	80	17.85	5	2	6.80
M10x1.5	M12-M48x1.50	1.50		08079L208-I1.50ISO		8	7.90	80	22.30	6	2	8.60
M12x1.75	-	1.75		10099L250-I1.75ISO		10	9.90	101	26.75	6	2	10.40

(ℓ ≤ 3 × Thread diameter)

Thread		Pitch	Designation		PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine	(mm)				Ød	D	L	ℓ	z	zt	mm
M2x0.4	-	0.40	STMD2L	06015L062-I0.40ISO		6	1.55	76	6.60	4	2	1.60
M2.5x0.45	-	0.45		06019L077-I0.45ISO		6	1.95	76	8.15	4	2	2.05
M3x0.5	M3.5-M16x0.5	0.50		06024L092-I0.50ISO		6	2.40	76	9.75	4	2	2.55
M4x0.7	-	0.70		06031L123-I0.70ISO		6	3.15	76	13.05	4	2	3.35
M5x0.8	-	0.80		06040L154-I0.80ISO		6	4.05	76	16.20	4	2	4.30
M6x1.0	M8-M40x1.0	1.00		06048L185-I1.00ISO		6	4.80	76	19.50	5	2	5.10
M8x1.25	-	1.25		08065L246-I1.25ISO		8	6.50	80	25.85	5	2	6.80



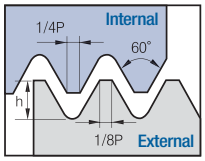
Two cutting teeth: Partial profile for leading tooth followed by full profile for finishing
The work direction should be from the top to the bottom (Climb Milling)



Deep threading for hard materials tools are left handed.
For CNC use M04 code.

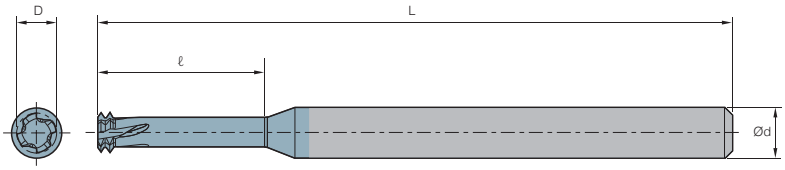
American UN (UNC,UNF)

Deep threading for hard materials



Internal

Defined by : ANSI B1.1.74
Tolerance class : 2B



(ℓ ≤ 2 × Thread diameter)

Thread		Pitch (tpi)		Designation	PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF					Ød	D	L	ℓ	z	zt	mm
No.2-56	No.3-56	56	STMD2L	06016L050-I56UN		6	1.65	76	5.45	4	2	1.80
No.3-48	No.4-48	48		06019L060-I48UN		6	1.90	76	6.53	4	2	2.10
No.4-40, No.5-40	No.6-40	40		06021L060-I40UN		6	2.10	76	6.64	4	2	2.35
No.5-40	No.6-40	40		06024L072-I40UN		6	2.45	76	7.84	4	2	2.65
-	No.8-36	36		06033L087-I36UN		6	3.30	76	9.41	4	2	3.55
No.6-32, No.8-32	No.10-32	32		06025L074-I32UN		6	2.55	76	8.20	4	2	2.85
No.8-32	No.10-32	32		06032L100-I32UN		6	3.20	76	10.79	4	2	3.50
-	No.10-32	32		06037L100-I32UN		6	3.70	76	10.80	4	2	4.17
-	1/4˝x28	28		06052L132-I28UN		6	5.25	76	14.11	5	2	5.55
No.10-24	5/16˝x24	24		06035L102-I24UN		6	3.58	76	11.26	4	2	3.90
-	5/16˝x24	24		08066L165-I24UN		8	6.68	80	17.56	5	2	7.00
1/4˝-20	7/16˝x20	20		06048L134-I20UN		6	4.88	76	14.67	5	2	5.20
-	7/16˝x20	20		10095L230-I20UN		10	9.55	101	24.27	6	2	9.90
5/16˝x18	-	18		08061L160-I18UN		8	6.15	80	18.17	4	2	6.50
3/8˝x16	-	16		08076L197-I16UN		8	7.65	80	21.29	5	2	8.00
7/16˝x14	-	14		10090L233-I14UN		10	9.00	101	25.11	6	2	9.50
1/2˝x13	-	13		10099L256-I13UN		10	9.90	101	27.55	6	2	10.90

(ℓ ≤ 3 × Thread diameter)

Thread		Pitch (tpi)		Designation	PC9070M	Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF					Ød	D	L	ℓ	z	zt	mm
No.4-40, No.5-40	No.6-40	40	STMD2L	06021L090-I40UN		6	2.10	76	9.64	4	2	2.35
No.5-40	No.6-40	40		06024L100-I40UN		6	2.45	76	10.64	4	2	2.65
No.6-32, No.8-32	No.10-32	32		06025L110-I32UN		6	2.55	76	11.79	4	2	2.85
No.8-32	No.10-32	32		06032L130-I32UN		6	3.20	76	13.79	4	2	3.50
-	1/4˝x28	28		06052L196-I28UN		6	5.25	76	20.51	5	2	5.55
-	5/16˝x24	24		08066L245-I24UN		8	6.68	80	25.56	5	2	7.00
1/4˝x20	7/16˝x20	20		06048L198-I20UN		6	4.88	76	21.07	5	2	5.20
5/16˝x18	-	18		08061L240-I18UN		8	6.15	80	26.17	4	2	6.50
7/16˝x14	-	14		10090L335-I14UN		10	9.00	101	35.31	6	2	9.50

* Bore Diameter applies to smallest thread dia

● : Stock item

High performance carbide tap and HSS tap

TAP

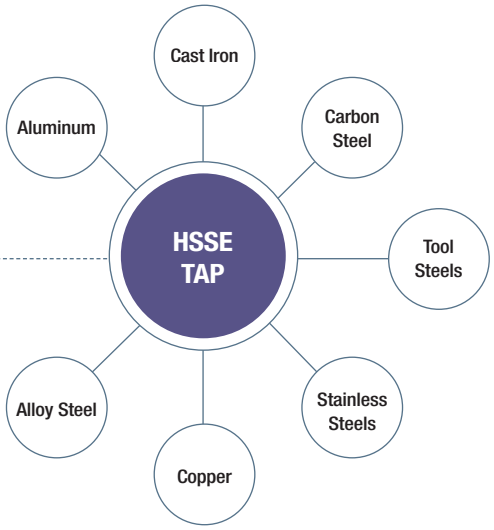
- Suitable for Alloy Steels, Carbon steels, Brass, Aluminum alloy steels
- Extend customer choice with variety of size and type

Features

- Improvement of wear resistance and chipping resistance by applied to high toughness material
- High processability and Minimized chip deposition by applied to TiN,TiCN coating
- Response to a wide range of processing conditions by adopting the stepwise accuracy method of WH or GH



Applications



Code system

V	R	0	M	06	100	40	-	S

Raw material
V : HSSE

Appearance
S (JIS) : Straight
G (DIN) : Straight
P (JIS) : Spiral
Q (DIN) : Spiral
N (JIS) : Point
D (DIN) : Point
R (JIS) : Roll
F (JIS) : Spiral Roll
M (DIN) : Roll

Surface treatment
O : NON
T : TiN
C : TiCN
H : HOMO

Thread
M : ISO Metric Thread
PT : Pipe Tapered
NPT : National Pipe Tapered
PS : Pipe Straight
PF : Pipe Fastening

Size
M3 ~ M24

Pitch
0.5 ~ 3.0

Chamfer length
1.5
2.0
2.5
4.0
5.0

Oil Groove
S : 1 Groove
M : 4 Groove

HSS TAP

EDP. NO	Appearance	Type		Surface treatment		Size range	Page
				Coating	Uncoated		
VPOM		JIS	Spiral flute tap	-	○	M3~M24	376
VPTM			Spiral flute tap	TiN	-	M3~M24	377
VPCM			Spiral flute tap	TiCN	-	M3~M24	378
VPHM			Spiral flute tap	HOMO	-	M3~M24	379
VNOM			Spiral point tap	-	○	M3~M24	380
VNTM			Flute point tap	TiN	-	M3~M24	381
VNCM			Flute point tap	TiCN	-	M3~M24	382
VNHM			Flute point tap	HOMO	-	M3~M24	383
VSOM			Straight flute tap	-	○	M3~M24	384
VSTM			Straight flute tap	TiN	-	M3~M24	385
VSCM			Straight flute tap	TiCN	-	M3~M24	386
VSHM			Straight flute tap	HOMO	-	M3~M24	387
VROM			Roll tap	-	○	M3~M12	388
VRTM			Roll tap	TiN	-	M3~M12	389
VRCM			Roll tap	TiCN	-	M3~M12	390
VFOM			Spiral roll tap	-	○	M3~M6	391
VFTM			Spiral roll tap	TiN	-	M3~M6	392
VFCM			Spiral roll tap	TiCN	-	M3~M6	393
VQOM		DIN	Spiral flute tap	-	○	M3~M24	394
VQTM			Spiral flute tap	TiN	-	M3~M24	395
VQCM			Spiral flute tap	TiCN	-	M3~M24	396
VQHM			Spiral flute tap	HOMO	-	M3~M24	397
VDOM			Spiral Point Tap	-	○	M3~M24	398
VDTM			Spiral Point Tap	TiN	-	M3~M24	399
VDCM			Flute point tap	TiCN	-	M3~M24	400
VDHM			Flute point tap	HOMO	-	M3~M24	401
VGOM			Straight flute tap	-	○	M3~M24	402
VGTM			Straight flute tap	TiN	-	M3~M24	403
VGCM			Straight flute tap	TiCN	-	M3~M24	404
VGHM			Straight flute tap	HOMO	-	M3~M24	405
VMOM			Roll Tap	-	○	M3~M12	406
VMTM			Roll Tap	TiN	-	M3~M12	407
VMCM			Roll Tap	TiCN	-	M3~M12	408

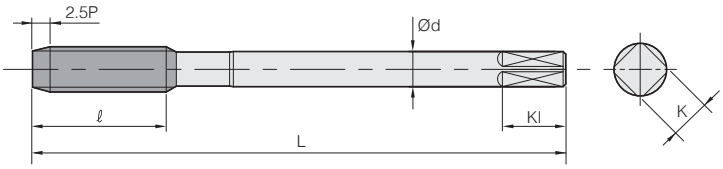
Thread **TAP**

VPOM

JIS spiral flute taps

HSSE | 35° HELIX | Un-coated





Designation 2.5P	Thread size	Limits	L	ℓ	d	K	KI	Z
VPOM0305025	M3 × 0.5	WH2	46	11	4	3.2	6	3
VPOM0407025	M4 × 0.7	WH2	52	13	5	4	7	3
VPOM04507525	M4.5 × 0.75	WH2	55	13	5	4	7	3
VPOM0508025	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VPOM0610025	M6 × 1.0	WH2	62	19	6	4.5	7	3
VPOM0812525	M8 × 1.25	WH2	70	22	6.2	5	8	3
VPOM1012525	M10 × 1.25	WH2	75	24	7	5.5	8	3
VPOM1015025	M10 × 1.5	WH2	75	24	7	5.5	8	3
VPOM1210025	M12 × 1.0	WH2	82	29	8.5	6.5	9	3
VPOM1212525	M12 × 1.25	WH2	82	29	8.5	6.5	9	3
VPOM1215025	M12 × 1.5	WH2	82	29	8.5	6.5	9	3
VPOM1217525	M12 × 1.75	WH2	82	29	8.5	6.5	9	3
VPOM1415025	M14 × 1.5	WH2	88	30	10.5	8	11	3
VPOM1420025	M14 × 2.0	WH2	88	30	10.5	8	11	3
VPOM1615025	M16 × 1.5	WH2	95	32	12.5	10	13	3
VPOM1620025	M16 × 2.0	WH2	95	32	12.5	10	13	3
VPOM1815025	M18 × 1.5	WH2	100	37	14	11	14	4
VPOM1825025	M18 × 2.5	WH3	100	37	14	11	14	4
VPOM2015025	M20 × 1.5	WH3	105	37	15	12	15	4
VPOM2025025	M20 × 2.5	WH3	105	37	15	12	15	4
VPOM2215025	M22 × 1.5	WH3	115	38	17	13	16	4
VPOM2225025	M22 × 2.5	WH3	115	38	17	13	16	4
VPOM2415025	M24 × 1.5	WH3	120	45	19	15	18	4
VPOM2420025	M24 × 2.0	WH3	120	45	19	15	18	4
VPOM2430025	M24 × 3.0	WH4	120	45	19	15	18	4

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	◎		◎								○	○	○	○	○	○	○	○	○				○

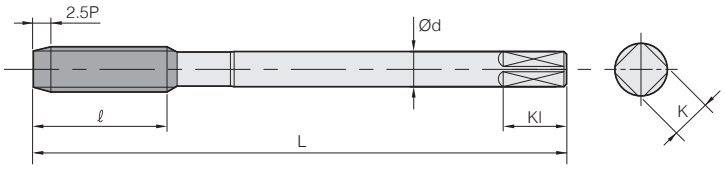
◎: Excellent ○: Good

VPTM

JIS spiral flute taps

HSSE | 35° HELIX | TiN





Designation 2.5P	Thread size	Limits	L	ℓ	d	K	Kl	Z
VPTM0305025	M3 × 0.5	WH2	46	11	4	3.2	6	3
VPTM0407025	M4 × 0.7	WH2	52	13	5	4	7	3
VPTM04507525	M4.5 × 0.75	WH2	55	13	5	4	7	3
VPTM0508025	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VPTM0610025	M6 × 1.0	WH2	62	19	6	4.5	7	3
VPTM0812525	M8 × 1.25	WH2	70	22	6.2	5	8	3
VPTM1012525	M10 × 1.25	WH2	75	24	7	5.5	8	3
VPTM1015025	M10 × 1.5	WH2	75	24	7	5.5	8	3
VPTM1210025	M12 × 1.0	WH2	82	29	8.5	6.5	9	3
VPTM1212525	M12 × 1.25	WH2	82	29	8.5	6.5	9	3
VPTM1215025	M12 × 1.5	WH2	82	29	8.5	6.5	9	3
VPTM1217525	M12 × 1.75	WH2	82	29	8.5	6.5	9	3
VPTM1415025	M14 × 1.5	WH2	88	30	10.5	8	11	3
VPTM1420025	M14 × 2.0	WH2	88	30	10.5	8	11	3
VPTM1615025	M16 × 1.5	WH2	95	32	12.5	10	13	3
VPTM1620025	M16 × 2.0	WH2	95	32	12.5	10	13	3
VPTM1815025	M18 × 1.5	WH2	100	37	14	11	14	4
VPTM1825025	M18 × 2.5	WH3	100	37	14	11	14	4
VPTM2015025	M20 × 1.5	WH3	105	37	15	12	15	4
VPTM2025025	M20 × 2.5	WH3	105	37	15	12	15	4
VPTM2215025	M22 × 1.5	WH3	115	38	17	13	16	4
VPTM2225025	M22 × 2.5	WH3	115	38	17	13	16	4
VPTM2415025	M24 × 1.5	WH3	120	45	19	15	18	4
VPTM2420025	M24 × 2.0	WH3	120	45	19	15	18	4
VPTM2430025	M24 × 3.0	WH4	120	45	19	15	18	4

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	◎		◎								○	○	○	○	○	○	○	○	○				○

◎: Excellent ○: Good

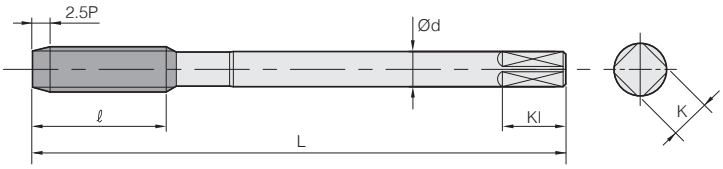
Thread **TAP**

VPCM

JIS spiral flute taps

HSSE | 35° HELIX | TiCN





Designation 2.5P	Thread size	Limits	L	ℓ	d	K	KI	Z
VPCM0305025	M3 × 0.5	WH2	46	11	4	3.2	6	3
VPCM0407025	M4 × 0.7	WH2	52	13	5	4	7	3
VPCM04507525	M4.5 × 0.75	WH2	55	13	5	4	7	3
VPCM0508025	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VPCM0610025	M6 × 1.0	WH2	62	19	6	4.5	7	3
VPCM0812525	M8 × 1.25	WH2	70	22	6.2	5	8	3
VPCM1012525	M10 × 1.25	WH2	75	24	7	5.5	8	3
VPCM1015025	M10 × 1.5	WH2	75	24	7	5.5	8	3
VPCM1210025	M12 × 1.0	WH2	82	29	8.5	6.5	9	3
VPCM1212525	M12 × 1.25	WH2	82	29	8.5	6.5	9	3
VPCM1215025	M12 × 1.5	WH2	82	29	8.5	6.5	9	3
VPCM1217525	M12 × 1.75	WH2	82	29	8.5	6.5	9	3
VPCM1415025	M14 × 1.5	WH2	88	30	10.5	8	11	3
VPCM1420025	M14 × 2.0	WH2	88	30	10.5	8	11	3
VPCM1615025	M16 × 1.5	WH2	95	32	12.5	10	13	3
VPCM1620025	M16 × 2.0	WH2	95	32	12.5	10	13	3
VPCM1815025	M18 × 1.5	WH2	100	37	14	11	14	4
VPCM1825025	M18 × 2.5	WH3	100	37	14	11	14	4
VPCM2015025	M20 × 1.5	WH3	105	37	15	12	15	4
VPCM2025025	M20 × 2.5	WH3	105	37	15	12	15	4
VPCM2215025	M22 × 1.5	WH3	115	38	17	13	16	4
VPCM2225025	M22 × 2.5	WH3	115	38	17	13	16	4
VPCM2415025	M24 × 1.5	WH3	120	45	19	15	18	4
VPCM2420025	M24 × 2.0	WH3	120	45	19	15	18	4
VPCM2430025	M24 × 3.0	WH4	120	45	19	15	18	4

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	◎		◎								○	○	○	○	○	○	○	○	○				○

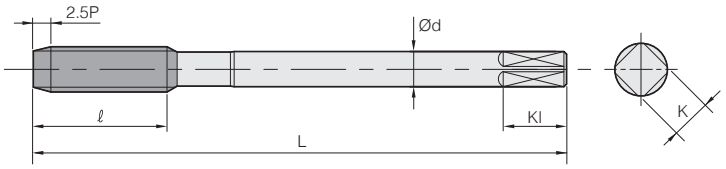
◎: Excellent ○: Good

VPHM

JIS spiral flute taps

HSSE | 35° HELIX | HOMO





Designation 2.5P	Thread size	Limits	L	ℓ	d	K	Kl	Z
VPHM0305025	M3 × 0.5	WH2	46	11	4	3.2	6	3
VPHM0407025	M4 × 0.7	WH2	52	13	5	4	7	3
VPHM04507525	M4.5 × 0.75	WH2	55	13	5	4	7	3
VPHM0508025	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VPHM0610025	M6 × 1.0	WH2	62	19	6	4.5	7	3
VPHM0812525	M8 × 1.25	WH2	70	22	6.2	5	8	3
VPHM1012525	M10 × 1.25	WH2	75	24	7	5.5	8	3
VPHM1015025	M10 × 1.5	WH2	75	24	7	5.5	8	3
VPHM1210025	M12 × 1.0	WH2	82	29	8.5	6.5	9	3
VPHM1212525	M12 × 1.25	WH2	82	29	8.5	6.5	9	3
VPHM1215025	M12 × 1.5	WH2	82	29	8.5	6.5	9	3
VPHM1217525	M12 × 1.75	WH2	82	29	8.5	6.5	9	3
VPHM1415025	M14 × 1.5	WH2	88	30	10.5	8	11	3
VPHM1420025	M14 × 2.0	WH2	88	30	10.5	8	11	3
VPHM1615025	M16 × 1.5	WH2	95	32	12.5	10	13	3
VPHM1620025	M16 × 2.0	WH2	95	32	12.5	10	13	3
VPHM1815025	M18 × 1.5	WH2	100	37	14	11	14	4
VPHM1825025	M18 × 2.5	WH3	100	37	14	11	14	4
VPHM2015025	M20 × 1.5	WH3	105	37	15	12	15	4
VPHM2025025	M20 × 2.5	WH3	105	37	15	12	15	4
VPHM2215025	M22 × 1.5	WH3	115	38	17	13	16	4
VPHM2225025	M22 × 2.5	WH3	115	38	17	13	16	4
VPHM2415025	M24 × 1.5	WH3	120	45	19	15	18	4
VPHM2420025	M24 × 2.0	WH3	120	45	19	15	18	4
VPHM2430025	M24 × 3.0	WH4	120	45	19	15	18	4

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	◎		◎								○	○	○	○	○	○	○	○	○				○

◎: Excellent ○: Good

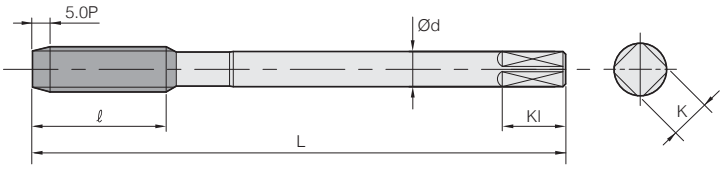
Thread **TAP**

VNOM

JIS spiral point taps

HSSE | Un-coated





Designation 5P	Thread size	Limits	L	ℓ	d	K	KI	Z
VNOM0305050	M3 × 0.5	WH2	46	11	4	3.2	6	3
VNOM0407050	M4 × 0.7	WH2	52	13	5	4	7	3
VNOM0508050	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VNOM0610050	M6 × 1.0	WH2	62	19	6	4.5	7	3
VNOM0812550	M8 × 1.25	WH3	70	22	6.2	5	8	3
VNOM1012550	M10 × 1.25	WH3	75	24	7	5.5	8	3
VNOM1015050	M10 × 1.5	WH3	75	24	7	5.5	8	3
VNOM1210050	M12 × 1.0	WH3	82	29	8.5	6.5	9	3
VNOM1212550	M12 × 1.25	WH3	82	29	8.5	6.5	9	3
VNOM1215050	M12 × 1.5	WH3	82	29	8.5	6.5	9	3
VNOM1217550	M12 × 1.75	WH4	82	29	8.5	6.5	9	3
VNOM1415050	M14 × 1.5	WH3	88	30	10.5	8	11	3
VNOM1420050	M14 × 2.0	WH4	88	30	10.5	8	11	3
VNOM1615050	M16 × 1.5	WH3	95	32	12.5	10	13	3
VNOM1620050	M16 × 2.0	WH4	95	32	12.5	10	13	3
VNOM1815050	M18 × 1.5	WH4	100	37	14	11	14	3
VNOM1825050	M18 × 2.5	WH4	100	37	14	11	14	3
VNOM2015050	M20 × 1.5	WH4	105	37	15	12	15	3
VNOM2025050	M20 × 2.5	WH4	105	37	15	12	15	3
VNOM2215050	M22 × 1.5	WH4	115	38	17	13	16	3
VNOM2225050	M22 × 2.5	WH4	115	38	17	13	16	3
VNOM2415050	M24 × 1.5	WH4	120	45	19	15	18	3
VNOM2420050	M24 × 2.0	WH4	120	45	19	15	18	3
VNOM2430050	M24 × 3.0	WH4	120	45	19	15	18	3

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	○	○	◎							○	○	○	○	○	○	◎	○	○	○				○

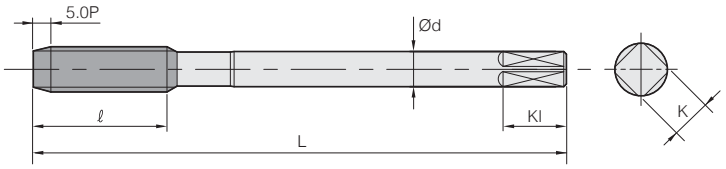
◎: Excellent ○: Good

VNTM

JIS flute point taps

HSSE TiN





Designation 5P	Thread size	Limits	L	ℓ	d	K	Kl	Z
VNTM0305050	M3 × 0.5	WH2	46	11	4	3.2	6	3
VNTM0407050	M4 × 0.7	WH2	52	13	5	4	7	3
VNTM0508050	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VNTM0610050	M6 × 1.0	WH2	62	19	6	4.5	7	3
VNTM0812550	M8 × 1.25	WH3	70	22	6.2	5	8	3
VNTM1012550	M10 × 1.25	WH3	75	24	7	5.5	8	3
VNTM1015050	M10 × 1.5	WH3	75	24	7	5.5	8	3
VNTM1210050	M12 × 1.0	WH3	82	29	8.5	6.5	9	3
VNTM1212550	M12 × 1.25	WH3	82	29	8.5	6.5	9	3
VNTM1215050	M12 × 1.5	WH3	82	29	8.5	6.5	9	3
VNTM1217550	M12 × 1.75	WH4	82	29	8.5	6.5	9	3
VNTM1415050	M14 × 1.5	WH3	88	30	10.5	8	11	3
VNTM1420050	M14 × 2.0	WH4	88	30	10.5	8	11	3
VNTM1615050	M16 × 1.5	WH3	95	32	12.5	10	13	3
VNTM1620050	M16 × 2.0	WH4	95	32	12.5	10	13	3
VNTM1815050	M18 × 1.5	WH4	100	37	14	11	14	3
VNTM1825050	M18 × 2.5	WH4	100	37	14	11	14	3
VNTM2015050	M20 × 1.5	WH4	105	37	15	12	15	3
VNTM2025050	M20 × 2.5	WH4	105	37	15	12	15	3
VNTM2215050	M22 × 1.5	WH4	115	38	17	13	16	3
VNTM2225050	M22 × 2.5	WH4	115	38	17	13	16	3
VNTM2415050	M24 × 1.5	WH4	120	45	19	15	18	3
VNTM2420050	M24 × 2.0	WH4	120	45	19	15	18	3
VNTM2430050	M24 × 3.0	WH4	120	45	19	15	18	3

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
○	○	○	○				◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○

◎: Excellent ○: Good

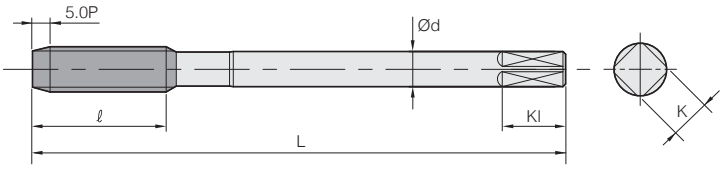
Thread **TAP**

VNCM

JIS flute point taps

HSSE TiCN





Designation 5P	Thread size	Limits	L	ℓ	d	K	KI	Z
VNCM0305050	M3 × 0.5	WH2	46	11	4	3.2	6	3
VNCM0407050	M4 × 0.7	WH2	52	13	5	4	7	3
VNCM0508050	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VNCM0610050	M6 × 1.0	WH2	62	19	6	4.5	7	3
VNCM0812550	M8 × 1.25	WH3	70	22	6.2	5	8	3
VNCM1012550	M10 × 1.25	WH3	75	24	7	5.5	8	3
VNCM1015050	M10 × 1.5	WH3	75	24	7	5.5	8	3
VNCM1210050	M12 × 1.0	WH3	82	29	8.5	6.5	9	3
VNCM1212550	M12 × 1.25	WH3	82	29	8.5	6.5	9	3
VNCM1215050	M12 × 1.5	WH3	82	29	8.5	6.5	9	3
VNCM1217550	M12 × 1.75	WH4	82	29	8.5	6.5	9	3
VNCM1415050	M14 × 1.5	WH3	88	30	10.5	8	11	3
VNCM1420050	M14 × 2.0	WH4	88	30	10.5	8	11	3
VNCM1615050	M16 × 1.5	WH3	95	32	12.5	10	13	3
VNCM1620050	M16 × 2.0	WH4	95	32	12.5	10	13	3
VNCM1815050	M18 × 1.5	WH4	100	37	14	11	14	3
VNCM1825050	M18 × 2.5	WH4	100	37	14	11	14	3
VNCM2015050	M20 × 1.5	WH4	105	37	15	12	15	3
VNCM2025050	M20 × 2.5	WH4	105	37	15	12	15	3
VNCM2215050	M22 × 1.5	WH4	115	38	17	13	16	3
VNCM2225050	M22 × 2.5	WH4	115	38	17	13	16	3
VNCM2415050	M24 × 1.5	WH4	120	45	19	15	18	3
VNCM2420050	M24 × 2.0	WH4	120	45	19	15	18	3
VNCM2430050	M24 × 3.0	WH4	120	45	19	15	18	3

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
◎	◎	◎	○				○	○	○	○	○	○	○	○	○	○	○	○	○				○

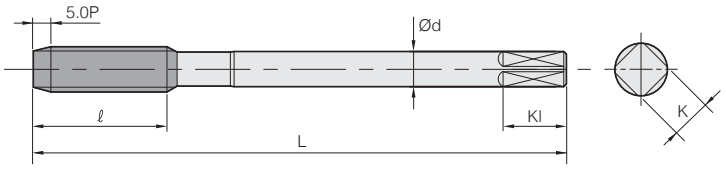
◎: Excellent ○: Good

VNHM

JIS flute point taps

HSSE HOMO





Designation 5P	Thread size	Limits	L	ℓ	d	K	Kl	Z
VNHM0305050	M3 × 0.5	WH2	46	11	4	3.2	6	3
VNHM0407050	M4 × 0.7	WH2	52	13	5	4	7	3
VNHM0508050	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VNHM0610050	M6 × 1.0	WH2	62	19	6	4.5	7	3
VNHM0812550	M8 × 1.25	WH3	70	22	6.2	5	8	3
VNHM1012550	M10 × 1.25	WH3	75	24	7	5.5	8	3
VNHM1015050	M10 × 1.5	WH3	75	24	7	5.5	8	3
VNHM1210050	M12 × 1.0	WH3	82	29	8.5	6.5	9	3
VNHM1212550	M12 × 1.25	WH3	82	29	8.5	6.5	9	3
VNHM1215050	M12 × 1.5	WH3	82	29	8.5	6.5	9	3
VNHM1217550	M12 × 1.75	WH4	82	29	8.5	6.5	9	3
VNHM1415050	M14 × 1.5	WH3	88	30	10.5	8	11	3
VNHM1420050	M14 × 2.0	WH4	88	30	10.5	8	11	3
VNHM1615050	M16 × 1.5	WH3	95	32	12.5	10	13	3
VNHM1620050	M16 × 2.0	WH4	95	32	12.5	10	13	3
VNHM1815050	M18 × 1.5	WH4	100	37	14	11	14	3
VNHM1825050	M18 × 2.5	WH4	100	37	14	11	14	3
VNHM2015050	M20 × 1.5	WH4	105	37	15	12	15	3
VNHM2025050	M20 × 2.5	WH4	105	37	15	12	15	3
VNHM2215050	M22 × 1.5	WH4	115	38	17	13	16	3
VNHM2225050	M22 × 2.5	WH4	115	38	17	13	16	3
VNHM2415050	M24 × 1.5	WH4	120	45	19	15	18	3
VNHM2420050	M24 × 2.0	WH4	120	45	19	15	18	3
VNHM2430050	M24 × 3.0	WH4	120	45	19	15	18	3

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
◎	◎		○						○														○

◎: Excellent ○: Good

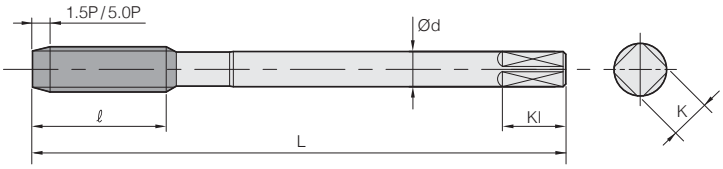
Thread **TAP**

VSOM

JIS straight flute taps

HSSE | Un-coated





Designation		Thread size	Limits	L	ℓ	d	K	KI	Z
1.5P	5P								
VSOM0305015	VSOM0305050	M3 × 0.5	WH2	46	11	4	3.2	6	3
VSOM0407015	VSOM0407050	M4 × 0.7	WH2	52	13	5	4	7	3
VSOM0508015	VSOM0508050	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VSOM0610015	VSOM0610050	M6 × 1.0	WH2	62	19	6	4.5	7	3
VSOM0812515	VSOM0812550	M8 × 1.25	WH2	70	22	6.2	5	8	4
VSOM1012515	VSOM1012550	M10 × 1.25	WH2	75	24	7	5.5	8	4
VSOM1015015	VSOM1015050	M10 × 1.5	WH3	75	24	7	5.5	8	4
VSOM1210015	VSOM1210050	M12 × 1.0	WH2	82	29	8.5	6.5	9	4
VSOM1212515	VSOM1212550	M12 × 1.25	WH2	82	29	8.5	6.5	9	4
VSOM1215015	VSOM1215050	M12 × 1.5	WH3	82	29	8.5	6.5	9	4
VSOM1217515	VSOM1217550	M12 × 1.75	WH3	82	29	8.5	6.5	9	4
VSOM1415015	VSOM1415050	M14 × 1.5	WH3	88	30	10.5	8	11	4
VSOM1420015	VSOM1420050	M14 × 2.0	WH3	88	30	10.5	8	11	4
VSOM1615015	VSOM1615050	M16 × 1.5	WH3	95	32	12.5	10	13	4
VSOM1620015	VSOM1620050	M16 × 2.0	WH3	95	32	12.5	10	13	4
VSOM1815015	VSOM1815050	M18 × 1.5	WH3	100	37	14	11	14	4
VSOM1825015	VSOM1825050	M18 × 2.5	WH3	100	37	14	11	14	4
VSOM2015015	VSOM2015050	M20 × 1.5	WH3	105	37	15	12	15	4
VSOM2025015	VSOM2025050	M20 × 2.5	WH3	105	37	15	12	15	4
VSOM2215015	VSOM2215050	M22 × 1.5	WH3	115	38	17	13	16	4
VSOM2225015	VSOM2225050	M22 × 2.5	WH3	115	38	17	13	16	4
VSOM2415015	VSOM2415050	M24 × 1.5	WH3	120	45	19	15	18	4
VSOM2420015	VSOM2420050	M24 × 2.0	WH3	120	45	19	15	18	4
VSOM2430015	VSOM2430050	M24 × 3.0	WH3	120	45	19	15	18	4

1.5P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
○	○	○	○	○									○	○	○		○	○	○				

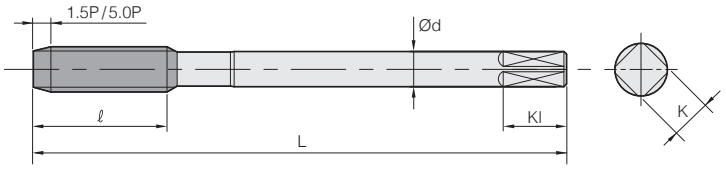
◎: Excellent ○: Good

VSTM

JIS straight flute taps

HSSE TiN





Designation		Thread size	Limits	L	ℓ	d	K	KI	Z
1.5P	5P								
VSTM0305015	VSTM0305050	M3 × 0.5	WH2	46	11	4	3.2	6	3
VSTM0407015	VSTM0407050	M4 × 0.7	WH2	52	13	5	4	7	3
VSTM0508015	VSTM0508050	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VSTM0610015	VSTM0610050	M6 × 1.0	WH2	62	19	6	4.5	7	3
VSTM0812515	VSTM0812550	M8 × 1.25	WH2	70	22	6.2	5	8	4
VSTM1012515	VSTM1012550	M10 × 1.25	WH2	75	24	7	5.5	8	4
VSTM1015015	VSTM1015050	M10 × 1.5	WH3	75	24	7	5.5	8	4
VSTM1210015	VSTM1210050	M12 × 1.0	WH2	82	29	8.5	6.5	9	4
VSTM1212515	VSTM1212550	M12 × 1.25	WH2	82	29	8.5	6.5	9	4
VSTM1215015	VSTM1215050	M12 × 1.5	WH3	82	29	8.5	6.5	9	4
VSTM1217515	VSTM1217550	M12 × 1.75	WH3	82	29	8.5	6.5	9	4
VSTM1415015	VSTM1415050	M14 × 1.5	WH3	88	30	10.5	8	11	4
VSTM1420015	VSTM1420050	M14 × 2.0	WH3	88	30	10.5	8	11	4
VSTM1615015	VSTM1615050	M16 × 1.5	WH3	95	32	12.5	10	13	4
VSTM1620015	VSTM1620050	M16 × 2.0	WH3	95	32	12.5	10	13	4
VSTM1815015	VSTM1815050	M18 × 1.5	WH3	100	37	14	11	14	4
VSTM1825015	VSTM1825050	M18 × 2.5	WH3	100	37	14	11	14	4
VSTM2015015	VSTM2015050	M20 × 1.5	WH3	105	37	15	12	15	4
VSTM2025015	VSTM2025050	M20 × 2.5	WH3	105	37	15	12	15	4
VSTM2215015	VSTM2215050	M22 × 1.5	WH3	115	38	17	13	16	4
VSTM2225015	VSTM2225050	M22 × 2.5	WH3	115	38	17	13	16	4
VSTM2415015	VSTM2415050	M24 × 1.5	WH3	120	45	19	15	18	4
VSTM2420015	VSTM2420050	M24 × 2.0	WH3	120	45	19	15	18	4
VSTM2430015	VSTM2430050	M24 × 3.0	WH3	120	45	19	15	18	4

1.5P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
○	○	○	○	○									○	○	○		○	○	○				

◎: Excellent ○: Good

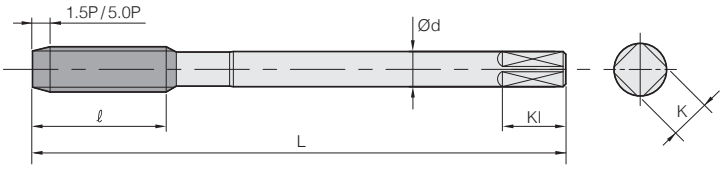
Thread **TAP**

VSCM

JIS straight flute taps

HSSE TiCN





Designation		Thread size	Limits	L	ℓ	d	K	KI	Z
1.5P	5P								
VSCM0305015	VSCM0305050	M3 × 0.5	WH2	46	11	4	3.2	6	3
VSCM0407015	VSCM0407050	M4 × 0.7	WH2	52	13	5	4	7	3
VSCM0508015	VSCM0508050	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VSCM0610015	VSCM0610050	M6 × 1.0	WH2	62	19	6	4.5	7	3
VSCM0812515	VSCM0812550	M8 × 1.25	WH2	70	22	6.2	5	8	4
VSCM1012515	VSCM1012550	M10 × 1.25	WH2	75	24	7	5.5	8	4
VSCM1015015	VSCM1015050	M10 × 1.5	WH3	75	24	7	5.5	8	4
VSCM1210015	VSCM1210050	M12 × 1.0	WH2	82	29	8.5	6.5	9	4
VSCM1212515	VSCM1212550	M12 × 1.25	WH2	82	29	8.5	6.5	9	4
VSCM1215015	VSCM1215050	M12 × 1.5	WH3	82	29	8.5	6.5	9	4
VSCM1217515	VSCM1217550	M12 × 1.75	WH3	82	29	8.5	6.5	9	4
VSCM1415015	VSCM1415050	M14 × 1.5	WH3	88	30	10.5	8	11	4
VSCM1420015	VSCM1420050	M14 × 2.0	WH3	88	30	10.5	8	11	4
VSCM1615015	VSCM1615050	M16 × 1.5	WH3	95	32	12.5	10	13	4
VSCM1620015	VSCM1620050	M16 × 2.0	WH3	95	32	12.5	10	13	4
VSCM1815015	VSCM1815050	M18 × 1.5	WH3	100	37	14	11	14	4
VSCM1825015	VSCM1825050	M18 × 2.5	WH3	100	37	14	11	14	4
VSCM2015015	VSCM2015050	M20 × 1.5	WH3	105	37	15	12	15	4
VSCM2025015	VSCM2025050	M20 × 2.5	WH3	105	37	15	12	15	4
VSCM2215015	VSCM2215050	M22 × 1.5	WH3	115	38	17	13	16	4
VSCM2225015	VSCM2225050	M22 × 2.5	WH3	115	38	17	13	16	4
VSCM2415015	VSCM2415050	M24 × 1.5	WH3	120	45	19	15	18	4
VSCM2420015	VSCM2420050	M24 × 2.0	WH3	120	45	19	15	18	4
VSCM2430015	VSCM2430050	M24 × 3.0	WH3	120	45	19	15	18	4

1.5P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
○	○	○	○	○									○	○	○		○	○	○				

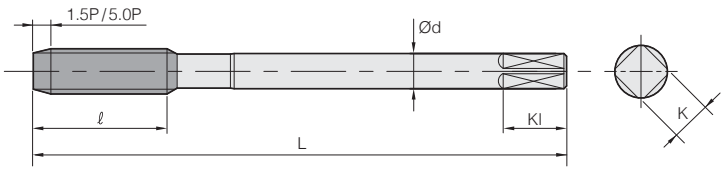
◎: Excellent ○: Good

VSHM

JIS straight flute taps

HSSE HOMO





Designation		Thread size	Limits	L	ℓ	d	K	Kl	Z
1.5P	5P								
VSHM0305015	VSHM0305050	M3 × 0.5	WH2	46	11	4	3.2	6	3
VSHM0407015	VSHM0407050	M4 × 0.7	WH2	52	13	5	4	7	3
VSHM0508015	VSHM0508050	M5 × 0.8	WH2	60	16	5.5	4.5	7	3
VSHM0610015	VSHM0610050	M6 × 1.0	WH2	62	19	6	4.5	7	3
VSHM0812515	VSHM0812550	M8 × 1.25	WH2	70	22	6.2	5	8	4
VSHM1012515	VSHM1012550	M10 × 1.25	WH2	75	24	7	5.5	8	4
VSHM1015015	VSHM1015050	M10 × 1.5	WH3	75	24	7	5.5	8	4
VSHM1210015	VSHM1210050	M12 × 1.0	WH2	82	29	8.5	6.5	9	4
VSHM1212515	VSHM1212550	M12 × 1.25	WH2	82	29	8.5	6.5	9	4
VSHM1215015	VSHM1215050	M12 × 1.5	WH3	82	29	8.5	6.5	9	4
VSHM1217515	VSHM1217550	M12 × 1.75	WH3	82	29	8.5	6.5	9	4
VSHM1415015	VSHM1415050	M14 × 1.5	WH3	88	30	10.5	8	11	4
VSHM1420015	VSHM1420050	M14 × 2.0	WH3	88	30	10.5	8	11	4
VSHM1615015	VSHM1615050	M16 × 1.5	WH3	95	32	12.5	10	13	4
VSHM1620015	VSHM1620050	M16 × 2.0	WH3	95	32	12.5	10	13	4
VSHM1815015	VSHM1815050	M18 × 1.5	WH3	100	37	14	11	14	4
VSHM1825015	VSHM1825050	M18 × 2.5	WH3	100	37	14	11	14	4
VSHM2015015	VSHM2015050	M20 × 1.5	WH3	105	37	15	12	15	4
VSHM2025015	VSHM2025050	M20 × 2.5	WH3	105	37	15	12	15	4
VSHM2215015	VSHM2215050	M22 × 1.5	WH3	115	38	17	13	16	4
VSHM2225015	VSHM2225050	M22 × 2.5	WH3	115	38	17	13	16	4
VSHM2415015	VSHM2415050	M24 × 1.5	WH3	120	45	19	15	18	4
VSHM2420015	VSHM2420050	M24 × 2.0	WH3	120	45	19	15	18	4
VSHM2430015	VSHM2430050	M24 × 3.0	WH3	120	45	19	15	18	4

1.5P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
○	○	○	○	○									○	○	○		○	○	○				

◎: Excellent ○: Good

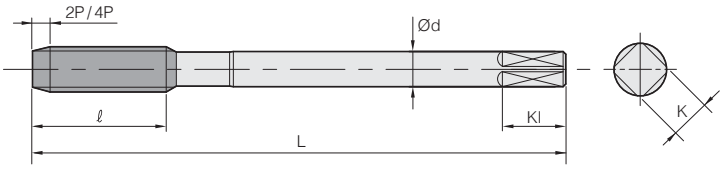
Thread **TAP**

VROM

JIS roll taps

HSSE | Un-coated





Designation		Thread size	Limits	L	ℓ	d	K	Kl	Oil groove
2P	4P								
VROM0305020S	-	M3 × 0.5	GH5	46	11	4	3.2	6	S
VROM0305020M	VROM0305040M	M3 × 0.5	GH5	46	11	4	3.2	6	M
VROM0407020S	-	M4 × 0.7	GH6	52	13	5	4	7	S
VROM0407020M	VROM0407040M	M4 × 0.7	GH6	52	13	5	4	7	M
VROM0508020S	-	M5 × 0.8	GH6	60	16	5.5	4.5	7	S
VROM0508020M	VROM0508040M	M5 × 0.8	GH6	60	16	5.5	4.5	7	M
VROM0610020S	-	M6 × 1.0	GH7	62	19	6	4.5	7	S
VROM0610020M	VROM0610040M	M6 × 1.0	GH7	62	19	6	4.5	7	M
VROM0812520S	-	M8 × 1.25	GH7	70	22	6.2	5	8	S
VROM0812520M	VROM0812540M	M8 × 1.25	GH7	70	22	6.2	5	8	M
VROM1012520S	-	M10 × 1.25	GH7	75	24	7	5.5	8	S
VROM1012520M	VROM1012540M	M10 × 1.25	GH7	75	24	7	5.5	8	M
VROM1015020S	-	M10 × 1.5	GH7	75	24	7	5.5	8	S
VROM1015020M	VROM1015040M	M10 × 1.5	GH7	75	24	7	5.5	8	M
VROM1210020S	-	M12 × 1.0	GH7	82	29	8.5	6.5	9	S
VROM1210020M	VROM1210040M	M12 × 1.0	GH7	82	29	8.5	6.5	9	M
VROM1212520S	-	M12 × 1.25	GH7	82	29	8.5	6.5	9	S
VROM1212520M	VROM1212540M	M12 × 1.25	GH7	82	29	8.5	6.5	9	M
VROM1215020S	-	M12 × 1.5	GH7	82	29	8.5	6.5	9	S
VROM1215020M	VROM1215040M	M12 × 1.5	GH7	82	29	8.5	6.5	9	M
VROM1217520S	-	M12 × 1.75	GH8	82	29	8.5	6.5	9	S
VROM1217520M	VROM1217540M	M12 × 1.75	GH8	82	29	8.5	6.5	9	M

2.0P Tap is removed external center as bottoming type

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
												◎	◎	◎		◎	◎		◎				

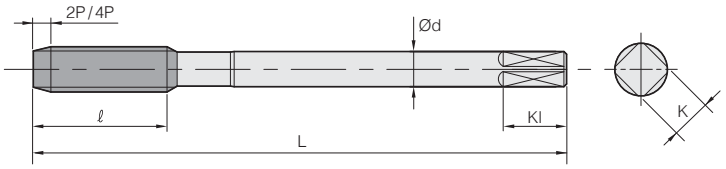
◎: Excellent ○: Good

VRTM

JIS roll taps

HSSE TiN





Designation		Thread size	Limits	L	ℓ	d	K	Kl	Oil groove
2P	4P								
VRTM0305020S	-	M3 × 0.5	GH5	46	11	4	3.2	6	S
VRTM0305020M	VRTM0305040M	M3 × 0.5	GH6	46	11	4	3.2	6	M
VRTM0407020S	-	M4 × 0.7	GH6	52	13	5	4	7	S
VRTM0407020M	VRTM0407040M	M4 × 0.7	GH6	52	13	5	4	7	M
VRTM0508020S	-	M5 × 0.8	GH6	60	16	5.5	4.5	7	S
VRTM0508020M	VRTM0508040M	M5 × 0.8	GH6	60	16	5.5	4.5	7	M
VRTM0610020S	-	M6 × 1.0	GH7	62	19	6	4.5	7	S
VRTM0610020M	VRTM0610040M	M6 × 1.0	GH7	62	19	6	4.5	7	M
VRTM0812520S	-	M8 × 1.25	GH7	70	22	6.2	5	8	S
VRTM0812520M	VRTM0812540M	M8 × 1.25	GH7	70	22	6.2	5	8	M
VRTM1012520S	-	M10 × 1.25	GH7	75	24	7	5.5	8	S
VRTM1012520M	VRTM1012540M	M10 × 1.25	GH7	75	24	7	5.5	8	M
VRTM1015020S	-	M10 × 1.5	GH7	75	24	7	5.5	8	S
VRTM1015020M	VRTM1015040M	M10 × 1.5	GH7	75	24	7	5.5	8	M
VRTM1210020S	-	M12 × 1.0	GH7	82	29	8.5	6.5	9	S
VRTM1210020M	VRTM1210040M	M12 × 1.0	GH7	82	29	8.5	6.5	9	M
VRTM1212520S	-	M12 × 1.25	GH7	82	29	8.5	6.5	9	S
VRTM1212520M	VRTM1212540M	M12 × 1.25	GH7	82	29	8.5	6.5	9	M
VRTM1215020S	-	M12 × 1.5	GH7	82	29	8.5	6.5	9	S
VRTM1215020M	VRTM1215040M	M12 × 1.5	GH7	82	29	8.5	6.5	9	M
VRTM1217520S	-	M12 × 1.75	GH8	82	29	8.5	6.5	9	S
VRTM1217520M	VRTM1217540M	M12 × 1.75	GH8	82	29	8.5	6.5	9	M

2.0P Tap is removed external center as bottoming type

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
												◎	◎	◎		◎	◎		◎				

◎: Excellent ○: Good

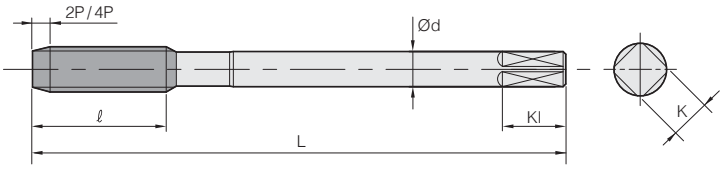
Thread **TAP**

VRCM

JIS roll taps

HSSE TiCN





Designation		Thread size	Limits	L	ℓ	d	K	KI	Oil groove
2P	4P								
VRCM0305020S	-	M3 × 0.5	GH5	46	11	4	3.2	6	S
VRCM0305020M	VRCM0305040M	M3 × 0.5	GH5	46	11	4	3.2	6	M
VRCM0407020S	-	M4 × 0.7	GH6	52	13	5	4	7	S
VRCM0407020M	VRCM0407040M	M4 × 0.7	GH6	52	13	5	4	7	M
VRCM0508020S	-	M5 × 0.8	GH6	60	16	5.5	4.5	7	S
VRCM0508020M	VRCM0508040M	M5 × 0.8	GH6	60	16	5.5	4.5	7	M
VRCM0610020S	-	M6 × 1.0	GH7	62	19	6	4.5	7	S
VRCM0610020M	VRCM0610040M	M6 × 1.0	GH7	62	19	6	4.5	7	M
VRCM0812520S	-	M8 × 1.25	GH7	70	22	6.2	5	8	S
VRCM0812520M	VRCM0812540M	M8 × 1.25	GH7	70	22	6.2	5	8	M
VRCM1012520S	-	M10 × 1.25	GH7	75	24	7	5.5	8	S
VRCM1012520M	VRCM1012540M	M10 × 1.25	GH7	75	24	7	5.5	8	M
VRCM1015020S	-	M10 × 1.50	GH7	75	24	7	5.5	8	S
VRCM1015020M	VRCM1015040M	M10 × 1.50	GH7	75	24	7	5.5	8	M
VRCM1210020S	-	M12 × 1.0	GH7	82	29	8.5	6.5	9	S
VRCM1210020M	VRCM1210040M	M12 × 1.0	GH7	82	29	8.5	6.5	9	M
VRCM1212520S	-	M12 × 1.25	GH7	82	29	8.5	6.5	9	S
VRCM1212520M	VRCM1212540M	M12 × 1.25	GH7	82	29	8.5	6.5	9	M
VRCM1215020S	-	M12 × 1.5	GH7	82	29	8.5	6.5	9	S
VRCM1215020M	VRCM1215040M	M12 × 1.5	GH7	82	29	8.5	6.5	9	M
VRCM1217520S	-	M12 × 1.75	GH8	82	29	8.5	6.5	9	S
VRCM1217520M	VRCM1217540M	M12 × 1.75	GH8	82	29	8.5	6.5	9	M

2.0P Tap is removed external center as bottoming type

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
												◎	◎	◎		◎	◎		◎				

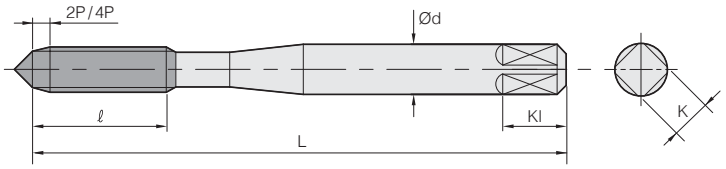
◎: Excellent ○: Good

VFOM

JIS spiral roll taps

HSSE | Un-coated





Designation		Thread size	Limits	L	ℓ	d	K	KI
2P	4P							
VFOM0305020	VFOM0305040	M3 × 0.5	GH6	46	18	4	3.2	6
VFOM03506020	VFOM03506040	M3.5 × 0.6	GH6	46	18	4	3.2	6
VFOM0407020	VFOM0407040	M4 × 0.7	GH7	52	20	5	4	7
VFOM0508020	VFOM0508040	M5 × 0.8	GH7	60	22	5.5	4.5	7
VFOM0610020	VFOM0610040	M6 × 1.0	GH7	62	24	6	4.5	7

2.0P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
												○	○	○		○	○		○				

◎: Excellent ○: Good

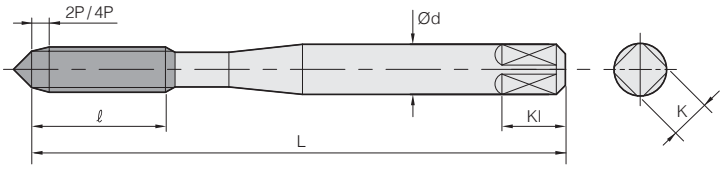
Thread **TAP**

VFTM

JIS spiral roll taps

HSSE TiN





Designation		Thread size	Limits	L	ℓ	d	K	KI
2P	4P							
VFTM0305020	VFTM0305040	M3 × 0.5	GH6	46	18	4	3.2	6
VFTM03506020	VFTM03506040	M3.5 × 0.6	GH6	46	18	4	3.2	6
VFTM0407020	VFTM0407040	M4 × 0.7	GH7	52	20	5	4	7
VFTM0508020	VFTM0508040	M5 × 0.8	GH7	60	22	5.5	4.5	7
VFTM0610020	VFTM0610040	M6 × 1.0	GH7	62	24	6	4.5	7

2.0P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
												○	○	○		○	○		○				

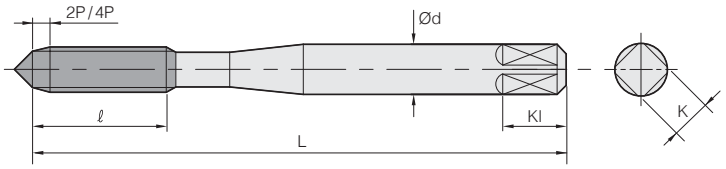
◎: Excellent ○: Good

VFCM

JIS spiral roll taps

HSSE TiCN





Designation		Thread size	Limits	L	ℓ	d	K	Kl
2P	4P							
VFCM0305020	VFCM0305040	M3 × 0.5	GH6	46	18	4	3.2	6
VFCM03506020	VFCM03506040	M3.5 × 0.6	GH6	46	18	4	3.2	6
VFCM0407020	VFCM0407040	M4 × 0.7	GH7	52	20	5	4	7
VFCM0508020	VFCM0508040	M5 × 0.8	GH7	60	22	5.5	4.5	7
VFCM0610020	VFCM0610040	M6 × 1.0	GH7	62	24	6	4.5	7

2.0P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

◎: Excellent ○: Good

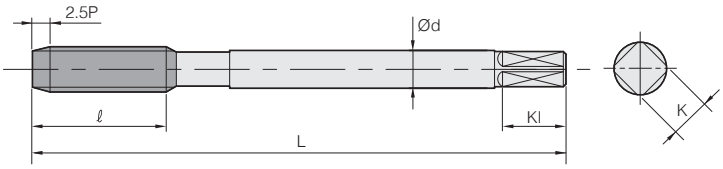
Thread **TAP**

VQOM

DIN spiral flute taps

DIN 371-376 374 | HSSE | 35° HELIX | Un-coated





Designation 2.5P	Thread size	Limits	L	ℓ	d	K	KI	Z	Din type
VQOM0305025	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VQOM0407025	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VQOM0508025	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VQOM0610025	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VQOM0810025	M8 × 1.0	6H	90	17	6	4.9	8	3	374
VQOM0812525	M8 × 1.25	6H	90	20	8	6.2	9	3	371
VQOM1010025	M10 × 1.0	6H	90	18	7	5.5	8	3	374
VQOM1012525	M10 × 1.25	6H	100	22	7	5.5	8	3	374
VQOM1015025	M10 × 1.5	6H	100	22	10	8	11	3	371
VQOM1210025	M12 × 1.0	6H	100	18	9	7	10	3	374
VQOM1212525	M12 × 1.25	6H	100	22	9	7	10	3	374
VQOM1215025	M12 × 1.5	6H	100	22	9	7	10	3	374
VQOM1217525	M12 × 1.75	6H	110	24	9	7	10	3	376
VQOM1415025	M14 × 1.5	6H	100	22	11	9	12	3	374
VQOM1420025	M14 × 2.0	6H	110	26	11	9	12	3	376
VQOM1615025	M16 × 1.5	6H	100	22	12	9	12	3	374
VQOM1620025	M16 × 2.0	6H	110	27	12	9	12	3	376
VQOM1815025	M18 × 1.5	6H	110	25	14	11	14	4	374
VQOM1825025	M18 × 2.5	6H	125	30	14	11	14	4	376
VQOM2015025	M20 × 1.5	6H	125	25	16	12	15	4	374
VQOM2025025	M20 × 2.5	6H	140	32	16	12	15	4	376
VQOM2215025	M22 × 1.5	6H	125	25	18	14.5	17	4	374
VQOM2225025	M22 × 2.5	6H	140	32	18	14.5	17	4	376
VQOM2415025	M24 × 1.5	6H	140	27	18	14.5	17	4	374
VQOM2420025	M24 × 2.0	6H	140	27	18	14.5	17	4	374
VQOM2430025	M24 × 3.0	6H	160	34	18	14.5	17	4	376

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	◎		◎								○	○	○	○	○	○	○	○	○				○

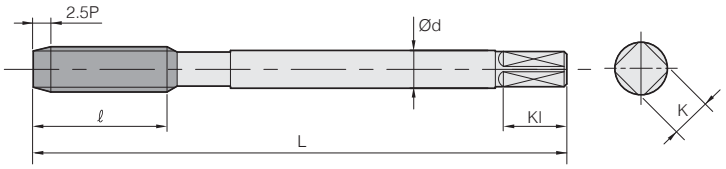
◎: Excellent ○: Good

VQTM

DIN spiral flute taps

DIN 371-376 374 | HSSE | 35° HELIX | TiN





Designation 2.5P	Thread size	Limits	L	ℓ	d	K	KI	Z	Din type
VQTM0305025	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VQTM0407025	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VQTM0508025	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VQTM0610025	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VQTM0810025	M8 × 1.0	6H	90	17	6	4.9	8	3	374
VQTM0812525	M8 × 1.25	6H	90	20	8	6.2	9	3	371
VQTM1010025	M10 × 1.0	6H	90	18	7	5.5	8	3	374
VQTM1012525	M10 × 1.25	6H	100	22	7	5.5	8	3	374
VQTM1015025	M10 × 1.5	6H	100	22	10	8	11	3	371
VQTM1210025	M12 × 1.0	6H	100	18	9	7	10	3	374
VQTM1212525	M12 × 1.25	6H	100	22	9	7	10	3	374
VQTM1215025	M12 × 1.5	6H	100	22	9	7	10	3	374
VQTM1217525	M12 × 1.75	6H	110	24	9	7	10	3	376
VQTM1415025	M14 × 1.5	6H	100	22	11	9	12	3	374
VQTM1420025	M14 × 2.0	6H	110	26	11	9	12	3	376
VQTM1615025	M16 × 1.5	6H	100	22	12	9	12	3	374
VQTM1620025	M16 × 2.0	6H	110	27	12	9	12	3	376
VQTM1815025	M18 × 1.5	6H	110	25	14	11	14	4	374
VQTM1825025	M18 × 2.5	6H	125	30	14	11	14	4	376
VQTM2015025	M20 × 1.5	6H	125	25	16	12	15	4	374
VQTM2025025	M20 × 2.5	6H	140	32	16	12	15	4	376
VQTM2215025	M22 × 1.5	6H	125	25	18	14.5	17	4	374
VQTM2225025	M22 × 2.5	6H	140	32	18	14.5	17	4	376
VQTM2415025	M24 × 1.5	6H	140	27	18	14.5	17	4	374
VQTM2420025	M24 × 2.0	6H	140	27	18	14.5	17	4	374
VQTM2430025	M24 × 3.0	6H	160	34	18	14.5	17	4	376

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	◎		◎								○	○	○	○	○	○	○	○	○				○

◎: Excellent ○: Good

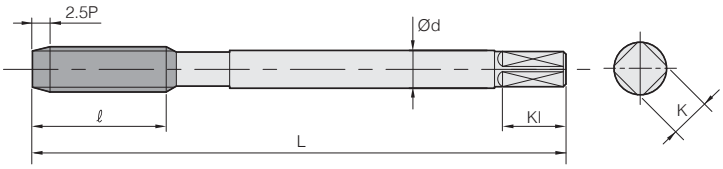
Thread **TAP**

VQCM

DIN spiral flute taps

DIN 371-376 374 | HSSE | 35° HELIX | TiCN





Designation 2.5P	Thread size	Limits	L	ℓ	d	K	KI	Z	Din type
VQCM0305025	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VQCM0407025	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VQCM0508025	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VQCM0610025	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VQCM0810025	M8 × 1.0	6H	90	17	6	4.9	8	3	374
VQCM0812525	M8 × 1.25	6H	90	20	8	6.2	9	3	371
VQCM1010025	M10 × 1.0	6H	90	18	7	5.5	8	3	374
VQCM1012525	M10 × 1.25	6H	100	22	7	5.5	8	3	374
VQCM1015025	M10 × 1.5	6H	100	22	10	8	11	3	371
VQCM1210025	M12 × 1.0	6H	100	18	9	7	10	3	374
VQCM1212525	M12 × 1.25	6H	100	22	9	7	10	3	374
VQCM1215025	M12 × 1.5	6H	100	22	9	7	10	3	374
VQCM1217525	M12 × 1.75	6H	110	24	9	7	10	3	376
VQCM1415025	M14 × 1.5	6H	100	22	11	9	12	3	374
VQCM1420025	M14 × 2.0	6H	110	26	11	9	12	3	376
VQCM1615025	M16 × 1.5	6H	100	22	12	9	12	3	374
VQCM1620025	M16 × 2.0	6H	110	27	12	9	12	3	376
VQCM1815025	M18 × 1.5	6H	110	25	14	11	14	4	374
VQCM1825025	M18 × 2.5	6H	125	30	14	11	14	4	376
VQCM2015025	M20 × 1.5	6H	125	25	16	12	15	4	374
VQCM2025025	M20 × 2.5	6H	140	32	16	12	15	4	376
VQCM2215025	M22 × 1.5	6H	125	25	18	14.5	17	4	374
VQCM2225025	M22 × 2.5	6H	140	32	18	14.5	17	4	376
VQCM2415025	M24 × 1.5	6H	140	27	18	14.5	17	4	374
VQCM2420025	M24 × 2.0	6H	140	27	18	14.5	17	4	374
VQCM2430025	M24 × 3.0	6H	160	34	18	14.5	17	4	376

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	◎		◎								○	○	○	○	○	○	○	○	○				○

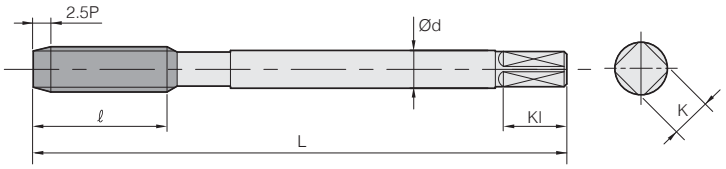
◎: Excellent ○: Good

VQHM

DIN spiral flute taps

DIN 371-376 374 | HSSE | 35° HELIX | HOMO





Designation 2.5P	Thread size	Limits	L	ℓ	d	K	KI	Z	Din type
VQHM0305025	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VQHM0407025	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VQHM0508025	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VQHM0610025	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VQHM0810025	M8 × 1.0	6H	90	17	6	4.9	8	3	374
VQHM0812525	M8 × 1.25	6H	90	20	8	6.2	9	3	371
VQHM1010025	M10 × 1.0	6H	90	18	7	5.5	8	3	374
VQHM1012525	M10 × 1.25	6H	100	22	7	5.5	8	3	374
VQHM1015025	M10 × 1.5	6H	100	22	10	8	11	3	371
VQHM1210025	M12 × 1.0	6H	100	18	9	7	10	3	374
VQHM1212525	M12 × 1.25	6H	100	22	9	7	10	3	374
VQHM1215025	M12 × 1.5	6H	100	22	9	7	10	3	374
VQHM1217525	M12 × 1.75	6H	110	24	9	7	10	3	376
VQHM1415025	M14 × 1.5	6H	100	22	11	9	12	3	374
VQHM1420025	M14 × 2.0	6H	110	26	11	9	12	3	376
VQHM1615025	M16 × 1.5	6H	100	22	12	9	12	3	374
VQHM1620025	M16 × 2.0	6H	110	27	12	9	12	3	376
VQHM1815025	M18 × 1.5	6H	110	25	14	11	14	4	374
VQHM1825025	M18 × 2.5	6H	125	30	14	11	14	4	376
VQHM2015025	M20 × 1.5	6H	125	25	16	12	15	4	374
VQHM2025025	M20 × 2.5	6H	140	32	16	12	15	4	376
VQHM2215025	M22 × 1.5	6H	125	25	18	14.5	17	4	374
VQHM2225025	M22 × 2.5	6H	140	32	18	14.5	17	4	376
VQHM2415025	M24 × 1.5	6H	140	27	18	14.5	17	4	374
VQHM2420025	M24 × 2.0	6H	140	27	18	14.5	17	4	374
VQHM2430025	M24 × 3.0	6H	160	34	18	14.5	17	4	376

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	◎		◎								○	○	○	○	○	○	○	○	○				○

◎: Excellent ○: Good

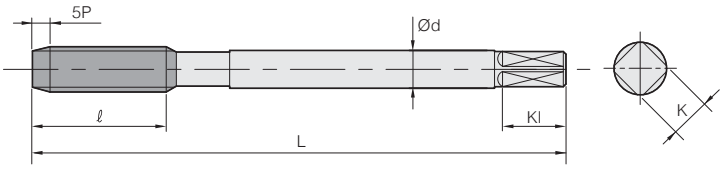
Thread **TAP**

VDOM

DIN point flute taps

DIN 371-376 374 | HSSE | Un-coated





Designation 5P	Thread size	Limits	L	ℓ	d	K	KI	Z	Din type
VDOM0305050	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VDOM0407050	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VDOM0508050	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VDOM0610050	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VDOM0810050	M8 × 1.0	6H	90	17	6	4.9	8	3	374
VDOM0812550	M8 × 1.25	6H	90	20	8	6.2	9	3	371
VDOM1010050	M10 × 1.0	6H	90	18	7	5.5	8	3	374
VDOM1012550	M10 × 1.25	6H	100	22	7	5.5	8	3	374
VDOM1015050	M10 × 1.5	6H	100	22	10	8	11	3	371
VDOM1210050	M12 × 1.0	6H	100	18	9	7	10	3	374
VDOM1212550	M12 × 1.25	6H	100	22	9	7	10	3	374
VDOM1215050	M12 × 1.5	6H	100	22	9	7	10	3	374
VDOM1217550	M12 × 1.75	6H	110	24	9	7	10	3	376
VDOM1415050	M14 × 1.5	6H	100	22	11	9	12	3	374
VDOM1420050	M14 × 2.0	6H	110	26	11	9	12	3	376
VDOM1615050	M16 × 1.5	6H	100	22	12	9	12	3	374
VDOM1620050	M16 × 2.0	6H	110	27	12	9	12	3	376
VDOM1815050	M18 × 1.5	6H	110	25	14	11	14	3	374
VDOM1825050	M18 × 2.5	6H	125	30	14	11	14	3	376
VDOM2015050	M20 × 1.5	6H	125	25	16	12	15	3	374
VDOM2025050	M20 × 2.5	6H	140	32	16	12	15	3	376
VDOM2215050	M22 × 1.5	6H	125	25	18	14.5	17	3	374
VDOM2225050	M22 × 2.5	6H	140	32	18	14.5	17	3	376
VDOM2415050	M24 × 1.5	6H	140	27	18	14.5	17	3	374
VDOM2420050	M24 × 2.0	6H	140	27	18	14.5	17	3	374
VDOM2430050	M24 × 3.0	6H	160	34	18	14.5	17	3	376

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	○	○	◎							○	○	○	○	○	○	◎	○	○	○				○

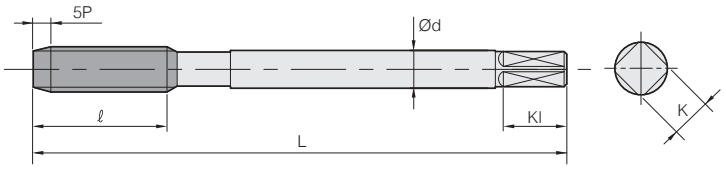
◎: Excellent ○: Good

VDTM

DIN point flute taps

DIN 371-376 374 | HSSE | TiN





Designation 5P	Thread size	Limits	L	ℓ	d	K	Kl	Z	Din type
VDTM0305050	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VDTM0407050	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VDTM0508050	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VDTM0610050	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VDTM0810050	M8 × 1.0	6H	90	17	6	4.9	8	3	374
VDTM0812550	M8 × 1.25	6H	90	20	8	6.2	9	3	371
VDTM1010050	M10 × 1.0	6H	90	18	7	5.5	8	3	374
VDTM1012550	M10 × 1.25	6H	100	22	7	5.5	8	3	374
VDTM1015050	M10 × 1.5	6H	100	22	10	8	11	3	371
VDTM1210050	M12 × 1.0	6H	100	18	9	7	10	3	374
VDTM1212550	M12 × 1.25	6H	100	22	9	7	10	3	374
VDTM1215050	M12 × 1.5	6H	100	22	9	7	10	3	374
VDTM1217550	M12 × 1.75	6H	110	24	9	7	10	3	376
VDTM1415050	M14 × 1.5	6H	100	22	11	9	12	3	374
VDTM1420050	M14 × 2.0	6H	110	26	11	9	12	3	376
VDTM1615050	M16 × 1.5	6H	100	22	12	9	12	3	374
VDTM1620050	M16 × 2.0	6H	110	27	12	9	12	3	376
VDTM1815050	M18 × 1.5	6H	110	25	14	11	14	3	374
VDTM1825050	M18 × 2.5	6H	125	30	14	11	14	3	376
VDTM2015050	M20 × 1.5	6H	125	25	16	12	15	3	374
VDTM2025050	M20 × 2.5	6H	140	32	16	12	15	3	376
VDTM2215050	M22 × 1.5	6H	125	25	18	14.5	17	3	374
VDTM2225050	M22 × 2.5	6H	140	32	18	14.5	17	3	376
VDTM2415050	M24 × 1.5	6H	140	27	18	14.5	17	3	374
VDTM2420050	M24 × 2.0	6H	140	27	18	14.5	17	3	374
VDTM2430050	M24 × 3.0	6H	160	34	18	14.5	17	3	376

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	○	○	◎							○	○	○	○	○	○	◎	○	○	○				○

◎: Excellent ○: Good

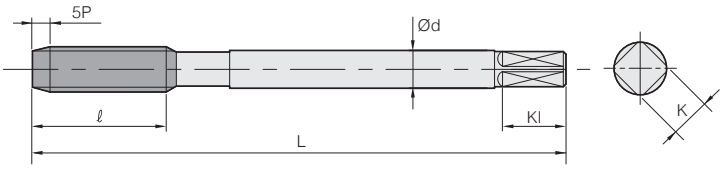
Thread **TAP**

VDCM

DIN point flute taps

DIN 371-376 374 | HSSE | TiCN





Designation 5P	Thread size	Limits	L	ℓ	d	K	KI	Z	Din type
VDCM0305050	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VDCM0407050	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VDCM0508050	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VDCM0610050	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VDCM0810050	M8 × 1.0	6H	90	17	6	4.9	8	3	374
VDCM0812550	M8 × 1.25	6H	90	20	8	6.2	9	3	371
VDCM1010050	M10 × 1.0	6H	90	18	7	5.5	8	3	374
VDCM1012550	M10 × 1.25	6H	100	22	7	5.5	8	3	374
VDCM1015050	M10 × 1.5	6H	100	22	10	8	11	3	371
VDCM1210050	M12 × 1.0	6H	100	18	9	7	10	3	374
VDCM1212550	M12 × 1.25	6H	100	22	9	7	10	3	374
VDCM1215050	M12 × 1.5	6H	100	22	9	7	10	3	374
VDCM1217550	M12 × 1.75	6H	110	24	9	7	10	3	376
VDCM1415050	M14 × 1.5	6H	100	22	11	9	12	3	374
VDCM1420050	M14 × 2.0	6H	110	26	11	9	12	3	376
VDCM1615050	M16 × 1.5	6H	100	22	12	9	12	3	374
VDCM1620050	M16 × 2.0	6H	110	27	12	9	12	3	376
VDCM1815050	M18 × 1.5	6H	110	25	14	11	14	3	374
VDCM1825050	M18 × 2.5	6H	125	30	14	11	14	3	376
VDCM2015050	M20 × 1.5	6H	125	25	16	12	15	3	374
VDCM2025050	M20 × 2.5	6H	140	32	16	12	15	3	376
VDCM2215050	M22 × 1.5	6H	125	25	18	14.5	17	3	374
VDCM2225050	M22 × 2.5	6H	140	32	18	14.5	17	3	376
VDCM2415050	M24 × 1.5	6H	140	27	18	14.5	17	3	374
VDCM2420050	M24 × 2.0	6H	140	27	18	14.5	17	3	374
VDCM2430050	M24 × 3.0	6H	160	34	18	14.5	17	3	376

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	○	○	◎							○	○	○	○	○	○	◎	○	○	○				○

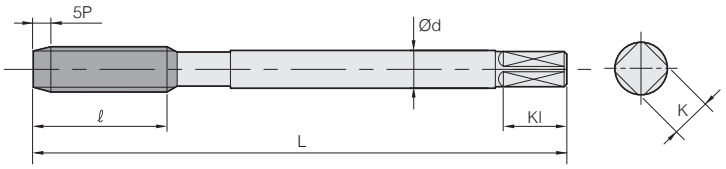
◎: Excellent ○: Good

VDHM

DIN point flute taps

DIN 371-376 374 | HSSE | HOMO





Designation 5P	Thread size	Limits	L	ℓ	d	K	Kl	Z	Din type
VDHM0305050	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VDHM0407050	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VDHM0508050	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VDHM0610050	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VDHM0810050	M8 × 1.0	6H	90	17	6	4.9	8	3	374
VDHM0812550	M8 × 1.25	6H	90	20	8	6.2	9	3	371
VDHM1010050	M10 × 1.0	6H	90	18	7	5.5	8	3	374
VDHM1012550	M10 × 1.25	6H	100	22	7	5.5	8	3	374
VDHM1015050	M10 × 1.5	6H	100	22	10	8	11	3	371
VDHM1210050	M12 × 1.0	6H	100	18	9	7	10	3	374
VDHM1212550	M12 × 1.25	6H	100	22	9	7	10	3	374
VDHM1215050	M12 × 1.5	6H	100	22	9	7	10	3	374
VDHM1217550	M12 × 1.75	6H	110	24	9	7	10	3	376
VDHM1415050	M14 × 1.5	6H	100	22	11	9	12	3	374
VDHM1420050	M14 × 2.0	6H	110	26	11	9	12	3	376
VDHM1615050	M16 × 1.5	6H	100	22	12	9	12	3	374
VDHM1620050	M16 × 2.0	6H	110	27	12	9	12	3	376
VDHM1815050	M18 × 1.5	6H	110	25	14	11	14	3	374
VDHM1825050	M18 × 2.5	6H	125	30	14	11	14	3	376
VDHM2015050	M20 × 1.5	6H	125	25	16	12	15	3	374
VDHM2025050	M20 × 2.5	6H	140	32	16	12	15	3	376
VDHM2215050	M22 × 1.5	6H	125	25	18	14.5	17	3	374
VDHM2225050	M22 × 2.5	6H	140	32	18	14.5	17	3	376
VDHM2415050	M24 × 1.5	6H	140	27	18	14.5	17	3	374
VDHM2420050	M24 × 2.0	6H	140	27	18	14.5	17	3	374
VDHM2430050	M24 × 3.0	6H	160	34	18	14.5	17	3	376

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
	○	○	◎							○	○	○	○	○	○	◎	○	○	○				○

◎: Excellent ○: Good

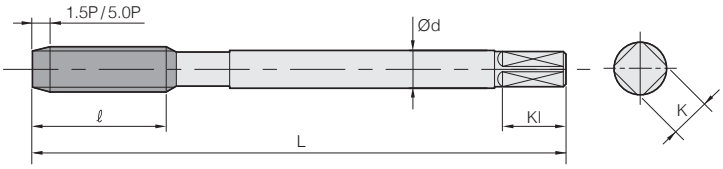
Thread **TAP**

VGOM

DIN straight flute taps

DIN 371-376 374 | HSSE | Un-coated





Designation		Thread size	Limits	L	ℓ	d	K	KI	Z	Din type
1.5P	5P									
VGOM0305015	VGOM0305050	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VGOM0407015	VGOM0407050	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VGOM0508015	VGOM0508050	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VGOM0610015	VGOM0610050	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VGOM0810015	VGOM0810050	M8 × 1.0	6H	90	17	6	4.9	8	4	374
VGOM0812515	VGOM0812550	M8 × 1.25	6H	90	20	8	6.2	9	4	371
VGOM1010015	VGOM1010050	M10 × 1.0	6H	90	18	7	5.5	8	4	374
VGOM1012515	VGOM1012550	M10 × 1.25	6H	100	22	7	5.5	8	4	374
VGOM1015015	VGOM1015050	M10 × 1.5	6H	100	22	10	8	11	4	371
VGOM1210015	VGOM1210050	M12 × 1.0	6H	100	18	9	7	10	4	374
VGOM1212515	VGOM1212550	M12 × 1.25	6H	100	22	9	7	10	4	374
VGOM1215015	VGOM1215050	M12 × 1.5	6H	100	22	9	7	10	4	374
VGOM1217515	VGOM1217550	M12 × 1.75	6H	110	24	9	7	10	4	376
VGOM1415015	VGOM1415050	M14 × 1.5	6H	100	22	11	9	12	4	374
VGOM1420015	VGOM1420050	M14 × 2.0	6H	110	26	11	9	12	4	376
VGOM1615015	VGOM1615050	M16 × 1.5	6H	100	22	12	9	12	4	374
VGOM1620015	VGOM1620050	M16 × 2.0	6H	110	27	12	9	12	4	376
VGOM1815015	VGOM1815050	M18 × 1.5	6H	110	25	14	11	14	4	374
VGOM1825015	VGOM1825050	M18 × 2.5	6H	125	30	14	11	14	4	376
VGOM2015015	VGOM2015050	M20 × 1.5	6H	125	25	16	12	15	4	374
VGOM2025015	VGOM2025050	M20 × 2.5	6H	140	32	16	12	15	4	376
VGOM2215015	VGOM2215050	M22 × 1.5	6H	125	25	18	14.5	17	4	374
VGOM2225015	VGOM2225050	M22 × 2.5	6H	140	32	18	14.5	17	4	376
VGOM2415015	VGOM2415050	M24 × 1.5	6H	140	27	18	14.5	17	4	374
VGOM2420015	VGOM2420050	M24 × 2.0	6H	140	27	18	14.5	17	4	374
VGOM2430015	VGOM2430050	M24 × 3.0	6H	160	34	18	14.5	17	4	376

1.5P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
○	○	○	○	○									○	○	○		○	○	○				

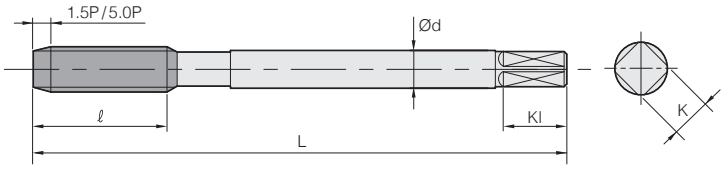
◎: Excellent ○: Good

VGTM

DIN straight flute taps

DIN 371-376 374 | HSSE | TiN





Designation		Thread size	Limits	L	ℓ	d	K	KI	Z	Din type
1.5P	5P									
VGTM0305015	VGTM0305050	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VGTM0407015	VGTM0407050	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VGTM0508015	VGTM0508050	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VGTM0610015	VGTM0610050	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VGTM0810015	VGTM0810050	M8 × 1.0	6H	90	17	6	4.9	8	4	374
VGTM0812515	VGTM0812550	M8 × 1.25	6H	90	20	8	6.2	9	4	371
VGTM1010015	VGTM1010050	M10 × 1.0	6H	90	18	7	5.5	8	4	374
VGTM1012515	VGTM1012550	M10 × 1.25	6H	100	22	7	5.5	8	4	374
VGTM1015015	VGTM1015050	M10 × 1.5	6H	100	22	10	8	11	4	371
VGTM1210015	VGTM1210050	M12 × 1.0	6H	100	18	9	7	10	4	374
VGTM1212515	VGTM1212550	M12 × 1.25	6H	100	22	9	7	10	4	374
VGTM1215015	VGTM1215050	M12 × 1.5	6H	100	22	9	7	10	4	374
VGTM1217515	VGTM1217550	M12 × 1.75	6H	110	24	9	7	10	4	376
VGTM1415015	VGTM1415050	M14 × 1.5	6H	100	22	11	9	12	4	374
VGTM1420015	VGTM1420050	M14 × 2.0	6H	110	26	11	9	12	4	376
VGTM1615015	VGTM1615050	M16 × 1.5	6H	100	22	12	9	12	4	374
VGTM1620015	VGTM1620050	M16 × 2.0	6H	110	27	12	9	12	4	376
VGTM1815015	VGTM1815050	M18 × 1.5	6H	110	25	14	11	14	4	374
VGTM1825015	VGTM1825050	M18 × 2.5	6H	125	30	14	11	14	4	376
VGTM2015015	VGTM2015050	M20 × 1.5	6H	125	25	16	12	15	4	374
VGTM2025015	VGTM2025050	M20 × 2.5	6H	140	32	16	12	15	4	376
VGTM2215015	VGTM2215050	M22 × 1.5	6H	125	25	18	14.5	17	4	374
VGTM2225015	VGTM2225050	M22 × 2.5	6H	140	32	18	14.5	17	4	376
VGTM2415015	VGTM2415050	M24 × 1.5	6H	140	27	18	14.5	17	4	374
VGTM2420015	VGTM2420050	M24 × 2.0	6H	140	27	18	14.5	17	4	374
VGTM2430015	VGTM2430050	M24 × 3.0	6H	160	34	18	14.5	17	4	376

1.5P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
○	○	○	○	○									○	○	○		○	○	○				

◎: Excellent ○: Good

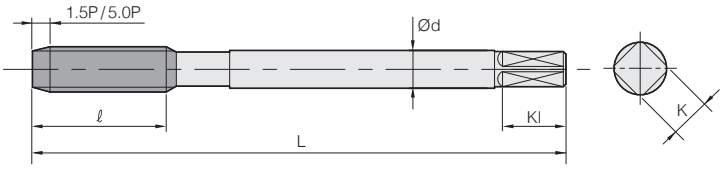
Thread **TAP**

VGCM

DIN straight flute taps

DIN 371-376 374 | HSSE | TiCN





Designation		Thread size	Limits	L	ℓ	d	K	KI	Z	Din type
1.5P	5P									
VGCM0305015	VGCM0305050	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VGCM0407015	VGCM0407050	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VGCM0508015	VGCM0508050	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VGCM0610015	VGCM0610050	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VGCM0810015	VGCM0810050	M8 × 1.0	6H	90	17	6	4.9	8	4	374
VGCM0812515	VGCM0812550	M8 × 1.25	6H	90	20	8	6.2	9	4	371
VGCM1010015	VGCM1010050	M10 × 1.0	6H	90	18	7	5.5	8	4	374
VGCM1012515	VGCM1012550	M10 × 1.25	6H	100	22	7	5.5	8	4	374
VGCM1015015	VGCM1015050	M10 × 1.5	6H	100	22	10	8	11	4	371
VGCM1210015	VGCM1210050	M12 × 1.0	6H	100	18	9	7	10	4	374
VGCM1212515	VGCM1212550	M12 × 1.25	6H	100	22	9	7	10	4	374
VGCM1215015	VGCM1215050	M12 × 1.5	6H	100	22	9	7	10	4	374
VGCM1217515	VGCM1217550	M12 × 1.75	6H	110	24	9	7	10	4	376
VGCM1415015	VGCM1415050	M14 × 1.5	6H	100	22	11	9	12	4	374
VGCM1420015	VGCM1420050	M14 × 2.0	6H	110	26	11	9	12	4	376
VGCM1615015	VGCM1615050	M16 × 1.5	6H	100	22	12	9	12	4	374
VGCM1620015	VGCM1620050	M16 × 2.0	6H	110	27	12	9	12	4	376
VGCM1815015	VGCM1815050	M18 × 1.5	6H	110	25	14	11	14	4	374
VGCM1825015	VGCM1825050	M18 × 2.5	6H	125	30	14	11	14	4	376
VGCM2015015	VGCM2015050	M20 × 1.5	6H	125	25	16	12	15	4	374
VGCM2025015	VGCM2025050	M20 × 2.5	6H	140	32	16	12	15	4	376
VGCM2215015	VGCM2215050	M22 × 1.5	6H	125	25	18	14.5	17	4	374
VGCM2225015	VGCM2225050	M22 × 2.5	6H	140	32	18	14.5	17	4	376
VGCM2415015	VGCM2415050	M24 × 1.5	6H	140	27	18	14.5	17	4	374
VGCM2420015	VGCM2420050	M24 × 2.0	6H	140	27	18	14.5	17	4	374
VGCM2430015	VGCM2430050	M24 × 3.0	6H	160	34	18	14.5	17	4	376

1.5P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
○	○	○	○	○									○	○	○		○	○	○				

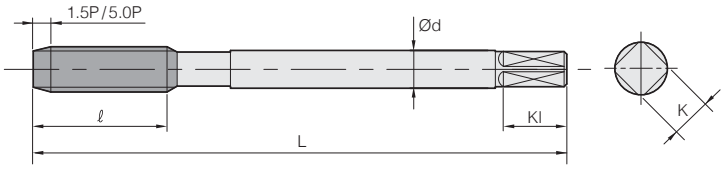
◎: Excellent ○: Good

VGHM

DIN straight flute taps

DIN 371-376 374 | HSSE | HOMO





Designation		Thread size	Limits	L	ℓ	d	K	Kl	Z	Din type
1.5P	5P									
VGHM0305015	VGHM0305050	M3 × 0.5	6H	56	11	3.5	2.7	6	3	371
VGHM0407015	VGHM0407050	M4 × 0.7	6H	63	13	4.5	3.4	6	3	371
VGHM0508015	VGHM0508050	M5 × 0.8	6H	70	15	6	4.9	8	3	371
VGHM0610015	VGHM0610050	M6 × 1.0	6H	80	17	6	4.9	8	3	371
VGHM0810015	VGHM0810050	M8 × 1.0	6H	90	17	6	4.9	8	4	374
VGHM0812515	VGHM0812550	M8 × 1.25	6H	90	20	8	6.2	9	4	371
VGHM1010015	VGHM1010050	M10 × 1.0	6H	90	18	7	5.5	8	4	374
VGHM1012515	VGHM1012550	M10 × 1.25	6H	100	22	7	5.5	8	4	374
VGHM1015015	VGHM1015050	M10 × 1.5	6H	100	22	10	8	11	4	371
VGHM1210015	VGHM1210050	M12 × 1.0	6H	100	18	9	7	10	4	374
VGHM1212515	VGHM1212550	M12 × 1.25	6H	100	22	9	7	10	4	374
VGHM1215015	VGHM1215050	M12 × 1.5	6H	100	22	9	7	10	4	374
VGHM1217515	VGHM1217550	M12 × 1.75	6H	110	24	9	7	10	4	376
VGHM1415015	VGHM1415050	M14 × 1.5	6H	100	22	11	9	12	4	374
VGHM1420015	VGHM1420050	M14 × 2.0	6H	110	26	11	9	12	4	376
VGHM1615015	VGHM1615050	M16 × 1.5	6H	100	22	12	9	12	4	374
VGHM1620015	VGHM1620050	M16 × 2.0	6H	110	27	12	9	12	4	376
VGHM1815015	VGHM1815050	M18 × 1.5	6H	110	25	14	11	14	4	374
VGHM1825015	VGHM1825050	M18 × 2.5	6H	125	30	14	11	14	4	376
VGHM2015015	VGHM2015050	M20 × 1.5	6H	125	25	16	12	15	4	374
VGHM2025015	VGHM2025050	M20 × 2.5	6H	140	32	16	12	15	4	376
VGHM2215015	VGHM2215050	M22 × 1.5	6H	125	25	18	14.5	17	4	374
VGHM2225015	VGHM2225050	M22 × 2.5	6H	140	32	18	14.5	17	4	376
VGHM2415015	VGHM2415050	M24 × 1.5	6H	140	27	18	14.5	17	4	374
VGHM2420015	VGHM2420050	M24 × 2.0	6H	140	27	18	14.5	17	4	374
VGHM2430015	VGHM2430050	M24 × 3.0	6H	160	34	18	14.5	17	4	376

1.5P Tap is removed external center as bottoming type

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
○	○	○	○	○									○	○	○		○	○	○				

◎: Excellent ○: Good

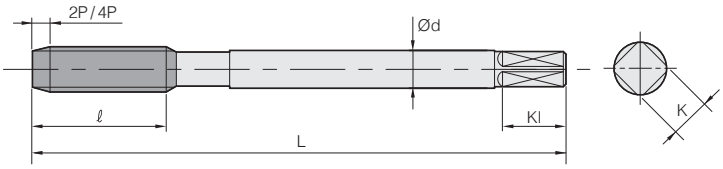
Thread **TAP**

VMOM

DIN roll taps

DIN 371-376 374 | HSSE | Un-coated





Designation		Thread size	Limits	L	ℓ	d	K	KI	Oil groove
2P	4P								
VMOM0305020S	-	M3 × 0.5	6HX	56	11	3.5	2.7	6	S
VMOM0305020M	VMOM0305040M	M3 × 0.5	6HX	56	11	3.5	2.7	6	M
VMOM0407020S	-	M4 × 0.7	6HX	63	13	4.5	3.4	6	S
VMOM0407020M	VMOM0407040M	M4 × 0.7	6HX	63	13	4.5	3.4	6	M
VMOM0508020S	-	M5 × 0.8	6HX	70	15	6	4.9	8	S
VMOM0508020M	VMOM0508040M	M5 × 0.8	6HX	70	15	6	4.9	8	M
VMOM0610020S	-	M6 × 1.0	6HX	80	17	6	4.9	8	S
VMOM0610020M	VMOM0610040M	M6 × 1.0	6HX	80	17	6	4.9	8	M
VMOM0810020S	-	M8 × 1.0	6HX	90	17	6	4.9	8	S
VMOM0810020M	VMOM0810040M	M8 × 1.0	6HX	90	17	6	4.9	8	M
VMOM0812520S	-	M8 × 1.25	6HX	90	20	8	6.2	9	S
VMOM0812520M	VMOM0812540M	M8 × 1.25	6HX	90	20	8	6.2	9	M
VMOM1010020S	-	M10 × 1.0	6HX	90	18	7	5.5	8	S
VMOM1010020M	VMOM1010040M	M10 × 1.0	6HX	90	18	7	5.5	8	M
VMOM1012520S	-	M10 × 1.25	6HX	100	22	7	5.5	8	S
VMOM1012520M	VMOM1012540M	M10 × 1.25	6HX	100	22	7	5.5	8	M
VMOM1015020S	-	M10 × 1.5	6HX	100	22	10	8	11	S
VMOM1015020M	VMOM1015040M	M10 × 1.5	6HX	100	22	10	8	11	M
VMOM1210020S	-	M12 × 1.0	6HX	100	18	9	7	10	S
-	VMOM1210040M	M12 × 1.0	6HX	100	18	9	7	10	M
VMOM1212520S	-	M12 × 1.25	6HX	100	22	9	7	10	S
VMOM1212520M	VMOM1212540M	M12 × 1.25	6HX	100	22	9	7	10	M
VMOM1215020S	-	M12 × 1.5	6HX	100	22	9	7	10	S
VMOM1215020M	VMOM1215040M	M12 × 1.5	6HX	100	22	9	7	10	M
VMOM1217520S	-	M12 × 1.75	6HX	110	24	9	7	10	S
VMOM1217520M	VMOM1217540M	M12 × 1.75	6HX	100	24	9	7	10	M

2.0P Tap is removed external center as bottoming type

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
												◎	◎	◎		◎	◎		◎				

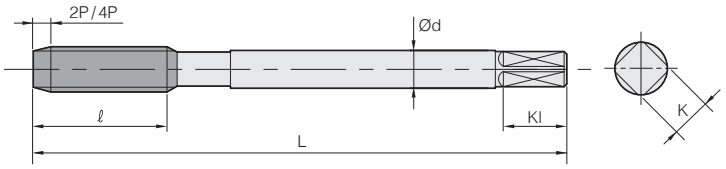
◎: Excellent ○: Good

VMTM

DIN roll taps

DIN 371-376 374 | HSSE | TiN





Designation		Thread size	Limits	L	ℓ	d	K	KI	Oil groove
2P	4P								
VMTM0305020S	-	M3 × 0.5	6HX	56	11	3.5	2.7	6	S
VMTM0305020M	VMTM0305040M	M3 × 0.5	6HX	56	11	3.5	2.7	6	M
VMTM0407020S	-	M4 × 0.7	6HX	63	13	4.5	3.4	6	S
VMTM0407020M	VMTM0407040M	M4 × 0.7	6HX	63	13	4.5	3.4	6	M
VMTM0508020S	-	M5 × 0.8	6HX	70	15	6	4.9	8	S
VMTM0508020M	VMTM0508040M	M5 × 0.8	6HX	70	15	6	4.9	8	M
VMTM0610020S	-	M6 × 1.0	6HX	80	17	6	4.9	8	S
VMTM0610020M	VMTM0610040M	M6 × 1.0	6HX	80	17	6	4.9	8	M
VMTM0810020S	-	M8 × 1.0	6HX	90	17	8	6.2	9	S
VMTM0810020M	VMTM0810040M	M8 × 1.0	6HX	90	17	8	6.2	9	M
VMTM0812520S	-	M8 × 1.25	6HX	90	20	8	6.2	9	S
VMTM0812520M	VMTM0812540M	M8 × 1.25	6HX	90	20	8	6.2	9	M
VMTM1010020S	-	M10 × 1.0	6HX	90	18	10	8	11	S
VMTM1010020M	VMTM1010040M	M10 × 1.0	6HX	90	18	10	8	11	M
VMTM1012520S	-	M10 × 1.25	6HX	100	22	10	8	11	S
VMTM1012520M	VMTM1012540M	M10 × 1.25	6HX	100	22	10	8	11	M
VMTM1015020S	-	M10 × 1.5	6HX	100	22	10	8	11	S
VMTM1015020M	VMTM1015040M	M10 × 1.5	6HX	100	22	10	8	11	M
VMTM1210020S	-	M12 × 1.0	6HX	100	18	9	7	10	S
-	VMTM1210040M	M12 × 1.0	6HX	100	18	9	7	10	M
VMTM1212520S	-	M12 × 1.25	6HX	100	22	9	7	10	S
VMTM1212520M	VMTM1212540M	M12 × 1.25	6HX	100	22	9	7	10	M
VMTM1215020S	-	M12 × 1.5	6HX	100	22	9	7	10	S
VMTM1215020M	VMTM1215040M	M12 × 1.5	6HX	100	22	9	7	10	M
VMTM1217520S	-	M12 × 1.75	6HX	110	24	9	7	10	S
VMTM1217520M	VMTM1217540M	M12 × 1.75	6HX	110	24	9	7	10	M

2.0P Tap is removed external center as bottoming type

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermosetting plastic	Thermoplastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
												◎	◎	◎		◎	◎		◎				

◎: Excellent ○: Good

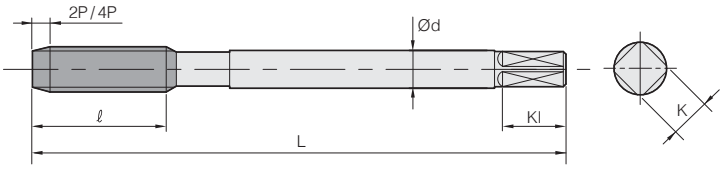
Thread **TAP**

VMCM

DIN roll taps

DIN 371-376 374 | HSSE | TiCN





Designation		Thread size	Limits	L	ℓ	d	K	KI	Oil groove
2P	4P								
VMCM0305020S	-	M3 × 0.5	6HX	56	11	3.5	2.7	6	S
VMCM0305020M	VMCM0305040M	M3 × 0.5	6HX	56	11	3.5	2.7	6	M
VMCM0407020S	-	M4 × 0.7	6HX	63	13	4.5	3.4	6	S
VMCM0407020M	VMCM0407040M	M4 × 0.7	6HX	63	13	4.5	3.4	6	M
VMCM0508020S	-	M5 × 0.8	6HX	70	15	6	4.9	8	S
VMCM0508020M	VMCM0508040M	M5 × 0.8	6HX	70	15	6	4.9	8	M
VMCM0610020S	-	M6 × 1.0	6HX	80	17	6	4.9	8	S
VMCM0610020M	VMCM0610040M	M6 × 1.0	6HX	80	17	6	4.9	8	M
VMCM0810020S	-	M8 × 1.0	6HX	90	17	8	6.2	9	S
VMCM0810020M	VMCM0810040M	M8 × 1.0	6HX	90	17	8	6.2	9	M
VMCM0812520S	-	M8 × 1.25	6HX	90	20	8	6.2	9	S
VMCM0812520M	VMCM0812540M	M8 × 1.25	6HX	90	20	8	6.2	9	M
VMCM1010020S	-	M10 × 1.0	6HX	90	18	10	8	11	S
VMCM1010020M	VMCM1010040M	M10 × 1.0	6HX	90	18	10	8	11	M
VMCM1012520S	-	M10 × 1.25	6HX	100	22	10	8	11	S
VMCM1012520M	VMCM1012540M	M10 × 1.25	6HX	100	22	10	8	11	M
VMCM1015020S	-	M10 × 1.5	6HX	100	22	10	8	11	S
VMCM1015020M	VMCM1015040M	M10 × 1.5	6HX	100	22	10	8	11	M
VMCM1210020S	-	M12 × 1.0	6HX	100	18	9	7	10	S
-	VMCM1210040M	M12 × 1.0	6HX	100	18	9	7	10	M
VMCM1212520S	-	M12 × 1.25	6HX	100	22	9	7	10	S
VMCM1212520M	VMCM1212540M	M12 × 1.25	6HX	100	22	9	7	10	M
VMCM1215020S	-	M12 × 1.5	6HX	100	22	9	7	10	S
VMCM1215020M	VMCM1215040M	M12 × 1.5	6HX	100	22	9	7	10	M
VMCM1217520S	-	M12 × 1.75	6HX	110	24	9	7	10	S
VMCM1217520M	VMCM1217540M	M12 × 1.75	6HX	110	24	9	7	10	M

2.0P Tap is removed external center as bottoming type

Oil groove S: 1 oil groove
Oil groove M: 4 oil groove

• Applicable Workpiece

Low carbon steels	Medium carbon steels	High carbon steels	Alloy steel	Hardened steels			Stainless steels	Tool steels	Cast steels	Cast iron	High strength steels	Copper	Brass	Casting brass	Bronze	Aluminum rolled material	Aluminum alloy castings	Magnesium alloy castings	Zinc alloy castings	Titanium alloys	Nickel alloy	Thermoset-ting plastic	Thermo-plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HrC	45~55 HrC	50~60 HrC	STS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
												◎	◎	◎		◎	◎		◎				

◎: Excellent ○: Good

Recommended Cutting Conditions


Endmill


Drill


Reamer


Chamfer


Thread

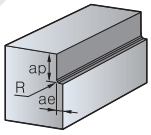


Super Endmill For HRSA

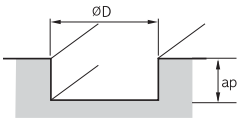
SFES4000 (Flat), SRES4000 (Radius)

Workpiece / Conditions / Diameter (Ø)	Ni based heat resistant super alloy (Inconel718, 625)			
	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
3	3,800	220	2,500	125
4	3,000	240	1,900	135
5	2,450	245	1,500	145
6	2,100	250	1,250	145
8	1,600	225	945	155
10	1,250	215	760	145
12	1,050	210	630	145
16	765	210	475	110
20	635	200	380	110

Application tip



■ **Shouldering depth**
- ap: ≤ 1.5D
- ae: ≤ 0.05D



■ **Slotting depth**
- ap: ≤ 0.2D

※ Notice

- Please adjust the recommended cutting conditions properly, according to the condition of your machines, the target shapes, and your purpose for machining.
- Please set the machine with high rigidity and check the workpiece clamping.
- Please select proper coolant for workpiece materials and check the pressure and amount of coolant enough for machining.
- In case of chattering, reduce RPM and feed rate by the same ratio.

Super Endmill For Ti/STS

SFET4000 (Flat), SRET4000 (Radius)

Workpiece				Brinell hardness (HB)	Specific cutting force (N/mm²)	ap (mm)	ae (mm)	Machining	Diameter (mm)	3	4	5	6	8	10	12	16	20
ISO	Workpiece materials	ISO (DIN)	AISI						Cutting length (mm)	8	10	15	15	20	25	30	42	48
P	Carbon steel	(C22) C40 C45	1020 1039 1045	230	400 ~ 600	1.5D	0.1D	Shouldering	vc	100	108	114	114	114	114	114	114	114
									fz	0.020	0.030	0.040	0.050	0.065	0.070	0.080	0.085	0.100
									rpm	10610	8594	7257	6048	4536	3629	3024	2268	1814
									feed	849	1031	1161	1210	1179	1016	968	771	726
						0.5D	1D	Slotting	vc	64	65	68	70	70	70	70	70	70
									fz	0.016	0.022	0.030	0.038	0.046	0.050	0.056	0.060	0.070
									rpm	6791	5173	4329	3714	2785	2228	1857	1393	1114
									feed	435	455	519	564	512	446	416	334	312
	Alloy steel	20NiCrMo2 - - 42CrMo4	8615 4320 4130 4140	280	800 ~ 1000	1.5D	0.1D	Shouldering	vc	141	138	151	151	151	151	151	151	151
									fz	0.021	0.032	0.049	0.069	0.067	0.075	0.078	0.095	0.090
									rpm	15000	11000	9600	8000	6000	4800	4000	3000	2400
									feed	1250	1400	1900	2200	1600	1440	1250	1140	860
						0.5D	1D	Slotting	vc	65	70	71	70	70	69	72	70	69
									fz	0.015	0.022	0.035	0.050	0.060	0.060	0.070	0.070	0.080
									rpm	6900	5600	4500	3700	2800	2200	1900	1400	1100
									feed	410	490	630	740	670	530	530	390	350
M	Ferritic/ martensitic series	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	405 430 416 434 403 410	240	450 540 450	1.5D	0.1D	Shouldering	vc	100	108	114	114	114	114	114	114	114
									fz	0.020	0.030	0.040	0.050	0.065	0.070	0.080	0.085	0.100
									rpm	10610	8594	7257	6048	4536	3629	3024	2268	1814
									feed	849	1031	1161	1210	1179	1016	968	771	726
						0.5D	1D	Slotting	vc	64	65	68	70	70	70	70	70	70
									fz	0.016	0.022	0.030	0.038	0.046	0.050	0.056	0.060	0.070
									rpm	6791	5173	4329	3714	2785	2228	1857	1393	1114
									feed	435	455	519	564	512	446	416	334	312
	Austenite series	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	303 304 316	200	520	1.5D	0.1D	Shouldering	vc	72	76	78	80	80	80	80	80	80
									fz	0.020	0.030	0.040	0.050	0.065	0.070	0.080	0.085	0.100
									rpm	7639	6048	4966	4244	3183	2546	2122	1592	1273
									feed	611	726	795	849	828	713	679	541	509
						0.5D	1D	Slotting	vc	45	46	48	50	50	50	50	50	50
									fz	0.016	0.022	0.030	0.038	0.046	0.050	0.056	0.060	0.070
									rpm	4775	3660	3056	2653	1990	1592	1326	955	796
									feed	306	322	367	403	366	318	297	229	223
S	Ti/ Ti Alloy	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	600 ~ 1800	1.5D	0.1D	Shouldering	vc	70	74	75	76	78	78	78	78	78
									fz	0.018	0.027	0.035	0.043	0.054	0.064	0.073	0.080	0.092
									rpm	7427	5889	4775	4032	3104	2483	2069	1552	1241
									feed	535	636	668	693	670	636	604	497	457
						0.5D	1D	Slotting	vc	40	41	43	45	45	45	45	45	45
									fz	0.014	0.020	0.027	0.034	0.040	0.045	0.050	0.054	0.063
									rpm	4244	3263	2737	2387	1790	1432	1194	895	716
									feed	238	261	296	327	286	258	239	193	180

Super Endmill for Ti/STS

SBET2000 (Ball)

Workpiece				Brinell hardness (HB)	Specific cutting force (N/mm²)	ap (mm)	ae (mm)	Machining	Diameter (mm)	1	2	3	4	5	6	8	10	12
ISO	Workpiece materials	ISO (DIN)	AISI						Cutting length (mm)	1	2	3	8	12	12	16	20	25
P	Carbon steel	(C22) C40 C45	1020 1039 1045	230	400 ~ 600	≤0.1D	≤0.1D	Copying	vc	130	130	123	200	200	200	200	200	200
									fz	0.039	0.056	0.080	0.044	0.051	0.050	0.059	0.070	0.085
									rpm	41600	20800	13000	16000	12700	10600	8000	6400	5300
	Alloy steel	20NiCrMo2 - - 42CrMo4	8615 4320 4130 4140	280	800 ~ 1000	≤0.1D	≤0.1D		feed	1625	1170	1040	1400	1300	1050	950	900	900
M	Ferritic/ martensitic series	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	405 430 416 434 403 410	240	450 540 450	≤0.1D	≤0.1D	Copying	vc	120	120	113	180	180	180	180	180	180
									fz	0.039	0.056	0.080	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	38400	19200	12000	14400	11520	9600	7200	5760	4800
						≤0.1D	≤0.1D		feed	3000	2160	1920	1008	897	845	835	783	778
	Austenite series	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	303 304 316	200	520	≤0.1D	≤0.1D	Copying	vc	100	100	94	150	150	150	150	150	150
									fz	0.039	0.056	0.080	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	32000	16000	10000	12000	9600	8000	6000	4800	4000
									feed	2500	1800	1600	850	750	700	700	650	650
S	Ti/ Ti Alloy	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	600 ~ 1800	≤0.1D	≤0.1D	Copying	vc	100	100	94	150	150	150	150	150	150
									fz	0.039	0.056	0.080	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	32000	16000	10000	12000	9600	8000	6000	4800	4000
									feed	2500	1800	1600	850	750	700	700	650	650

SBET4000 (Ball)

Workpiece				Brinell hardness (HB)	Specific cutting force (N/mm²)	ap (mm)	ae (mm)	Machining	Diameter (mm)	4	5	6	8	10	12
ISO	Workpiece materials	ISO (DIN)	AISI						Cutting length (mm)	8	12	12	16	20	25
P	Carbon steel	(C22) C40 C45	1020 1039 1045	230	400 ~ 600	≤0.1D	≤0.1D	Copying	vc	200	200	200	200	200	200
									fz	0.044	0.051	0.050	0.059	0.070	0.085
									rpm	16000	12700	10600	8000	6400	5300
	Alloy steel	20NiCrMo2 - - 42CrMo4	8615 4320 4130 4140	280	800 ~ 1000	≤0.1D	≤0.1D		feed	2800	2600	2100	1900	1800	1800
M	Ferritic/ martensitic series	X6CrAl13 X6Cr17 X12CrS13 X6CrMo17-1 (X6Cr13) X12Cr13	405 430 416 434 403 410	240	450 540 450	≤0.1D	≤0.1D	Copying	vc	180	180	180	180	180	180
									fz	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	14400	11520	9600	7200	5760	4800
						≤0.1D	≤0.1D		feed	2040	1800	1680	1680	1560	1560
	Austenite series	X10CrNiS18-9 X5CrNi18-9 X5CrNiMo17-12-2	303 304 316	200	520	≤0.1D	≤0.1D	Copying	vc	150	150	150	150	150	150
									fz	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	12000	9600	8000	6000	4800	4000
									feed	1700	1500	1400	1400	1300	1300
S	Ti/ Ti Alloy	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	Ti6Al4V Ti5Al5V5Mo Ti7Al4Mo	320	600 ~ 1800	≤0.1D	≤0.1D	Copying	vc	150	150	150	150	150	150
									fz	0.035	0.039	0.044	0.058	0.068	0.081
									rpm	12000	9600	8000	6000	4800	4000
									feed	1700	1500	1400	1400	1300	1300

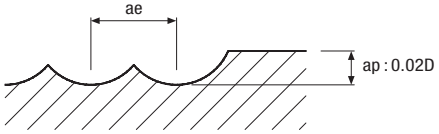
H-Star Endmill

ESB702, ESB712 series

Workpiece	Hardened steels Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
~0.2	50,000	1,200	50,000	1,050	45,000	960	40,000	770	35,000	674	31,500	570
0.3	50,000	1,500	50,000	1,350	45,000	1,200	40,000	765	35,000	840	31,500	700
0.4	50,000	1,900	50,000	1,700	45,000	1,500	40,000	1,200	35,000	1,050	31,500	1,100
0.5	50,000	2,400	50,000	2,100	45,000	1,900	40,000	1,500	35,000	1,300	31,500	1,100
0.6	50,000	2,900	50,000	2,500	45,000	2,200	40,000	1,800	35,000	1,600	31,500	1,400
0.8	50,000	3,900	50,000	3,300	45,000	3,000	40,000	2,400	35,000	1,600	31,500	1,800
1	50,000	4,800	50,000	4,200	45,000	3,800	40,000	3,000	35,000	2,600	35,000	2,300
1.5	50,000	5,400	48,000	4,500	43,000	4,000	23,000	3,100	33,000	2,700	29,700	2,300
2	49,700	5,700	47,800	4,800	40,000	4,000	35,000	3,150	32,000	2,800	28,500	2,300
3	33,100	6,000	31,800	5,300	26,500	4,000	23,500	3,150	21,000	28,00	19,000	2,300
4	24,900	6,000	23,900	5,300	20,000	4,000	17,500	3,150	16,000	2,800	14,500	2,300
5	18.6	5,800	17,800	4,900	15,000	3,750	13,500	3,050	11,500	2,550	10,500	2,100
6	13,900	4,850	13,400	4,100	11,000	3,100	10,000	2,500	8,800	2,150	8,000	1,750
8	11,100	4,200	10,700	3,500	9,000	2,700	8,000	2,150	7,000	1,850	6,500	1,550
10	9,300	3,700	8,900	3,100	7,500	2,400	6,600	1,900	5,800	1,650	5,300	1,380
12	6,950	2,950	6,680	2,500	5,600	1,900	5,000	1,550	4,400	1,250	4,000	1,050

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm

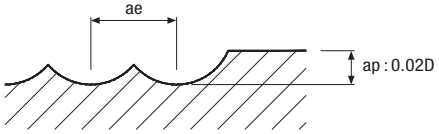


ESB703 series

Workpiece	Hardened steels											
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
D × R(mm)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
2.5	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
3	38,000	7,500	36,600	6,600	30,500	5,000	27,000	3,900	24,200	3,500	21,900	2,900
4	28,500	7,500	27,500	6,600	23,000	5,000	20,100	3,900	18,400	3,500	16,700	2,900
5	21,500	7,300	20,500	6,100	17,300	4,700	15,500	3,800	13,200	3,200	12,100	2,600
6	16,000	6,100	15,400	5,100	12,700	3,900	11,500	3,100	10,100	2,700	9,200	2,200
8	12,700	5,300	12,300	4,400	10,400	3,400	9,200	2,700	8,100	2,300	7,500	1,900
10	10,700	4,600	10,200	3,900	8,600	3,000	7,600	2,400	6,700	2,100	6,100	1,700
12	8,000	3,700	7,700	3,100	6,400	2,400	5,800	1,900	5,100	1,600	4,600	1,300

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



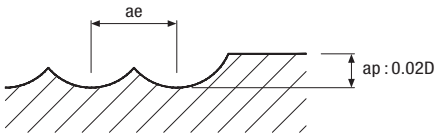
H-Star Endmill

ESB734 series

Workpiece	Hardened steels											
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
2.5	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
3	41,400	9,000	39,800	8,000	33,100	6,000	29,400	4,700	26,300	4,200	23,800	3,500
4	31,100	9,000	29,900	8,000	25,000	6,000	21,900	4,700	20,000	4,200	18,100	3,500
5	23,300	8,700	22,300	7,400	18,800	5,600	16,900	4,600	14,400	3,800	13,100	3,200
6	17,400	7,300	16,800	6,200	13,800	4,700	12,500	3,800	11,000	3,200	10,000	2,600
8	13,900	6,300	13,400	5,300	11,300	4,100	10,000	3,200	8,800	2,800	8,100	2,300
10	11,600	5,600	11,100	4,700	9,400	3,600	8,300	2,900	7,300	2,500	6,600	2,100

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm

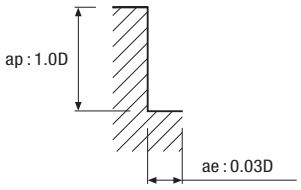


ESE702 series

Side cutting

Workpiece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4	16,700	1,250	13,200	1,000	8,800	625	7,200	385	5,600	240	4,750	170
5	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

Application tip

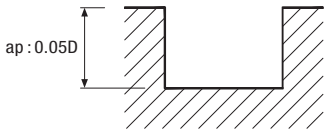


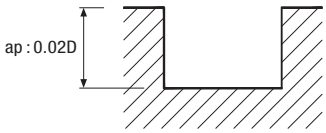
ESE702 series

Slotting

Workpiece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
~0.2	50,000	130	45,000	115	40,000	95	33,000	60	33,000	45	26,400	30
0.3	50,000	190	45,000	140	40,000	115	33,000	70	25,000	50	20,000	35
0.4	50,000	235	45,000	180	40,000	140	33,000	90	25,000	55	20,000	40
0.5	50,000	370	45,000	280	40,000	220	33,000	140	25,000	85	20,000	60
0.6	50,000	470	45,000	360	40,000	285	33,000	160	25,000	105	20,000	75
0.8	50,000	600	40,000	440	30,000	295	25,000	185	19,000	110	15,200	80
0.9	49,000	655	39,000	520	27,800	330	22,700	205	17,500	125	14,000	90
1	48,000	750	38,000	570	25,500	360	20,500	215	16,000	135	12,500	85
2	33,300	850	26,000	680	17,500	420	14,500	260	11,000	160	9,500	115
3	21,800	850	17,300	680	11,500	420	9,500	260	7,500	160	6,400	115
4	16,700	880	13,200	700	8,800	440	7,200	270	5,600	170	4,750	118
5	15,700	1,000	12,500	805	8,300	500	6,400	285	5,100	180	4,450	132
6	13,100	950	10,350	770	6,900	480	5,300	280	4,200	180	3,700	130
8	9,880	930	7,800	720	5,200	445	4,000	255	3,200	165	2,800	120
10	7,800	850	6,150	680	4,100	415	3,200	240	2,550	155	2,200	122
12	6,650	850	5,250	680	3,500	415	2,650	240	2,100	155	1,860	112
16	4,900	730	3,900	580	2,600	365	2,000	210	1,600	135	1,400	95
20	3,900	660	3,100	525	2,050	335	1,600	195	1,300	125	1,100	85

Application tip



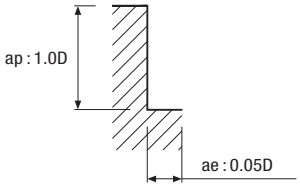


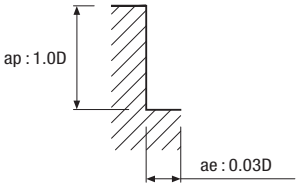
ESE704, ESE714, ESE744 series

Side cutting

Workpiece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

Application tip





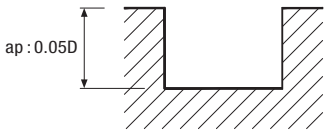
H-Star Endmill

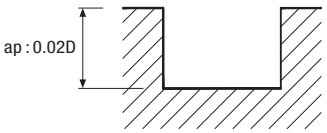
ESE712 series

Slotting

Workpiece	Hardened steel Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
0.2	50,000	130	45,000	115	40,000	95	33,000	60	33,000	45	26,400	30
0.3	50,000	190	45,000	140	40,000	115	33,000	70	25,000	50	20,000	35
0.4	50,000	235	45,000	180	40,000	140	33,000	90	25,000	55	20,000	40
0.5	50,000	370	45,000	280	40,000	220	33,000	140	25,000	85	20,000	60
0.6	50,000	470	45,000	360	40,000	285	30,000	160	25,000	105	20,000	75
0.8	50,000	600	40,000	440	30,000	295	25,000	185	19,000	110	15,200	80
0.9	49,000	655	39,000	520	27,800	330	22,700	205	17,500	125	14,000	90
1	48,000	750	38,000	570	25,500	360	20,500	215	16,000	135	12,500	85
2	33,300	850	26,000	680	17,500	420	14,500	260	11,000	160	9,500	115
3	21,800	850	17,300	680	11,500	420	9,500	260	7,500	160	6,400	115
4	16,700	880	13,200	700	8,800	440	7,200	270	5,600	170	4,750	118
5	15,700	1,000	12,500	805	8,300	500	6,400	285	5,100	180	4,450	132
6	13,100	950	10,350	770	6,900	480	5,300	280	4,200	180	3,700	130
8	9,880	930	7,800	720	5,200	445	4,000	255	3,200	165	2,800	120
10	7,800	850	6,150	680	4,100	415	3,200	240	2,550	155	2,200	112
12	6,650	850	5,250	680	3,500	415	2,650	240	2,100	155	1,860	112
16	4,900	730	3,900	580	2,600	365	2,000	210	1,600	135	1,400	95
20	3,900	660	3,100	525	2,050	335	1,600	195	1,300	125	1,100	85

Application tip



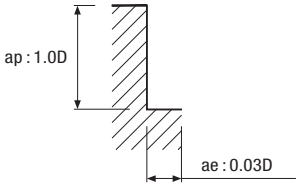


ESE712 series

Side cutting

Workpiece	Hardened steels Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4	16,700	1,250	13,200	1,000	8,800	625	7,200	385	5,600	240	4,750	170
5	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

Application tip

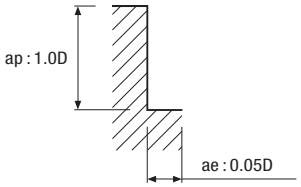


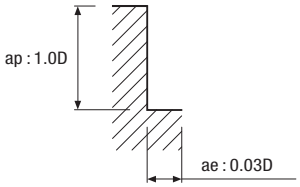
ESE716 series

Side cutting

Workpiece	Hardened steels Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

Application tip



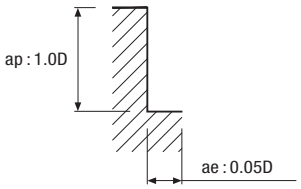


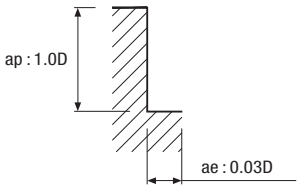
ESE724 series

Side cutting

Workpiece	Hardened steels Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

Application tip



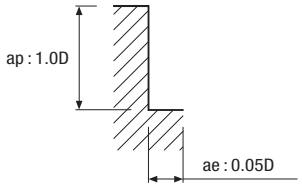


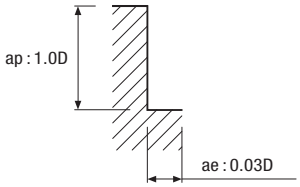
H-Star Endmill

ESE726, ESR736 series

Workpiece	Hardened steels Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

Application tip



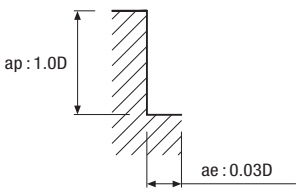


ESR702 series

Side cutting

Workpiece	Hardened steels Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2	33,300	960	26,000	776	17,500	480	14,500	296	11,000	184	9,500	132
3	21,800	960	17,300	776	11,500	480	9,500	296	7,500	184	6,400	132
4	16,700	1,000	13,200	800	8,800	500	7,200	308	5,600	192	4,750	136
5	15,700	1,160	12,500	920	8,300	568	6,400	328	5,100	208	4,450	152
6	13,100	1,080	10,350	880	6,900	552	5,300	320	4,200	204	3,700	148
8	9,880	1,056	7,800	824	5,200	508	4,000	292	3,200	188	2,800	136
10	7,800	960	6,150	776	4,100	472	3,200	272	2,550	176	2,200	128
12	6,650	960	5,250	776	3,500	472	2,650	272	2,100	176	1,860	128
16	4,900	840	3,900	672	2,600	416	2,000	240	1,600	152	1,400	112
20	3,900	760	3,100	600	2,050	380	1,600	220	1,300	140	1,100	100

Application tip

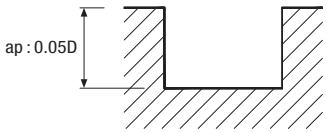


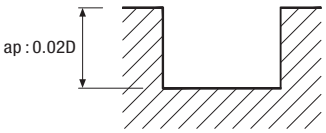
ESR702, ESR732 series

Slotting

Workpiece	Hardened steels Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2	33,300	680	26,000	544	17,500	336	14,500	208	11,000	128	9,500	92
3	21,800	680	17,300	544	11,500	336	9,500	208	7,500	128	6,400	92
4	16,700	704	13,200	560	8,800	352	7,200	216	5,600	136	4,750	94
5	15,700	800	12,500	644	8,300	400	6,400	228	5,100	144	4,450	106
6	13,100	760	10,350	616	6,900	384	5,300	224	4,200	144	3,700	104
8	9,880	744	7,800	576	5,200	356	4,000	204	3,200	132	2,800	96
10	7,800	680	6,150	544	4,100	332	3,200	192	2,550	124	2,200	90
12	6,650	680	5,250	544	3,500	332	2,650	192	2,100	124	1,860	90
16	4,900	584	3,900	464	2,600	292	2,000	168	1,600	108	1,400	78
20	3,900	528	3,100	420	2,050	268	1,600	168	1,300	100	1,100	70

Application tip



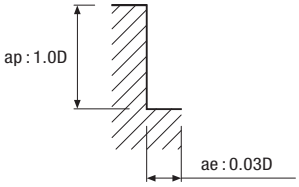


ESR724, ESR714, ESR734, ESR704 series

Side cutting

Workpiece	Hardened steels Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
3	21,800	1,400	17,300	1,000	11,500	672	9,500	416	7,500	256	6,400	184
4	16,700	1,440	13,200	1,040	8,800	704	7,200	432	5,600	268	4,750	192
5	15,700	1,600	12,500	1,200	8,300	800	6,400	464	5,100	296	4,450	216
6	13,100	1,560	10,350	1,120	6,900	760	5,300	448	4,200	280	3,700	208
8	9,880	1,504	7,800	1,080	5,200	720	4,000	416	3,200	264	2,800	192
10	7,800	1,400	6,150	1,008	4,100	672	3,200	384	2,550	248	2,200	176
12	6,650	1,400	5,250	1,008	3,500	672	2,650	384	2,100	240	1,860	176
16	4,900	1,200	3,900	880	2,600	584	2,000	336	1,600	216	1,400	160
20	3,900	1,040	3,100	776	2,050	520	1,600	304	1,300	200	1,100	144

Application tip

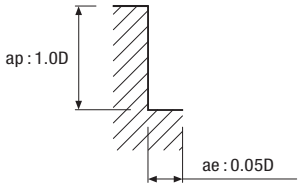


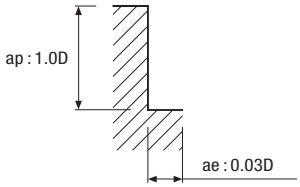
H-Star Endmill

ESR706 series

Workpiece	Hardened steels Heat resistant alloy		Hardened steels									
Conditions	HRC30~40		HRC40~50		HRC50~55		HRC55~60		HRC60~65		HRC65~70	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

Application tip





ESRB712

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.1	**0.3**	50,000	240	0.009	50,000	215	0.007	50,000	190	0.005
0.1	**0.5**	50,000	240	0.006	50,000	215	0.005	50,000	190	0.004
0.1	**1**	45,000	195	0.002	45,000	175	0.002	45,000	155	0.001
0.2	**0.5**	50,000	335	0.018	50,000	310	0.014	43,200	260	0.010
0.2	**1**	50,000	335	0.013	50,000	310	0.010	43,200	260	0.007
0.2	**1.5**	45,000	270	0.007	45,000	250	0.006	38,880	210	0.004
0.2	**2**	45,000	270	0.005	45,000	250	0.004	38,880	210	0.003
0.2	3	45,000	270	0.003	45,000	250	0.003	38,880	210	0.002
0.3	1	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
0.3	1.5	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
0.3	2	45,000	385	0.011	45,000	350	0.008	38,520	295	0.006
0.3	2.5	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
0.3	3	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
0.3	4	40,000	305	0.004	40,000	275	0.003	34,240	235	0.002
0.3	5	30,000	200	0.003	30,000	180	0.002	25,680	155	0.002
0.4	1	41,000	490	0.036	38,800	425	0.028	34,200	340	0.020
0.4	1.5	41,000	490	0.025	38,800	425	0.020	34,200	340	0.014
0.4	2	41,000	490	0.025	38,800	425	0.020	34,200	340	0.014
0.4	2.5	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
0.4	3	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
0.4	4	36,900	395	0.009	34,920	345	0.007	30,780	275	0.005
0.4	5	32,800	315	0.009	31,040	270	0.007	27,360	220	0.005
0.4	6	32,800	315	0.005	31,040	270	0.004	27,360	220	0.003
0.4	8	24,600	205	0.004	23,280	180	0.003	20,520	145	0.002
0.4	10	12,300	90	0.004	11,640	75	0.003	10,260	60	0.002
0.5	1	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
0.5	1.5	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
0.5	2	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
0.5	2.5	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
0.5	3	30,780	555	0.018	29,070	470	0.014	25,650	415	0.010
0.5	4	30,780	555	0.018	29,070	470	0.014	25,650	415	0.010
0.5	5	30,780	555	0.011	29,070	470	0.009	25,650	415	0.006
0.5	6	27,360	440	0.011	25,840	370	0.009	22,800	330	0.006
0.5	8	20,520	290	0.007	19,380	245	0.005	17,100	215	0.004
0.5	10	20,520	290	0.005	19,380	245	0.004	17,100	215	0.003
0.5	12	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
0.5	14	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
0.5	16	3,420	35	0.005	3,230	30	0.004	2,850	25	0.003
0.6	1	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
0.6	2	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
0.6	3	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
0.6	4	30,780	830	0.022	29,070	680	0.017	25,650	555	0.012
0.6	5	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008
0.6	6	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008

H-Star Endmill

ESRB712

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.6	8	27,360	655	0.008	25,840	540	0.006	22,800	440	0.005
0.6	10	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
0.6	12	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
0.6	14	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
0.6	16	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
0.7	2	34,200	1,130	0.063	32,300	930	0.049	28,500	765	0.035
0.7	4	30,780	915	0.025	29,070	755	0.020	25,650	620	0.014
0.7	6	30,780	915	0.016	29,070	755	0.012	25,650	620	0.009
0.7	8	27,360	725	0.016	25,840	595	0.012	22,800	490	0.009
0.7	10	27,360	725	0.009	25,840	595	0.007	22,800	490	0.005
0.7	12	20,520	475	0.006	19,380	390	0.005	17,100	320	0.004
0.8	2	34,200	1,230	0.072	32,300	1,035	0.056	28,500	855	0.040
0.8	3	34,200	1,230	0.050	32,300	1,035	0.039	28,500	855	0.028
0.8	4	34,200	1,230	0.050	32,300	1,035	0.039	28,500	855	0.028
0.8	5	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
0.8	6	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
0.8	8	30,780	995	0.018	29,070	840	0.014	25,650	695	0.010
0.8	10	27,360	785	0.018	25,840	660	0.014	22,800	545	0.010
0.8	12	27,360	785	0.011	25,840	660	0.008	22,800	545	0.006
0.8	14	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
0.8	16	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
0.8	20	10,260	220	0.007	9,690	185	0.006	8,550	155	0.004
0.9	4	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
0.9	6	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
0.9	8	29,250	1,120	0.020	27,630	935	0.016	24,390	775	0.011
0.9	10	26,000	885	0.020	24,560	740	0.016	21,680	610	0.011
1.0	2	30,800	1,540	0.090	29,100	1,310	0.070	25,700	1,075	0.050
1.0	3	30,800	1,540	0.090	29,100	1,310	0.070	25,700	1,075	0.050
1.0	4	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
1.0	5	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
1.0	6	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
1.0	7	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
1.0	8	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
1.0	10	27,720	1,245	0.023	26,190	1,060	0.018	23,130	870	0.013
1.0	12	24,640	985	0.023	23,280	840	0.018	20,560	690	0.013
1.0	14	24,640	985	0.014	23,280	840	0.011	20,560	690	0.008
1.0	16	18,480	645	0.014	17,460	550	0.011	15,420	450	0.008
1.0	18	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
1.0	20	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
1.0	22	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
1.0	26	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
1.0	30	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
1.0	40	3,080	75	0.009	2,910	65	0.007	2,570	55	0.005
1.0	50	3,080	75	0.006	2,910	65	0.005	2,570	55	0.003

ESRB712

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
1.2	4	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
1.2	6	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
1.2	8	23,670	1,115	0.043	22,320	930	0.034	19,710	770	0.024
1.2	10	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
1.2	12	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
1.2	16	21,040	880	0.016	19,840	735	0.013	17,520	610	0.009
1.2	20	15,780	580	0.011	14,880	485	0.008	13,140	400	0.006
1.2	26	7,890	245	0.011	7,440	205	0.008	6,570	170	0.006
1.4	6	21,500	1,295	0.088	20,300	1,100	0.069	18,000	935	0.049
1.4	8	19,350	1,050	0.050	18,270	890	0.039	16,200	755	0.028
1.4	10	19,350	1,050	0.050	18,270	890	0.039	16,200	755	0.028
1.4	16	17,200	830	0.032	16,240	705	0.025	14,400	600	0.018
1.5	4	23,900	1,580	0.135	22,600	1,355	0.105	20,000	1,075	0.075
1.5	5	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
1.5	6	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
1.5	7	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
1.5	8	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
1.5	10	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
1.5	12	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
1.5	14	21,510	1,280	0.034	20,340	1,100	0.026	18,000	870	0.019
1.5	16	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
1.5	18	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
1.5	20	19,120	1,010	0.020	18,080	865	0.016	16,000	690	0.011
1.5	22	19,120	1,010	0.020	18,080	865	0.016	16,000	690	0.011
1.5	26	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
1.5	30	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
1.5	35	7,170	285	0.010	6,780	245	0.008	6,000	195	0.005
1.5	40	7,170	285	0.010	6,780	245	0.008	6,000	195	0.005
1.6	4	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
1.6	6	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
1.6	8	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
1.6	10	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
1.6	12	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
1.6	16	19,980	1,260	0.036	18,900	1,055	0.028	16,650	900	0.020
1.6	20	17,760	995	0.036	16,800	830	0.028	14,800	710	0.020
1.8	4	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
1.8	6	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
1.8	8	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
1.8	10	19,980	1,440	0.065	18,900	1,190	0.050	16,650	990	0.036
1.8	12	19,980	1,440	0.065	18,900	1,190	0.050	16,650	990	0.036
1.8	16	19,980	1,440	0.041	18,900	1,190	0.032	16,650	990	0.023
1.8	20	17,760	1,140	0.041	16,800	940	0.032	14,800	785	0.023
2.0	6	18,000	1,795	0.180	17,000	1,525	0.140	15,000	1,285	0.100
2.0	8	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.070

H-Star Endmill

ESRB712

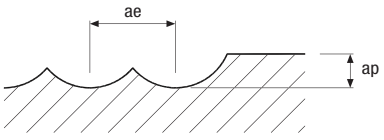
Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
2.0	10	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.070
2.0	12	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
2.0	14	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
2.0	16	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
2.0	18	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
2.0	20	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
2.0	22	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
2.0	26	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
2.0	30	14,400	1,150	0.027	13,600	975	0.021	12,000	820	0.015
2.0	35	10,800	755	0.018	10,200	640	0.014	9,000	540	0.010
2.0	40	10,800	755	0.018	10,200	640	0.014	9,000	540	0.010
2.0	45	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.0	50	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.0	60	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.5	8	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
2.5	10	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
2.5	12	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
2.5	16	14,220	1,560	0.090	13,410	1,300	0.070	11,880	1,055	0.050
2.5	20	14,220	1,560	0.090	13,410	1,300	0.070	11,880	1,055	0.050
2.5	22	14,220	1,560	0.056	13,410	1,300	0.044	11,880	1,055	0.031
2.5	26	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
2.5	30	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
2.5	35	12,640	1,230	0.034	11,920	1,025	0.026	10,560	835	0.019
2.5	40	9,480	810	0.034	8,940	675	0.026	7,920	550	0.019
2.5	45	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
2.5	50	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
3.0	6	13,700	2,050	0.270	12,900	1,730	0.210	11,400	1,435	0.150
3.0	8	13,700	2,050	0.270	12,900	1,730	0.210	11,400	1,435	0.150
3.0	10	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
3.0	12	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
3.0	14	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
3.0	16	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
3.0	18	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
3.0	20	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
3.0	22	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.06
3.0	26	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
3.0	30	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
3.0	35	10,960	1,310	0.068	10,320	1,105	0.053	9,120	920	0.038
3.0	40	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023
3.0	45	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023
3.0	50	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
3.0	60	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
4.0	8	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200
4.0	10	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200

ESRB712

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
4.0	12	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200
4.0	14	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	16	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	18	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	20	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	22	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
4.0	26	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
4.0	30	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
4.0	35	8,820	1,590	0.090	8,370	1,355	0.070	7,380	1,130	0.050
4.0	40	8,820	1,590	0.090	8,370	1,355	0.070	7,380	1,130	0.050
4.0	45	7,840	1,260	0.090	7,440	1,070	0.070	6,560	895	0.050
4.0	50	7,840	1,260	0.090	7,440	1,070	0.070	6,560	895	0.050
4.0	60	7,840	1,260	0.054	7,440	1,070	0.042	6,560	895	0.030
5.0	15	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
5.0	20	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
5.0	26	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	30	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	35	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	40	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	50	6,930	1,495	0.113	6,570	1,180	0.088	5,760	1,040	0.063
5.0	60	6,160	1,180	0.113	5,840	930	0.088	5,120	820	0.063
6.0	20	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.210
6.0	30	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.210
8.0	25	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.280
8.0	30	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.280
10.0	30	3,850	1,650	0.900	3,680	1,400	0.700	3,200	1,200	0.500
10.0	40	3,850	1,650	0.630	3,680	1,400	0.490	3,200	1,200	0.350
12.0	32	3,200	1,520	1.080	3,050	1,300	0.840	2,650	1,100	0.600
12.0	45	3,200	1,520	0.756	3,050	1,300	0.588	2,650	1,100	0.420

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



H-Star Endmill

ESRE712

Side cutting

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.1	0.3	50,000	315	0.009	46,200	230	0.007	40,600	170	0.005
0.1	0.5	50,000	315	0.006	46,200	230	0.005	40,600	170	0.004
0.1	1	45,000	255	0.002	41,580	185	0.002	36,540	140	0.001
0.2	0.5	38,500	380	0.018	36,300	270	0.014	32,100	200	0.010
0.2	1	38,500	380	0.013	36,300	270	0.010	32,100	200	0.007
0.2	1.5	34,650	310	0.007	32,670	220	0.006	28,890	160	0.004
0.2	2	34,650	310	0.005	32,670	220	0.004	28,890	160	0.003
0.3	1	34,200	390	0.019	32,300	270	0.015	28,500	230	0.011
0.3	1.5	34,200	390	0.019	32,300	270	0.015	25,800	230	0.011
0.3	2	30,780	315	0.011	29,070	220	0.008	25,650	185	0.006
0.3	2.5	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
0.3	3	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
0.3	4	27,360	250	0.004	25,840	175	0.003	22,800	145	0.002
0.3	5	20,520	165	0.003	19,380	115	0.002	17,100	95	0.002
0.4	1	27,400	540	0.036	25,800	380	0.028	22,800	280	0.020
0.4	1.5	27,400	540	0.025	25,800	380	0.020	22,800	280	0.014
0.4	2	27,400	540	0.025	25,800	380	0.020	22,800	280	0.014
0.4	2.5	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
0.4	3	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
0.4	4	24,660	435	0.009	23,220	310	0.007	20,520	225	0.005
0.4	5	21,920	345	0.009	20,640	245	0.007	18,240	180	0.005
0.4	6	21,920	345	0.005	20,640	245	0.004	18,240	180	0.003
0.4	8	16,440	225	0.004	15,480	160	0.003	13,680	120	0.002
0.4	10	8,220	95	0.004	7,740	70	0.003	6,840	50	0.002
0.5	1	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
0.5	1.5	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
0.5	2	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
0.5	2.5	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
0.5	3	24,660	435	0.018	23,220	345	0.014	20,520	230	0.010
0.5	4	24,660	435	0.018	23,220	345	0.014	20,520	230	0.010
0.5	5	24,660	435	0.011	23,220	345	0.009	20,520	230	0.006
0.5	6	21,920	345	0.011	20,640	270	0.009	18,240	180	0.006
0.5	8	16,440	225	0.007	15,480	180	0.005	13,680	120	0.004
0.5	10	16,440	225	0.005	15,480	180	0.004	13,680	120	0.003
0.5	12	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
0.5	14	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
0.5	16	2,740	25	0.005	2,580	20	0.004	2,280	15	0.003
0.6	2	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
0.6	3	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
0.6	4	24,660	630	0.022	23,220	440	0.017	20,520	330	0.012
0.6	5	24,660	630	0.014	23,220	440	0.011	20,520	330	0.008
0.6	6	24,660	630	0.014	23,220	440	0.011	20,520	330	0.008
0.6	8	21,920	495	0.008	20,640	350	0.006	18,240	260	0.005
0.6	10	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003

ESRE712

Side cutting

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.6	12	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003
0.6	14	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
0.6	16	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
0.7	2	27,400	775	0.063	25,800	545	0.049	22,800	405	0.035
0.7	4	24,660	630	0.025	23,220	440	0.020	20,520	330	0.014
0.7	6	24,660	630	0.016	23,220	440	0.012	20,520	330	0.009
0.7	8	21,920	495	0.016	20,640	350	0.012	18,240	260	0.009
0.7	10	21,920	495	0.009	20,640	350	0.007	18,240	260	0.005
0.7	12	16,440	325	0.009	15,480	230	0.005	13,680	170	0.004
0.8	2	27,400	775	0.072	25,800	605	0.056	22,800	450	0.040
0.8	3	27,400	775	0.050	25,800	605	0.039	22,800	450	0.028
0.8	4	27,400	775	0.050	25,800	605	0.039	22,800	450	0.028
0.8	5	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
0.8	6	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
0.8	8	24,660	630	0.018	23,220	490	0.014	20,520	365	0.010
0.8	10	21,920	495	0.018	20,640	385	0.014	18,240	290	0.010
0.8	12	21,920	495	0.011	20,640	385	0.008	18,240	290	0.006
0.8	14	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
0.8	16	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
0.8	20	8,220	140	0.007	7,740	110	0.006	6,840	80	0.004
0.9	6	22,140	575	0.032	20,970	440	0.025	18,450	330	0.018
0.9	8	22,140	575	0.020	20,970	440	0.016	18,450	330	0.011
0.9	10	19,680	455	0.020	18,640	350	0.016	16,400	260	0.011
1.0	2	24,600	1,045	0.090	23,300	890	0.070	20,500	665	0.050
1.0	3	24,600	1,045	0.090	23,300	890	0.070	20,500	665	0.050
1.0	4	24,600	1,045	0.063	23,300	890	0.049	20,500	665	0.035
1.0	5	24,600	1,045	0.063	23,300	890	0.049	20,500	665	0.035
1.0	6	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
1.0	7	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
1.0	8	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
1.0	10	22,140	845	0.023	20,970	720	0.018	18,450	540	0.013
1.0	12	19,680	670	0.023	18,640	570	0.018	16,400	425	0.013
1.0	14	19,680	670	0.014	18,640	570	0.011	16,400	425	0.008
1.0	16	14,760	440	0.014	13,980	375	0.011	12,300	280	0.008
1.0	18	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
1.0	20	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
1.0	22	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
1.0	26	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
1.0	30	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
1.0	40	2,460	50	0.009	2,330	45	0.007	2,050	35	0.005
1.0	50	2,460	50	0.006	2,330	45	0.005	2,050	35	0.003
1.2	4	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042
1.2	6	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042
1.2	8	19,710	755	0.043	18,630	585	0.034	16,380	395	0.024

H-Star Endmill

ESRE712

Side cutting

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
1.2	10	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
1.2	12	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
1.2	14	17,520	595	0.027	16,560	460	0.021	14,560	310	0.015
1.2	16	17,520	595	0.016	16,560	460	0.013	14,560	310	0.009
1.2	20	13,140	390	0.011	12,420	300	0.008	10,920	205	0.006
1.2	26	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
1.2	30	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
1.4	6	19,200	815	0.088	18,100	570	0.069	16,000	425	0.049
1.4	8	17,280	660	0.050	16,290	460	0.039	14,400	345	0.028
1.4	10	17,280	660	0.050	16,290	460	0.039	14,400	345	0.028
1.4	14	17,280	660	0.032	16,290	460	0.025	14,400	345	0.018
1.4	16	15,360	520	0.032	14,480	365	0.025	12,800	270	0.018
1.4	20	15,360	520	0.019	14,480	365	0.015	12,800	270	0.011
1.5	4	19,200	905	0.135	18,100	635	0.105	16,000	475	0.075
1.5	5	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
1.5	6	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
1.5	7	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
1.5	8	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
1.5	10	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
1.5	12	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
1.5	14	17,280	735	0.034	16,290	515	0.026	14,400	385	0.019
1.5	16	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
1.5	18	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
1.5	20	15,360	580	0.020	14,480	405	0.016	12,800	305	0.011
1.5	22	15,360	580	0.020	14,480	405	0.016	12,800	305	0.011
1.5	26	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
1.5	30	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
1.6	8	17,800	840	0.101	16,800	655	0.078	14,800	490	0.056
1.6	10	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
1.6	12	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
1.6	16	16,020	680	0.036	15,120	530	0.028	13,320	395	0.020
1.6	20	14,240	540	0.036	13,440	420	0.028	11,840	315	0.020
1.8	8	17,800	840	0.113	16,800	655	0.088	14,800	490	0.063
1.8	10	16,020	680	0.065	15,120	530	0.050	13,320	395	0.036
1.8	12	16,020	680	0.065	15,120	530	0.050	13,320	395	0.036
1.8	16	16,020	680	0.041	15,120	530	0.032	13,320	395	0.023
1.8	20	14,240	540	0.041	13,440	420	0.032	11,840	315	0.023
2.0	6	14,400	820	0.180	13,600	620	0.140	12,000	475	0.100
2.0	8	14,400	820	0.126	13,600	620	0.098	12,000	475	0.070
2.0	10	14,400	820	0.126	13,600	620	0.098	12,000	475	0.070
2.0	12	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
2.0	14	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
2.0	16	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
2.0	18	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025

ESRE712

Side cutting

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
2.0	20	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025
2.0	22	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
2.0	26	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
2.0	30	11,520	525	0.027	10,880	395	0.021	9,600	305	0.015
2.0	35	8,640	345	0.018	8,160	260	0.014	7,200	200	0.010
2.0	40	8,640	345	0.018	8,160	260	0.014	7,200	200	0.010
2.0	45	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.0	50	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.0	60	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.5	8	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
2.5	10	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
2.5	12	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
2.5	14	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	16	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	18	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	20	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	22	11,070	785	0.056	10,440	550	0.044	9,270	415	0.031
2.5	26	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
2.5	30	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
2.5	35	9,840	620	0.034	9,280	435	0.026	8,240	325	0.019
2.5	40	7,380	405	0.034	6,960	285	0.026	6,180	215	0.019
2.5	45	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
2.5	50	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
3.0	6	10,900	860	0.270	10,300	605	0.210	6,600	450	0.150
3.0	8	10,900	860	0.270	10,300	605	0.210	6,600	450	0.150
3.0	10	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
3.0	12	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
3.0	14	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
3.0	16	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	18	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	20	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	22	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	26	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
3.0	30	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
3.0	35	8,720	550	0.068	8,240	385	0.053	5,280	290	0.038
3.0	40	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
3.0	45	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
3.0	50	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
3.0	60	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
4.0	8	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
4.0	10	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
4.0	12	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
4.0	14	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
4.0	16	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140

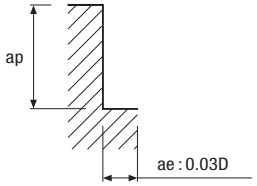
H-Star Endmill

ESRE712

Side cutting

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
4.0	18	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
4.0	20	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
4.0	22	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
4.0	26	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
4.0	30	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
4.0	35	7,200	1,055	0.090	6,840	940	0.070	6,030	625	0.050
4.0	40	7,200	1,055	0.090	6,840	940	0.070	6,030	625	0.050
4.0	45	6,400	830	0.090	6,080	740	0.070	5,360	495	0.050
4.0	50	6,400	830	0.090	6,080	740	0.070	5,360	495	0.050
4.0	60	6,400	830	0.054	6,080	740	0.042	5,360	495	0.030
5.0	16	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
5.0	20	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
5.0	26	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	30	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	35	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	40	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	50	5,760	935	0.113	5,490	730	0.088	4,860	490	0.063
5.0	60	5,120	740	0.113	4,880	575	0.088	4,320	385	0.063
6.0	15	5,300	1,055	0.540	5,000	820	0.420	4,400	550	0.300
6.0	20	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.210
6.0	30	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.210
6.0	32	4,770	855	0.216	4,500	665	0.168	3,960	445	0.120
8.0	25	4,000	950	0.504	3,800	750	0.392	3,300	500	0.280
8.0	30	4,000	950	0.504	3,800	750	0.392	3,300	500	0.280
8.0	42	3,600	770	0.288	3,400	605	0.224	2,950	405	0.160
10.0	30	3,200	900	0.900	3,050	680	0.700	2,630	400	0.500
10.0	35	3,200	900	0.630	3,050	680	0.490	2,630	400	0.350
10.0	45	3,200	900	0.630	3,050	680	0.490	2,630	400	0.350
12.0	35	2,650	800	1.080	2,520	600	0.840	2,180	350	0.600
12.0	40	2,650	800	0.756	2,520	600	0.588	2,180	350	0.420
12.0	50	2,650	800	0.756	2,520	600	0.588	2,180	350	0.420

Application tip



ESRE714

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.5	1	27,400	756	0.045	25,800	595	0.035	22,800	399	0.025
0.5	2	27,400	756	0.032	25,800	595	0.025	22,800	399	0.018
0.5	3	24,660	609	0.018	23,220	483	0.014	20,520	322	0.01
0.5	4	24,660	609	0.018	23,220	483	0.014	20,520	322	0.01
0.5	5	24,660	609	0.011	23,220	483	0.009	20,520	322	0.006
0.5	6	21,920	483	0.011	20,640	378	0.009	18,240	252	0.006
0.5	8	16,440	315	0.007	15,480	252	0.005	13,680	168	0.004
0.5	10	16,440	315	0.005	15,480	252	0.004	13,680	168	0.003
0.6	1	27,400	1085	0.038	25,800	763	0.029	22,800	567	0.021
0.6	2	27,400	1085	0.038	25,800	763	0.029	22,800	567	0.021
0.6	3	27,400	1085	0.038	25,800	763	0.029	22,800	567	0.021
0.6	4	24,660	882	0.022	23,220	616	0.017	20,520	462	0.012
0.6	5	24,660	882	0.014	23,220	616	0.011	20,520	462	0.008
0.6	6	24,660	882	0.014	23,220	616	0.011	20,520	462	0.008
0.6	8	21,920	693	0.008	20,640	490	0.006	18,240	364	0.005
0.6	10	16,440	455	0.005	15,480	322	0.004	13,680	238	0.003
0.6	12	16,440	455	0.005	15,480	322	0.004	13,680	238	0.003
0.7	2	27,400	1085	0.063	25,800	763	0.049	22,800	567	0.035
0.7	4	24,660	882	0.025	23,220	616	0.02	20,520	462	0.014
0.7	6	24,660	693	0.016	23,220	616	0.012	20,520	462	0.009
0.7	8	21,920	693	0.016	20,640	490	0.012	18,240	364	0.009
0.7	10	21,920		0.009	20,640	490	0.007	18,240	364	0.005
0.8	1	27,400	1085	0.072	25,800	847	0.056	22,800	630	0.04
0.8	2	27,400	1085	0.072	25,800	847	0.056	22,800	630	0.04
0.8	3	27,400	1085	0.05	25,800	847	0.039	22,800	630	0.028
0.8	4	27,400	1085	0.05	25,800	847	0.039	22,800	630	0.028
0.8	5	24,660	882	0.029	23,220	686	0.022	20,520	511	0.016
0.8	6	24,660	882	0.029	23,220	686	0.022	20,520	511	0.016
0.8	8	24,660	882	0.018	23,220	686	0.014	20,520	511	0.01
0.8	10	21,920	693	0.018	20,640	539	0.014	18,240	406	0.01
0.8	12	21,920	693	0.011	20,640	539	0.008	18,240	406	0.006
0.8	16	16,440	455	0.007	15,480	357	0.006	13,680	266	0.004
1	2	24,600	1463	0.09	23,300	1246	0.07	20,500	931	0.05
1	3	24,600	1463	0.09	23,300	1246	0.07	20,500	931	0.05
1	4	24,600	1463	0.063	23,300	1246	0.049	20,500	931	0.035
1	6	22,140	1183	0.036	20,970	1008	0.028	18,450	756	0.02
1	8	22,140	1183	0.036	20,970	1008	0.028	18,450	756	0.02
1	10	22,140	1183	0.023	20,970	1008	0.018	18,450	756	0.013
1	12	19,680	938	0.023	18,640	798	0.018	16,400	595	0.013
1	14	19,680	938	0.014	18,640	798	0.011	16,400	595	0.008
1	16	14,760	616	0.014	13,980	525	0.011	12,300	392	0.008
1	18	14,760	616	0.009	13,980	525	0.007	12,300	392	0.005
1	20	14,760	616	0.009	13,980	525	0.007	12,300	392	0.005
1.2	4	21,900	1,302	0.076	20,700	1008	0.059	18,200	679	0.042
1.2	6	21,900	1,302	0.076	20,700	1008	0.059	18,200	679	0.042
1.2	8	19,710	1,057	0.043	18,630	819	0.034	16,380	553	0.024
1.2	10	19,710	1,057	0.027	18,630	819	0.021	16,380	553	0.015
1.2	12	19,710	1057	0.027	18,630	819	0.021	16,380	553	0.015

H-Star Endmill

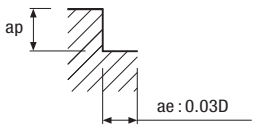
ESRE714

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
1.2	16	17,520	833	0.016	16,560	644	0.013	14,560	434	0.009
1.2	18	17,520	833	0.016	16,560	644	0.013	14,560	434	0.009
1.2	20	13,140	546	0.011	12,420	420	0.008	10,920	287	0.006
1.4	6	19,200	1141	0.088	18,100	798	0.069	16,000	595	0.049
1.4	8	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
1.4	10	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
1.4	12	17,280	924	0.05	16,290	644	0.039	14,400	483	0.028
1.4	14	17,280	924	0.032	16,290	644	0.025	14,400	483	0.018
1.4	16	15,360	728	0.032	14,480	511	0.025	12,800	378	0.018
1.5	4	19,200	1267	0.135	18,100	889	0.105	16,000	665	0.075
1.5	6	19,200	1267	0.095	18,100	889	0.074	16,000	665	0.053
1.5	8	17,280	1029	0.054	16,290	721	0.042	14,400	539	0.03
1.5	10	17,280	1029	0.054	16,290	721	0.042	14,400	539	0.03
1.5	12	17,280	1029	0.054	16,290	721	0.042	14,400	539	0.03
1.5	16	15,360	812	0.034	14,480	567	0.026	12,800	427	0.019
1.5	18	15,360	812	0.034	14,480	567	0.026	12,800	427	0.019
1.5	20	15,360	812	0.02	14,480	567	0.016	12,800	427	0.011
1.5	25	11,520	532	0.014	10,860	371	0.011	9,600	280	0.008
1.5	30	11,520	532	0.014	10,860	371	0.011	9,600	280	0.008
1.6	6	17,800	1176	0.101	16,800	917	0.078	14,800	686	0.056
1.6	8	17,800	1176	0.101	16,800	917	0.078	14,800	686	0.056
1.6	10	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
1.6	12	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
1.6	14	16,020	952	0.058	15,120	742	0.045	13,320	553	0.032
1.6	16	16,020	952	0.036	15,120	752	0.028	13,320	553	0.02
1.6	18	16,020	952	0.036	15,120	752	0.028	13,320	553	0.02
1.6	20	14,240	756	0.036	13,440	588	0.028	11,840	441	0.02
1.6	25	14,240	756	0.036	13,440	588	0.028	11,840	441	0.02
1.8	6	17,800	1176	0.113	16,800	917	0.088	14,800	686	0.063
1.8	8	17,800	1176	0.113	16,800	917	0.088	14,800	686	0.063
1.8	10	16,020	952	0.065	15,120	742	0.05	13,320	553	0.036
1.8	12	16,020	952	0.065	15,120	742	0.05	13,320	553	0.036
1.8	16	16,020	952	0.041	15,120	742	0.032	13,320	553	0.023
1.8	20	14,240	756	0.041	13,440	588	0.032	11,840	441	0.023
1.8	25	14,240	756	0.041	13,440	588	0.032	11,840	441	0.023
2	4	14,400	1148	0.18	13,600	868	0.14	12,000	665	0.1
2	6	14,400	1148	0.18	13,600	868	0.14	12,000	665	0.1
2	8	14,400	1148	0.126	13,600	868	0.098	12,000	665	0.07
2	10	14,400	1148	0.126	13,600	868	0.098	12,000	665	0.07
2	12	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
2	14	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
2	16	12,960	931	0.072	12,240	700	0.056	10,800	539	0.04
2	18	12,960	931	0.045	12,240	700	0.035	10,800	539	0.025
2	20	12,960	931	0.045	12,240	700	0.035	10,800	539	0.025
2	22	11,520	735	0.045	10,880	553	0.035	9,600	427	0.025
2	25	11,520	735	0.045	10,880	553	0.035	9,600	427	0.025
2	30	11,520	735	0.027	10,880	553	0.021	9,600	427	0.015
2.5	10	12,300	1358	0.158	11,600	952	0.123	10,300	714	0.088

ESRE714

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
2.5	12	12,300	1358	0.158	11,600	952	0.123	10,300	714	0.088
2.5	16	11,070	1099	0.09	10,440	770	0.07	9,270	581	0.05
2.5	20	11,070	1099	0.09	10,440	770	0.07	9,270	581	0.05
2.5	25	9,840	868	0.056	9,280	609	0.044	8,240	455	0.031
2.5	30	9,840	868	0.056	9,280	609	0.044	8,240	455	0.031
3	6	10,900	1204	0.27	10,300	847	0.21	6,600	630	0.15
3	8	10,900	1204	0.27	10,300	847	0.21	6,600	630	0.15
3	10	10,900	1204	0.189	10,300	847	0.147	6,600	630	0.105
3	12	10,900	1204	0.189	10,300	847	0.147	6,600	630	0.105
3	16	9,810	973	0.108	9,270	686	0.084	5,940	511	0.06
3	20	9,810	973	0.108	9,270	686	0.084	5,940	511	0.06
3	25	9,810	973	0.068	9,270	686	0.053	5,940	511	0.038
3	30	9,810	973	0.068	9,270	686	0.053	5,940	511	0.038
3	35	8,720	770	0.068	8,240	539	0.053	5,280	406	0.038
3	40	8,720	770	0.041	8,240	539	0.032	5,280	406	0.023
3	45	8,720	770	0.041	8,240	539	0.032	5,280	406	0.023
3	50	6,540	504	0.027	6,180	357	0.021	3,960	266	0.015
3	60	6,540	504	0.027	6,180	357	0.021	3,960	266	0.015
3.5	12	9,310	1430	0.236	8,800	1008	0.183	5,640	750	0.131
3.5	16	8,380	1158	0.135	7,920	816	0.105	5,070	608	0.075
3.5	20	8,380	1158	0.135	7,920	816	0.105	5,070	608	0.047
3.5	25	8,380	1158	0.085	7,920	816	0.066	5,070	608	0.047
3.5	30	8,380	1158	0.085	7,920	816	0.066	5,070	608	0.047
3.5	35	7,450	916	0.085	7,040	641	0.066	4,510	483	0.047
3.5	40	7,450	916	0.051	7,040	641	0.04	4,510	483	0.028
4	6	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
4	8	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
4	10	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
4	12	8,000	1820	0.36	7,600	1624	0.28	6,700	1078	0.2
4	16	8,000	1820	0.252	7,600	1624	0.196	6,700	1078	0.14
4	20	8,000	1820	0.252	7,600	1624	0.196	6,700	1078	0.14
4	25	7,200	1477	0.144	6,840	1316	0.112	6,030	875	0.08
4	30	7,200	1477	0.144	6,840	1316	0.112	6,030	875	0.08
4	40	7,200	1477	0.09	6,840	1316	0.07	6,030	875	0.05
4	45	6,400	1162	0.09	6,080	1036	0.07	5,360	693	0.05
4	50	6,400	1162	0.09	6,080	1036	0.07	5,360	693	0.05
4	60	6,400	1162	0.054	6,080	1036	0.042	5,360	693	0.03
4.5	12	6,830	2166	0.45	6,490	1933	0.35	5,720	1283	0.25
4.5	16	6,830	2166	0.315	6,490	1933	0.245	5,720	1283	0.175
4.5	20	6,830	2166	0.315	6,490	1933	0.245	5,720	1283	0.175
4.5	25	6,150	1758	0.18	5,840	1566	0.14	5,150	1041	0.1
4.5	30	6,150	1758	0.18	5,840	1566	0.14	5,150	1041	0.1

Application tip

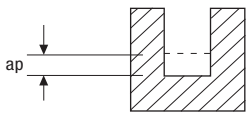


H-Star Endmill

ESRE714

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter(Ø)	Effective Length	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
4.5	40	6,150	1758	0.112	5,840	1566	0.087	5,150	1041	0.062
5	16	6,400	1617	0.315	6,100	1260	0.245	5,400	847	0.175
5	20	6,400	1617	0.315	6,100	1260	0.245	5,400	847	0.175
5	25	5,760	1309	0.18	5,490	1022	0.14	4,860	686	0.1
5	30	5,760	1309	0.18	5,490	1022	0.14	4,860	686	0.1
5	40	5,760	1309	0.18	5,490	1022	0.14	4,860	686	0.1
5	50	5,760	1309	0.113	5,490	1022	0.088	4,860	686	0.063
5	60	5,120	1036	0.113	4,880	805	0.088	4,320	539	0.063
6	20	5,300	1477	0.378	5,000	1148	0.294	4,400	770	0.21
6	30	5,300	1,477	0.378	5,000	1,148	0.294	4,400	770	0.21
6	40	4,770	1,197	0.216	4,500	931	0.168	3,960	623	0.12
6	50	4,770	1,197	0.216	4,500	931	0.168	3,960	623	0.12
6	60	4,370	958	0.141	4,171	931	0.11	3,690	623	0.078
8	25	4,000	1,330	0.504	3,800	1,050	0.392	3,300	700	0.28
8	40	3,600	1,078	0.288	3,400	847	0.224	2,950	567	0.16
8	50	3,600	1,078	0.288	3,400	847	0.224	2,950	567	0.16
10	30	3,200	1,260	0.9	3,050	952	0.7	2,630	560	0.5
10	50	3,200	1,260	0.63	3,050	952	0.49	2,630	560	0.35
10	60	3,200	1,260	0.63	3,050	952	0.49	2,630	560	0.35
12	40	2,650	1,120	0.756	2,520	840	0.588	2,180	490	0.42
12	60	2,360	896	0.472	2,250	672	0.367	1,940	392	0.262
12	70	2,360	896	0.472	2,250	672	0.367	1,940	392	0.262

Application tip



ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
0.2	0.02	0.5	0.016	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.011	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.007	42,000	202	36,700	176	36,700	162	36,700	147
	0.05	0.5	0.02	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.014	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.008	50,000	240	45,900	202	45,900	170	45,900	153
0.3	0.02	1	0.016	50,000	585	50,000	456	50,000	336	50,000	320
		2	0.011	45,000	530	45,000	420	45,000	300	45,000	290
		3	0.007	35,000	412	35,000	326	30,000	200	30,000	194
	0.05	1	0.021	50,000	585	50,000	456	50,000	336	50,000	320
		2	0.012	45,000	530	45,000	420	45,000	300	45,000	290
		3	0.008	35,000	412	35,000	326	30,000	200	30,000	194
0.4	0.02	1	0.016	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.013	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.01	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.007	30,000	320	30,000	250	21,600	160	19,200	150
	0.05	1	0.025	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.016	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.014	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.008	30,000	320	30,000	250	21,600	160	19,200	150
	0.1	1	0.033	50,000	580	50,000	461	40,000	320	36,000	270
		1.5	0.03	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.028	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.016	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.01	30,000	320	30,000	250	21,600	160	19,200	150
0.5	0.02	1	0.016	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.014	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.013	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.011	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.01	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.008	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.007	40,000	720	32,000	378	24,000	279	20,000	234
		6	0.006	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.005	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.004	28,800	480	19,400	260	18,000	250	15,000	200
	0.05	1	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.026	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.023	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.02	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.017	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.017	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.011	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.008	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.007	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.006	28,800	480	19,400	260	18,000	250	15,000	200

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
0.5	0.1	1	0.035	50,000	898	40,000	464	30,000	378	28,000	315
		1.5	0.032	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.03	50,000	898	40,000	464	30,000	378	28,000	315
		2.5	0.025	45,000	810	36,000	414	27,000	315	24,500	261
		3	0.02	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.02	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.013	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.013	28,800	480	19,400	260	18,000	250	15,000	200
		8	0.01	28,800	480	19,400	260	18,000	250	15,000	200
		10	0.08	28,800	480	19,400	260	18,000	250	15,000	200
0.6	0.02	2	0.016	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.014	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.013	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.01	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.008	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.007	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.006	24,000	451	18,000	276	17,800	221	15,000	193
	0.05	2	0.028	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.023	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.019	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.012	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.01	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.007	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.006	24,000	451	18,000	276	17,800	221	15,000	193
	0.1	2	0.035	50,000	1,159	37,830	600	28,200	390	23,000	320
		3	0.03	40,000	830	27,800	440	23,600	280	21,000	230
		4	0.024	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.013	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193
		12	0.007	24,000	451	18,000	276	17,800	221	15,000	193
0.7	0.1	2	0.042	49,200	1,054	34,190	558	29,030	355	25,830	292
		4	0.029	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.018	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		10	0.012	24,000	490	18,000	300	17,800	240	15,000	210
0.8	0.02	2	0.016	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.016	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.013	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.011	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.01	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.09	29,025	570	20,000	350	16,200	246	16,200	219
	0.05	2	0.038	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.026	48,000	1,102	28,000	518	20,000	320	20,000	288

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
0.8	0.05	6	0.015	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.012	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.011	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.01	29,025	570	20,000	350	16,200	246	16,200	219
	0.1	2	0.047	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.013	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	2	0.081	48,000	1,378	28,000	647	20,000	400	20,000	360
		4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.018	29,025	600	20,000	369	16,200	259	16,200	230
		10	0.016	29,025	570	20,000	350	16,200	246	16,200	219
		12	0.015	29,025	570	20,000	350	16,200	246	16,200	219
1	0.02	4	0.013	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.01	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.008	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.006	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.005	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.004	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.004	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.003	13,608	399	11,567	315	10,206	257	9,526	200
	0.05	4	0.027	32,400	1,359	28,917	1,128	24,300	815	22,680	666
		6	0.017	26,244	990	24,538	928	19,683	660	18,371	539
		8	0.016	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.011	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.01	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.008	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.006	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.004	13,608	399	11,567	315	10,206	257	9,526	200
	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.015	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.012	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.009	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.04	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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	0.2	12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.02	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.04	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.04	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		14	0.02	18,144	533	15,422	420	13,608	342	12,701	266
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
1.2	0.02	4	0.013	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.01	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.008	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.006	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.005	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.004	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.004	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.003	13,608	399	11,567	315	10,206	257	9,526	200
	0.05	4	0.027	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.017	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.016	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.011	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.01	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.008	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.006	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.004	13,608	399	11,567	315	10,206	257	9,526	200
	0.1	4	0.03	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.03	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.022	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.012	19,278	652	16,386	554	14,458	428	13,494	342
		14	0.01	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.01	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.037	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.02	19,278	651	16,386	554	14,458	428	13,494	342
		14	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
1.2	0.3	4	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		6	0.05	28,868	1,154	24,538	928	21,651	727	20,208	594
		8	0.037	24,640	962	20,944	791	18,480	620	17,248	506
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.02	19,278	651	16,386	554	14,458	428	13,494	342
		14	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		16	0.016	18,144	533	15,422	453	13,608	342	12,701	266
		20	0.01	13,608	399	11,567	315	10,206	257	9,526	200
1.5	0.02	4	0.013	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.01	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.008	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.006	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.005	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.004	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.004	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.003	14,112	568	11,995	423	10,584	373	9,878	298
	0.05	4	0.027	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.017	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.016	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.011	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.01	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.008	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.006	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.004	14,112	568	11,995	423	10,584	373	9,878	298
	0.1	4	0.042	24,930	1,130	20,956	947	18,711	752	17,364	611
		6	0.04	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.036	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.036	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.036	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.018	14,112	568	11,995	423	10,584	373	9,878	298
	0.2	4	0.07	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.065	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.06	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.06	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
	0.3	4	0.07	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.065	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.06	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.06	20,412	924	17,350	785	15,309	616	14,288	503

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
1.5	0.3	12	0.06	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.03	14,112	568	11,995	423	10,584	373	9,878	298
	0.5	4	0.085	24,930	1,130	20,956	868	18,711	678	17,364	556
		6	0.08	23,779	1,074	20,382	921	17,834	716	16,560	582
		8	0.07	22,680	1,027	19,278	873	17,010	685	15,876	559
		10	0.067	20,412	924	17,350	785	15,309	616	14,288	503
		12	0.065	18,144	822	15,422	698	13,608	548	12,701	447
		14	0.045	14,112	568	11,995	423	10,584	373	9,878	298
		16	0.045	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.035	14,112	568	11,995	423	10,584	373	9,878	298
	0.02	6	0.013	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.01	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.008	17104	1284	14539	1092	12828	807	11973	659
		12	0.006	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.005	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.004	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.004	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.003	11,907	757	10,121	643	8,930	505	8,335	411
	0.05	6	0.027	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.017	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.016	17104	1284	14539	1092	12828	807	11973	659
		12	0.011	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.01	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.008	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.006	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.004	11,907	757	10,121	643	8,930	505	8,335	411
	0.1	6	0.07	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.055	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.042	17104	1284	14539	1092	12828	807	11973	659
		12	0.03	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.03	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.03	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.025	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.015	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.01	11,312	719	9,615	611	8,484	480	7,918	391
	0.2	6	0.08	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.055	17,104	1,284	14,539	1,092	12,828	807	11,973	659
		12	0.04	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.04	14,458	1,023	12,290	869	10,844	682	10,121	557
		16	0.04	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.035	11,907	843	10,121	716	8,930	562	8,335	459

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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	0.2	25	0.025	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.017	11,312	719	9,615	611	8,484	480	7,918	391
	0.3	6	0.11	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.09	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.075	17,104	1,284	14,539	1,092	12,828	807	11,973	659
		12	0.06	15,309	1,083	13,013	921	11,482	722	10,716	590
		14	0.06	14,458	1023	12,290	869	10,844	682	10,121	557
		16	0.06	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.037	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.03	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.021	11,312	719	9,615	611	8,484	480	7,918	391
	0.5	6	0.17	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.14	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		10	0.11	17,104	1284	14,539	1143	12,828	807	11,973	659
		12	0.08	15,309	1,083	13,013	1,023	11,482	722	10,716	590
		14	0.08	14,458	1023	12,290	920	1,084	682	10,121	557
		16	0.08	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.05	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.05	11,907	757	10,121	643	8,930	505	8,335	411
		30	0.03	11,312	719	9,615	611	8,484	480	7,918	391
2.5	0.1	10	0.055	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.042	16,254	1224	13,816	1040	12,190	767	11,378	626
		20	0.03	13,608	963	11,567	818	10,206	642	9,526	524
		25	0.022	12,757	860	10,844	730	9,568	573	8,930	467
		30	0.015	11,907	757	10,121	643	8,930	505	8,335	411
	0.2	10	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.055	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.04	13,608	963	11,567	818	10,206	642	9,526	524
	0.3	10	0.09	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.075	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.06	13,608	963	11,567	818	10,206	642	9,526	524
	0.5	10	0.14	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		16	0.11	16,254	1,224	1,386	1040	12,190	767	11,378	626
		20	0.08	13,608	963	11,567	818	10,206	642	9,526	524
3	0.1	10	0.06	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.035	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.035	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.031	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.027	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.02	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.015	9,072	801	7,711	681	6,804	480	6,350	393
	0.2	10	0.08	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.07	14,400	1,415	12,240	1,203	10,800	849	10,080	693

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
3	0.2	16	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.05	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.045	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.04	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.035	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.03	9,072	801	7,711	681	6,804	480	6,350	393
	0.3	10	0.115	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.1	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.075	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.075	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.067	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.06	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.05	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.04	9,072	801	7,711	681	6,804	480	6,350	393
	0.5	10	0.155	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.13	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.1	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.1	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.09	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.08	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.065	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.05	9,072	801	7,711	681	6,804	480	6,350	393
	1	10	0.175	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.15	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.12	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.11	11,664	1,146	9,914	974	8,748	687	8,165	561
		25	0.1	10,368	973	8,812	827	7,776	583	7,257	477
		30	0.09	9,072	801	7,711	681	6,804	480	6,350	393
		35	0.075	9,072	801	7,711	681	6,804	480	6,350	393
		40	0.06	9,072	801	7,711	681	6,804	480	6,350	393
4	0.1	12	0.065	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.06	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.055	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.05	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.045	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.04	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.035	10,255	1,783	6,867	1,075	5,491	688	5,124	561
	0.2	12	0.14	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.13	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.11	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.105	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.1	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.08	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.07	9,247	1,429	6,225	901	5,217	602	4,621	459

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
4	0.3	12	0.22	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.2	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.18	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.17	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.16	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.14	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.13	9,247	1,429	6,225	901	5,217	602	4,621	459
	0.5	12	0.35	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.25	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.2	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.175	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.15	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.1	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.075	9,247	1,429	6,225	901	5,217	602	4,621	459
	1	12	0.4	11,213	1,950	9,531	1,658	8,410	1,170	7,849	956
		16	0.29	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		20	0.23	10,255	1,783	8,697	1,512	7,599	1,057	6,684	814
		25	0.2	10,255	1,783	7,782	1293	6,545	872	5,904	687
		30	0.17	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		35	0.12	10,255	1,783	6,867	1,075	5,491	688	5,124	561
		40	0.09	9,247	1,429	6,225	901	5,217	602	4,621	459
5	0.2	15	0.16	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.152	8,513	1813	7,236	1541	6,385	1088	5,959	888
		30	0.145	7,872	1637	6,691	1391	5,904	982	5,510	802
		40	0.13	6,590	1,284	5,602	1,091	4,943	770	4,613	629
	0.5	15	0.35	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.296	8,513	1813	7,236	1541	6,385	1088	5,959	888
		30	0.24	7,872	1637	6,691	1391	5,904	982	5,510	802
		40	0.135	6,590	1,284	5,602	1,091	4,943	770	4,613	629
	1	15	0.4	9,154	1,990	7,781	1,692	6,866	1,194	6,408	975
		25	0.337	8,513	1813	7,236	1541	6,385	1088	5,959	888
		30	0.275	7,872	1637	6,691	1391	5,904	982	5,510	802
		40	0.15	6,590	1,284	5,602	1,091	4,943	770	4,613	629
6	0.1	20	0.065	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.05	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.2	20	0.14	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.11	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.3	20	0.22	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.18	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	0.5	20	0.35	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.24	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	1	20	0.4	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.28	6,486	1,523	5,513	1,294	4,865	914	4,540	746
	1.5	20	0.45	7,630	1,991	6,486	1,692	5,722	1,194	5,342	975
		40	0.3	6,486	1,523	5,513	1,294	4,865	914	4,540	746

H-Star Endmill

ESRR712 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
8	0.2	22	0.35	5,730	1900	4,524	1483	3,016	914	2,320	584
	0.3	22	0.5	5,730	1900	4,524	1483	3,016	914	2,320	584
	0.5	22	0.6	5,730	1900	4,524	1483	3,016	914	2,320	584
	1	22	0.7	5,730	1900	4,524	1483	3,016	914	2,320	584
	1.5	22	0.8	5,730	1900	4,524	1483	3,016	914	2,320	584
10	0.2	24	0.4	4,524	1728	3,567	1396	2,378	849	1,856	544
	0.3	24	0.5	4,524	1728	3,567	1396	2,378	849	1,856	544
	0.5	24	0.6	4,524	1728	3,567	1396	2,378	849	1,856	544
	1	24	0.7	4,524	1728	3,567	1396	2,378	849	1,856	544
	1.5	24	0.8	4,524	1728	3,567	1396	2,378	849	1,856	544
	2	24	0.9	4,524	1728	3,567	1396	2,378	849	1,856	544
12	0.2	26	0.5	3,857	1728	3,045	1396	2,030	849	1,537	544
	0.3	26	0.6	3,857	1728	3,045	1396	2,030	849	1,537	544
	0.5	26	0.7	3,857	1728	3,045	1396	2,030	849	1,537	544
	1	26	0.8	3,857	1728	3,045	1396	2,030	849	1,537	544
	1.5	26	0.9	3,857	1728	3,045	1396	2,030	849	1,537	544
	2	26	1	3,857	1728	3,045	1396	2,030	849	1,537	544
	3	26	1	3,857	1728	3,045	1396	2,030	849	1,537	544
16	0.5	35	2	2,842	1,512	2,262	1209	1,508	748	1,160	480
	1	35	2	2,842	453	2,262	362	1,508	224	1,160	480

- Please adjust the cutting depth index according to the cutting depth factors of above table.
- In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
0.5	0.05	2	0.023	50,000	1257	40,000	649	30,000	529	28,000	441
		4	0.017	40,000	1008	32,000	529	24,000	390	20,000	327
		6	0.008	28,800	672	19,400	364	18,000	350	15,000	280
		8	0.007	28,800	672	19,400	364	18,000	350	15,000	280
	0.1	2	0.03	50,000	1257	40,000	649	30,000	529	28,000	441
		4	0.02	40,000	1008	32,000	529	24,000	390	20,000	327
		6	0.013	28,800	672	19,400	364	18,000	350	15,000	280
		8	0.01	28,800	672	19,400	364	18,000	350	15,000	280
0.6	0.05	2	0.028	50,000	1622	37,830	840	28,200	546	23,000	448
		4	0.019	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.012	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.01	24,000	652	18,000	399	17,800	319	15,000	280
	0.1	2	0.035	50,000	1622	37,830	840	28,200	546	23,000	448
		4	0.024	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.015	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.013	24,000	652	18,000	399	17,800	319	15,000	280
0.7	0.05	2	0.028	49,200	1,475	34,190	781	29,030	497	25,830	408
		4	0.019	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.012	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.01	24,000	686	18,000	420	17,800	336	15,000	294
	0.1	2	0.042	49,200	1,475	34,190	781	29,030	497	25,830	408
		4	0.029	40,000	1,162	27,800	616	23,600	392	21,000	322
		6	0.018	24,000	686	18,000	420	17,800	336	15,000	294
		8	0.015	24,000	686	18,000	420	17,800	336	15,000	294
0.8	0.02	2	0.016	48,000	1929	28,000	905	20,000	560	360	504
		4	0.016	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.013	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.011	29,025	840	20,000	516	16,200	362	230	322
		10	0.01	29,025	798	20,000	490	16,200	344	219	306
		12	0.09	29,025	798	20,000	490	16,200	344	219	306
	0.05	2	0.038	48,000	1929	28,000	905	20,000	560	360	504
		4	0.026	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.015	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.012	29,025	840	20,000	516	16,200	362	230	322
		10	0.011	29,025	798	20,000	490	16,200	344	219	306
		12	0.01	29,025	798	20,000	490	16,200	344	219	306
	0.1	2	0.047	48,000	1929	28,000	905	20,000	560	360	504
		4	0.032	48,000	1,542	28,000	725	20,000	448	288	403
		6	0.019	38,700	1,120	25,000	645	18,000	403	256	358
		8	0.015	29,025	840	20,000	516	16,200	362	230	322
		10	0.013	29,025	798	20,000	490	16,200	344	219	306
		12	0.012	29,025	798	20,000	490	16,200	344	219	306
1	0.02	4	0.013	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.01	26,244	1386	22,307	1178	19,683	924	18,371	754

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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	0.02	8	0.008	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.006	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.005	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.004	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.004	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.003	13,608	558	11,567	441	10,206	359	9,526	280
	0.05	3	0.027	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.027	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.017	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.016	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.011	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.01	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.008	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.006	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.004	13,608	558	11,567	441	10,206	359	9,526	280
	0.1	3	0.038	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.038	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.024	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.024	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.015	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.015	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.012	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.009	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.006	13,608	558	11,567	441	10,206	359	9,526	280
	0.2	3	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.04	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.04	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.025	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.02	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.015	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
	0.3	3	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		4	0.07	32,400	1902	27,540	1454	24,300	1141	22,680	932
		6	0.04	26,244	1386	22,307	1178	19,683	924	18,371	754
		8	0.04	23,328	1232	19,829	1047	17,496	821	16,330	670
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.025	18,144	852	15,422	634	13,608	558	12,701	448
		14	0.02	18,144	746	15,422	588	13,608	478	12,701	372
		16	0.015	18,144	746	15,422	588	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
1.2	0.02	4	0.013	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.01	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
1.2	0.02	8	0.008	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.006	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.005	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.004	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.004	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.003	13,608	558	11,567	441	10,206	359	9,526	280
	0.05	3	0.027	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.027	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.017	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.016	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.011	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.01	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.008	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.006	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.004	13,608	558	11,567	441	10,206	359	9,526	280
	0.1	3	0.03	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.03	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.03	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.022	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.015	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.012	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.01	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.01	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.006	13,608	558	11,567	441	10,206	359	9,526	280
	0.2	3	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.037	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.02	19,278	912	16,386	775	14,458	599	13,494	478
		14	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		16	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
	0.3	3	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		4	0.05	28,868	1,615	24,538	1,299	21,651	1017	20,208	831
		6	0.05	28,868	1,615	24,538	1,299	21,651	1,017	20,208	831
		8	0.037	24,640	1,346	20,944	1,107	18,480	868	17,248	708
		10	0.025	20,412	1,078	17,350	917	15,309	719	14,288	586
		12	0.02	19,278	912	16,386	775	14,458	599	13,494	478
		16	0.016	18,144	746	15,422	634	13,608	478	12,701	372
		20	0.01	13,608	558	11,567	441	10,206	359	9,526	280
1.5	0.02	6	0.01	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.008	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.006	20,412	1,293	17,350	1,222	15,309	959	14,288	782

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
1.5	0.02	12	0.005	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.004	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.003	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.003	14,112	795	11,995	592	10,584	522	9,878	417
	0.05	4	0.027	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.017	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.016	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.011	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.01	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.008	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.006	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.004	14,112	795	11,995	592	10,584	522	9,878	417
		26	0.003	14,112	795	11,995	592	10,584	522	9,878	417
	0.1	4	0.042	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.04	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.036	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.036	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.036	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.023	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.023	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.018	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.015	14,112	795	11,995	592	10,584	522	9,878	417
		26	0.01	14,112	795	11,995	592	10,584	522	9,878	417
	0.2	4	0.07	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.065	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.06	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.06	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.06	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.038	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.038	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.025	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.02	14,112	795	11,995	592	10,584	522	9,878	417
	0.3	4	0.07	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.065	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.06	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.06	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.06	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.038	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.038	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.025	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.02	14,112	795	11,995	592	10,584	522	9,878	417

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
1.5	0.5	4	0.085	24,930	1,582	20,956	1325	18,711	1052	17,364	855
		6	0.08	23,779	1,503	20,382	1,325	17,834	1,052	16,560	855
		8	0.07	22,680	1,437	19,278	1,289	17,010	1,002	15,876	814
		10	0.067	20,412	1,293	17,350	1,222	15,309	959	14,288	782
		12	0.065	18,144	1,150	15,422	1,099	13,608	862	12,701	704
		14	0.045	14,112	795	11,995	977	10,584	767	9,878	625
		16	0.045	14,112	795	11,995	592	10,584	522	9,878	417
		20	0.035	14,112	795	11,995	592	10,584	522	9,878	417
		22	0.03	14,112	795	11,995	592	10,584	522	9,878	417
		25	0.025	14,112	795	11,995	592	10,584	522	9,878	417
2	0.02	6	0.013	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.01	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.008	17104	1797	14539	1528	12828	1129	11973	922
		12	0.006	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.005	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.004	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.004	11,907	1180	10,121	1002	8,930	786	8,335	642
		25	0.003	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.003	11,312	1006	9,615	855	8,484	672	7,918	547
	0.05	6	0.027	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.017	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.016	17104	1797	14539	1528	12828	1129	11973	922
		12	0.011	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.01	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.008	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.006	11,907	1180	10,121	1002	8,930	786	8,335	642
		25	0.004	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.003	11,312	1006	9,615	855	8,484	672	7,918	547
	0.1	6	0.07	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.055	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.042	17104	1797	14539	1528	12828	1129	11973	922
		12	0.03	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.03	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.03	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.025	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.02	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.015	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.01	11,312	1006	9,615	855	8,484	672	7,918	547
	0.2	6	0.08	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.07	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.055	17104	1797	14539	1528	12828	1129	11973	922
		12	0.04	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.04	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.04	13,608	1,348	11,567	1145	10,206	898	9,526	733

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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	0.2	20	0.035	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.03	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.025	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.017	11,312	1006	9,615	855	8,484	672	7,918	547
	0.3	6	0.11	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.09	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.075	17104	1797	14539	1528	12828	1129	11973	922
		12	0.06	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.06	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.06	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.037	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.033	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.03	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.021	11,312	1006	9,615	855	8,484	672	7,918	547
	0.5	6	0.17	20,790	2289	17,672	1944	15,593	1373	14,553	1121
		8	0.14	18,900	2080	16,065	1768	14,175	1248	13,230	1019
		10	0.11	17104	1797	14539	1528	12828	1129	11973	922
		12	0.08	15,309	1516	13,013	1289	11,482	1010	10,716	826
		14	0.08	14,458	1432	12,290	1216	10,844	954	10,121	779
		16	0.08	13,608	1,348	11,567	1145	10,206	898	9,526	733
		20	0.05	11,907	1180	10,121	1002	8,930	786	8,335	642
		22	0.05	11,907	1059	10,121	900	8,930	707	8,335	575
		25	0.05	11,907	1059	10,121	900	8,930	707	8,335	575
		30	0.03	11,312	1006	9,615	855	8,484	672	7,918	547
2.5	0.1	8	0.06	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.055	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.051	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.046	17,136	1835	14,566	1560	12,852	1132	11,995	971
		16	0.042	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.03	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.022	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.015	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.2	8	0.08	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.07	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.06	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.05	17,136	1835	14,566	1560	12,852	1132	11,995	971
		16	0.055	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.04	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.03	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.02	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.3	8	0.1	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.09	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.085	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.08	17,136	1835	14,566	1560	12,852	1132	11,995	971

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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	0.3	16	0.075	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.06	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.065	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.06	11,907	1,059	10,121	900	8,930	707	8,335	575
	0.5	8	0.15	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		10	0.14	18,900	2,080	16,065	1,768	14,175	1248	13,230	1019
		12	0.13	18,018	1,958	15,315	1664	13,513	1190	12,613	1019
		14	0.12	17,136	1835	14,566	1560	12,852	1132	11,995	971
		16	0.11	16,254	1,713	13,816	1,456	12,190	1,073	11,378	876
		20	0.08	13,608	1,348	11,567	1,145	10,206	898	9,526	733
		25	0.07	12,757	1204	10,844	1022	9,568	802	8,930	653
		30	0.05	11,907	1,059	10,121	900	8,930	707	8,335	575
3	0.1	8	0.07	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.06	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.05	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.047	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.035	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.035	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.031	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.027	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.02	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.015	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.01	7,258	672	6,169	572	5,443	403	5,080	330
	0.2	8	0.09	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.08	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.07	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.06	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.05	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.05	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.045	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.04	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.035	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.03	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.025	7,258	672	6,169	572	5,443	403	5,080	330
	0.3	8	0.13	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.115	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.1	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.085	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.075	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.075	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.0675	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.06	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.05	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.04	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.03	7,258	672	6,169	572	5,443	403	5,080	330

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
3	0.5	8	0.18	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.155	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.13	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.12	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.1	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.1	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.09	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.08	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.065	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.05	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.04	7,258	672	6,169	572	5,443	403	5,080	330
		50	0.03	6,532	538	5,552	457	4,899	322	4,572	264
	1	8	0.2	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		10	0.175	14400	1,981	12240	1,684	10800	1188	10080	970
		12	0.15	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		14	0.13	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		16	0.12	14,400	1,981	12,240	1,684	10,800	1188	10,080	970
		20	0.11	11,664	1,604	9,914	1,363	8,748	961	8,165	785
		25	0.1	10368	1,362	8812.5	1,158	7776	816	7257.5	667
		30	0.09	9,072	1,121	7,711	953	6,804	672	6,350	550
		35	0.075	9,072	1,121	7,711	953	6,804	672	6,350	550
		40	0.06	8,164	897	6,939	762	6,123	537	5,715	440
		45	0.045	7,258	672	6,169	572	5,443	403	5,080	330
		50	0.03	6,532	538	5,552	457	4,899	322	4,572	264
4	0.1	10	0.072	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.065	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.062	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.06	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.055	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.05	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.045	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.04	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.035	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.03	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.02	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.2	10	0.15	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.14	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.135	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.13	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.11	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.105	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.1	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.08	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.07	9,247	2,000	6,225	1,262	5,217	842	4,621	643

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
4	0.2	45	0.06	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.05	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.3	10	0.23	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.22	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.21	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.2	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.18	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.17	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.16	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.14	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.13	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.12	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.11	7,398	1,200	4,980	757	4,174	505	3,697	385
	0.5	10	0.4	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.35	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.3	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.25	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.2	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.175	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.15	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.1	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.075	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.05	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.04	7,398	1,200	4,980	757	4,174	505	3,697	385
		55	0.03	6,592	9903	4,467	611	3,955	433	3,295	300
	1	10	0.5	11,213	2,730	9,531	2,321	8,410	1,638	7,849	1338
		12	0.4	11,213	2,730	9,531	2,321	8,410	1638	7,849	1338
		13	0.35	10,734	2,613	9,114	2,219	8,004	1558	7,266	1239
		16	0.29	10,255	2,496	8,697	2116	7,599	1479	6,684	1139
		20	0.23	10,255	2496	8,697	2,116	7,599	1479	6,884	1139
		25	0.2	10,255	2,496	7,782	1,810	6,545	1,221	5,904	962
		30	0.17	10,255	2,496	6,867	1,505	5,491	963	5,124	785
		35	0.12	10,255	2,496	6,867	1505	5,491	963	5,124	785
		40	0.09	9,247	2,000	6,225	1,262	5,217	842	4,621	643
		45	0.06	8,240	1,505	5,584	1,019	4,944	722	4,119	501
		50	0.05	7,398	1,200	4,980	757	4,174	505	3,697	385
		55	0.04	6,592	9903	4,467	611	3,955	433	3,295	300
5	0.1	16	0.08	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.07	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.06	6,590	1797	5,602	1527	4,943	1078	4,613	880
	0.2	16	0.16	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.145	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.13	6,590	1797	5,602	1527	4,943	1078	4,613	880

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
5	0.3	16	0.24	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.22	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.2	6,590	1797	5,602	1527	4,943	1078	4,613	880
	0.5	16	0.35	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.296	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.135	6,590	1797	5,602	1527	4,943	1078	4,613	880
		50	0.12	5,272	1078	4,482	916	3,954	646	3,690	528
		60	0.1	4,218	647	3,585	549	3,164	388	2,952	317
	1	16	0.4	9,154	2786	7,781	2368	6,866	1671	6,408	1365
		30	0.275	7,872	2291	6,691	1948	5,904	1374	5,510	1122
		40	0.15	6,590	1797	5,602	1527	4,943	1078	4,613	880
		50	0.13	5,272	1078	4,482	916	3,954	646	3,690	528
		60	0.11	4,218	647	3,585	549	3,164	388	2,952	317
	1.5	15	0.45	9,154	2786	7,781	2368	6,866	1671	6,408	1365
	2	15	0.5	9,154	2786	7,781	2368	6,866	1671	6,408	1365
6	0.1	20	0.065	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.05	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.04	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.2	20	0.14	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.11	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.08	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.3	20	0.22	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.2	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.18	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.14	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	0.5	20	0.35	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.29	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.24	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.165	5,491	1,470	4,668	1,248	4,118	872	3,844	711
		60	0.1	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	1	20	0.4	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.35	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.28	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.2	5,491	1,470	4,668	1,248	4,118	872	3,844	711
		60	0.15	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	1.5	20	0.45	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.4	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.3	5,491	1,470	4,668	1,248	4,118	872	3,844	711
	2	20	0.5	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		30	0.4	7,630	2787	6,486	2368	5,722	1671	5,432	1365
		40	0.3	6,486	2132	5,513	1811	4,865	1279	4,540	1044
		50	0.2	5,491	1,470	4,668	1,248	4,118	872	3,844	711

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
8	0.1	25	0.35	5,730	2660	4,524	2076	3,016	1279	2,320	817
	0.2	22	0.5	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.25	5,730	2660	4,524	2076	3,016	1279	2,320	817
	0.3	22	0.6	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.3	5,730	2660	4,524	2076	3,016	1279	2,320	817
	0.5	22	0.7	5,730	2660	4,524	2076	3,016	1279	2,320	817
		35	0.5	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.35	5,730	2660	4,524	2076	3,016	1279	2,320	817
		50	0.3	4,584	1596	3,619	1245	2,413	767	1,856	490
		60	0.25	4,584	1596	3,619	1245	2,413	767	1,856	490
	1	22	0.8	5,730	2660	4,524	2076	3,016	1279	2,320	817
		35	0.6	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.4	5,730	2660	4,524	2076	3,016	1279	2,320	817
		50	0.4	4,584	1596	3,619	1245	2,413	767	1,856	490
		60	0.3	4,584	1596	3,619	1245	2,413	767	1,856	490
	1.2	22	0.9	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.45	5,730	2660	4,524	2076	3,016	1279	2,320	817
	2	22	1	5,730	2660	4,524	2076	3,016	1279	2,320	817
		40	0.5	5,730	2660	4,524	2076	3,016	1279	2,320	817
		50	0.4	4,584	1596	3,619	1245	2,413	767	1,856	490
10	0.1	30	0.4	4,524	2419	3,567	1954	2,378	1188	1,856	761
	0.2	24	0.5	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.25	4,524	2419	3,567	1954	2,378	1188	1,856	761
	0.3	24	0.6	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.3	4,524	2419	3,567	1954	2,378	1188	1,856	761
	0.5	24	0.7	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.4	4,524	2419	3,567	1954	2,378	1188	1,856	761
		50	0.3	3,619	1451	2,854	1172	1,902	713	1,485	456
		60	0.2	3,619	1451	2,854	1172	1,902	713	1,485	456
	1	24	0.8	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.5	4,524	2419	3,567	1954	2,378	1188	1,856	761
		50	0.4	3,619	1451	2,854	1172	1,902	713	1,485	456
		60	0.3	3,619	1451	2,854	1172	1,902	713	1,485	456
	1.5	24	0.9	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.55	4,524	2419	3,567	1954	2,378	1188	1,856	761
	2	24	1	4,524	2419	3,567	1954	2,378	1188	1,856	761
		40	0.5	3,619	1451	2,854	1172	1,902	713	1,485	456
		50	0.4	2,895	870	2,283	703	1,522	427	1,188	274
	2.5	24	1.1	4,524	2419	3,567	1954	2,378	1188	1,856	761
12	0.2	32	0.5	3,857	2419	3,045	1954	2,030	1188	1,537	761
	0.3	26	0.6	3,857	2419	3,045	1954	2,030	1188	1,537	761
		45	0.3	3,857	2419	3,045	1954	2,030	1188	1,537	761
	0.5	26	0.7	3,857	2419	3,045	1954	2,030	1188	1,537	761
		40	0.4	3,857	2419	3,045	1954	2,030	1188	1,537	761

H-Star Endmill

ESRR714 series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
12	0.5	60	0.3	3,086	1451	2,436	1172	1,624	713	1,230	456
	1	26	0.8	3,857	2419	3,045	1954	2,030	1188	1,537	761
		40	0.5	3,857	2419	3,045	1954	2,030	1188	1,537	761
		60	0.3	3,086	1451	2,436	1172	1,624	713	1,230	456
	1.5	26	0.9	3,857	2419	3,045	1954	2,030	1188	1,537	761
	2	26	1	3,857	2419	3,045	1954	2,030	1188	1,537	761
		40	0.5	3,857	2419	3,045	1954	2,030	1188	1,537	761
	3	26	1	3,857	2419	3,045	1954	2,030	1188	1,537	761
16	0.5	35	2	2,842	2116	2,262	1692	1,508	1047	1,160	672
		50	1	2,842	2116	2,262	1692	1,508	1047	1,160	672
	1	35	2	2,842	2116	2,262	1692	1,508	1047	1,160	672
		50	1	2,842	2116	2,262	1692	1,508	1047	1,160	672
20	0.5	40	2	2,262	1915	1,798	1512	1,189	957	928	616
		55	1	2,262	1915	1,798	1512	1,189	957	928	616
	1	40	2	2,262	1915	1,798	1512	1,189	957	928	616
		55	1	2,262	1915	1,798	1512	1,189	957	928	616

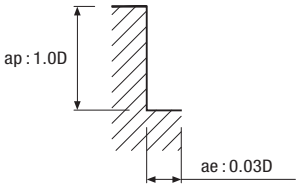
- Please adjust the cutting depth index according to the cutting depth factors of above table.
- In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

ESXR704, ESXE704, ESXE714 series

Side cutting

Workpiece / Conditions / Diameter(Ø)	Hardened steels Heat resistant alloy HRC40~50		Hardened steels HRC50~55		Hardened steels HRC55~60		Hardened steels HRC60~65		Hardened steels HRC65~70	
	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
4	17,200	1,690	11,440	1,140	9,360	700	7,280	430	6,170	310
6	13,450	1,820	8,970	1,230	6,890	720	5,460	450	4,810	330
8	9,100	1,750	6,760	1,170	5,200	670	4,160	420	3,640	310
10	8,000	1,630	5,330	1,090	4,160	620	3,320	400	2,860	280
12	6,830	1,630	4,550	1,010	3,450	580	2,730	370	2,420	260

Application tip

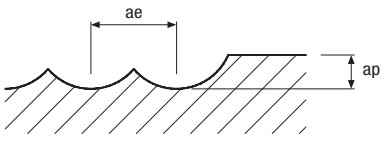


ESLNB20 series

Workpiece / Conditions / Diameter(Ø)	Alloy steels, Heat resistant steels HRC30~45			Hardened steels HRC45~55			Hardened steels HRC55~65			Copper, Copper alloy		
	R.P.M n (min⁻¹)	Feed vf (mm/min)	ae (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ae (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ae (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ae (mm)
0.5	34,100~49,500	600~870	0.007~0.028	31,900~35,200	490~540	0.005~0.023	31,900~35,200	440~480	0.005~0.021	49,000~50,000	1,100~1,400	0.010~0.042
0.6	28,600~40,700	590~850	0.007~0.034	26,400~29,700	480~540	0.006~0.028	26,400~29,700	400~480	0.006~0.025	42,000~50,000	1,100~1,700	0.011~0.050
0.8	22,000~30,800	640~890	0.016~0.064	19,800~22,000	490~550	0.013~0.052	19,800~22,000	440~500	0.012~0.048	31,000~50,000	1,100~2,250	0.024~0.096
1.0	17,600~24,200	600~850	0.008~0.080	15,400~17,600	470~540	0.007~0.065	15,400~17,600	440~500	0.006~0.060	24,000~49,500	1,100~2,200	0.012~0.120
1.2	14,300~18,700	590~780	0.024~0.032	12,000~14,000	480~540	0.020~0.026	12,000~14,000	420~480	0.018~0.024	28,500~38,500	1,480~1,950	0.036~0.048
1.5	11,000~14,300	580~760	0.031~0.048	10,000~11,500	480~540	0.025~0.039	10,000~11,500	420~480	0.023~0.036	17,000~28,500	1,100~1,950	0.046~0.072
2.0	8,500~11,000	590~800	0.024~0.160	7,900~8,800	470~530	0.020~0.130	7,900~8,800	440~480	0.018~0.120	12,600~24,000	1,100~2,150	0.036~0.240
3.0	5,700~8,200	730~1,000	0.064~0.24	5,300~5,800	590~650	0.052~0.195	5,300~5,800	550~620	0.048~0.120	11,900~17,000	1,850~2,700	0.096~0.360
4.0	4,300~6,200	680~990	0.080~0.320	3,950~4,400	550~620	0.065~0.260	3,850~4,400	530~570	0.060~0.240	6,600~12,500	1,260~2,500	0.120~0.480

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



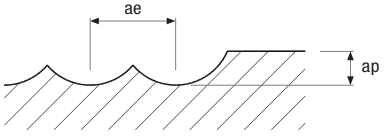
H-Star Endmill

ESTNB20 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	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)
0.4	0.8	4	0.4	0.062	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		6	0.4	0.045	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		8	0.9	0.026	25,600	1,475	17,920	1,032	16,640	852	16,640	745
		12	0.9	0.020	20,800	1,065	14,560	699	13,520	606	13,520	519
		16	0.9	0.018	20,800	932	14,560	612	13,520	530	13,520	454
0.45	0.9	4	0.4	0.063	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		8	0.4	0.050	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		12	0.4	0.037	18,400	1,325	12,880	811	11,960	753	11,960	646
		16	0.4	0.024	18,400	1,325	12,880	811	11,960	753	11,960	646
		18	0.4	0.018	18,400	1,325	12,880	811	11,960	753	11,960	646
		20	0.4	0.015	15,850	1,141	11,095	699	10,303	649	10,303	556
		22	0.4	0.012	15,850	1,141	11,095	699	10,303	649	10,303	556
		24	0.4	0.009	14,150	1,019	9,905	624	9,198	579	9,198	497
0.5	1	6	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		8	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		10	0.4	0.032	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		10	0.9	0.035	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		15	0.9	0.028	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.4	0.018	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.9	0.020	16,640	1,331	11,648	874	10,816	757	10,816	649
		25	0.9	0.017	14,560	1,165	10,192	764	9,464	662	9,464	568
		30	0.4	0.015	12,480	874	8,736	568	8,112	487	8,112	406
		30	0.9	0.017	12,480	874	8,736	568	8,112	487	8,112	406
		35	0.9	0.010	10,400	728	7,280	473	6,760	406	6,760	338
		40	0.9	0.009	10,000	700	7,000	455	6,500	390	6,500	325
		50	0.9	0.007	9,500	665	6,650	432	6,175	371	6,175	309
		60	0.9	0.005	9,000	630	6,300	410	5,850	351	5,850	293
		70	0.9	0.003	8,500	595	5,950	387	5,525	332	5,525	276
0.75	1.5	8	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		10	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		12	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		15	0.9	0.045	13,568	1,832	9,498	1,282	8,819	1,058	8,819	926
		20	0.9	0.040	11,024	1,323	7,717	810	7,166	752	7,166	645
		30	0.9	0.028	11,024	1,323	7,717	810	7,166	752	7,166	645

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



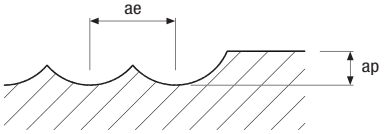
- Please adjust the cutting depth index according to the cutting depth factors of above table.
- For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.
  ex) ESTNB2040-20-10, HRC 55, Rib processing
  ex) Cutting depth: 0.32(standard cutting depth) × 0.65 × 0.8 = 0.17mm
- In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

ESTNB20 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	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)
0.9	1.8	4	0.4	0.120	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		8	0.4	0.100	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		12	0.4	0.080	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		16	0.4	0.071	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		20	0.4	0.062	9,230	1,329	6,461	814	6,000	756	6,000	648
		24	0.4	0.053	9,230	1,329	6,461	814	6,000	756	6,000	648
		28	0.4	0.044	9,230	1,329	6,461	814	6,000	756	6,000	648
		32	0.4	0.036	9,230	1,329	6,461	814	6,000	756	6,000	648
		36	0.4	0.028	9,230	1,329	6,461	814	6,000	756	6,000	648
		38	0.4	0.020	8,000	1,152	5,600	706	5,200	655	5,200	562
		40	0.4	0.015	8,000	1,152	5,600	706	5,200	655	5,200	562
1	2	8	0.4	0.150	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		12	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		16	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		20	0.4	0.060	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		20	0.9	0.070	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		25	0.9	0.070	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.4	0.040	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		35	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.4	0.030	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.9	0.035	9,880	1,581	6,916	968	6,442	899	6,422	771
		50	0.9	0.170	8,512	1,192	5,958	775	5,533	664	5,533	553
		60	0.9	0.009	7,235	1,013	5,065	658	4,703	564	4,703	470
		70	0.9	0.005	6,150	861	4,305	560	3,997	480	3,997	400
1.5	3	8	0.4	0.320	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		16	0.4	0.220	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		20	0.4	0.150	12,720	3,434	8,904	2,137	8,268	1,736	8,268	1,488
		30	0.4	0.080	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		30	0.9	0.090	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		40	0.4	0.060	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		40	0.9	0.070	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		50	0.9	0.050	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		60	0.9	0.030	7,123	1,710	4,986	1,047	4,630	972	4,630	833
		70	0.9	0.020	6,233	1,496	4,363	916	4,051	851	4,051	729

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



- Please adjust the cutting depth index according to the cutting depth factors of above table.
- For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.
  ex) ESTNB2040-20-10, HRC 55, Rib processing
  ex) Cutting depth: 0.32(standard cutting depth) × 0.65 × 0.8 = 0.17mm
- In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

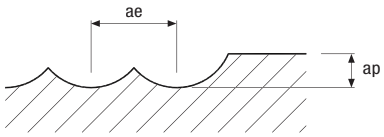
H-Star Endmill

ESTNB20 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	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	4	20	1	0.32	11,900	2,860	9,000	2,050	7,800	1,680	7,800	1,590
		30	1	0.23	11,900	2,570	9,000	1,850	7,800	1,520	7,800	1,430
		40	1	0.14	9,500	1,940	7,200	1,400	6,200	1,140	6,200	1,080
		50	1	0.11	7,800	1,590	5,800	1,120	5,000	920	5,000	870
		60	1	0.07	7,800	1,590	5,800	1,120	5,000	920	5,000	870
2.5	5	30	1	0.34	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		40	1	0.25	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		60	1	0.15	6,200	1,320	4,700	950	4,000	770	4,000	720
3	6	30	1	0.45	8,000	2,000	6,000	1,430	5,200	1,170	5,200	1,110
		40	1	0.40	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		50	1	0.32	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		60	1	0.22	6,400	1,360	4,800	970	4,100	780	4,100	740
		70	1	0.18	5,200	1,110	3,900	790	3,400	650	3,400	610
		80	1	0.14	5,200	1,110	3,900	790	3,400	650	3,400	610
4	8	50	1	0.50	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		60	1	0.43	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		70	1	0.33	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		80	1	0.25	4,800	1,100	3,600	780	3,100	640	3,100	600
5	10	60	1	0.70	4,800	1,300	3,600	920	3,100	750	3,100	710
		75	1	0.50	4,800	1,300	3,600	920	3,100	750	3,100	710

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



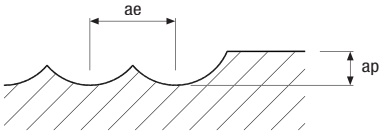
- Please adjust the cutting depth index according to the cutting depth factors of above table.
- For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.
  ex) ESTNB2040-20-10, HRC 55, Rib processing
  ex) Cutting depth: 0.32(standard cutting depth) × 0.65 × 0.8 = 0.17mm
- In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

ESTNB30 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	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)
0.1	0.2	1	0.4	0.017	40,000	800	28,000	504	26,000	416	26,000	364
		1.5	0.4	0.009	40,000	800	28,000	504	26,000	416	26,000	364
		2	0.9	0.007	32,000	461	22,400	323	20,800	266	20,800	233
		2.5	0.9	0.004	26,000	333	18,200	204	16,900	189	16,900	162
0.15	0.3	2	0.4	0.025	40,000	1,200	28,000	756	26,000	624	26,000	546
		3	0.9	0.013	32,000	691	22,400	484	20,800	399	20,800	349
		4	0.9	0.010	26,000	499	18,200	306	16,900	284	16,900	243
0.2	0.4	2	0.4	0.035	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		3	0.4	0.020	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		4	0.4	0.007	32,000	922	22,400	645	20,800	532	20,800	466
		4	0.9	0.009	32,000	922	22,400	645	20,800	532	20,800	466
		5	0.4	0.006	26,000	666	18,200	408	16,900	379	16,900	324
		5	0.9	0.007	26,000	666	18,200	408	16,900	379	16,900	324
0.25	0.5	4	0.4	0.040	40,000	2,000	28,000	1,260	26,000	1,040	26,000	910
		8	0.9	0.010	26,000	728	18,200	446	16,900	414	16,900	355
		12	0.9	0.005	22,400	627	15,680	384	14,560	357	14,560	306
0.27	0.54	2	0.4	0.050	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		4	0.4	0.037	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		5	0.4	0.031	40,000	1,512	28,000	1,176	26,000	1,040	26,000	832
		6	0.4	0.025	26,000	1,244	18,200	871	16,900	676	16,900	629
		6.5	0.4	0.020	26,000	1,011	18,200	619	16,900	575	16,900	493
		7	0.4	0.015	26,000	899	18,200	585	16,900	543	16,900	465
0.3	0.6	2	0.4	0.055	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		4	0.4	0.035	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		6	0.4	0.018	32,000	1,382	22,400	968	20,800	799	20,800	699
		6	0.9	0.020	32,000	1,382	22,400	968	20,800	799	20,800	699
		8	0.9	0.020	26,000	998	18,200	612	16,900	568	16,900	487
		10	0.4	0.013	26,000	874	18,200	535	16,900	497	16,900	426
		10	0.9	0.015	26,000	874	18,200	535	16,900	497	16,900	426
		12	0.9	0.010	26,000	874	18,200	535	16,900	497	16,900	426
		15	0.4	0.005	22,400	753	15,680	461	14,560	367	14,560	367
		15	0.9	0.006	22,400	753	15,680	461	14,560	367	14,560	367

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



- Please adjust the cutting depth index according to the cutting depth factors of above table.
- For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.
  ex) ESTNB3040-20-10, HRC 55, Rib processing
  ex) Cutting depth: 0.32(standard cutting depth) × 0.65 × 0.8 = 0.17mm
- In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

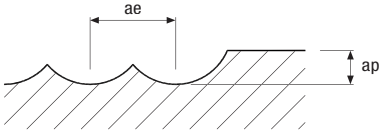
H-Star Endmill

ESTNB30 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	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)
0.4	0.8	4	0.4	0.062	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		6	0.4	0.045	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		8	0.9	0.026	25,600	1,475	17,920	1,032	16,640	852	16,640	745
		12	0.9	0.020	20,800	1,065	14,560	699	13,520	606	13,520	519
		16	0.9	0.018	20,800	932	14,560	612	13,520	530	13,520	454
0.45	0.9	4	0.4	0.063	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		8	0.4	0.050	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		12	0.4	0.037	18,400	1,325	12,880	811	11,960	753	11,960	646
		16	0.4	0.024	18,400	1,325	12,880	811	11,960	753	11,960	646
		18	0.4	0.018	18,400	1,325	12,880	811	11,960	753	11,960	646
		20	0.4	0.015	15,850	1,141	11,095	699	10,303	649	10,303	556
		22	0.4	0.012	15,850	1,141	11,095	699	10,303	649	10,303	556
		24	0.4	0.009	14,150	1,019	9,905	624	9,198	579	9,198	497
0.5	1	6	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		8	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		10	0.4	0.032	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		10	0.9	0.035	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		15	0.9	0.028	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.4	0.018	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.9	0.020	16,640	1,331	11,648	874	10,816	757	10,816	649
		25	0.9	0.017	14,560	1,165	10,192	764	9,464	662	9,464	568
		30	0.4	0.015	12,480	874	8,736	568	8,112	487	8,112	406
		30	0.9	0.017	12,480	874	8,736	568	8,112	487	8,112	406
		35	0.9	0.010	10,400	728	7,280	473	6,760	406	6,760	338
		40	0.9	0.009	10,000	700	7,000	455	6,500	390	6,500	325
		50	0.9	0.007	9,500	665	6,650	432	6,175	371	6,175	309
		60	0.9	0.005	9,000	630	6,300	410	5,850	351	5,850	293
		70	0.9	0.003	8,500	595	5,950	387	5,525	332	5,525	276
0.75	1.5	8	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		10	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		12	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		15	0.9	0.045	13,568	1,832	9,498	1,282	8,819	1,058	8,819	926
		20	0.9	0.040	11,024	1,323	7,717	810	7,166	752	7,166	645
		30	0.9	0.028	11,024	1,323	7,717	810	7,166	752	7,166	645

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



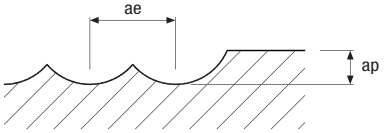
- Please adjust the cutting depth index according to the cutting depth factors of above table.
- For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.
  ex) ESTNB3040-20-10, HRC 55, Rib processing
  ex) Cutting depth: 0.32(standard cutting depth) × 0.65 × 0.8 = 0.17mm
- In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

ESTNB30 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	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)
0.9	1.8	4	0.4	0.120	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		8	0.4	0.100	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		12	0.4	0.080	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		16	0.4	0.071	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		20	0.4	0.062	9,230	1,329	6,461	814	6,000	756	6,000	648
		24	0.4	0.053	9,230	1,329	6,461	814	6,000	756	6,000	648
		28	0.4	0.044	9,230	1,329	6,461	814	6,000	756	6,000	648
		32	0.4	0.036	9,230	1,329	6,461	814	6,000	756	6,000	648
		36	0.4	0.028	9,230	1,329	6,461	814	6,000	756	6,000	648
		38	0.4	0.020	8,000	1,152	5,600	706	5,200	655	5,200	562
		40	0.4	0.015	8,000	1,152	5,600	706	5,200	655	5,200	562
1	2	8	0.4	0.150	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		12	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		16	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		20	0.4	0.060	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		20	0.9	0.070	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		25	0.9	0.070	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.4	0.040	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		35	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.4	0.030	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.9	0.035	9,880	1,581	6,916	968	6,442	899	6,422	771
		50	0.9	0.170	8,512	1,192	5,958	775	5,533	664	5,533	553
		60	0.9	0.009	7,235	1,013	5,065	658	4,703	564	4,703	470
		70	0.9	0.005	6,150	861	4,305	560	3,997	480	3,997	400
1.5	3	8	0.4	0.320	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		16	0.4	0.220	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		20	0.4	0.150	12,720	3,434	8,904	2,137	8,268	1,736	8,268	1,488
		30	0.4	0.080	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		30	0.9	0.090	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		40	0.4	0.060	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		40	0.9	0.070	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		50	0.9	0.050	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		60	0.9	0.030	7,123	1,710	4,986	1,047	4,630	972	4,630	833
		70	0.9	0.020	6,233	1,496	4,363	916	4,051	851	4,051	729

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm



- Please adjust the cutting depth index according to the cutting depth factors of above table.
- For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.
  ex) ESTNB3040-20-10, HRC 55, Rib processing
  ex) Cutting depth: 0.32(standard cutting depth) × 0.65 × 0.8 = 0.17mm
- In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

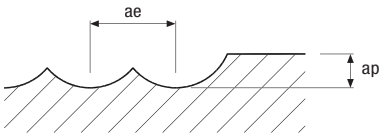
H-Star Endmill

ESTNB30 series

Workpiece					Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut					Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
R (mm)	Diameter (Ø)	Neck length (mm)	Neck Angle (°)	Depth of Cut (mm)	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	4	20	1	0.32	11,900	2,860	9,000	2,050	7,800	1,680	7,800	1,590
		30	1	0.23	11,900	2,570	9,000	1,850	7,800	1,520	7,800	1,430
		40	1	0.14	9,500	1,940	7,200	1,400	6,200	1,140	6,200	1,080
		50	1	0.11	7,800	1,590	5,800	1,120	5,000	920	5,000	870
		60	1	0.07	7,800	1,590	5,800	1,120	5,000	920	5,000	870
2.5	5	30	1	0.34	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		40	1	0.25	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		60	1	0.15	6,200	1,320	4,700	950	4,000	770	4,000	720
3	6	30	1	0.45	8,000	2,000	6,000	1,430	5,200	1,170	5,200	1,110
		40	1	0.40	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		50	1	0.32	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		60	1	0.22	6,400	1,360	4,800	970	4,100	780	4,100	740
		70	1	0.18	5,200	1,110	3,900	790	3,400	650	3,400	610
		80	1	0.14	5,200	1,110	3,900	790	3,400	650	3,400	610
4	8	50	1	0.50	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		60	1	0.43	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		70	1	0.33	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		80	1	0.25	4,800	1,100	3,600	780	3,100	640	3,100	600
5	10	60	1	0.70	4,800	1,300	3,600	920	3,100	750	3,100	710
		75	1	0.50	4,800	1,300	3,600	920	3,100	750	3,100	710

Application tip

*ae : D1 ~ D4 = 0.05 × D
D5 ~ D8 = 0.025mm
D10 ~ D20 = 0.30mm

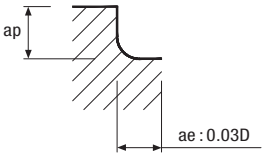


- Please adjust the cutting depth index according to the cutting depth factors of above table.
- For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.
  ex) ESTNB2040-20-10, HRC 55, Rib processing
  ex) Cutting depth: 0.32(standard cutting depth) × 0.65 × 0.8 = 0.17mm
- In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

ESLNS20, ESLNS40 series

Workpiece / Conditions / Diameter(Ø)	Alloy steels, Heat resistant steels HRC30~45			Hardened steels HRC45~55			High-hardened steels HRC55~65			Copper, Copper alloy		
	R.P.M n (min⁻¹)	Feed vf (mm/min)	ae (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ae (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ae (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ae (mm)
0.4	34,100~50,000	350~590	0.005~0.028	30,500~35,200	295~340	0.003~0.020	18,300~24,600	120~200	0.002~0.012	48,000~50,000	790~920	0.008~0.048
0.5	25,650~33,000	370~470	0.006~0.035	23,750~26,000	285~315	0.004~0.025	14,200~18,000	115~130	0.003~0.015	44,000~50,000	800~1,150	0.010~0.060
0.6	20,900~35,200	330~560	0.007~0.030	19,900~22,000	260~290	0.005~0.021	11,900~15,500	100~120	0.003~0.013	37,500~50,000	770~1,250	0.011~0.051
0.8	16,150~26,400	360~590	0.009~0.040	15,200~16,700	280~310	0.006~0.028	9,000~11,700	110~125	0.004~0.017	28,500~47,000	770~1,300	0.015~0.068
1.0	12,300~18,700	350~540	0.011~0.028	10,500~11,500	250~280	0.008~0.020	6,300~8,050	100~115	0.005~0.012	22,500~34,000	810~1,300	0.018~0.048
1.2	10,450~17,600	350~590	0.025~0.070	9,100~10,000	250~280	0.015~0.042	5,400~7,000	100~115	0.009~0.026	22,500~31,500	950~1,350	0.036~0.101
1.5	9,100~17,600	430~830	0.017~0.077	7,000~8,000	250~280	0.012~0.055	4,300~5,500	100~115	0.007~0.033	14,500~25,000	770~1,320	0.028~0.132
2.0	6,350~10,550	340~570	0.021~0.140	6,100~6,700	270~300	0.015~0.100	3,600~4,700	100~120	0.009~0.060	11,500~18,500	770~1,250	0.036~0.240
3.0	4,300~7,050	550~900	0.056~0.210	3,990~4,600	445~515	0.040~0.150	2,400~3,200	105~310	0.024~0.090	9,000~13,000	1,400~2,110	0.096~0.360
4.0	3,200~5,300	400~675	0.074~0.280	3,000~3,400	335~380	0.053~0.200	1,800~2,400	75~230	0.032~0.120	6,750~9,750	1,050~1,575	0.128~0.480

Application tip

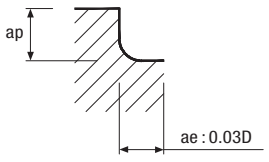


H-Star Endmill

ESLNR series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
0.2	0.05	0.5	0.020	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.014	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.008	50,000	240	45,900	202	45,900	170	45,900	153
		2	0.008	42,000	202	36,700	176	36,700	162	36,700	147
0.3	0.05	1	0.021	50,000	585	50,000	456	50,000	336	50,000	320
		1.5	0.016	50,000	585	45,000	456	45,000	336	45,000	320
		2	0.012	45,000	530	45,000	420	45,000	300	45,000	290
		2.5	0.010	40,000	471	40,000	373	40,000	267	40,000	258
		3	0.008	35,000	412	35,000	326	30,000	200	30,000	194
0.4	0.05	1	0.025	50,000	580	50,000	461	40,000	320	36,000	270
		1.5	0.020	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.016	45,000	520	45,000	410	36,000	290	34,000	240
		2.5	0.015	40,500	480	40,500	370	33,400	270	30,600	220
		3	0.014	40,000	410	40,000	330	32,800	240	25,600	200
		3.5	0.012	36,000	380	36,000	300	29,400	200	22,920	180
		4	0.008	30,000	320	30,000	250	21,600	160	19,200	150
	0.1	2	0.028	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.016	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.010	30,000	320	30,000	250	21,600	160	19,200	150
0.5	0.05	1	0.030	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.023	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.017	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.017	40,000	820	32,000	378	24,000	279	20,000	234
		5	0.011	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.008	28,800	480	19,400	260	18,000	250	15,000	200
	0.1	1	0.035	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.030	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.020	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.020	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.013	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.013	28,800	480	19,400	260	18,000	250	15,000	200
0.6	0.1	2	0.035	50,000	1,159	37,830	600	28,200	390	23,000	320
		4	0.024	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.013	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193

Application tip

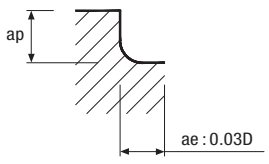


- Please adjust the cutting depth index according to the cutting depth factors of above table.
- In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

ESLNR series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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	0.2	6	0.08	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.07	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		12	0.04	15,309	1,083	13,013	921	11,482	722	10,716	590
		16	0.04	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.035	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.025	11,907	843	10,121	716	8,930	562	8,335	459
		30	0.017	11,312	800	9,615	680	8,484	534	7,918	436
	0.3	8	0.09	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.06	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.037	11,907	936	10,121	796	8,930	624	8,335	510
	0.5	6	0.017	20,709	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.014	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		12	0.08	15,309	1,204	13,013	1,023	11,482	802	10,716	655
		16	0.08	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.05	11,907	936	10,121	796	8,930	624	8,335	510
		25	0.05	11,907	936	10,121	796	8,930	624	8,335	510
		30	0.03	11,312	889	9,615	756	8,484	593	7,918	484
	0.8	8	0.2	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.1	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.06	11,907	936	10,121	796	8,930	624	8,335	510
3	0.2	8	0.09	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.07	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.05	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.05	11,664	1,146	9,914	974	8,748	764	8,165	624
		30	0.04	9,072	1,146	7,711	974	6,804	764	6,350	624
		35	0.035	9,072	1,146	7,711	974	6,804	764	6,350	624
	0.3	8	0.13	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.075	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.075	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.06	9,072	1,274	7,711	1,083	6,804	849	6,350	693
	0.5	8	0.18	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		12	0.13	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.1	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.1	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.08	9,072	1,274	7,711	1,083	6,804	849	6,350	693
		35	0.065	9,072	1,274	7,711	1,083	6,804	849	6,350	693

Application tip



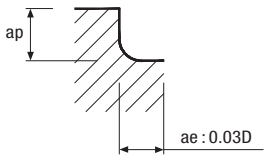
- Please adjust the cutting depth index according to the cutting depth factors of above table.
- In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

H-Star Endmill

ESLNR series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
0.8	0.1	4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
1	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.015	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.009	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.07	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.040	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.040	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.010	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	6	0.040	26,244	990	22,307	842	19,683	660	18,371	539
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.010	13,608	399	11,567	315	10,206	257	9,526	200
1.5	0.1	4	0.042	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.036	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.036	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.018	14,112	568	11,995	423	10,584	373	9,878	298
	0.2	4	0.070	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.060	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.060	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.030	14,112	568	11,995	423	10,584	373	9,878	298
	0.3	8	0.060	22,680	1,027	19,278	873	17,010	685	15,876	559
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.030	14,112	568	11,995	423	10,584	373	9,878	298

Application tip

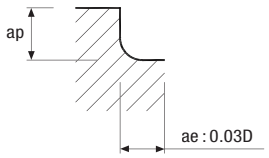


- Please adjust the cutting depth index according to the cutting depth factors of above table.
- In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

ESTNR series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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)
0.2	0.05	2	0.007	39,660	887	33,660	754	29,700	591	27,720	483
0.4	0.05	4	0.009	30,096	899	25,582	764	22,572	599	21,067	489
		5	0.007	26,752	710	22,739	528	20,064	466	18,726	373
	0.1	4	0.009	31,680	946	26,928	804	23,760	631	22,176	515
		5	0.007	28,160	747	23,936	556	21,120	490	19,712	392
0.5	0.1	5	0.013	30,413	1,090	25,851	753	22,810	562	21,289	453
		8	0.008	24,330	678	20,681	468	18,248	350	17,031	282
		10	0.007	18,248	509	15,511	351	13,686	262	12,773	211
0.6	0.1	12	0.01	20,377	791	17,320	546	15,282	408	14,264	329
		15	0.006	16,727	649	14,218	448	12,545	335	11,709	270
0.8	0.2	6	0.045	31,680	1,084	26,928	921	23,760	723	22,176	590
		12	0.02	28,160	943	23,936	695	21,120	613	19,712	490
1	0.2	8	0.04	28,512	1,463	24,235	1,244	21,384	976	19,958	797
		10	0.035	28,512	1,596	24,235	1,357	21,384	1,064	19,958	869
		15	0.028	25,344	1,261	21,542	938	19,008	828	17,741	662
		20	0.02	19,008	828	16,157	653	14,256	532	13,306	414
		25	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		30	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		35	0.01	15,840	690	13,464	544	11,880	443	11,088	345
	0.3	8	0.04	28,512	1,463	24,235	1,244	21,384	976	19,958	797
		15	0.028	25,344	1,261	21,542	938	19,008	828	17,741	662
		25	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		30	0.017	15,840	690	13,464	544	11,880	443	11,088	345
1.5	0.2	10	0.05	21,683	1,079	18,431	803	16,262	708	15,178	567
		15	0.045	19,712	981	16,755	730	14,784	644	13,798	515
		20	0.042	17,347	863	14,745	642	13,010	567	12,143	453
		25	0.032	14,784	644	12,566	508	11,088	414	10,349	322
		30	0.028	12,320	536	10,472	423	9,240	345	8,624	268
	0.3	10	0.05	21,683	1,079	18,431	803	16,262	708	15,178	567
		20	0.042	17,347	863	14,745	642	13,010	567	12,143	453
		25	0.032	14,784	644	12,566	508	11,088	414	10,349	322
		30	0.028	12,320	536	10,472	423	9,240	345	8,624	268

Application tip



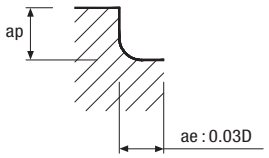
- Please adjust the cutting depth index according to the cutting depth factors of above table.
- In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

H-Star Endmill

ESTNR series

Workpiece				Carbon steels, Alloy steels 180~250HB		Pre-hardened steels HRC35~45		Hardened steels HRC45~55		High-hardened steels HRC55~65	
Ratio to standard depth of cut				Depth of Cut × 100%		Depth of Cut × 80%		Depth of Cut × 65%		Depth of Cut × 60%	
Diameter (Ø)	Corner R (mm)	Neck length (mm)	Depth of Cut (mm)	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	0.2	30	0.045	13,440	1,254	11,424	933	10,080	823	9,408	658
		40	0.035	10,080	823	8,568	650	7,560	529	7,056	412
		50	0.017	8,400	686	7,140	541	6,300	441	5,880	343
	0.3	12	0.088	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		20	0.054	18,144	1,452	15,422	1,141	13,608	953	12,701	838
		30	0.045	13,440	1,393	11,424	1,036	10,080	914	9,408	732
		40	0.035	10,080	914	8,568	722	7,560	588	7,056	457
		50	0.017	8,400	762	7,140	601	6,300	490	5,880	381
	0.5	8	0.170	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		12	0.088	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		16	0.088	19,278	1,542	16,386	1,213	14,459	1,012	13,495	891
		20	0.054	18,114	1,452	15,422	1,141	13,608	953	12,701	838
		25	0.054	15,876	1,270	13,495	999	11,907	833	11,113	733
		30	0.045	13,440	1,393	11,424	1,036	10,080	914	9,408	732
		40	0.035	10,080	914	8,568	722	7,560	588	7,056	457
		50	0.017	8,400	762	7,140	601	6,300	490	5,880	381
3	0.2	40	0.070	10,240	956	8,704	711	7,680	627	7,168	502
		50	0.050	7,680	627	6,528	495	5,760	403	5,376	314
		60	0.030	6,400	523	5,440	412	4,800	336	4,480	261
	0.3	40	0.070	10,240	1,062	8,704	790	7,680	697	7,168	557
		50	0.050	7,680	697	6,528	550	5,760	448	5,376	348
		60	0.030	6,400	581	5,440	458	4,800	373	4,480	290
	0.5	40	0.070	10,240	1,062	8,704	790	7,680	697	7,168	557
		50	0.050	7,680	697	6,528	550	5,760	448	5,376	348
		60	0.030	6,400	581	5,440	458	4,800	373	4,480	290

Application tip



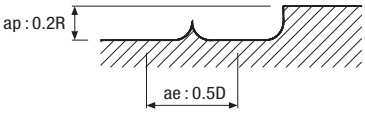
- Please adjust the cutting depth index according to the cutting depth factors of above table.
- In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

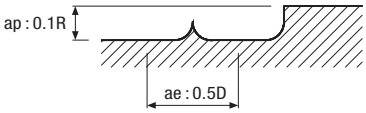
ESPM4 series

Side cutting

Workpiece	Hardened steels Heat resistant alloy		Hardened steels							
Conditions	~HRC40		HRC40~50		HRC50~55		HRC55~60		HRC60~65	
Diameter (Ø) × R (mm)	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)
3 × R0.5	9,550	6,500	6,900	4,150	4,550	2,750	2,850	1,150	1,900	610
4 × R0.5	7,950	7,000	5,750	4,600	4,000	3,200	2,550	1,350	1,750	700
6 × R0.5	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
6 × R1.0	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
8 × R1.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
8 × R2.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
10 × R1.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
10 × R2.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
12 × R2.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795
12 × R3.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795

Application tip



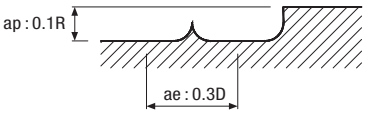


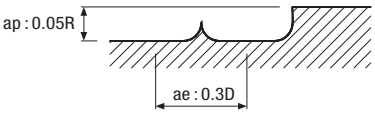
ESPM4 series

High Speed Cutting

Workpiece	Hardened steels Heat resistant alloy		Hardened steels							
Conditions	~HRC40		HRC40~50		HRC50~55		HRC55~60		HRC60~65	
Diameter (Ø) × R (mm)	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)
3 × R0.5	22,000	16,000	17,000	10,000	12,500	8,000	9,500	4,600	6,900	2,500
4 × R0.5	17,000	17,500	13,000	12,000	11,000	9,200	8,000	5,500	5,600	2,900
6 × R0.5	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
6 × R1.0	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
8 × R1.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
8 × R2.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
10 × R1.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
10 × R2.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
12 × R2.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600
12 × R3.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600

Application tip



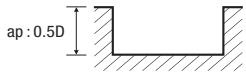


U-Star Endmill

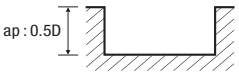
UE502, UXE502 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Stainless steels (SUS)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45				HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²				1500~2000N/mm²	
Diameter(Ø)	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)
2.0	11,560	190	7,560	120	6,300	90	5,040	35
3.0	8,920	210	5,560	140	4,620	120	3,360	40
4.0	7,560	300	4,620	180	3,880	150	2,940	40
5.0	6,300	320	3,780	190	3,160	160	2,320	50
6.0	5,560	350	3,360	220	2,840	180	2,000	55
8.0	4,200	380	2,520	200	2,100	180	1,680	75
10.0	3,260	330	2,000	160	1,680	160	1,360	60
12.0	2,740	280	1,680	130	1,360	130	1,160	55
16.0	2,200	220	1,360	110	1,060	110	900	40
20.0	1,680	170	1,060	80	840	80	680	30
25.0	1,360	130	840	70	680	60	540	20

Application tip



(ap : UP to Ø3 : 0.2D)



UE512 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.1	0.3	50000	315	0.009	46200	230	0.007	40600	170	0.005
0.1	0.5	50000	315	0.006	46200	230	0.005	40600	170	0.004
0.1	1	45000	255	0.002	41580	185	0.002	36540	140	0.001
0.2	0.5	38500	380	0.018	36300	270	0.014	32100	200	0.01
0.2	1	38500	380	0.013	36300	270	0.010	32100	200	0.007
0.2	1.5	34650	310	0.007	32670	220	0.006	28890	160	0.004
0.2	2	34650	310	0.005	32670	220	0.004	28890	160	0.003
0.3	1	34200	390	0.019	32300	270	0.015	28500	230	0.011
0.3	1.5	34200	390	0.019	32300	270	0.015	25800	230	0.011
0.3	2	30780	315	0.011	29070	220	0.008	25650	185	0.006
0.3	2.5	30780	315	0.007	29070	220	0.005	25650	185	0.004
0.3	3	30780	315	0.007	29070	220	0.005	25650	185	0.004
0.3	4	27360	250	0.004	25840	175	0.003	22800	145	0.002
0.3	5	20520	165	0.003	19380	115	0.002	17100	95	0.002
0.4	1	27400	540	0.036	25800	380	0.028	22800	280	0.02
0.4	1.5	27400	540	0.025	25800	380	0.020	22800	280	0.014
0.4	2	27400	540	0.025	25800	380	0.020	22800	280	0.014
0.4	2.5	24660	435	0.014	23220	310	0.011	20520	225	0.008
0.4	3	24660	435	0.014	23220	310	0.011	20520	225	0.008
0.4	4	24660	435	0.009	23220	310	0.007	20520	225	0.005
0.4	5	21920	345	0.009	20640	245	0.007	18240	180	0.005
0.4	6	21920	345	0.005	20640	245	0.004	18240	180	0.003
0.4	8	16440	225	0.004	15480	160	0.003	13680	120	0.002
0.4	10	8220	95	0.004	7740	70	0.003	6840	50	0.002
0.5	1	27400	540	0.045	25800	425	0.035	22800	285	0.025
0.5	1.5	27400	540	0.045	25800	425	0.035	22800	285	0.025
0.5	2	27400	540	0.032	25800	425	0.025	22800	285	0.018
0.5	2.5	27400	540	0.032	25800	425	0.025	22800	285	0.018
0.5	3	24660	435	0.018	23220	345	0.014	20520	230	0.01
0.5	4	24660	435	0.018	23220	345	0.014	20520	230	0.01
0.5	5	24660	435	0.011	23220	345	0.009	20520	230	0.006
0.5	6	21920	345	0.011	20640	270	0.009	18240	180	0.006
0.5	8	16440	225	0.007	15480	180	0.005	13680	120	0.004
0.5	10	16440	225	0.005	15480	180	0.004	13680	120	0.003
0.5	12	8220	95	0.005	7740	75	0.004	6840	50	0.003
0.5	14	8220	95	0.005	7740	75	0.004	6840	50	0.003
0.5	16	2740	25	0.005	2580	20	0.004	2280	15	0.003
0.6	2	27400	775	0.038	25800	545	0.029	22800	405	0.021
0.6	3	27400	775	0.038	25800	545	0.029	22800	405	0.021
0.6	4	24660	630	0.022	23220	440	0.017	20520	330	0.012
0.6	5	24660	630	0.014	23220	440	0.011	20520	330	0.008
0.6	6	24660	630	0.014	23220	440	0.011	20520	330	0.008
0.6	8	21920	495	0.008	20640	350	0.006	18240	260	0.005

U-Star Endmill

UE512 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.6	10	16440	325	0.005	15480	230	0.004	13680	170	0.003
0.6	12	16440	325	0.005	15480	230	0.004	13680	170	0.003
0.6	14	8220	140	0.005	7740	100	0.004	6840	75	0.003
0.6	16	8220	140	0.005	7740	100	0.004	6840	75	0.003
0.7	2	27400	775	0.063	25800	545	0.049	22800	405	0.035
0.7	4	24660	630	0.025	23220	440	0.020	20520	330	0.014
0.7	6	24660	630	0.016	23220	440	0.012	20520	330	0.009
0.7	8	21920	495	0.016	20640	350	0.012	18240	260	0.009
0.7	10	21920	495	0.009	20640	350	0.007	18240	260	0.005
0.7	12	16440	325	0.009	15480	230	0.005	13680	170	0.004
0.8	2	27400	775	0.072	25800	605	0.056	22800	450	0.040
0.8	3	27400	775	0.050	25800	605	0.039	22800	450	0.028
0.8	4	27400	775	0.050	25800	605	0.039	22800	450	0.028
0.8	5	24660	630	0.029	23220	490	0.022	20520	365	0.016
0.8	6	24660	630	0.029	23220	490	0.022	20520	365	0.016
0.8	8	24660	630	0.018	23220	490	0.014	20520	365	0.010
0.8	10	21920	495	0.018	20640	385	0.014	18240	290	0.01
0.8	12	21920	495	0.011	20640	385	0.008	18240	290	0.006
0.8	14	16440	325	0.007	15480	255	0.006	13680	190	0.004
0.8	16	16440	325	0.007	15480	255	0.006	13680	190	0.004
0.8	20	8220	140	0.007	7740	110	0.006	6840	80	0.004
0.9	6	22140	575	0.032	20970	440	0.025	18450	330	0.018
0.9	8	22140	575	0.020	20970	440	0.016	18450	330	0.011
0.9	10	19680	455	0.020	18640	350	0.016	16400	260	0.011
1.0	2	24600	1045	0.090	23300	890	0.070	20500	665	0.050
1.0	3	24600	1045	0.090	23300	890	0.070	20500	665	0.050
1.0	4	24600	1045	0.063	23300	890	0.049	20500	665	0.035
1.0	5	24600	1045	0.063	23300	890	0.049	20500	665	0.035
1.0	6	22140	845	0.036	20970	720	0.028	18450	540	0.020
1.0	7	22140	845	0.036	20970	720	0.028	18450	540	0.020
1.0	8	22140	845	0.036	20970	720	0.028	18450	540	0.020
1.0	10	22140	845	0.023	20970	720	0.018	18450	540	0.013
1.0	12	19680	670	0.023	18640	570	0.018	16400	425	0.013
1.0	14	19680	670	0.014	18640	570	0.011	16400	425	0.008
1.0	16	14760	440	0.014	13980	375	0.011	12300	280	0.008
1.0	18	14760	440	0.009	13980	375	0.007	12300	280	0.005
1.0	20	14760	440	0.009	13980	375	0.007	12300	280	0.005
1.0	22	7380	190	0.009	6990	160	0.007	6150	120	0.005
1.0	26	7380	190	0.009	6990	160	0.007	6150	120	0.005
1.0	30	7380	190	0.009	6990	160	0.007	6150	120	0.005
1.0	40	2460	50	0.009	2330	45	0.007	2050	35	0.005
1.0	50	2460	50	0.006	2330	45	0.005	2050	35	0.003
1.2	4	21900	930	0.076	20700	720	0.059	18200	485	0.042

UE512 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
1.2	6	21900	930	0.076	20700	720	0.059	18200	485	0.042
1.2	8	19710	755	0.043	18630	585	0.034	16380	395	0.024
1.2	10	19710	755	0.027	18630	585	0.021	16380	395	0.015
1.2	12	19710	755	0.027	18630	585	0.021	16380	395	0.015
1.2	14	17520	595	0.027	16560	460	0.021	14560	310	0.015
1.2	16	17520	595	0.016	16560	460	0.013	14560	310	0.009
1.2	20	13140	390	0.011	12420	300	0.008	10920	205	0.006
1.2	26	6570	165	0.011	6210	130	0.008	5460	85	0.006
1.2	30	6570	165	0.011	6210	130	0.008	5460	85	0.006
1.4	6	19200	815	0.088	18100	570	0.069	16000	425	0.049
1.4	8	17280	660	0.050	16290	460	0.039	14400	345	0.028
1.4	10	17280	660	0.050	16290	460	0.039	14400	345	0.028
1.4	14	17280	660	0.032	16290	460	0.025	14400	345	0.018
1.4	16	15360	520	0.032	14480	365	0.025	12800	270	0.018
1.4	20	15360	520	0.019	14480	365	0.015	12800	270	0.011
1.5	4	19200	905	0.135	18100	635	0.105	16000	475	0.075
1.5	5	19200	905	0.095	18100	635	0.074	16000	475	0.053
1.5	6	19200	905	0.095	18100	635	0.074	16000	475	0.053
1.5	7	19200	905	0.095	18100	635	0.074	16000	475	0.053
1.5	8	17280	735	0.054	16290	515	0.042	14400	385	0.030
1.5	10	17280	735	0.054	16290	515	0.042	14400	385	0.03
1.5	12	17280	735	0.054	16290	515	0.042	14400	385	0.030
1.5	14	17280	735	0.034	16290	515	0.026	14400	385	0.019
1.5	16	15360	580	0.034	14480	405	0.026	12800	305	0.019
1.5	18	15360	580	0.034	14480	405	0.026	12800	305	0.019
1.5	20	15360	580	0.020	14480	405	0.016	12800	305	0.011
1.5	22	15360	580	0.020	14480	405	0.016	12800	305	0.011
1.5	26	11520	380	0.014	10860	265	0.011	9600	200	0.008
1.5	30	11520	380	0.014	10860	265	0.011	9600	200	0.008
1.6	8	17800	840	0.101	16800	655	0.078	14800	490	0.056
1.6	10	16020	680	0.058	15120	530	0.045	13320	395	0.032
1.6	12	16020	680	0.058	15120	530	0.045	13320	395	0.032
1.6	16	16020	680	0.036	15120	530	0.028	13320	395	0.020
1.6	20	14240	540	0.036	13440	420	0.028	11840	315	0.020
1.8	8	17800	840	0.113	16800	655	0.088	14800	490	0.063
1.8	10	16020	680	0.065	15120	530	0.050	13320	395	0.036
1.8	12	16020	680	0.065	15120	530	0.050	13320	395	0.036
1.8	16	16020	680	0.041	15120	530	0.032	13320	395	0.023
1.8	20	14240	540	0.041	13440	420	0.032	11840	315	0.023
2.0	6	14400	820	0.180	13600	620	0.140	12000	475	0.100
2.0	8	14400	820	0.126	13600	620	0.098	12000	475	0.070
2.0	10	14400	820	0.126	13600	620	0.098	12000	475	0.070
2.0	12	12960	665	0.072	12240	500	0.056	10800	385	0.040

U-Star Endmill

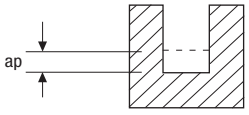
UE512 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
2.0	14	12960	665	0.072	12240	500	0.056	10800	385	0.040
2.0	16	12960	665	0.072	12240	500	0.056	10800	385	0.040
2.0	18	12960	665	0.045	12240	500	0.035	10800	385	0.025
2.0	20	12960	665	0.045	12240	500	0.035	10800	385	0.025
2.0	22	11520	525	0.045	10880	395	0.035	9600	305	0.025
2.0	26	11520	525	0.045	10880	395	0.035	9600	305	0.025
2.0	30	11520	525	0.027	10880	395	0.021	9600	305	0.015
2.0	35	8640	345	0.018	8160	260	0.014	7200	200	0.010
2.0	40	8640	345	0.018	8160	260	0.014	7200	200	0.010
2.0	45	4320	150	0.018	4080	110	0.014	3600	85	0.010
2.0	50	4320	150	0.018	4080	110	0.014	3600	85	0.010
2.0	60	4320	150	0.018	4080	110	0.014	3600	85	0.010
2.5	8	12300	970	0.158	11600	680	0.123	10300	510	0.088
2.5	10	12300	970	0.158	11600	680	0.123	10300	510	0.088
2.5	12	12300	970	0.158	11600	680	0.123	10300	510	0.088
2.5	14	11070	785	0.090	10440	550	0.070	9270	415	0.050
2.5	16	11070	785	0.090	10440	550	0.070	9270	415	0.050
2.5	18	11070	785	0.090	10440	550	0.070	9270	415	0.050
2.5	20	11070	785	0.090	10440	550	0.070	9270	415	0.050
2.5	22	11070	785	0.056	10440	550	0.044	9270	415	0.031
2.5	26	9840	620	0.056	9280	435	0.044	8240	325	0.031
2.5	30	9840	620	0.056	9280	435	0.044	8240	325	0.031
2.5	35	9840	620	0.034	9280	435	0.026	8240	325	0.019
2.5	40	7380	405	0.034	6960	285	0.026	6180	215	0.019
2.5	45	7380	405	0.023	6960	285	0.018	6180	215	0.013
2.5	50	7380	405	0.023	6960	285	0.018	6180	215	0.013
3.0	6	10900	860	0.270	10300	605	0.210	6600	450	0.150
3.0	8	10900	860	0.270	10300	605	0.210	6600	450	0.150
3.0	10	10900	860	0.189	10300	605	0.147	6600	450	0.105
3.0	12	10900	860	0.189	10300	605	0.147	6600	450	0.105
3.0	14	10900	860	0.189	10300	605	0.147	6600	450	0.105
3.0	16	9810	695	0.108	9270	490	0.084	5940	365	0.060
3.0	18	9810	695	0.108	9270	490	0.084	5940	365	0.060
3.0	20	9810	695	0.108	9270	490	0.084	5940	365	0.060
3.0	22	9810	695	0.108	9270	490	0.084	5940	365	0.060
3.0	26	9810	695	0.068	9270	490	0.053	5940	365	0.038
3.0	30	9810	695	0.068	9270	490	0.053	5940	365	0.038
3.0	35	8720	550	0.068	8240	385	0.053	5280	290	0.038
3.0	40	8720	550	0.041	8240	385	0.032	5280	290	0.023
3.0	45	8720	550	0.041	8240	385	0.032	5280	290	0.023
3.0	50	6540	360	0.027	6180	255	0.021	3960	190	0.015
3.0	60	6540	360	0.027	6180	255	0.021	3960	190	0.015
4.0	8	8000	1300	0.360	7600	1160	0.280	6700	770	0.200

UE512 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
4.0	10	8000	1300	0.360	7600	1160	0.280	6700	770	0.200
4.0	12	8000	1300	0.360	7600	1160	0.280	6700	770	0.200
4.0	14	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
4.0	16	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
4.0	18	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
4.0	20	8000	1300	0.252	7600	1160	0.196	6700	770	0.140
4.0	22	7200	1055	0.144	6840	940	0.112	6030	625	0.080
4.0	26	7200	1055	0.144	6840	940	0.112	6030	625	0.080
4.0	30	7200	1055	0.144	6840	940	0.112	6030	625	0.080
4.0	35	7200	1055	0.090	6840	940	0.070	6030	625	0.050
4.0	40	7200	1055	0.090	6840	940	0.070	6030	625	0.050
4.0	45	6400	830	0.090	6080	740	0.070	5360	495	0.050
4.0	50	6400	830	0.090	6080	740	0.070	5360	495	0.050
4.0	60	6400	830	0.054	6080	740	0.042	5360	495	0.030
5.0	16	6400	1155	0.315	6100	900	0.245	5400	605	0.175
5.0	20	6400	1155	0.315	6100	900	0.245	5400	605	0.175
5.0	26	5760	935	0.180	5490	730	0.140	4860	490	0.100
5.0	30	5760	935	0.180	5490	730	0.140	4860	490	0.100
5.0	35	5760	935	0.180	5490	730	0.140	4860	490	0.100
5.0	40	5760	935	0.180	5490	730	0.140	4860	490	0.100
5.0	50	5760	935	0.113	5490	730	0.088	4860	490	0.063
5.0	60	5120	740	0.113	4880	575	0.088	4320	385	0.063
6.0	15	5300	1055	0.540	5000	820	0.420	4400	550	0.300
6.0	20	5300	1055	0.378	5000	820	0.294	4400	550	0.210
6.0	30	5300	1055	0.378	5000	820	0.294	4400	550	0.210
6.0	32	4770	855	0.216	4500	665	0.168	3960	445	0.120
8.0	25	4000	950	0.504	3800	750	0.392	3300	500	0.280
8.0	30	4000	950	0.504	3800	750	0.392	3300	500	0.280
8.0	42	3600	770	0.288	3400	605	0.224	2950	405	0.160
10	30	3200	900	0.900	3050	680	0.700	2630	400	0.500
10	35	3200	900	0.630	3050	680	0.490	2630	400	0.350
10	45	3200	900	0.630	3050	680	0.490	2630	400	0.350
12	35	2650	800	1.080	2520	600	0.840	2180	350	0.600
12	40	2650	800	0.756	2520	600	0.588	2180	350	0.420
12	50	2650	800	0.756	2520	600	0.588	2180	350	0.420

Application tip

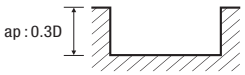


U-Star Endmill

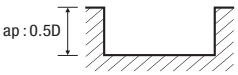
UE522 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	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)
2.0	6,300	60	5,040	50	3,150	25
3.0	4,410	70	3,570	60	2,200	30
4.0	3,570	85	2,840	70	1,790	35
5.0	3,050	105	2,420	85	1,580	40
6.0	2,630	125	2,100	105	1,370	50
8.0	2,000	135	1,580	105	1,050	50
10.0	1,680	135	1,370	105	840	50
12.0	1,370	105	1,160	95	700	40
16.0	1,160	95	890	75	560	35
20.0	840	70	680	50	420	25

Application tip



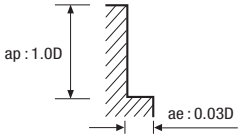
(ap : UP to Ø3.0 : 0.4mm)



UE504H series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	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)
1.0	45,000	750	37,000	560	23,000	300
2.0	23,500	800	18,000	540	12,000	360
3.0	15,750	810	12,600	580	8,280	380
4.0	12,150	830	9,540	600	6,345	400
6.0	9,450	900	7,470	640	4,950	440
8.0	7,110	860	5,625	620	3,780	410
10.0	5,580	800	4,410	570	2,925	380
12.0	4,770	800	3,780	570	2,520	380
16.0	3,600	810	2,900	570	2,000	400
20.0	3,000	810	2,300	570	1,600	400

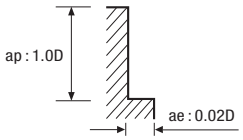
Application tip



UE514 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Stainless steels (SUS)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45				HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²				1500~2000N/mm²	
Diameter(Ø)	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)
1.0	22,000	310	13,500	180	10,750	140	8,500	50
1.5	17,000	320	10,700	190	8,500	150	6,500	50
2.0	13,900	330	9,070	200	7,560	165	6,000	60
2.5	12,000	350	7,600	220	6,000	180	4,500	60
3.0	10,700	380	6,670	240	5,110	200	4,030	70
4.0	9,070	680	5,540	420	4,650	330	3,530	70
5.0	7,560	720	4,530	430	3,800	360	2,780	85
6.0	6,670	790	4,030	490	3,400	390	2,400	95
8.0	5,040	850	3,020	450	2,520	420	2,010	130
10.0	3,910	730	2,400	360	2,010	360	1,630	105
12.0	3,300	620	2,010	300	1,630	280	1,400	95

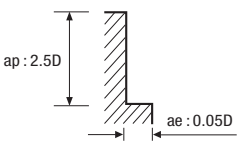
Application tip

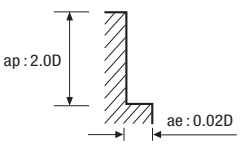


UE524 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
2.0	6,300	100	5,040	80	3,150	45
3.0	4,410	115	3,570	100	2,200	55
4.0	3,570	140	2,840	115	1,790	60
5.0	3,050	180	2,420	140	1,580	70
6.0	2,630	215	2,100	180	1,370	90
8.0	2,000	230	1,580	180	1,050	90
10.0	1,680	230	1,370	180	840	90
12.0	1,370	180	1,160	160	700	70
16.0	1,160	160	890	125	560	60
20.0	840	115	680	90	420	45

Application tip





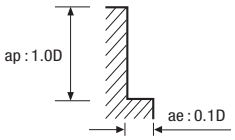
U-Star Endmill

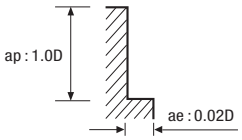
ULE504 series

General processing

Workpiece	Non-ferrous steel Alloy steel, Cast iron		Heat treatment steel				Stainless steel	
Strength	~HRC30		HRC35~45		HRC45~55			
Conditions	~1000N/mm²		1000 ~ 1500N/mm²		1500 ~ 2000N/mm²			
Diameter(Ø)	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)
2.0	12,100	320	7,900	195	2,700	47	6,600	160
3.0	9,400	370	5,840	230	2,000	58	4,850	195
4.0	7,900	655	4,850	405	1,500	58	4,070	320
5.0	6,600	690	3,970	415	1,300	58	3,320	345
6.0	5,830	760	3,530	470	1,150	58	2,980	380
8.0	4,410	815	2,650	435	880	58	2,200	405
10.0	3,420	700	2,100	345	720	46	1,760	345
12.0	2,880	600	1,760	290	590	46	1,430	275
16.0	2,310	470	1,430	230	460	29	1,150	230
20.0	1,760	370	1,110	185	340	29	880	175
25.0	1,430	290	880	150	270	23	715	140

Application tip

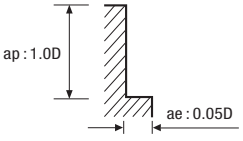




UE504, UXE504 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Stainless steels (SUS)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45				HRC45~55	
Conditions	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	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)
2.0	11,560	280	7,560	170	6,300	140	6,300	5,040
3.0	8,920	320	5,560	200	4,620	170	4,620	3,360
4.0	7,560	570	4,620	350	3,880	280	3,880	2,940
5.0	6,300	600	3,780	360	3,160	300	3,160	2,320
6.0	5,560	660	3,360	410	2,840	330	2,840	2,000
8.0	4,200	710	2,520	380	2,100	350	2,100	1,680
10.0	3,260	610	2,000	300	1,680	300	1,680	1,360
12.0	2,740	520	1,680	250	1,360	240	1,360	1,160
16.0	2,200	410	1,360	200	1,100	300	1,100	900
20.0	1,680	320	1,060	160	840	150	840	680
25.0	1,360	250	840	130	680	120	680	540

Application tip

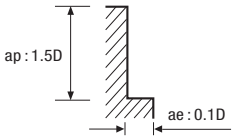


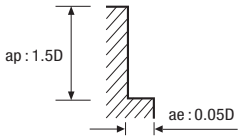
UE506 series

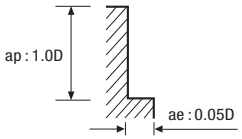
General processing

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
6.0	5,560	2,000	3,880	1,370	1,580	210
8.0	4,200	2,000	2,940	1,370	1,160	210
10.0	3,360	2,000	2,320	1,370	1,000	210
12.0	2,840	1,680	2,000	1,160	840	180
16.0	2,100	1,260	1,480	880	640	130
20.0	1,680	1,010	1,160	690	500	110
25.0	1,500	90	1,100	600	430	90

Application tip





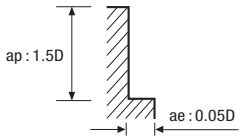


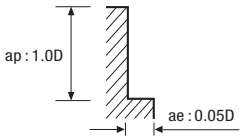
UE506 series

High speed processing

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC45~55	
Conditions	~ 1100N/mm²		1500~2000N/mm²	
Diameter(Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6.0	16,800	6,090	8,400	3,050
8.0	12,600	6,090	6,300	3,050
10.0	9,980	5,990	5,040	3,050
12.0	8,400	5,040	4,200	2,520
16.0	6,300	3,780	3,160	1,890
20.0	5,040	3,050	2,520	1,470
25.0	4,500	2,700	2,200	1,300

Application tip



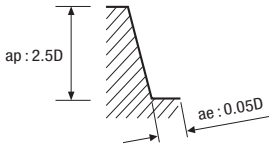


U-Star Endmill

UTE502 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)	
Strength	~HRC35		HRC35~45	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²	
Diameter(Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
0.3	45,000	135	35,000	105
0.4	36,000	144	27,900	113
0.6	25,200	144	18,900	113
0.8	18,000	144	13,950	108
1.0	14,850	149	11,250	113
2.0	7,560	153	5,670	113
3.0	3,969	108	3,213	90
4.0	3,213	126	2,556	104
6.0	2,367	189	1,890	153
8.0	1,800	225	1,422	162
10.0	1,440	225	1,170	167

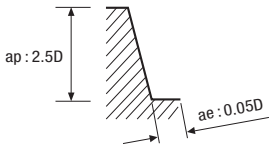
Application tip



UTE504 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)	
Strength	~HRC35		HRC35~45	
Conditions	~ 1100N/mm²		1100 ~ 1500N/mm²	
Diameter(Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
3.0	3,969	216	3,213	180
4.0	3,213	252	2,556	207
6.0	2,367	378	1,890	306
8.0	1,800	450	1,422	324
10.0	1,440	450	1,170	333

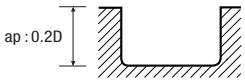
Application tip

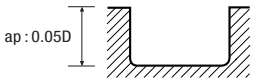


UR502 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
0.2	44,000	145	28,800	60	17,600	40
0.3	41,000	170	27,000	70	16,500	45
0.4	41,000	170	27,000	70	16,500	45
0.5	36,000	190	23,400	80	14,300	50
0.6	30,000	210	19,800	90	12,100	55
0.8	30,000	210	19,800	90	12,100	55
1.0	27,600	240	18,000	100	11,000	60
1.5	22,000	250	13,500	110	8,500	60
2.0	18,000	260	11,560	120	7,200	70
2.5	15,000	270	9,500	130	6,100	70
3.0	13,240	280	8,560	140	5,280	70
4.0	10,720	340	6,820	170	4,300	80
5.0	9,160	420	5,800	200	3,800	100
6.0	7,900	500	5,040	250	3,280	120
8.0	6,000	540	3,800	250	2,520	120
10.0	5,040	540	3,280	250	2,020	120
12.0	4,120	420	2,780	230	1,680	100
16.0	3,100	360	2,100	170	1,280	80
20.0	2,520	280	1,640	120	1,000	60

Application tip



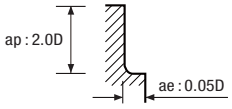


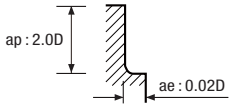
U-Star Endmill

UR504, UR512 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	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)
3.0	4,410	115	3,570	100	2,200	55
4.0	3,570	140	2,840	115	1,790	60
5.0	3,050	180	2,420	140	1,580	70
6.0	2,630	215	2,100	180	1,370	85
8.0	2,000	230	1,580	180	1,050	85
10.0	1,680	230	1,370	180	840	85
12.0	1,370	180	1,160	160	700	70
16.0	1,160	160	890	125	560	60
20.0	840	115	680	90	420	45

Application tip

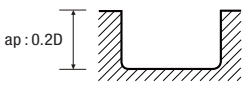


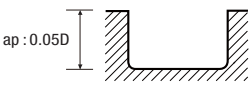


UR542 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	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)
0.2	50,000	170	34,500	75	21,150	45
0.3	50,000	200	32,000	85	20,000	50
0.4	50,000	200	32,000	85	20,000	50
0.5	43,000	220	28,000	95	17,100	60
0.6	36,400	250	24,000	110	14,500	65
0.8	36,400	250	24,000	110	14,500	65
1.0	33,100	280	21,600	120	13,200	70
1.5	26,400	300	16,200	130	10,200	70
2.0	21,600	310	13,800	140	8,640	80
2.5	18,000	320	11,400	150	7,320	80
3.0	15,900	330	10,300	160	6,300	80
4.0	12,800	400	8,200	200	5,150	95
5.0	11,000	500	7,000	240	4,560	120
6.0	9,500	600	6,000	300	3,930	140
8.0	7,200	640	4,550	300	3,020	140
10.0	6,000	640	4,000	300	2,420	140
12.0	5,000	500	3,340	270	2,000	120
16.0	3,720	450	2,520	210	1,540	95
20.0	3,000	330	1,950	140	1,200	70

Application tip

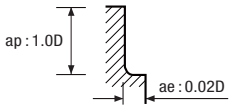




UR544, UXR514 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
1.0	33,100	360	21,600	260	13,200	140
1.5	26,400	370	16,200	270	10,200	140
2.0	21,600	380	13,800	280	8,640	150
2.5	18,000	390	11,400	300	7,320	150
3.0	15,900	400	10,300	310	6,300	150
4.0	12,800	500	8,200	360	5,150	160
5.0	11,000	510	7,000	430	4,560	200
6.0	9,500	510	6,000	430	3,930	200
8.0	7,200	550	4,550	430	3,020	200
10.0	6,000	550	4,000	430	2,420	200
12.0	5,000	430	3,340	380	2,000	160
16.0	3,720	330	2,520	280	1,540	135
20.0	3,000	270	1,950	210	1,200	100

Application tip

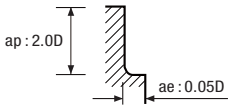


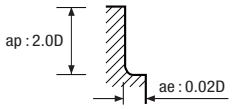
U-Star Endmill

UXR504 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC25		HRC35~45		HRC25~35	
Conditions	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	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)
1.0	27,600	300	18,000	220	11,000	120
1.5	22,000	310	13,500	230	8,500	120
2.0	18,000	320	11,560	240	7,200	130
2.5	15,000	330	9,500	250	6,100	130
3.0	13,240	340	8,560	260	5,280	130
4.0	10,720	420	6,820	300	4,300	140
5.0	9,160	430	5,800	360	3,800	170
6.0	7,900	430	5,040	360	3,280	170
8.0	6,000	460	3,800	360	2,520	170
10.0	5,040	460	3,280	360	2,020	170
12.0	4,120	360	2,780	320	1,680	140
16.0	3,100	280	2,100	230	1,280	115
20.0	2,520	230	1,640	180	1,000	90

Application tip

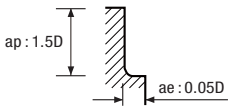


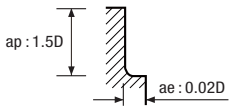


UR506 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC25		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	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)
6.0	14,880	3,210	14,100	2,940	9,600	2,940
8.0	12,000	3,300	11,400	3,000	7,200	2,760
10.0	9,600	2,940	9,300	2,700	5,700	2,460
12.0	7,800	2,700	7,500	2,460	4,800	2,280
16.0	6,000	2,400	5,820	2,220	3,600	2,040
20.0	4,800	2,010	4,680	2,040	2,880	1,920

Application tip



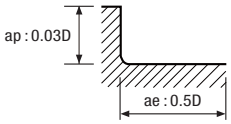


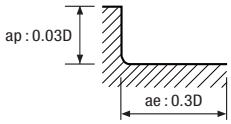
UDR503 series

General processing

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
6.0	5,100	3,500	5,500	3,750	3,850	2,700
8.0	3,800	3,400	4,150	3,700	2,850	2,550
10.0	3,800	3,750	3,600	3,500	2,700	2,700
12.0	3,200	4,200	3,250	4,250	2,250	2,300
16.0	2,400	3,100	2,250	2,900	1,700	1,750
20.0	1,900	2,500	1,800	2,350	1,350	1,400

Application tip



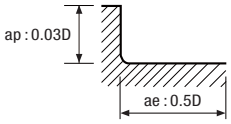


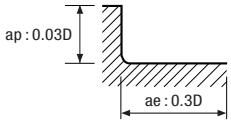
UDR503 series

High speed processing

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
6.0	8,300	5,700	7,650	5,250	6,400	4,550
8.0	6,200	5,550	5,750	5,100	5,250	4,700
10.0	5,750	5,650	5,000	4,900	4,200	4,250
12.0	4,800	6,300	4,150	5,450	3,500	3,650
16.0	3,600	4,700	3,100	4,050	2,650	2,700
20.0	2,900	3,750	2,500	3,250	2,100	2,150

Application tip



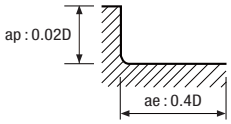


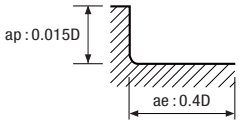
U-Star Endmill

USPM4 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	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)
1.0	49000	7650	40000	6500	35000	5750
1.5	37000	8550	30000	7200	27000	6400
2.0	29700	9000	24300	7560	21600	6750
3.0	19800	9900	16200	8100	14400	7650
4.0	15300	10800	12600	8550	10800	7920
6.0	9900	11700	8100	9900	7200	8640
8.0	7380	11700	6300	9900	5400	8640
10.0	5850	10800	4950	9000	4320	8550
12.0	4950	10800	4140	9000	3690	8100
16.0	3690	9000	3060	7920	2700	7020
20.0	2970	7200	2430	6300	2160	5670

Application tip

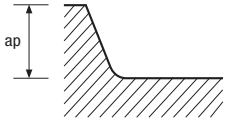




UTR504 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength	~HRC35			HRC35~45			HRC45~55		
Conditions	~1100N/mm²			1100 ~ 1500N/mm²			1500 ~ 2000N/mm²		
Diameter(Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	Ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	Ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	Ap (mm)
0.4	40,000	630	0.008~0.016	32,000	450	0.008~0.012	22,000	270	0.004~0.008
0.6	30,000	630	0.012~0.024	23,000	450	0.012~0.018	15,000	270	0.006~0.012
0.8	22,500	630	0.016~0.032	17,000	450	0.016~0.024	11,500	270	0.008~0.016
1.0	18,000	630	0.020~0.040	13,500	450	0.020~0.030	9,000	270	0.010~0.020
1.2	14,400	630	0.025~0.050	11,700	450	0.025~0.040	7,200	270	0.012~0.025
1.5	11,700	630	0.030~0.060	9,000	450	0.030~0.050	5,850	270	0.015~0.030
2.0	9,000	630	0.040~0.080	7,200	450	0.040~0.060	4,500	270	0.020~0.040

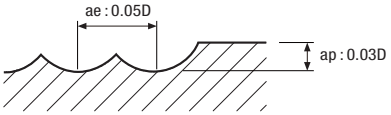
Application tip



UB502---P series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
0.1	40,000	550	40,000	500	33,000	400
0.2	30,000	720	30,000	630	27,000	575
0.3	30,000	900	30,000	810	27,000	720
0.4	30,000	1,140	30,000	1,020	27,000	900
0.5	30,000	1,440	30,000	1,260	27,000	1,140
0.6	30,000	1,740	30,000	1,500	27,000	1,320
0.8	30,000	2,340	30,000	1,980	27,000	1,800
1.0	30,000	2,880	30,000	2,520	27,000	2,280
1.2	30,000	3,060	28,800	2,580	25,800	2,310
1.5	30,000	3,240	28,800	2,700	25,800	2,400
2.0	29,820	3,420	28,680	2,880	24,000	2,400
3.0	19,860	3,600	19,080	3,180	15,900	2,400
4.0	14,940	3,600	14,340	3,180	12,000	2,400
5.0	11,160	3,480	10,680	2,940	9,000	2,250
6.0	8,340	2,910	8,040	2,460	6,600	1,860
8.0	6,660	2,520	6,420	2,100	5,400	1,620
10.0	5,580	2,220	5,340	1,860	4,500	1,440
12.0	4,170	1,770	4,008	1,500	3,360	1,140
16.0	3,340	1,590	3,210	1,320	2,700	1,020
20.0	2,670	1,410	2,580	1,170	2,160	900
25.0	2,130	1,150	2,060	950	1,730	730

Application tip



U-Star Endmill

UB512, UB512S6 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.1	0.2	50000	240	0.009	50000	215	0.007	50000	190	0.005
0.1	0.3	50000	240	0.009	50000	215	0.007	50000	190	0.005
0.1	0.5	50000	240	0.006	50000	215	0.005	50000	190	0.004
0.1	1	45000	195	0.002	45000	175	0.002	45000	155	0.001
0.2	0.5	50000	335	0.018	50000	310	0.014	43200	260	0.010
0.2	1	50000	335	0.013	50000	310	0.010	43200	260	0.007
0.2	1.5	45000	270	0.007	45000	250	0.006	38880	210	0.004
0.2	2	45000	270	0.005	45000	250	0.004	38880	210	0.003
0.2	3	45000	270	0.003	45000	250	0.003	38880	210	0.002
0.3	1	50000	475	0.019	50000	430	0.015	42800	365	0.011
0.3	1.5	50000	475	0.019	50000	430	0.015	42800	365	0.011
0.3	2	45000	385	0.011	45000	350	0.008	38520	295	0.006
0.3	2.5	45000	385	0.007	45000	350	0.005	38520	295	0.004
0.3	3	45000	385	0.007	45000	350	0.005	38520	295	0.004
0.3	4	40000	305	0.004	40000	275	0.003	34240	235	0.002
0.3	5	30000	200	0.003	30000	180	0.002	25680	155	0.002
0.4	1	41000	490	0.036	38800	425	0.028	34200	340	0.020
0.4	1.5	41000	490	0.025	38800	425	0.020	34200	340	0.014
0.4	2	41000	490	0.025	38800	425	0.020	34200	340	0.014
0.4	2.5	36900	395	0.014	34920	345	0.011	30780	275	0.008
0.4	3	36900	395	0.014	34920	345	0.011	30780	275	0.008
0.4	4	36900	395	0.009	34920	345	0.007	30780	275	0.005
0.4	5	32800	315	0.009	31040	270	0.007	27360	220	0.005
0.4	6	32800	315	0.005	31040	270	0.004	27360	220	0.003
0.4	8	24600	205	0.004	23280	180	0.003	20520	145	0.002
0.4	10	12300	90	0.004	11640	75	0.003	10260	60	0.002
0.5	1	34200	685	0.045	32300	580	0.035	28500	515	0.025
0.5	1.5	34200	685	0.045	32300	580	0.035	28500	515	0.025
0.5	2	34200	685	0.032	32300	580	0.025	28500	515	0.018
0.5	2.5	34200	685	0.032	32300	580	0.025	28500	515	0.018
0.5	3	30780	555	0.018	29070	470	0.014	25650	415	0.010
0.5	4	30780	555	0.018	29070	470	0.014	25650	415	0.010
0.5	5	30780	555	0.011	29070	470	0.009	25650	415	0.006
0.5	6	27360	440	0.011	25840	370	0.009	22800	330	0.006
0.5	8	20520	290	0.007	19380	245	0.005	17100	215	0.004
0.5	10	20520	290	0.005	19380	245	0.004	17100	215	0.003
0.5	12	10260	125	0.005	9690	105	0.004	8550	95	0.003
0.5	14	10260	125	0.005	9690	105	0.004	8550	95	0.003
0.5	16	3420	35	0.005	3230	30	0.004	2850	25	0.003
0.6	1	34200	1025	0.038	32300	840	0.029	28500	685	0.021
0.6	2	34200	1025	0.038	32300	840	0.029	28500	685	0.021
0.6	3	34200	1025	0.038	32300	840	0.029	28500	685	0.021
0.6	4	30780	830	0.022	29070	680	0.017	25650	555	0.012

UB512, UB512S6 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
0.6	5	30780	830	0.014	29070	680	0.011	25650	555	0.008
0.6	6	30780	830	0.014	29070	680	0.011	25650	555	0.008
0.6	8	27360	655	0.008	25840	540	0.006	22800	440	0.005
0.6	10	20520	430	0.005	19380	355	0.004	17100	290	0.003
0.6	12	20520	430	0.005	19380	355	0.004	17100	290	0.003
0.6	14	10260	185	0.005	9690	150	0.004	8550	125	0.003
0.6	16	10260	185	0.005	9690	150	0.004	8550	125	0.003
0.7	2	34200	1130	0.063	32300	930	0.049	28500	765	0.035
0.7	4	30780	915	0.025	29070	755	0.020	25650	620	0.014
0.7	6	30780	915	0.016	29070	755	0.012	25650	620	0.009
0.7	8	27360	725	0.016	25840	595	0.012	22800	490	0.009
0.7	10	27360	725	0.009	25840	595	0.007	22800	490	0.005
0.7	12	20520	475	0.006	19380	390	0.005	17100	320	0.004
0.8	2	34200	1230	0.072	32300	1035	0.056	28500	855	0.040
0.8	3	34200	1230	0.050	32300	1035	0.039	28500	855	0.028
0.8	4	34200	1230	0.050	32300	1035	0.039	28500	855	0.028
0.8	5	30780	995	0.029	29070	840	0.022	25650	695	0.016
0.8	6	30780	995	0.029	29070	840	0.022	25650	695	0.016
0.8	8	30780	995	0.018	29070	840	0.014	25650	695	0.010
0.8	10	27360	785	0.018	25840	660	0.014	22800	545	0.010
0.8	12	27360	785	0.011	25840	660	0.008	22800	545	0.006
0.8	14	20520	515	0.007	19380	435	0.006	17100	360	0.004
0.8	16	20520	515	0.007	19380	435	0.006	17100	360	0.004
0.8	20	10260	220	0.007	9690	185	0.006	8550	155	0.004
0.9	4	29250	1120	0.032	27630	935	0.025	24390	775	0.018
0.9	6	29250	1120	0.032	27630	935	0.025	24390	775	0.018
0.9	8	29250	1120	0.020	27630	935	0.016	24390	775	0.011
0.9	10	26000	885	0.020	24560	740	0.016	21680	610	0.011
1.0	2	30800	1540	0.090	29100	1310	0.070	25700	1075	0.050
1.0	3	30800	1540	0.090	29100	1310	0.070	25700	1075	0.050
1.0	4	30800	1540	0.063	29100	1310	0.049	25700	1075	0.035
1.0	5	30800	1540	0.063	29100	1310	0.049	25700	1075	0.035
1.0	6	27720	1245	0.036	26190	1060	0.028	23130	870	0.020
1.0	7	27720	1245	0.036	26190	1060	0.028	23130	870	0.020
1.0	8	27720	1245	0.036	26190	1060	0.028	23130	870	0.020
1.0	10	27720	1245	0.023	26190	1060	0.018	23130	870	0.013
1.0	12	24640	985	0.023	23280	840	0.018	20560	690	0.013
1.0	14	24640	985	0.014	23280	840	0.011	20560	690	0.008
1.0	16	18480	645	0.014	17460	550	0.011	15420	450	0.008
1.0	18	18480	645	0.009	17460	550	0.007	15420	450	0.005
1.0	20	18480	645	0.009	17460	550	0.007	15420	450	0.005
1.0	22	9240	275	0.009	8730	235	0.007	7710	195	0.005
1.0	26	9240	275	0.009	8730	235	0.007	7710	195	0.005

U-Star Endmill

UB512, UB512S6 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
1.0	30	9240	275	0.009	8730	235	0.007	7710	195	0.005
1.0	40	3080	75	0.009	2910	65	0.007	2570	55	0.005
1.0	50	3080	75	0.006	2910	65	0.005	2570	55	0.003
1.2	4	26300	1375	0.076	24800	1150	0.059	21900	950	0.042
1.2	6	26300	1375	0.076	24800	1150	0.059	21900	950	0.042
1.2	8	23670	1115	0.043	22320	930	0.034	19710	770	0.024
1.2	10	23670	1115	0.027	22320	930	0.021	19710	770	0.015
1.2	12	23670	1115	0.027	22320	930	0.021	19710	770	0.015
1.2	16	21040	880	0.016	19840	735	0.013	17520	610	0.009
1.2	20	15780	580	0.011	14880	485	0.008	13140	400	0.006
1.2	26	7890	245	0.011	7440	205	0.008	6570	170	0.006
1.4	6	21500	1295	0.088	20300	1100	0.069	18000	935	0.049
1.4	8	19350	1050	0.050	18270	890	0.039	16200	755	0.028
1.4	10	19350	1050	0.050	18270	890	0.039	16200	755	0.028
1.4	16	17200	830	0.032	16240	705	0.025	14400	600	0.018
1.5	4	23900	1580	0.135	22600	1355	0.105	20000	1075	0.075
1.5	5	23900	1580	0.095	22600	1355	0.074	20000	1075	0.053
1.5	6	23900	1580	0.095	22600	1355	0.074	20000	1075	0.053
1.5	7	23900	1580	0.095	22600	1355	0.074	20000	1075	0.053
1.5	8	21510	1280	0.054	20340	1100	0.042	18000	870	0.030
1.5	10	21510	1280	0.054	20340	1100	0.042	18000	870	0.03
1.5	12	21510	1280	0.054	20340	1100	0.042	18000	870	0.030
1.5	14	21510	1280	0.034	20340	1100	0.026	18000	870	0.019
1.5	16	19120	1010	0.034	18080	865	0.026	16000	690	0.019
1.5	18	19120	1010	0.034	18080	865	0.026	16000	690	0.019
1.5	20	19120	1010	0.020	18080	865	0.016	16000	690	0.011
1.5	22	19120	1010	0.020	18080	865	0.016	16000	690	0.011
1.5	26	14340	665	0.014	13560	570	0.011	12000	450	0.008
1.5	30	14340	665	0.014	13560	570	0.011	12000	450	0.008
1.5	35	7170	285	0.010	6780	245	0.008	6000	195	0.005
1.5	40	7170	285	0.010	6780	245	0.008	6000	195	0.005
1.6	4	22200	1555	0.101	21000	1300	0.078	18500	1110	0.056
1.6	6	22200	1555	0.101	21000	1300	0.078	18500	1110	0.056
1.6	8	22200	1555	0.101	21000	1300	0.078	18500	1110	0.056
1.6	10	19980	1260	0.058	18900	1055	0.045	16650	900	0.032
1.6	12	19980	1260	0.058	18900	1055	0.045	16650	900	0.032
1.6	16	19980	1260	0.036	18900	1055	0.028	16650	900	0.020
1.6	20	17760	995	0.036	16800	830	0.028	14800	710	0.020
1.8	4	22200	1780	0.113	21000	1470	0.088	18500	1225	0.063
1.8	6	22200	1780	0.113	21000	1470	0.088	18500	1225	0.063
1.8	8	22200	1780	0.113	21000	1470	0.088	18500	1225	0.063
1.8	10	19980	1440	0.065	18900	1190	0.050	16650	990	0.036
1.8	12	19980	1440	0.065	18900	1190	0.050	16650	990	0.036

UB512, UB512S6 series

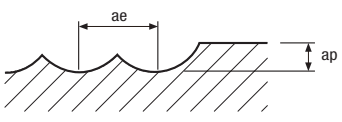
Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
1.8	16	19980	1440	0.041	18900	1190	0.032	16650	990	0.023
1.8	20	17760	1140	0.041	16800	940	0.032	14800	785	0.023
2.0	6	18000	1795	0.18	17000	1525	0.140	15000	1285	0.100
2.0	8	18000	1795	0.126	17000	1525	0.098	15000	1285	0.070
2.0	10	18000	1795	0.126	17000	1525	0.098	15000	1285	0.070
2.0	12	16200	1455	0.072	15300	1235	0.056	13500	1040	0.040
2.0	14	16200	1455	0.072	15300	1235	0.056	13500	1040	0.040
2.0	16	16200	1455	0.072	15300	1235	0.056	13500	1040	0.040
2.0	18	16200	1455	0.045	15300	1235	0.035	13500	1040	0.025
2.0	20	16200	1455	0.045	15300	1235	0.035	13500	1040	0.025
2.0	22	14400	1150	0.045	13600	975	0.035	12000	820	0.025
2.0	26	14400	1150	0.045	13600	975	0.035	12000	820	0.025
2.0	30	14400	1150	0.027	13600	975	0.021	12000	820	0.015
2.0	35	10800	755	0.018	10200	640	0.014	9000	540	0.010
2.0	40	10800	755	0.018	10200	640	0.014	9000	540	0.010
2.0	45	5400	325	0.018	5100	275	0.014	4500	230	0.010
2.0	50	5400	325	0.018	5100	275	0.014	4500	230	0.010
2.0	60	5400	325	0.018	5100	275	0.014	4500	230	0.010
2.5	8	15800	1925	0.158	14900	1605	0.123	13200	1305	0.088
2.5	10	15800	1925	0.158	14900	1605	0.123	13200	1305	0.088
2.5	12	15800	1925	0.158	14900	1605	0.123	13200	1305	0.088
2.5	16	14220	1560	0.090	13410	1300	0.070	11880	1055	0.050
2.5	20	14220	1560	0.090	13410	1300	0.070	11880	1055	0.050
2.5	22	14220	1560	0.056	13410	1300	0.044	11880	1055	0.031
2.5	26	12640	1230	0.056	11920	1025	0.044	10560	835	0.031
2.5	30	12640	1230	0.056	11920	1025	0.044	10560	835	0.031
2.5	35	12640	1230	0.034	11920	1025	0.026	10560	835	0.019
2.5	40	9480	810	0.034	8940	675	0.026	7920	550	0.019
2.5	45	9480	810	0.023	8940	675	0.018	7920	550	0.013
2.5	50	9480	810	0.023	8940	675	0.018	7920	550	0.013
3.0	6	13700	2050	0.270	12900	1730	0.21	11400	1435	0.150
3.0	8	13700	2050	0.270	12900	1730	0.21	11400	1435	0.150
3.0	10	13700	2050	0.189	12900	1730	0.147	11400	1435	0.105
3.0	12	13700	2050	0.189	12900	1730	0.147	11400	1435	0.105
3.0	14	13700	2050	0.189	12900	1730	0.147	11400	1435	0.105
3.0	16	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
3.0	18	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
3.0	20	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
3.0	22	12330	1660	0.108	11610	1400	0.084	10260	1160	0.060
3.0	26	12330	1660	0.068	11610	1400	0.053	10260	1160	0.038
3.0	30	12330	1660	0.068	11610	1400	0.053	10260	1160	0.038
3.0	35	10960	1310	0.068	10320	1105	0.053	9120	920	0.038
3.0	40	10960	1310	0.041	10320	1105	0.032	9120	920	0.023

U-Star Endmill

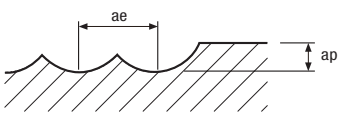
UB512, UB512S6 series

Workpiece		Alloy steels, Carbon steels (SCM, SNCM, S45C)			Pre-hardened steels (NAK, CENA, KP4)			Hardened steels (SKD, SKT, STAVAX)		
Strength		~HRC35			HRC35~45			HRC45~55		
Conditions		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
Diameter (Ø)	Effective Length (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)	R.P.M n (min⁻¹)	Feed vf (mm/min)	ap (mm)
3.0	45	10960	1310	0.041	10320	1105	0.032	9120	920	0.023
3.0	50	8220	860	0.027	7740	725	0.021	6840	605	0.015
3.0	60	8220	860	0.027	7740	725	0.021	6840	605	0.015
4.0	8	9800	1965	0.360	9300	1670	0.28	8200	1395	0.200
4.0	10	9800	1965	0.360	9300	1670	0.28	8200	1395	0.200
4.0	12	9800	1965	0.360	9300	1670	0.28	8200	1395	0.200
4.0	14	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
4.0	16	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
4.0	18	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
4.0	20	9800	1965	0.252	9300	1670	0.196	8200	1395	0.140
4.0	22	8820	1590	0.144	8370	1355	0.112	7380	1130	0.080
4.0	26	8820	1590	0.144	8370	1355	0.112	7380	1130	0.080
4.0	30	8820	1590	0.144	8370	1355	0.112	7380	1130	0.080
4.0	35	8820	1590	0.090	8370	1355	0.07	7380	1130	0.050
4.0	40	8820	1590	0.090	8370	1355	0.07	7380	1130	0.050
4.0	45	7840	1260	0.090	7440	1070	0.07	6560	895	0.050
4.0	50	7840	1260	0.090	7440	1070	0.07	6560	895	0.050
4.0	60	7840	1260	0.054	7440	1070	0.042	6560	895	0.030
5.0	15	7700	1845	0.315	7300	1455	0.245	6400	1285	0.175
5.0	20	7700	1845	0.315	7300	1455	0.245	6400	1285	0.175
5.0	26	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
5.0	30	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
5.0	35	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
5.0	40	6930	1495	0.180	6570	1180	0.14	5760	1040	0.100
5.0	50	6930	1495	0.113	6570	1180	0.088	5760	1040	0.063
5.0	60	6160	1180	0.113	5840	930	0.088	5120	820	0.063
6.0	20	6500	1900	0.378	6200	1600	0.294	5500	1330	0.210
6.0	30	6500	1900	0.378	6200	1600	0.294	5500	1330	0.210
8.0	25	4850	1800	0.504	4600	1500	0.392	4000	1280	0.280
8.0	30	4850	1800	0.504	4600	1500	0.392	4000	1280	0.280
10.0	30	3850	1650	0.900	3680	1400	0.7	3200	1200	0.500
10.0	40	3850	1650	0.630	3680	1400	0.49	3200	1200	0.350
12.0	32	3200	1520	1.080	3050	1300	0.84	2650	1100	0.600
12.0	45	3200	1520	0.756	3050	1300	0.588	2650	1100	0.420

Application tip



ap: D1~D6 = 0.2mm
D8~D12 = 0.3mm
ae: 0.2 × D

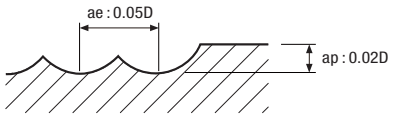


ap: D1~D4 = 0.05 × D
D5~D8 = 0.25mm
D10~D12 = 0.3mm
ae: 0.1 × D

UB532 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
3.0	35,000	2,800	33,000	2,600	12,000	900
4.0	26,000	2,300	25,000	2,200	9,000	800
5.0	21,000	2,100	20,000	2,000	7,000	700
6.0	17,000	1,900	16,000	1,800	6,000	650
8.0	13,000	1,700	12,000	1,600	4,500	550
10.0	10,500	1,450	10,000	1,400	3,500	500
12.0	9,000	1,400	8,000	1,300	3,000	450

Application tip

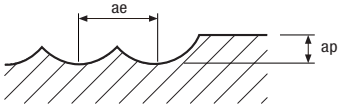


UB542 series

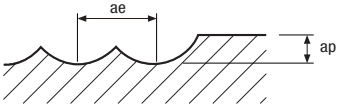
General processing

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
0.1	16,500	80	25,500	185	25,500	160
0.2	16,500	90	25,500	220	25,500	200
0.3	15,300	112	24,000	260	24,000	220
0.4	15,300	112	24,000	260	24,000	220
0.5	13,300	128	20,800	300	20,800	250
0.6	11,200	144	17,600	330	17,600	280
0.8	11,200	144	17,600	330	17,600	280
1.0	10,180	160	16,000	370	16,000	320
1.5	9,500	220	13,000	500	12,800	400
2.0	9,250	260	11,500	640	11,300	590
3.0	8,000	370	10,200	880	9,800	850
4.0	6,720	420	8,500	880	8,200	850
5.0	5,840	460	7,500	880	7,200	850
6.0	5,500	660	6,900	920	6,500	880
8.0	4,600	740	5,600	840	5,300	800
10	4,070	820	4,850	800	4,650	770
12	3,700	890	4,350	800	4,150	770

Application tip



ap: D1~D6 = 0.2mm
D8~D12 = 0.3mm
ae: 0.2 × D



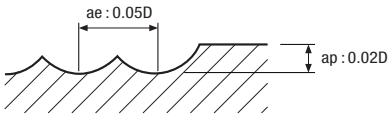
ap: D1~D4 = 0.05 × D
D5~D8 = 0.25mm
D10~D12 = 0.3mm
ae: 0.1 × D

U-Star Endmill

USB502 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	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)
3.0	13,500	1,700	13,200	1,620	12,500	860
4.0	10,600	1,700	10,300	1,620	9,800	860
5.0	9,400	1,650	9,050	1,570	8,600	860
6.0	8,600	1,750	8,250	1,670	7,850	865
8.0	7,000	1,550	6,700	1,460	6,350	890
10.0	6,050	1,450	5,800	1,360	5,450	870
12.0	5,450	1,420	5,200	1,330	4,900	785
16.0	4,300	1,200	4,000	1,100	3,700	650
20.0	3,600	1,050	3,200	900	3,000	550

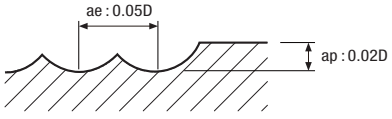
Application tip



UB503 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100 ~ 1500N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	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)
1.0	50,000	4,150	44,000	3,000	33,000	2100
1.5	40,000	5,100	35,000	3,660	36,400	2600
2.0	33,000	5,890	29,000	4,150	21,700	3000
3.0	25,000	6,930	22,000	4,880	16,500	3490
4.0	21,670	6,930	18,120	4,880	13,400	3490
5.0	18,000	6,520	15,100	4,880	11,160	3320
6.0	16,200	7,710	13,680	5,590	10,980	4050
8.0	12,150	6,610	10,170	4,720	8,280	3580
10.0	9,720	5,870	8,190	4,130	6,620	3100
12.0	8,150	5,490	4,130	3,830	5,520	2870

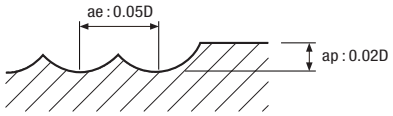
Application tip



UB504 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
1.0	48,000	3,300	35,000	2,350	32,000	2,200
1.5	38,400	4,100	28,000	2,900	25,600	2,700
2.0	31,680	4,600	23,100	3,300	21,000	3,100
3.0	24,000	5,430	17,500	3,880	16,000	3,650
4.0	20,130	5,430	14,880	3,880	14,220	3,650
5.0	16,780	5,430	12,400	3,690	11,670	3,470
6.0	15,200	6,220	12,200	4,500	11,100	3,830
8.0	11,300	5,250	9,200	3,980	8,320	3,350
10.0	9,100	4,590	7,350	3,450	6,660	2,870
12.0	7,590	4,260	6,130	3,190	5,530	2,400

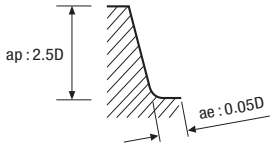
Application tip



UTB502 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)	
Strength	~HRC35		HRC35~45	
Conditions	~ 1100N/mm²		1100~1500N/mm²	
Diameter(Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
0.4	36,000	144	27,900	113
0.6	25,200	144	18,900	113
0.8	18,000	144	13,950	108
1.0	14,850	149	11,250	113
2.0	7,560	153	5,670	113
3.0	3,969	108	3,213	90
4.0	3,213	126	2,556	104

Application tip

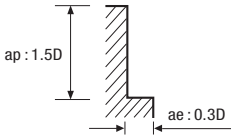


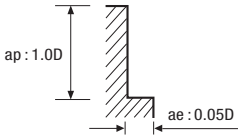
U-Star Endmill

UF50 series

Workpiece	Non ferrous 3teel, Alloy steel, Cast iron		Alloy steel, Heat resisting steel		Stainless Steel		Heat treatment steel			
Strength	~HRC30		HRC30~38		HRC38~45		HRC45~55		HRC55~65	
Conditions	~1000N/mm²		1000~1200N/mm²		1200~1400N/mm²		1400~2000N/mm²		2000N/mm²~	
Diameter(Ø)	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)
6.0	15,600	2,320	12,400	840	8,400	570	3,400	260	2,400	190
8.0	11,600	2,320	9,200	840	6,300	570	2,400	240	1,800	180
10.0	9,200	2,320	7,600	840	5,100	570	2,000	290	1,300	190
12.0	8,000	2,400	6,000	800	4,200	570	1,680	260	1,200	190
14.0	6,800	2,400	5,200	840	3,600	570	1,400	200	900	130
16.0	6,000	2,400	4,800	760	3,300	510	1,200	160	800	110
18.0	5,200	2,320	4,400	720	2,700	420	1,100	150	700	100
20.0	4,800	2,160	3,600	560	2,400	360	1,000	150	660	100
25.0	4,300	2,150	3,200	620	2,160	410	900	160	600	100

Application tip

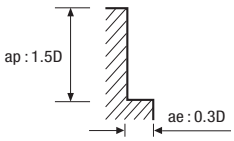


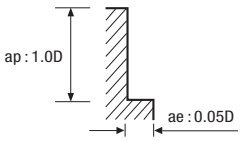


UF51 series

Workpiece	Alloy steels, Carbon steels (SCM, SNCM, S45C)		Pre-hardened steels (NAK, CENA, KP4)		Hardened steels (SKD, SKT, STAVAX)	
Strength	~HRC35		HRC35~45		HRC45~55	
Conditions	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
6.0	12,400	840	8,400	570	3,400	260
8.0	9,200	840	6,300	570	2,400	240
10.0	7,600	840	5,100	570	2,000	290
12.0	6,000	800	4,200	570	1,680	260
14.0	5,200	840	3,600	570	1,400	200
16.0	4,800	760	3,300	510	1,200	160
18.0	4,400	720	2,700	420	1,100	150
20.0	3,600	560	2,400	360	1,000	150
25.0	3,200	620	2,160	410	900	160

Application tip

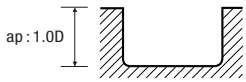


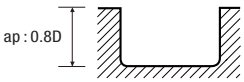


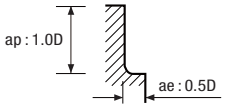
UF51---H series

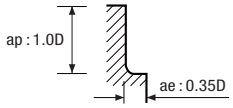
Workpiece	Alloy steels Carbon steels (SCM, S45C, S50C)		Alloy steels Carbon steels Pre-hardened steels (SCM, SKD, NAK, KP4)		Alloy steels Carbon steels (SCM, S45C, S50C)		Alloy steels Carbon steels Pre-hardened steels (SCM, SKD, NAK, KP4)	
Conditions	~HRC25		HRC25~40		~HRC25		HRC25~40	
Diameter(Ø)	R.P.M 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)
6.0	12,000	1,550	10,600	1,100	15,800	2,570	14,300	1,850
8.0	9,000	1,650	8,100	1,180	11,900	2,700	10,700	1,950
10.0	7,200	1,650	6,400	1,180	9,500	2,700	8,500	1,950
12.0	6,000	1,540	5,400	1,140	8,000	2,570	7,100	1,850
16.0	4,500	1,500	4,100	1,050	6,000	2,450	5,400	1,750
20.0	3,600	1,330	3,200	900	4,800	2,140	4,300	1,500

Application tip









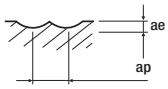
G-Star Endmill

DB312, DB342, DB402, DB502, DB512, DB522, DB54(5)2

General Cutting

Workpiece	NON-alloyed steels alloy steels · Cast iron		Alloy steels, Heat resistant steels		Hardened steels	
Strength	~HRC30		HRC30~40		HRC40~55	
Conditions	~1100N/mm²		1000 ~ 1250N/mm²		1500N/mm²	
Diameter(Ø)	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)
1.0	16,500	290	13,300	230	6,100	105
1.5	16,500	405	12,700	310	5,590	140
2.0	15,100	865	11,200	565	4,900	175
2.5	15,100	865	11,200	565	4,900	175
3.0	13,800	780	10,500	530	4,750	175
4.0	11,000	850	8,800	610	4,410	205
5.0	9,600	945	7,600	665	3,860	205
6.0	8,900	1,150	7,200	955	3,340	220
8.0	7,500	1,500	6,050	1,060	2,590	255
10.0	6,700	1,750	5,300	1,170	2,140	260
12.0	6,150	2,000	4,900	1,280	1,840	280
16.0	5,000	1,950	3,900	1,220	1,420	280
20.0	4,350	1,900	3,400	1,200	1,170	290

Application tip



ae: D1~D6 = 0.2mm
D8~D20 = 0.3mm
ap: 0.2 × D

ae: D1~D6 = 0.2mm
D8~D20 = 0.25mm
ap: 0.1 × D

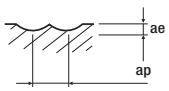
※ Please reduce cutting speed around 20~30% from the above table or DB522 series.

DB312, DB342, DB402, DB502, DB512, DB522, DB54(5)2

High Speed Cutting

Workpiece	NON-alloyed steels alloy steels · Cast iron		Alloy steels, Heat resistant steels	
Strength	~HRC45		HRC30~40	
Conditions	~1500N/mm²		1500 ~ 2000N/mm²	
Diameter(Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	26,000	1,500	26,000	920
1.5	24,000	1,600	24,000	990
2.0	22,000	1,700	22,000	1,080
2.5	22,000	2,000	20,000	1,130
3.0	22,000	2,300	17,800	1,200
4.0	22,000	3,350	14,300	1,300
5.0	22,000	4,150	12,600	1,380
6.0	22,000	4,600	11,000	1,440
8.0	17,500	4,600	8,800	1,440
10.0	14,700	4,450	7,350	1,380
12.0	12,800	4,450	6,400	1,330
16.0	10,000	4,000	5,000	1,150
20.0	8,350	3,650	4,150	1,060

Application tip



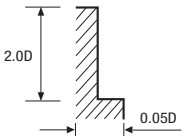
ae: D1~D6 = 0.2mm
D8~D20 = 0.3mm
ap: 0.2 × D

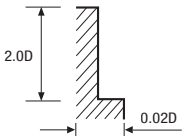
※ Please reduce cutting speed around 20~30% from the above table or DB522 series.

ZR324, ZR504, ZR514, ZR524

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Alloy steels, Heat resistant steels		hardened steels	
Strength	~HRC30		HRC30~45		HRC45~55	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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	6,950	195	4,500	150	3,300	100
4	5,600	240	3,600	170	2,700	105
5	4,800	250	3,050	210	2,350	125
6	4,150	250	2,650	210	2,050	125
8	3,150	265	2,000	210	1,600	125
10	2,150	265	1,700	210	1,250	125
12	1,800	210	1,500	185	1,050	105
16	1,880	185	1,100	140	840	90
20	1,300	130	860	105	625	65

Application tip

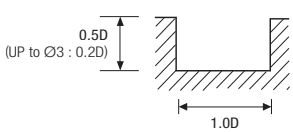


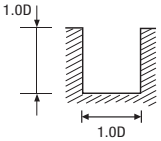


TX202, TX222, TX302

Workpiece	Non-Alloy steels, alloy steels, Cast iron		Alloy steels, Heat resistant steels		Stainless steels		Cast iron		Aluminum alloys		Copper, Brass Non-ferrous metals	
Strength	~HRC30		HRC30~45		-		-		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		-		-		-		-	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	14,300	105	8,500	65	7,150	50	18,700	205	44,000	330	24,700	200
1.5	9,350	150	5,550	85	5,600	80	12,100	205	27,500	385	20,300	300
2.0	7,850	160	5,150	100	4,300	80	9,350	220	22,000	460	16,500	340
3.0	6,100	180	3,800	120	3,150	100	6,050	220	15,400	460	11,000	340
4.0	5,150	255	3,150	155	2,650	130	4,600	220	11,000	460	8,800	340
5.0	4,300	270	2,550	160	2,150	135	3,650	220	9,150	460	6,800	340
6.0	3,800	300	2,300	190	1,950	155	2,950	255	7,600	485	5,700	375
8.0	2,850	325	1,700	170	1,450	155	2,200	275	5,700	485	4,400	375
10.0	2,200	280	1,350	135	1,150	135	1,850	285	4,600	485	3,400	375
12.0	1,850	240	1,150	110	950	110	1,450	295	3,750	485	2,850	375
14.0	1,700	215	1,050	100	850	100	1,300	310	3,300	485	2,400	375
16.0	1,500	185	950	95	700	95	1,100	320	2,850	485	2,200	375
20.0	1,150	145	700	70	550	70	900	340	2,200	485	1,700	375

Application tip





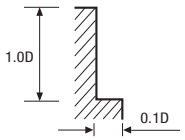
※ The Feed for long & extra long types, should be reduced by around 30~40%.

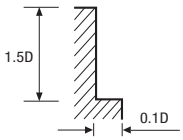
G-Star Endmill

TX204, TX224, TX304

Workpiece	Non-Alloy steels, alloy steels, Cast iron		Alloy steels, Heat resistant steels		Stainless steels		Cast iron		Aluminum alloys		Copper, Brass Non-ferrous metals	
Strength	~HRC30		HRC30~45		-		-		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		-		-		-		-	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	17,600	150	10,250	85	8,650	75	18,700	620	44,000	1,050	24,700	605
1.5	11,800	215	7,050	115	7,050	120	12,100	620	27500	1,160	20,300	910
2.0	9,850	240	6,450	145	5,350	120	9,350	640	22000	1,320	16,500	1,035
3.0	7,600	270	4,750	170	3,950	145	6,050	640	15400	1,320	11,000	1,035
4.0	6,450	485	3,950	300	3,300	240	4,600	640	11000	1,320	8,800	1,035
5.0	5,350	510	3,200	305	2,700	255	3,650	640	9150	1,320	6,800	1,035
6.0	4,750	560	2,850	350	2,400	280	2,950	770	7600	1,430	5,700	1,100
8.0	3,550	605	2,150	325	1,800	300	2,200	815	5700	1,430	4,400	1,100
10.0	2,750	520	1,700	255	1,450	255	1,850	860	4600	1,430	3,400	1,100
12.0	2,350	440	1,450	215	1,150	205	1,450	900	3750	1,430	2,850	1,100
14.0	2,100	395	1,300	195	1,050	190	1,300	945	3300	1,430	2,400	1,100
16.0	1,850	350	1,150	170	950	170	1,100	970	2850	1,430	2,200	1,100
20.0	1,450	270	900	135	700	130	900	1,035	2200	1,430	1,700	1,100

Application tip



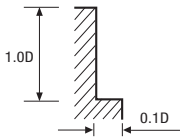


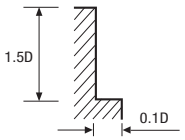
※ The Feed for long & extra long types, should be reduced by around 30~40%.

TX304H

Workpiece	Non-Alloy steels, alloy steels, Cast iron		Alloy steels, Heat resistant steels		Stainless steels		Cast iron		Aluminum alloys		Copper, Brass Non-ferrous metals	
Strength	≤ HRC30		HRC30~45		-		-		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		-		-		-		-	
Diameter(Ø)	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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	17,600	150	10,250	85	8,650	75	18,700	620	44,000	1,050	24,700	605
1.5	11,800	215	7,050	115	7,050	120	12,100	620	27,500	1,160	20,300	910
2.0	9,850	240	6,450	145	5,350	120	9,350	640	22,000	1,320	16,500	1,035
3.0	7,600	270	4,750	170	3,950	145	6,050	640	15,400	1,320	11,000	1,035
4.0	6,450	485	3,950	300	3,300	240	4,600	640	11,000	1,320	8,800	1,035
5.0	5,350	510	3,200	305	2,700	255	3,650	640	9,150	1,320	6,800	1,035
6.0	4,750	560	2,850	350	2,400	280	2,950	770	7,600	1,430	5,700	1,100
8.0	3,550	605	2,150	325	1,800	300	2,200	815	5,700	1,430	4,400	1,100
10.0	2,750	520	1,700	255	1,450	255	1,850	860	4,600	1,430	3,400	1,100
12.0	2,350	440	1,450	215	1,150	205	1,450	900	3,750	1,430	2,850	1,100
14.0	2,100	395	1,300	195	1,080	190	1,300	945	3,300	1,430	2,400	1,100
16.0	1,850	350	1,150	170	950	170	1,100	970	2,850	1,430	2,200	1,100
20.0	1,450	270	900	135	700	130	900	1,035	2,200	1,430	1,700	1,100

Application tip



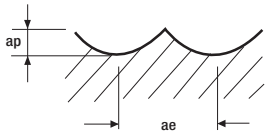


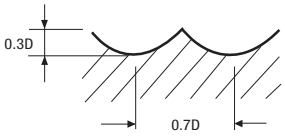
TXB202, TXB222, TXB232, TXB302

Workpiece	Carbon steels, Alloy steels, Tool steels				Hardened steels		Cast iron		Aluminum alloys	
Strength	≤ HRC30		HRC30~45		HRC45~50		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		1500N/mm²		-		-	
Diameter(Ø)	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)
2.0	12,350	640	9,150	415	4,000	125	10,500	220	30,800	395
3.0	11,400	575	8,550	390	3,800	125	7,050	230	20,500	395
4.0	8,950	630	7,150	450	3,600	150	5,150	285	15,400	395
5.0	7,800	700	6,200	490	3,100	150	4,150	330	12,100	470
6.0	7,250	870	5,900	705	2,700	160	3,400	360	10,300	470
8.0	6,100	1,090	4,900	785	2,050	190	2,500	460	7,900	540
10.0	5,450	1,330	4,350	870	1,750	190	2,050	460	6,150	540
12.0	4,990	1,500	3,950	950	1,500	210	1,750	460	5,150	630
14.0	4,530	1,495	3,600	925	1,300	210	1,400	460	4,300	630
16.0	4,085	1,470	3,200	905	1,150	210	1,300	460	3,850	540
18.0	3,800	1,425	3,000	890	1,050	210	1,100	460	3,400	540
20.0	3,550	1,425	2,800	885	950	210	1,050	420	2,950	540

Application tip

ae: D1~D6 = 0.2mm
D8~D20 = 0.3mm
ap: 0.2





※ The Feed for long & extra long types, should be reduced by around 30~40%.

G-Star Endmill

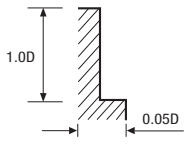
TXB304, TXB204 series

Workpiece	Alloy steels, Tool steels				Hardened steels		Cast iron		Aluminum alloys	
Strength	≤ HRC30		HRC30~45		HRC45~50		-		-	
Conditions	~1000N/mm²		1000~1500N/mm²		1500N/mm²		-		-	
Diameter(Ø)	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	15,400	1,000	11,400	600	5,000	200	13,100	300	38,500	600
3	14,300	900	10,700	600	4,800	200	8,800	300	25,600	600
4	11,200	900	8,900	700	4,500	200	6,400	400	19,300	600
5	9,800	1,100	7,800	700	3,900	200	5,200	500	15,100	700
6	9,100	1,300	7,400	1,100	3,400	200	4,300	500	12,900	700
8	7,600	1,600	6,100	1,200	2,600	300	3,100	700	9,900	800
10	6,800	2,000	5,400	1,300	2,200	300	2,600	700	7,700	800
12	6,200	2,300	4,900	1,400	1,900	300	2,200	700	6,400	900
14	5,700	2,200	4,500	1,400	1,600	300	1,800	700	5,400	900
16	5,100	2,200	4,000	1,400	1,400	300	1,600	700	4,800	800
18	4,800	2,100	3,800	1,300	1,300	300	1,400	700	4,300	800
20	4,400	2,100	3,500	1,300	1,200	300	1,300	600	3,700	800

ZR304H, ZR324H

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Alloy steels, Heat resistant steels		hardened steels	
Strength	~HRC30		HRC30~45		HRC30~45	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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)
6	7,000	910	4,200	560	3,000	140
8	5,300	980	3,200	530	2,500	190
10	4,100	840	2,500	410	2,050	165
12	3,500	730	2,100	340	1,700	140

Application tip

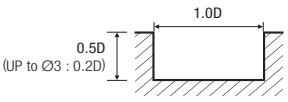


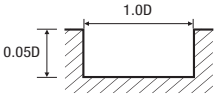
ZE302, ZE322, ZE402, ZE502, ZE522, ZE512

General Cutting

Workpiece	Alloy steels, Heat resistant steels		Hardened steels		Stainless steels	
Strength	HRC30~40		HRC40~50		-	
Conditions	1000~1250N/mm²		1250~1750N/mm²		-	
Diameter(Ø)	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	9,700	220	6,350	135	5,300	105
3	7,500	240	4,670	160	3,880	135
4	6,350	345	3,880	205	3,250	175
5	5,300	370	3,170	220	2,650	185
6	4,670	405	2,830	255	2,380	205
8	3,530	435	2,120	230	1,760	205
10	2,730	380	1,680	185	1,420	185
12	2,310	320	1,420	150	1,140	150
16	1,850	255	1,140	125	890	125
20	1,420	195	890	90	705	90
25	1,150	150	705	80	580	70

Application tip





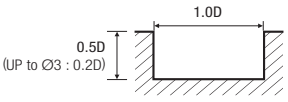
※ Please reduce cutting speed around 20~30% from the above table or ZE522, ZE322 series.

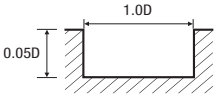
ZE302, ZE322, ZE402, ZE502, ZE522, ZE512

High Speed Cutting

Workpiece	Alloy steels, Heat resistant steels		Hardened steels				stainless steels	
Strength	HRC30~40		HRC40~50		HRC40~55		-	
Conditions	1000~1250N/mm²		1250~1750N/mm²		1750~2000N/mm²		-	
Diameter(Ø)	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	18,000	665	11,800	415	8,700	175	9,800	345
3	11,000	655	6,800	435	5,600	185	6,200	370
4	10,300	725	6,300	430	4,300	185	5,300	370
5	9,350	715	5,570	420	3,700	185	4,620	355
6	8,200	750	4,930	470	3,250	185	4,100	390
8	6,300	770	3,780	410	2,470	185	3,120	355
10	4,830	750	2,940	360	2,000	160	2,470	310
12	4,100	750	2,520	345	1,680	160	2,100	300
16	3,260	715	2,000	355	1,890	150	1,940	290
20	2,520	665	1,580	310	1,680	150	1,630	275
25	2,000	635	1,260	340	1,570	150	1,420	290

Application tip





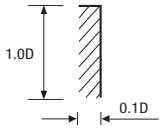
G-Star Endmill

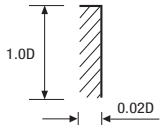
ZE304, ZE324, ZE404, ZE504, ZE524, ZE534, ZE514, ACE4

General Cutting

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Hardened steels				Stainless steels	
Strength	~HRC30		HRC30~45		HRC45~55		-	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²		-	
Diameter(Ø)	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	12,100	320	7,900	195	2,700	47	6,600	160
3	9,400	370	5,840	230	2,000	58	4,850	195
4	7,900	655	4,850	405	1,500	58	4,070	320
5	6,600	690	3,970	415	1,300	58	3,320	345
6	5,830	760	3,530	470	1,150	58	2,980	380
8	4,410	815	2,650	435	880	58	2,200	405
10	3,420	700	2,100	345	720	46	1,760	345
12	2,880	600	1,760	290	590	46	1,430	275
16	2,310	470	1,430	230	460	29	1,150	230
20	1,760	370	1,110	185	340	29	880	175
25	1,430	290	880	150	270	23	715	140

Application tip





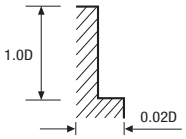
※ Please reduce cutting speed around 20~30% from the above table or ZE524 & ZE324 series.

ZE304, ZE324, ZE404, ZE504, ZE524, ZE534, ZE514, ACE4

High Speed Cutting

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Hardened steels				Stainless steels	
Strength	~HRC30		HRC30~45		HRC45~55		-	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²		-	
Diameter(Ø)	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	31,400	1,230	23,500	520	12,600	275	21,600	465
3	19,300	1,210	13,600	735	8,900	390	13,500	660
4	18,100	1,330	12,600	865	7,090	465	11,800	775
5	16,400	1,310	11,100	1,010	6,040	530	10,300	910
6	14,400	1,380	9,900	1,100	5,300	580	9,100	990
8	11,000	1,430	7,600	1,090	3,990	575	6,900	980
10	8,500	1,380	5,880	1,110	3,150	580	5,420	1,000
12	7,200	1,380	5,040	1,090	2,620	575	4,600	985
16	5,700	1,320	3,990	1,010	2,000	535	3,590	910
20	4,400	1,270	3,150	930	1,580	490	2,840	840
25	3,500	1,170	2,520	755	1,260	390	2,270	680

Application tip

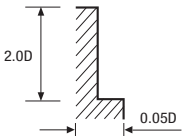


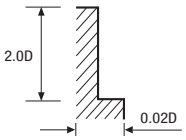
ZR322, ZR502, ZR512, ZR522

Side cutting

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Alloy steels, Heat resistant steels		hardened steels	
Strength	~HRC30		HRC30~45		HRC45~55	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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	6,950	195	4,500	150	3,300	100
4	5,600	240	3,600	170	2,700	105
5	4,800	250	3,050	210	2,350	125
6	4,150	250	2,650	210	2,050	125
8	3,150	265	2,000	210	1,600	125
10	2,150	265	1,700	210	1,250	125
12	1,800	210	1,500	185	1,050	105
16	1,800	185	1,100	140	840	90
20	1,300	130	860	105	625	65

Application tip



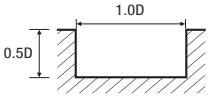


ZR322, ZR502, ZR512, ZR522

Slotting

Workpiece	Non-Alloyed steels Alloy steels · Cast iron		Alloy steels, Heat resistant steels		hardened steels	
Strength	~HRC30		HRC30~45		HRC45~55	
Conditions	~1000N/mm²		1000~1500N/mm²		1500~2000N/mm²	
Diameter(Ø)	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	6,950	160	4,500	80	3,300	55
4	5,600	195	3,600	100	2,700	60
5	4,800	240	3,050	115	2,350	75
6	4,150	290	2,650	145	2,050	90
8	3,150	210	2,000	145	1,600	90
10	2,150	250	1,700	140	1,250	90
12	1,800	200	1,500	135	1,050	75
16	1,800	215	1,100	100	840	60
20	1,300	160	860	70	625	45

Application tip



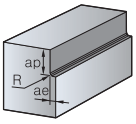
R+ Endmill

RPAE

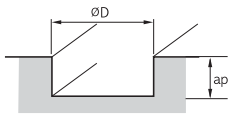
*For Carbide

Workpiece / Conditions / Diameter(Ø)	Aluminum, Non-ferrous metal		Aluminum, Non-ferrous metal	
	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6.0	13,000	1,125	13,000	1,400
8.0	10,400	1,300	10,400	1,600
10.0	10,400	1,585	10,400	2,000
12.0	10,400	1,950	10,400	1,650
14.0	7,800	1,675	7,800	2,050
16.0	7,800	1,755	7,800	2,250
18.0	5,200	1,300	5,200	1,700
20.0	5,200	1,495	5,200	1,800
25.0	5,000	1,495	5,000	1,800

Application tip



■ **Shouldering depth(ap)**
- ap : ≤ 1.5D
- ae : ≤ 0.15D



■ **Slotting depth(ap)**
- ap : ≤ 0.2D

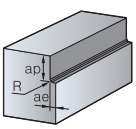
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RP(L)E-FP-H

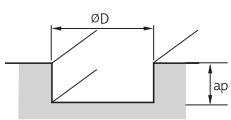
*For Carbide

Workpiece / Conditions / Diameter(Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	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)
6.0	12,000	1,550	10,600	1,100	15,800	2,570	14,300	1,850
8.0	9,000	1,650	8,100	1,180	11,900	2,700	10,700	1,950
10.0	7,200	1,650	6,400	1,180	9,500	2,700	8,500	1,950
12.0	6,000	1,540	5,400	1,140	8,000	2,570	7,100	1,850
14.0	5,200	1,540	4,750	1,095	7,000	2,510	6,250	1,800
16.0	4,500	1,540	4,100	1,050	6,000	2,450	5,400	1,750
18.0	4,400	1,435	3,650	975	5,400	2,295	4,850	1,625
20.0	3,600	1,330	3,200	900	4,800	2,140	4,300	1,500
25.0	3,200	1,200	2,800	850	4,400	2,000	3,800	1,400

Application tip



■ **Shouldering depth(ap)**
- ap : ≤ 1.0D
- ae : ≤ 0.5D (≤HRC25)
  ≤ 0.35D (HRC25~40)



■ **Slotting depth(ap)**
- ap : ≤ 1.0D (≤HRC25)
  ≤ 0.8D (HRC25~40)

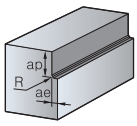
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RPE-XG

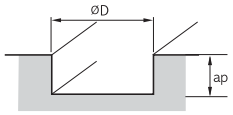
*For Carbide

Workpiece / Conditions / Diameter(Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	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)
6.0	12,000	1,090	10,600	770	15,800	1,800	14,300	1,300
8.0	9,000	1,160	8,100	830	11,900	1,890	10,700	1,370
10.0	7,200	1,160	6,400	830	9,500	1,890	8,500	1,370
12.0	6,000	1,080	5,400	800	8,000	1,800	7,100	1,300
14.0	5,200	1,080	4,750	770	7,000	1,760	6,250	1,260
16.0	4,500	1,080	4,100	740	6,000	1,720	5,400	1,230
18.0	4,400	1,000	3,650	680	5,400	1,610	4,850	1,140
20.0	3,600	930	3,200	630	4,800	1,500	4,300	1,050
25.0	3,200	840	2,800	600	4,400	1,400	3,800	980

Application tip



■ **Shouldering depth(ap)**
- ap : ≤ 1.0D
- ae : ≤ 0.5D (≤HRC25)
  ≤ 0.35D (HRC25~40)



■ **Slotting depth(ap)**
- ap : ≤ 1.0D (≤HRC25)
  ≤ 0.8D (HRC25~40)

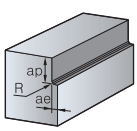
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RPE-FP-L

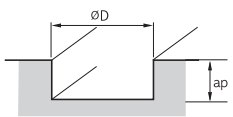
*For Carbide

Workpiece / Conditions / Diameter(Ø)	Alloy steel, Carbon steels ≤HRC35		Pre-hardened steels HRC35~45		High hardened steels 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)
6.0	12,400	840	8,400	570	3,400	260
8.0	9,200	840	6,300	570	2,400	240
10.0	7,600	840	5,100	570	2,000	290
12.0	6,000	840	4,200	570	1,680	260
14.0	5,200	840	3,600	570	1,400	200
16.0	4,800	760	3,300	510	1,200	160
18.0	4,400	720	2,700	420	1,100	150
20.0	3,600	560	2,400	360	1,000	150
25.0	3,200	620	2,160	410	900	160

Application tip



■ **Shouldering depth(ap)**
- ap : ≤ 1.0D
- ae : ≤ 0.3D (≤HRC45)
  ≤ 0.05D (HRC45~55)



■ **Slotting depth(ap)**
- ap : ≤ 0.3D (≤HRC45)
  ≤ 0.05D (HRC45~55)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

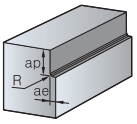
R+ Endmill

RPE-RG

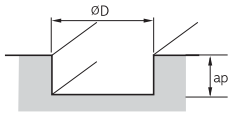
*For Carbide

Workpiece / Conditions / Diameter(Ø)	Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40		Alloy steels, Carbon steels ≤HRC25		Alloy steels, Carbon steels, Pre-hardened steels HRC25~40	
	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)
6.0	12,000	1,240	10,600	800	15,800	2,060	14,300	1,480
8.0	9,000	1,320	8,100	940	11,900	2,160	10,700	1,560
10.0	7,200	1,320	6,400	940	9,500	2,160	8,500	1,560
12.0	6,000	1,230	5,400	910	8,000	2,060	7,100	1,480
14.0	5,200	1,230	4,750	880	7,000	2,010	6,250	1,440
16.0	4,500	1,230	4,100	840	6,000	1,960	5,400	1,400
18.0	4,400	1,150	3,650	780	5,400	1,840	4,850	1,300
20.0	3,600	1,060	3,200	720	4,800	1,710	4,300	1,200
25.0	3,200	960	2,800	680	4,400	1,600	3,800	1,120

Application tip



■ **Shouldering depth(ap)**
- ap : ≤ 1.0D
- ae : ≤ 0.5D (≤HRC25)
  ≤ 0.35D (HRC25~40)



■ **Slotting depth(ap)**
- ap : ≤ 1.0D (≤HRC25)
  ≤ 0.8D (HRC25~40)

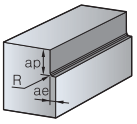
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RPE-FF, FP, RG

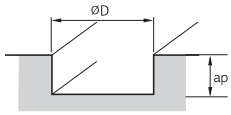
*For HSS PM

Workpiece / Conditions / Diameter(Ø)	Alloy steels, Carbon steels, Tool steels		Alloy steels, Carbon steels, Tool steels ≤HRC20		Alloy steels, Carbon steels, Tool steels HRC20~30		Alloy steels, Carbon steels, Tool steels HRC30~40	
	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)
6.0	2,700	200	2,100	155	1,500	100	1,250	90
8.0	2,300	250	1,800	200	1,300	140	1,000	110
10.0	1,800	360	1,400	275	1,000	170	850	140
12.0	1,500	360	1,150	290	850	200	700	155
14.0	1,300	360	1,000	290	720	200	600	155
16.0	1,150	360	900	290	625	200	520	155
18.0	1,000	360	850	290	580	200	470	155
20.0	920	370	720	290	500	200	420	155
22.0	850	370	620	290	450	200	380	155
25.0	750	360	570	275	400	190	340	155

Application tip



■ **Shouldering depth(ap)**
- ap : ≤ 1.5D (All dia.)
- ae : ≤ 0.5D (All dia.)



■ **Slotting depth(ap)**
- ap : ≤ 0.15D

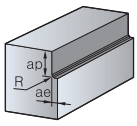
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

RPE-RG

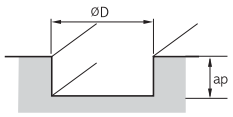
*For HSS Co

Workpiece / Conditions / Diameter(Ø)	Alloy steels, Carbon steels, Tool steels		Alloy steels, Carbon steels, Tool steels ≤HRC20		Alloy steels, Carbon steels, Tool steels HRC20~30		Alloy steels, Carbon steels, Tool steels HRC30~40	
	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)
6.0	1,800	80	1,600	60	1,200	55	800	30
8.0	1,400	105	1,100	75	900	65	560	45
10.0	1,100	150	900	120	800	110	450	60
12.0	900	180	800	140	630	110	400	70
14.0	800	180	700	140	560	110	350	70
16.0	700	180	560	140	450	110	280	70
18.0	630	180	500	140	400	110	250	70
20.0	560	180	450	140	400	110	220	70
22.0	500	220	450	170	350	140	220	70
25.0	450	220	400	170	310	140	180	85
28.0	400	210	350	160	280	130	160	85
30.0	350	210	310	160	250	130	160	85
32.0	350	210	280	160	220	130	140	85
36.0	310	210	250	160	200	130	120	85
40.0	280	200	220	150	180	120	110	80
50.0	220	200	180	170	160	140	90	80

Application tip



■ **Shouldering depth(ap)**
- ap : ≤ 1.5D
- ae : ≤ 0.1D



■ **Slotting depth(ap)**
- ap : ≤ 0.15D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

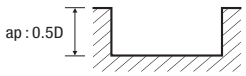
S-Star Endmill

SE502 series

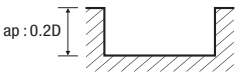
Slotting

Workpiece	Carbon steel, Alloy steel, Tool steel				Stainless steel 300 series	
Conditions	~HRC30		HRC30~40			
Diameter(Ø)	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)
1.0	13000	220	9800	160	21000	170
1.2	12500	210	9000	150	17500	140
1.5	12000	200	8300	140	14000	110
2.0	11560	190	7560	120	10500	85
2.5	10240	200	6560	130	8500	70
3.0	8920	210	5560	140	8000	65
4.0	7560	300	4620	180	7500	75
5.0	6300	320	3780	190	6000	80
6.0	5560	350	3360	220	5000	80
8.0	4200	380	2520	200	3750	90
10.0	3260	330	2000	160	3000	90
12.0	2740	280	1680	130	2500	95
14.0	2470	250	1520	120	2150	100
16.0	2200	220	1360	110	1880	105
18.0	1940	195	1210	95	1670	110
20.0	1680	170	1060	80	1500	115

Application tip



(ap : UP to Ø3.0 : 0.2D)

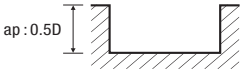


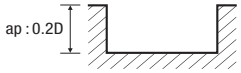
SE503 series

Slotting

Workpiece	Carbon steel, Alloy steel, Tool steel						Cast iron		Stainless steel		Copper alloy		Ti alloy		Ti alloy	
Conditions	~HRC20		HRC20~30		HRC30~45											
Diameter(Ø)	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)	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)
1.0	30000	1000	23000	800	16500	450	20000	500	16500	350	25000	360	16500	380	6500	100
1.5	20000	1000	15500	800	11000	450	13000	500	11000	350	16500	360	11000	380	4500	100
2.0	15000	1000	11500	800	8200	450	10000	500	8400	350	12500	360	8200	380	3500	100
2.5	12000	1000	9400	800	7500	450	8000	500	6500	350	10000	360	6500	380	2600	100
3.0	10080	950	7750	740	5550	395	6700	520	5550	350	8300	360	5550	395	2200	100
4.0	7550	1400	5850	1100	4200	595	5050	550	4200	320	6200	400	4200	595	1650	105
5.0	6000	1500	4700	1200	3300	650	4000	600	3300	350	5000	420	3300	600	1400	120
6.0	5050	1650	3850	1250	2800	700	3350	660	2800	370	4100	440	2800	700	1150	130
8.0	3750	1700	2950	1330	2100	710	2500	665	2100	375	3100	500	2100	710	850	120
10.0	3050	1650	2300	1250	1650	665	2000	630	1350	355	2500	530	1650	665	650	120
12.0	2500	1500	2000	1200	1350	605	1650	570	1350	320	2000	550	1350	605	555	110
14.0	2150	1550	1700	1200	1200	605	1450	580	1200	250	1700	600	1200	605	500	110
16.0	1850	1600	1450	1250	1000	650	1250	600	1000	200	1500	650	1000	610	400	115
18.0	1650	1650	1300	1300	920	700	1100	620	900	150	1300	700	900	615	350	120
20.0	1500	1700	1150	1350	840	750	1000	640	800	100	1200	750	800	620	320	125

Application tip



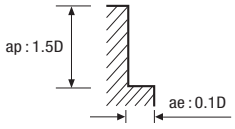


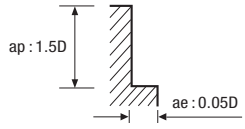
SE503 series

Side machining

Workpiece	Carbon steel, Alloy steel, Tool steel						Cast iron		Stainless steel		Copper alloy		Ti alloy		Ti alloy	
Conditions	~HRC20		HRC20~30		HRC30~45											
Diameter(Ø)	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)	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)
1.0	30000	1000	23000	800	16500	450	20000	500	16500	350	25000	360	16500	380	6500	100
1.5	20000	1000	15500	800	11000	450	13000	500	11000	350	16500	360	11000	380	4500	100
2.0	15000	1000	11500	800	8200	450	10000	500	8400	350	12500	360	8200	380	3500	100
2.5	12000	1000	9400	800	7500	450	8000	500	6500	350	10000	360	6500	380	2600	100
3.0	10080	950	7750	740	5550	395	6700	520	5550	350	8300	360	5550	395	2200	100
4.0	7550	1400	5850	1100	4200	595	5050	550	4200	320	6200	400	4200	595	1650	105
5.0	6000	1500	4700	1200	3300	650	4000	600	3300	350	5000	420	3300	600	1400	120
6.0	5050	1650	3850	1250	2800	700	3350	660	2800	370	4100	440	2800	700	1150	130
8.0	3750	1700	2950	1330	2100	710	2500	665	2100	375	3100	500	2100	710	850	120
10.0	3050	1650	2300	1250	1650	665	2000	630	1350	355	2500	530	1650	665	650	120
12.0	2500	1500	2000	1200	1350	605	1650	570	1350	320	2000	550	1350	605	555	110
14.0	2150	1550	1700	1200	1200	605	1450	580	1200	250	1700	600	1200	605	500	110
16.0	1850	1600	1450	1250	1000	650	1250	600	1000	200	1500	650	1000	610	400	115
18.0	1650	1650	1300	1300	920	700	1100	620	900	150	1300	700	900	615	350	120
20.0	1500	1700	1150	1350	840	750	1000	640	800	100	1200	750	800	620	320	125

Application tip





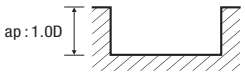
S-Star Endmill

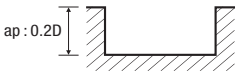
SE504 , SR504 series

Slotting

Workpiece	Alloy steel, Cast iron		Stainless steel 300 series		Stainless steel 400 series		Titanium		Inconel	
Conditions	~HB230									
Diameter(Ø)	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)
1.0	40,500	300	20,000	250	28,000	160	23,925	225	9330	60
1.5	27,000	300	13,000	180	18,500	160	15,730	185	6135	50
2.0	20,300	300	10,000	150	14,000	160	12,010	165	4685	45
2.5	16,200	300	8,000	120	11,000	165	9,490	155	3700	40
3.0	13,500	275	6,690	105	9,350	145	8,045	135	3135	35
4.0	10,100	370	5,050	135	7,000	185	6,005	195	2340	50
5.0	8,090	410	4,050	165	5,600	230	4,815	360	1875	60
6.0	6,750	480	3,350	190	4,700	265	4,030	415	1570	70
8.0	5,050	620	2,500	250	3,500	340	3,000	545	1170	95
10.0	4,050	780	2,050	320	2,800	430	2,430	695	945	120
12.0	3,370	750	1,680	310	2,350	435	2,010	685	780	115
14.0	2,890	670	1,400	280	2,000	405	1,700	820	715	150
16.0	2,500	630	1,250	265	1,750	370	1,500	950	600	180
18.0	2,250	630	1,100	260	1,550	365	1,320	1,245	515	250
20.0	2,000	620	1,000	260	1,400	365	1,200	1,875	480	390

Application tip



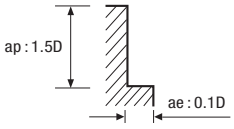


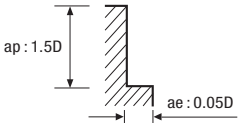
SE504 , SR504 series

Side machining

Workpiece	Alloy steel, Cast iron		Stainless steel 300 series		Stainless steel 400 series		Titanium		Inconel	
Conditions	~HB230									
Diameter(Ø)	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)
1.0	40,500	335	20,000	280	28,000	180	23,925	260	9570	65
1.5	27,000	335	13,000	200	18,500	180	15,730	215	6290	55
2.0	20,300	335	10,000	170	14,000	180	12,010	195	4805	50
2.5	16,200	335	8,000	135	11,000	185	9,490	180	3795	45
3.0	13,500	310	6,690	115	9,350	160	8,045	155	3215	40
4.0	10,100	415	5,050	150	7,000	205	6,000	335	2520	60
5.0	8,090	460	4,050	185	5,600	260	4,815	410	2020	75
6.0	6,750	540	3,350	215	4,700	295	4,030	470	1690	85
8.0	5,050	700	2,500	280	3,500	380	3,000	620	1260	110
10.0	4,050	880	2,050	360	2,800	485	2,430	790	1020	145
12.0	3,370	845	1,680	350	2,350	490	2,010	780	845	140
14.0	2,890	755	1,400	315	2,000	455	1,700	925	715	170
16.0	2,500	710	1,250	295	1,750	415	1,500	1075	600	205
18.0	2,250	710	1,100	290	1,550	410	1,320	1410	515	275
20.0	2,000	700	1,000	290	1,400	410	1,200	2120	480	430

Application tip



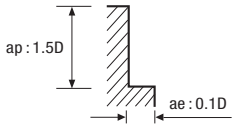


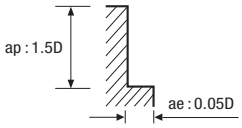
SE506 series

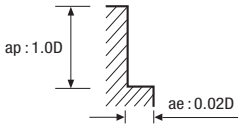
Side machining - Normal speed

Workpiece	Carbon steel, Alloy steel, Tool steel				Stainless steel, Ti alloy		Inconel	
Conditions	~HRC30		HRC30~HRC40					
Diameter(Ø)	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)
6.0	5560	2000	3880	1370	3370	1100	1350	280
8.0	4200	2000	2940	1370	2490	1100	1000	280
10.0	3360	2000	2320	1370	1920	1100	440	280
12.0	2840	1680	2000	1160	1610	1000	400	250
16.0	2100	1260	1480	880	1160	770	310	190
20.0	1680	1010	1160	690	900	620	250	155

Application tip





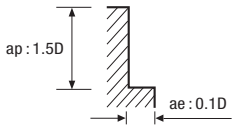


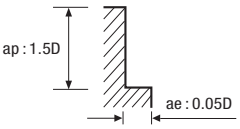
SE506 series

Side machining - High speed

Workpiece	Carbon steel, Alloy steel, Tool steel			
Conditions	~HRC30		HRC30~HRC40	
Diameter(Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6.0	22200	8000	16800	6090
8.0	16800	8000	12600	6090
10.0	13400	8000	9988	5990
12.0	11350	6720	8400	5040
16.0	8400	5040	6300	3780
20.0	6700	4040	5040	3050

Application tip





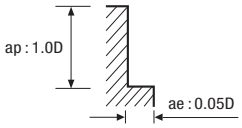
S-Star Endmill

SR505, SR507 series

Side machining

Workpiece	Alloy steel, Cast iron		Stainless steel, Titanium		High hardened steel	
Conditions	SKD61					
Diameter(Ø)	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)
6.0	3700	450	3200	380	1100	65
8.0	2800	400	2350	420	950	60
10.0	2250	325	1990	350	750	60
12.0	1990	300	1550	270	600	55
16.0	1550	250	1250	250	500	50
20.0	1200	180	900	150	350	50

Application tip

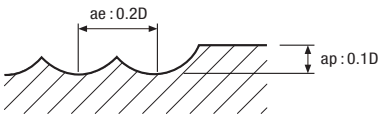


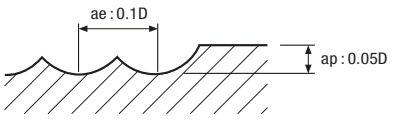
SB502 series

Side machining - Normal speed

Workpiece	Carbon steel, Cast iron		Alloy steel, Pre-hardened steel		Heat treated steel			
Conditions	150~250HB		HRC25~HRC35		HRC35~HRC45		HRC45~HRC55	
Diameter(Ø)	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)
2.0	19100	770	12800	370	10200	270	8900	190
4.0	10800	1100	7200	550	5700	400	5000	280
6.0	7700	1300	5200	660	4100	480	3600	330
8.0	6000	1400	4000	700	3200	510	2800	360
10.0	4800	1400	3200	700	2600	520	2300	370
12.0	4000	1400	2700	710	2200	530	1900	370

Application tip

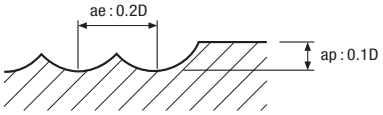


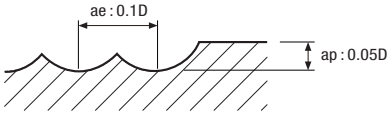


SR505, SR507 series

Workpiece / Conditions / Diameter(Ø)	Stainless steel 300 series		Ni alloy, Ti alloy	
	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
2.0	8900	210	6400	120
4.0	5000	310	3600	180
6.0	3600	380	2600	210
8.0	2800	400	2000	230
10.0	2300	410	1600	230
12.0	1900	410	1400	240

Application tip

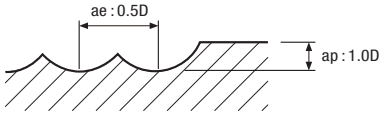




SB504 series

Workpiece / Conditions / Diameter(Ø)	Alloy steel, Cast iron ~HB230		Stainless steel 300 series, Titanium		Stainless steel 400 series	
	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)
3.0	13500	275	6690	105	9350	145
4.0	10100	370	5050	135	7000	185
5.0	8090	410	4050	165	5600	230
6.0	6750	480	3350	190	4700	265
8.0	5050	620	2500	250	3500	340
10.0	4050	780	2050	320	2800	430
12.0	3370	750	1680	310	2350	435
16.0	2530	700	1250	300	1750	395
20.0	2030	680	1000	290	1400	370

Application tip



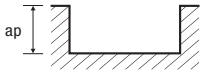
S-Star Endmill

SF51H series

Slotting

Workpiece	Stainless Steel, Titanium alloys	
Conditions	SUS304, SUS316, Ti6A	
Diameter(Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)
3	5000	380
4	4800	350
5	4700	350
6	4400	340
7	3800	340
8	3300	340
9	3000	340
10	2700	330
12	2200	330
14	2000	310
16	1750	300
20	1300	210

Application tip



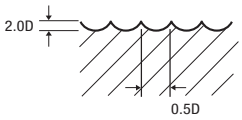
ap: D3~D5 = 0.3 × D
D6~D10 = 0.25mm × D
D12~D16 = 0.15mm × D
D18~D20 = 0.1mm × D

A-Star Endmill

WAB312

Workpiece / Conditions / Diameter(Ø)	Aluminium alloy		Copper alloy	
	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6.0	18,000	1,750	5,500	440
8.0	14,000	2,000	4,200	500
10.0	14,000	2,350	4,200	580
12.0	14,000	3,000	4,200	750
16.0	11,000	2,700	3,300	670
20.0	8,000	2,200	2,200	600

Application tip

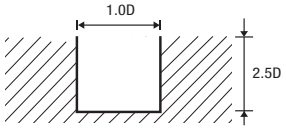


WAE301

Slotting, General Cutting

Workpiece / Conditions / Diameter(Ø)	Acrylic		Alloy steels	
	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	32,000	2,000	23,000	1,300
2.0	32,000	2,200	23,000	1,500
3.0	25,000	2,400	18,000	1,700
4.0	20,000	2,400	15,000	1,800
5.0	15,000	2,200	12,000	1,800
6.0	13,500	2,300	10,000	1,800
8.0	10,000	2,400	7,800	1,900
10.0	8,000	2,400	6,000	2,000
12.0	7,000	2,200	5,000	1,900

Application tip



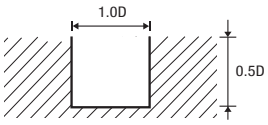
A-Star Endmill

WAE302

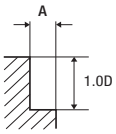
Slotting, Side cutting

Workpiece	Alloy steels, Cast iron		Aluminium	
Conditions	~HB230		-	
Diameter(Ø)	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	16,870	505	16,870	845
1.5	13,150	525	13,150	790
2.0	11,300	565	11,300	790
2.5	10,565	635	10,565	845
3.0	10,000	700	10,000	900
4.0	10,000	900	10,000	1,100
5.0	10,000	1,000	10,000	1,300
6.0	10,000	1,200	10,000	1,500
7.0	8,850	1,240	8,850	1,505
8.0	8,000	1,400	8,000	1,800
9.0	8,000	1,550	8,000	1,680
10.0	8,000	1,700	8,000	2,100
12.0	8,000	2,100	8,000	2,600
14.0	6,000	1,800	6,000	2,200
16.0	6,000	1,900	6,000	2,400
18.0	4,000	1,400	4,000	1,800
20.0	4,000	1,600	4,000	1,900

Application tip



A : Ø3~Ø10 = 0.25 × D
Ø12~Ø20 = 0.5 × D

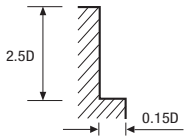


WAE30(2)3, WAR303

Side cutting , General Cutting

Workpiece / Conditions / Diameter(Ø)	Aluminium, Non-ferrous metals	
	R.P.M n (min⁻¹)	Feed vf (mm/min)
3	7,000	455
4	7,000	546
5	7,000	651
6	7,000	756
8	5,600	861
10	5,600	1,050
12	5,600	882
14	4,200	1106
16	4,200	1,211
18	2,800	910
20	2,800	956

Application tip



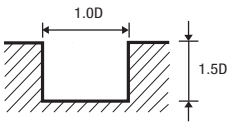
※ Please reduce cutting speed around 20~30% from the above table or AE323 series.

WAE30(2)3, WAR303

Slotting, General Cutting

Workpiece / Conditions / Diameter(Ø)	Aluminium, Non-ferrous metals	
	R.P.M n (min⁻¹)	Feed vf (mm/min)
3	7,000	350
4	7,000	441
5	7,000	504
6	7,000	606
8	5,600	700
10	5,600	854
12	5,600	1,050
14	4,200	903
16	4,200	945
18	2,800	700
20	2,800	805

Application tip



※ Please reduce cutting speed around 20~30% from the above table or AE323 series.

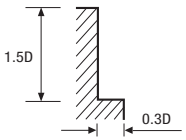
A-Star Endmill

WAR302

Side cutting, General Cutting

Workpiece / Conditions / Diameter(Ø)	Aluminium alloy (<Si 4%)		Aluminium alloy (<Si 8%)		Aluminium alloy (Die casting)		Aluminium alloy (Cu)	
	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)
4	24,000	4,800	19,900	3,980	16,000	3,200	12,000	2,400
6	16,000	3,840	13,200	3,160	10,600	2,544	8,000	1,920
8	12,000	3,600	9,900	2,970	8,000	2,400	6,000	1,800
10	9,500	3,420	8,000	2,880	6,300	2,260	4,800	1,720
12	8,000	3,200	6,600	2,640	5,300	2,120	4,000	1,600
14	6,800	2,990	5,600	2,460	4,500	1,980	3,400	1,490
16	6,000	3,000	5,000	2,500	4,000	2,000	3,000	1,500
18	5,300	2,600	4,400	2,200	3,500	1,750	2,600	1,300
20	4,800	2,400	4,000	2,000	3,200	1,600	2,400	1,200

Application tip

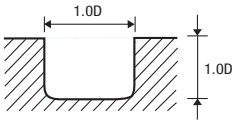


WAR302

Slotting, General Cutting

Workpiece / Conditions / Diameter(Ø)	Aluminium alloy (<Si 4%)		Aluminium alloy (<Si 8%)		Aluminium alloy (Die casting)		Aluminium alloy (Cu)	
	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)
4	24,000	3,840	19,900	2,980	16,000	2,240	12,000	1,440
6	16,000	3,072	13,200	2,370	10,600	1,780	8,000	1,150
8	12,000	2,880	9,900	2,230	8,000	1,680	6,000	1,080
10	9,500	2,730	8,000	2,160	6,300	1,580	4,800	1,030
12	8,000	2,560	6,600	1,980	5,300	1,480	4,000	960
14	6,800	2,390	5,600	1,845	4,500	1,380	3,400	890
16	6,000	2,400	5,000	1,870	4,000	1,400	3,000	900
18	5,300	2,080	4,400	1,650	3,500	1,220	2,600	780
20	4,800	1,920	4,000	1,500	3,200	1,260	2,400	720

Application tip

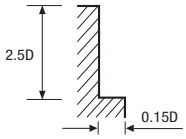


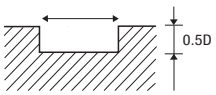
WAR502

Side cutting, Slotting, General cutting

Workpiece / Conditions / Diameter(Ø)	Aluminium alloy (A7075)		Aluminum alloy casting (Si13%)		Magnesium alloy · Copper alloys	
	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)
1.0	32,000	220	32,000	220	23,000	220
1.2	32,000	230	32,000	230	19,000	220
1.4	32,000	260	32,000	260	16,500	220
1.5	32,000	280	32,000	280	15,500	220
1.6	32,000	320	32,000	320	14,500	220
1.8	32,000	360	32,000	360	13,000	220
2.0	32,000	420	32,000	420	11,500	220
2.5	25,000	600	25,000	600	9,500	250
3.0	21,000	700	21,000	700	7,950	250
4.0	15,500	725	15,500	725	5,950	280
5.0	12,500	760	12,500	760	4,750	295
6.0	10,500	830	10,500	830	3,950	310
8.0	7,950	890	7,950	890	2,950	300
10.0	6,350	995	6,350	995	2,350	365
12.0	5,300	1,050	5,300	1,050	1,950	390

Application tip



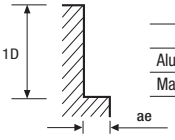


WAR502

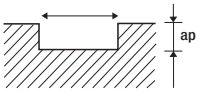
Side cutting, Slotting, High speed cutting

Workpiece / Conditions / Diameter(Ø)	Aluminium alloy (A7075)		Aluminum alloy casting (Si13%)		Magnesium alloy · Copper alloys	
	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)
1.0	50,000	1,000	50,000	950	42,000	700
1.2	50,000	1,200	50,000	1,150	36,000	700
1.4	50,000	1,400	50,000	1,250	31,000	700
1.5	50,000	1,600	48,000	1,250	29,500	700
1.6	50,000	1,700	45,000	1,250	28,000	700
1.8	50,000	1,850	41,000	1,250	26,500	750
2.0	50,000	2,000	38,000	1,250	24,000	750
2.5	48,000	2,100	31,000	1,250	20,000	750
3.0	40,000	2,100	26,000	1,250	17,000	750
4.0	33,000	2,250	20,000	1,350	14,000	800
5.0	31,000	2,800	19,200	1,650	12,500	950
6.0	26,000	2,800	15,900	1,700	10,500	1,000
8.0	19,500	2,900	12,000	1,800	7,900	1,000
10.0	15,500	3,200	9,600	1,900	6,350	1,100
12.0	13,000	3,200	8,000	1,900	5,300	1,100

Application tip



	ae
Aluminium alloy, Aluminum alloy casting	0.15D
Magnesium alloy, Copper alloys	0.1D



	ap
Aluminium alloy, Aluminum alloy casting	0.15D
Magnesium alloy, Copper alloys	0.1D

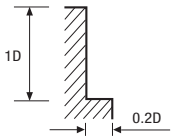
A-Star Endmill

WAR503

Side cutting , General Cutting

Workpiece / Conditions / Diameter(Ø)	Aluminium alloy (A7075)		Aluminum alloy casting (Si13%)		Magnesium alloy · Copper alloys	
	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	21,000	1,100	21,000	1,100	7,950	325
4	15,500	1,250	15,500	1,250	5,950	365
5	12,500	1,300	12,500	1,275	4,750	385
6	10,500	1,400	10,500	1,400	3,950	400
8	7,950	1,500	7,950	1,500	2,950	460
10	6,350	1,700	6,350	1,700	2,350	475
12	5,300	1,750	5,300	1,750	1,950	510
16	3,950	1,750	3,950	1,750	1,450	510
20	3,150	1,750	3,150	1,750	1,150	510

Application tip

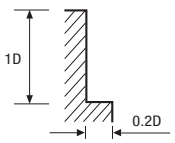


WAR503

Side cutting , High speed cutting

Workpiece / Conditions / Diameter(Ø)	Aluminium alloy (A7075)		Aluminum alloy casting (Si13%)		Magnesium alloy · Copper alloys	
	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	40,000	2,100	24,000	1,250	17,000	625
4	32,000	2,250	19,200	1,550	14,300	800
5	32,000	3,250	19,200	1,950	12,700	925
6	26,500	3,500	15,900	2,150	10,600	960
8	20,000	3,750	12,000	2,250	8,000	1,130
10	16,000	4,300	9,600	2,580	6,350	1,150
12	13,300	4,400	8,000	2,650	5,300	1,250
16	10,000	4,400	6,000	2,650	4,000	1,250
20	8,000	4,400	4,800	2,650	3,200	1,250

Application tip

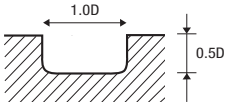


WAR503

Slotting, General Cutting

Workpiece / Conditions / Diameter(Ø)	Aluminium alloy (A7075)		Aluminum alloy casting (Si13%)		Magnesium alloy · Copper alloys	
	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	21,000	770	2,100	770	7,950	325
4	15,500	810	15,500	810	5,950	375
5	12,500	860	12,500	860	4,750	385
6	10,500	950	10,500	950	3,950	400
8	8,000	1,000	8,000	1,000	2,950	460
10	6,350	1,150	6,350	1,150	2,350	475
12	5,300	1,200	5,300	1,200	1,950	510
16	3,950	1,200	3,950	1,200	1,450	510
20	3,150	1,200	3,150	1,200	1,150	510

Application tip

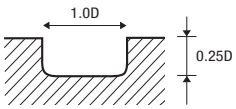


WAR503

Slotting, High speed cutting

Workpiece / Conditions / Diameter(Ø)	Aluminium alloy (A7075)		Aluminum alloy casting (Si13%)	
	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
3	40,000	1,450	24,000	880
4	32,000	1,700	19,200	1,000
5	32,000	2,200	19,200	1,350
6	26,500	2,400	15,900	1,450
8	20,000	2,500	12,000	1,500
10	16,000	2,800	9,600	1,700
12	13,300	2,950	8,000	1,800
16	10,000	3,000	6,000	1,800
20	8,000	3,000	4,800	1,800

Application tip



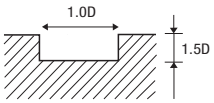
A-Star Endmill

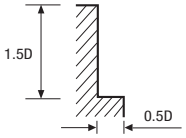
WAF303

Slotting

Workpiece / Conditions / Diameter(Ø)	aluminium, Non-ferrous metals			
	R.P.M n (min⁻¹)	Feed vf (mm/min)	R.P.M n (min⁻¹)	Feed vf (mm/min)
6	10,500	800	13,500	1,050
8	8,000	700	10,500	900
10	6,500	750	8,500	950
12	5,250	800	6,800	1,050
16	4,000	800	5,200	1,050
20	3,200	800	4,200	1,050

Application tip



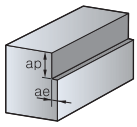


D Endmill

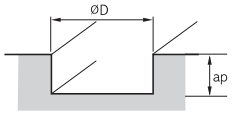
Flat type

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)	R.P.M n (min⁻¹)	Feed vf (mm/min)
1.0	40,000	500	40,000	700	-	-
2.0	25,000	570	25,000	800	25,000	1,600
3.0	20,000	570	20,000	800	20,000	1,600
4.0	18,000	680	18,000	950	18,000	1,900
5.0	14,000	960	14,000	1,200	14,000	2,400
6.0	11,000	1,000	11,000	1,400	11,000	2,800
8.0	8,000	930	8,000	1,300	8,000	2,600
10.0	6,500	860	6,500	1,200	6,500	2,400
12.0	5,500	860	5,500	1,200	5,500	2,400

Application tip



- D ≤ Ø2.5, ap = 1.5D, ae = 0.05D
- D > Ø2.5, ap = 1.5D, ae = 0.1D



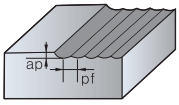
- D ≤ Ø2.5, ap = 0.3D
- D > Ø2.5, ap = 0.5D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

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)
1.0	16,000	400	-	-
2.0	16,000	800	16,000	1,200
3.0	16,000	1,450	16,000	2,000
4.0	16,000	2,100	16,000	3,100
5.0	15,500	2,550	15,000	3,800
6.0	15,000	2,950	15,000	4,400
8.0	13,000	3,000	13,000	4,500
10.0	11,500	3,000	12,000	4,600
12.0	10,700	3,200	10,000	4,700

Application tip



- ap = 0.2D
- pf = 0.2D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM 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

T Endmill

Titanium/Co-Cr

Diameter (Ø)	Application	ap (mm)	ae (mm)	R.P.M n (min⁻¹)	Feed 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

Zirconia

Diameter (Ø)	Application	ap (mm)	ae (mm)	R.P.M n (min⁻¹)	Feed 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

PCD Endmill

Workpiece	vc (m/min)	n (min⁻¹)	fz (mm/t)
Aluminum Alloy, Copper	30~300	2,000~12,000	0.02~0.07
Reinforced Plastic	35~300	2,800~16,000	0.04~0.12
Carbon steel, Graphite	10~100	5,300~16,000	0.04~0.2

MSD Plus

Workpiece			HB	Grade	vc (m/min)	Depth of cut = 10D~25D Feed rate (mm/rev) per drill dia. (mm)				
ISO		Workpiece				Ø1.0~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0	Ø16.1~Ø20.0
P	Carbon steel	Low carbon steel	80~120	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		High carbon steel	Over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
	Alloy steel	Low alloy steel	140~260	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		Hardened low alloy steel	200~400	PC325U	60 (50~100)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		High alloy steel	50~260	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
		Hardened high alloy steel	over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
M	Stainless steel	Austenite series	135~275	PC325U	45 (25~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
		Ferrite series Martensite series	135~275	PC325U	50 (30~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
K	Cast iron	Gray cast iron	150~230	PC325U	100 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		Ductile cast iron	160~260	PC325U	90 (70~140)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
N	Aluminum	Aluminum alloy	30~150	FG2	150 (125~220)	0.24~0.38	0.38~0.53	0.53~0.75	0.61~0.85	0.68~0.98
	Copper alloy	Copper alloy	150~160	FG2	150 (125~220)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40

- 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%

MSD Plus-S

Workpiece			HB	Grade	vc (m/min)	Depth of cut = 3D~5D Feed rate (mm/rev) per drill dia. (mm)			
ISO		Workpiece				Ø2.5~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0
S	Heat resistant alloy	Fe-base	25~35	PC325T	25~30	0.055~0.07	0.07~0.10	0.08~0.13	0.10~0.15
		Ni or Co base	35~45	PC325T	20~25	0.045~0.06	0.06~0.09	0.07~0.12	0.09~0.14
	Titanium	Pure titanium	10~15	PC325T	40~50	0.07~0.11	0.09~0.14	0.12~0.18	0.16~0.23
		α and β alloys	35~45	PC325T	30~40	0.05~0.09	0.07~0.12	0.10~0.16	0.14~0.21

- Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied.

MLD Plus

Workpiece				Grade	vc (m/min)	Depth of cut = 10D~25D		
						Feed rate (mm/rev) per drill dia. (mm)		
ISO		Workpiece	HB	Recommended		Ø3.0~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø10.0
P	Carbon steel	Low carbon steel	80~120	PC315G	80 (60~90)	0.10~0.15	0.15~0.20	0.20~0.25
		High carbon steel	180~280	PC315G	70 (60~80)	0.10~0.15	0.15~0.20	0.20~0.25
	Alloy steel	Low alloy steel	140~260	PC215G	80 (60~90)	0.10~0.15	0.12~0.17	0.15~0.20
		Low carbon steel	50-260	PC215G	70 (60~80)	0.08~0.15	0.10~0.15	0.15~0.20
K	Cast iron	Gray cast iron	150-230	PC215G	80 (60~100)	0.10~0.20	0.15~0.20	0.15~0.20
		Ductile cast iron	160-260	PC215G	70 (60~80)	0.10~0.20	0.15~0.20	0.15~0.20
N	Aluminum	Aluminum alloy	30-150	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25
	Copper lloy	Copper alloy	150-160	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25

MSD Plus CFRP

Workpiece	Grade	vc (m/min)	Depth of cut = 5D		
			Feed rate (mm/rev) per drill dia. (mm)		
			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
CFRP	ND2100	100 (100~150)	0.03 ~ 0.07	0.03 ~ 0.07	0.03 ~ 0.07

MSFD

Workpiece				Grade	Cutting speed, vc (m/min)	Feed (Depth of cut = 2D~3D)		
						Feed rate (mm/rev) per drill dia. (mm)		
ISO		Workpiece	HB	Recommended		Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
P	Carbon steel	Low carbon steel	80~120	PC325U	75 (60~90)	0.03~0.10	0.05~0.15	0.10~0.20
		High carbon steel	180~280	PC325U	75 (60~80)	0.03~0.10	0.05~0.15	0.10~0.20
	Alloy steel	Low alloy steel	140~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20
		High alloy steel	50~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20

P-Star Drill

HPI503, 505, 508, HP503

Workpiece / Solidity / Conditions / Diameter(Ø)	Non-Alloyed steel		Alloy steels		Gray cast iron		Gray cast iron	
	< 700N/mm²		< 1000N/mm²		< HB240, GG25		< HB300, GG40	
	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)
1	16,250	0.05	14,800	0.05	26,600	0.05	17,300	0.05
2	16,250	0.07	14,800	0.07	26,600	0.07	17,300	0.07
3	16,000	0.16	14,500	0.16	26,000	0.16	17,000	0.16
4	12,000	0.17	11,000	0.17	20,000	0.17	13,000	0.17
5	9,550	0.18	8,600	0.18	16,000	0.18	10,000	0.18
6	8,000	0.2	7,200	0.2	13,000	0.2	8,500	0.2
7	6,800	0.22	6,100	0.22	11,500	0.22	7,300	0.22
8	6,000	0.24	5,400	0.24	9,900	0.24	6,400	0.24
9	5,300	0.27	4,800	0.27	8,800	0.27	5,700	0.27
10	4,800	0.3	4,300	0.3	8,000	0.3	5,100	0.3
12	4,000	0.33	3,600	0.33	6,600	0.33	4,250	0.33
14	3,400	0.36	3,050	0.36	5,700	0.36	3,650	0.36
16	3,000	0.39	2,700	0.39	5,000	0.39	3,200	0.39
18	2,650	0.42	2,400	0.42	4,400	0.42	2,850	0.42
20	2,400	0.45	2,150	0.45	4,000	0.45	2,550	0.45

※ Apply to the feed rate for each product as follows.
HPI503(3×D): Feed 100%
HPI505(5×D): Feed 90%
HPI508(8×D): Feed 70~80%

P-Star Drill

PF50, P50, HP50 Series

Workpiece / V / Conditions / Diameter(Ø)	Carbon steels (C<0.3%) Alloy steels/SS400 SCM~710N/mm²		Carbon steels (C≥0.3%) Alloy steels/S50C SCM~1.060N/mm²		SUJ2· SUS440		SKD61 HRC34~43		HRC43~48		SKD11 HRC48~53		Cast iron FC 250~350		Ductile FC 400~500	
	80~125m/min		80~125m/min		63~80m/min		40~63m/min		32~45m/min		25~36m/min		80~125m/min		63~90m/min	
	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)
2	12,000	0.06~0.08	12,000	0.06~0.08	11,000	0.06~0.08	8,000	0.06~0.08	6,000	0.05~0.07	4,500	0.03~0.06	15,000	0.06~0.08	11,000	0.06~0.08
3	9,600	0.09~0.12	9,600	0.09~0.12	7,500	0.09~0.12	5,300	0.09~0.12	4,000	0.07~0.11	3,200	0.05~0.09	10,000	0.09~0.12	7,600	0.09~0.12
4	8,000	0.10~0.15	8,000	0.10~0.15	5,650	0.10~0.15	4,000	0.10~0.15	3,000	0.08~0.13	2,600	0.06~0.10	8,000	0.10~0.15	6,000	0.10~0.15
5	6,400	0.12~0.18	6,400	0.12~0.18	4,550	0.12~0.18	3,300	0.12~0.18	2,400	0.10~0.15	2,000	0.8~0.12	6,400	0.12~0.18	4,800	0.12~0.18
6	5,300	0.14~0.20	5,300	0.14~0.20	3,800	0.14~0.20	2,750	0.14~0.20	2,000	0.12~0.18	1,700	0.09~0.15	5,300	0.14~0.20	4,000	0.14~0.20
8	4,000	0.16~0.24	4,000	0.16~0.24	2,850	0.16~0.24	2,100	0.16~0.24	1,500	0.14~0.22	1,300	0.12~0.20	4,000	0.16~0.24	3,000	0.16~0.24
10	3,200	0.18~0.27	3,200	0.18~0.27	2,250	0.18~0.27	1,700	0.18~0.27	1,200	0.15~0.25	1,000	0.13~0.23	3,200	0.18~0.27	2,400	0.18~0.27
12	2,650	0.20~0.30	2,650	0.20~0.30	1,900	0.20~0.30	1,400	0.20~0.30	1,000	0.17~0.26	850	0.14~0.24	2,700	0.20~0.30	2,000	0.20~0.30
14	2,300	0.22~0.35	2,300	0.22~0.35	1,600	0.22~0.35	1,200	0.22~0.35	860	0.18~0.30	730	0.15~0.26	2,300	0.22~0.35	1,700	0.22~0.35
16	2,000	0.25~0.36	2,000	0.25~0.36	1,400	0.25~0.36	1,050	0.25~0.36	760	0.20~0.32	640	0.16~0.26	2,000	0.25~0.36	1,500	0.25~0.36
18	1,800	0.28~0.38	1,800	0.28~0.38	1,250	0.28~0.38	920	0.28~0.38	670	0.23~0.33	570	0.18~0.28	1,800	0.28~0.38	1,350	0.28~0.38
20	1,600	0.30~0.40	1,600	0.30~0.40	1,150	0.30~0.40	850	0.30~0.40	600	0.25~0.35	500	0.20~0.30	1,600	0.30~0.40	1,200	0.30~0.40

SF503, SF505, SF508, PI503, PI505 Series

Workpiece / V / Conditions / Diameter(Ø)	Carbon steels (C<0.3%) Alloy steels/SS400 SCM~710N/mm²		Carbon steels (C≥0.3%) Alloy steels/S50C SCM~1.060N/mm²		SUJ2· SUS440		SKD61 HRC34~43		HRC43~48		SKD11 HRC48~53		Cast iron FC 250~350		Ductile FC 400~500	
	80~125m/min		80~125m/min		63~80m/min		40~63m/min		32~45m/min		25~36m/min		80~125m/min		63~90m/min	
	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)
3	13,000	0.09~0.12	12,000	0.09~0.12	7,600	0.09~0.12	6,400	0.09~0.12	5,300	0.07~0.11	3,800	0.05~0.09	12,000	0.09~0.12	8,500	0.09~0.12
4	10,000	0.1~0.15	9,500	0.1~0.15	5,700	0.1~0.15	4,800	0.1~0.15	4,000	0.08~0.13	2,950	0.06~0.1	9,000	0.1~0.15	6,350	0.1~0.15
5	8,000	0.12~0.18	7,600	0.12~0.18	4,600	0.12~0.18	3,800	0.12~0.18	3,200	0.1~0.15	2,300	0.08~0.12	7,600	0.12~0.18	5,100	0.12~0.18
6	6,600	0.14~0.20	6,400	0.14~0.20	3,800	0.14~0.20	3,200	0.14~0.20	2,650	0.12~0.18	1,900	0.09~0.15	6,400	0.14~0.20	4,250	0.14~0.20
8	5,000	0.16~0.24	4,800	0.16~0.24	2,900	0.16~0.24	2,400	0.16~0.24	2,000	0.14~0.22	1,450	0.12~0.2	4,800	0.16~0.24	3,200	0.16~0.24
10	4,000	0.18~0.27	3,800	0.18~0.27	2,300	0.18~0.27	1,900	0.18~0.27	1,600	0.15~0.25	1,150	0.13~0.23	3,800	0.18~0.27	2,550	0.18~0.27
12	3,300	0.20~0.30	3,200	0.20~0.30	1,900	0.20~0.30	1,600	0.20~0.30	1,300	0.17~0.26	950	0.14~0.24	3,200	0.20~0.30	2,100	0.20~0.30
14	2,800	0.22~0.35	2,700	0.22~0.35	1,600	0.22~0.35	1,350	0.22~0.35	1,150	0.18~0.3	800	0.15~0.26	2,700	0.22~0.35	1,800	0.22~0.35
16	2,500	0.25~0.36	2,400	0.25~0.36	1,400	0.25~0.36	1,200	0.25~0.36	1,000	0.2~0.32	700	0.16~0.26	2,400	0.25~0.36	1,600	0.25~0.36
18	2,200	0.28~0.38	2,100	0.28~0.38	1,300	0.28~0.38	1,100	0.28~0.38	900	0.23~0.33	650	0.18~0.28	2,100	0.28~0.38	1,400	0.28~0.38
20	2,000	0.30~0.40	1,900	0.30~0.40	1,150	0.30~0.40	1,000	0.30~0.40	800	0.25~0.35	600	0.2~0.3	1,900	0.30~0.40	1,250	0.30~0.40

- SF503(3×D): fn 100%
- SF505(5×D): fn 90%
- SF508(8×D): fn 70~80%

W-Star Drill

NDPG Series

Workpiece / V / Conditions / Mill Dia (mm)	Carbon steels (C<0.3%) Alloy steels/SS400 SCM~710N/mm²		Carbon steels (C>0.3%) Alloy steels/S50C SCM~1.060N/mm²		Grey cast iron < HB240		Grey cast iron < HB350		Stainless steels	
	80~120m/min		80~120m/min		120~200m/min		80~130m/min		40~45m/min	
	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)
1	13,000	0.04	13,000	0.04	21,300	0.04	14,200	0.04	7,160	0.03
2	13,000	0.06	13,000	0.06	21,300	0.06	14,200	0.06	7,160	0.04
3	13,000	0.13	13,000	0.13	21,000	0.13	14,000	0.13	4,780	0.07
4	9,500	0.14	9,500	0.14	16,000	0.14	10,500	0.14	3,600	0.08
5	7,600	0.15	7,600	0.15	13,000	0.15	8,300	0.15	2,850	0.09
6	6,400	0.17	6,400	0.17	11,000	0.17	6,900	0.17	2,400	0.1
8	4,800	0.21	4,800	0.21	8,000	0.21	5,200	0.21	1,800	0.12
10	3,800	0.25	3,800	0.25	6,400	0.25	4,150	0.25	1,450	0.15
12	3,200	0.27	3,200	0.27	5,300	0.27	3,450	0.27	1,200	0.17
14	2,750	0.29	2,750	0.29	4,550	0.29	3,000	0.29	1,000	0.19
16	2,400	0.31	2,400	0.31	4,000	0.31	2,600	0.31	900	0.21
18	2,100	0.33	2,100	0.33	3,550	0.33	2,300	0.33	800	0.23
20	1,900	0.35	1,900	0.35	3,200	0.35	2,100	0.35	700	0.25

※ NDPG507: Use 85% to the above condition

SSD-N

SSD-N

Workpiece / Conditions / Diameter(Ø)	Tool steels, Alloy steels		Aluminium, Aluminium alloy		Brass, Bronze		Epoxy, Resin	
	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)	R.P.M n (min⁻¹)	Feed fn (mm/rev)
3	4,000~7,000	0.02	10,000~12,000	0.03	7,000~10,000	0.02	9,000~12,000	0.08
5	2,400~4,200	0.03	6,000~8,000	0.05	4,200~6,000	0.04	5,400~7,200	0.08
8	1,500~2,600	0.05	3,700~5,000	0.08	2,600~3,700	0.08	3,400~4,500	0.09
12	1,000~1,700	0.06	2,500~3,200	0.12	1,700~2,500	0.12	2,200~3,000	0.11

Workpiece				Grade	vc (m/min)	Feed rate (mm/rev) per drill dia. (mm)			
ISO		Workpiece	HB			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø15.0
P	Carbon steel	Low carbon steel	80~120	Carbide	35 (20~65)	0.02~0.06	0.04~0.08	0.06~0.12	0.10~0.16
N	Aluminum	Aluminum alloy	30-150		100 (94~120)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18
	Copper alloy	Copper alloy	150-160		80 (65~95)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18

Burnishing Drill

Workpiece	Cutting speed vc (m/min)	Feed rate (mm/rev) per drill dia. (mm)				
		Ø2.0~3.0	Ø3.5~5.0	Ø5.5~8.0	Ø8.5~12.0	Ø12.5~18.0
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

Top Solid Drill

Diameter	Cutting condition	Ductile cast iron	Gray cast iron	Soft steel
Ø8.0~Ø10.0	vc (m/min)	30 (20~35)	40 (20~60)	100 (50~150)
	fn (mm/rev)	0.30 (0.20~0.40)	0.30 (0.20~0.40)	0.15 (0.10~0.20)
Ø10.1~Ø15.0	vc (m/min)	50 (30~70)	60 (30~80)	130 (70~200)
	fn (mm/rev)	0.35 (0.30~0.40)	0.35 (0.30~0.40)	0.15 (0.10~0.20)
Ø15.1~Ø25.0	vc (m/min)	60 (50~60)	75 (50~100)	150 (100~250)
	fn (mm/rev)	0.35 (0.30~0.45)	0.40 (0.30~0.50)	0.15 (0.10~0.20)

PCD Drill

Workpiece	vc (m/min)	fn (mm/rev)
CFRP	50~250	0.075 (0.05~0.25)
Aluminum alloy		0.050 (0.03~0.20)
Counter sink section		0.040 (0.02~0.15)

Gun Drill

Workpiece	Hardness (HB)	Cutting speed vc (m/min)	Feed rate (mm/rev) per drill dia. (mm)					
			~Ø4	~Ø6	~Ø10	~Ø14	~Ø24	Ø25~
Carbon steel Alloy steel	~150	100~150	0.005~0.015	0.010~0.025	0.015~0.035	0.020~0.050	0.030~0.070	0.040~0.080
	150~250	80~120	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.030~0.060	0.030~0.060
	250~350	50~100	0.005~0.010	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.020~0.040
	350~	~30	-	0.005~0.010	0.005~0.010	0.010~0.020	0.020~0.035	0.020~0.035
Stainless steel	~250	50~80	0.005~0.015	0.010~0.020	0.010~0.020	0.010~0.030	0.020~0.035	0.020~0.040
	250~350	40~50	-	0.005~0.015	0.010~0.015	0.010~0.020	0.010~0.020	0.010~0.020
Cast iron	~220	80~100	0.010~0.0120	0.020~0.040	0.030~0.050	0.040~0.080	0.080~0.120	0.100~0.150
	220~	40~80	0.005~0.010	0.005~0.015	0.010~0.020	0.015~0.030	0.020~0.050	0.025~0.070
Aluminum alloy	-	180~250	0.010~0.020	0.020~0.040	0.030~0.060	0.040~0.080	0.100~0.180	0.150~0.200
Light alloy	-	120~200	0.005~0.010	0.010~0.020	0.020~0.025	0.020~0.030	0.030~0.040	0.040~0.060

PCD Reamer

For high speed and high precision machining

Workpiece	vc (m/min)	fn (mm/rev)
Aluminum alloy	50 ~ 250	0.05~0.20

Cermet Reamer

Workpiece	Hardness	fz (mm/t)	vc (m/min)
Carbon steel	Under HRC30	0.1~0.4	50~80
High carbon steel, Alloy steel	HRC30 ~ 40	0.1~0.4	80~120
	HRC40 ~ 50	0.1~0.4	50~80
Alloy steel	More than HRC50	0.05~0.2	30~60

Counter Sink

CSPC

Diameter (ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels HRC30~50		Hardened steels HRC45~55		Aluminum alloy	
	R.P.M n (min⁻¹)	Feed (mm/min)	R.P.M n (min⁻¹)	Feed (mm/min)	R.P.M n (min⁻¹)	Feed (mm/min)	R.P.M n (min⁻¹)	Feed (mm/min)	R.P.M n (min⁻¹)	Feed (mm/min)
6.0	3,030	1,550	1,820	600	1,520	500	1,350	240	7,580	3,870
8.0	2,300	1,520	1,370	580	1,150	480	1,015	270	5,750	3,800
10.0	1,840	1,490	1,100	590	920	500	810	270	4,590	3,720
12.0	1,540	1,480	930	610	780	510	690	270	3,850	3,700
16.0	1,150	1,310	690	520	570	460	505	260	2,890	3,470

CSNC/CSHC

1F(Hole) Type

Diameter (ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels		Aluminum alloy	
	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)
~ 10.0	42~72	121	28~48	120	15~17	50	50~110	350
10.0 ~ 20.0		110		70		25		230
20.0 ~ 30.0		75		50		20		200

CSNC

3F Type

Diameter (ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels		Aluminum alloy	
	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)
~ 10.0	30~60	170	20~40	100	10~12	30	40~100	350
10.0 ~ 20.0		85		60		16		230
20.0 ~ 30.0		60		40		10		200

CSPH

Diameter (ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels HRC30~50		Hardened steels HRC45~55		Aluminum alloy	
	R.P.M n (min⁻¹)	Feed (mm/min)	R.P.M n (min⁻¹)	Feed (mm/min)	R.P.M n (min⁻¹)	Feed (mm/min)	R.P.M n (min⁻¹)	Feed (mm/min)	R.P.M n (min⁻¹)	Feed (mm/min)
6.3	1,328	230	1,970	350	905	160	807	140	5,760	1,040
8.3	995	230	1,490	360	690	160	610	140	4,370	1,050
10.4	792	230	1,190	360	550	160	487	130	3,485	940
12.4	665	230	1,000	360	460	150	407	130	2,920	960
16.5	500	230	750	360	345	160	307	140	2,200	990
20.5	402	230	600	360	276	160	247	140	1,770	1,010

Counter Sink

CSNH/CSHH

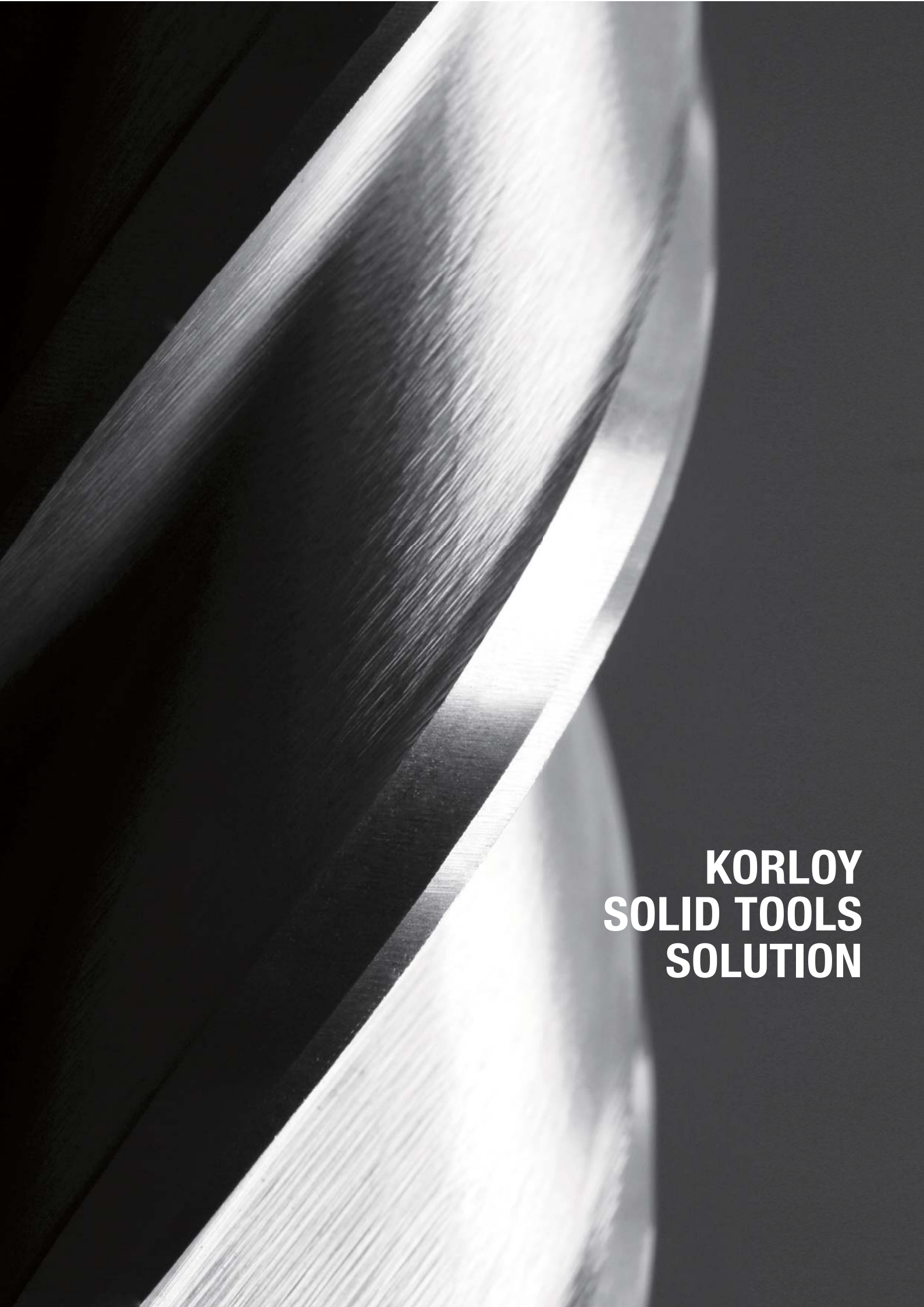
1F(Hole) Type

Diameter (Ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels		Aluminum alloy	
	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)
~ 10.0	20-30	110	16-20	55	50-60	255	50-100	450
10.0 ~ 20.0		55		35		180		350
20.0 ~ 30.0		35		55		150		300

CSNH

3F Type

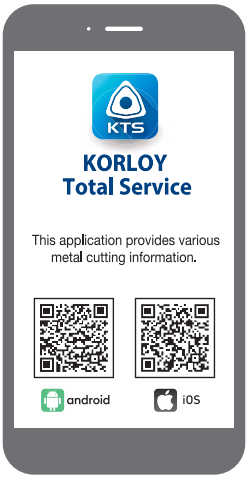
Diameter (Ø)	Alloy steels & carbon steels under HRC30		Pre-hardened steels HRC30~45		Stainless steels		Aluminum alloy		Plastic	
	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)	vc (m/min)	Feed (mm/min)
~ 10.0	10~15	60	8~12	35	4~6	30	50~60	255	35~70	400
10.0 ~ 20.0		30		25		16		180		300
20.0 ~ 30.0		20		15		10		150		250



KORLOY
SOLID TOOLS
SOLUTION

⚠ For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasess 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.



KORLOY

Head Office: Holystar B/D, 326, Seocho-daero, Seocho-gu, Seoul, 06633, Republic of Korea
Tel: +82-2-522-3181 Fax: +82-2-522-3184, +82-2-3474-4744 Web: www.korloy.com E-mail: sales.khq@korloy.com

KORLOY AMERICA
620 Maple Avenue, Torrance, CA 90503, USA
Tel: +1-310-782-3800 Toll Free: +1-888-711-0001 Fax: +1-310-782-3885
E-mail: sales.kai@korloy.com

KORLOY INDIA
Plot No. 415, Sector 8, IMT Manesar, Gurgaon 122051, Haryana, India
Tel: +91-124-4391790 Fax: +91-124-4050032
E-mail: sales.kip@korloy.com

KORLOY TURKIYE
Serifali Mahallesi, Burhan Sokak NO: 34
Dudullu OSB/Umraniye/Istanbul, 34775, Turkiye
Tel: +90-216-415-8874 E-mail: sales.ktl@korloy.com

KORLOY RUSSIA
Krasivy Dom office No. 305, Bld. 5, Novovladykinskiy proezd 8, 127106, Moscow, Russia
Tel: +7-495-280-1458 Fax: +7-495-280-1459 E-mail: sales.krc@korloy.com

KORLOY FACTORY INDIA
Plot No. 415, Sector 8, IMT Manesar, Gurgaon 122051, Haryana, India
Tel: +91-124-4391790 Fax: +91-124-4050032
E-mail: pro.kim@korloy.com

KORLOY EUROPE
Gablonzer Str. 25-27, 61440 Oberursel, Germany
Tel: +49-6171-277-83-0 Fax: +49-6171-277-83-59
E-mail: sales.keg@korloy.com

KORLOY BRASIL
Av. Aruana 280, conj.12, WLC, Alphaville, Barueri, CEP06460-010, SP, Brasil
Tel: +55-11-4193-3810 E-mail: sales.kbl@korloy.com

KORLOY CHILE
Av. Providencia 1650, Office 1009, 7500027
Providencia-Santiago, Chile
Tel: +56-229-295-490 E-mail: sales.kcs@korloy.com

KORLOY MEXICO
Calle R. M. Clemencia Borja Taboada 522, Jurica Acueducto, 76230 Juriquilla, Qro., Mexico
Tel: +52-442-673-7388 E-mail: sales.kml@korloy.com

PRINTED WITH SOY INK

PC03-EM-06 / 20230101