Solid Carbide

End Mills | Drills | Special Tools

Guide Page

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Series (2)

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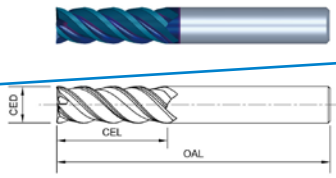
Cutting Suitability (9)

Work Material (10)

UFMG Carbide - High-Speed End Mill

A700+ - 11454TB

- Square - 4-Flute x 3D
- Helix 45°



CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
A700+-11454TB	1	3	4	50	4
	2	6	4	50	
	3	9	4	50	
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	

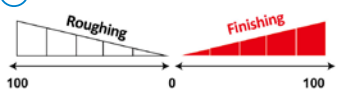
Code No.	CED	CEL	SD	OAL	Flute
A700+-11454TB	EU 3	9	6	57	4
	EU 4	12	6	65	
	EU 5	15	6	65	
	EU 6	18	6	65	

12	3,840	910	3,480	550	2,700	380	2,160	260

Depth of cut	ap	ae
	1.5D	0.2D
	1.5D	0.1D
	1.5D	0.05D
	1.5D	0.03D

Work Material

P			H		
G1	G2	G3	G14	G15	G16
•	•	•	•	•	○



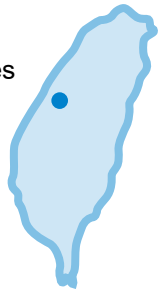
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

About Us

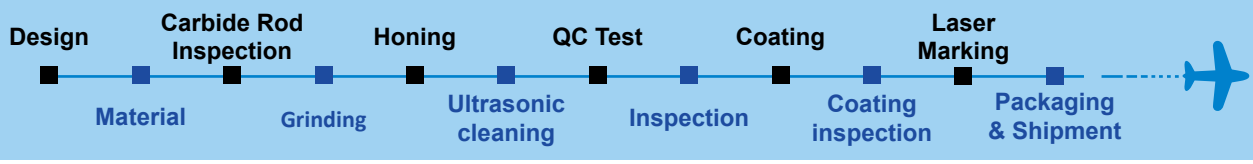
Founded in **1986**, **CITY TOOLS** is a leading solid carbide cutting tool manufacturer located in Taiwan.

ISO900 1:2000 certified, our products are widely used in Aerospace, Medical, Automotive, Electronic industry, Mechanical parts, Molds & Die, Woodworking, Plastic and all kinds of Metal / Non-Metal processing industrial.

In order to improve our production quality, we imported advanced CNC grinding machines from Germany. We use advanced inspection equipment to conduct 100% inspections at every stage of production to ensure quality and provide customers with perfect service.



Manufacturing



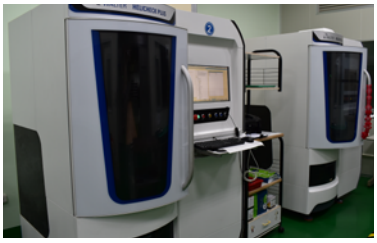
Walter Grinding Machine

Production | ***Ensure accuracy quality tools and Increase productivity***

Quality Management

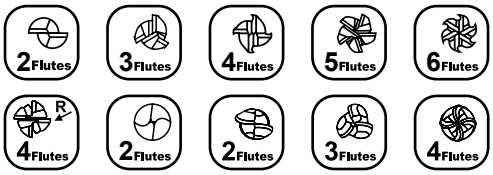
Full inspection on each tool with precised accuracy

100% comprehensive inspection with precised accuracy

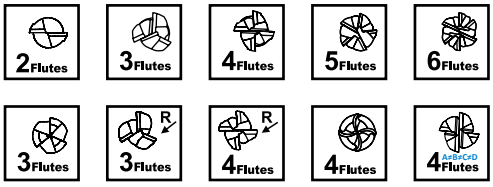


Icon Guide

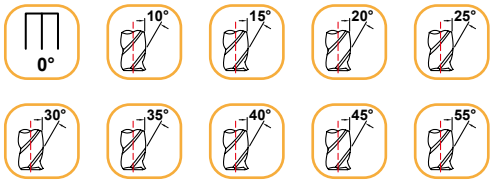
Type of Flute



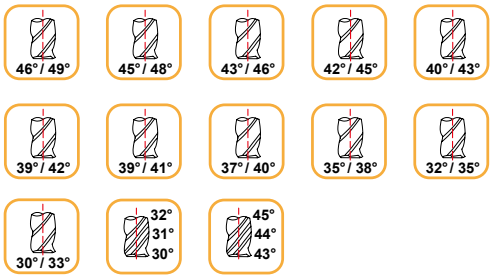
Type of Uneven Flute



Helix angle



Variable helix angle



Honing Process


with honing


without honing

Type of cutting edge


with gashland protection


sharp corner

IE

Uneven Flute,
Variable Helix Angle

Processing direction

Work piece material hardness

Angle & Type of Cutting Edge

Drill bit point angle

Drill bit point angle

Flat-Bottom Drill

Square

Corner Radius

Ball Nose

Spherical Ball End Mill

Chamfering

Corner C

Corner rounding

Front / Back chamfer

Fine tooth rough milling


Fine tooth sharp edge

Roughing

Icon Guide

Type of Coating

TA TN TB TO Z3 DLC TS

Code	Name	Oxidation Temperature	Surface Hardness(Hv)	Coefficient of Friction	Coating Thickness(μm)
TA	AlTiCrN	900℃	3200	0.5	1~4
TN	TiAlN	800℃	2600	0.4	1~4
TB	AlTiSiN-B	1100℃	3500	0.45	1~4
TO	AlTiSiN	1000℃	3200	0.45	1~4
Z3	AlTiSiZrN	1000℃	3000	0.4	1~4
DLC	Diamod	550℃	2500	0.1	0.8
TS	TA-C	1100℃	5500	0.1	0.1~1

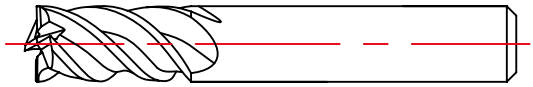
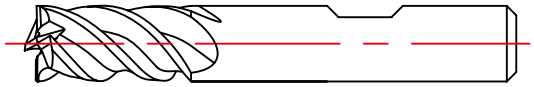
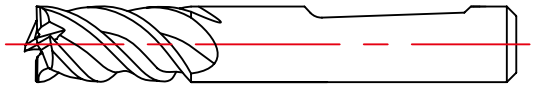
※ Actual coating color may have slight difference due to coating temperature.

Solid Carbide Material

icon	Grade	Grain size	Cobalt	Hardness
UFMG	Ultrafine Micro Grain Carbide	0.2um~0.3um	8.2%	HRA93.7
UMG	Ultra Micro Grain Carbide	0.4um~0.5um	12%	HRA92.7
SMG	Super Micro Grain Carbide	0.6um~0.8um	10%	HRA92.3
HSS	High Speed Steel	---	8%	HRC66~68

Icon Guide

Optional Weldon Shank HB, HE Service

Form HA, plain	
Form HB, with drive flat	
Form HE, with whistle notch flat	

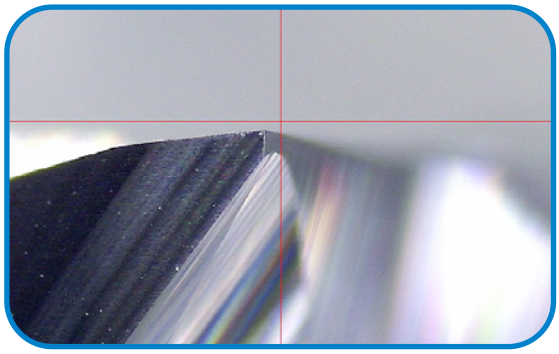
Type of cutting edge

	**Gashland Edge:** **The tools with Gashland Edge have reduced corner sharpness, increasing strength and preventing chipping to enhance tool life.**
	**Sharp Edge:** **The sharp edge blade is used for cleaning pin corners on the workpiece, which are left uncleaned by tools with Gashland Edge.**

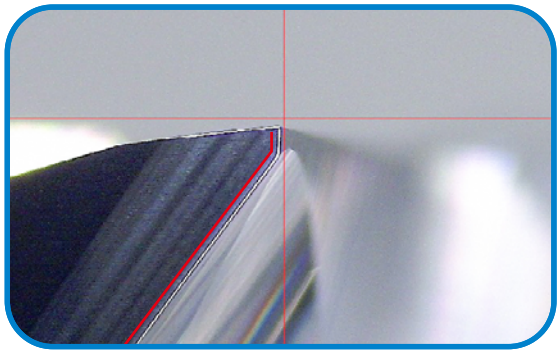
Honing Process

The honing process creates a micro R on the edge, it's enable to reduce chipping, enhancing coating adhesion and prolonging tool life.

 **without honing**



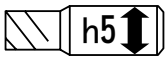
 **with honing**



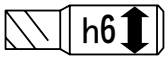
Material CHART

ISO	Group	Material	Tensile Strength N/mm2	Hardness HB
P	G1	Non-alloyed Steel, cast steel, free cutting steel	420 - 848	125 -300
	G2	<24HRC Low-alloyed Steel, cast steel	600 - 1200	200 - 300
	G3	<30HRC Hi-alloyed Steel, cast steel, tool steel	680-1100	200- 325
M	G4	Stainless Steel, cast steel	600 - 820	180 - 240
K	G5	Gray Cast Iron, Ductile cast iron, Malleable cast iron		130 - 260
N	G6	Aluminium		60 - 130
	G7	Copper		90 - 110
	G8	Plastics, Hard rubber		
	G9	FRP CFRP Composite Material		
	G10	Graphite		
S	G11	High Temp Alloys		200 - 280
	G12	Nickel		320 - 350
	G13	Titanium	400 - 1,050	
H	G14	30-38HRC Hardened Steel		
	G15	38-48HRC Hardened Steel		
	G16	48-56HRC Hardened Steel		
	G17	56-65HRC Hardened Steel		

High Precision Shank Tolerance



The h5 high precision tolerance, optimum concentricity and runout for precision chucks.



h6 high precision tolerance for HSS series, optimum concentricity and runout for precision chucks.

Coding Principle

Helix Angle

Number of Flute

RPA700+-14352TB

Coating

Series

RP = Long Neck
RT = Taper Neck
AC = Aluminum Series
CS = Stainless Steel Series
TI = Titanium Series
RF = Roughing Series
DR = Drill Series
CF = Chamfering Series
IR = Corner Radius Series
VF = Grooving Series
HS = High Speed Steel Series

Type

1 = Square
2 = Corner Radius
4 = Drill
5 = Reammer
8 = Ball nose

Flue type

1 = Standard Flute
2 = Long Flute
3 = Long shank
4 = Stub Flute

A700IE+-11384TH

I = Uneven flute
E = Variable helix angle

S500M+-11302TN

M= Miniature

AC100RN+-11403

R = Heavy Duty Operation

N = Sharp edge

A700+ Series

High Speed High Feed & Finishing

Appearance	Code No	Description	Size	Pg
	A700+-11454TB	Square - 4-Flute x 3D - Helix 45°	Ø1~Ø12	19
	A700+-11554TB	Square - 4-Flute x 2.5D - Helix 55°	Ø4~Ø20	21
	A700+-11555TB	Square - 5-Flute x 2.5D - Helix 55°	Ø4~Ø20	21
	A700+-11556TB	Square - 6-Flute x 2.5D - Helix 55°	Ø4~Ø20	21
	A700+-81402TB	Ball Nose - 2-Flute x 2D - Helix 40°	0.5R~6R	23
	A700+-81454TB	Ball Nose - 4-Flute x 2D - Helix 45°	3R~10R	25
	A700+-83402TB	Ball Nose - 2-Flute x 1D / Long Shank Helix 40°	0.5R~6R	27
	A700+-83454TB	Ball Nose - 4-Flute x 2D / Long Shank Helix 45°	3R~10R	29
	A700+-21454TB	Corner Radius - 4-Flute x 3D - Helix 45°	Ø1~Ø12	31
	A700IE+-11454TB	Square - 4-Flute x 3D Uneven Flute / Variable Helix 45°/48°	Ø4~Ø20	33
	A700IE+-12464TB	Square - 4-Flute x 4D / Long Flute Uneven Flute / Variable Helix 46°/49°	Ø4~Ø20	35
	A700IE+-12465TB	Square - 5-Flute x 4D / Long Flute Uneven Flute / Variable Helix 46°/49°	Ø4~Ø20	35
	A700IE+-12466TB	Square - 6-Flute x 4D / Long Flute Uneven Flute / Variable Helix 46°/49°	Ø4~Ø20	35
	A700IE+-81404TB	Ball Nose - 4-Flute x 2D Uneven Flute / Variable Helix 40°/43°	3R~10R	37
	A700IE+-21454TB	Corner Radius - 4-Flute x 3D Uneven Flute / Variable Helix 45°/48°	Ø1~Ø12	39
	RPA700+-14352TB	Square - 2-Flute x 1.5D - Long Neck Helix 35°	Ø0.5~Ø6	41
	RPA700+-84302TB	Ball Nose - 2-Flute x 1.5D - Long Neck Helix 30°	0.25R~3R	43
	RTA700+-14352TB	Square - 2-Flute x 1.5D Taper Neck Helix 35°	Ø0.5~Ø6	45
	RTA700+-84302TB	Ball Nose - 2-Flute x 1.5D Taper Neck Helix 30°	0.25R~3R	47

X600+ Series

Mold Processing & Parts Processing

Appearance	Code No	Description	Size	Pg
	X600+-11374TO	Square - 4-Flute x 2.5D / Helix 37°	Ø1~Ø12	51
	X600+-11374TO	Square - 4-Flute x 3D / Helix 37°	Ø1~Ø20	53
	X600+-12456TO	Square - 6-Flute x 4D Long Flute Helix 45°	Ø6~Ø20	55
	X600M+-14352TO	Square - 2-Flute x 1D / Helix 35° / Miniature	Ø0.2~Ø0.9	57
	X600+-81372TO	Ball Nose - 2-Flute x 2D / Helix 37°	0.5R~6R	59
	X600+-81404TO	Ball Nose - 4-Flute x 2D / Helix 40°	3R~10R	61
	X600+-83372TO	Ball Nose - 2-Flute x 1D / Long Shank Helix 37°	0.5R~6R	63
	X600+-83404TO	Ball Nose - 4-Flute x 2D / Long Shank Helix 40°	3R~10R	65
	X600M+-84352TO	Ball Nose - 2-Flute x 1D / Helix 35° Miniature	0.1R~0.45R	67
	X600+-21454TO	Corner Radius - 4-Flute x 3D / Helix 45°	Ø1~Ø12	69
	X600IE+-11374TO	Square - 4-Flute x 2.5D Uneven Flute / Variable Helix 37°/40°	Ø1~Ø20	71
	X600IE+-12394TO	Square - 4-Flute x 4D / Long Flute Uneven Flute / Variable Helix 39°/42°	Ø4~Ø20	73
	X600IE+-81374TO	Ball Nose - 4-Flute x 2D Uneven Flute / Variable Helix 37°/40°	3R~10R	75
	X600IE+-21374TO	Corner Radius - 4-Flute x 2.5D Uneven Flute / Variable Helix 37°/40°	Ø1~Ø12	77

S500+ Series

Parts Processing & General Processing

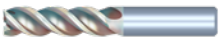
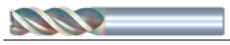
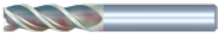
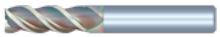
Appearance	Code No	Description	Size	Pg
	S500+-11352TN	Square - 2-Flute x 2.5D / Helix 35°	Ø0.5~Ø16	81
	S500+-11354TN	Square - 4-Flute x 2.5D / Helix 35°	Ø0.5~Ø16	83
	S500+-11354TN	Square - 4-Flute x 3D / Helix 35°	Ø0.5~Ø16	85
	S500+-11454TN	Square - 4-Flute x 2.5D / Helix 45°	Ø0.5~Ø2	87
	S500+-11454TN	Square - 4-Flute x 3D / Helix 45°	Ø0.5~Ø20	89
	S500+-11506TN	Square - 6-Flute x 3D / Multi-Flute Helix 50°	Ø6~Ø20	91
	S500+-12354TN	Square - 4-Flute x 4D / Long Flute Helix 35°	Ø0.5~Ø20	93
	S500+-12454TN	Square - 4-Flute x 4D / Long Flute Helix 45°	Ø0.5~Ø20	95
	RPS500+-14354TN	Square - 4-Flute x 1D / Stub Flute Long Neck / Helix 35°	Ø0.5~Ø6	97
	S500+-81302TN	Ball Nose - 2-Flute x 2D / Helix 30°	0.5R~8R	99
	S500+-81354TN	Ball Nose - 4-Flute x 2D / Helix 35°	0.5R~10R	101
	S500+-83302TN	Ball Nose - 2-Flute x 2D / Helix 30°	0.5R~6R	103
	S500+-83354TN	Ball Nose - 4-Flute x 2D / Helix 35°	3R~10R	105
	RPS500+-84352TN	Ball Nose - 2-Flute x 1D / Stub Flute Long Neck / Helix 35°	0.25R~3R	107
	S500+-21354TN	Corner Radius - 4-Flute x 3D / Helix 35°	Ø1~Ø12	109
	S500IE+-11324TA	Square - 4-Flute x 3D Uneven Flute / Variable Helix Angle 32°/35°	Ø6~Ø16	111
	S500IE+-11354TA	Square - 4-Flute x 2.5D Uneven Flute / Variable Helix 35°/38°	Ø1~Ø16	113
	S500IE+-11374TA	Square - 4-Flute x 2.5D Uneven Flute / Variable Helix 37°/40°	Ø1~Ø16	115
	S500IE+-11434TA	Square - 4-Flute x 2.5D Uneven Flute / Variable Helix 43°/46°	Ø4~Ø20	117
	S500IE+-11434TA	Square - 4-Flute x 3D Uneven Flute / Variable Helix 43°/46°	Ø1~Ø16	119

S500+ Series

Parts Processing & General Processing

Appearance	Code No	Description	Size	Pg
	S500IE+-12434TA	Square - 4-Flute x 4D / Long Flute Uneven Flute / Variable Helix 43°/46°	Ø4~Ø20	121
	S500IE+-12434TA	Square - 4-Flute x 5D / Long Flute Uneven Flute / Variable Helix Angle 43°/46°	Ø6~Ø16	123
	S500IE+-12424TA	Square - 4-Flute / Long Flute Uneven Flute / Variable Helix Angle 42°/45°	Ø6~Ø16	125
	S500IE+-13424TA	Square - 4-Flute / Long Shank Uneven Flute / Variable Helix Angle 42°/45°	Ø6~Ø16	127
	S500IE+-12435TA	Square - 5-Flute x 4D / Long Flute Uneven Flute / Variable Helix 43°/46°	Ø6~Ø16	129
	S500IE+-12436TA	Square - 6-Flute x 4D / Long Flute Uneven Flute / Variable Helix 43°/46°	Ø6~Ø16	131
	S500IE+-81354TA	Ball Nose - 4-Flute x 2D Uneven Flute / Variable Helix 35°/38°	3R~10R	133
	S500IE+-83354TA	Ball Nose - 4-Flute x 2D / Long Shank Uneven Flute / Variable Helix 35°/38°	3R~10R	135
	S500IE+-21434TA	Corner Radius - 4-Flute x 3D Uneven Flute / Variable Helix 43°/46°	Ø1~Ø12	137
	S500E+-11302TA	Square - 2-Flute x 2.5D Variable Helix Angle 30°/33°	Ø1~Ø16	139
	S500E+-81302TA	Ball Nose - 2-Flute x 2.5D Variable Helix Angle 30°/33°	0.5R~8R	141
	S500E+-11303TA	Square - 3-Flute x 2.5D Variable Helix Angle 30°/31°/32°	Ø1~Ø16	143
	S500E+-81303TA	Ball Nose - 3-Flute x 2.5D Variable Helix Angle 30°/31°/32°	0.5R~8R	145

Specialized+ Series

Appearance	Code No	Description	Size	Pg
Spherical Ball End Mill				
	SS100+-84302TN	2-Flute / Spherical Ball End Mill Long Shank with Neck	1.5R~8R	149
	SS100+-84304TN	4-Flute / Spherical Ball End Mill Long Shank with Neck	2.5R~8R	151
Roughing End Mills				
	RF100IE+-11394TN	4-Flute / Fine Pitch Roughing | Square Uneven Flute / Variable Helix 39°/41°	Ø6~Ø12	153
	RF100+-11304TN	4-Flute / Fine Pitch Roughing End Mill Helix 30°	Ø5~Ø20	155
	S480+-RF100IE-11354TB	4-Flute / Corse Pitch Roughing | Square Uneven Flute / Variable Helix 35°/38°	Ø6~Ø20	157
End Mill for Aluminum				
	AC100IER+-11433TS	3-Flute / End Mill for Aluminum | Square Uneven Flute / Variable Helix 43°/44°/45°	Ø3~Ø12	159
	AC100IE+-21433TS	3-Flute / Corner Radius for Aluminum Uneven Flute / Variable Helix 43°/44°/45°	Ø3~Ø12	161
	AC100E+-81432TS	2-Flute / End Mill for Aluminum | Ball Nose Variable Helix 43°/46°	Ø3~Ø12	163
	AC100IE+-11453TS	3-Flute / End Mill for Aluminum | Square Uneven Flute / Variable Helix 45°/46°/47°	Ø3~Ø25	165
	AC100IEN+-11453TS	3-Flute / Sharp Edge for Aluminum Uneven Flute / Variable Helix 45°/46°/47°	Ø3~Ø12	167
Stainless Steels End Mill				
	CS100IE+-11404Z3	4-Flute / Stainless Steel End Mill | Square Uneven Flute / Variable Helix 40°/43°	Ø4~Ø16	169
	CS100IE+-21404Z3	4-Flute / Corner Radius for Stainless Steel Uneven Flute / Variable Helix 40°/43°	Ø4~Ø16	171
	CS100IE+-81354Z3	4-Flute / Stainless Steel End Mill | Ball Nose Uneven Flute / Variable Helix 35°/38°	2R~8R	173
End Mill for Titanium				

Specialized+ Series

Appearance	Code No	Description	Size	Pg
	TI100IE+-11454Z3	4-Flute / End Mill for Titanium | Square Uneven Flute / Variable Helix 45°/48°	Ø4~Ø16	175
	TI100IE+-21404Z3	4-Flute / Corner Radius for Titanium Uneven Flute / Variable Helix 45°/48°	Ø4~Ø16	177
	TI100IE+-81374Z3	4-Flute / End Mill for Titanium | Ball Nose Uneven Flute / Variable Helix 37°/40°	2R~8R	179
End Mill for Dental				
	DT100-81302TN	2-Flute / Dental Ball Nose End Mill 4mm Shank	0.3R~1R	181
	DT100-11302TN	2-Flute / Dental Square End Mill 4mm Shank	Ø0.5~Ø2	183
	DT100-21304TN	4-Flute / Dental Corner Radius Mill 4mm Shank	Ø1~Ø2	185
	DT100-41302TN	2-Flute / Dental Drill Bits | 3mm Shank	Ø0.5~Ø3	187
Flat Bottom Drill				
	DR360+-41202TN	2-Flute / Flat Bottom Drill Bit | Helix 20°	Ø6~Ø16	189
	DR365+-41202TN	2-Flute / Flat Bottom Drill Bit Coolant Hole x 3D	Ø6~Ø16	191
Drills				
	DR300+-41302TN	2-Flute / SMG Carbide -Drill Bit | 140° tip	Ø3~Ø20	193
	DR350+-41302TN	2-Flute / Coolant Hole Drill Bit-x 3D 140° tip	Ø1~Ø16	197
	DR350+-42302TN	2-Flute / Coolant Hole Drill Bit-x 5D 140° tip	Ø1~Ø16	199
	DR100+-40902TN	2-Flute / SMG Carbide -Spot Drill 90°	Ø4~Ø12	201
	DR100+-90120TN	2-Flute / SMG Carbide- Spot Drill 90°/120°	Ø3~Ø12	203
	DR500+-40902TN	2-Flute / SMG Carbide 90° Drill Point End Mill	Ø4~Ø12	205
	DR200+-40602TN	2-Flute / Countersink Center Drill | 60°	Ø1~Ø5	207

Specialized+ Series

Appearance	Code No	Description	Size	Pg
Corner Rounding End Mill				
	IR100+-81003TN	3-Flute / Corner Rounding End Mill	Ø2.1~Ø12	209
Chamfering End Mills				
	VF100+-11903TN	3-Flute / Front-Back Chamfer End Mill Short Type	Ø1.5~Ø12	211
	VF100+-11903TN	3-Flute / Front-Back Chamfer End Mill Long Type	Ø3~Ø6	213
	VF100+-11904TN	4-Flute / Front-Back Chamfer End Mill Long Type	Ø8	213
	VF100+-11905TN	5-Flute / Front-Back Chamfer End Mill Long Type	Ø10	213
	VF100+-11906TN	6-Flute / Front-Back Chamfer End Mill Long Type	Ø12	213
	CF400+-40903TN	3-Flute / Carbide-Spiral Chamfer End Mill 90°	Ø4~Ø12	215
	CF300+-40903TN	3-Flute / Carbide-Chamfer End Mill| 90°	Ø4~Ø10	217
	CF300+-40906TN	6-Flute / SMG Carbide-Chamfer End Mill V-90°	Ø4~Ø12	219
	CF300+-41202TN	2-Flute / SMG Carbide-Chamfer End Mill V120°	Ø4~Ø10	221
	CF300+-40602TN	2-Flute / SMG Carbide-Chamfer End Mill V-60°	Ø4~Ø10	223
	CF300+-40902TN	2-Flute / SMG Carbide-Chamfer End Mill V-90°	Ø4~Ø10	225
Carbide Hard Cut Drill				
	HCD-Hard Cut Drill	Straight Flute / UMG Carbide Hard Cut Drill | V-60°	Ø2~Ø6	227

HSS+ Series

High Speed Steel Series

Appearance	Code No	Description	Size	Pg
	HS400IE+-11304TN	Square / 4-Flute Uneven Flute / Variable Helix 30°/33°	Ø6~Ø25	229
	HS400IE+-11305TN	Square / 5-Flute Uneven Flute / Variable Helix 30°/33°	Ø8~Ø25	231
	HS400N+-11304TN	Square / 4-Flute / Sharp Edge Helix 30°	Ø8~Ø14	233
	HS100E+-11302TN	Square / 2-Flute Variable Helix 30°/33°	Ø6~Ø20	235
	HS100IE+-11304TN	Square / 4-Flute Uneven Flute / Variable Helix 30°/33°	Ø6~Ø20	237
	HDR300+-41302TN	2-Flute / HSS Twist Drills | 118° Tip	Ø0.2~Ø20	239
	HRD100+-40902TN	2-Flute / Spot Drill 90° 45° Chamfering	Ø4~Ø20	243
	HPRD100+-90120TN	2-Flute / Spot Drill 120°/90° 45° Chamfering	Ø4~Ø20	245
	HCF100+-40903TN	3-Flute / 90° 45° Chamfering	Ø6.3~Ø25	247
	HCF100I+-40903TN	3-Flute / 90° / Uneven Flute 45° Chamfering	Ø4.3~Ø35	249

Rotary Burrs

Specialized+ Series

Appearance	Code No	Description	Size	Pg
	Type-A	Type A - Cylinder / Flat End	Ø1.5~Ø25	253
	Type-B	Type B - Cylinder / with End Cut	Ø1.5~Ø25	255
	Type-C	Type C - Ball Nose Cylinder	Ø2~Ø20	257
	Type-D	Type D - Spherical Ball	Ø2~Ø25	259
	Type-E	Type E - Oval shape	Ø3~Ø20	261
	Type-F	Type F - Ball Nose Tree shape	Ø3~Ø20	263

Rotary Burrs

Specialized+ Series

Appearance	Code No	Description	Size	Pg
	Type-G	Type G - Flat End Tree shape	Ø3~Ø20	265
	Type-H	Type H - Flame shape	Ø3~Ø20	267
	Type-L	Type L - Ball Nose Cone shape	Ø3~Ø20	269
	Type-M	Type M - Flat End Cone shape	Ø3~Ø16	271
	Type-N	Type N - Flat End / Inverted Cone Shape	Ø3~Ø20	273
	Type-O	Type O - Cylinder / Corner Radius End Cut	Ø3~Ø16	273
	Type-J	Type J - V Shape 60° Countersink deburring	Ø3~Ø25	275
	Type-K	Type K - V Shape 90° Countersink deburring	Ø3~Ø20	275

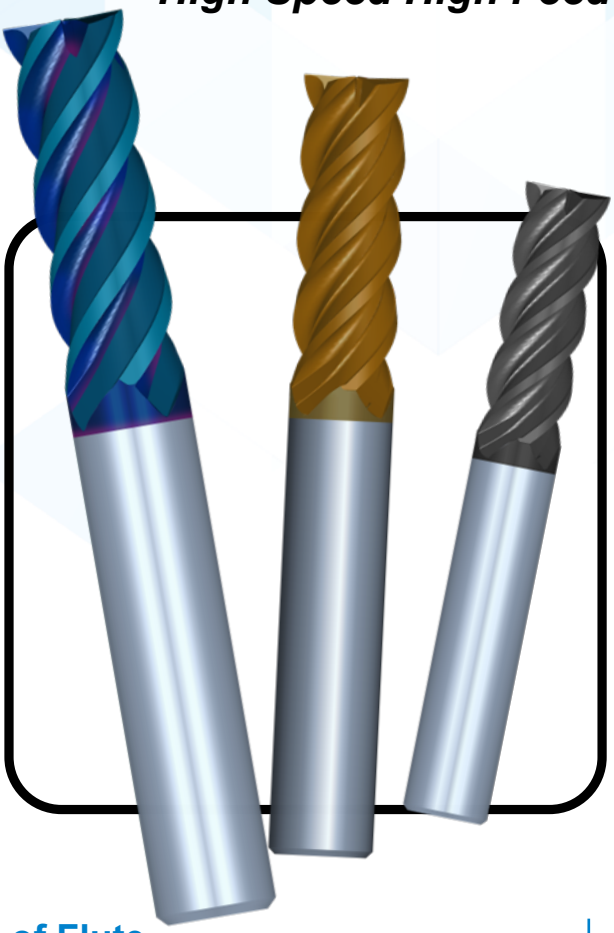
Router

Specialized+ Series

Appearance	Code No	Description	Size	Pg
	FG10010	2 Flute - End Cut Helix 10° / Upcut	Ø3~Ø12	279
	FG20010	Square type - Flat End Helix 10° / Upcut	Ø3~Ø12	279
	FG30010	2 Flute - Drill Point Helix 10° / Upcut	Ø3~Ø12	280
	FG40030	Square -Burr Point Helix 30° / Upcut	Ø3~Ø12	280
	FG10030	2 Flute - End Cut Helix 30° / Upcut	Ø3~Ø12	281
	FG30030	2 Flute - Drill Point Helix 30° / Upcut	Ø3~Ø12	281
	FG500-1108	8 Flute - End Cut Helix 10° / Upcut	Ø3~Ø12	282
	FG600	2 Flute - Drill Point Helix 30° / Upcut	Ø3~Ø12	282

A700+ Series

High Speed High Feed & Finishing



UFMG — Super Ultrafine Micro Grain Carbide

HRC ▶65 — Suitable for work material ~HRC65

Optional Coating

TB TO TH

Optional 3 types of selectable coating

Types of Flute

2Flutes 4Flutes 5Flutes 6Flutes 4Flutes (R) 2Flutes 4Flutes

Types of Uneven Flute

4Flutes (AFBPCFD) 4Flutes 5Flutes 6Flutes 4Flutes 4Flutes (R)

Honing Process

with honing

without honing

Cutting edge protection

with gashland protection

sharp corner

Helix angle

30° / 35° / 40° / 45° / 46° / 55°

Best Seller IE Series

Optional DIN Weldon Shank

DIN 6535 HA DIN 6535 HB DIN 6535 HE

Special & Custom Tooling Services

Customized acceptable !

From Coating, flute, Helix angle, cutting length, to total length.

UFMG Carbide - High-Speed Finishing End Mill

A700IE+-11454TB

Best Seller IE Series

Starter Pack

Experience High-Speed Cutting
One pack for all needs!

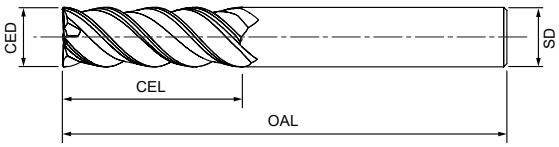
Package sizes Ø6, Ø8, Ø10, Ø12

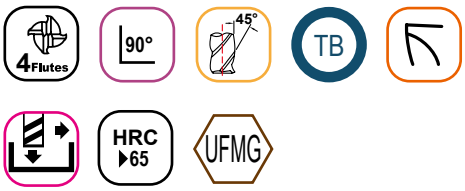
Code No.	CED	CEL	SD	OAL
A700IE+-11454TB	Ø 6	18	6	50
	Ø 8	24	8	65
	Ø10	30	10	75
	Ø12	36	12	80

Contact us now for more information!

A700+ - 11454TB

- Square - 4-Flute x 3D
- Helix 45°





CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

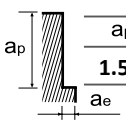
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
A700+-11454TB	1	3	4	50	4
	2	6	4	50	
	3	9	4	50	
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	

Code No.	CED	CEL	SD	OAL	Flute
A700+-11454TB	EU 3	9	6	57	4
	EU 4	12	6	65	
	EU 5	15	6	65	
	EU 6	18	6	65	
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

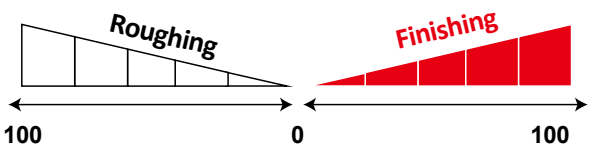
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
1	33,600	530	30,480	390	24,000	280	19,200	195
2	20,760	650	17,040	480	13,600	240	10,880	165
3	15,240	770	12,960	550	10,300	380	8,240	260
4	11,520	825	9,600	570	7,680	400	6,100	280
5	9,120	880	7,920	650	6,300	450	5,040	310
6	7,680	1,100	6,480	770	5,100	540	4,080	380
8	5,760	1,100	5,040	750	4,000	530	3,200	370
10	4,560	980	4,080	715	3,200	500	2,560	350
12	3,840	910	3,480	550	2,700	380	2,160	260
Depth of cut		a_p: 1.5D, a_e: 0.2D	a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D	

Work Material

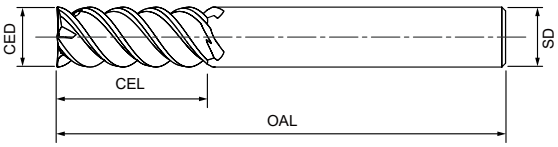
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	○

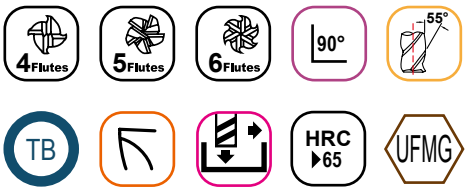


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

A700+ - 11554TB / 11555TB / 11556TB

- Square - 4~6-Flute x 2.5D
- Helix 55°





CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

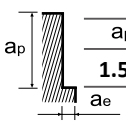
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
A700+-11554TB	4	10	4	50	4
	5	13	6	50	
A700+-11555TB	6	15	6	50	5
	8	20	8	60	
A700+-11556TB	10	25	10	75	6
	12	30	12	75	
	16	40	16	100	
	20	50	20	100	

Code No.	CED	CEL	SD	OAL	Flute
A700+-11554TB	EU 4	11	6	57	4
	EU 5	13	6	57	
A700+-11555TB	EU 6	13	6	57	5
	EU 8	19	8	63	
A700+-11556TB	EU 10	22	10	72	6
	EU 12	26	12	83	

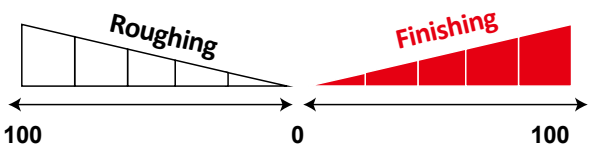
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
4	11,520	825	9,600	570	7,680	400	6,100	280
5	9,120	880	7,920	650	6,300	450	5,040	310
6	7,680	1,100	6,480	770	5,100	540	4,080	380
8	5,760	1,100	5,040	750	4,000	530	3,200	370
10	4,560	980	4,080	715	3,200	500	2,560	350
12	3,840	910	3,480	550	2,700	380	2,160	260
16	2,880	680	2,640	440	2,100	300	1,680	210
20	2,280	550	2,160	300	1,720	210	1,370	150
Depth of cut		a_p: 1.5D, a_e: 0.2D	a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D	

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



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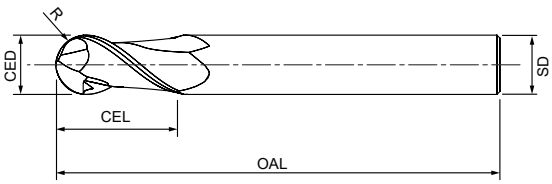
A700+ - 81402TB

- Ball Nose - 2-Flute x 2D
- Helix 40°



CED Tolerance(mm)	
R	±0.02

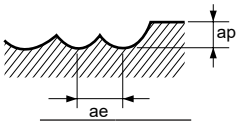
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
A700+-81402TB	0.5R	2	4	50	2
	1R	4	4	50	
	1.5R	6	4	50	
	2R	8	4	50	
	2.5R	10	6	50	
	3R	12	6	50	
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	75	

Code No.	Radius	CEL	SD	OAL	Flute
A700+-81402TB	EU 1.5R	6	6	57	2
	EU 2R	8	6	57	
	EU 2.5R	10	6	57	
	EU 3R	12	6	57	
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

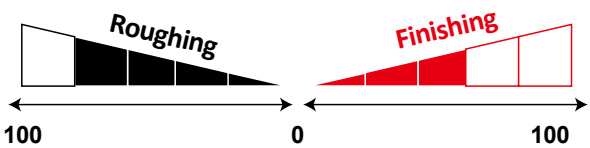
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D
0.5R	30,000	600	28,000	360	24,000	290	21,600	220
1.0R	21,600	870	17,000	520	13,800	350	12,420	260
1.5R	14,000	840	11,700	540	10,100	430	9,090	310
2R	10,800	840	9,000	520	7,700	410	6,930	325
2.5R	8,600	830	7,200	510	6,100	470	5,490	360
3R	7,200	830	5,800	490	5,100	390	4,590	430
4R	5,400	810	4,400	490	3,800	550	3,420	430
5R	4,300	810	3,500	490	3,000	390	2,700	400
6R	3,600	810	2,900	490	2,500	390	2,250	310
Depth of cut								
	a_p	a_e	a_p	a_e	a_p	a_e	a_p	a_e
	0.1D	0.2D	0.08D	0.2D	0.05D	0.1D	0.03D	0.1D

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



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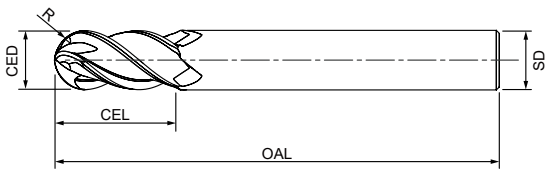
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

A700+ - 81454TB

- Ball Nose - 4-Flute x 2D
- Helix 45°



CED Tolerance(mm)	
R	±0.02

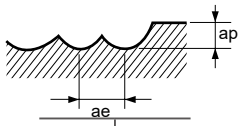
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
A700+-81454TB	3R	12	6	50	4
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	75	
	8R	32	16	100	
	10R	40	20	100	

Code No.	Radius	CEL	SD	OAL	Flute
A700+-81454TB	EU 3R	12	6	57	4
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

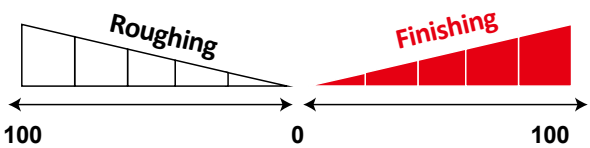
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D
3R	8,400	1,400	7,560	1,120	6,000	780	4,800	540
4R	6,300	1,400	5,670	1,120	4,500	780	3,600	540
5R	5,000	1,400	4,500	1,120	3,600	780	2,880	540
6R	4,200	1,400	3,780	1,120	3,000	780	2,400	540
8R	3,100	1,400	2,790	1,120	2,200	780	1,760	540
10R	2,500	1,200	2,250	960	1,800	670	1,440	470
Depth of cut	 a_p: 0.1D, a_e: 0.2D		a_p: 0.08D, a_e: 0.2D		a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D	

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



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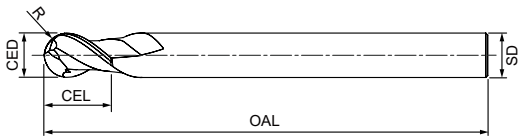
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

A700+ - 83402TB

- Ball Nose - 2-Flute x 1D / Long Shank
- Helix 40°



CED Tolerance(mm)	
R	±0.02

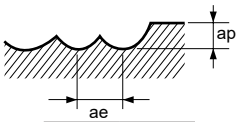
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
A700+-83402TB	0.5R	1	4	75	2
	1R	2	4	75	
	1.5R	3	4	75	
	2R	4	4	75	
	2.5R	5	6	75	
	3R	6	6	75	
	4R	8	8	100	
	5R	10	10	100	
	6R	12	12	100	

Code No.	Radius	CEL	SD	OAL	Flute
A700+-83402TB	EU 1.5R	3	6	80	2
	EU 2R	4	6	80	
	EU 2.5R	5	6	80	
	EU 3R	6	6	80	
	EU 4R	8	8	90	
	EU 5R	10	10	100	
	EU 6R	12	12	120	

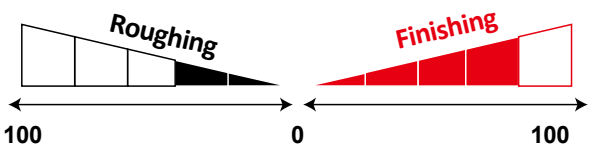
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D
0.5R	36,000	680	33,600	400	28,800	320	25,000	240
1.0R	25,920	900	20,400	540	16,560	380	14,900	280
1.5R	16,800	920	14,040	550	12,120	470	10,900	340
2R	12,960	920	10,800	550	9,240	450	8,300	360
2.5R	10,320	910	8,640	540	7,320	510	6,500	400
3R	8,640	910	6,960	540	6,120	430	5,500	470
4R	6,480	890	5,280	530	4,560	600	4,100	470
5R	5,160	890	4,200	530	3,600	430	3,200	440
6R	4,320	890	3,480	530	3,000	430	2,700	340
Depth of cut	 a_p: 0.1D, a_e: 0.2D		a_p: 0.08D, a_e: 0.2D		a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D	

Work Material

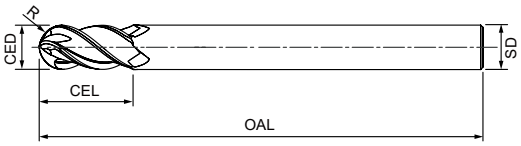
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

A700+ - 83454TB

- Ball Nose - 4-Flute x 2D / Long Shank
- Helix 45°



CED Tolerance(mm)	
R	±0.02

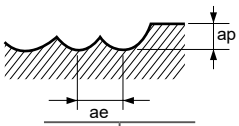
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
A700+-83454TB	3R	12	6	75	4
	4R	16	8	100	
	5R	20	10	100	
	6R	24	12	100	
	8R	32	16	150	
	10R	40	20	150	

Code No.	Radius	CEL	SD	OAL	Flute
A700+-83454TB	EU 3R	12	6	100	4
	EU 4R	16	8	100	
	EU 5R	20	10	100	
	EU 6R	24	12	150	

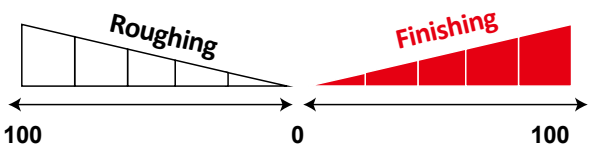
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D
3R	8,400	1,400	7,560	1,120	6,000	780	4,800	540
4R	6,300	1,400	5,670	1,120	4,500	780	3,600	540
5R	5,000	1,400	4,500	1,120	3,600	780	2,880	540
6R	4,200	1,400	3,780	1,120	3,000	780	2,400	540
8R	3,100	1,400	2,790	1,120	2,200	780	1,760	540
10R	2,500	1,200	2,250	960	1,800	670	1,440	470
Depth of cut	 a_p: 0.1D, a_e: 0.2D		a_p: 0.08D, a_e: 0.2D		a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D	

Work Material

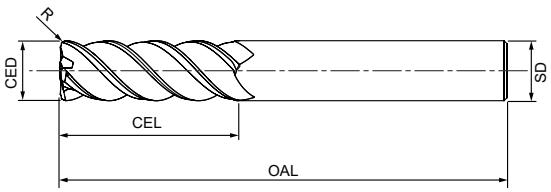
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

A700+ - 21454TB

- Corner Radius - 4-Flute x 3D
- Helix 45°



CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

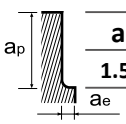
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Radius	Flute
A700+-21454TB	1	3	4	50	0.2R	4
	2	6	4	50	0.2R	
	3	9	4	50	0.2R	
	4	12	4	50	0.2R	
	5	15	6	50	0.2R	
	6	18	6	50	0.2R	
	8	24	8	65	0.2R	
					0.5R	
	10	30	10	75	0.2R	
					0.5R	
	12	36	12	80	0.2R	
					0.5R	

Code No.	CED	CEL	SD	OAL	Radius	Flute
A700+-21454TB	EU 3	9	6	57	0.2R	4
	EU 4	12	6	65	0.2R	
	EU 5	15	6	65	0.2R	
	EU 6	18	6	65	0.2R	
	EU 8	24	8	75	0.2R	
					0.5R	
	EU 10	30	10	80	0.2R	
					0.5R	
	EU 12	36	12	93	0.2R	
					0.5R	

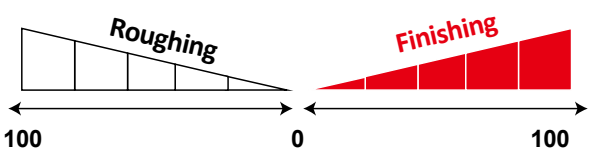
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
1	33,600	530	30,480	390	24,000	280	19,200	195
2	20,760	650	17,040	480	13,600	240	10,880	165
3	15,240	770	12,960	550	10,300	380	8,240	260
4	11,520	825	9,600	570	7,680	400	6,100	280
5	9,120	880	7,920	650	6,300	450	5,040	310
6	7,680	1,100	6,480	770	5,100	540	4,080	380
8	5,760	1,100	5,040	750	4,000	530	3,200	370
10	4,560	980	4,080	710	3,200	500	2,560	350
12	3,840	910	3,480	550	2,700	380	2,160	260
Depth of cut	 a_p: 1.5D, a_e: 0.2D		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D	

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



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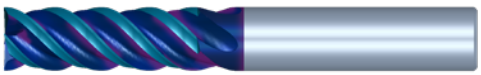
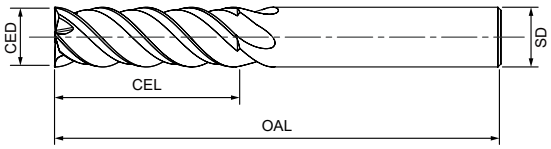
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

A700IE+ - 11454TB

- Square - 4-Flute x 3D
- Uneven Flute / Veriable Helix 45° /48°

$a_1 \neq a_2$





Best Seller IE Series

4 Flutes | 90° | 45° / 48° | TB | HRC ▸65 | UFMG

CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

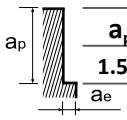
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
A700IE+-11454TB	4	12	4	50	4
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	
	16	48	16	100	
	20	60	20	125	

Code No.	CED	CEL	SD	OAL	Flute
A700IE+-11454TB	EU 4	12	4	65	4
	EU 5	15	6	65	
	EU 6	18	6	65	
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

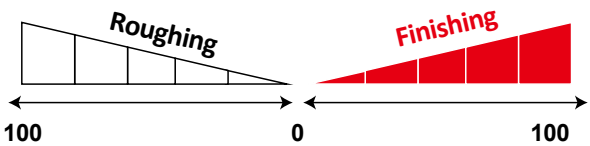
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
4	10,750	1,000	9,100	850	8,100	680	7,290	400
5	8,599	1,350	7,300	1,150	6,500	910	5,850	540
6	7,150	1,500	6,000	1,270	5,400	1,000	4,860	610
8	5,350	1,600	4,500	1,360	4,000	1,080	3,600	650
10	4,300	1,500	3,650	1,270	3,200	1,010	2,880	610
12	3,600	1,450	3,060	1,200	2,700	980	2,430	580
16	2,700	1,400	2,300	1,200	2,000	950	1,800	570
20	2,150	1,350	1,820	1,150	1,600	910	1,440	540
Depth of cut	 a_p: 1.5D, a_e: 0.2D		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D	

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



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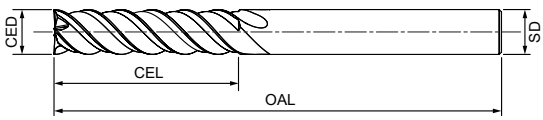
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

UFMG Carbide - High-Speed Finishing Long Flute End Mill

A700IE+ - 12464TB / 12465TB / 12466TB

- Square - 4~6-Flute x 4D / Long Flute
- Uneven Flute / Veriable Helix 46° /49°

$a_1 \neq a_2$



Best Seller IE Series

4 Flutes | 5 Flutes | 6 Flutes | 90° | 46° / 49°

TB | HRC ▶65 | UFMG

CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

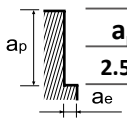
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
A700IE+-12464TB	4	16	4	60	4
	5	20	6	60	
A700IE+-12465TB	6	24	6	65	5
	8	32	8	90	
A700IE+-12466TB	10	40	10	100	6
	12	48	12	110	
	16	64	16	140	
	20	80	20	160	

Code No.	CED	CEL	SD	OAL	Flute
A700IE+-12464TB	EU 4	16	6	65	4
	EU 5	20	6	65	
A700IE+-12465TB	EU 6	24	6	65	5
	EU 8	32	8	80	
A700IE+-12466TB	EU 10	40	10	90	6
	EU 12	48	12	100	

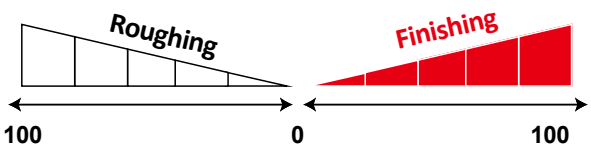
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 2.5D	a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D	a_p: 2.5D	a_e: 0.01D
4	9,600	900	8,100	760	7,290	610	6,500	360
5	7,700	1,215	6,570	1,000	5,850	810	5,200	480
6	6,400	1,350	5,400	1,100	4,860	910	4,300	450
8	4,800	1,440	4,050	1,200	3,600	970	3,240	580
10	3,870	1,350	3,285	1,140	2,880	910	2,600	550
12	3,240	1,305	2,750	1,080	2,430	880	2,190	520
16	2,430	1,260	2,070	1,080	1,800	855	1,600	510
20	1,900	1,215	1,630	1,030	1,440	820	1,300	480
Depth of cut	 a_p: 2.5D, a_e: 0.05D		a_p: 2.5D, a_e: 0.03D		a_p: 2.5D, a_e: 0.02D		a_p: 2.5D, a_e: 0.01D	

Work Material

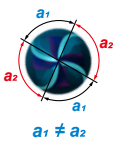
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●

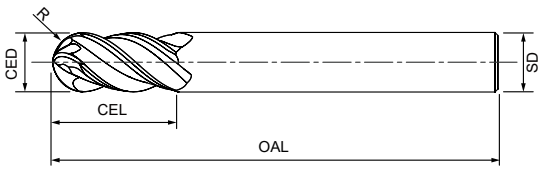


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

A700IE+ - 81404TB

- Ball Nose - 4-Flute x 2D
- Uneven Flute / Veriable Helix 40° /43°





Best Seller IE Series

4 Flutes | R | 40° / 43° | TB | HRC ▶65 | UFMG

CED Tolerance(mm)	
R	±0.02

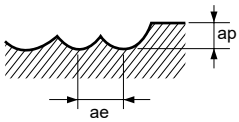
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
A700IE+-81404TB	3R	12	6	50	4
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	75	
	8R	32	16	100	
	10R	40	20	100	

Code No.	Radius	CEL	SD	OAL	Flute
A700IE+-81404TB	EU 3R	12	6	57	4
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

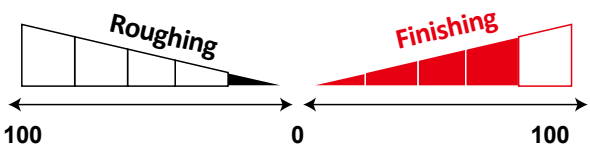
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D
3R	10,080	1,820	9,000	1,400	7,200	1,000	5,760	700
4R	7,560	1,820	6,800	1,400	5,400	1,000	4,320	700
5R	6,000	1,820	5,400	1,400	4,320	1,000	3,400	700
6R	5,040	1,820	4,500	1,400	3,600	1,000	2,880	700
8R	3,720	1,820	3,300	1,400	2,640	1,000	2,100	700
10R	3,000	1,560	2,700	1,250	2,160	870	1,700	610
Depth of cut	 a_p: 0.1D, a_e: 0.2D		a_p: 0.08D, a_e: 0.2D		a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D	

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●

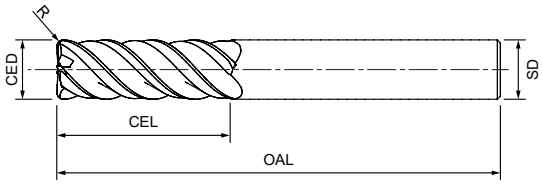


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

A700IE+ - 21454TB

- Corner Radius - 4-Flute x 3D
- Uneven Flute / Veriable Helix 45° /48°

$a_1 \neq a_2$



Best Seller IE Series

4 Flutes | R | 45° / 48° | TB | HRC ▶65 | UFMG

CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

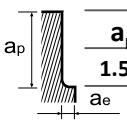
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Radius	Flute
A700IE+-21454TB	1	3	4	50	0.2R	4
	2	6	4	50	0.2R	
	3	9	4	50	0.2R	
	4	12	4	50	0.2R	
	5	15	6	50	0.2R	
	6	18	6	50	0.2R	
	8	24	8	65	0.2R	
					0.5R	
	10	30	10	75	0.2R	
					0.5R	
	12	36	12	80	0.2R	
					0.5R	

Code No.	CED	CEL	SD	OAL	Radius	Flute
A700IE+-21454TB	EU 3	9	6	57	0.2R	4
	EU 4	12	6	65	0.2R	
	EU 5	15	6	65	0.2R	
	EU 6	18	6	65	0.2R	
	EU 8	24	8	75	0.2R	
					0.5R	
	EU 10	30	10	80	0.2R	
					0.5R	
	EU 12	36	12	93	0.2R	
					0.5R	

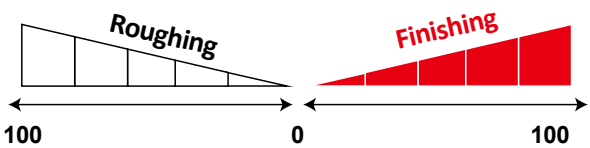
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
1	43,000	500	36,500	420	32,800	330	29,520	200
2	21,500	600	18,200	510	16,300	400	14,670	240
3	14,300	850	12,100	720	10,800	570	9,720	340
4	10,750	1,000	9,100	850	8,100	680	7,290	400
5	8,600	1,350	7,300	1,150	6,500	910	5,850	540
6	7,150	1,500	6,000	1,270	5,400	1,000	4,860	610
8	5,350	1,600	4,500	1,360	4,000	1,080	3,600	650
10	4,300	1,500	3,650	1,270	3,200	1,010	2,880	610
12	3,600	1,450	3,060	1,200	2,700	980	2,430	580
Depth of cut	 a_p 1.5D, a_e 0.2D		a_p 1.5D, a_e 0.2D		a_p 1.5D, a_e 0.2D		a_p 1.5D, a_e 0.2D	

Work Material

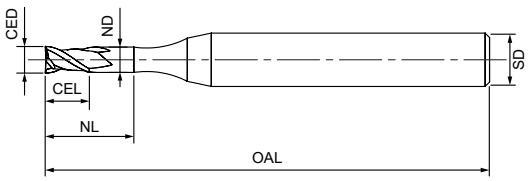
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●

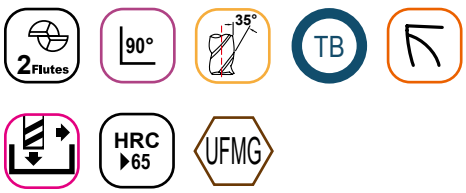


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

RPA700+ - 14352TB

- Square - 2-Flute x 1.5D / Long Neck / Long Shank
- Helix 35°





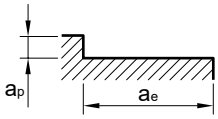
CED Tolerance(mm)	
0.5~3	0~-0.014
3~6	0~-0.018

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	NL	ND	Flute
RPA700+-14352TB	0.5	0.7	4	50	4	0.45	2
					6		
					8		
	1	1.5	4	50	6	0.95	
					8		
					10		
	1.5	2.3	4	50	6	1.45	
					8		
					10		
	2	3	4	50	6	1.95	
					8		
					10		
	3	5	6	50	8	2.85	
					10		
					12		
	4	6	6	60	12	3.85	
				60	16		
				70	20		
	5	8	6	60	16	4.8	
				70	20		
				80	30		
	6	9	6	70	20	5.8	
				80	30		
				90	40		

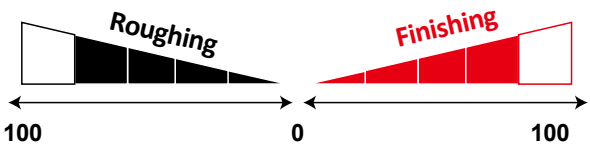
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.05D	a_e: 0.6D	a_p: 0.04D	a_e: 0.5D	a_p: 0.03D	a_e: 0.4D	a_p: 0.02D	a_e: 0.2D
0.5	32,000	180	32,000	140	29,000	110	20,000	70
1	30,000	360	30,000	280	22,000	220	14,960	130
1.5	17,000	600	17,000	480	13,000	380	9,360	230
2	15,000	800	14,000	640	11,000	510	7,480	300
3	10,000	800	10,000	640	8,000	510	5,440	300
4	7,000	700	7,000	560	6,000	440	4,080	260
5	6,000	600	5,500	480	5,000	380	3,250	230
6	5,000	500	4,600	400	4,000	320	2,700	190
Depth of cut	 a_p 0.05D, a_e 0.6D		a_p 0.04D, a_e 0.5D		a_p 0.03D, a_e 0.4D		a_p 0.02D, a_e 0.2D	

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



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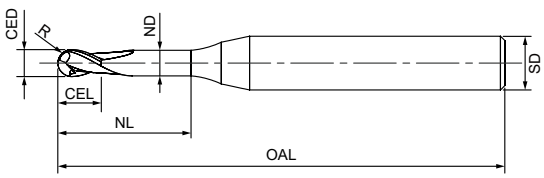
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

RPA700+ - 84302TB

- Ball Nose - 2-Flute x 1.5D / Long Neck / Long Shank
- Helix 30°



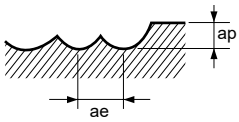
CED Tolerance(mm)	
R	±0.02

h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	NL	ND	Flute
RPA700+-84302TB	0.25R	0.7	4	50	4	0.45	2
					6		
					8		
	0.5R	1.5	4	50	6	0.95	
					8		
					10		
	0.75R	2.3	4	50	6	1.45	
					8		
					10		
	1R	3	4	50	6	1.95	
					8		
					10		
	1.5R	5	6	50	8	2.85	
					10		
					12		
	2R	6	6	60	12	3.85	
				60	16		
				70	20		
	2.5R	8	6	60	16	4.8	
				70	20		
				80	30		
	3R	9	6	70	20	5.8	
				80	30		
				90	40		

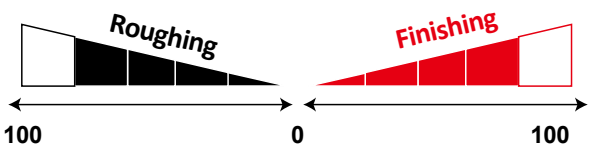
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.02D	a_e: 0.03D	a_p: 0.02D	a_e: 0.03D
0.25R	32,000	800	32,000	640	29,000	480	20,000	300
0.5R	30,000	1,300	30,000	1,040	22,000	780	14,960	500
0.75R	17,000	1,820	17,000	1,456	13,000	1,092	9,360	700
1R	15,000	1,950	14,000	1,560	11,000	1,170	7,480	760
1.5R	10,000	2,080	10,000	1,664	8,000	1,248	5,440	800
2R	7,000	2,080	7,000	1,664	6,000	1,248	4,080	800
2.5R	6,000	1,820	5,500	1,456	5,000	1,092	3,250	710
3R	5,000	1,800	4,600	1,440	4,000	1,080	2,700	700
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.02D, a_e: 0.03D		a_p: 0.02D, a_e: 0.03D	

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



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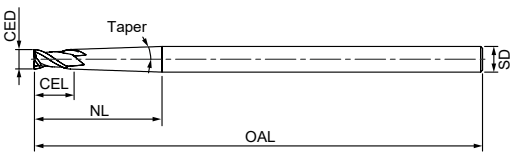
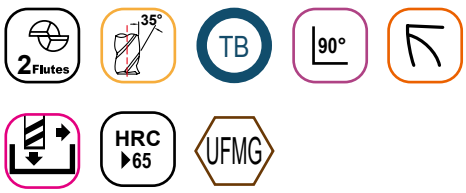
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

RTA700+ - 14352TB

- Square - 2-Flute x 1.5D / Taper Neck / Long Shank
- Helix 35°





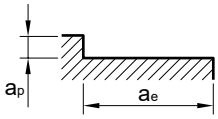
CED Tolerance(mm)	
0.5~3	0~-0.014
3~6	0~-0.018

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute	NL	Taper
RTA700+-14352TB	0.5	0.7	4	50	2	8	1.5°
	1	1.5	4	50		10	1.5°
	1.5	2.3	4	50		12	1°
	2	3	4	50		14	1°
	3	5	6	70		20	1°
	4	6	6	70		30	1°
	5	8	8	80		40	1°
	6	9	8	90		40	1°

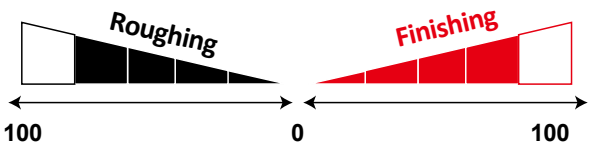
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.05D	a_e: 0.6D	a_p: 0.04D	a_e: 0.5D	a_p: 0.03D	a_e: 0.4D	a_p: 0.02D	a_e: 0.2D
0.5	32,000	180	32,000	140	29,000	110	20,000	70
1	30,000	360	30,000	280	22,000	220	14,960	130
1.5	17,000	600	17,000	480	13,000	380	9,360	230
2	15,000	800	14,000	640	11,000	510	7,480	300
3	10,000	800	10,000	640	8,000	510	5,440	300
4	7,000	700	7,000	560	6,000	440	4,080	260
5	6,000	600	5,500	480	5,000	380	3,250	230
6	5,000	500	4,600	400	4,000	320	2,700	190
Depth of cut	 a_p 0.05D, a_e 0.6D		a_p 0.04D, a_e 0.5D		a_p 0.03D, a_e 0.4D		a_p 0.02D, a_e 0.2D	

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



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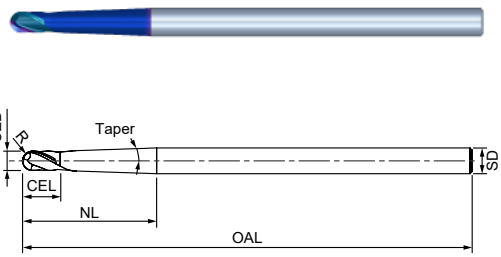
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

RTA700+ - 84302TB

- Ball Nose - 2-Flute x 1.5D / Taper Neck / Long Shank
- Helix 30°



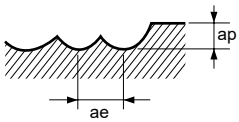
CED Tolerance(mm)	
R	±0.02

h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute	NL	Taper
RTA700+-84302TB	0.25R	0.35	4	50	2	8	1°
							2°
	0.5R	0.75	4	50		10	0.5°
							1°
	0.75R	1.1	4	50		12	0.5°
							1°
	1R	1.5	4	50		14	1°
	1.5R	2.25	6	70		20	1°
	2R	3	6	70		30	1°
	2.5R	3.75	8	80		40	1°
	3R	4.5	8	90		40	1°

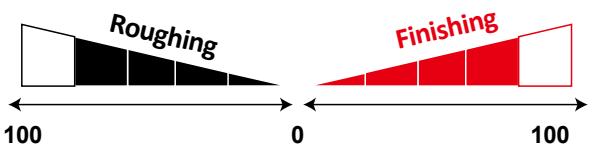
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~65HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.02D	a_e: 0.03D	a_p: 0.02D	a_e: 0.03D
0.25R	32,000	800	32,000	640	29,000	480	20,000	300
0.5R	30,000	1,300	30,000	1,040	22,000	780	14,960	500
0.75R	17,000	1,820	17,000	1,456	13,000	1,092	9,360	700
1R	15,000	1,950	14,000	1,560	11,000	1,170	7,480	760
1.5R	10,000	2,080	10,000	1,664	8,000	1,248	5,440	800
2R	7,000	2,080	7,000	1,664	6,000	1,248	4,080	800
2.5R	6,000	1,820	5,500	1,456	5,000	1,092	3,250	710
3R	5,000	1,800	4,600	1,440	4,000	1,080	2,700	700
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.02D, a_e: 0.03D		a_p: 0.02D, a_e: 0.03D	

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



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2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
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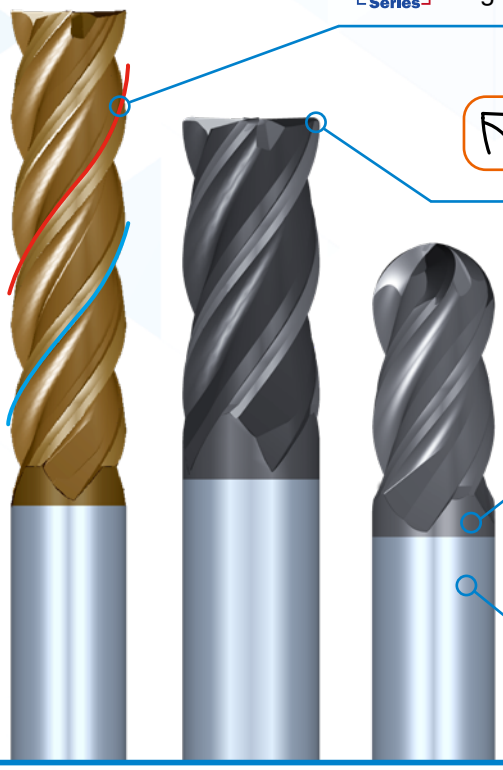
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600+ Series

Mold Processing & Parts Processing



Best Seller IE Series

Variable Helix Angle & Uneven Flute

High Speed Cutting, enable to reduce vibration and noise

Cutting edge with Gashland

Enable to reduce chipping with longer tool life

Optional Coating

Optional 3 types of selectable coating

TO TE TA

Ultrafine Micro Grain Carbide

UMG

Suitable for work material ~ HRC60

Types of Flute

2Flutes 4Flutes 6Flutes 4Flutes R 2Flutes 4Flutes

Types of Uneven Flute

4Flutes 4Flutes A≠B≠C≠D 4Flutes R 4Flutes

Optional DIN Weldon Shank

DIN 6535 HA DIN 6535 HB DIN 6535 HE

Honing Process

with honing

without honing

Special & Custom Tooling Services

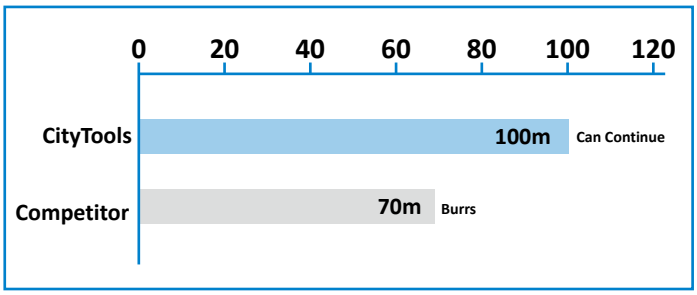
Customized acceptable !

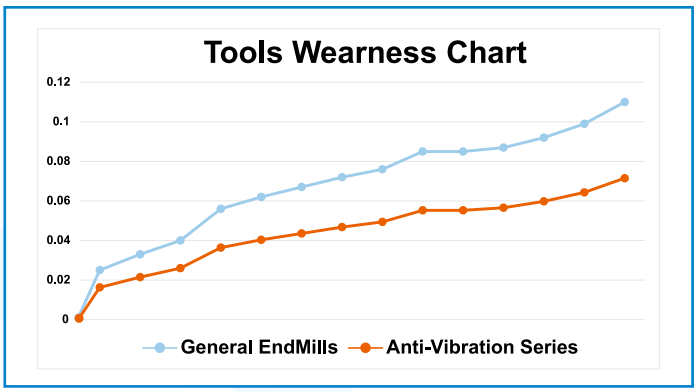
From Coating, flute, Helix angle, cutting length, to total length.

Smooth cutting & Longer Tool Life

X600IE with Uneven Flute/Variable Helix angle geometry design, TO coating (AlTiCrSiN) layer with high temperature resistance and high hardness, resulting in better cutting stability and increasing longer tool life 30%.

Suitable for Mild steels, Cast Irons, Hardened steels with longer tool life.





Tool	X600IE+-11374TO
Tool Size	Ø10
Work Material	S50C
Milling Method	Side Milling
Cutting Speed	3870 rev/min
Feed Rate	850 (0.055 mm/t)
Depth of Cut	Ap=15mm, Ae=1mm
Coolant	Air Cooling
Machine	Vertical Machining Center

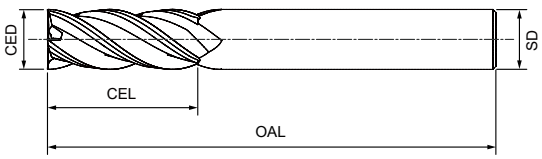
Unique heat resistance coating reduce wear reduction

Longer Tool life and Better Surface

Under the same condition of cutting, the wear resistance of X600IE+-11394TO is about 30% lower and get longer tool life comparing with competitor brand.

X600+ - 11374TO

- Square - 4-Flute x 2.5D
- Helix 37°



CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~0.002
10~12	0~-0.025

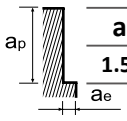
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
X600+-11374TO	1	3	4	50	4
	2	5	4	50	
	3	8	4	50	
	4	10	4	50	
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	

Code No.	CED	CEL	SD	OAL	Flute
X600+-11374TO	EU 3	8	6	57	4
	EU 4	11	6	57	
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

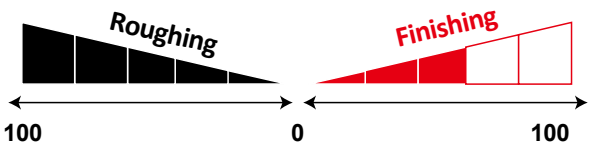
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
1	30,200	470	27,180	360	21,600	250	17,000	170
2	18,600	580	16,740	440	12,240	210	9,700	150
3	13,700	690	12,330	520	9,270	240	7,400	230
4	10,300	740	9,270	560	6,900	360	5,500	250
5	8,200	790	7,380	600	5,670	400	4,500	280
6	5,900	990	5,310	750	4,590	480	3,600	340
8	5,100	990	4,590	750	3,600	470	2,880	330
10	4,100	880	3,690	670	2,880	450	2,300	320
12	3,400	820	3,060	620	2,430	340	1,900	230
Depth of cut		a_p: 1.5D, a_e: 0.2D		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D

Work Material

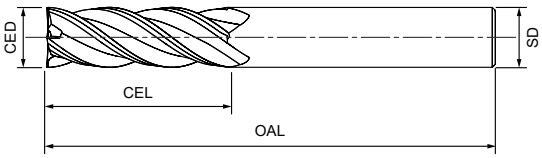
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600+ - 11374TO

- Square - 4-Flute x 3D
- Helix 37°



CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~18	0~-0.025
18~20	0~-0.03

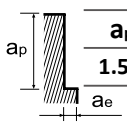
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
X600+-11374TO	1	3	4	50	4
	2	6	4	50	
	3	9	4	50	
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	
	16	48	16	100	
	20	60	20	125	

Code No.	CED	CEL	SD	OAL	Flute
X600+-11374TO	EU 3	9	6	57	4
	EU 4	12	6	65	
	EU 5	15	6	65	
	EU 6	18	6	65	
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

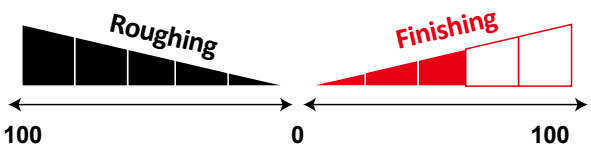
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
1	30,200	470	27,180	360	21,600	250	17,000	170
2	18,600	580	16,740	440	12,240	210	9,700	150
3	13,700	690	12,330	520	9,270	240	7,400	230
4	10,300	740	9,270	560	6,900	360	5,500	250
5	8,200	790	7,380	600	5,670	400	4,500	280
6	5,900	990	5,310	750	4,590	480	3,600	340
8	5,100	990	4,590	750	3,600	470	2,880	330
10	4,100	880	3,690	670	2,880	450	2,300	320
12	3,400	820	3,060	620	2,430	340	1,900	230
16	2,600	610	2,340	460	1,890	270	1,500	190
20	2,050	490	1,840	370	1,500	190	1,200	140
Depth of cut		a_p: 1.5D, a_e: 0.2D		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D

Work Material

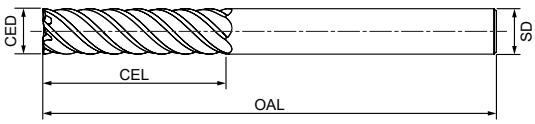
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600+ - 12466TO

- Square - 6-Flute x 4D / Long Flute
- Helix 46°



CED Tolerance(mm)	
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

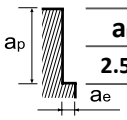
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
X600+-12466TO	6	24	6	65	6
	8	32	8	90	
	10	40	10	100	
	12	48	12	110	
	16	64	16	140	
	20	80	20	160	

Code No.	CED	CEL	SD	OAL	Flute
X600+-12466TO	EU 6	24	6	65	6
	EU 8	32	8	80	
	EU 10	40	10	90	
	EU 12	48	12	100	

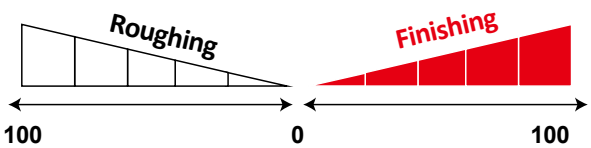
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 2.5D	a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D	a_p: 2.5D	a_e: 0.01D
6	6,400	1,200	5,760	1,080	4,300	910	4,300	450
8	4,800	1,400	4,000	1,190	3,200	910	2,900	450
10	3,400	1,300	2,800	1,170	2,500	910	2,600	450
12	2,900	1,250	2,750	1,100	2,100	880	2,190	450
16	2,100	1,150	1,800	1,000	1,620	800	1,600	430
20	1,900	1,100	1,600	990	1,300	780	1,300	480
Depth of cut	 a_p: 2.5D, a_e: 0.05D		a_p: 2.5D, a_e: 0.03D		a_p: 2.5D, a_e: 0.02D		a_p: 2.5D, a_e: 0.01D	

Work Material

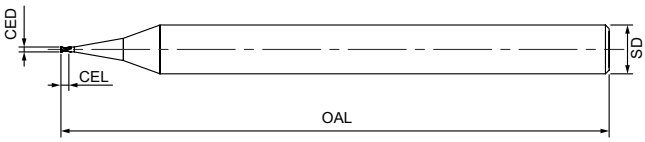
P			H			
G1	G2	G3	G14	G15	G16	G17
●	●	●	●	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600M+ - 14352TO

- Square - 2-Flute x 1D / Miniature
- Helix 35°



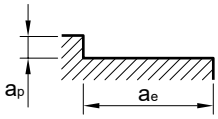
CED Tolerance(mm)	
0.2~0.9	0~-0.014

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
X600M+-14352TO	0.2	0.2	4	45	2
	0.3	0.3	4	45	
	0.4	0.4	4	45	
	0.5	0.5	4	45	
	0.6	0.6	4	45	
	0.7	0.7	4	45	
	0.8	0.8	4	45	
	0.9	0.9	4	45	

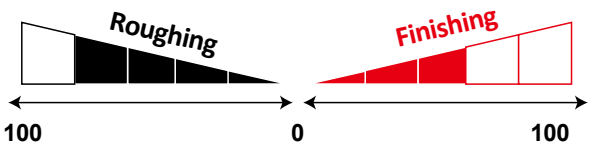
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.05D	a_e: 0.6D	a_p: 0.04D	a_e: 0.5D	a_p: 0.03D	a_e: 0.4D	a_p: 0.02D	a_e: 0.2D
0.2	40,000	300	38,000	270	33,700	215	31,500	190
0.3	36,000	400	34,000	360	30,000	285	28,000	220
0.4	28,000	420	27,000	378	24,000	300	22,400	240
0.5	28,000	520	27,000	440	24,000	350	22,400	280
0.6	28,000	600	27,000	570	24,000	450	22,400	360
0.7	28,000	600	27,000	570	24,000	450	22,400	360
0.8	28,000	680	27,000	610	24,000	480	22,400	380
0.9	28,000	700	27,000	620	24,000	550	22,400	450
Depth of cut	 a_p: 0.05D, a_e: 0.6D		a_p: 0.04D, a_e: 0.5D		a_p: 0.03D, a_e: 0.4D		a_p: 0.02D, a_e: 0.2D	

Work Material

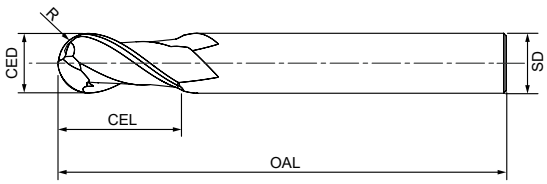
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600+ - 81372TO

- Ball Nose - 2-Flute x 2D
- Helix 37°



CED Tolerance(mm)	
R	±0.02

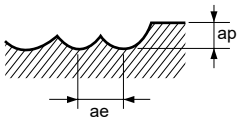
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
X600+-81372TO	0.5R	2	4	50	2
	1R	4	4	50	
	1.5R	6	4	50	
	2R	8	4	50	
	2.5R	10	6	50	
	3R	12	6	50	
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	75	

Code No.	Radius	CEL	SD	OAL	Flute
X600+-81372TO	EU 1.5R	6	6	57	2
	EU 2R	8	6	57	
	EU 2.5R	10	6	57	
	EU 3R	12	6	57	
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

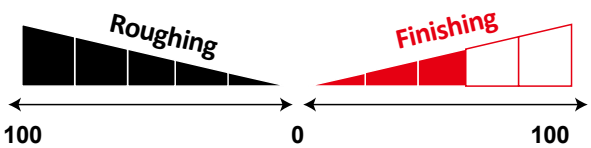
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D
0.5R	29,000	590	28,000	350	23,000	290	20,000	220
1.0R	21,000	850	17,000	520	13,800	350	12,420	260
1.5R	14,000	840	11,700	540	10,000	430	9,000	310
2R	10,000	840	9,000	520	7,700	410	6,930	320
2.5R	8,600	830	7,200	510	6,100	470	5,490	360
3R	7,200	830	5,800	490	5,100	390	4,590	430
4R	5,400	810	4,400	490	3,800	550	3,420	430
5R	4,300	810	3,500	490	3,000	390	2,700	400
6R	3,600	810	2,900	490	2,500	390	2,250	310
Depth of cut								
	a_p	a_e	a_p	a_e	a_p	a_e	a_p	a_e
	0.1D	0.2D	0.08D	0.2D	0.05D	0.1D	0.03D	0.1D

Work Material

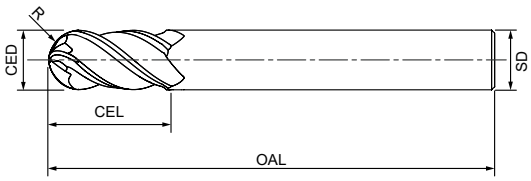
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600+ - 81404TO

- Ball Nose - 4-Flute x 2D
- Helix 40°



CED Tolerance(mm)	
R	±0.02

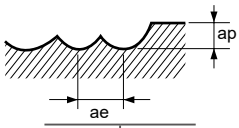
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
X600+-81404TO	3R	12	6	50	4
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	75	
	8R	32	16	100	
	10R	40	20	100	

Code No.	Radius	CEL	SD	OAL	Flute
X600+-81404TO	EU 3R	12	6	57	4
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

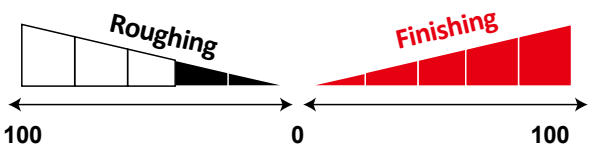
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D
3R	7,980	1,400	1,780	1,120	6,000	780	4,800	540
4R	5,900	1,400	5,300	1,120	4,500	780	3,600	540
5R	4,700	1,400	4,200	1,120	3,360	780	2,600	540
6R	4,000	1,400	5,900	1,120	3,000	780	2,400	540
8R	2,900	1,400	2,650	1,120	2,200	780	1,760	540
10R	2,300	1,200	2,130	960	1,700	670	1,360	470
Depth of cut	 a_p: 0.1D, a_e: 0.2D		a_p: 0.08D, a_e: 0.2D		a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D	

Work Material

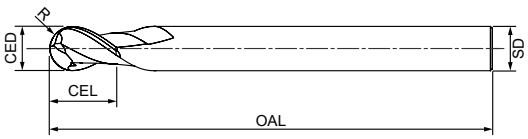
P			H			
G1	G2	G3	G14	G15	G16	G17
●	●	●	●	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600+ - 83372TO

- Ball Nose - 2-Flute x 1D / Long Shank
- Helix 37°



CED Tolerance(mm)	
R	±0.02

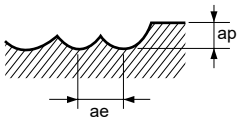
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
X600+-83372TO	0.5R	1	4	75	2
	1R	2	4	75	
	1.5R	3	4	75	
	2R	4	4	75	
	2.5R	5	6	75	
	3R	6	6	75	
	4R	8	8	100	
	5R	10	10	100	
	6R	12	12	100	

Code No.	Radius	CEL	SD	OAL	Flute
X600+-83372TO	EU 1.5R	3	6	80	2
	EU 2R	4	6	80	
	EU 2.5R	5	6	80	
	EU 3R	6	6	80	
	EU 4R	8	8	90	
	EU 5R	10	10	100	
	EU 6R	12	12	120	

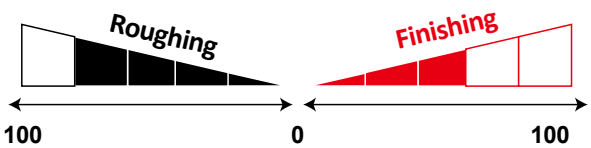
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D
0.5R	34,000	670	33,600	400	27,600	320	25,000	240
1.0R	25,000	890	20,400	530	16,560	380	14,900	280
1.5R	16,000	900	14,040	550	12,000	470	10,900	340
2R	12,000	920	10,800	550	9,240	450	8,300	360
2.5R	9,600	930	8,640	540	7,320	510	6,500	400
3R	8,640	910	6,960	540	6,120	430	5,500	470
4R	6,480	890	5,280	530	4,560	430	4,100	470
5R	5,160	890	4,200	530	3,600	430	3,200	440
6R	4,320	890	3,480	530	3,000	430	2,700	340
Depth of cut								
	a_p	a_e	a_p	a_e	a_p	a_e	a_p	a_e
	0.1D	0.2D	0.08D	0.2D	0.05D	0.1D	0.03D	0.1D

Work Material

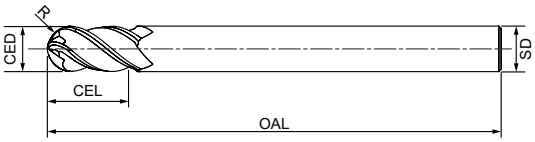
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600+ - 83404TO

- Ball Nose - 4-Flute x 2D / Long Shank
- Helix 40°



CED Tolerance(mm)	
R	±0.02

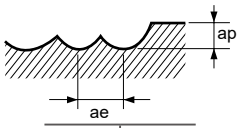
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
X600+-83404TO	3R	12	6	75	4
	4R	16	8	100	
	5R	20	10	100	
	6R	24	12	100	
	8R	32	16	150	
	10R	40	20	150	

Code No.	Radius	CEL	SD	OAL	Flute
X600+-83404TO	EU 3R	12	6	100	4
	EU 4R	16	8	100	
	EU 5R	20	10	100	
	EU 6R	24	12	150	

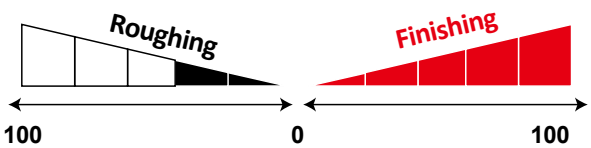
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D
3R	7,980	1,400	1,780	1,120	6,000	780	4,800	540
4R	5,900	1,400	5,300	1,120	4,500	780	3,600	540
5R	4,700	1,400	4,200	1,120	3,360	780	2,600	540
6R	4,000	1,400	5,900	1,120	3,000	780	2,400	540
8R	2,900	1,400	2,650	1,120	2,200	780	1,760	540
10R	2,300	1,200	2,130	960	1,700	670	1,360	470
Depth of cut	 a_p: 0.1D, a_e: 0.2D		a_p: 0.08D, a_e: 0.2D		a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D	

Work Material

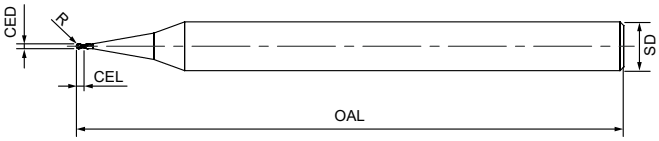
P			H			
G1	G2	G3	G14	G15	G16	G17
●	●	●	●	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600M+ - 84352TO

- Ball Nose - 2-Flute x 1D / Miniature
- Helix 35°



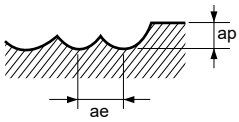
CED Tolerance(mm)	
R	±0.01

h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
X600M+-84352TO	0.1R	0.2	4	45	2
	0.15R	0.3	4	45	
	0.2R	0.4	4	45	
	0.25R	0.5	4	45	
	0.3R	0.6	4	45	
	0.35R	0.7	4	45	
	0.4R	0.8	4	45	
	0.45R	0.9	4	45	

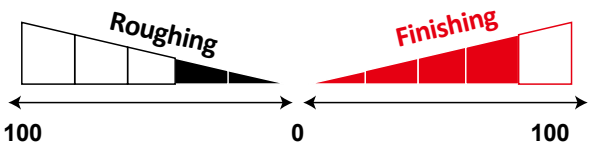
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.04D	a_e: 0.05D	a_p: 0.03D	a_e: 0.03D	a_p: 0.02D	a_e: 0.02D
0.1R	20,000	540	20,000	375	20,000	215	20,000	160
0.15R	20,000	1,000	20,000	700	20,000	400	20,000	300
0.2R	20,000	1,400	20,000	980	20,000	560	20,000	420
0.25R	20,000	1,600	20,000	1,120	20,000	640	20,000	480
0.3R	20,000	1,800	20,000	1,260	20,000	720	20,000	540
0.35R	20,000	1,900	20,000	1,330	20,000	760	20,000	570
0.4R	20,000	2,000	20,000	1,400	20,000	800	20,000	600
0.45R	20,000	2,200	20,000	1,540	20,000	880	20,000	660
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.04D, a_e: 0.05D		a_p: 0.03D, a_e: 0.03D		a_p: 0.02D, a_e: 0.02D	

Work Material

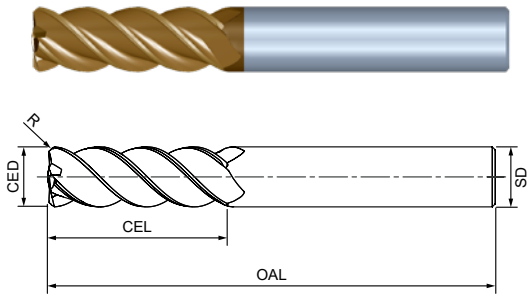
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600+ - 21454TO

- Corner Radius - 4-Flute x 3D
- Helix 45°



CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

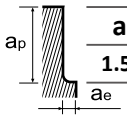
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Radius	Flute
X600+-21454TO	1	3	4	50	0.2R	4
	2	6	4	50	0.2R	
	3	9	4	50	0.2R	
	4	12	4	50	0.2R	
	5	15	6	50	0.2R	
	6	18	6	50	0.2R	
	8	24	8	65	0.2R	
					0.5R	
	10	30	10	75	0.2R	
					0.5R	
	12	36	12	80	0.2R	
					0.5R	

Code No.	CED	CEL	SD	OAL	Radius	Flute
X600+-21454TO	EU 3	9	6	57	0.2R	4
	EU 4	12	6	65	0.2R	
	EU 5	15	6	65	0.2R	
	EU 6	18	6	65	0.2R	
	EU 8	24	8	75	0.2R	
					0.5R	
	EU 10	30	10	80	0.2R	
					0.5R	
	EU 12	36	12	93	0.2R	
					0.5R	

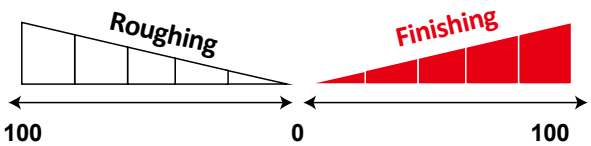
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
1	30,200	470	27,180	360	21,600	250	17,000	170
2	18,600	580	16,740	440	12,240	210	9,700	150
3	13,700	690	12,330	520	9,270	240	7,400	230
4	10,300	740	9,270	560	6,900	360	5,500	250
5	8,200	790	7,380	600	5,670	400	4,500	280
6	5,900	990	5,310	750	4,590	480	3,600	340
8	5,100	990	4,590	750	3,600	470	2,880	330
10	4,100	880	3,690	670	2,880	450	2,300	320
12	3,400	820	3,060	620	2,430	340	1,900	230
Depth of cut	 a_p: 1.5D, a_e: 0.2D		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D	

Work Material

P			H			
G1	G2	G3	G14	G15	G16	G17
●	●	●	●	●	●	○

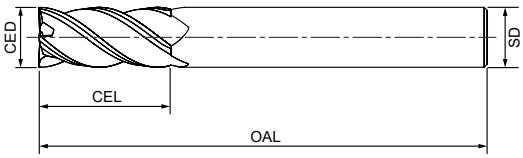


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600IE+ - 11374TO

- Square - 4-Flute x 2.5D
- Uneven Flute / Variable Helix 37° /40°

$a_1 \neq a_2$



Best Seller IE Series

4 Flutes | 90° | 37° / 40° | TO | HRC ▸60 | UMG

CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

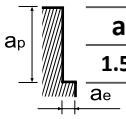
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
X600IE+-11374TO	1	3	4	50	4
	2	5	4	50	
	3	8	4	50	
	4	10	4	50	
	5	13	6	50	
	6	15	6	50	
	8	20	8	65	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	
	20	50	20	100	

Code No.	CED	CEL	SD	OAL	Flute
X600IE+-11374TO	EU 3	8	6	57	4
	EU 4	11	6	57	
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

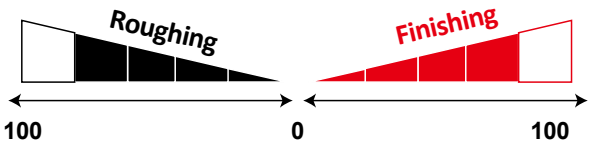
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
1	38,700	480	32,850	400	29,000	310	26,500	190
2	19,350	570	16,380	480	14,600	360	13,200	220
3	12,870	808	10,890	680	9,720	510	8,700	230
4	9,600	950	8,190	800	7,290	610	6,500	380
5	7,700	1,280	6,570	1,090	5,850	810	5,200	510
6	6,400	1,400	5,400	1,200	4,860	900	4,300	580
8	4,800	1,520	4,050	1,290	3,600	970	3,240	610
10	3,870	1,400	3,200	1,200	2,880	910	2,600	580
12	3,240	1,370	2,700	1,140	2,430	880	2,200	550
16	2,430	1,330	2,070	1,140	1,800	850	1,600	540
20	1,900	1,280	1,600	1,090	1,440	820	1,300	510
Depth of cut		a_p: 1.5D, a_e: 0.2D		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●

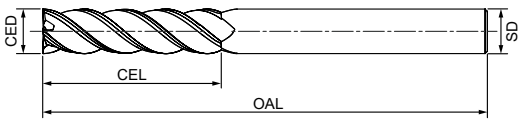


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600IE+ - 12394TO

- Square - 4-Flute x 4D / Long Flute
- Uneven Flute / Variable Helix 39° /42°

$a_1 \neq a_2$



Best Seller IE Series

4 Flutes | 90° | 39° / 42° | TO | HRC ▸60 | UMG

CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

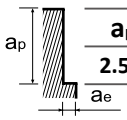
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
X600IE+-12394TO	4	16	4	60	4
	5	20	6	60	
	6	24	6	65	
	8	32	8	90	
	10	40	10	100	
	12	48	12	110	
	16	64	16	140	
	20	80	20	160	

Code No.	CED	CEL	SD	OAL	Flute
X600IE+-12394TO	EU 4	16	6	65	4
	EU 5	20	6	65	
	EU 6	24	6	65	
	EU 8	32	8	80	
	EU 10	40	10	90	
	EU 12	48	12	100	

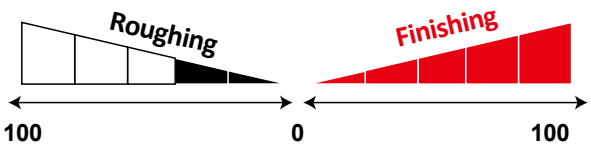
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 2.5D	a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D	a_p: 2.5D	a_e: 0.01D
4	8,600	900	7,740	810	6,500	610	6,500	450
5	7,000	1,100	6,300	990	5,200	810	5,200	450
6	6,400	1,200	5,760	1,080	4,300	910	4,300	450
8	4,800	1,400	4,000	1,190	3,200	910	2,900	450
10	3,400	1,300	2,800	1,170	2,500	910	2,600	450
12	2,900	1,250	2,750	1,100	2,100	880	2,190	450
16	2,100	1,150	1,800	1,000	1,620	800	1,600	430
20	1,900	1,100	1,600	990	1,300	780	1,300	480
Depth of cut		a_p: 2.5D, a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D	a_p: 2.5D	a_e: 0.01D

Work Material

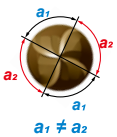
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●

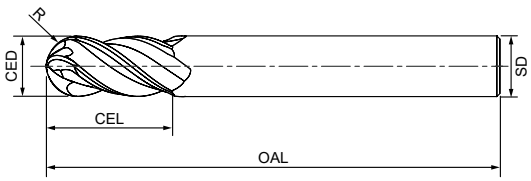


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600IE+ - 81374TO

- Ball Nose - 4-Flute x 2D
- Uneven Flute / Variable Helix 37° /40°





Best Seller IE Series

4 Flutes | R | 37° / 40° | TO | HRC ▶60 | UMG

CED Tolerance(mm)	
R	±0.02

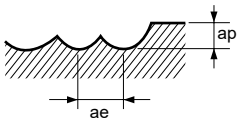
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
X600IE+-81374TO	3R	12	6	50	4
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	75	
	8R	32	16	100	
	10R	40	20	100	

Code No.	Radius	CEL	SD	OAL	Flute
X600IE+-81374TO	EU 3R	12	6	57	4
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

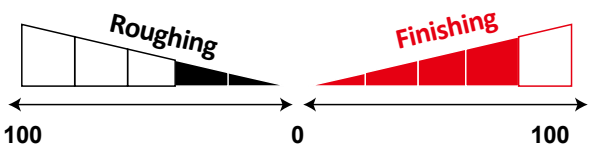
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D
3R	10,080	1,820	9,000	1,400	7,200	1,000	5,760	700
4R	7,560	1,820	6,800	1,400	5,400	1,000	4,320	700
5R	6,000	1,820	5,400	1,400	4,320	1,000	3,400	700
6R	5,040	1,820	4,500	1,400	3,600	1,000	2,880	700
8R	3,720	1,820	3,300	1,400	2,640	1,000	2,100	700
10R	3,000	1,560	2,700	1,250	2,160	870	1,700	610
Depth of cut	 a_p: 0.1D, a_e: 0.2D		a_p: 0.08D, a_e: 0.2D		a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D	

Work Material

P			H			
G1	G2	G3	G14	G15	G16	G17
●	●	●	●	●	●	○

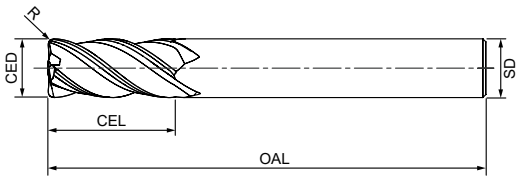


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

X600IE+ - 21374TO

- Corner Radius - 4-Flute x 2.5D
- Uneven Flute / Variable Helix 37° /40°

$a_1 \neq a_2$



Best Seller IE Series

4 Flutes | R | 37° / 40° | TO | HRC ▶60 | UMG

CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

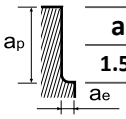
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Radius	Flute
X600IE+-21374TO	1	3	4	50	0.2R	4
	2	5	4	50	0.2R	
	3	8	4	50	0.2R	
	4	10	4	50	0.2R	
	5	13	6	50	0.2R	
	6	15	6	50	0.2R	
	8	20	8	60	0.2R	
					0.5R	
	10	25	10	75	0.2R	
					0.5R	
	12	30	12	75	0.2R	
					0.5R	

Code No.	CED	CEL	SD	OAL	Radius	Flute
X600IE+-21374TO	EU 3	8	6	57	0.2R	4
	EU 4	11	6	57	0.2R	
	EU 5	13	6	57	0.2R	
	EU 6	13	6	57	0.2R	
	EU 8	19	8	63	0.2R	
					0.5R	
	EU 10	22	10	72	0.2R	
					0.5R	
	EU 12	26	12	83	0.2R	
					0.5R	

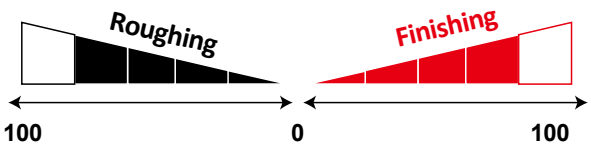
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Hardened Steel 55~60HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
1	38,700	480	32,850	400	29,000	310	26,500	190
2	19,350	570	16,380	480	14,600	360	13,200	220
3	12,870	808	10,890	680	9,720	510	8,700	230
4	9,600	950	8,190	800	7,290	610	6,500	380
5	7,700	1,280	6,570	1,090	5,850	810	5,200	510
6	6,400	1,400	5,400	1,200	4,860	900	4,300	580
8	4,800	1,520	4,050	1,290	3,600	970	3,240	610
10	3,870	1,400	3,200	1,200	2,880	910	2,600	580
12	3,240	1,370	2,700	1,140	2,430	880	2,200	550
Depth of cut		a_p: 1.5D, a_e: 0.2D		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D

Work Material

P			H			
G1	G2	G3	G14	G15	G16	G17
●	●	●	●	●	●	○



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2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
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5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ Series

Machinery Parts & General Process

Types of Flute

2Flutes | 3Flutes | 4Flutes | 5Flutes | 6Flutes

4Flutes (R) | 2Flutes | 3Flutes | 4Flutes

Types of Uneven Flute

4Flutes | 4Flutes (A≠B≠C≠D) | 5Flutes | 6Flutes | 4Flutes

4Flutes (R)

Honing Process

with honing

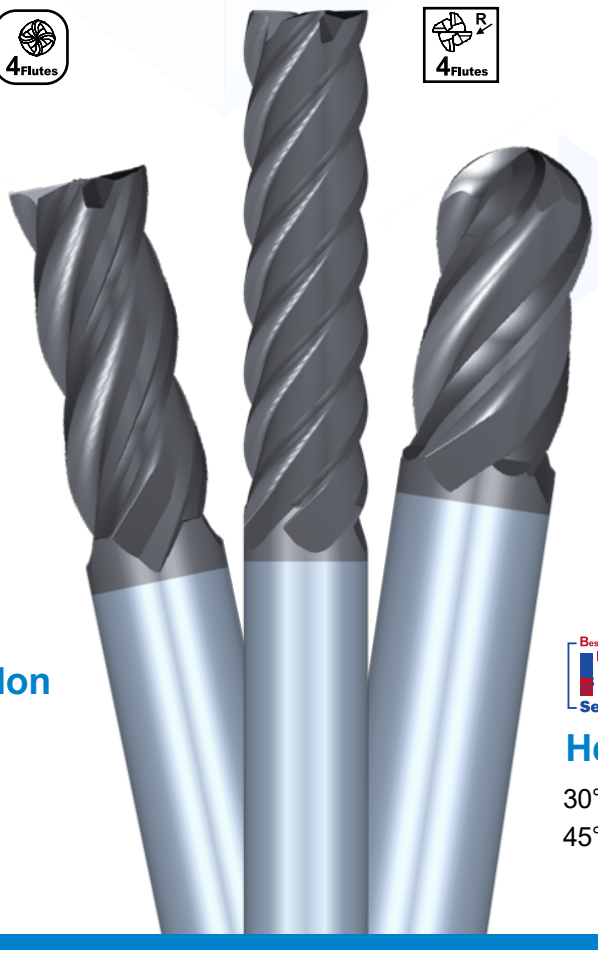
without honing

Coating Type

TN | TA

Optional DIN Weldon Shank

DIN 6535 HA | DIN 6535 HB | DIN 6535 HE



Cutting edge

with gashland protection

Solid Carbide Material

SMG — Super Micro Grain Carbide

HRC ▸55 — Applicable for material HRC 55

Best Seller IE Series

Helix angle

30° / 32° / 35° / 37° / 42° / 43° / 45°

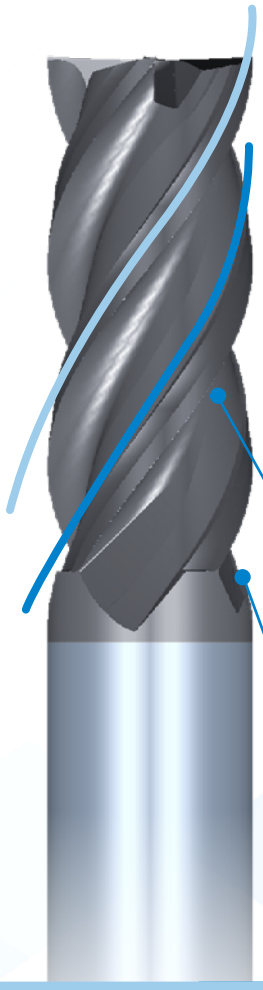
This series is mainly focus on high speed cutting in roughing and semi-finishing process on hardness material <HRC55.

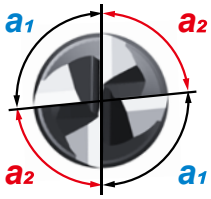
Special & Custom Tooling Services

Customized acceptable !
From Coating, flute, Helix angle, cutting length, to total length.

High Speed & Anti-Vibration

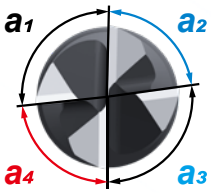
Ideal for Mild steels, Cast Irons, Hardened steels with extended tool life.





$a_1 \neq a_2$

Unevn Flute



$a_1 \neq a_2 \neq a_3 \neq a_4$

Available Make to Order!

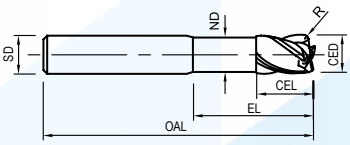
Best Seller IE Series

Variable Helix Angle

Anti-Vibration, Providing smooth and steady chip evaluation.

Unique coating for wear reduction and heat resistance.

Short Flute Provide	Multiple flute design provide	Heavy Duty Cutter design



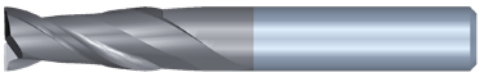
Ideal for cutting different hard metals.

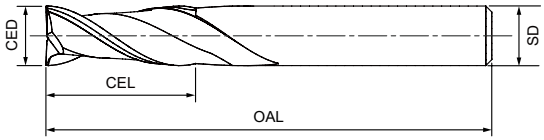
Ideal for high hardness metals andfinishing applications.

Ideal for heavy duty cutting operation.

S500+ - 11352TN

- Square - 2-Flute x 2.5D
- Helix 35°





CED Tolerance(mm)	
0.5~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

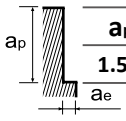
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500+-11352TN	0.5	2	4	50	2
	1	3	4	50	
	2	5	4	50	
	3	8	4	50	
	4	10	4	50	
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

Code No.	CED	CEL	SD	OAL	Flute
S500+-11352TN	EU 3	8	6	57	2
	EU 4	11	6	57	
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

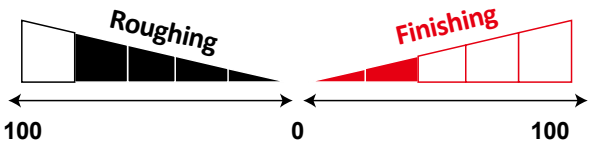
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
0.5	30,000	160	23,000	90	20,000	60	30,000	160
1	24,000	240	19,200	130	15,360	75	24,000	240
2	12,000	260	9,600	150	7,680	90	12,000	260
3	8,200	320	6,500	160	5,600	100	8,200	320
4	6,200	340	4,900	170	4,200	110	6,200	340
5	4,600	360	3,600	180	3,300	120	4,600	360
6	4,100	370	3,200	185	2,800	120	4,100	370
8	3,100	370	2,400	185	2,100	120	3,100	370
10	2,400	360	1,900	180	1,700	110	2,400	360
12	2,000	330	1,560	165	1,400	95	2,000	330
16	1,500	290	1,200	145	1,050	80	1,500	290
Depth of cut		a_p: 1.5D, a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	●



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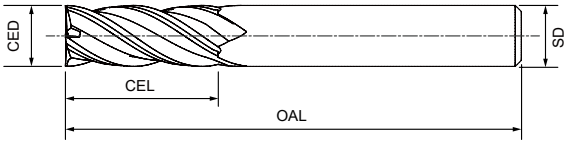
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 11354TN

- Square - 4-Flute x 2.5D
- Helix 35°



CED Tolerance(mm)	
0.5~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

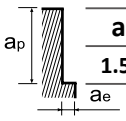
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500+-11354TN	0.5	2	4	50	4
	1	3	4	50	
	2	5	4	50	
	3	8	4	50	
	4	10	4	50	
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

Code No.	CED	CEL	SD	OAL	Flute
S500+-11354TN	EU 3	8	6	57	4
	EU 4	11	6	57	
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

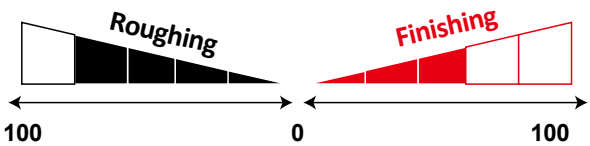
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
0.5	30,000	160	23,000	70	20,000	50	30,000	160
1	24,000	190	14,000	85	12,500	60	24,000	190
2	12,000	270	7,000	120	6,350	85	12,000	270
3	8,000	380	5,300	140	4,240	100	8,000	380
4	6,000	410	4,250	150	3,700	105	6,000	410
5	4,800	470	3,550	160	3,150	110	4,800	470
6	4,000	470	2,950	175	2,650	120	4,000	470
8	3,000	460	2,200	170	1,950	130	3,000	460
10	2,400	460	1,750	160	1,550	120	2,400	460
12	2,000	460	1,470	160	1,300	115	2,000	460
16	1,500	430	1,100	145	975	110	1,500	430
Depth of cut		a_p: 1.5D, a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	●



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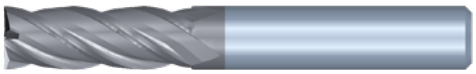
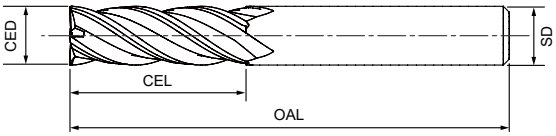
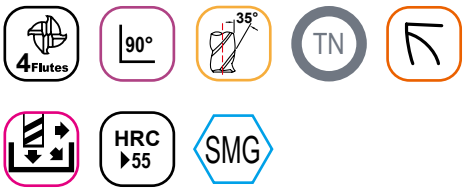
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 11354TN

- Square - 4-Flute x 3D
- Helix 35°







CED Tolerance(mm)	
0.5~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

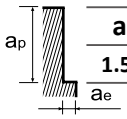
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500+-11354TN	0.5	2	4	50	4
	1	3	4	50	
	2	6	4	50	
	3	9	4	50	
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	
	16	48	16	100	
	20	60	20	125	

Code No.	CED	CEL	SD	OAL	Flute
S500+-11354TN	EU 3	9	6	57	4
	EU 4	12	6	65	
	EU 5	15	6	65	
	EU 6	18	6	65	
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

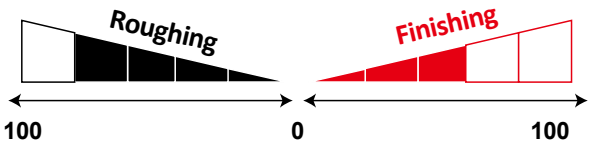
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
0.5	30,000	160	23,000	70	20,000	50	30,000	160
1	24,000	190	14,000	85	12,500	60	24,000	190
2	12,000	270	7,000	120	6,350	85	12,000	270
3	8,000	380	5,300	140	4,240	100	8,000	380
4	6,000	410	4,250	150	3,700	105	6,000	410
5	4,800	470	3,550	160	3,150	110	4,800	470
6	4,000	470	2,950	175	2,650	120	4,000	470
8	3,000	460	2,200	170	1,950	130	3,000	460
10	2,400	460	1,750	160	1,550	120	2,400	460
12	2,000	460	1,470	160	1,300	115	2,000	460
16	1,500	430	1,100	145	975	110	1,500	430
20	1,200	400	890	145	800	105	1,200	400
Depth of cut		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D		a_p: 1.5D, a_e: 0.1D

Work Material

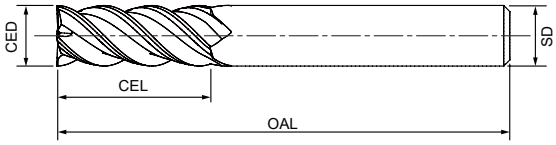
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 11454TN

- Square - 4-Flute x 2.5D
- Helix 45°



CED Tolerance(mm)	
0.5~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

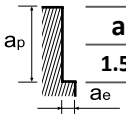
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500+-11454TN	0.5	2	4	50	4
	1	3	4	50	
	2	5	4	50	
	3	8	4	50	
	4	10	4	50	
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

Code No.	CED	CEL	SD	OAL	Flute
S500+-11454TN	EU 3	8	6	57	4
	EU 4	11	6	57	
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

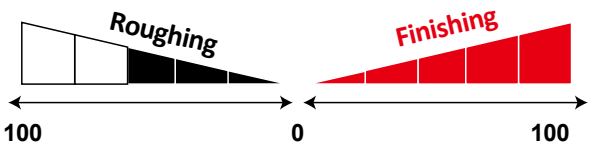
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
0.5	30,000	160	23,000	70	20,000	50	30,000	160
1	24,000	190	14,000	85	12,500	60	24,000	190
2	12,000	270	7,000	120	6,350	85	12,000	270
3	8,000	380	5,300	140	4,240	100	8,000	380
4	6,000	410	4,250	150	3,700	105	6,000	410
5	4,800	470	3,550	160	3,150	110	4,800	470
6	4,000	470	2,950	175	2,650	120	4,000	470
8	3,000	460	2,200	170	1,950	130	3,000	460
10	2,400	460	1,750	160	1,550	120	2,400	460
12	2,000	460	1,470	160	1,300	115	2,000	460
16	1,500	430	1,100	145	975	110	1,500	430
Depth of cut		a_p: 1.5D, a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D

Work Material

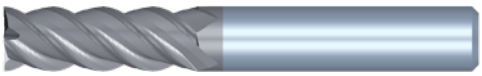
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	○	●	●	●

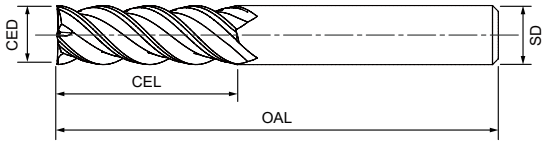


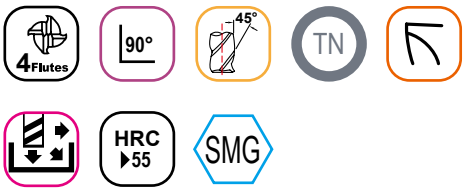
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 11454TN

- Square - 4-Flute x 3D
- Helix 45°







CED Tolerance(mm)	
0.5~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

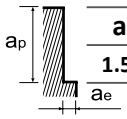
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500+-11454TN	0.5	2	4	50	4
	1	3	4	50	
	2	6	4	50	
	3	9	4	50	
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	
	16	48	16	100	
	20	60	20	125	

Code No.	CED	CEL	SD	OAL	Flute
S500+-11454TN	EU 3	9	6	57	4
	EU 4	12	6	65	
	EU 5	15	6	65	
	EU 6	18	6	65	
	EU 6	18	6	65	
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

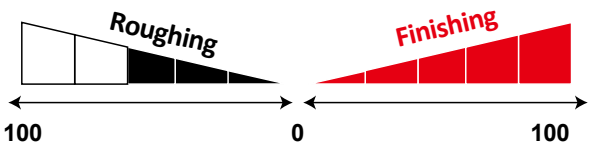
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
0.5	30,000	160	23,000	70	20,000	50	30,000	160
1	24,000	190	14,000	85	12,500	60	24,000	190
2	12,000	270	7,000	120	6,350	85	12,000	270
3	8,000	380	5,300	140	4,240	100	8,000	380
4	6,000	410	4,250	150	3,700	105	6,000	410
5	4,800	470	3,550	160	3,150	110	4,800	470
6	4,000	470	2,950	175	2,650	120	4,000	470
8	3,000	460	2,200	170	1,950	130	3,000	460
10	2,400	460	1,750	160	1,550	120	2,400	460
12	2,000	460	1,470	160	1,300	115	2,000	460
16	1,500	430	1,100	145	975	110	1,500	430
20	1,200	400	890	145	800	105	1,200	400
Depth of cut		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D		a_p: 1.5D, a_e: 0.1D

Work Material

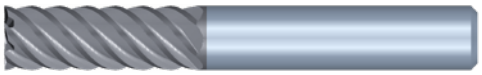
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	○	●	●	●

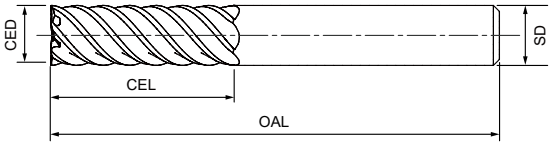


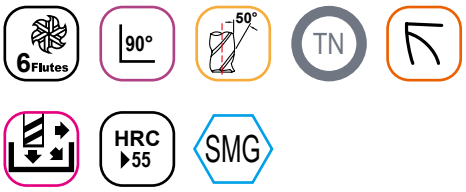
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 11506TN

- Square - 6-Flute x 3D / Multi-Flute
- Helix 50°







CED Tolerance(mm)	
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

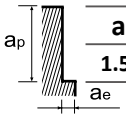
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500+-11506TN	6	18	6	50	6
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	
	16	48	16	100	
	20	60	20	125	

Code No.	CED	CEL	SD	OAL	Flute
S500+-11506TN	EU 6	18	6	65	6
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

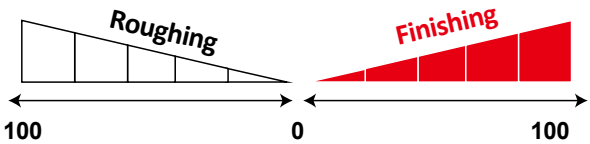
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D
6	7,450	1,270	6,650	1,010	6,300	810
8	5,550	1,270	4,900	1,010	4,000	810
10	4,450	1,100	4,000	880	3,200	700
12	3,700	1,050	3,300	840	2,650	670
16	2,700	920	2,600	740	1,650	590
20	2,200	850	1,950	680	1,550	540
Depth of cut		a_p: 1.5D, a_e: 0.1D	a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D	

Work Material

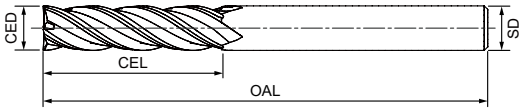
P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●

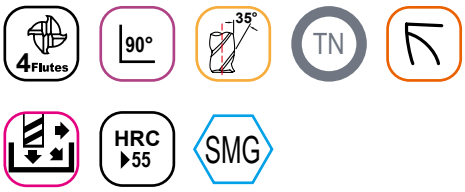


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 12354TN

- Square - 4-Flute x 4D / Long Flute
- Helix 35°





CED Tolerance(mm)	
0.5~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

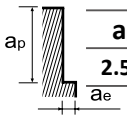
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500+-12354TN	0.5	2	4	50	4
	1	4	4	50	
	2	8	4	50	
	3	12	4	50	
	4	16	4	50	
	5	20	6	60	
	6	24	6	65	
	8	32	8	90	
	10	40	10	100	
	12	48	12	110	
	16	64	16	140	
	20	80	20	160	

Code No.	CED	CEL	SD	OAL	Flute
S500+-12354TN	EU 3	12	6	57	4
	EU 4	16	6	65	
	EU 5	20	6	65	
	EU 6	24	6	65	
	EU 8	32	8	80	
	EU 10	40	10	90	
	EU 12	48	12	100	

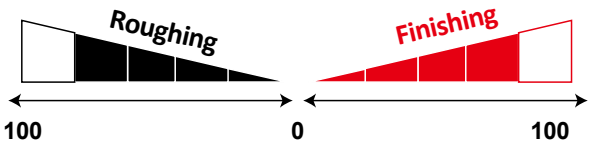
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 2.5D	a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D	a_p: 2.5D	a_e: 0.05D
0.5	40,000	200	36,000	160	35,000	130	40,000	200
1	21,000	250	19,700	220	19,100	155	21,000	250
2	10,500	360	9,800	230	9,550	235	10,500	360
3	7,000	455	6,600	410	6,350	430	7,000	455
4	5,250	455	4,950	415	4,700	300	5,250	455
5	4,200	480	3,950	430	3,800	310	4,200	480
6	3,500	660	2,100	480	1,500	270	3,500	660
8	2,650	705	1,800	500	1,200	285	2,650	705
10	2,100	750	1,600	520	1,150	220	2,100	750
12	1,750	720	1,350	470	960	260	1,750	720
16	1,300	630	1,000	420	720	215	1,300	630
20	1,050	520	800	340	580	200	1,050	520
Depth of cut		a_p: 2.5D, a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D	a_p: 2.5D	a_e: 0.05D

Work Material

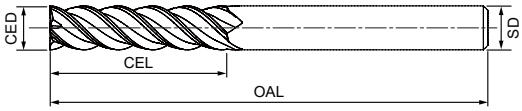
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 12454TN

- Square - 4-Flute x 4D / Long Flute
- Helix 45°



CED Tolerance(mm)	
0.5~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

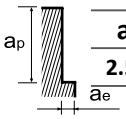
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500+-12454TN	0.5	2	4	50	4
	1	4	4	50	
	2	8	4	50	
	3	12	4	50	
	4	16	4	50	
	5	20	6	60	
	6	24	6	65	
	8	32	8	90	
	10	40	10	100	
	12	48	12	110	
	16	64	16	140	
	20	80	20	160	

Code No.	CED	CEL	SD	OAL	Flute
S500+-12454TN	EU 3	12	6	57	4
	EU 4	16	6	65	
	EU 5	20	6	65	
	EU 6	24	6	65	
	EU 8	32	8	80	
	EU 10	40	10	90	
	EU 12	48	12	100	

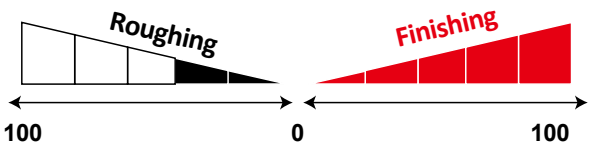
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 2.5D	a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D	a_p: 2.5D	a_e: 0.05D
0.5	40,000	200	36,000	160	35,000	130	40,000	200
1	21,000	250	19,700	220	19,100	155	21,000	250
2	10,500	360	9,800	230	9,550	235	10,500	360
3	7,000	455	6,600	410	6,350	430	7,000	455
4	5,250	455	4,950	415	4,700	300	5,250	455
5	4,200	480	3,950	430	3,800	310	4,200	480
6	3,500	660	2,100	480	1,500	270	3,500	660
8	2,650	705	1,800	500	1,200	285	2,650	705
10	2,100	750	1,600	520	1,150	220	2,100	750
12	1,750	720	1,350	470	960	260	1,750	720
16	1,300	630	1,000	420	720	215	1,300	630
20	1,050	520	800	340	580	200	1,050	520
Depth of cut		a_p: 2.5D, a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D	a_p: 2.5D	a_e: 0.05D

Work Material

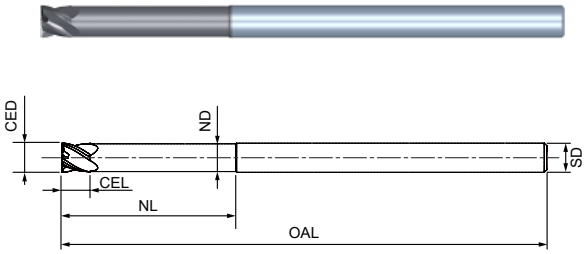
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	○	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

RPS500+ - 14354TN

- Square - 4-Flute x 1D / Stub Flute - Long Neck
- Helix 35°



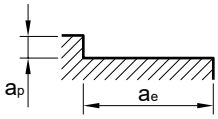
CED Tolerance(mm)	
0.5~3	0~-0.014
3~6	0~-0.018

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	NL	ND	Flute
RPS500+-14354TN	0.5	0.5	4	50	3	0.45	4
	1	1	4	50	6	0.95	
	1.5	1.5	4	50	9	1.45	
	2	2	4	50	12	1.95	
	3	3	6	75	18	2.85	
	4	4	6	75	24	3.85	
	5	5	6	100	30	4.85	
	6	6	6	100	36	5.85	

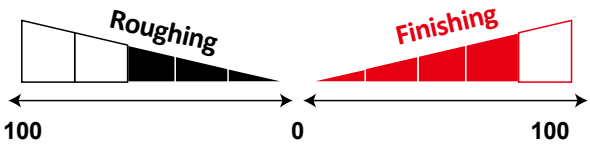
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.05D	a_e: 0.5D	a_p: 0.04D	a_e: 0.5D	a_p: 0.03D	a_e: 0.5D	a_p: 0.05D	a_e: 0.5D
0.5	28,800	315	28,800	200	26,100	160	28,800	315
1	27,000	540	27,000	390	19,800	250	27,000	540
1.5	15,300	550	15,300	450	11,700	270	15,300	550
2	13,500	720	12,600	630	9,900	380	13,500	720
3	9,000	720	9,000	630	7,200	390	9,000	720
4	6,300	720	6,300	600	5,400	400	6,300	720
5	5,400	540	4,950	520	4,500	450	5,400	540
6	4,500	480	4,140	440	3,600	370	4,500	480
Depth of cut	 a_p: 0.05D, a_e: 0.5D		a_p: 0.04D, a_e: 0.5D		a_p: 0.03D, a_e: 0.5D		a_p: 0.05D, a_e: 0.5D	

Work Material

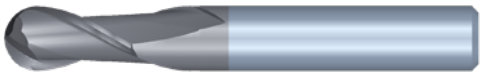
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○

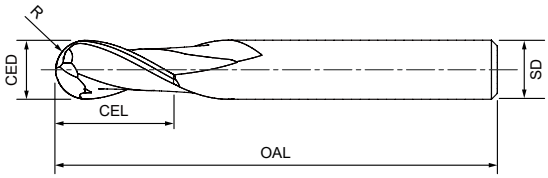


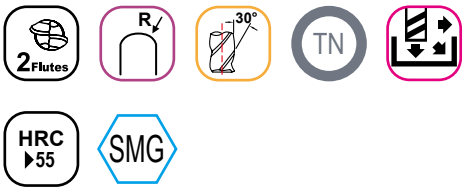
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 81302TN

- Ball Nose - 2-Flute x 2D
- Helix 30°







CED Tolerance(mm)	
R	±0.02

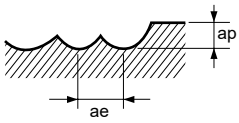
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
S500+-81302TN	0.5R	2	4	50	2
	1R	4	4	50	
	1.5R	6	4	50	
	2R	8	4	50	
	2.5R	10	6	50	
	3R	12	6	50	
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	75	
	8R	32	16	100	

Code No.	Radius	CEL	SD	OAL	Flute
S500+-81302TN	EU 1.5R	6	6	57	2
	EU 2R	8	6	57	
	EU 2.5R	10	6	57	
	EU 3R	12	6	57	
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

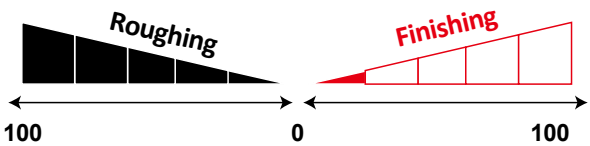
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.05D	a_e: 0.1D
0.5R	30,000	700	28,000	420	24,000	290	30,000	700
1.0R	21,600	870	17,000	520	13,800	350	21,600	870
1.5R	14,000	840	11,700	540	10,100	432	14,000	840
2R	10,800	840	9,000	520	7,700	410	10,800	840
2.5R	8,600	830	7,200	510	6,100	430	8,600	830
3R	7,200	830	5,800	490	5,100	460	7,200	830
4R	5,400	810	5,000	560	3,800	550	5,400	810
5R	4,300	810	3,500	560	3,000	510	4,300	810
6R	3,600	810	2,900	510	2,500	390	3,600	810
8R	2,700	800	2,200	490	1,900	360	2,700	800
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.05D, a_e: 0.1D	

Work Material

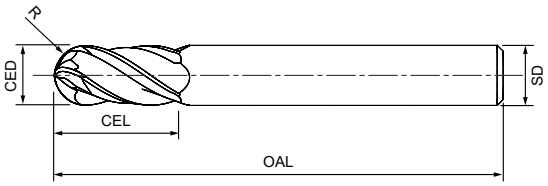
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 81354TN

- Ball Nose - 4-Flute x 2D
- Helix 35°



CED Tolerance(mm)	
R	±0.02

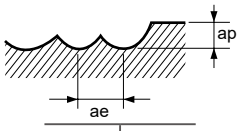
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
S500+-81354TN	0.5R	2	4	50	4
	1R	4	4	50	
	1.5R	6	4	50	
	2R	8	4	50	
	2.5R	10	6	50	
	3R	12	6	50	
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	75	
	8R	32	16	100	
	10R	40	20	100	

Code No.	Radius	CEL	SD	OAL	Flute
S500+-81354TN	EU 1.5R	6	6	57	4
	EU 2R	8	6	57	
	EU 2.5R	10	6	57	
	EU 3R	12	6	57	
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

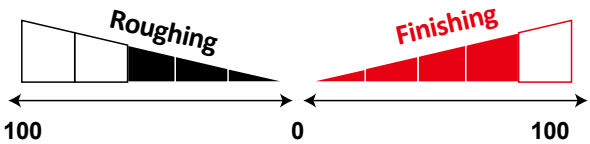
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.05D	a_e: 0.1D
0.5R	28,800	960	28,800	760	28,800	600	28,800	960
1.0R	22,500	1,520	21,420	1,210	17,000	960	22,500	1,520
1.5R	15,030	2,300	14,310	1,600	11,400	1,280	15,030	2,300
2R	11,250	2,100	13,410	1,710	8,600	1,360	11,250	2,100
2.5R	9,000	1,900	8,550	1,530	6,800	1,220	9,000	1,900
3R	7,560	2,100	7,200	1,680	5,700	1,300	7,560	2,100
4R	5,670	2,160	5,360	1,700	7,300	1,360	5,670	2,160
5R	4,600	2,080	4,320	1,600	3,420	1,280	4,600	2,080
6R	3,780	1,900	3,600	1,900	2,880	1,300	3,780	1,900
8R	2,800	1,440	2,700	1,530	2,160	1,220	2,800	1,440
10R	2,250	1,150	2,160	1,260	1,710	1,010	2,250	1,150
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.05D, a_e: 0.1D	

Work Material

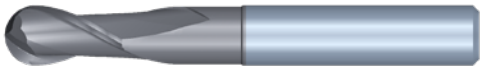
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○

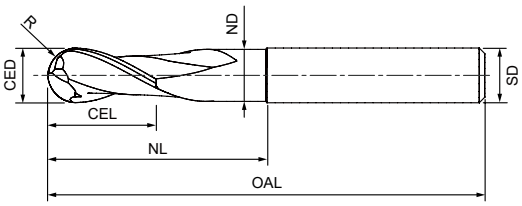


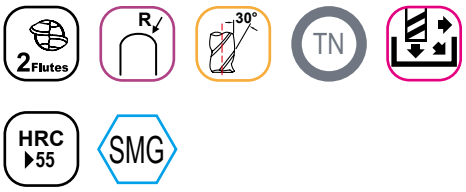
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 83302TN

- Ball Nose - 2-Flute x 2D / Long Shank with Neck
- Helix 30°







CED Tolerance(mm)	
R	±0.02

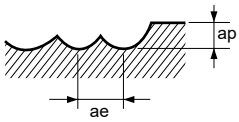
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	NL	ND	Flute
S500+-83302TN	0.5R	2	4	75	5	0.95	2
	1R	4	4	75	10	1.95	
	1.5R	6	4	75	15	2.85	
	2R	8	4	75	20	3.85	
	2.5R	10	6	75	25	4.85	
	3R	12	6	75	30	5.7	
	4R	16	8	100	35	7.6	
	5R	20	10	100	45	9.5	
	6R	24	12	100	50	11.4	

Code No.	Radius	CEL	SD	OAL	NL	ND	Flute
S500+-83302TN	EU 1.5R	6	6	80	15	2.85	2
	EU 2R	8	6	80	20	3.85	
	EU 2.5R	10	6	80	25	4.85	
	EU 3R	12	6	100	30	5.7	
	EU 4R	16	8	100	35	7.6	
	EU 5R	20	10	100	45	9.5	
	EU 6R	24	12	150	50	11.4	

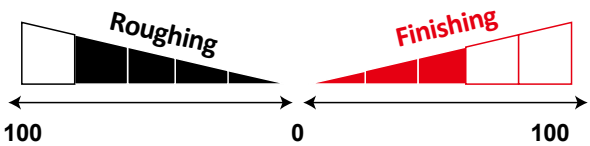
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.05D	a_e: 0.1D
0.5R	25,900	680	24,000	430	22,000	340	25,900	680
1.0R	25,900	1,720	19,440	960	16,200	760	25,900	1,720
1.5R	17,000	1,550	12,960	1,040	10,930	830	17,000	1,550
2R	12,900	1,430	9,720	1,080	8,060	860	12,900	1,430
2.5R	10,100	1,280	7,700	1,090	6,440	870	10,100	1,280
3R	8,500	1,110	6,440	1,000	5,380	800	8,500	1,110
4R	6,440	1,090	4,800	870	4,010	700	6,440	1,090
5R	5,140	980	3,890	740	3,240	600	5,140	980
6R	4,290	980	3,240	610	2,670	490	4,290	980
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.05D, a_e: 0.1D	

Work Material

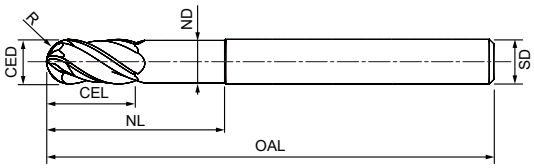
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 83354TN

- Ball Nose - 4-Flute x 2D / Long Shank with Neck
- Helix 35°



CED Tolerance(mm)	
R	±0.02

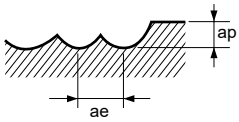
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	NL	ND	Flute
S500+-83354TN	3R	12	6	75	18	5.7	4
	4R	16	8	100	32	7.6	
	5R	20	10	100	40	9.5	
	6R	24	12	100	48	11.4	
	8R	32	16	150	64	15.5	
	10R	40	20	150	80	19.5	

Code No.	Radius	CEL	SD	OAL	NL	ND	Flute
S500+-83354TN	EU 3R	12	6	100	30	5.7	4
	EU 4R	16	8	100	35	7.6	
	EU 5R	20	10	100	45	9.5	
	EU 6R	24	12	150	50	11.4	

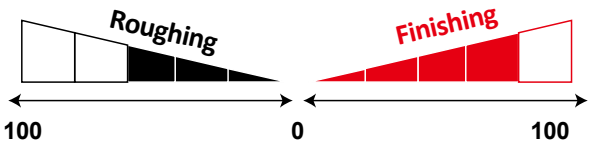
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.05D	a_e: 0.1D
3R	7,560	1,680	7,150	1,340	5,710	1,070	7,560	1,680
4R	5,670	1,650	5,350	1,320	4,270	1,055	5,670	1,650
5R	5,140	1,480	4,320	1,060	3,420	950	5,140	1,480
6R	4,290	1,480	3,600	1,060	2,880	950	4,290	1,480
8R	3,240	1,430	2,700	1,030	2,160	980	3,240	1,430
10R	2,590	1,340	2,160	960	1,710	890	2,590	1,340
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.05D, a_e: 0.1D	

Work Material

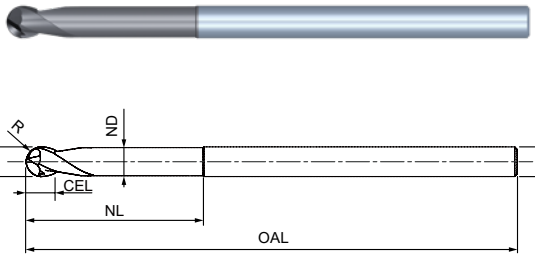
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

RPS500+ - 84352TN

- Ball Nose - 2-Flute x 1D / Stub Flute - Long Neck
- Helix 35°



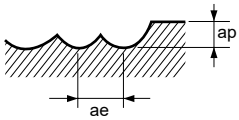
CED Tolerance(mm)	
R	±0.02

h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	NL	ND	Flute
RPS500+-84352TN	0.25R	0.5	4	50	3	0.45	2
	0.5R	1	4	50	6	0.95	
	0.75R	1.5	4	50	9	1.45	
	1R	2	4	50	12	1.95	
	1.5R	3	6	75	18	2.85	
	2R	4	6	75	24	3.85	
	2.5R	5	6	100	30	4.85	
	3R	6	6	100	36	5.85	

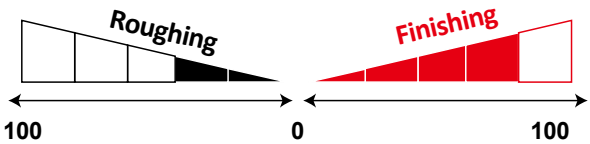
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.02D	a_e: 0.03D	a_p: 0.05D	a_e: 0.1D
0.25R	36,000	420	36,000	310	36,000	280	36,000	420
0.5R	36,000	980	27,000	580	22,500	420	36,000	980
0.75R	27,000	1,200	27,000	860	22,500	650	27,000	1,200
1.0R	22,500	1,420	22,500	1,150	18,000	860	22,500	1,420
1.5R	18,000	1,800	16,200	1,150	12,600	860	18,000	1,800
2R	18,000	2,160	14,400	1,300	10,800	980	18,000	2,160
2.5R	16,200	2,100	10,800	1,080	8,280	870	16,200	2,100
3R	14,400	1,900	7,200	860	6,300	720	14,400	1,900
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.02D, a_e: 0.03D		a_p: 0.05D, a_e: 0.1D	

Work Material

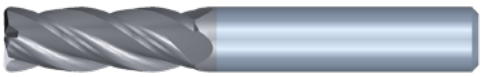
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○

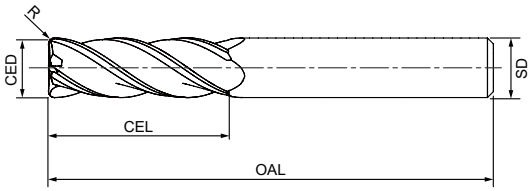


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500+ - 21354TN

- Corner Radius - 4-Flute x 3D
- Helix 35°





CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

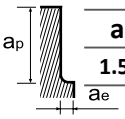
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Radius	Flute
S500+-21354TN	1	3	4	50	0.2R	4
	2	6	4	50	0.2R	
	3	9	4	50	0.2R	
	4	12	4	50	0.2R	
	5	15	6	50	0.2R	
	6	18	6	50	0.2R	
	8	24	8	65	0.2R	
					0.5R	
	10	30	10	75	0.2R	
					0.5R	
	12	36	12	80	0.2R	
					0.5R	

Code No.	CED	CEL	SD	OAL	Radius	Flute
S500+-21354TN	EU 3	9	6	57	0.2R	4
	EU 4	12	6	65	0.2R	
	EU 5	15	6	65	0.2R	
	EU 6	18	6	65	0.2R	
	EU 8	24	8	75	0.2R	
					0.5R	
	EU 10	30	10	80	0.2R	
					0.5R	
	EU 12	36	12	93	0.2R	
					0.5R	

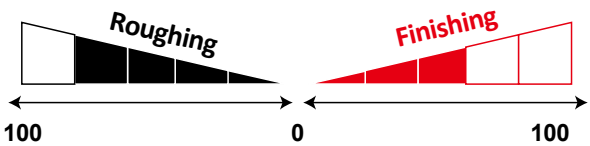
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
1	24,000	190	14,000	85	12,500	60	24,000	190
2	12,000	270	7,000	120	6,350	85	12,000	270
3	8,000	380	5,300	135	4,240	100	8,000	380
4	6,000	410	4,250	145	3,700	105	6,000	410
5	4,800	470	3,550	150	3,150	110	4,800	470
6	4,000	470	2,950	175	2,650	115	4,000	470
8	3,000	460	2,200	170	1,950	115	3,000	460
10	2,400	460	1,750	160	1,550	115	2,400	460
12	2,000	460	1,470	160	1,300	115	2,000	460
Depth of cut	 a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D		a_p: 1.5D, a_e: 0.1D	

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○

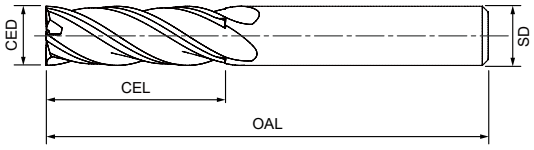


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 11324TA

- Square - 4-Flute x 3D
- Uneven Flute / Variable Helix Angle 32° /35°

$a_1 \neq a_2$



Best Seller IE Series

4 Flutes | 90° | 32° / 35° | TA | HRC 55 | SMG

CED Tolerance(mm)	
6~10	0~-0.02
10~16	0~-0.025

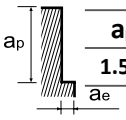
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-11324TA	6	18	6	50	4
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	
	16	48	16	100	

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-11324TA	EU 6	18	6	65	4
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

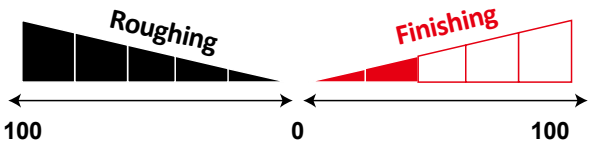
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
6	6,400	910	5,400	700	5,100	560	6,400	910
8	4,800	900	4,200	690	3,800	550	4,800	900
10	3,800	890	3,400	650	3,000	520	3,800	890
12	3,200	830	2,900	500	2,500	400	3,200	830
16	2,200	680	1,800	400	1,700	320	2,200	680
Depth of cut		a_p: 1.5D, a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D

Work Material

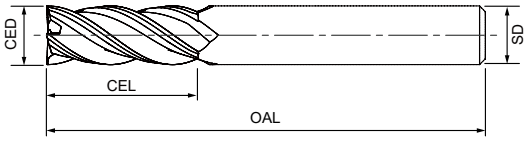
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	○	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 11354TA

- Square - 4-Flute x 2.5D
- Uneven Flute / Variable Helix 35° /38°



CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

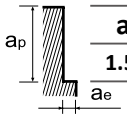
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-11354TA	1	3	4	50	4
	2	5	4	50	
	3	8	4	50	
	4	10	4	50	
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-11354TA	EU 3	8	6	57	4
	EU 4	11	6	57	
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

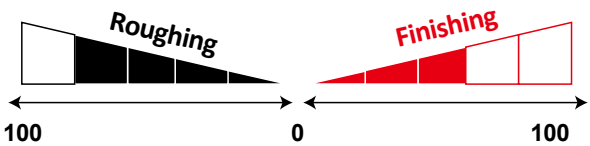
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
1	28,000	480	25,400	360	22,400	290	28,000	480
2	17,300	590	14,200	440	13,800	350	17,300	590
3	12,700	700	10,800	500	10,100	400	12,700	700
4	9,600	750	8,000	520	7,700	410	9,600	750
5	7,600	800	6,600	590	6,100	470	7,600	800
6	6,400	1,000	5,400	700	5,100	560	6,400	1,000
8	4,800	1,000	4,200	690	3,800	550	4,800	1,000
10	3,800	890	3,400	650	3,000	520	3,800	890
12	3,200	830	2,900	500	2,500	400	3,200	830
16	2,400	620	2,200	400	1,900	320	2,400	620
Depth of cut		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D		a_p: 1.5D, a_e: 0.1D

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



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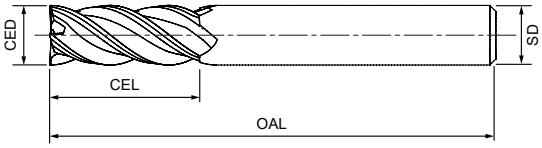
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 11374TA

- Square - 4-Flute x 2.5D
- Uneven Flute / Variable Helix 37° /40°



Best Seller IE Series

4 Flutes | 90° | 37° / 40° | TA | HRC ▸55 | SMG

CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

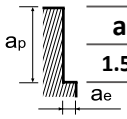
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-11374TA	1	3	4	50	4
	2	5	4	50	
	3	8	4	50	
	4	10	4	50	
	5	13	6	50	
	6	15	6	50	
	8	20	8	65	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-11374TA	EU 3	8	6	57	4
	EU 4	11	6	57	
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

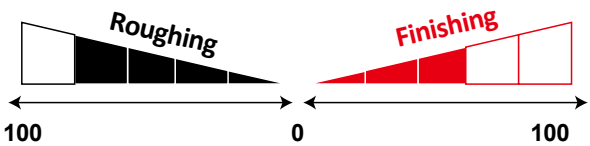
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
1	28,000	480	25,400	360	22,400	290	28,000	480
2	17,300	590	14,200	440	13,800	350	17,300	590
3	12,700	700	10,800	500	10,100	400	12,700	700
4	9,600	750	8,000	520	7,700	410	9,600	750
5	7,600	800	6,600	590	6,100	470	7,600	800
6	6,400	1,000	5,400	700	5,100	560	6,400	1,000
8	4,800	1,000	4,200	690	3,800	550	4,800	1,000
10	3,800	890	3,400	650	3,000	520	3,800	890
12	3,200	830	2,900	500	2,500	400	3,200	830
16	2,400	620	2,200	400	1,900	320	2,400	620
Depth of cut		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D		a_p: 1.5D, a_e: 0.1D

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



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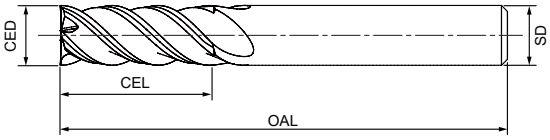
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 11434TA

- Square - 4-Flute x 2.5D
- Uneven Flute / Variable Helix 43° /46°

$a_1 \neq a_2$



Best Seller IE Series

4 Flutes | 90° | 43° / 46° | TA | HRC 55 | SMG

CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

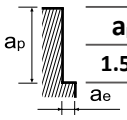
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-11434TA	4	10	4	50	4
	5	13	6	50	
	6	15	6	50	
	8	20	8	75	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	
	20	50	20	110	

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-11434TA	EU 4	11	6	57	4
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

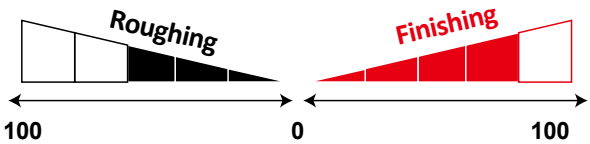
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
4	9,600	750	8,000	520	7,700	410	9,600	750
5	7,600	800	6,600	590	6,100	470	7,600	800
6	6,400	1,000	5,400	700	5,100	560	6,400	1,000
8	4,800	1,000	4,200	690	3,800	550	4,800	1,000
10	3,800	890	3,400	650	3,000	520	3,800	890
12	3,200	830	2,900	500	2,500	400	3,200	830
16	2,400	620	2,200	400	1,900	320	2,400	620
20	1,900	500	1,800	280	1,500	220	1,900	500
Depth of cut		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D		a_p: 1.5D, a_e: 0.1D

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	○	●	●	●

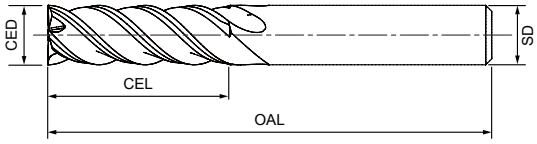


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 11434TA

- Square - 4-Flute x 3D
- Uneven Flute / Variable Helix 43° /46°

$a_1 \neq a_2$



Best Seller IE Series

4 Flutes | 90° | 43° / 46° | TA | HRC ▸55 | SMG

CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

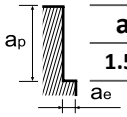
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-11434TA	1	3	4	50	4
	2	6	4	50	
	3	9	4	50	
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	
	16	48	16	100	

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-11434TA	EU 3	9	6	57	4
	EU 4	12	6	65	
	EU 5	15	6	65	
	EU 6	18	6	65	
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

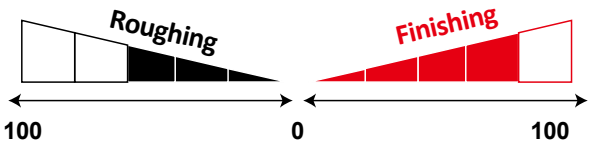
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
1	28,000	480	25,400	360	22,400	290	28,000	480
2	17,300	590	14,200	440	13,800	350	17,300	590
3	12,700	700	10,800	500	10,100	400	12,700	700
4	9,600	750	8,000	520	7,700	410	9,600	750
5	7,600	800	6,600	590	6,100	470	7,600	800
6	6,400	1,000	5,400	700	5,100	560	6,400	1,000
8	4,800	1,000	4,200	690	3,800	550	4,800	1,000
10	3,800	890	3,400	650	3,000	520	3,800	890
12	3,200	830	2,900	500	2,500	400	3,200	830
16	2,400	620	2,200	400	1,900	320	2,400	620
Depth of cut		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D		a_p: 1.5D, a_e: 0.1D

Work Material

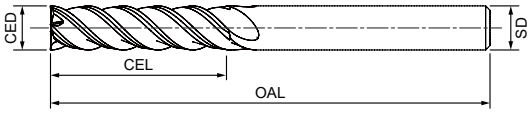
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	○	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 12434TA

- Square - 4-Flute x 4D / Long Flute
- Uneven Flute / Variable Helix 43° /46°



Best Seller IE Series

4 Flutes | 90° | 43° / 46° | TA | HRC 55 | SMG

CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

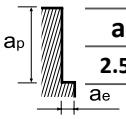
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-12434TA	4	16	4	50	4
	5	20	6	60	
	6	24	6	65	
	8	32	8	90	
	10	40	10	100	
	12	48	12	100	
	16	64	16	140	
	20	80	20	160	

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-12434TA	EU 4	16	6	65	4
	EU 5	20	6	65	
	EU 6	24	6	65	
	EU 8	32	8	80	
	EU 10	40	10	90	
	EU 12	48	12	100	

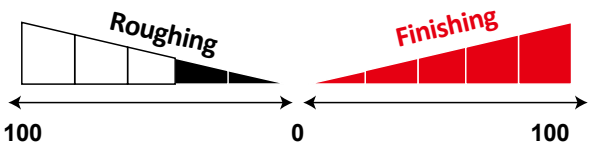
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 2.5D	a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D	a_p: 2.5D	a_e: 0.05D
4	5,750	500	5,400	450	4,700	300	5,750	500
5	4,620	530	4,340	470	3,820	310	4,620	530
6	3,850	730	2,300	530	1,500	270	3,850	730
8	2,900	770	1,980	550	1,200	280	2,900	770
10	2,300	830	1,760	570	1,150	220	2,300	830
12	1,900	790	1,480	520	1,000	260	1,900	790
16	1,430	690	1,090	460	720	220	1,430	690
20	1,150	570	870	380	580	200	1,150	570
Depth of cut		a_p: 2.5D, a_e: 0.05D		a_p: 2.5D, a_e: 0.03D		a_p: 2.5D, a_e: 0.02D		a_p: 2.5D, a_e: 0.05D

Work Material

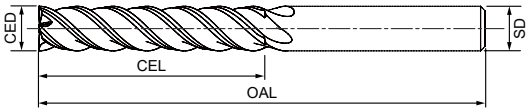
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	○	●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 12434TA

- Square - 4-Flute x 5D / Long Flute
- Uneven Flute / Variable Helix Angle 43° /46°



Best Seller IE Series

4 Flutes | 90° | 43° / 46° | TA | HRC 55 | SMG

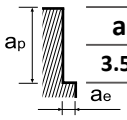
CED Tolerance(mm)	
6~10	0~-0.02
10~16	0~-0.025

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-12434TA	6	30	6	75	4
	8	40	8	90	
	10	50	10	100	
	12	60	12	110	
	16	80	16	160	

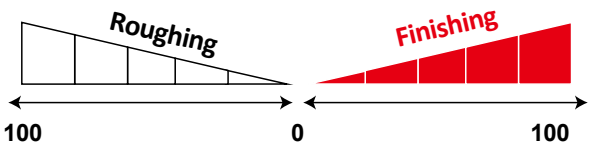
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 3.5D	a_e: 0.05D	a_p: 3.5D	a_e: 0.03D	a_p: 3.5D	a_e: 0.02D	a_p: 3.5D	a_e: 0.05D
6	3,800	500	2,800	300	1,680	160	3,800	500
8	2,900	520	2,200	320	1,320	170	2,900	520
10	2,300	520	1,760	310	1,050	170	2,300	520
12	1,900	510	1,480	300	890	170	1,900	510
16	1,400	500	1,100	290	660	160	1,400	500
Depth of cut		a_p: 3.5D, a_e: 0.05D	a_p: 3.5D	a_e: 0.03D	a_p: 3.5D	a_e: 0.02D	a_p: 3.5D	a_e: 0.05D

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	○	●	●	○

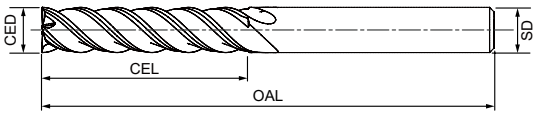


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

SMG Carbide - Anti-Vibration Long Shank Type End Mill

S500IE+ - 12424TA

- Square - 4-Flute / Long Flute / Long Shank
- Uneven Flute / Variable Helix Angle 42° /45°



Best Seller IE Series

4 Flutes | 90° | 42° / 45° | TA | HRC ▸55 | SMG

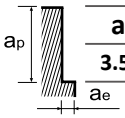
CED Tolerance(mm)	
6~10	0~-0.02
10~16	0~-0.025

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-12424TA	6	45	6	100	4
	8	38	8	100	
	10	45	10	100	
	12	55	12	100	
	16	90	16	150	

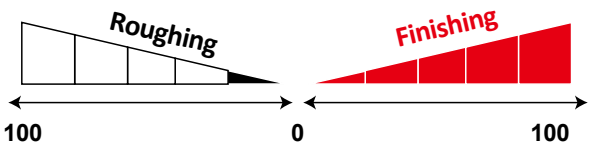
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 3.5D	a_e: 0.05D	a_p: 3.5D	a_e: 0.03D	a_p: 3.5D	a_e: 0.02D	a_p: 3.5D	a_e: 0.05D
6	3,800	500	2,800	300	1,680	160	3,800	500
8	2,900	520	2,200	320	1,320	170	2,900	520
10	2,300	520	1,760	310	1,050	170	2,300	520
12	1,900	510	1,480	300	890	170	1,900	510
16	1,400	500	1,100	290	660	160	1,400	500
Depth of cut		a_p: 3.5D, a_e: 0.05D	a_p: 3.5D	a_e: 0.03D	a_p: 3.5D	a_e: 0.02D	a_p: 3.5D	a_e: 0.05D

Work Material

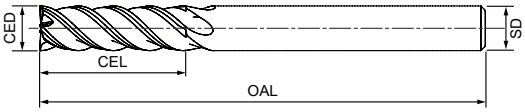
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 13424TA

- Square - 4-Flute / Long Shank
- Uneven Flute / Variable Helix Angle 42° /45°



Best Seller IE Series

4 Flutes | 90° | 42° / 45° | TA | HRC ▸55 | SMG

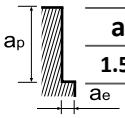
CED Tolerance(mm)	
6~10	0~-0.02
10~16	0~-0.025

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-13424TA	6	16	6	75	4
	8	20	8	100	
	10	32	10	100	
	12	32	12	100	
	16	45	16	150	

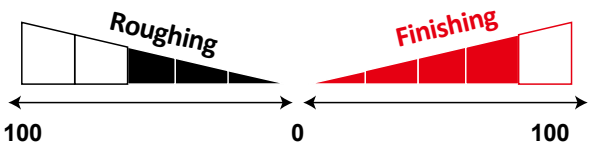
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
6	3,800	500	2,800	300	1,680	160	3,800	500
8	2,900	520	2,200	320	1,320	170	2,900	520
10	2,300	520	1,760	310	1,050	170	2,300	520
12	1,900	510	1,480	300	890	170	1,900	510
16	1,400	500	1,100	290	660	160	1,400	500
Depth of cut		a_p: 1.5D, a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D

Work Material

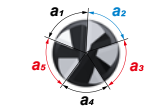
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	○	●	●	○



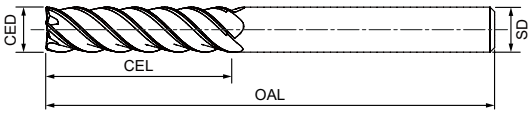
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 12435TA

- Square - 5-Flute x 4D / Multi-Flute / Long Flute Type
- Uneven Flute / Variable Helix 43° /46°



$a_1 \neq a_2 \neq a_3 \neq a_4 \neq a_5$



Best Seller IE Series

5 Flutes | 90° | 43° / 46° | TA | HRC 55 | SMG

CED Tolerance(mm)	
6~10	0~-0.02
10~16	0~-0.025

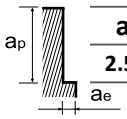
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-12435TA	6	24	6	65	5
	8	32	8	90	
	10	40	10	100	
	12	48	12	110	
	16	64	16	140	

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-12435TA	EU 6	24	6	65	5
	EU 8	32	8	80	
	EU 10	40	10	90	
	EU 12	48	12	100	

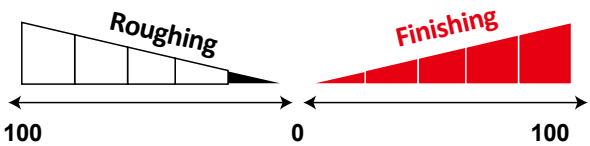
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 2.5D	a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D
6	3,850	730	2,300	530	1,500	270
8	2,900	770	1,980	550	1,200	280
10	2,300	830	1,760	570	1,150	220
12	1,900	790	1,480	520	1,000	260
16	1,430	690	1,090	460	720	220
Depth of cut		a_p: 2.5D, a_e: 0.05D		a_p: 2.5D, a_e: 0.03D		a_p: 2.5D, a_e: 0.02D

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●

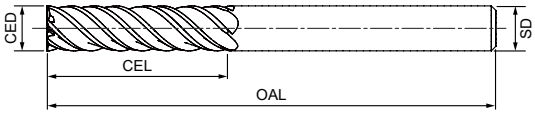


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 12436TA

- Square - 6-Flute x 4D / Multi-Flute / Long Flute Type
- Uneven Flute / Variable Helix 43°/46°

$a_1 \neq a_2 \neq a_3$



Best Seller IE Series

6 Flutes | 90° | 43° / 46° | TA | HRC ▸55 | SMG

CED Tolerance(mm)	
6~10	0~-0.02
10~16	0~-0.025

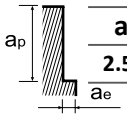
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-12436TA	6	24	6	65	6
	8	32	8	90	
	10	40	10	100	
	12	48	12	110	
	16	64	16	140	

Code No.	CED	CEL	SD	OAL	Flute
S500IE+-12436TA	EU 6	24	6	65	6
	EU 8	32	8	80	
	EU 10	40	10	90	
	EU 12	48	12	100	

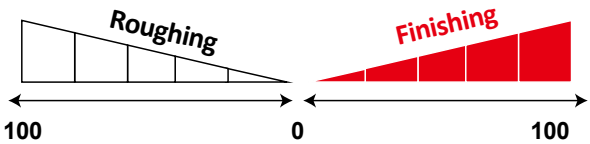
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 2.5D	a_e: 0.05D	a_p: 2.5D	a_e: 0.03D	a_p: 2.5D	a_e: 0.02D
6	3,850	730	2,300	530	1,500	270
8	2,900	770	1,980	550	1,200	280
10	2,300	830	1,760	570	1,150	220
12	1,900	790	1,480	520	1,000	260
16	1,430	690	1,090	460	720	220
Depth of cut		a_p: 2.5D, a_e: 0.05D		a_p: 2.5D, a_e: 0.03D		a_p: 2.5D, a_e: 0.02D

Work Material

P			H		
G1	G2	G3	G14	G15	G16
●	●	●	●	●	●

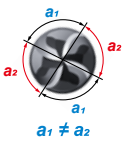


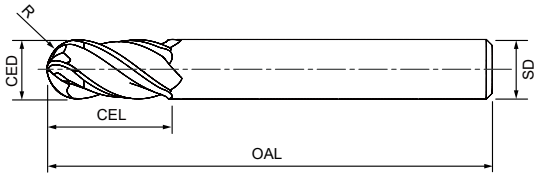
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

SMG Carbide - Anti-Vibration Ball End Mill

S500IE+ - 81354TA

- Ball Nose - 4-Flute x 2D
- Uneven Flute / Variable Helix 35°/38°





Best Seller IE Series

4 Flutes | R | 35° / 38° | TA | HRC ▶55 | SMG

CED Tolerance(mm)	
R	±0.02

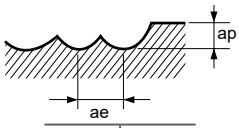
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
S500IE+-81354TA	3R	12	6	50	4
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	75	
	8R	32	16	100	
	10R	40	20	100	

Code No.	Radius	CEL	SD	OAL	Flute
S500IE+-81354TA	EU 3R	12	6	57	4
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

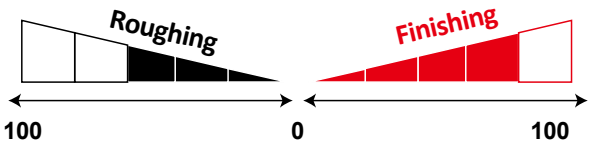
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.05D	a_e: 0.1D
3R	8,400	2,300	7,950	1,600	6,350	1,280	8,400	2,300
4R	6,300	2,400	5,950	1,600	4,750	1,280	6,300	2,400
5R	5,050	2,320	4,800	1,560	3,800	1,250	5,050	2,320
6R	4,200	2,120	4,000	1,720	3,200	1,370	4,200	2,120
8R	3,150	1,600	3,000	1,360	2,400	1,200	3,150	1,600
10R	2,500	1,280	2,400	1,120	1,900	970	2,500	1,280
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.05D, a_e: 0.1D	

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○

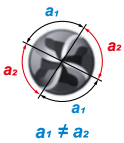


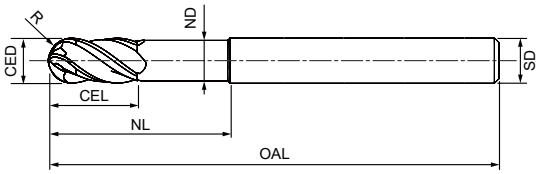
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

SMG Carbide - Anti-Vibration Long Shank Type Ball End Mill

S500IE+ - 83354TA

- Ball Nose - 4-Flute x 2D / Long Shank with Neck
- Uneven Flute / Variable Helix 35°/38°





Best Seller IE Series

4 Flutes | R | 35° / 38° | TA | HRC ▶55 | SMG

CED Tolerance(mm)	
R	±0.02

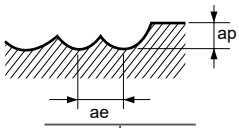
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	NL	ND	Flute
S500IE+-83354TA	3R	12	6	75	18	5.7	4
	4R	16	8	100	32	7.6	
	5R	20	10	100	40	9.5	
	6R	24	12	100	48	11.4	
	8R	32	16	150	64	15.5	
	10R	40	20	150	80	19.5	

Code No.	Radius	CEL	SD	OAL	NL	ND	Flute
S500IE+-83354TA	EU 3R	12	6	100	30	5.7	4
	EU 4R	16	8	100	35	7.6	
	EU 5R	20	10	100	45	9.5	
	EU 6R	24	12	150	50	11.4	

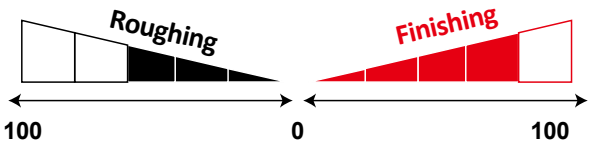
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.05D	a_e: 0.1D
3R	8,400	2,300	7,950	1,600	6,350	1,280	8,400	2,300
4R	6,300	2,400	5,950	1,600	4,750	1,280	6,300	2,400
5R	5,050	2,320	4,800	1,560	3,800	1,250	5,050	2,320
6R	4,200	2,120	4,000	1,720	3,200	1,370	4,200	2,120
8R	3,150	1,600	3,000	1,360	2,400	1,200	3,150	1,600
10R	2,500	1,280	2,400	1,120	1,900	970	2,500	1,280
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.05D, a_e: 0.1D	

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



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2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
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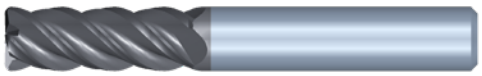
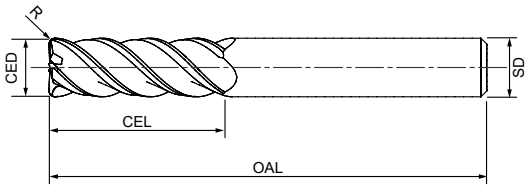
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500IE+ - 21434TA

- Corner Radius - 4-Flute x 3D
- Uneven Flute / Variable Helix 43°/46°

$a_1 \neq a_2$





Best Seller IE Series

4 Flutes | R | 43° / 46° | TA | HRC ▶55 | SMG

CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

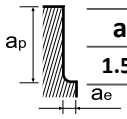
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Radius	Flute
S500IE+-24134TA	1	3	4	50	0.2R	4
	2	6	4	50	0.2R	
	3	9	4	50	0.2R	
	4	12	4	50	0.2R	
	5	15	6	50	0.2R	
	6	18	6	50	0.2R	
	8	24	8	65	0.2R	
					0.5R	
	10	30	10	75	0.2R	
					0.5R	
	12	36	12	80	0.2R	
					0.5R	

Code No.	CED	CEL	SD	OAL	Radius	Flute
S500IE+-24134TA	EU 3	9	6	57	0.2R	4
	EU 4	12	6	65	0.2R	
	EU 5	15	6	65	0.2R	
	EU 6	18	6	65	0.2R	
	EU 8	24	8	75	0.2R	
					0.5R	
	EU 10	30	10	80	0.2R	
					0.5R	
	EU 12	36	12	93	0.2R	
					0.5R	

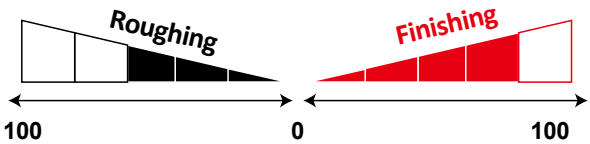
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
1	28,000	480	25,400	360	22,400	290	28,000	480
2	17,300	590	14,200	440	13,800	350	17,300	590
3	12,700	700	10,800	500	10,100	400	12,700	700
4	9,600	750	8,000	520	7,700	410	9,600	750
5	7,600	800	6,600	590	6,100	470	7,600	800
6	6,400	1,000	5,400	700	5,100	560	6,400	1,000
8	4,800	1,000	4,200	690	3,800	550	4,800	1,000
10	3,800	890	3,400	650	3,000	520	3,800	890
12	3,200	830	2,900	500	2,500	400	3,200	830
Depth of cut	 a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D		a_p: 1.5D, a_e: 0.1D	

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	○	●	●	●



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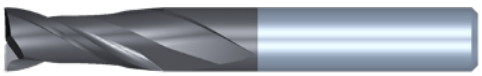
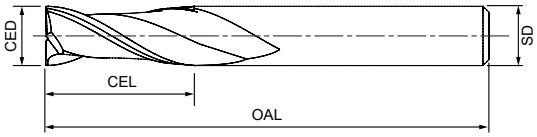
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500E+ - 11302TA

- Square - 2-Flute x 2.5D
- Variable Helix Angle 30°/33°





Best Seller IE Series

2 Flutes | 90° | 30° / 33° | TA | HRC 55 | SMG

CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

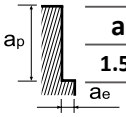
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500E+-11302TA	1	3	4	50	2
	2	5	4	50	
	3	8	4	50	
	4	10	4	50	
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

Code No.	CED	CEL	SD	OAL	Flute
S500E+-11302TA	EU 3	8	6	57	2
	EU 4	11	6	57	
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

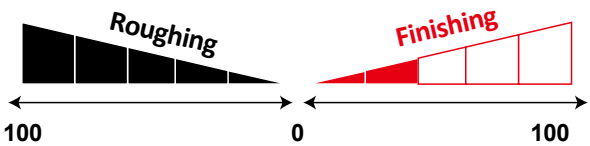
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
1	24,000	280	19,200	130	15,360	90	24,000	280
2	12,000	310	9,600	180	7,680	120	12,000	310
3	8,200	380	6,500	250	5,600	170	8,200	380
4	6,200	390	4,900	270	4,200	180	6,200	390
5	4,600	430	3,600	300	3,300	210	4,600	430
6	4,100	440	3,200	310	2,800	220	4,100	440
8	3,100	440	2,400	310	2,100	220	3,100	440
10	2,400	430	1,900	320	1,700	250	2,400	430
12	2,000	400	1,560	300	1,400	210	2,000	400
16	1,500	350	1,200	240	1,050	170	1,500	350
Depth of cut		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D		a_p: 1.5D, a_e: 0.1D

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



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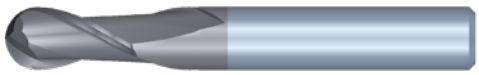
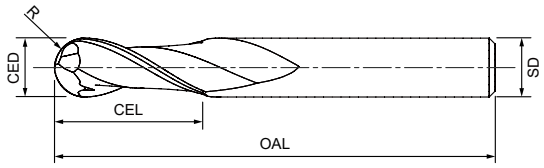
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500E+ - 81302TA

- Ball Nose - 2-Flute x 2.5D
- Variable Helix Angle 30°/33°





CED Tolerance(mm)	
R	±0.02

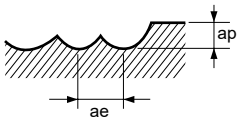
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
S500E+-81302TA	0.5R	3	4	50	2
	1R	5	4	50	
	1.5R	8	4	50	
	2R	10	4	50	
	2.5R	13	6	50	
	3R	15	6	50	
	4R	20	8	60	
	5R	25	10	75	
	6R	30	12	75	
	8R	40	16	100	

Code No.	Radius	CEL	SD	OAL	Flute
S500E+-81302TA	EU 1.5R	8	6	57	2
	EU 2R	11	6	57	
	EU 2.5R	13	6	57	
	EU 3R	13	6	57	
	EU 4R	19	8	63	
	EU 5R	22	10	72	
	EU 6R	26	12	83	

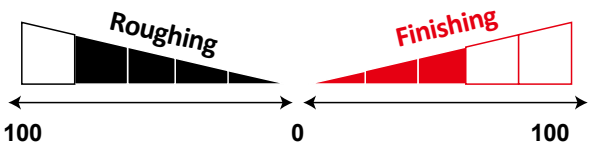
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.05D	a_e: 0.1D
0.5R	30,000	700	28,000	420	24,000	290	30,000	700
1.0R	21,600	870	17,000	520	13,800	350	21,600	870
1.5R	14,000	840	11,700	540	10,100	432	14,000	840
2R	10,800	840	9,000	520	7,700	410	10,800	840
2.5R	8,600	830	7,200	510	6,100	430	8,600	830
3R	7,200	830	5,800	490	5,100	460	7,200	830
4R	5,400	810	5,000	560	3,800	550	5,400	810
5R	4,300	810	3,500	560	3,000	510	4,300	810
6R	3,600	810	2,900	510	2,500	390	3,600	810
8R	2,700	800	2,200	490	1,900	360	2,700	800
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.05D, a_e: 0.1D	

Work Material

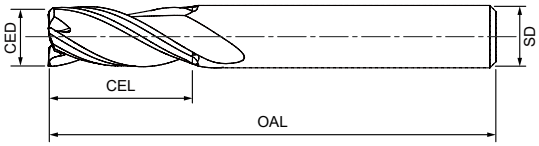
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500E+ - 11303TA

- Square - 3-Flute x 2.5D
- Variable Helix Angle 30° /31° /32°



CED Tolerance(mm)	
1~3	0~-0.014
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

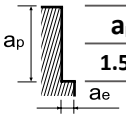
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S500E+-11303TA	1	3	4	50	3
	2	5	4	50	
	3	8	4	50	
	4	10	4	50	
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

Code No.	CED	CEL	SD	OAL	Flute
S500E+-11303TA	EU 3	8	6	57	3
	EU 4	11	6	57	
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

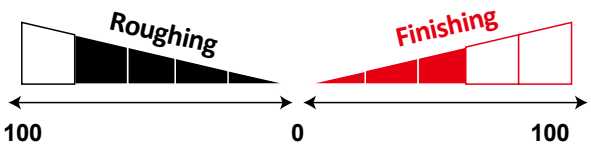
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.05D	a_p: 1.5D	a_e: 0.03D	a_p: 1.5D	a_e: 0.1D
1	28,000	480	25,400	360	22,400	290	28,000	480
2	17,300	590	14,200	440	13,800	350	17,300	590
3	12,700	700	10,800	500	10,100	400	12,700	700
4	9,600	750	8,000	520	7,700	410	9,600	750
5	7,600	800	6,600	590	6,100	470	7,600	800
6	6,400	1,000	5,400	700	5,100	560	6,400	1,000
8	4,800	1,000	4,200	690	3,800	550	4,800	1,000
10	3,800	890	3,400	650	3,000	520	3,800	890
12	3,200	830	2,900	500	2,500	400	3,200	830
16	2,400	620	2,200	400	1,900	320	2,400	620
Depth of cut		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.05D		a_p: 1.5D, a_e: 0.03D		a_p: 1.5D, a_e: 0.1D

Work Material

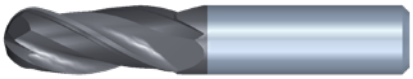
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○

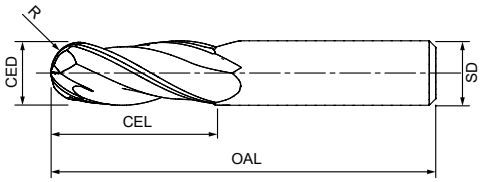


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

S500E+ - 81303TA

- Ball Nose - 3-Flute x 2.5D
- Variable Helix Angle 30° /31° /32°





CED Tolerance(mm)	
R	±0.02

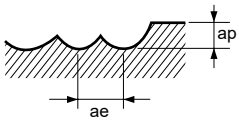
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
S500E+-81303TA	0.5R	3	4	50	3
	1R	5	4	50	
	1.5R	8	4	50	
	2R	10	4	50	
	2.5R	13	6	50	
	3R	15	6	50	
	4R	20	8	60	
	5R	25	10	75	
	6R	30	12	75	
	8R	40	16	100	

Code No.	Radius	CEL	SD	OAL	Flute
S500E+-81303TA	EU 1.5R	8	6	57	3
	EU 2R	11	6	57	
	EU 2.5R	13	6	57	
	EU 3R	13	6	57	
	EU 4R	19	8	63	
	EU 5R	22	10	72	
	EU 6R	26	12	83	

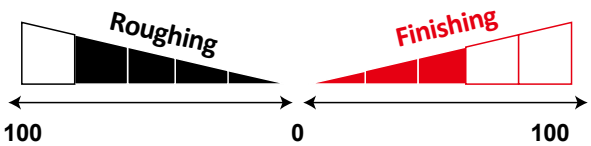
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.05D	a_e: 0.1D
0.5R	33,000	1,100	30,800	650	26,400	450	33,000	1,100
1.0R	23,760	1,360	18,700	800	15,180	560	23,760	1,360
1.5R	15,400	1,320	12,870	930	11,110	540	15,400	1,320
2R	11,880	1,320	9,900	930	8,470	540	11,880	1,320
2.5R	9,460	1,300	7,920	760	6,710	530	9,460	1,300
3R	7,920	1,300	6,380	760	5,610	530	7,920	1,300
4R	5,940	1,280	5,500	750	4,180	525	5,940	1,280
5R	4,730	1,280	3,850	750	3,300	525	4,730	1,280
6R	3,960	1,280	3,190	750	2,750	525	3,960	1,280
8R	2,970	1,270	2,420	740	2,090	520	2,970	1,270
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.05D, a_e: 0.1D	

Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○



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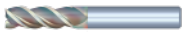
Specialized + Series

Appearance	Code No	Description	Size	Page
Spherical Ball End Mill				
	SS100+-84302TN	2-Flute / Spherical Ball Nose / 2-Flute / Long Shank with Neck	Ø3~Ø16	149
	SS100+84304TN	4-Flute / Spherical Ball End Mill | Long Shank with Neck	Ø5~Ø16	151
Roughing End Mills				
	RF100IE+-11394TN	4-Flute / Fine Pitch Roughing End Mill | Square Uneven Flute / Variable Helix 39°/41°	Ø6~Ø12	153
	RF100+-11304TN	4-Flute / Fine Pitch Roughing End Mill | Helix 30°	Ø5~Ø20	155
	S480+-RF100IE-11354TB	4-Flute / Corse Pitch Roughing End Mill | Square Uneven Flute / Variable Helix 35°/38°	Ø6~Ø20	157
End Mill for Aluminum				
	AC100IER+-11433TS	3-Flute / End Mill for Aluminum | Square Uneven Flute / Variable Helix 43°/44°/45°	Ø3~Ø12	159
	AC100IE+-21433TS	3-Flute / End Mill for Aluminum | Corner Radius Uneven Flute / Variable Helix 43°/44°/45°	Ø3~Ø12	161
	AC100E+-81432TS	2-Flute / End Mill for Aluminum | Ball Nose Variable Helix 43°/46°	Ø3~Ø12	163
	AC100IE+-11453TS	3-Flute / End Mill for Aluminum | Square Uneven Flute / Variable Helix 45°/46°/47°	Ø3~Ø25	165
	AC100IEN+-11453TS	3-Flute / End Mill for Aluminum | Sharp Edge Uneven Flute / Variable Helix 45°/46°/47°	Ø3~Ø12	167
Stainless Steels End Mill				
	CS100IE+-11404Z3	4-Flute / Stainless Steel End Mill | Square Uneven Flute / Variable Helix 40°/43°	Ø4~Ø16	169
	CS100IE+-21404Z3	4-Flute / Stainless Steel End Mill | Corner Radius Uneven Flute / Variable Helix 40°/43°	Ø4~Ø16	171
	CS100IE+-81354Z3	4-Flute / Stainless Steel End Mill | Ball Nose Uneven Flute / Variable Helix 35°/38°	Ø4~Ø16	173
End Mill for Titanium				
	TI100IE+-11454Z3	4-Flute / End Mill for Titanium | Square Uneven Flute / Variable Helix 45°/48°	Ø4~Ø16	175
	TI100IE+-21454Z3	4-Flute / End Mill for Titanium | Corner Radius Uneven Flute / Variable Helix 45°/48°	Ø4~Ø16	177
	TI100IE+-81375Z3	4-Flute / End Mill for Titanium | Ball Nose Uneven Flute / Variable Helix 37°/40°	Ø4~Ø16	179
End Mill for Dental				
	DT100-81302TN	2-Flute / Dental Ball Nose End Mill | 4mm Shank	0.3R~1R	181
	DT100-11302TN	2-Flute / Dental Square End Mill | 4mm Shank	Ø0.5~Ø2	183
	DT100-21304TN	4-Flute / Dental Corner Radius Mill | 4mm Shank	Ø0.5~Ø2	185
	DT100-41302TN	2-Flute / Dental Drill Bits | 3mm Shank	Ø0.5~Ø3	187
Flat Bottom Drill				
	DR360+-41202TN	2-Flute / Flat Bottom Drill Bit | Helix 20°	Ø1~Ø16	189

Appearance	Code No	Description	Size	Page
	DR365+-41202TN	2-Flute / Flat Bottom Drill Bit | Coolant Hole	Ø1~Ø16	191

Drills

	DR300+-41302TN	2-Flute / SMG Carbide -Drill Bit | 140° tip	Ø3~Ø20	193
	DR350+-41302TN	2-Flute / Coolant Hole Drill Bit x 3D | 140° tip	Ø1~Ø16	197
	DR350+-42302TN	2-Flute / Coolant Hole Drill Bit x 5D | 140° tip	Ø1~Ø16	199
	DR100+-40902TN	2-Flute / SMG Carbide -Spot Drill 90°	Ø4~Ø12	201
	DR100+-90120TN	2-Flute / SMG Carbide- Spot Drill 90°/120°	Ø3~Ø10	203
	DR500+-40902TN	2-Flute / SMG Carbide | 90° Drill Point End Mill	Ø4~Ø12	205
	DR200+-40602TN	2-Flute / Countersink Center Drill | 60°	Ø1~Ø5	207

Corner Rounding End Mill

	IR100+-81003TN	3-Flute / Corner Rounding End Mill	Ø4~Ø12	209

Chamfering End Mills

	VF100+-11903TN	3-Flute / Front-Back Chamfer End Mill | Short Type	1.5~12	211
	VF100+-11903TN	Multi-Flute / Front-Back Chamfer End Mill | Long Type	1.5~12	213
	CF400+-40903TN	3-Flute / Carbide-Spiral Chamfer End Mill | 90°	Ø4~Ø12	215
	CF300+-40903TN	3-Flute / Carbide-Chamfer End Mill| 90°	Ø4~Ø12	217
	CF300+-40906TN	6-Flute / SMG Carbide-Chamfer End Mill | V-90°	Ø4~Ø12	219
	CF300+-41202TN	2-Flute / SMG Carbide-Chamfer End Mill | V-60°	Ø4~Ø10	221
	CF300+-40602TN	2-Flute / SMG Carbide-Chamfer End Mill | V-90°	Ø4~Ø10	223
	CF300+-40902TN	2-Flute / SMG Carbide-Chamfer End Mill | V120°	Ø4~Ø10	225

Carbide Hard Cut Drill

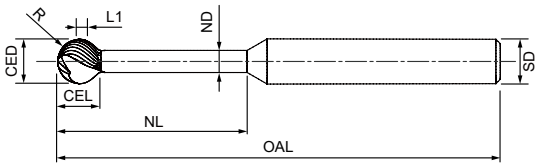
	HCD	Straight Flute / UMG Carbide Hard Cut Drill | V-60°	Ø2~Ø6	227

High Speed Steel Series

	HS400IE+-11304TN	4-Flute / HSS - Fine Pitch Roughing End Mill	Ø6~Ø25	229
	HS400IE+-11305TN	5-Flute / HSS - Rough Pitch Roughing End Mill	Ø8~Ø25	231
	HS400N+-11304TN	4-Flute / HSS - Coarse Pitch Roughing End Mill	Ø8~Ø14	233
	HS100E+-11302TN	2-Flute / HSS - Anti-Vibration Square End Mill	Ø6~Ø20	235
	HS100IE+-11304TN	4-Flute / HSS - Anti-Vibration Square End Mill	Ø6~Ø20	237
	HDR300+-41302TN	2-Flute / HSS Twist Drills | 118° Tip	Ø0.2~Ø20	239
	HRD100+-40902TN	2-Flute / HSS -Spot Drill | V 90°	Ø4~Ø20	243
	HPRD100+-90120TN	2-Flute / HSS -Spot Drill | 120°/ 90° Drill Tip	Ø4~Ø20	245
	HCF100+-40903TN	3-Flute / HSS - 3-Flute Chamfer End Mill | 90°	Ø6.3~Ø25	247
	HCF100I+-40903TN	3-Flute / HSS - Anti-Vibration Chamfer Mill | 90°	Ø4.3~Ø35	249

SS100+ - 84302TN

- Spherical Ball Nose / 2-Flute / Long Shank with Neck
- Helix 30°



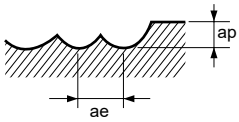
CED Tolerance(mm)	
R	±0.02

h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	NL	ND	L1	Flute
SS100+-84302TN	1.5R	4	6	80	30	2.5	1.5	2
		2.3					-	
	2R	5	6	80	30	3.3	2	
		3.1					-	
	2.5R	6	6	80	43	4.1	2	
		3.9			38		-	
	3R	7	6	100	30	4.7	3	
		4.9			28		-	
	4R	9	8	100	36	6.5	3	
		6.3			33		-	
	5R	11	10	100	43	8.2	3	
		7.9			40		-	
	6R	13	12	120	52	9.8	3	
		9.5			49		-	
	8R	15	16	150	61	13.4	3	
		12.4			59		-	

※ Customized Special sizes, Coating type and Inches are available to order.

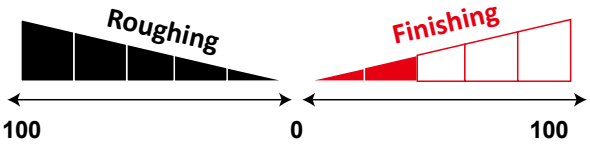
General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.08D	a_e: 0.2D	a_p: 0.05D	a_e: 0.1D	a_p: 0.1D	a_e: 0.2D
1.5R	14,000	840	11,700	540	10,100	430	14,000	840
2R	10,800	840	9,000	520	7,700	410	10,800	840
2.5R	8,600	830	7,200	510	6,100	430	8,600	830
3R	7,200	830	5,800	490	5,100	460	7,200	830
4R	5,400	810	5,000	560	3,800	550	5,400	810
5R	4,300	810	3,500	560	3,000	510	4,300	810
6R	3,600	810	2,900	510	2,500	390	3,600	810
8R	2,700	800	2,200	490	1,900	360	2,700	800
Depth of cut	 a_p: 0.1D, a_e: 0.2D		a_p: 0.08D, a_e: 0.2D		a_p: 0.05D, a_e: 0.1D		a_p: 0.1D, a_e: 0.2D	

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D
1.5R	10,100	430
2R	7,700	410
2.5R	6,100	430
3R	5,100	460
4R	3,800	550
5R	3,000	510
6R	2,500	390
8R	1,900	360
Depth of cut	a_p: 0.05D, a_e: 0.1D	

Work Material

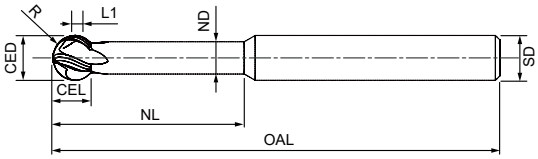
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

SS100+ - 84304TN

- Spherical Ball Nose / 4-Flute / Long Shank with Neck
- Helix 30°



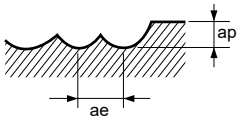
CED Tolerance(mm)	
R	±0.02

h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	NL	ND	L1	Flute
SS100+-84304TN	2.5R	6	6	80	43	4.1	2	4
		3.9			38		-	
	3R	7	6	100	30	4.7	2	
		4.9			28		-	
	4R	9	8	100	36	6.5	3	
		6.3			33		-	
	5R	11	10	100	43	8.2	3	
		7.9			40		-	
	6R	13	12	120	52	9.8	3	
		9.5			49		-	
	8R	15	16	150	61	13.4	3	
		12.4			59		-	

※ Customized Special sizes, Coating type and Inches are available to order.

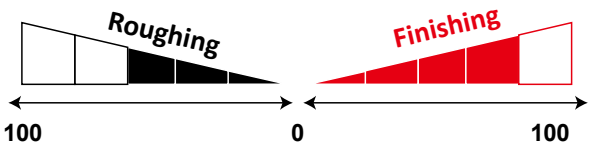
General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D	a_p: 0.03D	a_e: 0.1D	a_p: 0.03D	a_e: 0.05D	a_p: 0.05D	a_e: 0.1D
2.5R	9,000	1,140	8,550	918	6,800	550	9,000	1,140
3R	7,560	1,260	7,155	1,000	5,700	600	7,560	1,260
4R	5,670	1,290	5,355	1,020	7,300	610	5,670	1,290
5R	4,600	1,300	4,320	1,200	3,420	720	4,600	1,300
6R	3,780	1,140	3,600	1,140	2,880	680	3,780	1,140
8R	2,800	860	2,700	918	2,160	550	2,800	860
Depth of cut	 a_p: 0.05D, a_e: 0.1D		a_p: 0.03D, a_e: 0.1D		a_p: 0.03D, a_e: 0.05D		a_p: 0.05D, a_e: 0.1D	

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
R	a_p: 0.03D	a_e: 0.05D
2.5R	6,800	550
3R	5,700	600
4R	7,300	610
5R	3,420	720
6R	2,880	680
8R	2,160	550
Depth of cut	a_p: 0.03D, a_e: 0.05D	

Work Material

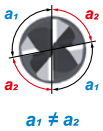
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○

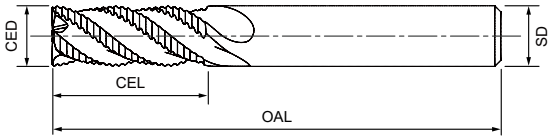


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

RF100IE+ - 11394TN

- Square / 4-Flute / Fine Pitch
- Uneven Flute / Variable Helix 39° /41°





CED Tolerance(mm)	
6~10	0~-0.02
10~12	0~-0.025

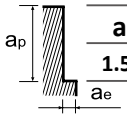
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
RF100IE+-11394TN	6	16	6	50	4
	8	20	8	60	
	10	25	10	75	
	12	30	12	80	

Code No.	CED	CEL	SD	OAL	Flute
RF100IE+-11394TN	EU 6	13	6	57	4
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

Customized Special sizes, Coating type and Inches are available to order.

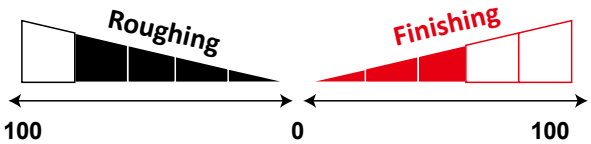
Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.3D	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.3D
6	6,000	680	4,500	380	3,150	220	6,000	680
8	4,500	900	3,400	530	2,380	340	4,500	900
10	3,600	950	2,700	540	1,890	350	3,600	950
12	3,000	960	2,200	510	1,540	320	3,000	960
Depth of cut	 a_p: 1.5D, a_e: 0.3D		a_p: 1.5D, a_e: 0.2D		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.3D	

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D
6	3,150	220
8	2,380	340
10	1,890	350
12	1,540	320
Depth of cut	a_p: 1.5D, a_e: 0.1D	

Work Material

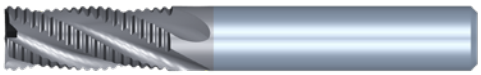
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	●	●	●	○

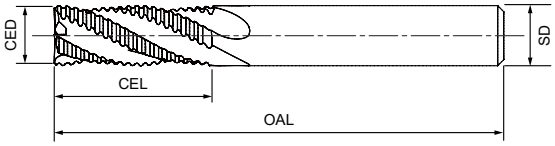


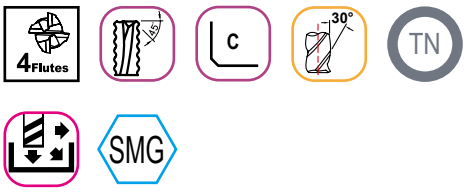
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

RF100+ - 11304TN

- Square / 4-Flute / Fine Pitch
- Helix 30°







CED Tolerance(mm)	
5~6	0~-0.018
6~10	0~-0.02
10~18	0~-0.025
18~20	0~-0.03

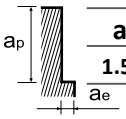
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
RF100+-11304TN	5	13	6	50	4
	6	16	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	80	
	14	35	16	100	
	16	40	16	100	
	18	40	20	100	
	20	45	20	100	

Code No.	CED	CEL	SD	OAL	Flute
RF100+-11304TN	EU 6	13	6	57	4
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

※ Customized Special sizes, Coating type and Inches are available to order.

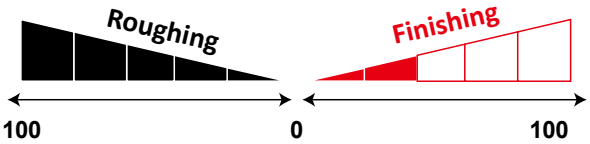
Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.3D	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.3D
5	7,200	430	5,400	210	3,780	130	7,200	430
6	6,000	610	4,500	300	3,150	170	6,000	610
8	4,500	810	3,400	420	2,380	270	4,500	810
10	3,600	850	2,700	430	1,890	280	3,600	850
12	3,000	860	2,200	405	1,540	250	3,000	860
14	2,600	820	1,900	415	1,330	250	2,600	820
16	2,200	820	1,700	410	1,190	245	2,200	820
18	1,900	770	1,500	400	1,050	240	1,900	770
20	1,800	730	1,300	380	910	230	1,800	730
Depth of cut	 a_p: 1.5D, a_e: 0.3D		a_p: 1.5D, a_e: 0.2D		a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.3D	

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D
5	3,780	130
6	3,150	170
8	2,380	270
10	1,890	280
12	1,540	250
14	1,330	250
16	1,190	245
18	1,050	240
20	910	230
Depth of cut	a_p: 1.5D, a_e: 0.1D	

Work Material

P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○

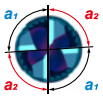


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

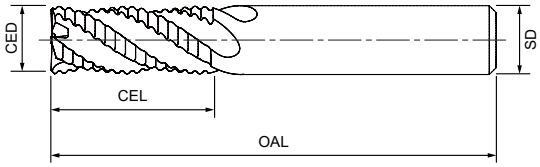
Solid Carbide - Corse Pitch Roughing End Mill

S480+-RF100IE- 11354TB

- Square / 4-Flute / Coarse Pitch
- Uneven Flute / Variable Helix 35° /38°



$a_1 \neq a_2$



Best Seller IE Series

4 Flutes | 35° / 38° | TB | C | SMG

CED Tolerance(mm)	
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

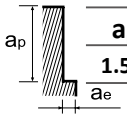
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
S480+-RF100IE-11354TB	6	15	6	45	4
	8	20	8	55	
	10	25	10	65	
	12	30	12	75	
	16	40	16	90	
	20	50	20	100	

Code No.	CED	CEL	SD	OAL	Flute
S480+-RF100IE-11354TB	EU 6	13	6	57	4
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

※ Customized Special sizes, Coating type and Inches are available to order.

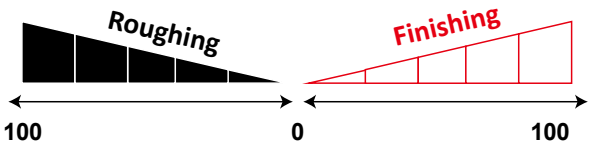
Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.3D	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.3D
6	6,000	680	4,500	380	3,150	220	6,000	680
8	4,500	900	3,400	530	2,380	340	4,500	900
10	3,600	950	2,700	540	1,890	350	3,600	950
12	3,000	960	2,200	510	1,540	320	3,000	960
16	2,200	910	1,700	510	1,190	305	2,200	910
20	1,800	820	1,300	480	910	290	1,800	820
Depth of cut		a_p: 1.5D, a_e: 0.3D	a_p: 1.5D	a_e: 0.2D	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.3D

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D
6	3,150	220
8	2,380	340
10	1,890	350
12	1,540	320
16	1,190	305
20	910	290
Depth of cut	a_p: 1.5D, a_e: 0.1D	

Work Material

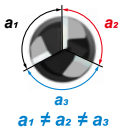
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	●	●	●	○

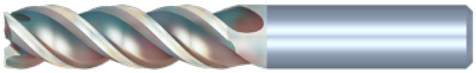


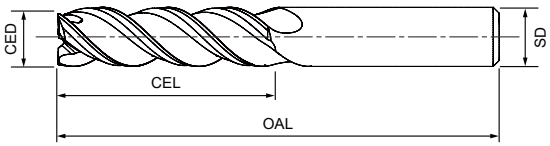
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

AC100IER+ - 11433TS

- Square / 3-Flute x 3D / Heavy Duty Roughing
- Uneven Flute / Variable Helix 43° /44° /45°







Best Seller IE Series

3 Flutes | 90° | Heavy Duty | 45° 44° 43° | TS | SMG

CED Tolerance(mm)	
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

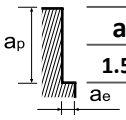
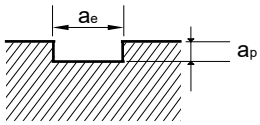
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
AC100IER+-11433TS	3	9	4	50	3
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	

Code No.	CED	CEL	SD	OAL	Flute
AC100IER+-11433TS	EU 3	9	6	57	3
	EU 4	12	6	65	
	EU 5	15	6	65	
	EU 6	18	6	65	
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

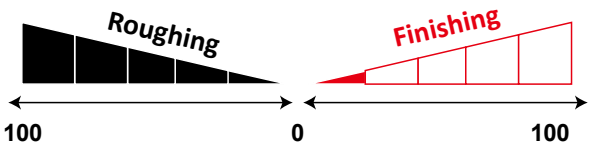
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Aluminium Alloy		Copper Alloy		Aluminium Alloy	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.1D	a_p: 0.5D	a_e: 1.0D
3	15,000	890	8,000	320	15,000	445
4	11,000	730	6,000	350	11,000	440
5	8,900	670	4,800	380	8,900	445
6	7,500	560	4,000	320	7,500	400
8	5,600	550	3,000	360	5,600	420
10	4,500	550	2,400	380	4,500	430
12	3,700	560	2,000	400	3,700	445
Depth of cut	 a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.1D		 a_p: 0.5D, a_e: 1D	

Work Material

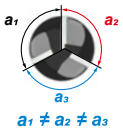
N	
G6	G7
●	●

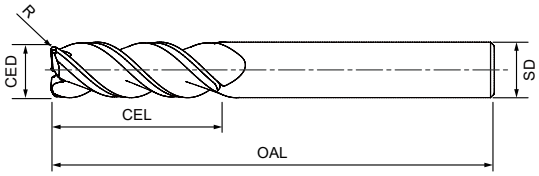


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

AC100IE+ - 21433TS

- Corner Radius / 3-Flute x 3D
- Uneven Flute / Variable Helix 43° /44° /45°





Best Seller IE Series

3 Flutes | R | 45° 44° 43° | TS | SMG

CED Tolerance(mm)	
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

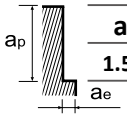
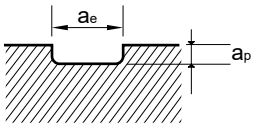
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Radius	Flute
AC100IE+-21433TS	3	9	4	50	0.2R	3
	4	12	4	50	0.2R	
	5	15	6	50	0.2R	
	6	18	6	50	0.2R	
	8	24	8	65	0.2R	
					0.5R	
	10	30	10	75	0.2R	
					0.5R	
	12	36	12	80	0.2R	
					0.5R	

Code No.	CED	CEL	SD	OAL	Radius	Flute
AC100IE+-21433TS	EU 3	9	6	57	0.2R	3
	EU 4	12	6	65	0.2R	
	EU 5	15	6	65	0.2R	
	EU 6	18	6	65	0.2R	
	EU 8	24	8	75	0.2R	
					0.5R	
	EU 10	30	10	80	0.2R	
					0.5R	
	EU 12	36	12	93	0.2R	
					0.5R	

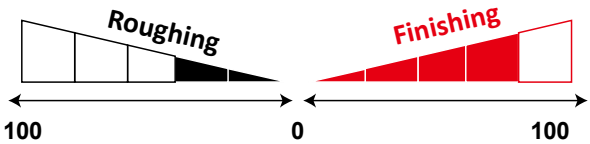
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Aluminium Alloy		Copper Alloy		Aluminium Alloy	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.1D	a_p: 0.5D	a_e: 1.0D
3	15,000	890	8,000	320	15,000	445
4	11,000	730	6,000	350	11,000	440
5	8,900	670	4,800	380	8,900	445
6	7,500	560	4,000	320	7,500	400
8	5,600	550	3,000	360	5,600	420
10	4,500	525	2,400	380	4,500	430
12	3,700	560	2,000	400	3,700	445
Depth of cut	 a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.1D		 a_p: 0.5D, a_e: 1D	

Work Material

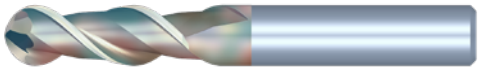
N	
G6	G7
●	●

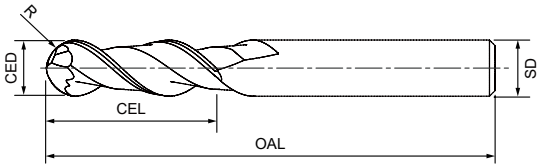


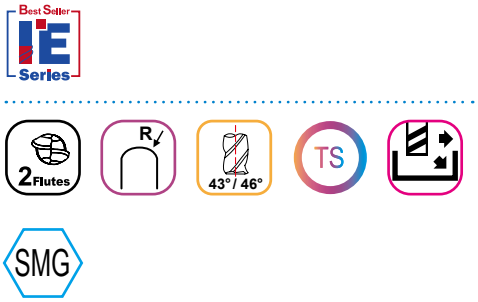
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

AC100E+ - 81432TS

- Ball Nose / 2-Flute x 3D
- Variable Helix 43° /46°







CED Tolerance(mm)	
R	±0.02

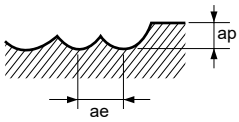
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
AC100E+-81432TS	1.5R	9	4	50	2
	2R	12	4	50	
	2.5R	15	6	50	
	3R	18	6	50	
	4R	24	8	65	
	5R	30	10	75	
	6R	36	12	80	

Code No.	Radius	CEL	SD	OAL	Flute
AC100E+-81432TS	EU 1.5R	9	6	57	2
	EU 2R	12	6	65	
	EU 2.5R	15	6	65	
	EU 3R	18	6	65	
	EU 4R	24	8	75	
	EU 5R	30	10	80	
	EU 6R	36	12	93	

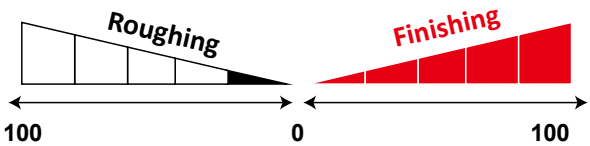
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Aluminium Alloy Side Milling		Copper Alloy Side Milling	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.1D	a_e: 0.2D	a_p: 0.1D	a_e: 0.2D
1.5R	21,000	1,400	18,900	1,120
2R	16,000	1,440	14,400	1,150
2.5R	12,800	1,440	11,520	1,150
3R	10,600	1,440	9,540	1,150
4R	8,000	1,485	7,200	1,190
5R	6,300	1,575	5,670	1,260
6R	5,300	1,485	4,770	1,190
Depth of cut	 a_p: 0.1D, a_e: 0.2D		a_p: 0.1D, a_e: 0.2D	

Work Material

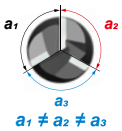
N	
G6	G7
●	●

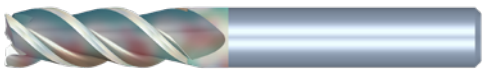


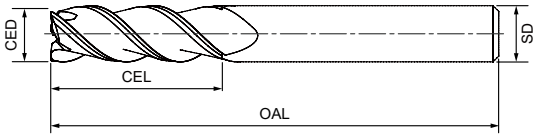
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

AC100IE+ - 11453TS

- Square / 3-Flute x 3D
- Uneven Flute / Variable Helix 45° /46° /47°







CED Tolerance(mm)	
3~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~25	0~-0.03

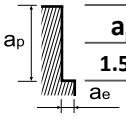
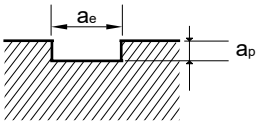
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
AC100IE+-11453TS	3	9	4	50	3
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	
	16	48	16	100	
	20	60	20	125	
	25	75	25	150	

Code No.	CED	CEL	SD	OAL	Flute
AC100IE+-11453TS	EU 3	9	6	57	3
	EU 4	12	6	65	
	EU 5	15	6	65	
	EU 6	18	6	65	
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

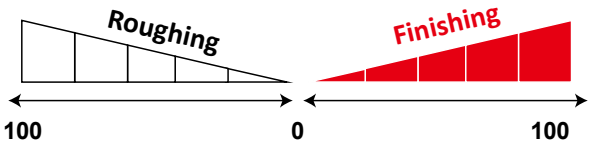
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Aluminium Alloy		Copper Alloy		Aluminium Alloy	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.1D	a_p: 0.5D	a_e: 1.0D
3	13,500	720	8,000	290	13,500	360
4	9,900	580	6,000	315	9,900	290
5	8,010	530	4,800	340	8,010	265
6	6,750	450	4,000	288	6,750	225
8	5,040	460	3,000	325	5,040	230
10	4,050	440	2,400	430	4,050	210
12	3,330	450	2,000	370	3,330	225
16	2,500	450	1,750	360	2,500	225
20	2,000	450	1,400	360	2,000	225
25	1,600	430	1,120	340	1,600	215
Depth of cut	 a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.1D		 a_p: 0.5D, a_e: 1D	

Work Material

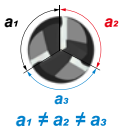
N	
G6	G7
●	●

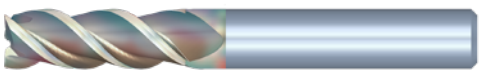


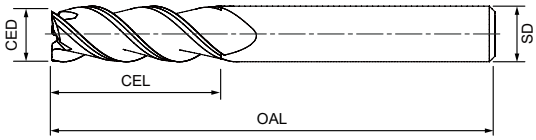
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

AC100IEN+ - 11453TS

- Square / 3-Flute / Sharp Edge
- Uneven Flute / Variable Helix 45° /46° /47°







Best Seller IE Series

3 Flutes | 90° | 45° 44° 43° | TS | SMG

CED Tolerance(mm)	
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

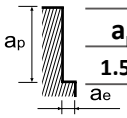
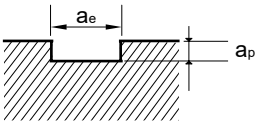
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
AC100IEN+-11453TS	3	9	4	50	3
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	

Code No.	CED	CEL	SD	OAL	Flute
AC100IEN+-11453TS	EU 3	9	6	57	3
	EU 4	12	6	65	
	EU 5	15	6	65	
	EU 6	18	6	65	
	EU 8	24	8	75	
	EU 10	30	10	80	
	EU 12	36	12	93	

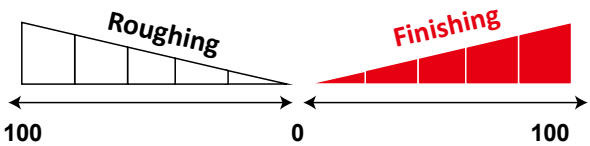
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Aluminium Alloy Side Milling		Copper Alloy Side Milling		Aluminium Alloy Slotting	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D	a_p: 1.5D	a_e: 0.1D	a_p: 0.5D	a_e: 1.0D
3	12,750	480	8,000	260	12,000	355
4	9,350	400	6,000	280	8,800	355
5	7,565	360	4,800	300	7,120	355
6	6,370	420	4,000	320	6,000	320
8	4,760	420	3,000	290	4,480	335
10	3,800	430	2,400	380	3,600	345
12	3,200	440	2,000	420	2,960	355
Depth of cut	 a_p: 1.5D, a_e: 0.1D		a_p: 1.5D, a_e: 0.1D		 a_p: 0.5D, a_e: 1D	

Work Material

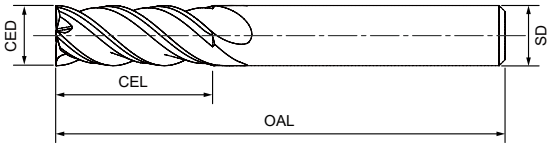
N	
G6	G7
●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

CS100IE+ - 11404Z3

- Square / 4-Flute / 2.5D
- Uneven Flute / Variable Helix 40° /43°



CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

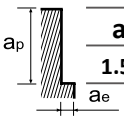
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
CS100IE+-11404Z3	4	10	4	50	4
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

Code No.	CED	CEL	SD	OAL	Flute
CS100IE+-11404Z3	EU 4	11	6	57	4
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

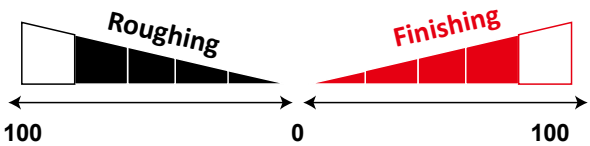
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Stainless Steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D
4	6,930	350
5	5,490	400
6	4,590	470
8	3,420	465
10	2,700	440
12	2,250	470
16	1,710	410
Depth of cut		a_p: 1.5D; a_e: 0.1D

Work Material

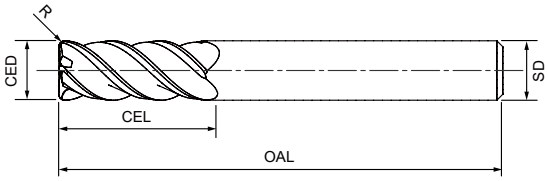
M
G4
●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

CS100IE+ - 21404Z3

- Corner Radius / 4-Flute / 2.5D
- Uneven Flute / Variable Helix 40° /43°



CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

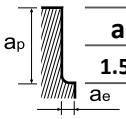
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Radius	Flute
CS100IE+-21404Z3	4	10	4	50	0.2R	4
	5	13	6	50	0.2R	
	6	15	6	50	0.2R	
	8	20	8	60	0.2R	
					0.5R	
	10	25	10	75	0.2R	
					0.5R	
	12	30	12	75	0.2R	
					0.5R	
	16	40	16	100	0.2R	
					0.5R	

Code No.	CED	CEL	SD	OAL	Radius	Flute
CS100IE+-21404Z3	EU 4	11	6	57	0.2R	4
	EU 5	13	6	57	0.2R	
	EU 6	13	6	57	0.2R	
	EU 8	19	8	63	0.2R	
					0.5R	
	EU 10	22	10	72	0.2R	
					0.5R	
	EU 12	26	12	83	0.2R	
					0.5R	

※ Customized Special sizes, Coating type and Inches are available to order.

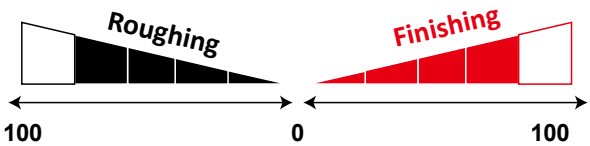
Side Milling

Work Material	Stainless Steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D
4	7,200	380
5	5,760	440
6	4,770	530
8	3,600	510
10	2,790	480
12	2,340	500
16	1,800	440
Depth of cut		

a_p	a_e
1.5D	0.1D

Work Material

M
G4
•

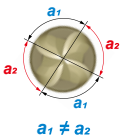


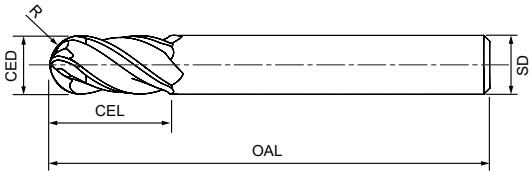
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

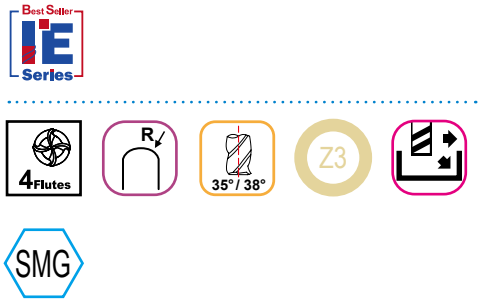
SMG Carbide - Anti-Vibration Stainless Steel Ball End Mill

CS100IE+ - 81354Z3

- Ball Nose / 4-Flute / 2D
- Uneven Flute / Variable Helix 35° /38°







CED Tolerance(mm)	
R	±0.02

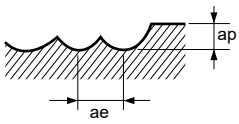
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
CS100IE+-81354Z3	2R	8	4	50	4
	2.5R	10	6	50	
	3R	12	6	50	
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	80	
	8R	32	16	100	

Code No.	Radius	CEL	SD	OAL	Flute
CS100IE+-81354Z3	EU 2R	8	6	57	4
	EU 2.5R	10	6	57	
	EU 3R	12	6	57	
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

※ Customized Special sizes, Coating type and Inches are available to order.

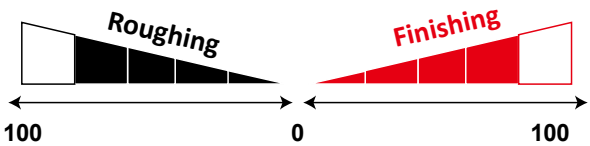
General Milling

Work Material	Stainless Steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.1D
2R	7,600	950
2.5R	6,080	970
3R	5,080	1,150
4R	3,800	1,150
5R	3,040	1,125
6R	2,560	1,200
8R	1,920	1,080
Depth of cut		

a_p	a_e
0.05D	0.1D

Work Material

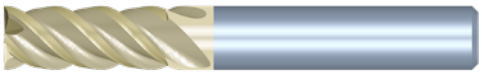
M
G4
●

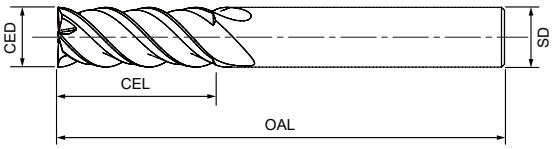


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

TI100IE+ - 11454Z3

- Square / 4-Flute / 2.5D
- Uneven Flute / Variable Helix 45° /48°





CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

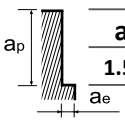
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
T100IE+-11454Z3	4	10	4	50	4
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

Code No.	CED	CEL	SD	OAL	Flute
T100IE+-11454Z3	EU 4	11	6	57	4
	EU 5	13	6	57	
	EU 6	13	6	57	
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

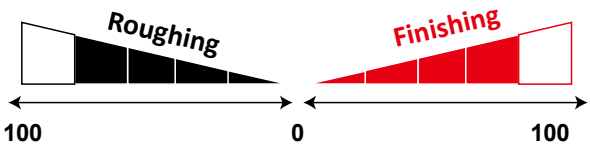
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Titanium	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D
4	5,600	460
5	4,500	530
6	3,700	640
8	2,800	620
10	2,300	600
12	1,900	680
16	1,400	580
Depth of cut		a_p: 1.5D; a_e: 0.1D

Work Material

S		
G11	G12	G12
●	●	●

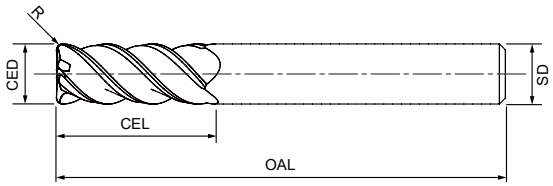


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

SMG Carbide - Anti-Vibration Corner Radius End Mill for Titanium

TI100IE+ - 21454Z3

- Corner Radius / 4-Flute / 2.5D
- Uneven Flute / Variable Helix 45° /48°



Best Seller IE Series

4 Flutes | R | 45° / 48° | Z3 | SMG

CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025

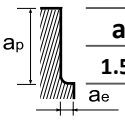
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Radius	Flute
T100IE+-21454Z3	4	10	4	50	0.2R	4
	5	13	6	50	0.2R	
	6	15	6	50	0.2R	
	8	20	8	60	0.2R	
					0.5R	
	10	25	10	75	0.2R	
					0.5R	
	12	30	12	75	0.2R	
					0.5R	
	16	40	16	100	0.2R	
					0.5R	

Code No.	CED	CEL	SD	OAL	Radius	Flute
T100IE+-21454Z3	EU 4	11	6	57	0.2R	4
	EU 5	13	6	57	0.2R	
	EU 6	13	6	57	0.2R	
	EU 8	19	8	63	0.2R	
					0.5R	
	EU 10	22	10	72	0.2R	
					0.5R	
	EU 12	26	12	83	0.2R	
					0.5R	

※ Customized Special sizes, Coating type and Inches are available to order.

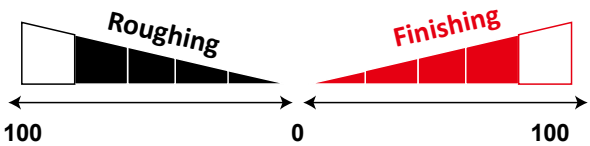
Side Milling

Work Material	Titanium	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.1D
4	5,900	480
5	4,700	550
6	3,900	670
8	2,940	650
10	2,400	630
12	2,000	710
16	1,500	610
Depth of cut		

a_p	a_e
1.5D	0.1D

Work Material

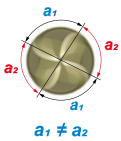
S		
G11	G12	G12
●	●	●

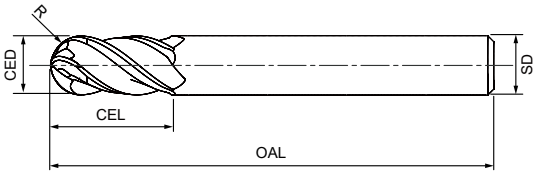


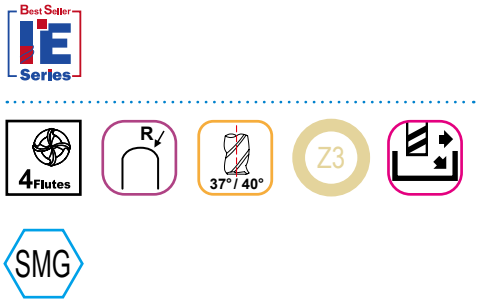
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

TI100IE+ - 81374Z3

- Ball Nose / 4-Flute / 2D
- Uneven Flute / Variable Helix 37° /40°







CED Tolerance(mm)	
R	±0.02

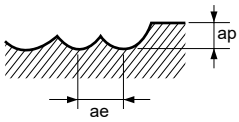
h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	Flute
T100IE+-81374Z3	2R	8	4	50	4
	2.5R	10	6	50	
	3R	12	6	50	
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	80	
	8R	32	16	100	

Code No.	Radius	CEL	SD	OAL	Flute
T100IE+-81374Z3	EU 2R	8	6	57	4
	EU 2.5R	10	6	57	
	EU 3R	12	6	57	
	EU 4R	16	8	63	
	EU 5R	20	10	72	
	EU 6R	24	12	83	

※ Customized Special sizes, Coating type and Inches are available to order.

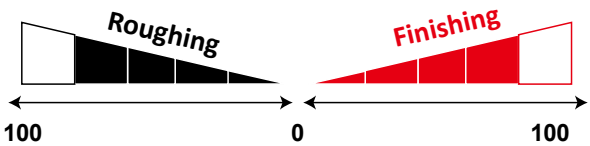
General Milling

Work Material	Titanium	
Cutting Condition	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.3D
2R	7,200	905
2.5R	5,700	920
3R	4,800	1,090
4R	3,600	1,090
5R	2,900	1,070
6R	2,400	1,100
8R	1,800	1,020
Depth of cut		

a_p	a_e
0.05D	0.3D

Work Material

S		
G11	G12	G12
●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
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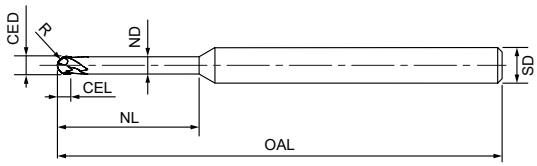
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

DT100- 81302TN

- Ball Nose / 2-Flute / 4mm Shank
- Helix 30°



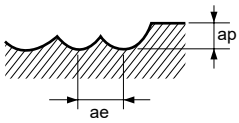
CED Tolerance(mm)	
R	±0.02

h5 (unit : mm)

Code No.	Radius	CEL	SD	OAL	NL	ND	Flute
DT100-81302TN	0.3R	0.5	4	50	6	0.55	2
	0.5R	0.8	4	50	12	0.95	
	1R	1.6	4	50	16	1.95	

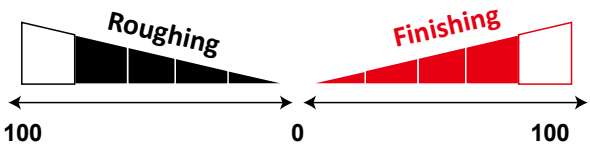
※ Customized Special sizes, Coating type and Inches are available to order.

General Milling

Work Material	Titanium		Cobalt Chromium (Co-Cr) alloys		PMMA / WAX	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	a_p: 0.05D	a_e: 0.2D	a_p: 0.05D	a_e: 0.2D	a_p: 0.05D	a_e: 0.2D
0.3R	29,000	280	28,000	230	29,000	380
0.5R	29,000	590	28,000	560	29,000	700
1R	18,000	730	17,000	680	18,000	870
	(Small Desk Top Machine)		(Small Desk Top Machine)		(Small Desk Top Machine)	
Depth of cut	 a_p: 0.05D, a_e: 0.2D		a_p: 0.05D, a_e: 0.2D		a_p: 0.05D, a_e: 0.2D	

Work Material

G	S		
G8	G11	G12	G12
●	●	●	●



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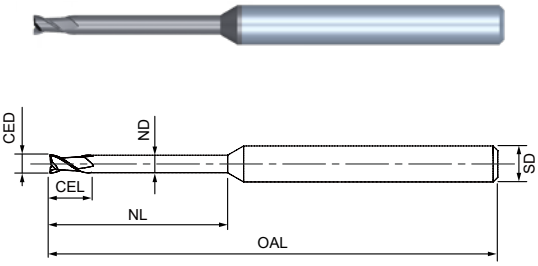
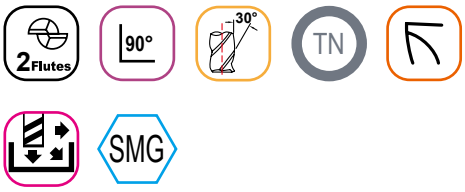
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

DT100- 11302TN

- Square / 2-Flute / 4mm Shank
- Helix 30°





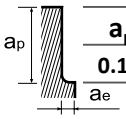
CED Tolerance(mm)	
0.5~2	0~-0.014

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	NL	ND	Flute
DT100-11302TN	0.5	0.7	4	50	4	0.45	2
	1	1.5	4	50	12	0.95	
	1.5	2.3	4	50	16	1.45	
	2	3	4	50	20	1.95	

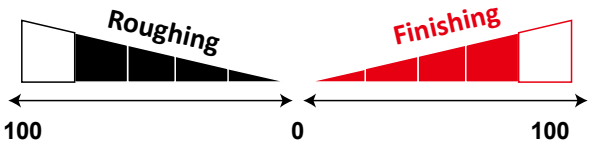
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Titanium		Cobalt Chromium (Co-Cr) alloys	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.1D	a_e: 0.3D	a_p: 0.1D	a_e: 0.3D
0.5	2,200	200	2,000	200
1	11,400	240	10,300	220
1.5	9,900	310	9,000	280
2	7,600	320	7,300	320
	(Small Desk Top Machine)		(Small Desk Top Machine)	
Depth of cut	 a_p: 0.1D; a_e: 0.3D		a_p: 0.1D; a_e: 0.3D	

Work Material

S		
G11	G12	G12
●	●	●



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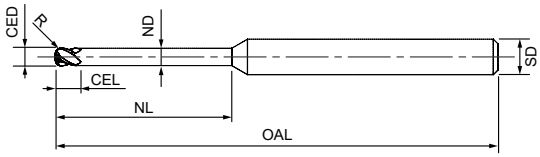
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

DT100- 21304TN

- Corner Radius / 4-Flute / 4mm Shank
- Helix 30°



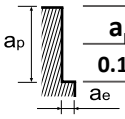
CED Tolerance(mm)	
1~2	0~-0.014

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	NL	ND	Radius	Flute
DT100-21304TN	1	1	4	50	12	0.95	0.2R	4
	1.5	1.5	4	50	16	1.45	0.2R	
	2	2	4	50	20	1.95	0.2R	

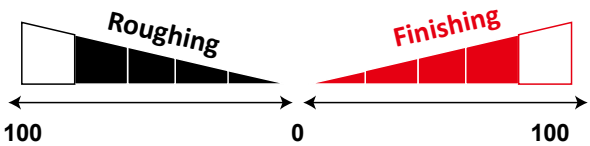
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Titanium		Cobalt Chromium (Co-Cr) alloys	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.1D	a_e: 0.3D	a_p: 0.1D	a_e: 0.3D
1	12,000	390	10,800	350
1.5	10,500	500	9,450	450
2	8,000	530	7,600	520
	(Small Desk Top Machine)		(Small Desk Top Machine)	
Depth of cut		a_p: 0.1D; a_e: 0.3D	a_p: 0.1D; a_e: 0.3D	

Work Material

S		
G11	G12	G12
●	●	●



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
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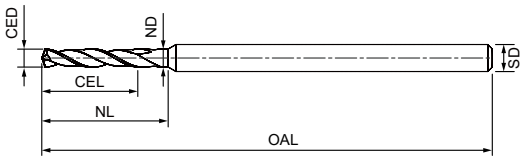
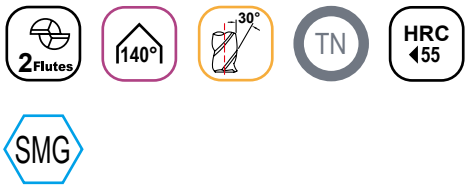
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

DT100- 41302TN

- 2-Flute / 3mm Shank
- Helix 30° / Drill point 140°





CED Tolerance(mm)	
0.5~3	0~-0.01

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	NL	ND	Flute
DT100-41302TN	0.5	5	3	38	6	0.5	2
	1	6	3	38	7	1	
	1.5	9	3	42	11	1.5	
	2	12	3	50	14	2	
	2.5	14	3	50	17	2.5	
	3	16	3	50	20	3	

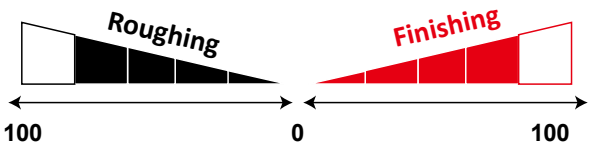
※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	Titanium		Cobalt Chromium (Co-Cr) alloys	
Cutting Condition / CED	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
0.5	8,000	0.016	7,600	0.016
1	4,800	0.026	4,560	0.024
1.5	3,200	0.039	3,040	0.036
2	2,400	0.052	2,280	0.048
2.5	1,900	0.066	1,800	0.061
3	1,600	0.078	1,520	0.072

Work Material

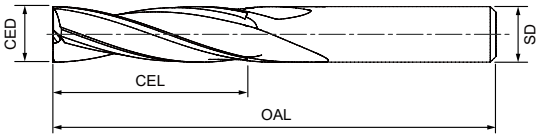
S		
G11	G12	G12
●	●	●



1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

DR360+ - 41202TN

- 2-Flute
- Helix 20° / Flat Drill point



CED Tolerance(mm)	
6~10	-0.009~-0.015
10~16	-0.011~-0.018

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
DR360+-41202TN	6	21	6	60	2
	8	28	8	70	
	10	35	10	80	
	12	42	12	90	
	16	56	16	115	

Code No.	CED	CEL	SD	OAL	Flute
DR360+-41202TN	EU 6	21	6	65	2
	EU 8	28	8	78	
	EU 10	35	10	87	
	EU 12	42	12	100	

※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC	
Cutting Condition / CED	Speed RPM/ min	Feed mm/ rev	Speed RPM/ min	Feed mm/ rev	Speed RPM/ min	Feed mm/ rev
6	4,000	0.06~0.1	3,200	0.06~0.1	2,100	0.05~0.08
8	3,000	0.08~0.13	2,450	0.08~0.13	1,600	0.07~0.11
10	2,400	0.1~0.15	1,900	0.1~0.15	1,250	0.9~0.12
12	2,000	0.13~0.18	1,600	0.13~0.18	1,050	0.11~0.15
16	1,500	0.17~0.22	1,200	0.17~0.22	800	0.15~0.20

Work Material	Gray Cast Iron Malleable cast iron	
Cutting Condition / CED	Speed RPM/ min	Feed mm/ rev
6	3,200	0.06~0.1
8	2,450	0.08~0.13
10	1,900	0.1~0.15
12	1,600	0.13~0.18
16	1,200	0.17~0.22

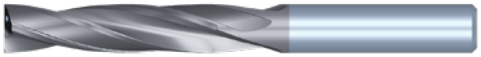
Work Material

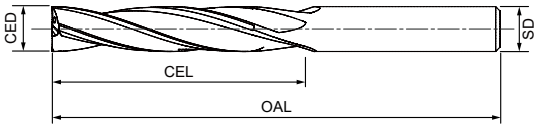
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

DR365+ - 41202TN

- 2-Flute / Coolant Hole x 3D
- Helix 20° / Flat Drill point





CED Tolerance(mm)	
6~10	0~-0.015
10~16	0~-0.018

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
DR365+-41202TN	6	27	6	80	2
	8	36	8	80	
	10	45	10	100	
	12	54	12	120	
	16	72	16	140	

Code No.	CED	CEL	SD	OAL	Flute
DR365+-41202TN	EU 6	26	6	65	2
	EU 8	35	8	78	
	EU 10	43	10	87	
	EU 12	52	12	100	

※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC	
Cutting Condition / CED	Speed RPM/ min	Feed mm/ rev	Speed RPM/ min	Feed mm/ rev	Speed RPM/ min	Feed mm/ rev
6	4,000	0.06~0.1	3,200	0.06~0.1	2,100	0.05~0.08
8	3,000	0.08~0.13	2,450	0.08~0.13	1,600	0.07~0.11
10	2,400	0.1~0.15	1,900	0.1~0.15	1,250	0.9~0.12
12	2,000	0.13~0.18	1,600	0.13~0.18	1,050	0.11~0.15
16	1,500	0.17~0.22	1,200	0.17~0.22	800	0.15~0.20

Work Material	Gray Cast Iron Malleable cast iron	
Cutting Condition / CED	Speed RPM/ min	Feed mm/ rev
6	3,200	0.06~0.1
8	2,450	0.08~0.13
10	1,900	0.1~0.15
12	1,600	0.13~0.18
16	1,200	0.17~0.22

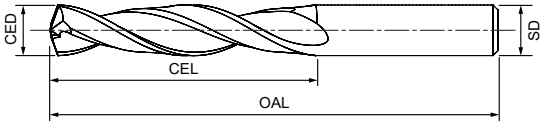
Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	●

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

DR300+ - 41302TN

- 2-Flute / Regular type
- Helix 30° / Drill point 140°



CED Tolerance(mm)	
3~6	-0.008~-0.012
6~10	-0.009~-0.015
10~18	-0.011~-0.018
18~20	-0.013~-0.021

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
DR300+-41302TN	3	25	4	55	2
	3.1	25	4	55	
	3.2	25	4	55	
	3.3	25	4	55	
	3.4	25	4	55	
	3.5	25	4	55	
	3.6	25	4	55	
	3.7	25	4	55	
	3.7	35	4	60	
	3.8	25	4	55	
	3.9	25	4	55	
	4	25	4	55	
	4.1	25	4	55	
	4.2	32	5	62	
	4.3	32	5	62	
	4.4	32	5	62	
	4.5	32	5	62	
	4.6	32	5	62	
	4.7	32	5	62	
	4.8	32	5	62	
	4.9	32	5	62	
	5	32	5	62	
	5.1	32	5	62	
	5.2	36	6	66	

Code No.	CED	CEL	SD	OAL	Flute
DR300+-41302TN	5.3	36	6	66	2
	5.4	36	6	66	
	5.5	36	6	66	
	5.6	36	6	66	
	5.7	36	6	66	
	5.8	36	6	66	
	5.9	36	6	66	
	6	36	6	66	
	6.1	36	6	66	
	6.2	42	7	74	
	6.3	42	7	74	
	6.4	42	7	74	
	6.5	42	7	74	
	6.6	42	7	74	
	6.7	42	7	74	
	6.8	42	7	74	
	6.9	42	7	74	
	7	42	7	74	
	7.1	42	7	74	
	7.2	46	8	79	
	7.3	46	8	79	
	7.4	46	8	79	
	7.5	46	8	79	
	7.6	46	8	79	

※ Customized Special sizes, Coating type and Inches are available to order.

Code No.	CED	CEL	SD	OAL	Flute
DR300+-41302TN	7.7	46	8	79	2
	7.8	46	8	79	
	7.9	46	8	79	
	8	46	8	79	
	8.1	46	8	79	
	8.2	50	9	84	
	8.3	50	9	84	
	8.4	50	9	84	
	8.5	50	9	84	
	8.6	50	9	84	
	8.7	50	9	84	
	8.8	50	9	84	
	8.9	50	9	84	
	9	50	9	84	
	9.1	50	9	84	
	9.2	53	10	89	
	9.3	53	10	89	
	9.4	53	10	89	
	9.5	53	10	89	
	9.6	53	10	89	
	9.7	53	10	89	
	9.8	53	10	89	
	9.9	53	10	89	
	10	53	10	89	
	10.1	53	10	89	
	10.2	55	11	95	
	10.3	55	11	95	
	10.4	55	11	95	
	10.5	55	11	95	
	10.6	55	11	95	
	10.7	55	11	95	
	10.8	55	11	95	
	10.9	55	11	95	
	11	55	11	95	
	11.1	55	11	95	
	11.2	62	12	102	

Code No.	CED	CEL	SD	OAL	Flute
DR300+-41302TN	11.3	62	12	102	2
	11.4	62	12	102	
	11.5	62	12	102	
	11.6	62	12	102	
	11.7	62	12	102	
	11.8	62	12	102	
	11.9	62	12	102	
	12	62	12	102	
	12.1	62	12	102	
	12.2	62	13	102	
	12.3	62	13	102	
	12.4	62	13	102	
	12.5	62	13	102	
	12.6	62	13	102	
	12.7	62	13	102	
	12.8	62	13	102	
	12.9	62	13	102	
	13	62	13	102	
	13.5	64	14	107	
	14	64	14	107	
	14.5	67	15	111	
	15	67	15	111	
	15.5	69	16	115	
	16	69	16	115	
	16.5	71	17	119	
	17	71	17	119	
	17.5	74	18	123	
	18	74	18	123	
	18.5	76	19	127	
	19	76	19	127	
	19.5	80	20	131	
	20	80	20	131	

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
3	8,500	0.05~0.1	6,800	0.05~0.1	4,250	0.04~0.08	6,800	0.05~0.1
4	6,400	0.07~0.14	5,120	0.07~0.14	3,420	0.07~0.12	5,120	0.07~0.14
5	5,100	0.09~0.16	4,080	0.09~0.16	2,760	0.08~0.15	4,080	0.09~0.16
6	4,250	0.11~0.18	3,400	0.11~0.18	2,280	0.09~0.17	3,400	0.11~0.18
7	3,650	0.13~0.2	3,650	0.13~0.2	1,950	0.11~0.19	3,650	0.13~0.2
8	3,200	0.15~0.22	3,000	0.15~0.22	1,740	0.14~0.20	3,000	0.15~0.22
9	2,830	0.16~0.25	2,830	0.16~0.25	1,500	0.15~0.22	2,830	0.16~0.25
10	2,500	0.18~0.28	2,500	0.18~0.28	1,380	0.18~0.25	2,500	0.18~0.28
11	2,300	0.18~0.3	2,300	0.18~0.3	1,250	0.18~0.29	2,300	0.18~0.3
12	2,100	0.19~0.32	1,680	0.19~0.32	1,140	0.19~0.3	1,680	0.19~0.32
13	1,960	0.19~0.33	1,570	0.19~0.33	980	0.19~0.3	1,570	0.19~0.33
14	1,820	0.20~0.34	1,450	0.20~0.34	910	0.20~0.31	1,450	0.20~0.34
15	1,700	0.21~0.35	1,360	0.21~0.35	850	0.21~0.31	1,360	0.21~0.35
16	1,600	0.22~0.35	1,280	0.22~0.35	800	0.22~0.32	1,280	0.22~0.35
17	1,500	0.23~0.36	1,200	0.23~0.36	750	0.22~0.34	1,200	0.23~0.36
18	1,420	0.24~0.37	1,130	0.24~0.37	710	0.23~0.36	1,130	0.24~0.37
19	1,340	0.25~0.39	1,070	0.25~0.39	670	0.24~0.38	1,070	0.25~0.39
20	1,200	0.25~0.4	960	0.25~0.4	600	0.25~0.4	960	0.25~0.4

Work Material

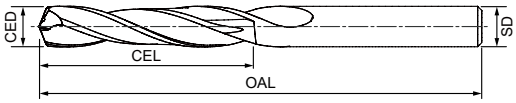
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

Notes

DR350+ - 41302TN

- 2-Flute / 3D / Coolant Hole
- Helix 30° / Drill point 140°



CED Tolerance(mm)	
1~3	-0.006~-0.01
3~6	-0.008~-0.012
6~10	-0.009~-0.015
10~16	-0.011~-0.018

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
DR350+-41302TN	1	6	3	60	2
	2	12	3	65	
	3	18	3	70	
	4	23	4	75	
	5	28	5	80	
	6	31	6	80	
	7	36	7	90	
	8	41	8	90	
	9	46	9	100	
	10	52	10	110	
	11	57	11	115	
	12	62	12	120	
	13	63	13	120	
	14	72	14	130	
	15	78	15	135	
	16	83	16	140	

※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition CED	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)
1	21,000	0.03~0.05	16,800	0.03~0.05	12,000	0.02~0.05	16,800	0.03~0.05
2	12,700	0.04~0.07	10,160	0.04~0.07	6,350	0.03~0.06	10,160	0.04~0.07
3	10,600	0.05~0.1	8,480	0.05~0.1	5,300	0.04~0.08	8,480	0.05~0.1
4	8,000	0.07~0.14	6,400	0.07~0.14	4,000	0.06~0.12	6,400	0.07~0.14
5	6,400	0.09~0.16	5,120	0.09~0.16	3,200	0.08~0.15	5,120	0.09~0.16
6	5,300	0.11~0.18	4,240	0.11~0.18	2,650	0.09~0.17	4,240	0.11~0.18
7	4900	0.13~0.2	3,700	0.13~0.2	2,400	0.11~0.19	3,700	0.13~0.2
8	4,500	0.15~0.22	3,600	0.15~0.22	2,250	0.14~0.20	3,600	0.15~0.22
9	3800	0.16~0.25	2,800	0.16~0.25	1,770	0.15~0.22	2,800	0.16~0.25
10	3,200	0.18~0.28	2,560	0.18~0.28	1,600	0.18~0.25	2,560	0.18~0.28
11	2900	0.18~0.3	2,300	0.18~0.3	1,450	0.18~0.29	2,300	0.18~0.3
12	2,700	0.19~0.32	2,160	0.19~0.32	1,350	0.19~0.3	2,160	0.19~0.32
13	2450	0.19~0.33	1,960	0.19~0.33	1,230	0.19~0.3	1,960	0.19~0.33
14	2270	0.20~0.34	1,820	0.20~0.34	1,140	0.20~0.31	1,820	0.20~0.34
15	2120	0.21~0.35	1,700	0.21~0.35	1,060	0.21~0.31	1,700	0.21~0.35
16	2,000	0.22~0.35	1,600	0.22~0.35	1,000	0.22~0.32	1,600	0.22~0.35

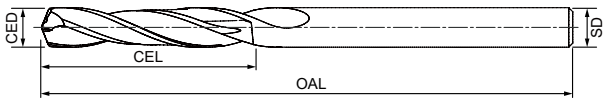
Work Material

P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	●

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

DR350+ - 42302TN

- 2-Flute / 5D / Coolant hole
- Helix 30° / Drill point 140°



CED Tolerance(mm)	
1~3	-0.006~-0.01
3~6	-0.008~-0.012
6~10	-0.009~-0.15
10~16	-0.011~-0.018

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
DR350+-42302TN	1	8	3	60	2
	2	17	3	70	
	3	28	3	75	
	4	36	4	85	
	5	45	5	95	
	6	49	6	100	
	7	57	7	110	
	8	65	8	120	
	9	73	9	125	
	10	82	10	135	
	11	90	11	150	
	12	98	12	160	
	13	106	13	170	
	14	115	14	180	
	15	123	15	185	
	16	130	16	190	

※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition CED	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)
1	21,000	0.03~0.05	16,800	0.03~0.05	12,000	0.02~0.05	16,800	0.03~0.05
2	12,700	0.04~0.07	10,160	0.04~0.07	6,350	0.03~0.06	10,160	0.04~0.07
3	10,600	0.05~0.1	8,480	0.05~0.1	5,300	0.04~0.08	8,480	0.05~0.1
4	8,000	0.07~0.14	6,400	0.07~0.14	4,000	0.06~0.12	6,400	0.07~0.14
5	6,400	0.09~0.16	5,120	0.09~0.16	3,200	0.08~0.15	5,120	0.09~0.16
6	5,300	0.11~0.18	4,240	0.11~0.18	2,650	0.09~0.17	4,240	0.11~0.18
7	4900	0.13~0.2	3,700	0.13~0.2	2,400	0.11~0.19	3,700	0.13~0.2
8	4,500	0.15~0.22	3,600	0.15~0.22	2,250	0.14~0.20	3,600	0.15~0.22
9	3800	0.16~0.25	2,800	0.16~0.25	1,770	0.15~0.22	2,800	0.16~0.25
10	3,200	0.18~0.28	2,560	0.18~0.28	1,600	0.18~0.25	2,560	0.18~0.28
11	2900	0.18~0.3	2,300	0.18~0.3	1,450	0.18~0.29	2,300	0.18~0.3
12	2,700	0.19~0.32	2,160	0.19~0.32	1,350	0.19~0.3	2,160	0.19~0.32
13	2450	0.19~0.33	1,960	0.19~0.33	1,230	0.19~0.3	1,960	0.19~0.33
14	2270	0.20~0.34	1,820	0.20~0.34	1,140	0.20~0.31	1,820	0.20~0.34
15	2120	0.21~0.35	1,700	0.21~0.35	1,060	0.21~0.31	1,700	0.21~0.35
16	2,000	0.22~0.35	1,600	0.22~0.35	1,000	0.22~0.32	1,600	0.22~0.35

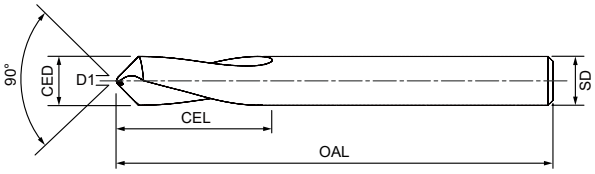
Work Material

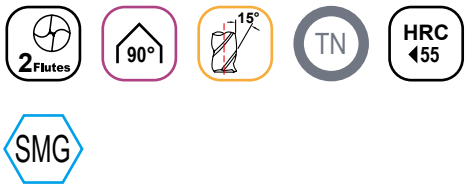
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	●

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

DR100+ - 40902TN

- 2-Flute / Spot Drill 90°
- Helix 15°





CED Tolerance(mm)	
4~6	-0.008~-0.012
6~10	-0.009~-0.015
10~12	-0.011~-0.018

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	D1	Flute
DR100+-40902TN	4	8	4	50	0.4	2
	6	12	6	70	0.6	
	8	16	8	80	0.8	
	10	20	10	90	1	
	12	24	12	110	1.2	

Code No.	CED	CEL	SD	OAL	D1	Flute
DR100+-40902TN	EU 4	12	4	55	0.4	2
	EU 6	16	6	66	0.6	
	EU 8	21	8	79	0.8	
	EU 10	25	10	89	1	
	EU 12	30	12	102	1.2	

※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	MildSteel CarbonSteel		AlloyedSteel 25~35HRC		HardenedSteel 35~45HRC	
Cutting Condition / CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
4	6,400	0.06~0.12	5,120	0.06~0.12	3,420	0.05~0.1
6	4,250	0.08~0.15	3,400	0.08~0.15	2,280	0.07~0.12
8	3,200	0.12~0.18	3,000	0.12~0.18	1,740	0.1~0.15
10	2,500	0.16~0.23	2,500	0.16~0.23	1,380	0.12~0.18
12	2,100	0.18~0.28	1,700	0.18~0.28	1,140	0.15~0.23

Work Material	GrayCastIron Malleablecastiron		Stainless Steel Cast steel	
Cutting Condition / CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
4	5,120	0.06~0.12	3,420	0.05~0.1
6	3,400	0.08~0.15	2,280	0.07~0.12
8	3,000	0.12~0.18	1,740	0.1~0.15
10	2,500	0.16~0.23	1,380	0.12~0.18
12	1,700	0.18~0.28	1,140	0.15~0.23

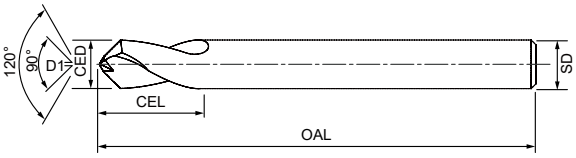
Work Material

P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	●	●	●	○

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

DR100+ - 90120TN

- 2-Flute / Spot Drill 120° /90°
- Helix 20°



CED Tolerance(mm)	
3~6	-0.008~-0.012
6~10	-0.009~-0.015
10~12	-0.011~-0.018

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	D1	Flute
DR100+-90120TN	3	6	3	45	1	2
	4	8	4	50	1.5	
	6	12	6	70	2	
	8	16	8	80	2.5	
	10	20	10	90	3	
	12	24	12	110	4	

Code No.	CED	CEL	SD	OAL	D1	Flute
DR100+-90120TN	EU 4	12	4	55	1.5	2
	EU 6	16	6	66	2	
	EU 8	21	8	79	2.5	
	EU 10	25	10	89	3	
	EU 12	30	12	102	4	

※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC	
Cutting Condition / CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
3	7,700	0.05~0.1	6,100	0.05~0.1	4,700	0.05~0.08
4	6,400	0.06~0.12	5,120	0.06~0.12	3,420	0.06~0.1
6	4,250	0.08~0.15	3,400	0.08~0.15	2,280	0.07~0.12
8	3,200	0.12~0.18	3,000	0.12~0.18	1,740	0.1~0.15
10	2,500	0.16~0.23	2,500	0.16~0.23	1,380	0.12~0.18
12	2,100	0.18~0.28	1,700	0.18~0.28	1,140	0.15~0.23

Work Material	Gray Cast Iron Malleable cast iron		Stainless Steel Cast steel	
Cutting Condition / CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
3	6,100	0.05~0.1	4,700	0.05~0.08
4	5,120	0.06~0.12	3,420	0.06~0.1
6	3,400	0.08~0.15	2,280	0.07~0.12
8	3,000	0.12~0.18	1,740	0.1~0.15
10	2,500	0.16~0.23	1,380	0.12~0.18
12	1,700	0.18~0.28	1,140	0.15~0.23

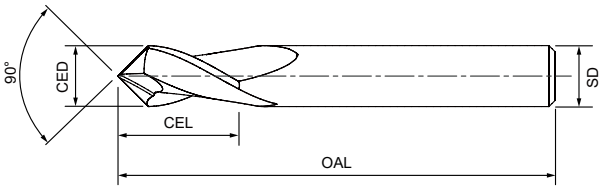
Work Material

P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

DR500+ - 40902TN

- 2-Flute / Drill Point End Mill 90°
- Helix 30°



CED Tolerance(mm)	
4~6	-0.008~-0.012
6~10	-0.009~-0.015
10~12	-0.011~-0.018

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
DR500+-40902TN	4	8	4	50	2
	6	12	6	50	
	8	16	8	60	
	10	20	10	72	
	12	24	12	75	

Code No.	CED	CEL	SD	OAL	Flute
DR500+-40902TN	EU 4	12	4	55	2
	EU 6	16	6	66	
	EU 8	21	8	79	
	EU 10	25	10	89	
	EU 12	30	12	102	

※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC	
Cutting Condition / CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
4	6,400	0.06~0.12	5,120	0.06~0.12	3,420	0.05~0.1
6	4,250	0.08~0.15	3,400	0.08~0.15	2,280	0.07~0.12
8	3,200	0.12~0.18	3,000	0.12~0.18	1,740	0.1~0.15
10	2,500	0.16~0.23	2,500	0.16~0.23	1,380	0.12~0.18
12	2,100	0.18~0.28	1,700	0.18~0.28	1,140	0.15~0.23

Work Material	Gray Cast Iron Malleable cast iron		Stainless Steel Cast steel	
Cutting Condition / CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
4	5,120	0.06~0.12	3,420	0.05~0.1
6	3,400	0.08~0.15	2,280	0.07~0.12
8	3,000	0.12~0.18	1,740	0.1~0.15
10	2,500	0.16~0.23	1,380	0.12~0.18
12	1,700	0.18~0.28	1,140	0.15~0.23

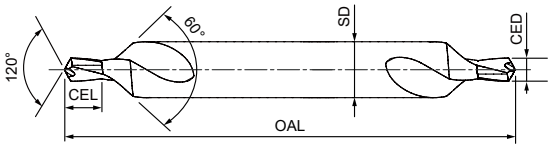
Work Material

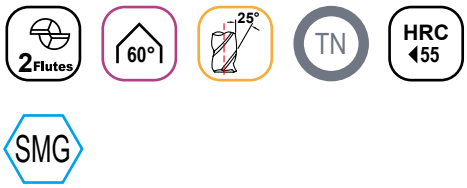
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	●	●	●	○

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

DR200+ - 40602TN

- 2-Flute / 60° Countersink Center Drill
- Helix 25°





CED Tolerance(mm)	
1~3	-0.006~-0.01
3~5	-0.008~-0.012

h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
DR200+-40602TN	1	1.5	3	50	2
	2	3	5	50	
	2.5	3.8	6	50	
	3	4.8	8	60	
	4	6	10	60	
	5	7.5	12	75	

Code No.	CED	CEL	SD	OAL	Flute
DR200+-40602TN	EU 3	4.8	8	50	2
	EU 4	6	10	56	
	EU 5	7.5	12	63	

※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC	
Cutting Condition CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
1	21,000	0.03~0.05	16,800	0.03~0.05	12,000	0.02~0.05
2	12,700	0.04~0.07	10,100	0.04~0.07	6,350	0.03~0.06
2.5	10,200	0.04~0.08	8,200	0.04~0.08	5,100	0.03~0.07
3	8,500	0.05~0.1	6,800	0.05~0.1	4,250	0.05~0.08
4	6,400	0.07~0.14	5,120	0.07~0.14	3,200	0.06~0.12
5	5,100	0.08~0.16	4,080	0.08~0.16	2,550	0.07~0.15

Work Material	Gray Cast Iron Malleable cast iron		Stainless Steel Cast steel	
Cutting Condition CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
1	16,800	0.03~0.05	12,000	0.02~0.05
2	10,100	0.04~0.07	6,350	0.03~0.06
2.5	8,200	0.04~0.08	5,100	0.03~0.07
3	6,800	0.05~0.1	4,250	0.05~0.08
4	5,120	0.07~0.14	3,200	0.06~0.12
5	4,080	0.08~0.16	2,550	0.07~0.15

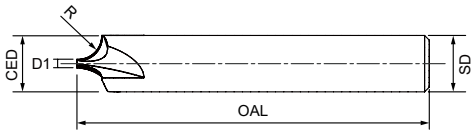
Work Material

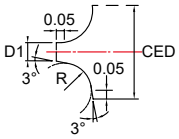
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	●	●	●	○

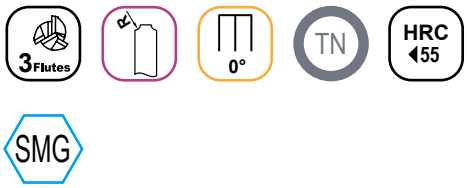
1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

IR100+ - 81003TN

- Corner Rounding / 3-Flute
- Inner Corner Radius







CED Tolerance(mm)	
R	±0.02

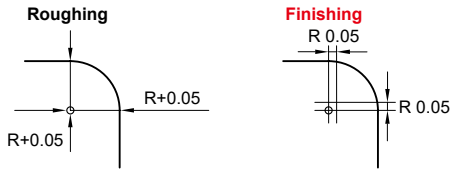
h5 (unit : mm)

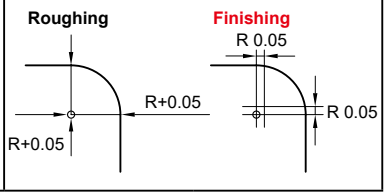
Code No.	Radius	D1	CED	SD	OAL	Flute
IR100+-81003TN	0.5R	1	2.1	4	49	3
	1R	3.9	6	6	59	
	1.5R	2.9	6	6	59	
	2R	1.9	6	6	59	
	2.5R	3	8	8	59	
	3R	2.2	8	8	59	
	3.5R	2.9	10	10	59	
	4R	2.2	10	10	59	
	4.5R	2.9	12	12	75	
	5R	1.8	12	12	75	

Code No.	Radius	D1	CED	SD	OAL	Flute
IR100+-81003TN	EU 1.5	2.9	6	6	58	3
	EU 2R	1.9	6	6	66	
	EU 2.5R	3	8	8	66	
	EU 3R	2.2	8	8	73	
	EU 3.5R	2.9	10	10	75	
	EU 4R	2.2	10	10	75	
	EU 4.5R	2.9	12	12	76	
	EU 5R	1.8	12	12	76	

※ Customized Special sizes, Coating type and Inches are available to order.

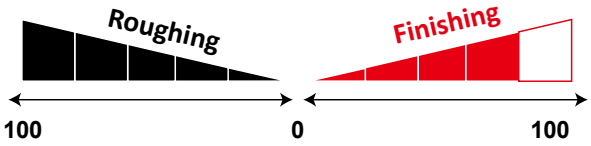
Corner Rounding

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
R	R+0.05		R+0.05		R+0.05		R+0.05	
0.5R	12,500	60	11,250	55	8,400	40	12,500	60
1R	6,200	60	5,580	55	4,400	40	6,200	60
1.5R	3,900	60	3,510	55	2,700	40	3,900	60
2R	3,200	60	2,880	55	2,300	40	3,200	60
2.5R	2,800	60	2,520	55	2,000	40	2,800	60
3R	2,500	60	2,250	55	1,800	40	2,500	60
3.5R	2,000	60	1,800	55	1,400	40	2,000	60
4R	1,850	60	1,665	55	1,300	40	1,850	60
4.5R	1,700	60	1,530	55	1,200	40	1,700	60
5R	1,600	60	1,440	55	1,100	40	1,600	60
Depth of cut								

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
R	R+0.05	
0.5R	8,400	40
1R	4,400	40
1.5R	2,700	40
2R	2,300	40
2.5R	2,000	40
3R	1,800	40
3.5R	1,400	40
4R	1,300	40
4.5R	1,200	40
5R	1,100	40
Depth of cut		

Work Material

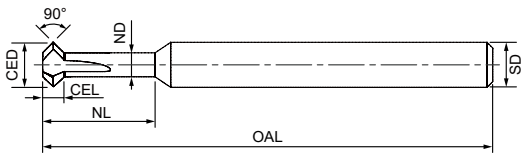
P			M	K	H	
G1	G2	G3	G4	G5	G14	G15
●	●	●	○	○	●	○

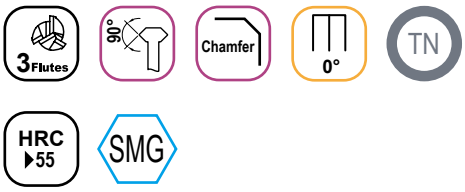


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

VF100+ - 11903TN

- V-Groove / 3-Flute / Short Type
- 45° Chamfering





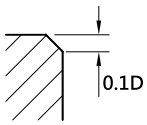
CED Tolerance(mm)	
1.5~3	0~-0.014
3~6	0~-0.018

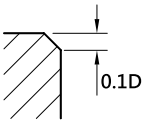
h5 (unit : mm)

Code No.	CED	CEL	SD	OAL	NL	ND	Flute
VF100+-11903TN	1.5	0.63	3	45	4	0.9	3
	2	0.83	3	45	5	1.2	
	2.5	1.03	3	45	6.5	1.5	
	3	1.23	3	45	7.5	1.8	
	3.5	1.5	4	45	8.5	2.1	
	4	1.7	4	53	10	2.4	
	4.5	2.1	5	53	11.5	2.5	
	5	2.3	5	53	12.5	2.8	
	5.5	2.5	6	53	13.5	3.1	
	6	2.9	6	53	15	3.2	

※ Customized Special sizes, Coating type and Inches are available to order.

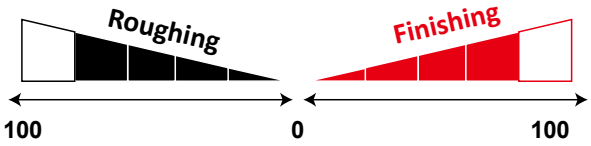
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	C45°: 0.1D		C45°: 0.1D		C45°: 0.1D		C45°: 0.1D	
1.5	17,000	480	13,600	330	11,900	240	17,000	480
2	12,700	500	10,160	350	8,890	250	12,700	500
2.5	10,100	550	8,080	385	7,070	275	10,100	550
3	8,500	700	6,800	490	5,950	350	8,500	700
3.5	7,200	620	5,040	430	4,410	310	7,200	620
4	6,400	700	5,120	490	4,480	350	6,400	700
4.5	5,600	680	4,480	470	3,920	340	5,600	680
5	5,100	650	4,080	455	3,570	325	5,100	650
5.5	4,600	600	3,680	420	3,220	300	4,600	600
6	4,250	600	3,400	480	2,900	300	4,250	600
Depth of cut								

Work Material	Hardened Steel 35~45HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	C45°: 0.1D	
1.5	11,900	240
2	8,890	250
2.5	7,070	275
3	5,950	350
3.5	4,410	310
4	4,480	350
4.5	3,920	340
5	3,570	325
5.5	3,220	300
6	2,900	300
Depth of cut		

Work Material

P			M	K	H	
G1	G2	G3	G4	G5	G14	G15
●	●	●	○	○	●	○

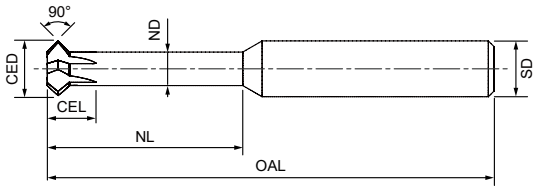


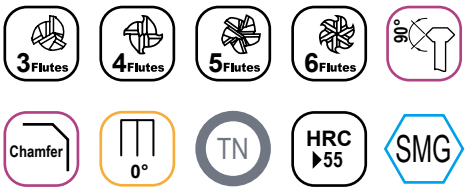
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

SMG Carbide - Front-Back Chamfer End Mill

VF100+ - 11903TN / 11904TN / 11905TN / 11906TN

- V-Groove / Multi-Flute / Long Type
- 45° Chamfering





CED Tolerance(mm)	
3~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

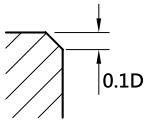
h5 (unit : mm)

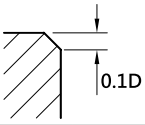
Code No.	CED	CEL	SD	OAL	NL	ND	Flute
VF100+-11903TN	3	1.23	3	45	12	1.8	3
	3.4	1.5	4	53	14	2	
	3.5	1.5	4	53	14	2.1	
	4	1.7	4	53	16	2.4	
	4.4	2.1	5	53	18	2.4	
	4.5	2.1	5	53	18	2.5	
	5	2.3	5	53	20	2.8	
	5.5	2.5	6	65	22	3.1	
	6	2.9	6	65	24	3.2	
VF100+-11904TN	8	3.4	8	65	28	4.8	4
VF100+-11905TN	10	3.8	10	80	35	6.4	5
VF100+-11906TN	12	4.4	12	80	42	7.8	6

Code No.	CED	CEL	SD	OAL	NL	ND	Flute
VF100+-11903TN	EU 3	1.23	4	75	12	1.8	3
	EU 4	1.7	4	75	15	2.4	
	EU 5	2.3	5	75	18	2.8	
	EU 6	2.9	6	100	18	3.2	
VF100+-11904TN	EU 8	3.4	8	100	24	4.8	4
VF100+-11905TN	EU 10	3.8	10	100	33	6.4	5
VF100+-11906TN	EU 12	4.4	12	100	42	7.8	6

※ Customized Special sizes, Coating type and Inches are available to order.

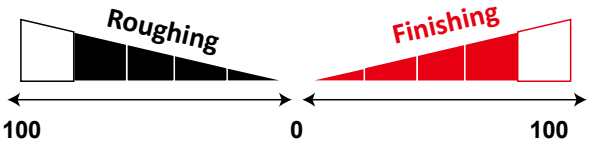
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	C45°: 0.1D		C45°: 0.1D		C45°: 0.1D		C45°: 0.1D	
3	8,500	700	6,800	490	5,950	350	8,500	700
3.4	7,500	700	6,000	490	5,250	350	7,500	700
3.5	7,200	620	5,760	430	5,040	310	7,200	620
4	6,400	700	5,120	490	4,480	350	6,400	700
4.4	5,800	700	4,640	490	4,060	350	5,800	700
4.5	5,600	680	4,480	470	3,920	340	5,600	680
5	5,100	650	4,080	455	3,570	325	5,100	650
5.5	4,600	600	3,680	420	3,220	300	4,600	600
6	4,250	600	3,400	480	2,900	300	4,250	600
8	3,200	530	2,560	424	2,240	265	3,200	530
10	2,500	620	2,000	496	1,750	310	2,500	620
12	2,100	800	1,680	640	1,470	400	2,100	800
Depth of cut								

Work Material	Hardened Steel 35~45HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	C45°: 0.1D	
3	5,950	350
3.4	5,250	350
3.5	5,040	310
4	4,480	350
4.4	4,060	350
4.5	3,920	340
5	3,570	325
5.5	3,220	300
6	2,900	300
8	2,240	265
10	1,750	310
12	1,470	400
Depth of cut		

Work Material

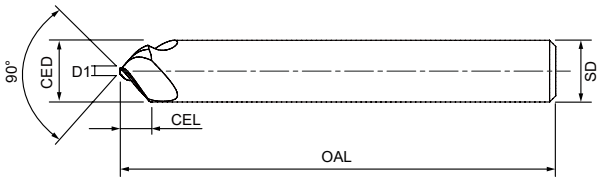
P			M	K	H	
G1	G2	G3	G4	G5	G14	G15
●	●	●	○	○	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

CF400+ - 40903TN

- 3-Flute / 90° Spiral Flute
- 45° Chamfering



CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~12	0~-0.025

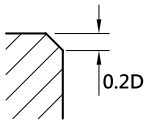
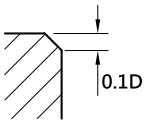
h5 (unit : mm)

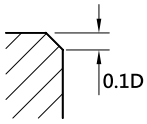
Code No.	CED	CEL	SD	OAL	D1	Flute
CF400+-40903TN	4	1.8	4	50	0.4	3
	6	2.7	6	50	0.6	
	8	3.6	8	60	0.8	
	10	4.5	10	72	1	
	12	5.4	12	75	1.2	

Code No.	CED	CEL	SD	OAL	D1	Flute
CF400+-40903TN	EU 4	1.8	4	50	0.4	3
	EU 6	2.7	6	57	0.6	
	EU 8	3.6	8	63	0.8	
	EU 10	4.5	10	72	1	
	EU 12	5.4	12	83	1.2	

※ Customized Special sizes, Coating type and Inches are available to order.

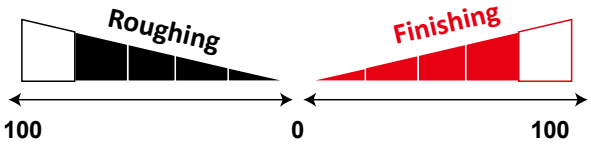
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.2D		a_p: 0.1D		a_p: 0.1D		a_p: 0.1D	
4	6,400	280	5,100	200	3,200	105	5,100	200
6	4,250	330	3,400	230	2,100	115	3,400	230
8	3,200	340	2,560	265	1,600	130	2,560	265
10	2,550	275	2,040	270	1,250	120	2,040	270
12	2,100	230	1,680	280	1,050	105	1,680	280
Depth of cut								

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.1D	
4	3,200	105
6	2,100	115
8	1,600	130
10	1,250	120
12	1,050	105
Depth of cut		

Work Material

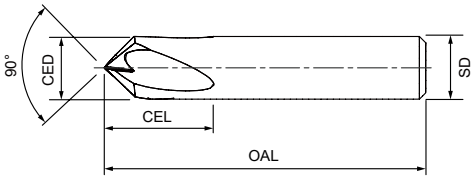
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

CF300+ - 40903TN

- 3-Flute / V 90°
- 45° Chamfering



CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02

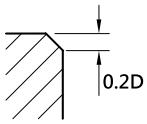
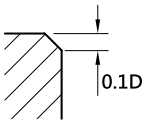
h5 (unit : mm)

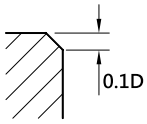
Code No.	CED	CEL	SD	OAL	Flute
CF300+-40903TN	4	10	4	45	3
	6	10	6	45	
	8	15	8	52	
	10	15	10	52	

Code No.	CED	CEL	SD	OAL	Flute
CF300+-40903TN	EU 4	10	4	50	3
	EU 6	10	6	57	
	EU 8	15	8	63	
	EU 10	15	10	72	

※ Customized Special sizes, Coating type and Inches are available to order.

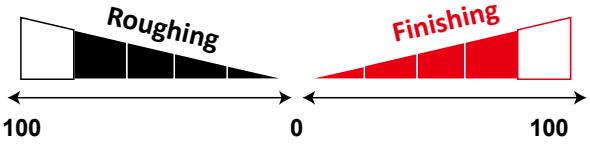
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.2D		a_p: 0.1D		a_p: 0.1D		a_p: 0.1D	
4	6,080	250	4,900	180	2,400	95	4,900	180
6	4,100	300	3,200	210	2,000	105	3,200	210
8	3,100	310	2,400	240	2,500	120	2,400	240
10	2,400	250	2,000	245	1,200	110	2,000	245
Depth of cut								

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.1D	
4	2,400	95
6	2,000	105
8	2,500	120
10	1,200	110
Depth of cut		

Work Material

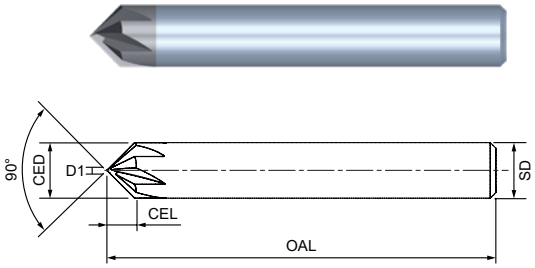
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

CF300+ - 40906TN

- 6-Flute / V 90°
- 45° Chamfering



CED Tolerance(mm)	
4~6	0~-0.018
6`10	0~-0.02
10~12	0~-0.025

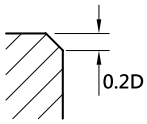
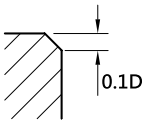
h5 (unit : mm)

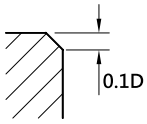
Code No.	CED	CEL	SD	OAL	D1	Flute
CF300+-40906TN	4	1.9	4	50	0.2	6
	6	2.5	6	50	0.2	
	8	3.5	8	60	0.2	
	10	4	10	70	0.2	
	12	5	12	75	0.2	

Code No.	CED	CEL	SD	OAL	D1	Flute
CF300+-40906TN	EU 4	1.9	4	50	0.2	6
	EU 6	2.5	6	57	0.2	
	EU 8	3.5	8	63	0.2	
	EU 10	4	10	72	0.2	
	EU 12	5	12	83	0.2	

※ Customized Special sizes, Coating type and Inches are available to order.

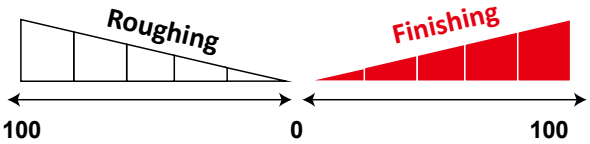
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.2D		a_p: 0.1D		a_p: 0.1D		a_p: 0.1D	
4	6,400	550	5,100	300	3,200	145	5,100	300
6	4,250	600	3,400	315	2,100	155	3,400	315
8	3,200	600	2,560	330	1,600	170	2,560	330
10	2,550	500	2,040	360	1,250	170	2,040	360
12	2,100	400	1,680	375	1,050	180	1,680	375
Depth of cut								

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.1D	
4	3,200	145
6	2,100	155
8	1,600	170
10	1,250	170
12	1,050	180
Depth of cut		

Work Material

P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○



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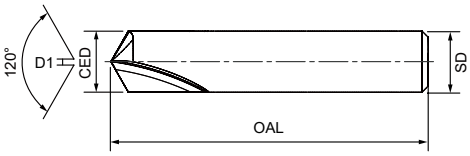
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

CF300+ - 41202TN

- 2-Flute / V 120°
- 30° Chamfering



CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02

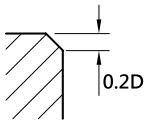
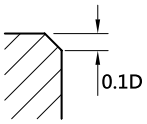
h5 (unit : mm)

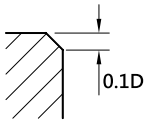
Code No.	CED	SD	OAL	D1	Flute
CF300+-41202TN	4	4	45	0.2	2
	6	6	45	0.2	
	8	8	52	0.2	
	10	10	52	0.2	

Code No.	CED	SD	OAL	D1	Flute
CF300+-41202TN	EU 4	4	50	0.2	2
	EU 6	6	57	0.2	
	EU 8	8	63	0.2	
	EU 10	10	72	0.2	

※ Customized Special sizes, Coating type and Inches are available to order.

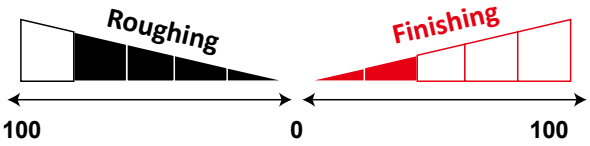
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.2D		a_p: 0.1D		a_p: 0.1D		a_p: 0.1D	
4	7,680	330	6,120	220	3,840	120	6,120	220
6	5,100	360	4,080	250	2,520	130	4,080	250
8	3,840	370	3,100	280	1,920	140	3,100	280
10	3,060	300	2,500	300	1,500	140	2,500	300
Depth of cut								

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.1D	
4	3,840	120
6	2,520	130
8	1,920	140
10	1,500	140
Depth of cut		

Work Material

P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○



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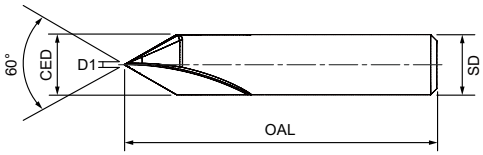
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

CF300+ - 40602TN

- 2-Flute / V 60°
- 60° Chamfering



CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02

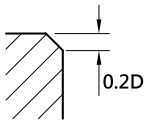
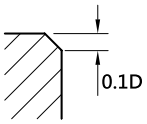
h5 (unit : mm)

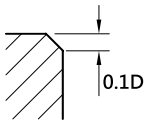
Code No.	CED	SD	OAL	D1	Flute
CF300+-40602TN	4	4	45	0.2	2
	6	6	45	0.2	
	8	8	52	0.2	
	10	10	52	0.2	

Code No.	CED	SD	OAL	D1	Flute
CF300+-40602TN	EU 4	4	50	0.2	2
	EU 6	6	57	0.2	
	EU 8	8	63	0.2	
	EU 10	10	72	0.2	

※ Customized Special sizes, Coating type and Inches are available to order.

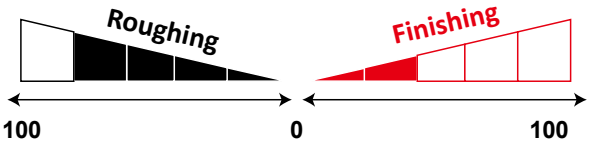
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.2D		a_p: 0.1D		a_p: 0.1D		a_p: 0.1D	
4	7,680	330	6,120	220	3,840	120	6,120	220
6	5,100	360	4,080	250	2,520	130	4,080	250
8	3,840	370	3,100	280	1,920	140	3,100	280
10	3,060	300	2,500	300	1,500	140	2,500	300
Depth of cut								

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.1D	
4	3,840	120
6	2,520	130
8	1,920	140
10	1,500	140
Depth of cut		

Work Material

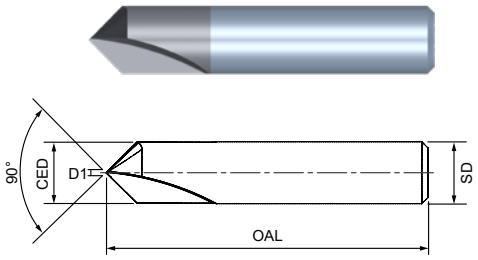
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

CF300+ - 40902TN

- 2-Flute / V 90°
- 45° Chamfering



CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02

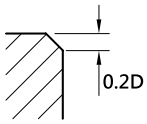
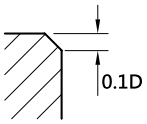
h5 (unit : mm)

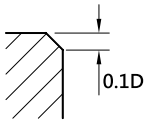
Code No.	CED	SD	OAL	D1	Flute
CF300+-40902TN	4	4	45	0.2	2
	6	6	45	0.2	
	8	8	52	0.2	
	10	10	52	0.2	

Code No.	CED	SD	OAL	D1	Flute
CF300+-40902TN	EU 4	4	50	0.2	2
	EU 6	6	57	0.2	
	EU 8	8	63	0.2	
	EU 10	10	72	0.2	

※ Customized Special sizes, Coating type and Inches are available to order.

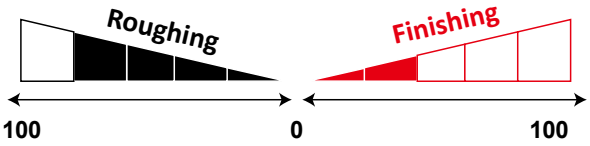
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.2D		a_p: 0.1D		a_p: 0.1D		a_p: 0.1D	
4	7,680	330	6,120	220	3,840	120	6,120	220
6	5,100	360	4,080	250	2,520	130	4,080	250
8	3,840	370	3,100	280	1,920	140	3,100	280
10	3,060	300	2,500	300	1,500	140	2,500	300
Depth of cut								

Work Material	Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.1D	
4	3,840	120
6	2,520	130
8	1,920	140
10	1,500	140
Depth of cut		

Work Material

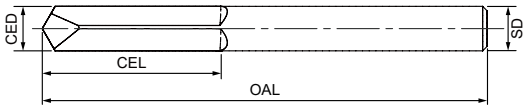
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

HCD+

- V 60° Drill Point / Hard Cut Drill
- For Broken Tap Removal



0° HRC ▶60 UMG

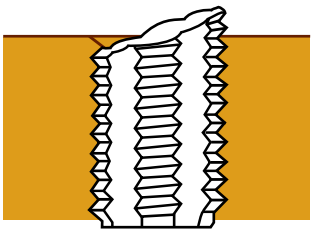
CED Tolerance(mm)	
2~3	0~-0.014
3~6	0~-0.018

h5 (unit : mm)

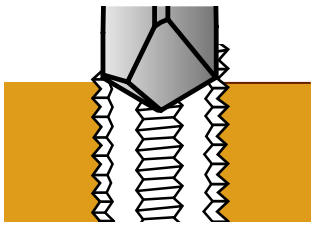
Code No.	CED	CEL	SD	OAL
Hard Cut Drill+	2	10	2	30
	3	14	3	40
	4	18	4	45
	5	20	5	50
	6	28	6	60

※ Customised Special sizes, Coating type and Inches are available to order.

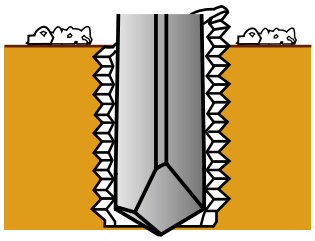
Instruction of removing broken taps/drill bit by hard cut drill.



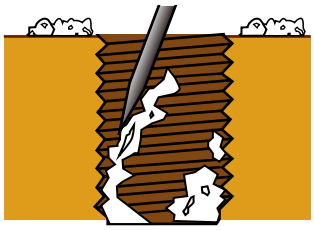
Remove or grind the taps/drill to create a flat surface as possible



Place the HCD drill with the correct size in the centre of the broken tap



Drill the tap remover through the end and applying cutting fluids all the times



Clean and remove the remaining chip by scriber

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	Manual Feed		Manual Feed		Manual Feed		Manual Feed	
2	3,000	Manual Feed	2,500	Manual Feed	2,000	Manual Feed	1,500	Manual Feed
3	3,000	Manual Feed	2,500	Manual Feed	2,000	Manual Feed	1,500	Manual Feed
4	3,000	Manual Feed	2,500	Manual Feed	2,000	Manual Feed	1,500	Manual Feed
5	3,000	Manual Feed	2,500	Manual Feed	2,000	Manual Feed	1,500	Manual Feed
6	3,000	Manual Feed	2,500	Manual Feed	2,000	Manual Feed	1,500	Manual Feed

Work Material	Gray Cast Iron Malleable cast iron		Stainless Steel Cast steel	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	Manual Feed		Manual Feed	
2	2,500	Manual Feed	1,500	Manual Feed
3	2,500	Manual Feed	1,500	Manual Feed
4	2,500	Manual Feed	1,500	Manual Feed
5	2,500	Manual Feed	1,500	Manual Feed
6	2,500	Manual Feed	1,500	Manual Feed

Work Material

P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○

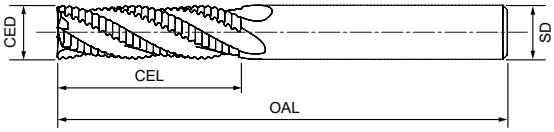
1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

HSS - Fine Pitch Roughing Square End Mill

HS400IE+ - 11304TN

- Square / 4-Flute Fine Pitch Roughing
- Uneven Flute / Variable Helix 30° /33°

$a_1 \neq a_2$



CED Tolerance(mm)	
6~10	0~-0.02
10~18	0~-0.025
18~25	0~-0.03

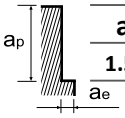
h6 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
HS400IE+-11304TN	6	20	6	60	4
	7	20	10	70	
	8	25	10	75	
	9	30	10	75	
	10	35	10	85	
	12	40	12	100	
	14	40	12	100	
	16	50	16	110	
	18	50	16	110	
	20	60	20	125	
	22	45	20	110	
	25	50	25	120	

Code No.	CED	CEL	SD	OAL	Flute
HS400IE+-11304TN	EU 6	19	6	63	4
	EU 8	28	10	72	
	EU 10	34	10	84	
	EU 12	40	12	97	

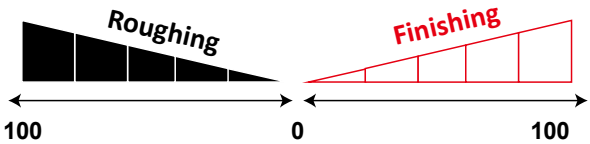
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Mild Steel Carbon Steel		Alloyed Steel ~30HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.5D	a_p: 1.5D	a_e: 0.3D	a_p: 1.5D	a_e: 0.3D
6	2,400	185	1,920	130	1,920	130
7	2,080	185	1,600	130	1,600	130
8	1,800	185	1,440	130	1,440	130
9	1,600	190	1,280	130	1,280	130
10	1,400	205	1,120	145	1,120	145
12	1,200	215	960	150	960	150
14	1,020	230	820	160	820	160
16	900	255	725	180	725	180
18	800	265	640	185	640	185
20	720	265	590	185	590	185
22	650	250	520	175	520	175
25	550	220	440	155	440	155
Depth of cut	 a_p: 1.5D, a_e: 0.5D		a_p: 1.5D, a_e: 0.3D		a_p: 1.5D, a_e: 0.3D	

Work Material

P		K
G1	G2	G5
●	○	○

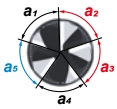


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

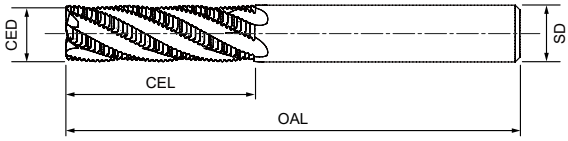
HSS - Fine Pitch Roughing Square End Mill

HS400IE+ - 11305TN

- Square / 5-Flute Rough Pitch Roughing
- Uneven Flute / Variable Helix 30° /33°



$a_1 \neq a_2 \neq a_3 \neq a_4 \neq a_5$



Best Seller IE Series

5 Flutes | 45° | C | 30°/33° | TN | HSS

CED Tolerance(mm)	
8~10	0~-0.02
10~18	0~-0.025
18~25	0~-0.03

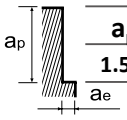
h6 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
HS400IE+-11305TN	8	25	10	75	5
	10	35	10	85	
	12	40	12	100	
	16	50	16	110	
	18	50	16	110	
	20	60	20	125	
	25	50	25	120	

Code No.	CED	CEL	SD	OAL	Flute
HS400IE+-11305TN	EU 8	28	10	72	5
	EU 10	34	10	84	
	EU 12	40	12	97	

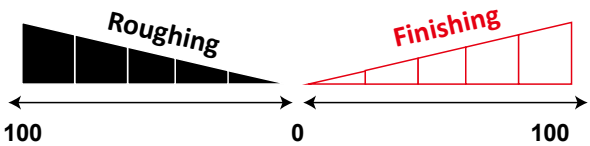
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Mild Steel Carbon Steel		Alloyed Steel ~30HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.5D	a_p: 1.5D	a_e: 0.3D	a_p: 1.5D	a_e: 0.3D
8	1,800	185	1,440	130	1,440	130
10	1,400	205	1,120	144	1,120	144
12	1,200	215	960	151	960	151
16	900	255	725	179	725	179
18	800	265	640	186	640	186
20	720	265	590	186	590	186
25	550	220	440	154	440	154
Depth of cut	 a_p: 1.5D, a_e: 0.5D		a_p: 1.5D, a_e: 0.3D		a_p: 1.5D, a_e: 0.3D	

Work Material

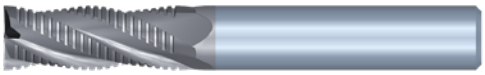
P		K
G1	G2	G5
●	○	○

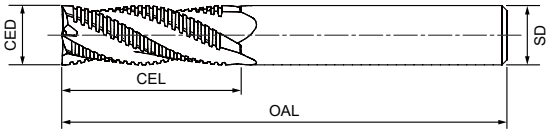


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

HS400N+ - 11304TN

- Square / 4-Flute / Coarse Pitch Roughing / Sharp Edge
- Helix 30°





CED Tolerance(mm)	
8~10	0~-0.02
10~14	0~-0.025

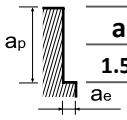
h6 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
HS400N+-11304TN	8	22	10	65	4
	10	28	12	75	
	11	35	12	80	
	12	35	12	80	
	12.5	36	16	90	
	14	42	16	90	

Code No.	CED	CEL	SD	OAL	Flute
HS400N+-11304TN	EU 8	28	10	72	4
	EU 10	34	10	84	
	EU 12	40	12	97	

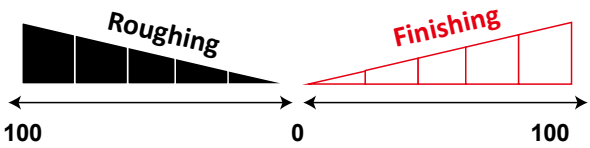
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Mild Steel Carbon Steel		Alloyed Steel ~30HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.5D	a_p: 1.5D	a_e: 0.3D	a_p: 1.5D	a_e: 0.3D
8	1,800	185	1,440	130	1,440	130
10	1,450	190	1,200	130	1,200	130
11	1,300	205	1,120	145	1,120	145
12	1,200	215	960	150	960	150
12.5	1,160	215	940	150	940	150
14	1,020	230	820	160	820	160
Depth of cut	 a_p: 1.5D, a_e: 0.5D		a_p: 1.5D, a_e: 0.3D		a_p: 1.5D, a_e: 0.3D	

Work Material

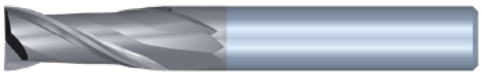
P		K
G1	G2	G5
●	○	○

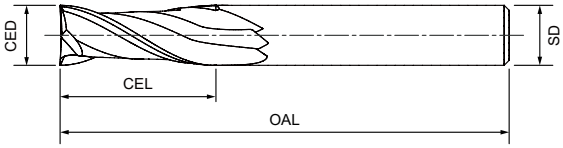


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

HS100E+ - 11302TN

- Square / 2-Flute
- Variable Helix 30° /33°





CED Tolerance(mm)	
6~10	0~-0.02
10~18	0~-0.025
18~20	0~-0.03

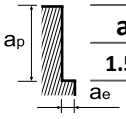
h6 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
HS100E+-11302TN	6	15	8	65	2
	7	20	10	75	
	8	20	10	75	
	9	25	10	80	
	10	25	10	80	
	12	30	12	90	
	14	35	12	95	
	16	40	16	105	
	18	40	16	105	
	20	45	20	115	

Code No.	CED	CEL	SD	OAL	Flute
HS100E+-11302TN	EU 6	13	6	57	2
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

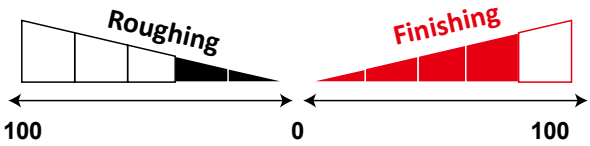
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Mild Steel Carbon Steel		Alloyed Steel ~30HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.5D	a_p: 1.5D	a_e: 0.3D	a_p: 1.5D	a_e: 0.3D
6	2,160	150	1,720	105	1,720	105
7	1,870	150	1,440	105	1,440	105
8	1,620	150	1,300	105	1,300	105
9	1,440	155	1,150	105	1,150	105
10	1,260	165	1,000	115	1,000	115
12	1,080	170	860	120	860	120
14	920	180	740	130	740	130
16	815	190	650	140	650	140
18	725	200	670	150	670	150
20	650	200	530	150	530	150
Depth of cut	 a_p: 1.5D, a_e: 0.5D		a_p: 1.5D, a_e: 0.3D		a_p: 1.5D, a_e: 0.3D	

Work Material

P		K
G1	G2	G5
●	○	○

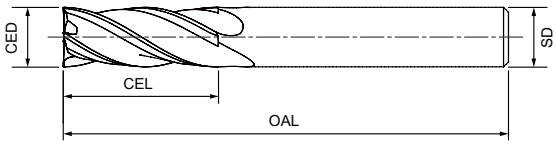


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

HS100IE+ - 11304TN

- Square / 4-Flute
- Uneven Flute / Variable Helix 30° /33°

$a_1 \neq a_2$



Best Seller IE Series

4 Flutes | 90° | 30° / 33° | TN

HRC ▸40 | HSS

CED Tolerance(mm)	
6~10	0~-0.02
10~18	0~-0.025
18~20	0~-0.03

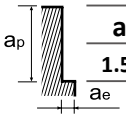
h6 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
HS100IE+-11304TN	6	15	8	65	4
	7	20	10	75	
	8	20	10	75	
	9	25	10	80	
	10	25	10	80	
	12	30	12	90	
	14	35	12	95	
	16	40	16	105	
	18	40	16	105	
	20	45	20	115	

Code No.	CED	CEL	SD	OAL	Flute
HS100IE+-11304TN	EU 6	13	6	57	4
	EU 8	19	8	63	
	EU 10	22	10	72	
	EU 12	26	12	83	

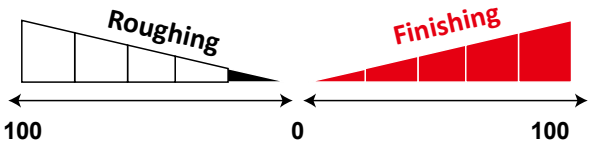
※ Customized Special sizes, Coating type and Inches are available to order.

Side Milling

Work Material	Mild Steel Carbon Steel		Alloyed Steel ~30HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 1.5D	a_e: 0.5D	a_p: 1.5D	a_e: 0.3D	a_p: 1.5D	a_e: 0.3D
6	2,160	165	1,700	120	1,700	120
7	1,870	165	1,440	120	1,440	120
8	1,620	165	1,300	120	1,300	120
9	1,440	170	1,150	120	1,150	120
10	1,260	185	1,000	129	1,000	129
12	1,080	195	860	135	860	135
14	920	210	740	145	740	145
16	815	230	650	160	650	160
18	725	240	570	165	570	165
20	650	240	530	165	530	165
Depth of cut		a_p: 1.5D, a_e: 0.5D		a_p: 1.5D, a_e: 0.5D		a_p: 1.5D, a_e: 0.3D

Work Material

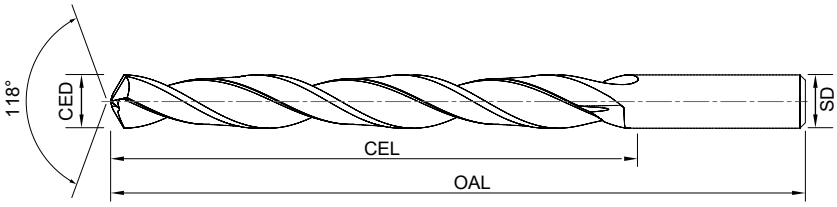
P		K
G1	G2	G5
●	○	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

HDR300+ - 41302TN

- HSS - Twist Drills / 2-Flute / Straight Shank
- Helix 30° / Drill Point 118°



h6 (unit : mm)

Code No.	CED	CEL	SD	OAL	Flute
HDR300+-41302TN	0.2	3	0.2	19	2
	0.3	3.5	0.3	20	
	0.4	5.5	0.4	24	
	0.5	7.5	0.5	27	
	0.6	8.5	0.6	30	
	0.7	10	0.7	32	
	0.8	11	0.8	34	
	0.9	13	0.9	36	
	1.0	18	1.0	40	
	1.1	20	1.1	42	
	1.2	20	1.2	42	
	1.3	22	1.3	45	
	1.4	23	1.4	48	
	1.5	23	1.5	48	
	1.6	25	1.6	50	
	1.7	25	1.7	50	
	1.8	28	1.8	52	
	1.9	28	1.9	52	
	2.0	29	2.0	55	
	2.1	29	2.1	55	
	2.2	33	2.2	58	
	2.3	33	2.3	58	
	2.4	35	2.4	61	
	2.5	35	2.5	61	
	2.6	37	2.6	64	
	2.7	37	2.7	64	
	2.8	39	2.8	67	
	2.9	42	2.9	71	

Code No.	CED	CEL	SD	OAL	Flute
HDR300+-41302TN	3.0	42	3.0	71	2
	3.1	42	3.1	71	
	3.2	42	3.2	71	
	3.3	45	3.3	73	
	3.4	45	3.4	73	
	3.5	45	3.5	73	
	3.6	48	3.6	76	
	3.7	48	3.7	76	
	3.8	48	3.8	76	
	3.9	51	3.9	79	
	4.0	54	4.0	83	
	4.1	54	4.1	83	
	4.2	54	4.2	83	
	4.3	54	4.3	83	
	4.4	56	4.4	86	
	4.5	56	4.5	86	
	4.6	56	4.6	86	
	4.7	59	4.7	89	
	4.8	59	4.8	89	
	4.9	62	4.9	92	
	5.0	62	5.0	92	
	5.1	62	5.1	92	
	5.2	64	5.2	95	
	5.3	64	5.3	95	
	5.4	64	5.4	95	
	5.5	64	5.5	95	
	5.6	67	5.6	98	
	5.7	67	5.7	98	

※ Customised Special sizes, Coating type and Inches are available to order.

Code No.	CED	CEL	SD	OAL	Flute
HDR300+-41302TN	5.8	67	5.8	98	2
	5.9	67	5.9	98	
	6.0	70	6.0	102	
	6.1	70	6.1	102	
	6.2	70	6.2	102	
	6.3	70	6.3	102	
	6.4	73	6.4	105	
	6.5	73	6.5	105	
	6.6	73	6.6	105	
	6.7	73	6.7	105	
	6.8	73	6.8	105	
	6.9	73	6.9	105	
	7.0	73	7.0	105	
	7.1	75	7.1	108	
	7.2	75	7.2	108	
	7.3	75	7.3	108	
	7.4	78	7.4	111	
	7.5	78	7.5	111	
	7.6	78	7.6	111	
	7.7	81	7.7	114	
	7.8	81	7.8	114	
	7.9	81	7.9	114	
	8.0	81	8.0	114	
	8.1	84	8.1	117	
	8.2	84	8.2	117	
	8.3	84	8.3	117	
	8.4	87	8.4	121	
	8.5	87	8.5	121	
	8.6	87	8.6	121	
	8.7	87	8.7	121	
	8.8	89	8.8	124	
	8.9	89	8.9	124	
	9.0	89	9.0	124	
	9.1	89	9.1	124	
	9.2	92	9.2	127	
	9.3	92	9.3	127	
	9.4	92	9.4	127	
	9.5	92	9.5	127	
	9.6	95	9.6	130	
	9.7	95	9.7	130	
	9.8	95	9.8	130	
	9.9	95	9.9	130	
	10.0	95	10.0	130	
	10.1	98	10.1	133	

Code No.	CED	CEL	SD	OAL	Flute
HDR300+-41302TN	10.2	98	10.2	133	2
	10.3	98	10.3	133	
	10.4	98	10.4	133	
	10.5	100	10.5	137	
	10.6	100	10.6	137	
	10.7	100	10.7	137	
	10.8	103	10.8	140	
	10.9	103	10.9	140	
	11.0	103	11.0	140	
	11.1	103	11.1	140	
	11.2	106	11.2	143	
	11.3	106	11.3	143	
	11.4	106	11.4	143	
	11.5	106	11.5	143	
	11.6	109	11.6	146	
	11.7	109	11.7	146	
	11.8	109	11.8	146	
	11.9	109	11.9	146	
	12.0	111	12.0	149	
	12.1	111	12.1	149	
	12.2	111	12.2	149	
	12.3	111	12.3	149	
	12.4	114	12.4	152	
	12.5	114	12.5	152	
	12.6	114	12.6	152	
	12.7	114	12.7	152	
	12.8	114	12.8	152	
	12.9	114	12.9	152	
	13.0	114	13.0	152	
	13.5	108	13.5	160	
	14.0	108	14.0	160	
	14.5	114	14.5	169	
	15.0	114	15.0	169	
	15.5	120	15.5	178	
	16.0	120	16.0	178	
	16.5	125	16.5	184	
	17.0	125	17.0	184	
	17.5	130	17.5	191	
	18.0	130	18.0	191	
	18.5	135	18.5	198	
	19.0	135	19.0	198	
	19.5	140	19.5	205	
	20.0	140	20.0	205	

Drilling

Work Material	Mild Steel Low Carbon Steel		Alloyed Steel 20~30HRC		Gray Cast Iron Malleable cast iron	
Cutting Condition CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
0.2	23,000	0.002~0.004	18,400	0.002~0.003	23,000	0.002~0.004
0.6	8,000	0.006~0.013	6,400	0.005~0.01	8,000	0.006~0.013
1	4,800	0.01~0.02	3,800	0.009~0.17	4,800	0.01~0.02
2	2,900	0.02~0.04	2,300	0.017~0.34	2,900	0.02~0.04
3	2,100	0.036~0.07	1,700	0.03~0.06	2,100	0.036~0.07
4	1,590	0.04~0.08	1,270	0.04~0.08	1,590	0.04~0.08
5	1,300	0.05~0.1	1,000	0.05~0.09	1,300	0.05~0.1
6	1,060	0.06~0.12	835	0.05~0.11	1,060	0.06~0.12
7	910	0.07~0.14	720	0.06~0.12	910	0.07~0.14
8	800	0.08~0.15	640	0.06~0.13	800	0.08~0.15
9	710	0.08~0.17	570	0.07~0.14	710	0.08~0.17
10	640	0.09~0.17	510	0.07~0.15	640	0.09~0.17
11	580	0.09~0.18	465	0.08~0.16	580	0.09~0.18
12	530	0.09~0.19	420	0.08~0.16	530	0.09~0.19
13	490	0.1~0.2	390	0.09~0.17	490	0.1~0.2
14	455	0.11~0.21	365	0.09~0.18	455	0.11~0.21
15	425	0.11~0.22	340	0.09~0.19	425	0.11~0.22
16	400	0.12~0.23	320	0.1~0.2	400	0.12~0.23
17	375	0.12~0.23	300	0.1~0.21	375	0.12~0.23
18	355	0.12~0.24	280	0.11~0.21	355	0.12~0.24
19	335	0.12~0.25	265	0.11~0.22	335	0.12~0.25
20	320	0.13~0.26	250	0.11~0.22	320	0.13~0.26

Work Material

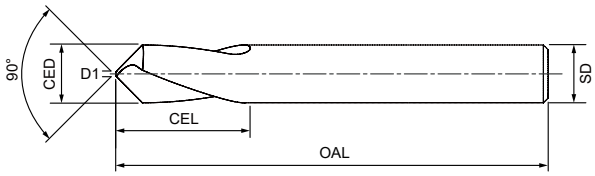
P			K
G1	G2	G3	G5
●	●	●	●

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

Notes

HRD100+ - 40902TN

- 2-Flute / V 90° / Spot Drill
- 45° Chamfering



CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

h6 (unit : mm)

Code No.	CED	CEL	SD	OAL	D1	Flute
HRD100+-40902TN	4	8	4	50	0.4	2
	5	10	5	60	0.5	
	6	12	6	70	0.6	
	8	16	8	80	0.8	
	10	20	10	90	1	
	12	24	12	110	1.2	
	16	32	16	120	1.6	
	20	40	20	120	2	

Code No.	CED	CEL	SD	OAL	D1	Flute
HRD100+-40902TN	EU 4	12	4	55	0.4	2
	EU 6	16	6	66	0.6	
	EU 8	21	8	79	0.8	
	EU 10	25	10	89	1.0	
	EU 12	30	12	102	1.2	

※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	Mild Steel		Carbon Steel		Alloyed Steel		Gray Cast Iron Malleable cast iron	
Cutting Condition / CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed mm/ min
4	2,700	0.03~0.06	2,700	0.03~0.06	2,230	0.02~0.05	3,100	120
5	2,300	0.04~0.08	2,300	0.04~0.08	1,780	0.03~0.06	2,500	120
6	1,900	0.05~0.1	1,900	0.05~0.1	1,490	0.04~0.8	2,090	110
8	1,500	0.06~0.12	1,500	0.06~0.12	1,110	0.05~0.1	1,600	115
10	1,200	0.07~0.15	1,200	0.07~0.15	890	0.06~0.12	1,260	115
12	980	0.08~0.18	980	0.08~0.18	740	0.07~0.15	1,050	115
16	750	0.1~0.2	750	0.1~0.2	560	0.09~0.18	795	100
20	600	0.13~0.25	600	0.13~0.25	450	0.11~0.22	635	95

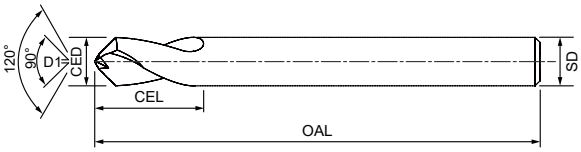
Work Material

P		K
G1	G2	G5
●	○	○

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

HPRD100+ - 90120TN

- 2-Flute / V 120° / 90° / Spot Drill
- Spot Drill



CED Tolerance(mm)	
4~6	0~-0.018
6~10	0~-0.02
10~16	0~-0.025
16~20	0~-0.03

h6 (unit : mm)

Code No.	CED	CEL	SD	OAL	D1	Flute
HPRD100+-90120TN	4	8	4	50	1.5	2
	6	12	6	70	2	
	8	16	8	80	2.5	
	10	20	10	90	3	
	12	24	12	110	4	
	16	32	16	120	5	
	20	40	20	120	6	

Code No.	CED	CEL	SD	OAL	D1	Flute
HPRD100+-90120TN	EU 4	12	4	55	1.5	2
	EU 6	16	6	66	2.0	
	EU 8	21	8	79	2.5	
	EU 10	25	10	89	3.0	
	EU 12	30	12	102	4.0	

※ Customized Special sizes, Coating type and Inches are available to order.

Drilling

Work Material	Mild Steel		Carbon Steel		Alloyed Steel		Gray Cast Iron Malleable cast iron	
Cutting Condition / CED	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed mm/ min
4	2,700	0.03~0.06	2,700	0.03~0.06	2,230	0.02~0.05	2,700	115
6	1,900	0.05~0.1	1,900	0.05~0.1	1,490	0.04~0.8	2,100	115
8	1,500	0.06~0.12	1,500	0.06~0.12	1,110	0.05~0.1	1,600	105
10	1,200	0.07~0.15	1,200	0.07~0.15	890	0.06~0.12	1,300	110
12	980	0.08~0.18	980	0.08~0.18	740	0.07~0.15	1,130	110
16	750	0.1~0.2	750	0.1~0.2	560	0.09~0.18	800	105
20	600	0.13~0.25	600	0.13~0.25	450	0.11~0.22	650	95

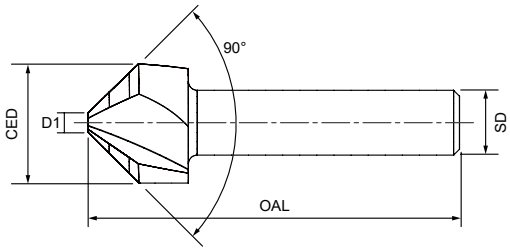
Work Material

P		K
G1	G2	G5
●	○	○

1. **Please select high rigid tool holder and collet chuck during machining.**
2. **Please select the suitable coolant fluid.**
3. **For dry cutting, please use air blow for chip removal and cooling.**
4. **These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.**
5. **If vibrations occur during cutting process, adjust and reduce the cutting speed.**

HCF100+ - 40903TN

- 3-Flute / 90°
- 45° Chamfering



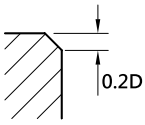
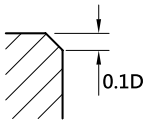
CED Tolerance(mm)	
6.3~8.3	0~-0.02
10.4~16.5	0~-0.025
20.5~25	0~-0.03

h6 (unit : mm)

Code No.	CED	SD	OAL	D1	Flute
HCF100+-40903TN	6.3	5	45	1.5	3
	8.3	6	50	2	
	10.4	6	50	2.5	
	14.4	8	56	2.8	
	16.5	10	60	3.2	
	20.5	10	63	3.5	
	25	10	67	3.8	

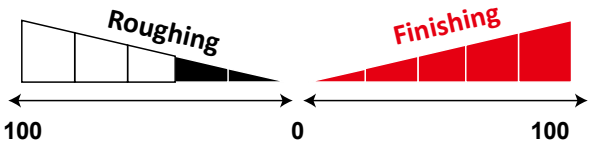
※ Customized Special sizes, Coating type and Inches are available to order.

Chamfering

Work Material	Mild Steel Carbon Steel		Carbon Steel		Alloyed Steel		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.2D		a_p: 0.2D		a_p: 0.1D		a_p: 0.1D	
6.3	1,950	270	1,950	270	1,950	270	1,950	270
8.3	1,500	265	1,500	265	1,500	265	1,500	265
10.4	1,200	265	1,200	265	1,200	265	1,200	265
14.4	1,000	265	1,000	265	1,000	265	1,00	265
16.5	860	320	860	320	860	320	860	320
20.5	605	285	605	285	605	285	605	285
25	480	225	480	225	480	225	480	225
Depth of cut								

Work Material

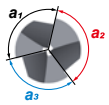
P		K
G1	G2	G5
●	○	○



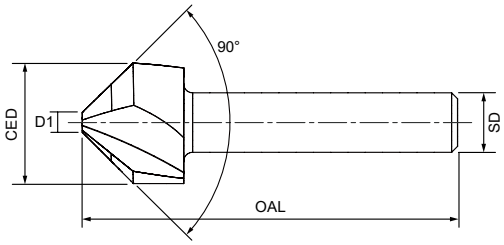
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

HCF100I+ - 40903TN

- 3-Flute / 90° / Uneven Flute
- 45° Chamfering



$a_1 \neq a_2 \neq a_3$



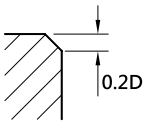
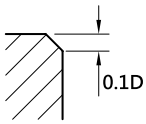
CED Tolerance(mm)	
4.3~5.3	0~-0.018
6.3~8.3	0~-0.02
10.4~16.5	0~-0.025
20.5~30	0~-0.03
30~35	0~-0.039

h6 (unit : mm)

Code No.	CED	SD	OAL	D1	Flute
HCF100I+-40903TN	4.3	4	40	1	3
	5.3	4	40	1	
	6.3	5	45	1.5	
	8.3	6	50	2	
	10.4	8	50	2.5	
	12.4	10	56	2.8	
	16.5	10	60	3.2	
	20.5	10	63	3.5	
	25	10	67	3.8	
	30	10	70	4.2	
	35	12	70	4.5	
	12.4	8	150	2.8	
	16.5	10	180	3.2	
	20.5	10	200	3.5	

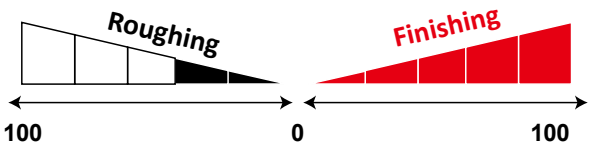
※ Customized Special sizes, Coating type and Inches are available to order.

Chamfering

Work Material	Mild Steel Carbon Steel		Carbon Steel		Alloyed Steel		Gray Cast Iron Malleable cast iron	
Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	a_p: 0.2D		a_p: 0.2D		a_p: 0.1D		a_p: 0.1D	
4.3	2,860	255	2,860	255	2,280	150	2,860	255
5.3	2,340	265	2,340	265	1,870	160	2,340	265
6.3	1,950	270	1,950	270	1,560	160	1,950	270
8.3	1,500	265	1,500	265	1,200	160	1,500	265
10.4	1,200	265	1,200	265	960	160	1,200	265
12.4	1,000	265	1,000	265	800	160	1,000	265
16.5	860	320	860	320	680	190	860	320
20.5	600	285	600	285	480	170	600	285
25	480	225	480	225	380	135	480	225
30	390	220	390	220	310	130	390	220
35	340	200	340	200	270	120	340	200
Depth of cut								

Work Material

P		K
G1	G2	G5
●	○	○



1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only.Please adjust the cutting speed according to machine capability and working conditions.
5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

Industrial Grade Rotary Burrs

Appearance	Code No	Description	Size	Page.
	Type-A	Type A - Cylinder / Flat End	Ø1.5~Ø25	248
	Type-B	Type B - Cylinder / with End Cut	Ø1.5~Ø25	250
	Type-C	Type C - Ball Nose Cylinder	Ø2~Ø20	252
	Type-D	Type D - Spherical Ball	Ø2~Ø25	254
	Type-E	Type E - Oval shape	Ø3~Ø20	256
	Type-F	Type F - Ball Nose Tree shape	Ø3~Ø20	258
	Type-G	Type G - Flat End Tree shape	Ø3~Ø20	260
	Type-H	Type H - Flame shape	Ø3~Ø20	262
	Type-L	Type L - Ball Nose Cone shape	Ø3~Ø20	264
	Type-M	Type M - Flat End Cone shape	Ø3~Ø16	266
	Type-N	Type N - Flat End / Inverted Cone Shape	Ø3~Ø20	268
	Type-O	Type O - Cylinder / Corner Radius End Cut	Ø3~Ø16	268
	Type-J	Type J - V Shape 60° / Countersink deburring	Ø3~Ø25	270
	Type-K	Type K - V Shape 90° / Countersink deburring	Ø3~Ø20	270

Rotary Burrs

Coding Principle

Series Number

A - 211338 - CRT

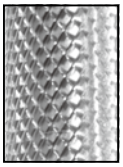
Type | Size | Design | Coating

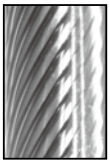
Optional Coating

TN

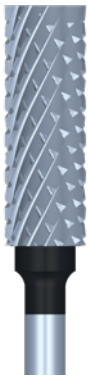
TiAlN-NANO

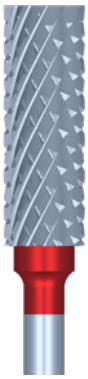
Teeth Type

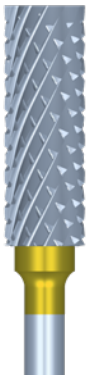
Double Cut Teeth			
	CR-Rough	CM-Medium	CF-Fine

Single Cut Teeth			
	SR-Rough	SM-Medium	SF-Fine

Teeth Type's Colors





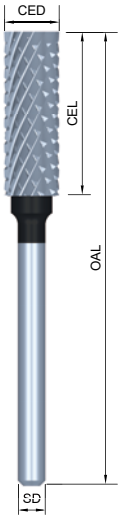


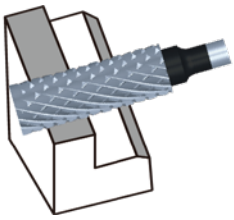
Black	Red	Yellow
Rough	Medium	Fine

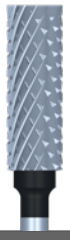
Rotary Burrs

Type : A

♦ Cylinder





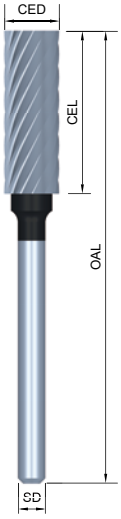


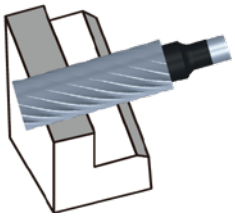
CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
A-1.56338-CR	1.5	6	3	38	V	
A-211338-CR	2	11	3	38	V	
A-2.511338-CR	2.5	11	3	38	V	
A-314338-CR	3	14	3	38	V	
A-414650-CR	4	14	6	50	V	
A-618650-CR	6	18	6	50	V	
A-820665-CR	8	20	6	65		V
A-1020665-CR	10	20	6	65		V
A-1225670-CR	12	25	6	70		V
A-1625670-CR	16	25	6	70		V
A-2025670-CR	20	25	6	70		V
A-2525670-CR	25	25	6	70		V



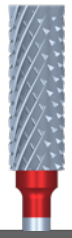


SR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
A-314338-SR	3	14	3	38	V	
A-618650-SR	6	18	6	50	V	
A-820665-SR	8	20	6	65		V
A-1020665-SR	10	20	6	65		V
A-1225670-SR	12	25	6	70		V
A-1625670-SR	16	25	6	70		V
A-2025670-SR	20	25	6	70		V

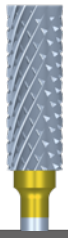


CM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
A-1.56338-CM	1.5	6	3	38	V	
A-211338-CM	2	11	3	38	V	
A-314338-CM	3	14	3	38	V	
A-414650-CM	4	14	6	50	V	
A-618650-CM	6	18	6	50	V	
A-820665-CM	8	20	6	65		V
A-1020665-CM	10	20	6	65		V
A-1225670-CM	12	25	6	70		V
A-1625670-CM	16	25	6	70		V



CF

3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
A-211338-CF	2	11	3	38	V	
A-314338-CF	3	14	3	38	V	
A-414650-CF	4	14	6	50	V	
A-618650-CF	6	18	6	50	V	
A-820665-CF	8	20	6	65		V
A-1020665-CF	10	20	6	65		V
A-1225670-CF	12	25	6	70		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
A-14338-SM	1	4	3	38	V	
A-1.56338-SM	1.5	6	3	38	V	
A-211338-SM	2	11	3	38	V	
A-314338-SM	3	14	3	38	V	
A-618650-SM	6	18	6	50	V	
A-820665-SM	8	20	6	65		V
A-1020665-SM	10	20	6	65		V
A-1225670-SM	12	25	6	70		V

SF

3.

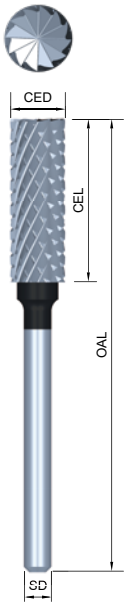
(unit : mm)

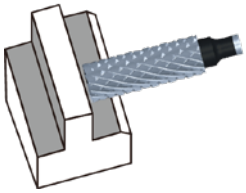
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
A-1.56338-SF	1.5	6	3	38	V	
A-211338-SF	2	11	3	38	V	
A-314338-SF	3	14	3	38	V	
A-414650-SF	4	14	6	50	V	
A-618650-SF	6	18	6	50	V	
A-820665-SF	8	20	6	65		V
A-1020665-SF	10	20	6	65		V
A-1225670-SF	12	25	6	70		V
A-1625670-SF	16	25	6	70		V

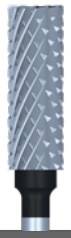
Rotary Burrs

Type : B

♦ Cylinder + End Cut





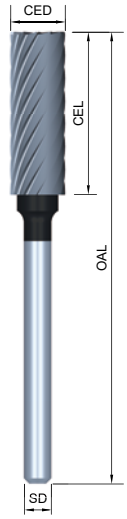


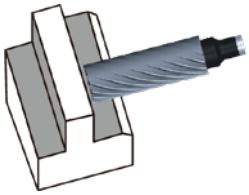
CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
B-1.56338-CR	1.5	6	3	38	V	
B-211338-CR	2	11	3	38	V	
B-2.511338-CR	2.5	11	3	38	V	
B-314338-CR	3	14	3	38	V	
B-414650-CR	4	14	6	50	V	
B-618650-CR	6	18	6	50	V	
B-820665-CR	8	20	6	65		V
B-1020670-CR	10	20	6	70		V
B-1225670-CR	12	25	6	70		V
B-1625670-CR	16	25	6	70		V
B-2025670-CR	20	25	6	70		V
B-2525670-CR	25	25	6	70		V



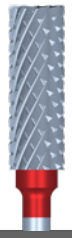


SR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
B-314338-SR	3	14	3	38	V	
B-618650-SR	6	18	6	50	V	
B-820665-SR	8	20	6	65		V
B-1020665-SR	10	20	6	65		V
B-1225670-SR	12	25	6	70		V
B-1625670-SR	16	25	6	70		V
B-2025670-SR	20	25	6	70		V
B-2525670-SR	25	25	6	70		V

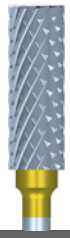


CM

2

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
B-1.56338-CM	1.5	6	3	38	V	
B-211338-CM	2	11	3	38	V	
B-314338-CM	3	14	3	38	V	
B-414650-CM	4	14	6	50	V	
B-618650-CM	6	18	6	50	V	
B-820665-CM	8	20	6	65		V
B-1020665-CM	10	20	6	65		V
B-1225670-CM	12	25	6	70		V
B-1625670-CM	16	25	6	70		V



CF

3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
B-618650-CF	6	18	6	50	V	
B-820665-CF	8	20	6	65		V
B-1020665-CF	10	20	6	65		V
B-1225670-CF	12	25	6	70		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
B-314338-SM	3	14	3	38	V	
B-618650-SM	6	18	6	50	V	
B-820665-SM	8	20	6	65		V
B-1020665-SM	10	20	6	65		V
B-1225670-SM	12	25	6	70		V

SF

3.

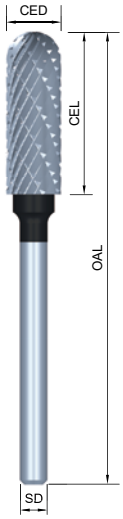
(unit : mm)

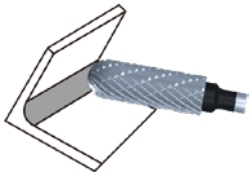
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
B-1.56338-SF	1.5	6	3	38	V	
B-211338-SF	2	11	3	38	V	
B-314338-SF	3	14	3	38	V	
B-412650-SF	4	12	6	50	V	
B-618650-SF	6	18	6	50	V	
B-820665-SF	8	20	6	65		V
B-1020665-SF	10	20	6	65		V
B-1225670-SF	12	25	6	70		V
B-1625670-SF	16	25	6	70		V

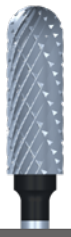
Rotary Burrs

Type : C

♦ Ball Nosed Cylinder





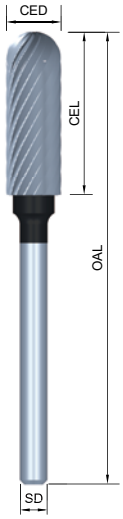


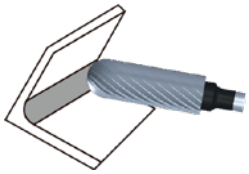
CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
C-211338-CR	2	11	3	38	V	
C-2.511338-CR	2.5	11	3	38	V	
C-314338-CR	3	14	3	38	V	
C-415660-CR	4	15/30	6	60	V	
C-618650-CR	6	18	6	50	V	
C-820665-CR	8	20	6	65		V
C-1020665-CR	10	20	6	65		V
C-1225670-CR	12	25	6	70		V
C-1625670-CR	16	25	6	70		V
C-2025670-CR	20	25	6	70		V



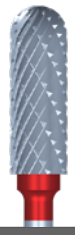


SR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
C-211338-SR	2	11	3	38	V	
C-314338-SR	3	14	3	38	V	
C-618650-SR	6	18	6	50	V	
C-820665-SR	8	20	6	65		V
C-1020665-SR	10	20	6	65		V
C-1225670-SR	12	25	6	70		V
C-1625670-SR	16	25	6	70		V
C-2025670-SR	20	25	6	70		V

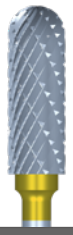


CM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
C-211338-CM	2	11	3	38	V	
C-314338-CM	3	14	3	38	V	
C-618650-CM	6	18	6	50	V	
C-820665-CM	8	20	6	65		V
C-1020665-CM	10	20	6	65		V
C-1225670-CM	12	25	6	70		V
C-1625670-CM	16	25	6	70		V



CF

3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
C-211338-CF	2	11	3	38	V	
C-314338-CF	3	14	3	38	V	
C-618650-CF	6	18	6	50	V	
C-820665-CF	8	20	6	65		V
C-1020665-CF	10	20	6	65		V
C-1225670-CF	12	25	6	70		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
C-14338-SM	1	4	3	38	V	
C-1.56338-SM	1.5	6	3	38	V	
C-211338-SM	2	11	3	38	V	
C-2.511338-SM	2.5	11	3	38	V	
C-314338-SM	3	14	3	38	V	
C-618650-SM	6	18	6	50	V	
C-820665-SM	8	20	6	65		V
C-1020665-SM	10	20	6	65		V
C-1225670-SM	12	25	6	70		V

SF

3.

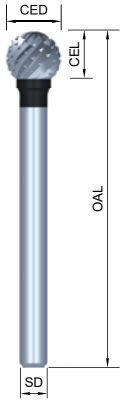
(unit : mm)

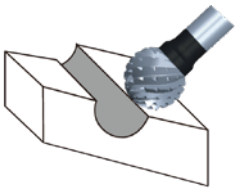
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
C-211338-SF	2	11	3	38	V	
C-314338-SF	3	14	3	38	V	
C-416650-SF	4	16	6	50	V	
C-618650-SF	6	18	6	50	V	
C-820665-SF	8	20	6	65		V
C-1020665-SF	10	20	6	65		V
C-1225670-SF	12	25	6	70		V
C-1625670-SF	16	25	6	70		V

Rotary Burrs

Type : D

♦ Ball



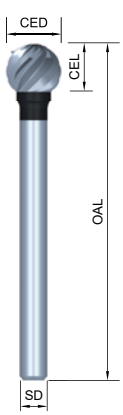


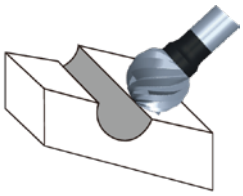
CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
D-21.8338-CR	2	1.8	3	38	V	
D-2.52.3338-CR	2.5	2.3	3	38	V	
D-32.5338-CR	3	2.5	3	38	V	
D-43.4650-CR	4	3.4	6	50	V	
D-64.7650-CR	6	4.7	6	50	V	
D-86665-CR	8	6	6	65		V
D-108665-CR	10	8	6	65		V
D-1211670-CR	12	11	6	70		V
D-1614670-CR	16	14	6	70		V
D-2016.5670-CR	20	16.5	6	70		V
D-2522670-CR	25	22	6	70		V





SR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
D-21.8338-SR	2	1.8	3	38	V	
D-32.5338-SR	3	2.5	3	38	V	
D-43.4650-SR	4	3.4	6	50	V	
D-64.7650-SR	6	4.7	6	50	V	
D-86665-SR	8	6	6	65		V
D-108665-SR	10	8	6	65		V
D-1211670-SR	12	11	6	70		V
D-1614670-SR	16	14	6	70		V
D-2016.5670-SR	20	16.5	6	70		V
D-2522670-SR	25	22	6	70		V

CM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
D-21.8338-CM	2	1.8	3	38	V	
D-32.5338-CM	3	2.5	3	38	V	
D-43.4650-CM	4	3.4	6	50	V	
D-64.7650-CM	6	4.7	6	50	V	
D-86665-CM	8	6	6	65		V
D-108665-CM	10	8	6	65		V
D-1211670-CM	12	11	6	70		V
D-1614670-CM	16	14	6	70		V

CF

3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
D-21.8338-CF	2	1.8	3	38	V	
D-32.5338-CF	3	2.5	3	38	V	
D-43.4650-CF	4	3.4	6	50	V	
D-64.7650-CF	6	4.7	6	50	V	
D-86665-CF	8	6	6	65		V
D-108665-CF	10	8	6	65		V
D-1211670-CF	12	11	6	70		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
D-11338-SM	1	1	3	38	V	
D-1.51338-SM	1.5	1	3	38	V	
D-22338-SM	2	2	3	38	V	
D-32.5338-SM	3	2.5	3	38	V	
D-43.4650-SM	4	3.4	6	50	V	
D-54650-SM	5	4	6	50	V	
D-64.7650-SM	6	4.7	6	50	V	
D-86665-SM	8	6	6	65		V
D-108665-SM	10	8	6	65		V
D-1211670-SM	12	11	6	70		V

SF

3.

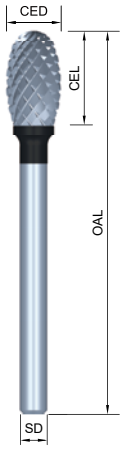
(unit : mm)

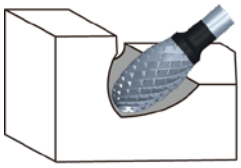
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
D-21.8338-SF	2	1.8	3	38	V	
D-32.5338-SF	3	2.5	3	38	V	
D-43.4650-SF	4	3.4	6	50	V	
D-64.7650-SF	6	4.7	6	50	V	
D-86665-SF	8	6	6	65		V
D-108665-SF	10	8	6	65		V
D-1211670-SF	12	11	6	70		V
D-1614670-SF	16	14	6	70		V

Rotary Burrs

Type : E

♦ Oval



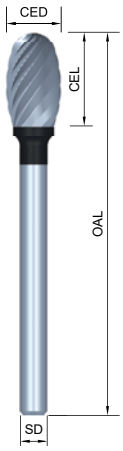


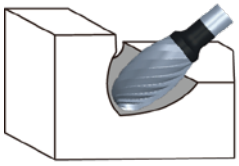
CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
E-36338-CR	3	6	3	38	V	
E-610650-CR	6	10	6	50	V	
E-815665-CR	8	15	6	65		V
E-1016665-CR	10	16	6	65		V
E-1222670-CR	12	22	6	70		V
E-1625670-CR	16	25	6	70		V
E-2025670-CR	20	25	6	70		V





SR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
E-36338-SR	3	6	3	38	V	
E-610650-SR	6	10	6	50	V	
E-815665-SR	8	15	6	65		V
E-1016665-SR	10	16	6	65		V
E-1222670-SR	12	22	6	70		V
E-1625670-SR	16	25	6	70		V
E-2025670-SR	20	25	6	70		V

CM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
E-36338-CM	3	6	3	38	V	
E-610650-CM	6	10	6	50	V	
E-815665-CM	8	15	6	65		V
E-1016665-CM	10	16	6	65		V
E-1222670-CM	12	22	6	70		V
E-1625670-CM	16	25	6	70		V

CF

3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
E-36338-CF	3	6	3	38	V	
E-610650-CF	6	10	6	50	V	
E-815665-CF	8	15	6	65		V
E-1016665-CF	10	16	6	65		V
E-1222670-CF	12	22	6	70		V
E-1625670-CF	16	25	6	70		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
E-1.54338-SM	1.5	4	3	38	V	
E-36338-SM	3	6	3	38	V	
E-610650-SM	6	10	6	50	V	
E-815665-SM	8	15	6	65		V
E-1016665-SM	10	16	6	65		V
E-1222670-SM	12	22	6	70		V

SF

3.

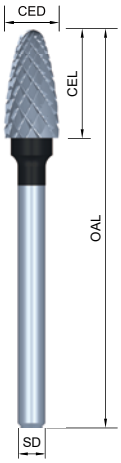
(unit : mm)

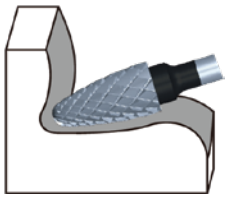
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
E-36338-SF	3	6	3	38	V	
E-610650-SF	6	10	6	50	V	
E-815665-SF	8	15	6	65		V
E-1016665-SF	10	16	6	65		V
E-1222670-SF	12	22	6	70		V
E-1625670-SF	16	25	6	70		V

Rotary Burrs

Type : F

♦ Ball Nosed Tree



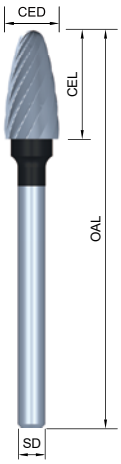


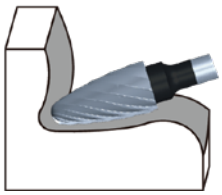
CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
F-314338-CR	3	14	3	38	V	
F-618650-CR	6	18	6	50	V	
F-820665-CR	8	20	6	65		V
F-1020665-CR	10	20	6	65		V
F-1225670-CR	12	25	6	70		V
F-1625670-CR	16	25	6	70		V
F-2025670-CR	20	25	6	70		V





SR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
F-314338-SR	3	14	3	38	V	
F-618650-SR	6	18	6	50	V	
F-820665-SR	8	20	6	65		V
F-1020665-SR	10	20	6	65		V
F-1225670-SR	12	25	6	70		V
F-1625670-SR	16	25	6	70		V
F-2025670-SR	20	25	6	70		V

CM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
F-314338-CM	3	14	3	38	V	
F-618650-CM	6	18	6	50	V	
F-820665-CM	8	20	6	65		V
F-1020665-CM	10	20	6	65		V
F-1225670-CM	12	25	6	70		V
F-1625670-CM	16	25	6	70		V

CF

3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
F-314338-CF	3	14	3	38	V	
F-618650-CF	6	18	6	50	V	
F-820665-CF	8	20	6	65		V
F-1020665-CF	10	20	6	65		V
F-1225670-CF	12	25	6	70		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
F-1.54338-SM	1.5	4	3	38	V	
F-314338-SM	3	14	3	38	V	
F-618650-SM	6	18	6	50	V	
F-820665-SM	8	20	6	65		V
F-1020665-SM	10	20	6	65		V
F-1225670-SM	12	25	6	70		V

SF

3.

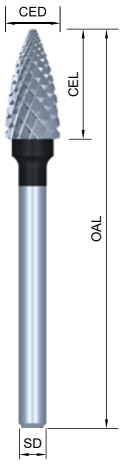
(unit : mm)

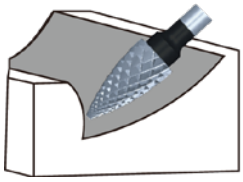
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
F-314338-SF	3	14	3	38	V	
F-618650-SF	6	18	6	50	V	
F-820665-SF	8	20	6	65		V
F-1020665-SF	10	20	6	65		V
F-1225670-SF	12	25	6	70		V
F-1625670-SF	16	25	6	70		V

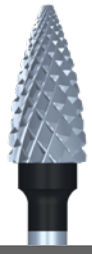
Rotary Burrs

Type : G

♦ Tree





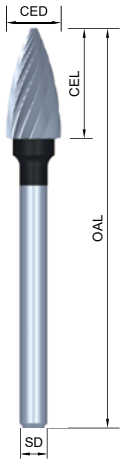


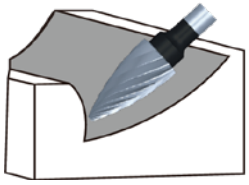
CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
G-314338-CR	3	14	3	38	V	
G-618650-CR	6	18	6	50	V	
G-820665-CR	8	20	6	65		V
G-1020665-CR	10	20	6	65		V
G-1225670-CR	12	25	6	70		V
G-1625670-CR	16	25	6	70		V
G-2025670-CR	20	25	6	70		V



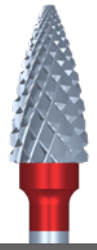


SR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
G-314338-SR	3	14	3	38	V	
G-618650-SR	6	18	6	50	V	
G-820665-SR	8	20	6	65		V
G-1020665-SR	10	20	6	65		V
G-1225670-SR	12	25	6	70		V
G-1625670-SR	16	25	6	70		V



CM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
G-314338-CM	3	14	3	38	V	
G-618650-CM	6	18	6	50	V	
G-820665-CM	8	20	6	65		V
G-1020665-CM	10	20	6	65		V
G-1225670-CM	12	25	6	70		V
G-1625670-CM	16	25	6	70		V

CF

3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
G-314338-CF	3	14	3	38	V	
G-618650-CF	6	18	6	50	V	
G-820665-CF	8	20	6	65		V
G-1020665-CF	10	20	6	65		V
G-1225670-CF	12	25	6	70		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
G-1.54338-SM	1.5	4	3	38	V	
G-314338-SM	3	14	3	38	V	
G-618650-SM	6	18	6	50	V	
G-820665-SM	8	20	6	65		V
G-1020665-SM	10	20	6	65		V
G-1225670-SM	12	25	6	70		V

SF

3.

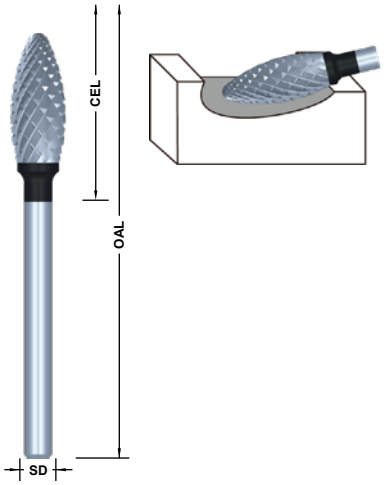
(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
G-314338-SF	3	14	3	38	V	
G-618650-SF	6	18	6	50	V	
G-820665-SF	8	20	6	65		V
G-1020665-SF	10	20	6	65		V
G-1225670-SF	12	25	6	70		V
G-1625670-SF	16	25	6	70		V

Rotary Burrs

Type : H

♦ Flame

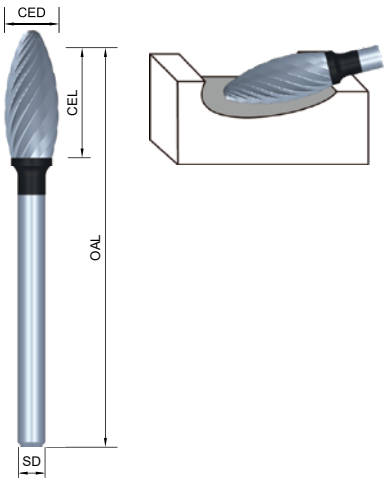


CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
H-36338-CR	3	6	3	38	V	
H-614650-CR	6	14	6	50	V	
H-820665-CR	8	20	6	65		V
H-1020665-CR	10	20	6	65		V
H-1232677-CR	12	32	6	77		V
H-1636681-CR	16	36	6	81		V
H-2041686-CR	20	41	6	86		V



SR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
H-820665-SR	8	20	6	65		V
H-1020665-SR	10	20	6	65		V
H-1232677-SR	12	32	6	77		V
H-1636681-SR	16	36	6	81		V

CM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
H-36338-CM	3	6	3	38	V	
H-614650-CM	6	14	6	50	V	
H-820665-CM	8	20	6	65		V
H-1020665-CM	10	20	6	65		V
H-1232677-CM	12	32	6	77		V
H-1636681-CM	16	36	6	81		V

CF

3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
H-36338-CF	3	6	3	38	V	
H-614650-CF	6	14	6	50	V	
H-820665-CF	8	20	6	65		V
H-1020665-CF	10	20	6	65		V
H-1232677-CF	12	32	6	77		V
H-1636681-CF	16	36	6	81		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
H-36338-SM	3	6	3	38	V	
H-820665-SM	8	20	6	65		V
H-1020665-SM	10	20	6	65		V
H-1232677-SM	12	32	6	77		V

SF

3.

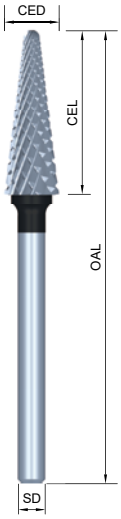
(unit : mm)

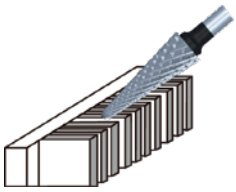
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
H-36338-SF	3	6	3	38	V	
H-614650-SF	6	14	6	50	V	
H-820665-SF	8	20	6	65		V
H-1020665-SF	10	20	6	65		V
H-1232677-SF	12	32	6	77		V
H-1636681-SF	16	36	6	81		V

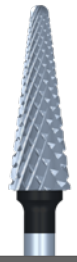
Rotary Burrs

Type : L

♦ Ball Nosed Cone





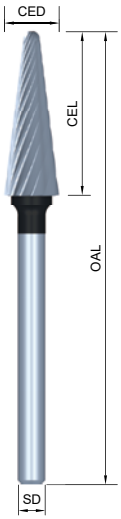


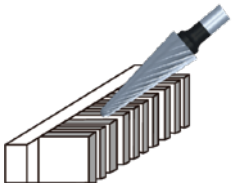
CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
L-314338-8-CR	3	14	3	38	8°	V	
L-618650-14-CR	6	18	6	50	14°	V	
L-825670-14-CR	8	25	6	70	14°		V
L-1020665-14-CR	10	20	6	65	14°		V
L-1232677-14-CR	12	32	6	77	14°		V
L-1633678-14-CR	16	33	6	78	14°		V
L-2041686-14-CR	20	41	6	86	14°		V



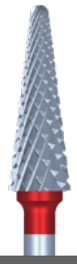


SR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
L-314338-8-SR	3	14	3	38	8°	V	
L-618650-14-SR	6	18	6	50	14°	V	
L-825670-14-SR	8	25	6	70	14°		V
L-1020665-14-SR	10	20	6	65	14°		V
L-1232677-14-SR	12	32	6	77	14°		V
L-1633678-14-SR	16	33	6	78	14°		V

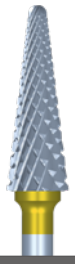


CM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
L-314338-8-CM	3	14	3	38	8°	V	
L-618650-14-CM	6	18	6	50	14°	V	
L-825670-14-CM	8	25	6	70	14°		V
L-1020665-14-CM	10	20	6	65	14°		V
L-1232677-14-CM	12	32	6	77	14°		V
L-1633678-14-CM	16	33	6	78	14°		V



CF

3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
L-314338-8-CF	3	14	3	38	8°	V	
L-618650-14-CF	6	18	6	50	14°	V	
L-825670-14-CF	8	25	6	70	14°		V
L-1020665-14-CF	10	20	6	65	14°		V
L-1232677-14-CF	12	32	6	77	14°		V
L-1633678-14-CF	16	33	6	78	14°		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
L-314338-8-SM	3	14	3	38	8°	V	
L-618650-14-SM	6	18	6	50	14°	V	
L-825670-14-SM	8	25	6	70	14°		V
L-1020665-14-SM	10	20	6	65	14°		V
L-1232677-14-SM	12	32	6	77	14°		V

SF

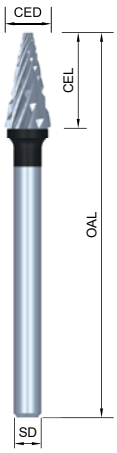
3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
L-314338-8-SF	3	14	3	38	8°	V	
L-618650-14-SF	6	18	6	50	14°	V	
L-825670-14-SF	8	25	6	70	14°		V
L-1020665-14-SF	10	20	6	65	14°		V
L-1232677-14-SF	12	32	6	77	14°		V
L-1633678-14-SF	16	33	6	78	14°		V

Type : M

♦ Cone

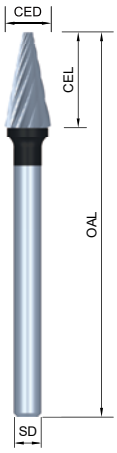


CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
M-315338-10-CR	3	15	3	38	10°	V	
M-618650-11-CR	6	18	6	50	11°	V	
M-818665-13-CR	8	18	6	65	13°		V
M-1020665-28-CR	10	20	6	65	28°		V
M-1225670-28-CR	12	25	6	70	28°		V
M-1625670-33-CR	16	25	6	70	33°		V



SR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
M-315338-10-SR	3	15	3	38	10°	V	
M-618650-14-SR	6	18	6	50	14°	V	
M-1020665-14-SR	10	20	6	65	14°		V
M-1225670-14-SR	12	25	6	70	14°		V

CM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
M-315338-10-CM	3	15	3	38	10°	V	
M-618650-14-CM	6	18	6	50	14°	V	
M-818665-13-CM	8	18	6	65	13°		V
M-1020665-28-CM	10	20	6	65	28°		V
M-1225670-28-CM	12	25	6	70	28°		V
M-1625670-33-CM	16	25	6	70	33°		V

CF

3.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
M-315338-10-CF	3	15	3	38	10°	V	
M-618650-14-CF	6	18	6	50	14°	V	
M-818665-13-CF	8	18	6	65	13°		V
M-1020665-28-CF	10	20	6	65	28°		V
M-1225670-28-CF	12	25	6	70	28°		V
M-1625670-33-CF	16	25	6	70	33°		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
M-1.54338-14-SM	1.5	4	3	38	14°	V	
M-315338-14-SM	3	15	3	38	14°	V	
M-618650-14-SM	6	18	6	50	14°	V	
M-1020665-28-SM	10	20	6	65	28°		V
M-1225670-28-SM	12	25	6	70	28°		V

SF

3.

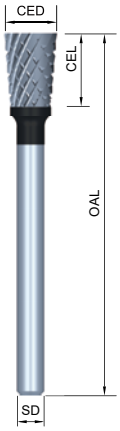
(unit : mm)

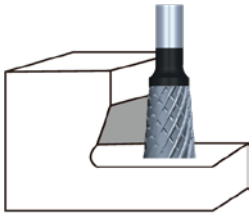
Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
M-315338-10-SF	3	15	3	38	10°	V	
M-618650-14-SF	6	18	6	50	14°	V	
M-818665-13-SF	8	18	6	65	13°		V
M-1020665-28-SF	10	20	6	65	28°		V
M-1225670-28-SF	12	25	6	70	28°		V
M-1625670-33-SF	16	25	6	70	33°		V

Rotary Burrs

Type : N

♦ Inverted Cone





CR

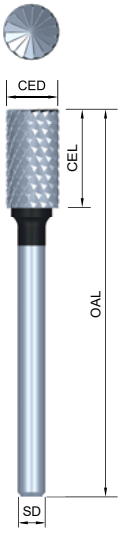
1.

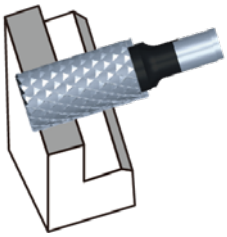
(unit : mm)

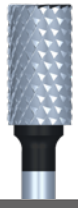
Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
N-35338-10-CR	3	5	3	38	10°	V	
N-68650-10-CR	6	8	6	50	10°	V	
N-1010665-10-CR	10	10	6	65	10°		V
N-1213665-16-CR	12	13	6	65	16°		V
N-1619665-16-CR	16	19	6	65	16°		V
N-2016665-28-CR	20	16	6	65	28°		V

Type : O

♦ Cylinder-Corner Radius







CR

1.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
O-314338-CR	3	14	3	38	V	
O-618650-CR	6	18	6	50	V	
O-820665-CR	8	20	6	65		V
O-1020665-CR	10	20	6	65		V
O-1225670-CR	12	25	6	70		V
O-1625670-CR	16	25	6	70		V

CM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
N-68650-10-CM	6	8	6	50	10°	V	
N-1010665-13-CM	10	10	6	65	13°		V
N-1213665-30-CM	12	13	6	65	30°		V

SF

3.

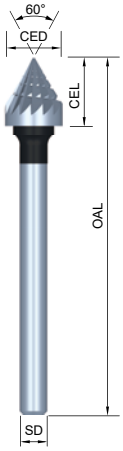
(unit : mm)

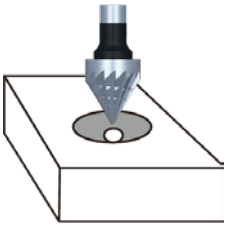
Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
N-35338-10-SF	3	5	3	38	10°	V	
N-68650-10-SF	6	8	6	50	10°	V	
N-1010665-10-SF	10	10	6	65	10°		V
N-1213665-16-SF	12	13	6	65	16°		V

Rotary Burrs

Type : J

♦ Countersink 60°





CR

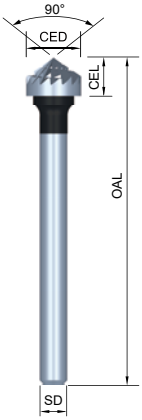
1.

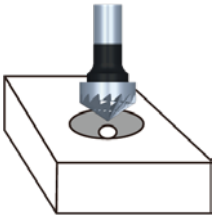
(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
J-33338-CR	3	3	3	38	V	
J-66650-CR	6	6	6	50	V	
J-1010665-CR	10	10	6	65		V
J-1213665-CR	12	13	6	65		V
J-1615665-CR	16	15	6	65		V
J-2017665-CR	20	17	6	65		V
J-2524.5670-CR	25	24.5	6	70		V

Type : K

♦ Countersink 90°





CR

1.

(unit : mm)

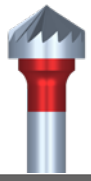
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
K-31.5338-CR	3	1.5	3	38	V	
K-63650-CR	6	3	6	50	V	
K-108665-CR	10	8	6	65		V
K-1211665-CR	12	11	6	65		V
K-1611665-CR	16	11	6	65		V
K-2012665-CR	20	12	6	65		V

SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
J-33338-SM	3	3	3	38	V	
J-66650-SM	6	6	6	50	V	
J-1010665-SM	10	10	6	65		V
J-1213665-SM	12	13	6	65		V



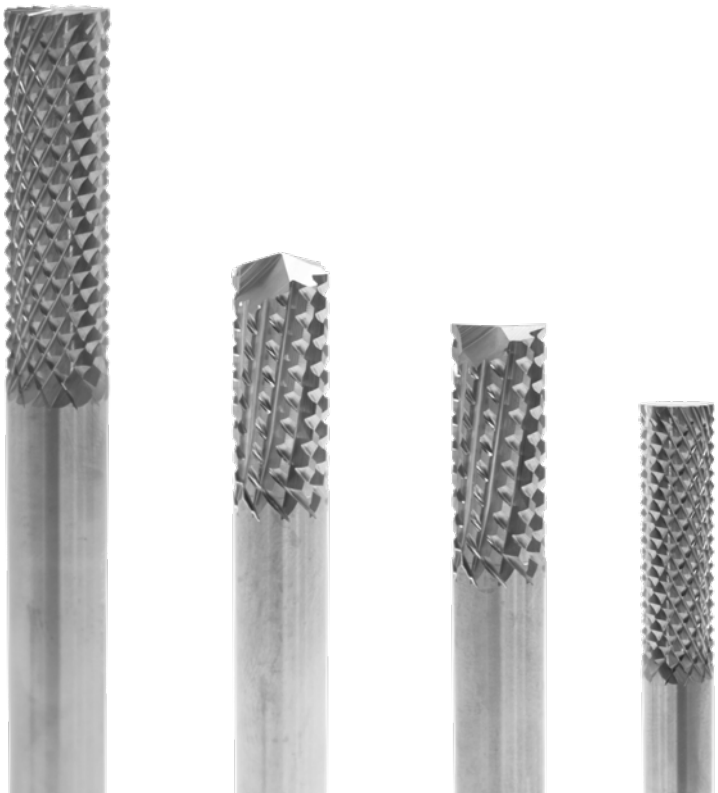
SM

2.

(unit : mm)

Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
K-31.5338-SM	3	1.5	3	38	V	
K-63650-SM	6	3	6	50	V	
K-108665-SM	10	8	6	65		V
K-1211665-SM	12	11	6	65		V

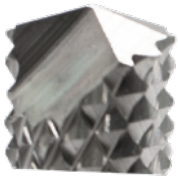
COMPOSITE FIBERGLASS

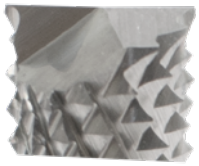
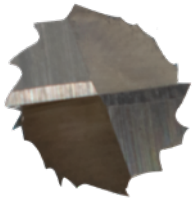


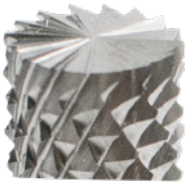
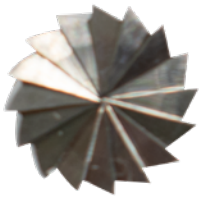
Fiberglass router burrs

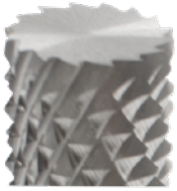
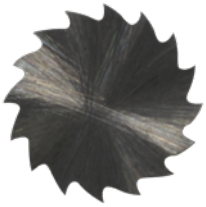
Fiberglass router burrs incorporate reciprocating diamond-fluted geometry, strong negative rake angles and generous fluting to provide the best cutting action in a wide variety of woven resin bond fiberglass and composite materials

Type of End Cutting

Drill Point	
	

End mill	
	

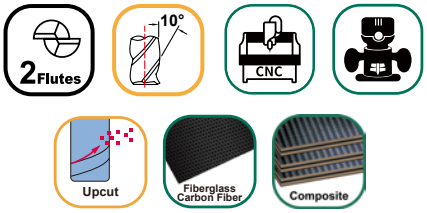
Burr End	
	

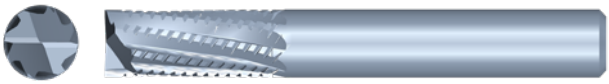
Flat End	
	

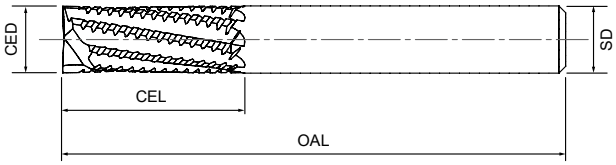
CNC Composite Router Bits

FG10010

- 2 Flute - with End Mill Cutting
- Helix 10°







unit:mm

CED	CEL	SD	OAL
4	16	4	50
6	25	6	75
8	25	8	75
10	25	10	75

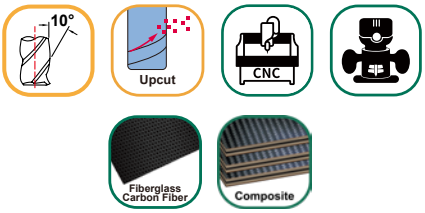
unit: inch

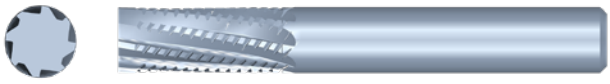
CED	CEL	SD	OAL
1/8	1/2	1/8	1-1/2
3/16	5/8	3/16	2
1/4	1	1/4	3
1/4	1-1/2	1/4	3-1/2
3/8	1	3/8	3

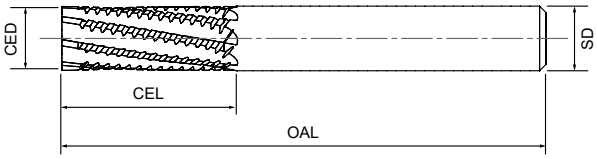
CNC Composite Router Bits

FG20010

- Square type - Flat End
- Helix 10°







unit:mm

CED	CEL	SD	OAL
4	16	4	50
6	25	6	75
8	25	8	75
10	25	10	75

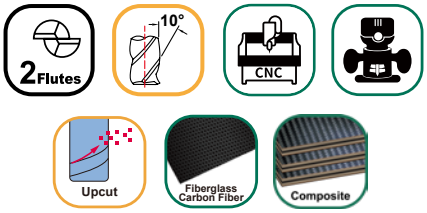
unit: inch

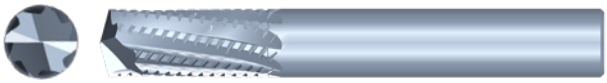
CED	CEL	SD	OAL
1/8	1/2	1/8	1-1/2
3/16	5/8	3/16	2
1/4	1	1/4	3
1/4	1-1/2	1/4	3-1/2
3/8	1	3/8	3

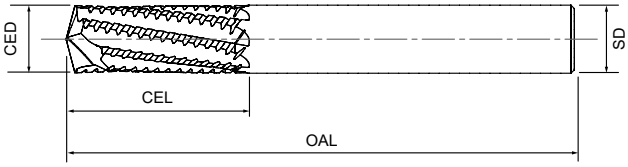
CNC Composite Router Bits

FG30010

- 2 Flute - Drill Point
- Helix 10°







unit:mm

CED	CEL	SD	OAL
4	16	4	50
6	25	6	75
8	25	8	75
10	25	10	75

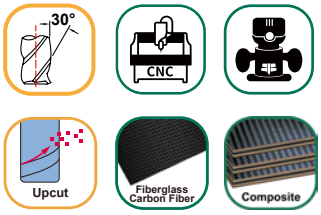
unit: inch

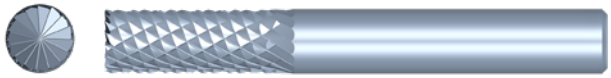
CED	CEL	SD	OAL
1/8	1/2	1/8	1-1/2
3/16	5/8	3/16	2
1/4	1	1/4	3
1/4	1-1/2	1/4	3-1/2
3/8	1	3/8	3

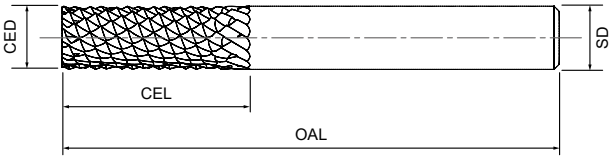
CNC Composite Router Bits

FG40030

- Square -with Burr End Cut
- Helix 30°







unit:mm

CED	CEL	SD	OAL
4	16	4	50
6	25	6	75
8	25	8	75
10	25	10	75

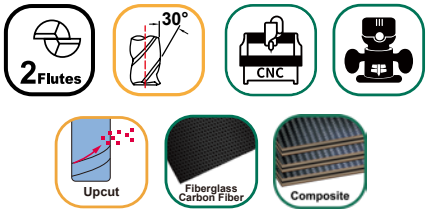
unit: inch

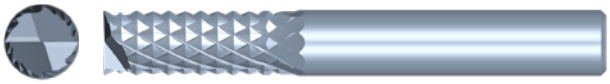
CED	CEL	SD	OAL
1/8	1/2	1/8	1-1/2
3/16	5/8	3/16	2
1/4	1	1/4	3
1/4	1-1/2	1/4	3-1/2
3/8	1	3/8	3

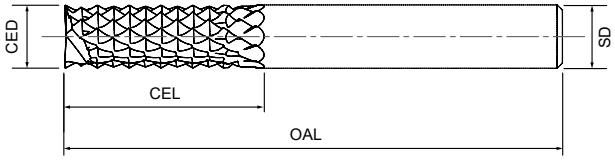
CNC Composite Router Bits

FG10030

- 2 Flute - with End Mill Cutting
- Helix 30°







unit:mm

CED	CEL	SD	OAL
4	16	4	50
6	25	6	75
8	25	8	75
10	25	10	75

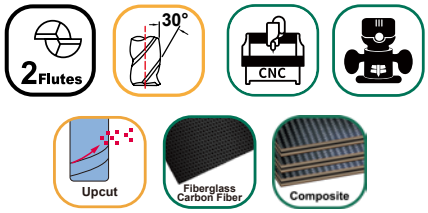
unit: inch

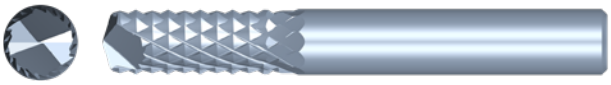
CED	CEL	SD	OAL
1/8	1/2	1/8	1-1/2
3/16	5/8	3/16	2
1/4	1	1/4	3
1/4	1-1/2	1/4	3-1/2
3/8	1	3/8	3

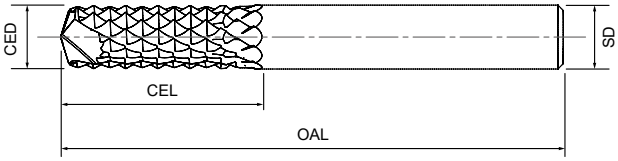
CNC Composite Router Bits

FG30030

- 2 Flute - Drill Point
- Helix 30°







unit:mm

CED	CEL	SD	OAL
4	16	4	50
6	25	6	75
8	25	8	75
10	25	10	75

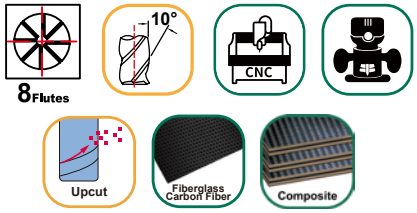
unit: inch

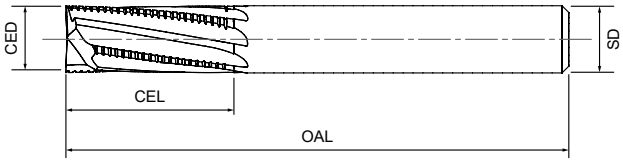
CED	CEL	SD	OAL
1/8	1/2	1/8	1-1/2
3/16	5/8	3/16	2
1/4	1	1/4	3
1/4	1-1/2	1/4	3-1/2
3/8	1	3/8	3

CNC Composite Router Bits

FG500-1108

- 8 Flute - End Cut
- Helix 10°





unit:mm

CED	CEL	SD	OAL
4	16	4	50
6	25	6	75
8	25	8	75
10	25	10	75

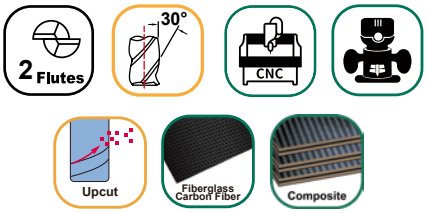
unit: inch

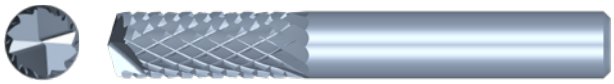
CED	CEL	SD	OAL
1/8	1/2	1/8	1-1/2
3/16	5/8	3/16	2
1/4	1	1/4	3
1/4	1-1/2	1/4	3-1/2
3/8	1	3/8	3

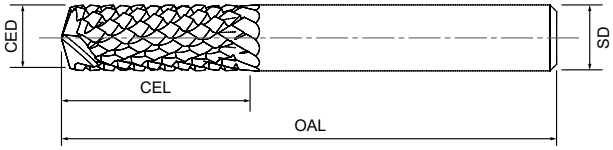
CNC Composite Router Bits

FG600

- 2 Flute - Drill Point
- Helix 30°







unit:mm

CED	CEL	SD	OAL
4	16	4	50
6	25	6	75
8	25	8	75
10	25	10	75

unit: inch

CED	CEL	SD	OAL
1/8	1/2	1/8	1-1/2
3/16	5/8	3/16	2
1/4	1	1/4	3
1/4	1-1/2	1/4	3-1/2
3/8	1	3/8	3

Causes and troubleshooting for cutting problem

This table is the guideline for common problems and troubleshooting. In some cases, multiple factors overlap and this is not necessarily the only countermeasure.

Problem	Possible Causes	Solution
Edge Chipping	Cutting speed too fast	Reduce cutting feed per tooth
	Too fast on first entering cut	Reduce initial cut feed rate
	Depth of cut too much	Reduce the speed of feed rate
	Cutting speed too fast	Reduce the spindle speed
	Spindle speed too slow	Increase the spindle speed
	Insufficient mechanical, chuck rigidity	Reduce spindle speed & feed rate, reduce cut per-tooth, use tool with less number flute
	Too much run-out	Check and tighten the tool holder, use shrink fit holder
	Insufficient of machine power	Reduce spindle speed & feed rate, reduce cut per-tooth, use tool with less number flute
	Workpice fixture rigidity insufficient	Reduce spindle speed & feed rate, reduce cut per-tooth, use tool with less number flute, change direction to upcut.
	Tool overhang	Reduce spindle & feed rate, reduce the cut per-tooth, use shrink fit holder.
Breakage	Feed rate too fast	Adjust and slow down speed
	High amount of chip evacuation	Reduce the feed amount per-tooth
	Chip packing	Reduce speed and feed, increasing cutting fluid or pressure air
	Tooling worn-out	Regularly check tools of wear or re-sharpening in earlier stage
Short tool life	Too much friction on cutting	Re-sharpened in earlier stage
	Tough workpiece material	Select higher grade of tool material
	Cutting rake angle too sharp	Select tool with lower rake angle or negative angle
Burr	Cutting speed too slow	Increase the spindle speed
	Feed rate too fast	Reduce the feeding amount per-tooth
	Too much of depth of cut	Decrease the depth of cut. Separate the cutting processes in roughing and finishing.
	Tool worn-out	Change a new tool or re-sharpening in earlier stage.
	Tool rake angle too small	Use a tool with bigger rake angle
	Cutting direction	Change it to down-cut.
Easy to worn-out	Workpiece material too hard	Select higher grade of tool material and coating type
	Chip jamming	Reduce cutting speed or clean chip with cutting fluid or air gun
	Cutting edge too sharp	Select tool with lower rake angle or negative angle
Chattering, noise	Cutting speed too fast	Reduce the spindle speed
	Resonance, vibration	Adjust feed rate to the area that has no resonance.

Problem	Possible Causes	Solution
Chattering, noise	Mechanical, chuck rigidity Not enough	Reduce the cutting amount Ae or change tool with less number of flutes
	Insufficient of tool rigidity	Change it to solid carbide tool. Increase the diameter of the tool. Use a short flute length tool. Reduce the overhang length.
	High number of tool flute	Use tool with less number of flutes
	Too long overhang	Increase the tool diameter. Use shrink fit holder. Decrease the spindle speed and depth of cut.
	Too much of cutting resistance	Decrease the depth of cut. Change it to roughing end mill. Use a tool with less flutes.

Formulas for Cutting

Cutting Speed $Vc = \dfrac{\pi \times CED \times n}{1000}$

Spindle Speed $n = Vc \div \pi \div CED \times 1{,}000$

Feed $Vf = n \times fz \times Z$

Feed per Tooth $Fz = \dfrac{Vf}{n \times Z}$

Vc = **Cutting Speed (m/min)**

π = **3.14**

CED = **Cutting Diameter (mm)**

n = **Spindle Speed (rpm.)**

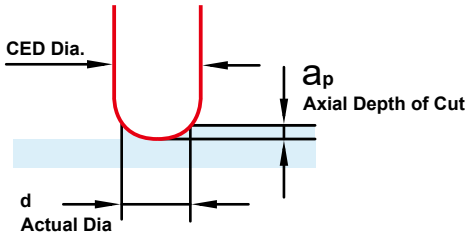
Vf = **Feed (mm/min)**

fz = **Feed per Tooth (mm/tooth)**

Z = **Number of Flute**

Calculation of actual dia. for Ball Nose

$$d = 2\sqrt{a_p\,(CED - a_p)}$$



Provide services other than End Mills

ASR Shrink Chuck Type

ASR Shrink Chuck Collant Type

ASR Shrink Chuck Curved Type

ASR Shrink Chuck Straight Shank Type

SLA End Mill Holder

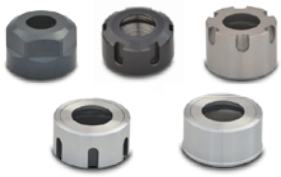
ER Spring Collet Chuck

QSK Zero Adjustable Precision Holder

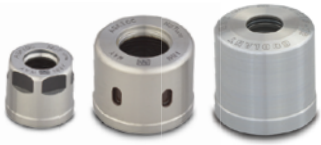
ER Spring Collet

SK High Speed Collet/ Collet Set/Extractor

ER Wrench



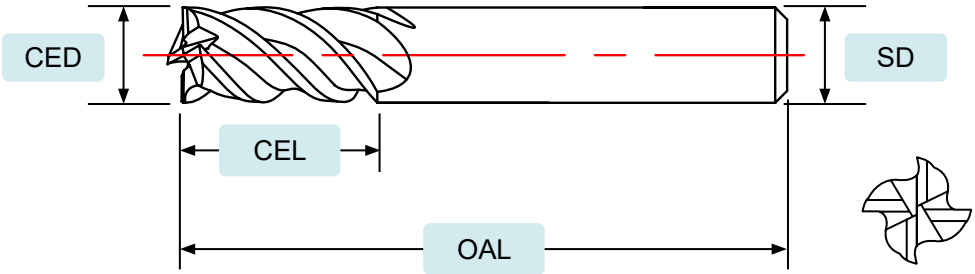
ER Clamping Nut



ASK Nut / Coolant Type

Customized Tools

Dimensions



CED : _____

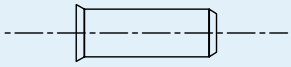
SD : _____

CEL : _____

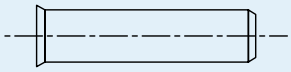
OAL : _____

Shank Type

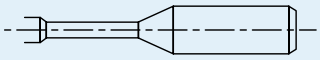
Standard



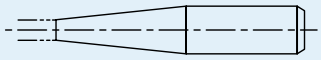
Long Shank



Long Neck



Tapered Neck



Tool Type

Square Type

Ball nose Type

Corner Radius

Material Coating

- ○ TH
- ○ TA
- ○ ____
- ○ TE
- ○ TN

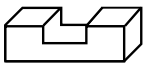
Application

workpiece material

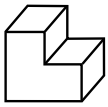
Hardness

Require quantity

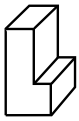
Operation



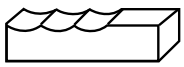
Slotting



Roughing



Finishing



Tracing

Dapth of cut: _____

Width of cut: _____

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