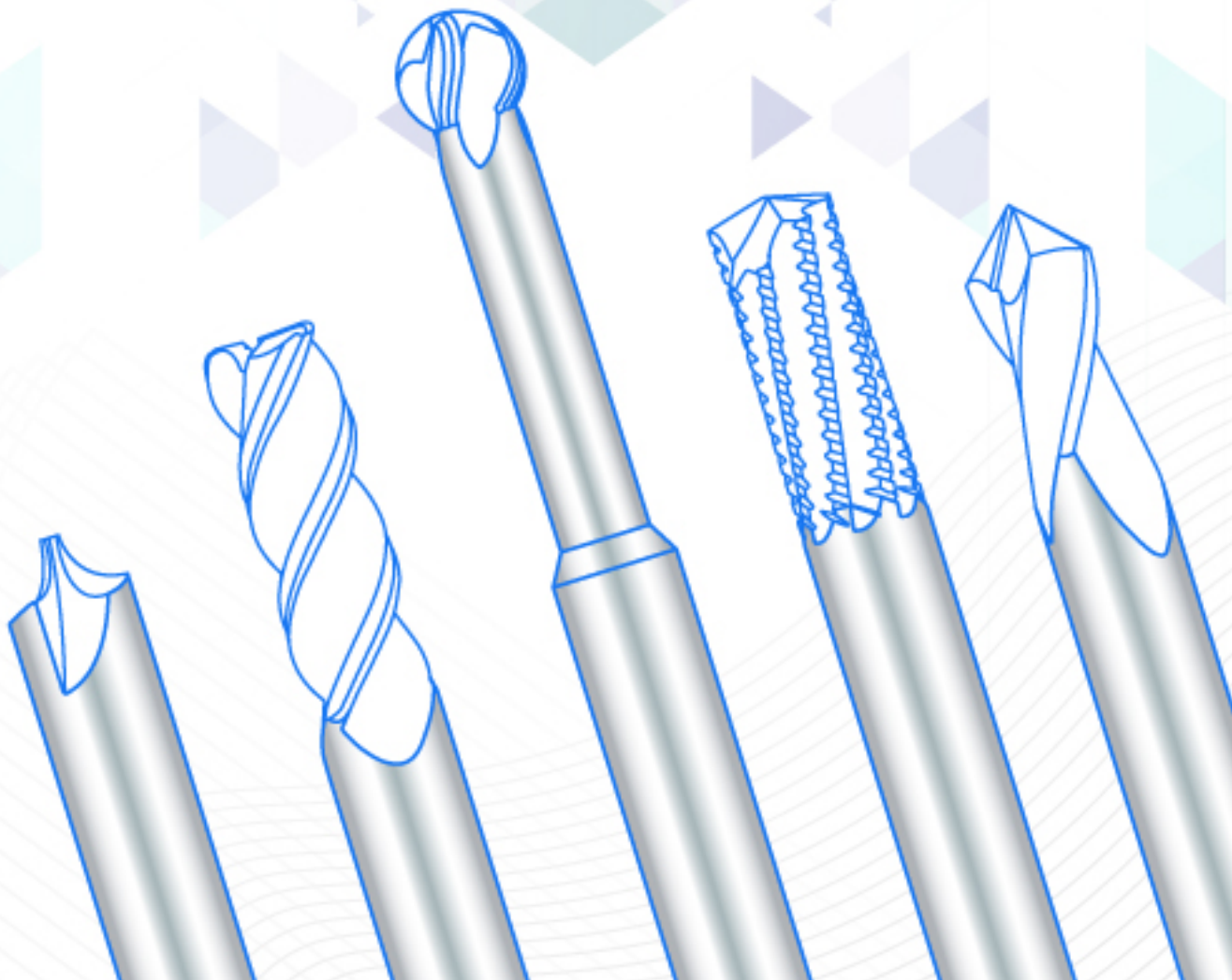




Specialized⁺ **Solid Carbide**
Series

End Mills | Drills | Chamfering



Guide Page

Carbide Material & Types of tool ①

Series ②

Code No. ③

Description ④

Icon ⑤

Diameter tolerance ⑥

Specification Table ⑦

DIN Standard ⑧

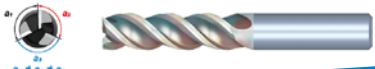
Cutting Suitability ⑨






Work Material ⑩

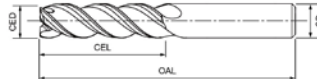
SMG Carbide - Anti-Vibration End Mill for Aluminum


AC100IER⁺ - 11433TS

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








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

(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		

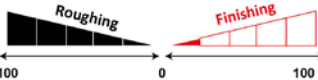
Code No.	CED	CEL	SD	OAL	Flute
AC100IER ⁺ -11433TS	3	9	6	57	3
	4	12	6	65	
	5	15	6	65	
	6	18	6	65	
	8	24	8	75	
	10	30	10	80	

Depth of cut	a_p	a_e	a_o
	1.5D	0.1D	
	1.5D	0.1D	

a_p	a_e	a_o
0.5D	1D	

Work Material

N
G6 G7
• •



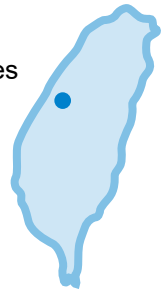
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

About Us

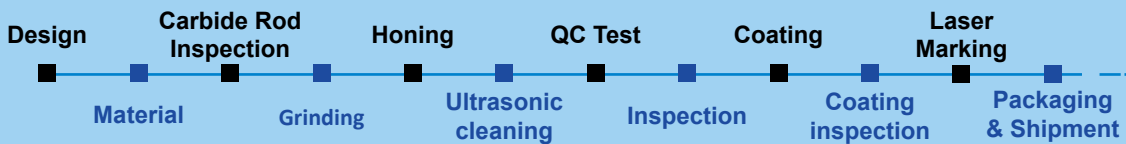
Founded in **1986**, **CITY TOOLS** is a leading solid carbide cutting tool manufacturer located in Taiwan.

ISO9001:2000 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

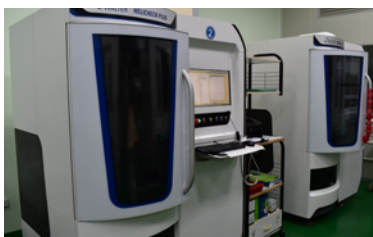
Production | *Ensure accuracy quality tools and Increase productivity*



Quality Management

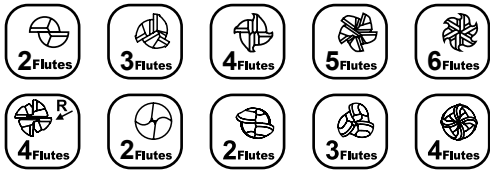
Full inspection on each tool with precised accuracy

| *100% comprehensive inspection with precised accuracy*

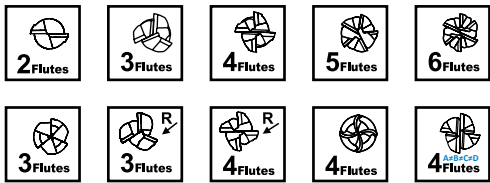


Icon Guide

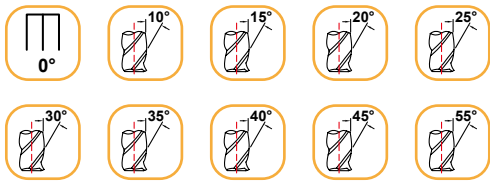
Type of Flute



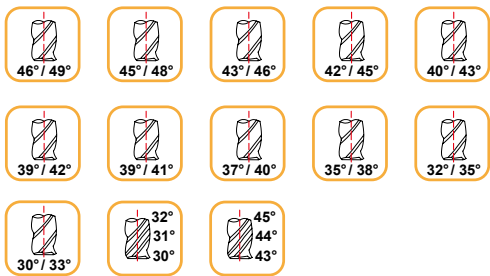
Type of Uneven Flute



Helix angle



Variable helix angle



Honing Process



Type of cutting edge



IE



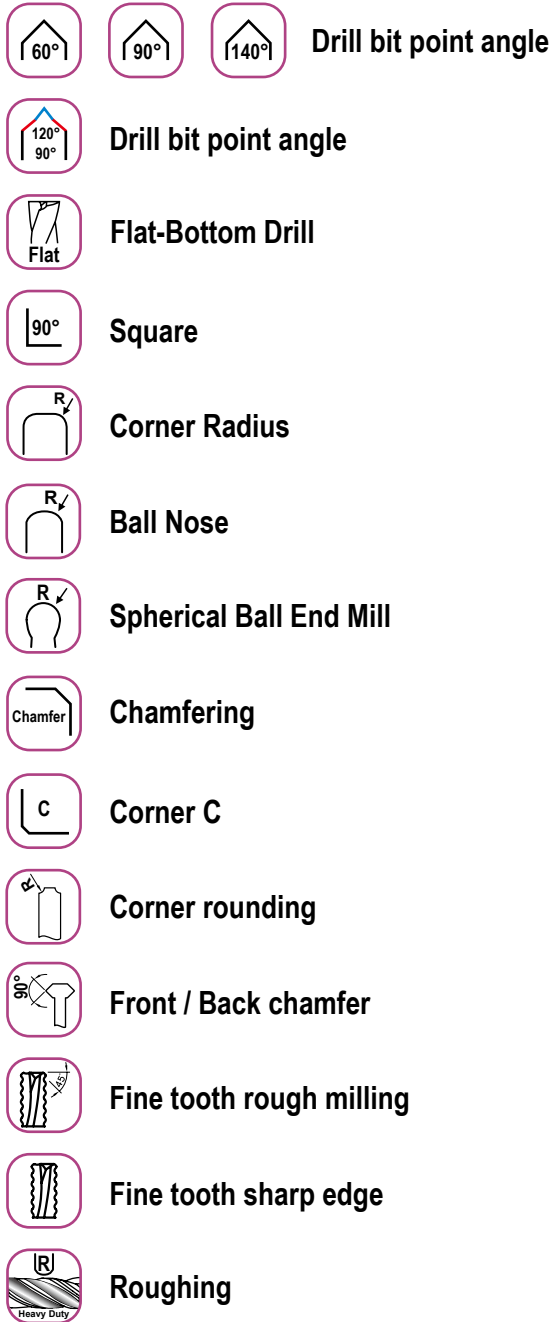
Processing direction



Work piece material hardness



Angle & Type of Cutting Edge



Icon Guide

Type of Coating



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

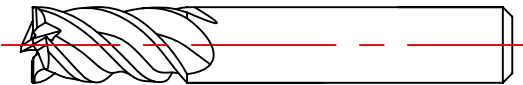
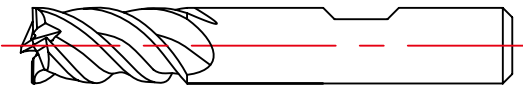
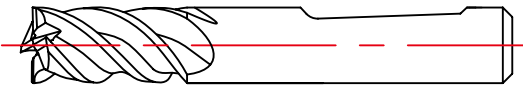
※ Actual coating color may have slight difference due to coating temperature.

Solid Carbide Material



icon	Grade	Grain size	Cobalt	Hardness
	Ultrafine Micro Grain Carbide	0.2um~0.3um	8.2%	HRA93.7
	Ultra Micro Grain Carbide	0.4um~0.5um	12%	HRA92.7
	Super Micro Grain Carbide	0.6um~0.8um	10%	HRA92.3
	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	

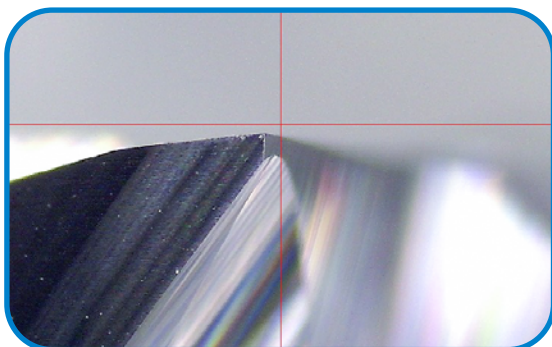
Type of cutting edge


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

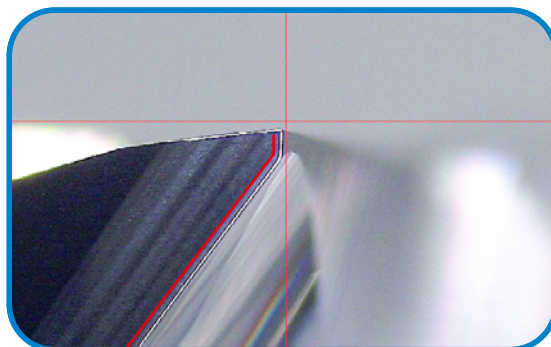
Honing Process

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



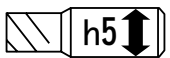
 with honing



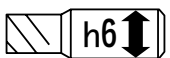
Material CHART

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

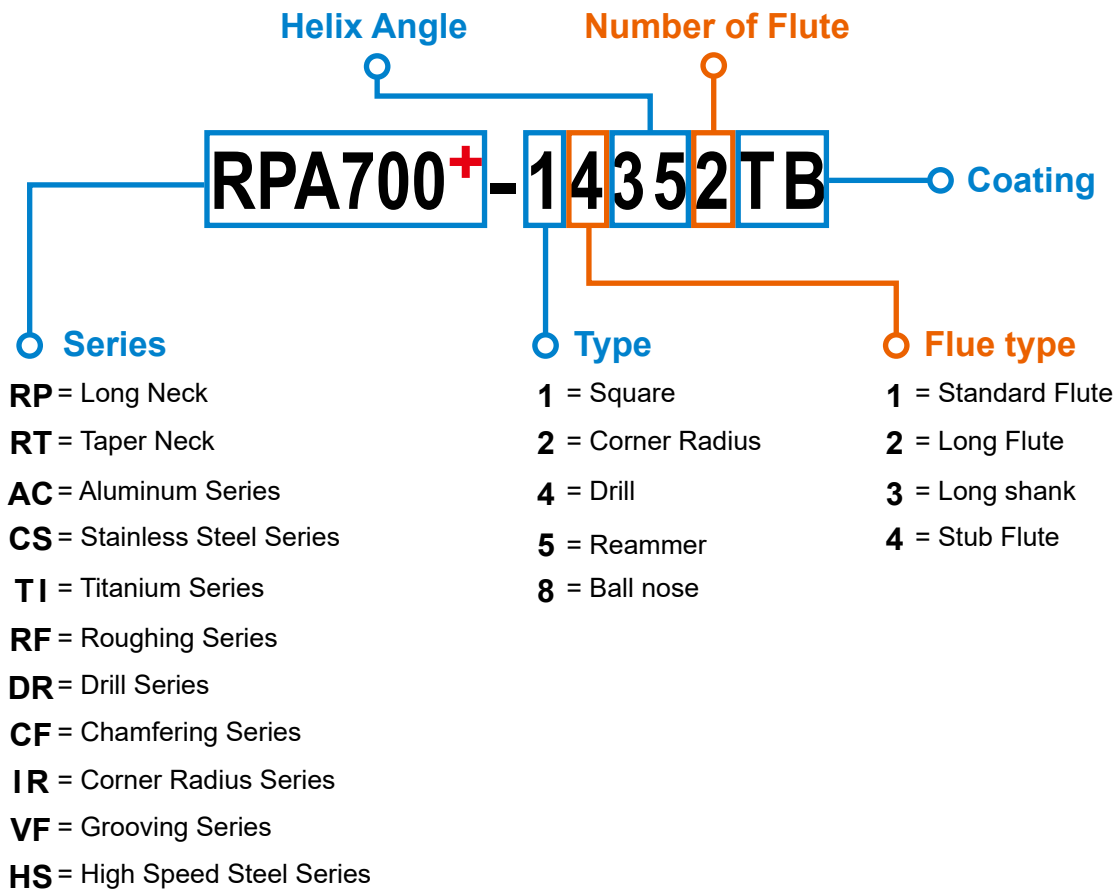


The h5 high precision tolerance, optimum concentricity and runout for precision chucks.



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

Coding Principle



A700**IE**⁺-11384TH

I = Uneven flute
E = Variable helix angle

S500**M**⁺-11302TN






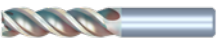







M = Miniature

AC100**RN**⁺-11403

















R = Heavy Duty Operation

N = Sharp edge













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	13
	SS100 ⁺ -84304TN	4-Flute / Spherical Ball End Mill Long Shank with Neck	2.5R~8R	15
Roughing End Mills				
	RF100IE ⁺ -11394TN	4-Flute / Fine Pitch Roughing Square Uneven Flute / Variable Helix 39°/41°	Ø6~Ø12	17
	RF100 ⁺ -11304TN	4-Flute / Fine Pitch Roughing End Mill Helix 30°	Ø5~Ø20	19
	S480 ⁺ -RF100IE- 11354TB	4-Flute / Corse Pitch Roughing Square Uneven Flute / Variable Helix 35°/38°	Ø6~Ø20	21
End Mill for Aluminum				
	AC100IER ⁺ -11433TS	3-Flute / End Mill for Aluminum Square Uneven Flute / Variable Helix 43°/44°/45°	Ø3~Ø12	23
	AC100IE ⁺ -21433TS	3-Flute / Corner Radius for Aluminum Uneven Flute / Variable Helix 43°/44°/45°	Ø3~Ø12	25
	AC100E ⁺ -81432TS	2-Flute / End Mill for Aluminum Ball Nose Variable Helix 43°/46°	Ø3~Ø12	27
	AC100IE ⁺ -11453TS	3-Flute / End Mill for Aluminum Square Uneven Flute / Variable Helix 45°/46°/47°	Ø3~Ø25	29
	AC100IEN ⁺ -11453TS	3-Flute / Sharp Edge for Aluminum Uneven Flute / Variable Helix 45°/46°/47°	Ø3~Ø12	31
Stainless Steels End Mill				
	CS100IE ⁺ -11404Z3	4-Flute / Stainless Steel End Mill Square Uneven Flute / Variable Helix 40°/43°	Ø4~Ø16	33
	CS100IE ⁺ -21404Z3	4-Flute / Corner Radius for Stainless Steel Uneven Flute / Variable Helix 40°/43°	Ø4~Ø16	35
	CS100IE ⁺ -81354Z3	4-Flute / Stainless Steel End Mill Ball Nose Uneven Flute / Variable Helix 35°/38°	2R~8R	37
End Mill for Titanium				
	TI100IE ⁺ -11454Z3	4-Flute / End Mill for Titanium Square Uneven Flute / Variable Helix 45°/48°	Ø4~Ø16	39

Specialized⁺ Series













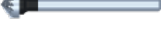
Appearance	Code No	Description	Size	Pg
	TI100IE ⁺ -21404Z3	4-Flute / Corner Radius for Titanium Uneven Flute / Variable Helix 45°/48°	Ø4~Ø16	41
	TI100IE ⁺ -81374Z3	4-Flute / End Mill for Titanium Ball Nose Uneven Flute / Variable Helix 37°/40°	2R~8R	43
End Mill for Dental				
	DT100-81302TN	2-Flute / Dental Ball Nose End Mill 4mm Shank	0.3R~1R	45
	DT100-11302TN	2-Flute / Dental Square End Mill 4mm Shank	Ø0.5~Ø2	47
	DT100-21304TN	4-Flute / Dental Corner Radius Mill 4mm Shank	Ø1~Ø2	49
	DT100-41302TN	2-Flute / Dental Drill Bits 3mm Shank	Ø0.5~Ø3	51
Flat Bottom Drill				
	DR360 ⁺ -41202TN	2-Flute / Flat Bottom Drill Bit Helix 20°	Ø6~Ø16	53
	DR365 ⁺ -41202TN	2-Flute / Flat Bottom Drill Bit Coolant Hole x 3D	Ø6~Ø16	55
Drills				
	DR300 ⁺ -41302TN	2-Flute / SMG Carbide -Drill Bit 140° tip	Ø3~Ø20	57
	DR350 ⁺ -41302TN	2-Flute / Coolant Hole Drill Bit-x 3D 140° tip	Ø1~Ø16	61
	DR350 ⁺ -42302TN	2-Flute / Coolant Hole Drill Bit-x 5D 140° tip	Ø1~Ø16	63
	DR100 ⁺ -40902TN	2-Flute / SMG Carbide -Spot Drill 90°	Ø4~Ø12	65
	DR100 ⁺ -90120TN	2-Flute / SMG Carbide- Spot Drill 90°/120°	Ø3~Ø12	67
	DR500 ⁺ -40902TN	2-Flute / SMG Carbide 90° Drill Point End Mill	Ø4~Ø12	69
	DR200 ⁺ -40602TN	2-Flute / Countersink Center Drill 60°	Ø1~Ø5	71
Corner Rounding End Mill				
	IR100 ⁺ -81003TN	3-Flute / Corner Rounding End Mill	Ø2.1~Ø12	73

Specialized⁺ Series

Appearance	Code No	Description	Size	Pg
Chamfering End Mills				
	VF100 ⁺ -11903TN	3-Flute / Front-Back Chamfer End Mill Short Type	Ø1.5~Ø12	75
	VF100 ⁺ -11903TN	3-Flute / Front-Back Chamfer End Mill Long Type	Ø3~Ø6	77
	VF100 ⁺ -11904TN	4-Flute / Front-Back Chamfer End Mill Long Type	Ø8	77
	VF100 ⁺ -11905TN	5-Flute / Front-Back Chamfer End Mill Long Type	Ø10	77
	VF100 ⁺ -11906TN	6-Flute / Front-Back Chamfer End Mill Long Type	Ø12	77
	CF400 ⁺ -40903TN	3-Flute / Carbide-Spiral Chamfer End Mill 90°	Ø4~Ø12	79
	CF300 ⁺ -40903TN	3-Flute / Carbide-Chamfer End Mill 90°	Ø4~Ø10	81
	CF300 ⁺ -40906TN	6-Flute / SMG Carbide-Chamfer End Mill V-90°	Ø4~Ø12	83
	CF300 ⁺ -41202TN	2-Flute / SMG Carbide-Chamfer End Mill V120°	Ø4~Ø10	85
	CF300 ⁺ -40602TN	2-Flute / SMG Carbide-Chamfer End Mill V-60°	Ø4~Ø10	87
	CF300 ⁺ -40902TN	2-Flute / SMG Carbide-Chamfer End Mill V-90°	Ø4~Ø10	89
Carbide Hard Cut Drill				
	HCD-Hard Cut Drill	Straight Flute / UMG Carbide Hard Cut Drill V-60°	Ø2~Ø6	91









Rotary Burrs

Specialized⁺ Series

Appearance	Code No	Description	Size	Pg
	Type-A	Type A - Cylinder / Flat End	Ø1.5~Ø25	95
	Type-B	Type B - Cylinder / with End Cut	Ø1.5~Ø25	97
	Type-C	Type C - Ball Nose Cylinder	Ø2~Ø20	99
	Type-D	Type D - Spherical Ball	Ø2~Ø25	101
	Type-E	Type E - Oval shape	Ø3~Ø20	103
	Type-F	Type F - Ball Nose Tree shape	Ø3~Ø20	105
	Type-G	Type G - Flat End Tree shape	Ø3~Ø20	107
	Type-H	Type H - Flame shape	Ø3~Ø20	109
	Type-L	Type L - Ball Nose Cone shape	Ø3~Ø20	111
	Type-M	Type M - Flat End Cone shape	Ø3~Ø16	113
	Type-N	Type N - Flat End / Inverted Cone Shape	Ø3~Ø20	115
	Type-O	Type O - Cylinder / Corner Radius End Cut	Ø3~Ø16	115
	Type-J	Type J - V Shape 60° Countersink deburring	Ø3~Ø25	117
	Type-K	Type K - V Shape 90° Countersink deburring	Ø3~Ø20	117

Router

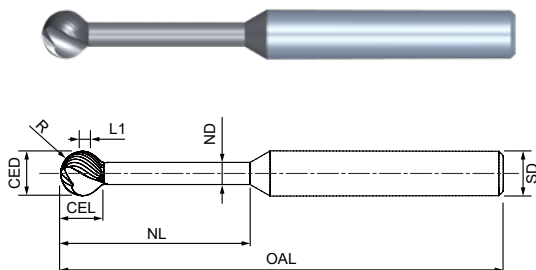
Specialized⁺ Series

Appearance	Code No	Description	Size	Pg
	FG10010	2 Flute - End Cut Helix 10° / Upcut	Ø3~Ø12	121
	FG20010	Square type - Flat End Helix 10° / Upcut	Ø3~Ø12	121
	FG30010	2 Flute - Drill Point Helix 10° / Upcut	Ø3~Ø12	122
	FG40030	Square -Burr Point Helix 30° / Upcut	Ø3~Ø12	122
	FG10030	2 Flute - End Cut Helix 30° / Upcut	Ø3~Ø12	123
	FG30030	2 Flute - Drill Point Helix 30° / Upcut	Ø3~Ø12	123
	FG500-1108	8 Flute - End Cut Helix 10° / Upcut	Ø3~Ø12	124
	FG600	2 Flute - Drill Point Helix 30° / Upcut	Ø3~Ø12	124

SMG Carbide - Spherical Ball End Mill

SS100⁺ - 84302TN

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



CED Tolerance(mm)	
R	±0.02

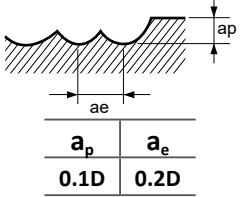
h5 (unit : mm)

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.

Recommended Cutting Condition

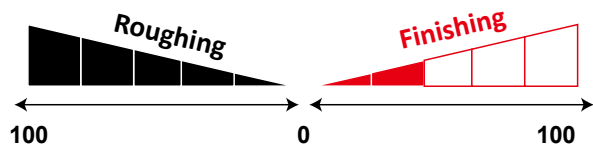
General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron																	
	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	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.1D</td><td>0.2D</td></tr> </table>		a_p	a_e	0.1D	0.2D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.08D</td><td>0.2D</td></tr> </table>		a_p	a_e	0.08D	0.2D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.05D</td><td>0.1D</td></tr> </table>		a_p	a_e	0.05D	0.1D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.1D</td><td>0.2D</td></tr> </table>		a_p	a_e	0.1D	0.2D
a_p	a_e																							
0.1D	0.2D																							
a_p	a_e																							
0.08D	0.2D																							
a_p	a_e																							
0.05D	0.1D																							
a_p	a_e																							
0.1D	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	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.05D</td><td>0.1D</td></tr> </table>		a_p	a_e	0.05D	0.1D
a_p	a_e					
0.05D	0.1D					

Work Material

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

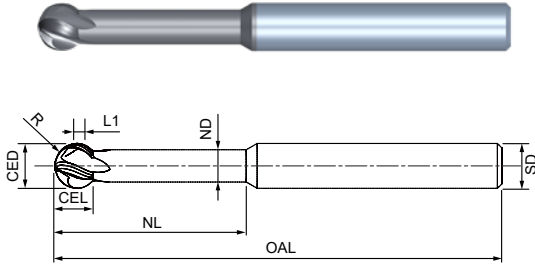


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Spherical Ball End Mill

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.

Recommended Cutting Condition

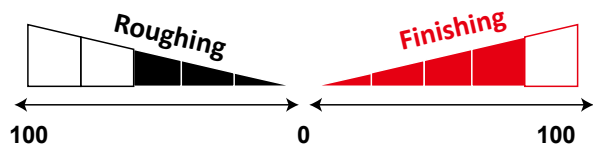
General Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron																	
	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	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.05D</td><td>0.1D</td></tr> </table>		a_p	a_e	0.05D	0.1D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.03D</td><td>0.1D</td></tr> </table>		a_p	a_e	0.03D	0.1D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.03D</td><td>0.05D</td></tr> </table>		a_p	a_e	0.03D	0.05D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.05D</td><td>0.1D</td></tr> </table>		a_p	a_e	0.05D	0.1D
a_p	a_e																							
0.05D	0.1D																							
a_p	a_e																							
0.03D	0.1D																							
a_p	a_e																							
0.03D	0.05D																							
a_p	a_e																							
0.05D	0.1D																							

Work Material	Stainless Steel Cast steel					
	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	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.03D</td><td>0.05D</td></tr> </table>		a_p	a_e	0.03D	0.05D
a_p	a_e					
0.03D	0.05D					

Work Material

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

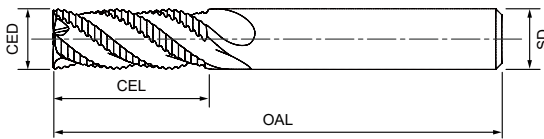
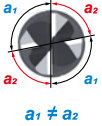


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Fine Pitch Roughing End Mill

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

(unit : mm)

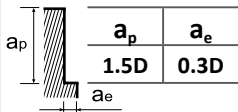
Code No.	CED	CEL	SD	OAL	Flute
RF100IE ⁺ -11394TN	6	16	6	50	4
	8	20	8	60	
	10	25	10	75	
	12	30	12	80	

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

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

Recommended Cutting Condition

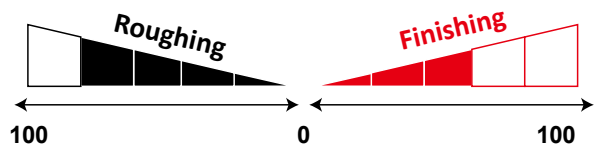
Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron																	
	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	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.3D</td></tr> </table>		a_p	a_e	1.5D	0.3D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.2D</td></tr> </table>		a_p	a_e	1.5D	0.2D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.1D</td></tr> </table>		a_p	a_e	1.5D	0.1D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.3D</td></tr> </table>		a_p	a_e	1.5D	0.3D
a_p	a_e																							
1.5D	0.3D																							
a_p	a_e																							
1.5D	0.2D																							
a_p	a_e																							
1.5D	0.1D																							
a_p	a_e																							
1.5D	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	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.1D</td></tr> </table>		a_p	a_e	1.5D	0.1D
a_p	a_e					
1.5D	0.1D					

Work Material

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

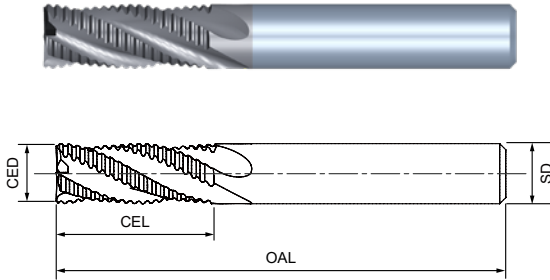


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Fine Pitch Roughing End Mill

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)

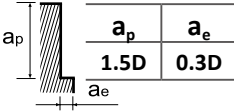
Code No.	CED	CEL	SD	OAL	Flute
RF100 ⁺ -11304TN	5	13	6	50	4
	6	16	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	80	
	14	35	16	100	
	16	40	16	100	
	18	40	20	100	
	20	45	20	100	

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

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

Recommended Cutting Condition

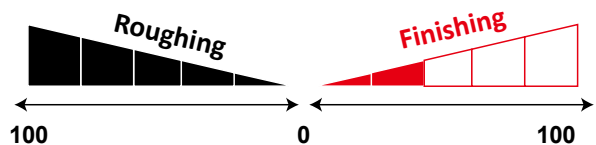
Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron																	
	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	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>1.5D</td> <td>0.3D</td> </tr> </table>		a_p	a_e	1.5D	0.3D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>1.5D</td> <td>0.2D</td> </tr> </table>		a_p	a_e	1.5D	0.2D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>1.5D</td> <td>0.1D</td> </tr> </table>		a_p	a_e	1.5D	0.1D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>1.5D</td> <td>0.3D</td> </tr> </table>		a_p	a_e	1.5D	0.3D
a_p	a_e																							
1.5D	0.3D																							
a_p	a_e																							
1.5D	0.2D																							
a_p	a_e																							
1.5D	0.1D																							
a_p	a_e																							
1.5D	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	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>1.5D</td> <td>0.1D</td> </tr> </table>		a_p	a_e	1.5D	0.1D
a_p	a_e					
1.5D	0.1D					

Work Material

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

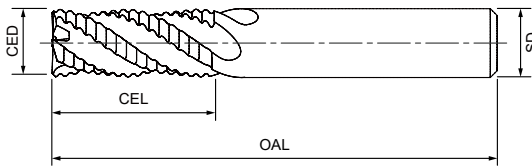


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

Solid Carbide - Coarse Pitch Roughing End Mill

S480⁺-RF100IE- 11354TB

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



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

(unit : mm)

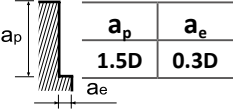
Code No.	CED	CEL	SD	OAL	Flute
S480 ⁺ -RF100IE-11354TB	6	15	6	45	4
	8	20	8	55	
	10	25	10	65	
	12	30	12	75	
	16	40	16	90	
	20	50	20	100	

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

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

Recommended Cutting Condition

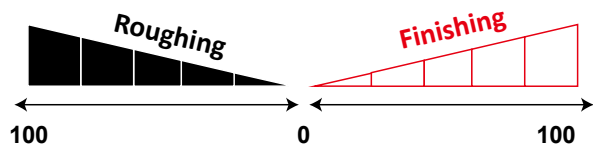
Side Milling

Work Material	Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC		Gray Cast Iron Malleable cast iron																	
	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	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.3D</td></tr> </table>		a_p	a_e	1.5D	0.3D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.2D</td></tr> </table>		a_p	a_e	1.5D	0.2D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.1D</td></tr> </table>		a_p	a_e	1.5D	0.1D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.3D</td></tr> </table>		a_p	a_e	1.5D	0.3D
a_p	a_e																							
1.5D	0.3D																							
a_p	a_e																							
1.5D	0.2D																							
a_p	a_e																							
1.5D	0.1D																							
a_p	a_e																							
1.5D	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	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.1D</td></tr> </table>		a_p	a_e	1.5D	0.1D
a_p	a_e					
1.5D	0.1D					

Work Material

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

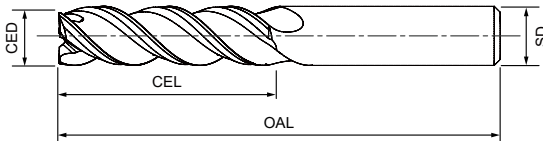
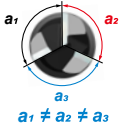


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2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.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

SMG Carbide - Anti-Vibration End Mill for Aluminum

AC100IER⁺ - 11433TS

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



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

h5 (unit : mm)

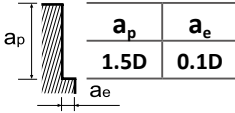
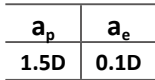
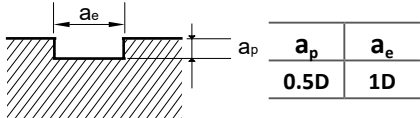
Code No.	CED	CEL	SD	OAL	Flute
AC100IER ⁺ -11433TS	3	9	4	50	3
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	

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

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

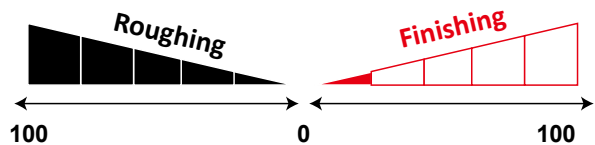
Recommended Cutting Condition

Side Milling

Work Material	Aluminium Alloy		Copper Alloy		Aluminium Alloy	
	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						

Work Material

N	
G6	G7
•	•

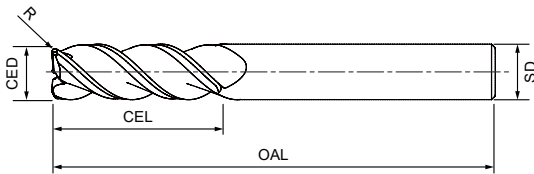
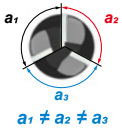


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

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

AC100IE⁺ - 21433TS

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



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

(unit : mm)

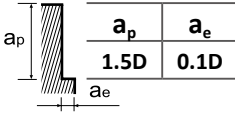
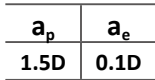
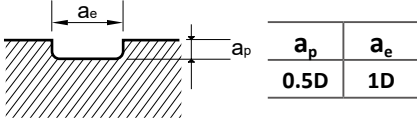
Code No.	CED	CEL	SD	OAL	Radius	Flute
AC100IE ⁺ -21433TS	3	9	4	50	0.2R	3
	4	12	4	50	0.2R	
	5	15	6	50	0.2R	
	6	18	6	50	0.2R	
	8	24	8	65	0.2R	
					0.5R	
	10	30	10	75	0.2R	
					0.5R	
12	36	12	80	0.2R		
				0.5R		

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

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

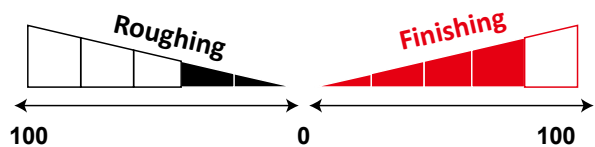
Recommended Cutting Condition

Side Milling

Work Material	Aluminium Alloy		Copper Alloy		Aluminium Alloy	
	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						

Work Material

N	
G6	G7
●	●

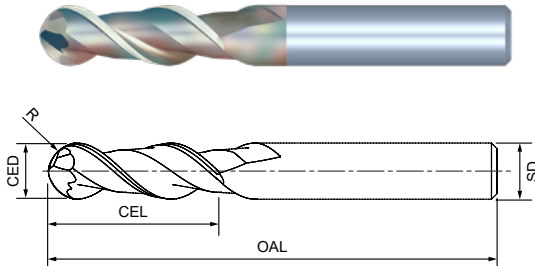


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Anti-Vibration Ball End Mill for Aluminum

AC100E⁺ - 81432TS

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



CED Tolerance(mm)	
R	±0.02

(unit : mm)

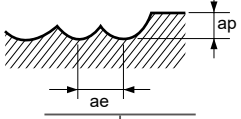
Code No.	Radius	CEL	SD	OAL	Flute
AC100E ⁺ -81432TS	1.5R	9	4	50	2
	2R	12	4	50	
	2.5R	15	6	50	
	3R	18	6	50	
	4R	24	8	65	
	5R	30	10	75	
	6R	36	12	80	

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

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

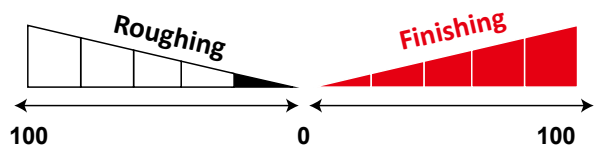
Recommended Cutting Condition

General Milling

Work Material	Aluminium Alloy Side Milling		Copper Alloy Side Milling									
	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	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.1D</td> <td>0.2D</td> </tr> </table>		a_p	a_e	0.1D	0.2D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.1D</td> <td>0.2D</td> </tr> </table>		a_p	a_e	0.1D	0.2D
a_p	a_e											
0.1D	0.2D											
a_p	a_e											
0.1D	0.2D											

Work Material

N	
G6	G7
•	•

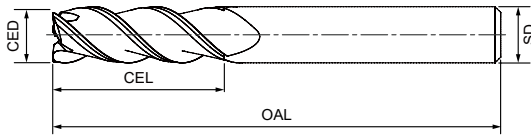
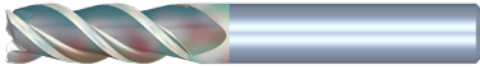
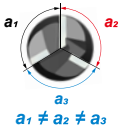


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - End Mill for Aluminum

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

(unit : mm)

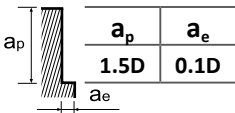
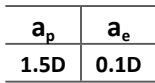
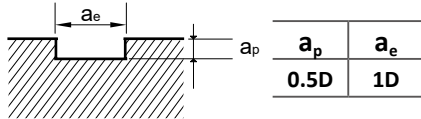
Code No.	CED	CEL	SD	OAL	Flute
AC100IE ⁺ -11453TS	3	9	4	50	3
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	
	16	48	16	100	
	20	60	20	125	
	25	75	25	150	

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

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

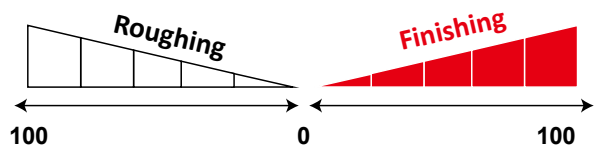
Recommended Cutting Condition

Side Milling

Work Material	Aluminium Alloy		Copper Alloy		Aluminium Alloy	
	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						

Work Material

N	
G6	G7
●	●

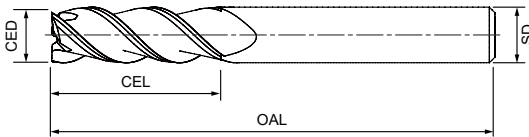
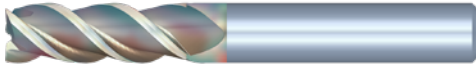
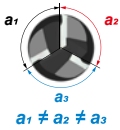


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - End Mill for Aluminum

AC100IEN⁺ - 11453TS

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



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

(unit : mm)

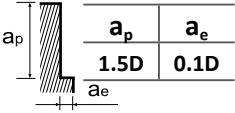
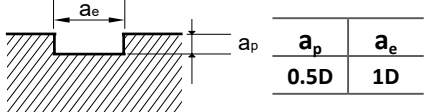
Code No.	CED	CEL	SD	OAL	Flute
AC100IEN ⁺ -11453TS	3	9	4	50	3
	4	12	4	50	
	5	15	6	50	
	6	18	6	50	
	8	24	8	65	
	10	30	10	75	
	12	36	12	80	

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

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

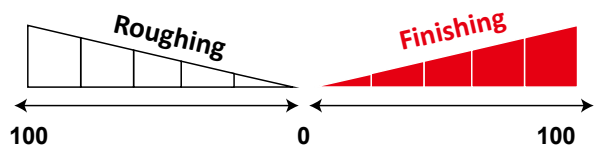
Recommended Cutting Condition

Side Milling

Work Material	Aluminium Alloy Side Milling		Copper Alloy Side Milling		Aluminium Alloy Slotting													
	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	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.1D</td></tr> </table>		a_p	a_e	1.5D	0.1D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>1.5D</td><td>0.1D</td></tr> </table>		a_p	a_e	1.5D	0.1D	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>a_p</td><td>a_e</td></tr> <tr><td>0.5D</td><td>1D</td></tr> </table>		a_p	a_e	0.5D	1D
a_p	a_e																	
1.5D	0.1D																	
a_p	a_e																	
1.5D	0.1D																	
a_p	a_e																	
0.5D	1D																	

Work Material

N	
G6	G7
●	●

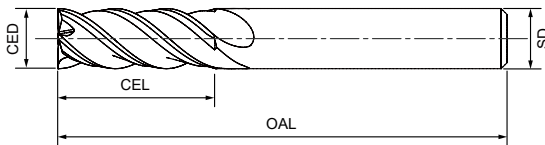
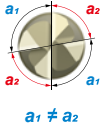


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Anti-Vibration Stainless Steel End Mill

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)

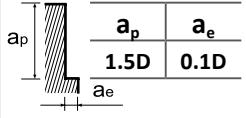
Code No.	CED	CEL	SD	OAL	Flute
CS100IE ⁺ -11404Z3	4	10	4	50	4
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

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

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

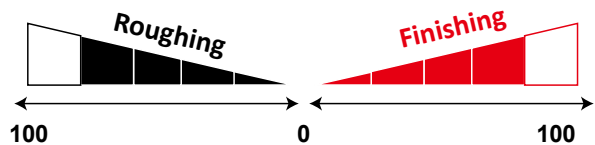
Recommended Cutting Condition

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	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>1.5D</td> <td>0.1D</td> </tr> </table>		a_p	a_e	1.5D	0.1D
a_p	a_e					
1.5D	0.1D					

Work Material

M
G4
•

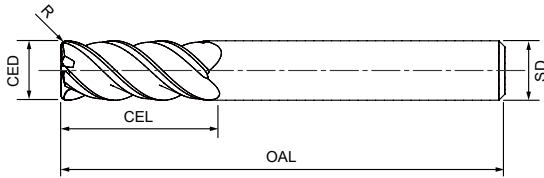
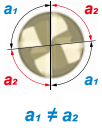


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Anti-Vibration Stainless Steel Corner Radius End Mill

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)

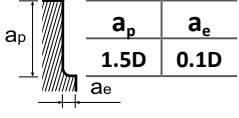
Code No.	CED	CEL	SD	OAL	Radius	Flute
CS100IE ⁺ -21404Z3	4	10	4	50	0.2R	4
	5	13	6	50	0.2R	
	6	15	6	50	0.2R	
	8	20	8	60	0.2R	
					0.5R	
	10	25	10	75	0.2R	
					0.5R	
	12	30	12	75	0.2R	
0.5R						
16	40	16	100	0.2R		
				0.5R		

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

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

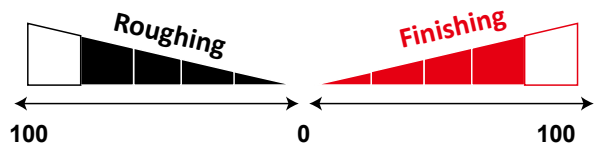
Recommended Cutting Condition

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		

Work Material

M
G4
•

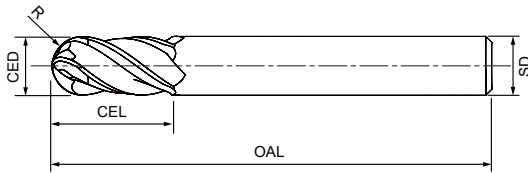
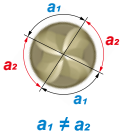


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

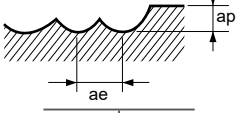
Code No.	Radius	CEL	SD	OAL	Flute
CS100IE ⁺ -81354Z3	2R	8	4	50	4
	2.5R	10	6	50	
	3R	12	6	50	
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	80	
	8R	32	16	100	

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

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

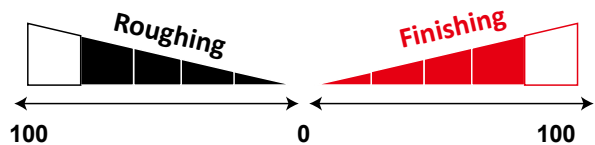
Recommended Cutting Condition

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	 <table border="1" data-bbox="339 917 492 989"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.05D</td> <td>0.1D</td> </tr> </table>		a_p	a_e	0.05D	0.1D
a_p	a_e					
0.05D	0.1D					

Work Material

M
G4
•

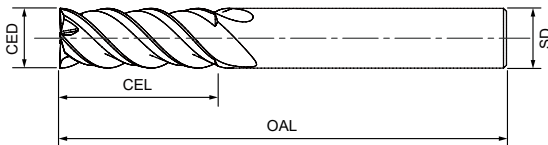
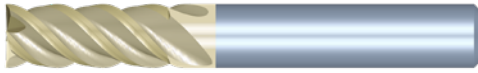
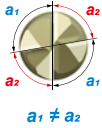


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Anti-Vibration End Mill for Titanium

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

(unit : mm)

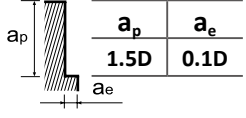
Code No.	CED	CEL	SD	OAL	Flute
T100IE ⁺ -11454Z3	4	10	4	50	4
	5	13	6	50	
	6	15	6	50	
	8	20	8	60	
	10	25	10	75	
	12	30	12	75	
	16	40	16	100	

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

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

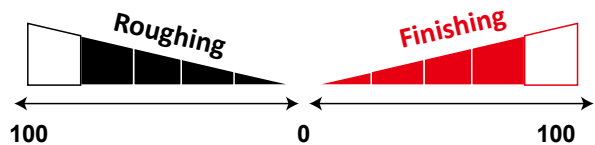
Recommended Cutting Condition

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		

Work Material

S		
G11	G12	G12
●	●	●

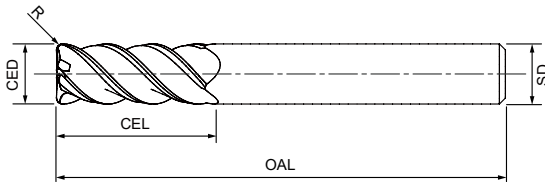
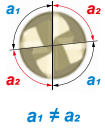


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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



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

h5 (unit : mm)

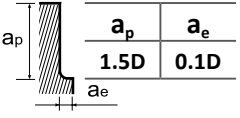
Code No.	CED	CEL	SD	OAL	Radius	Flute
T100IE ⁺ -21454Z3	4	10	4	50	0.2R	4
	5	13	6	50	0.2R	
	6	15	6	50	0.2R	
	8	20	8	60	0.2R	
					0.5R	
	10	25	10	75	0.2R	
					0.5R	
	12	30	12	75	0.2R	
0.5R						
16	40	16	100	0.2R		
				0.5R		

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

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

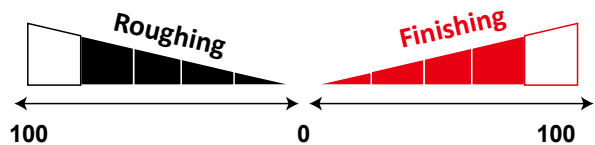
Recommended Cutting Condition

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	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>1.5D</td> <td>0.1D</td> </tr> </table>		a_p	a_e	1.5D	0.1D
a_p	a_e					
1.5D	0.1D					

Work Material

S		
G11	G12	G12
●	●	●

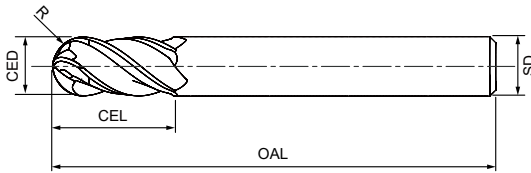
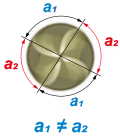


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Anti-Vibration Ball End Mill for Titanium

TI100IE⁺ - 81374Z3

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



CED Tolerance(mm)	
R	±0.02

(unit : mm)

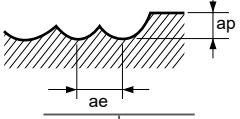
Code No.	Radius	CEL	SD	OAL	Flute
TI100IE ⁺ -81374Z3	2R	8	4	50	4
	2.5R	10	6	50	
	3R	12	6	50	
	4R	16	8	60	
	5R	20	10	75	
	6R	24	12	80	
	8R	32	16	100	

Code No.	Radius	CEL	SD	OAL	Flute
TI100IE ⁺ -81374Z3	2R	8	6	57	4
	2.5R	10	6	57	
	3R	12	6	57	
	4R	16	8	63	
	5R	20	10	72	
	6R	24	12	83	

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

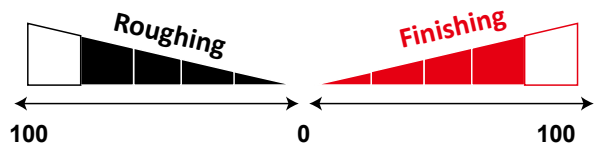
Recommended Cutting Condition

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	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.05D</td> <td>0.3D</td> </tr> </table>		a_p	a_e	0.05D	0.3D
a_p	a_e					
0.05D	0.3D					

Work Material

S		
G11	G12	G12
●	●	●

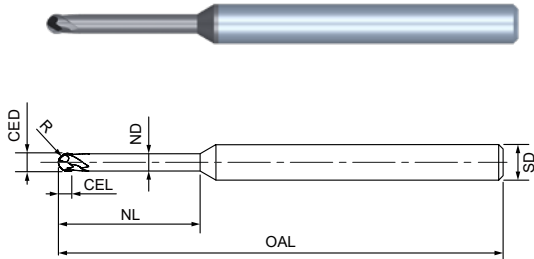


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Dental Ball End Mill

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.

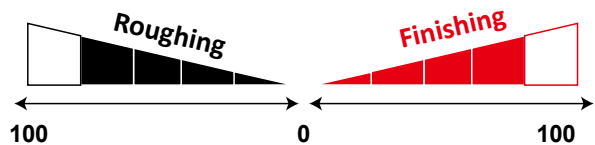
Recommended Cutting Condition

General Milling

Work Material	Titanium		Cobalt Chromium (Co-Cr) alloys		PMMA / WAX													
	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	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.05D</td> <td>0.2D</td> </tr> </table>		a_p	a_e	0.05D	0.2D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.05D</td> <td>0.2D</td> </tr> </table>		a_p	a_e	0.05D	0.2D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.05D</td> <td>0.2D</td> </tr> </table>		a_p	a_e	0.05D	0.2D
a_p	a_e																	
0.05D	0.2D																	
a_p	a_e																	
0.05D	0.2D																	
a_p	a_e																	
0.05D	0.2D																	

Work Material

G	S		
G8	G11	G12	G12
•	•	•	•

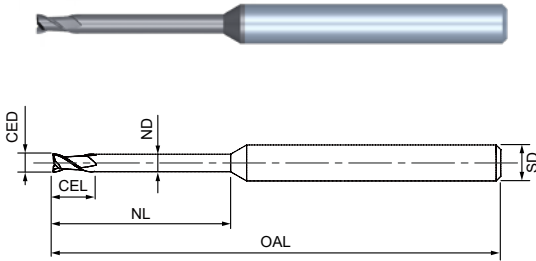


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Dental Square End Mill

DT100- 11302TN

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



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

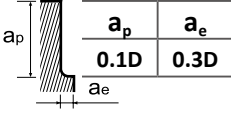
h5 (unit : mm)

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.

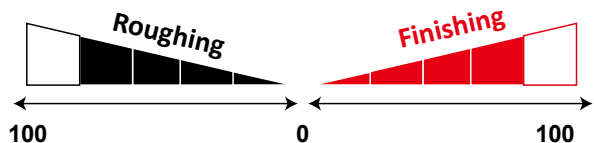
Recommended Cutting Condition

Side Milling

Work Material	Titanium		Cobalt Chromium (Co-Cr) alloys									
	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	 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.1D</td> <td>0.3D</td> </tr> </table>		a_p	a_e	0.1D	0.3D	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.1D</td> <td>0.3D</td> </tr> </table>		a_p	a_e	0.1D	0.3D
a_p	a_e											
0.1D	0.3D											
a_p	a_e											
0.1D	0.3D											

Work Material

S		
G11	G12	G12
•	•	•

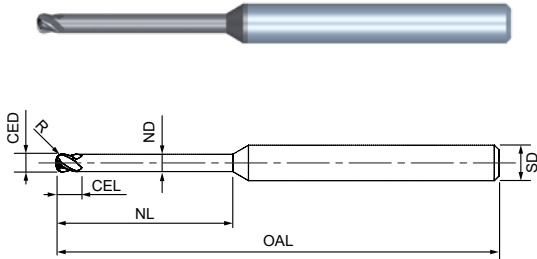


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Dental Corner Radius End Mill

DT100- 21304TN

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



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

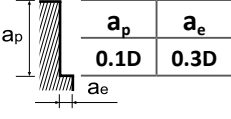
h5 (unit : mm)

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.

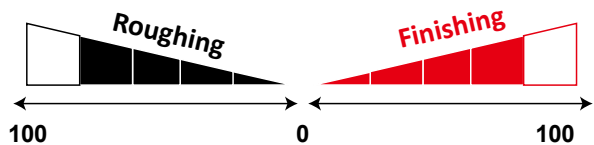
Recommended Cutting Condition

Side Milling

Work Material	Titanium		Cobalt Chromium (Co-Cr) alloys									
	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	 <table border="1" style="margin-left: 20px;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.1D</td> <td>0.3D</td> </tr> </table>		a_p	a_e	0.1D	0.3D	<table border="1" style="margin-left: 20px;"> <tr> <td>a_p</td> <td>a_e</td> </tr> <tr> <td>0.1D</td> <td>0.3D</td> </tr> </table>		a_p	a_e	0.1D	0.3D
a_p	a_e											
0.1D	0.3D											
a_p	a_e											
0.1D	0.3D											

Work Material

S		
G11	G12	G12
•	•	•

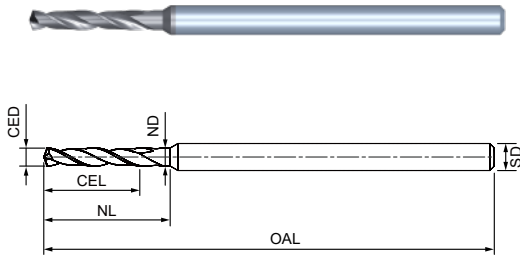


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Dental Drill Bits

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.

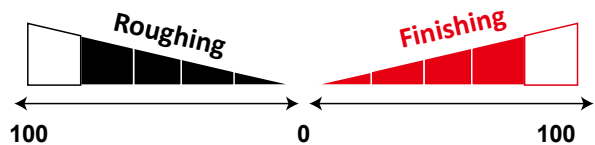
Recommended Cutting Condition

Drilling

Work Material	Titanium		Cobalt Chromium (Co-Cr) alloys	
	Cutting Condition	Speed RPM/ min	Feed mm/ min	Speed RPM/ 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
•	•	•

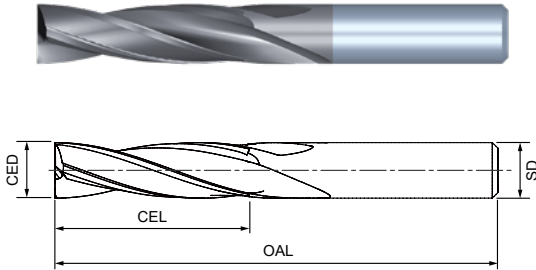


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - Flat Drill

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	6	21	6	65	2
	8	28	8	78	
	10	35	10	87	
	12	42	12	100	

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

Recommended Cutting Condition

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC	
	Speed RPM/ min	Feed mm/ rev	Speed RPM/ min	Feed mm/ rev	Speed RPM/ min	Feed mm/ rev
CED						
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	
	Speed RPM/ min	Feed mm/ rev
CED		
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

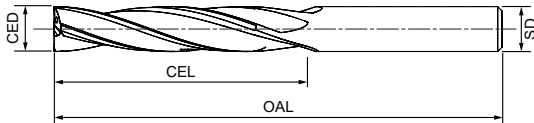
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○

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.

SMG Carbide - Coolant Hole Flat Drill

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

(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	6	26	6	65	2
	8	35	8	78	
	10	43	10	87	
	12	52	12	100	

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

Recommended Cutting Condition

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC	
	Speed RPM/ min	Feed mm/ rev	Speed RPM/ min	Feed mm/ rev	Speed RPM/ min	Feed mm/ rev
CED						
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	
	Speed RPM/ min	Feed mm/ rev
CED		
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

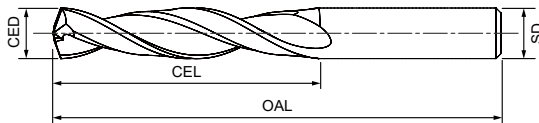
P			K	H		
G1	G2	G3	G5	G14	G15	G16
•	•	•	•	•	•	•

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.

SMG Carbide - Drill Bit

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.

SMG Carbide - Drill Bit

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		

Recommended Cutting Condition

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
CED								
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

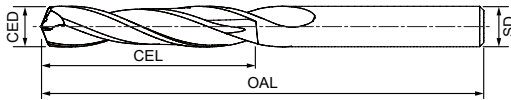
P			K	H		
G1	G2	G3	G5	G14	G15	G16
●	●	●	●	●	●	○

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.

SMG Carbide - Coolant hole Drill Bit

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.

Recommended Cutting Condition

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)
CED								
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

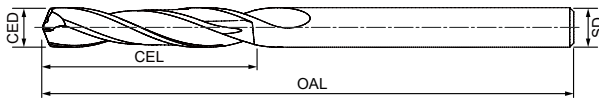
P			K	H		
G1	G2	G3	G5	G14	G15	G16
•	•	•	•	•	•	•

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.

SMG Carbide - Coolant hole Drill Bit

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.

Recommended Cutting Condition

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)	Speed RPM/ min	Feed (mm/ rev)
CED								
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

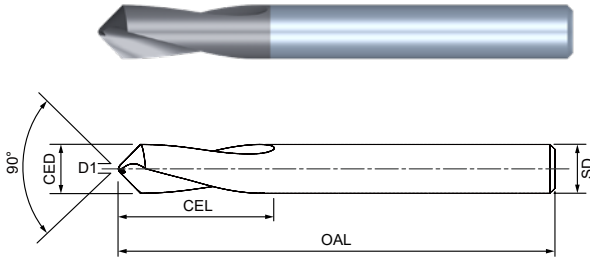
P			K	H		
G1	G2	G3	G5	G14	G15	G16
•	•	•	•	•	•	•

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.

SMG Carbide - Spot Drill

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

(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	4	12	4	55	0.4	2
	6	16	6	66	0.6	
	8	21	8	79	0.8	
	10	25	10	89	1	
	12	30	12	102	1.2	

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

Recommended Cutting Condition

Drilling

Work Material	MildSteel CarbonSteel		AlloyedSteel 25~35HRC		HardenedSteel 35~45HRC	
	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
CED						
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	
	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
CED				
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

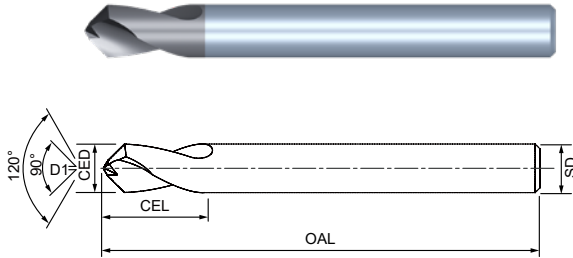
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	●	●	●	○

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.

SMG Carbide - 2-Flute Spot Drill

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	4	12	4	55	1.5	2
	6	16	6	66	2	
	8	21	8	79	2.5	
	10	25	10	89	3	
	12	30	12	102	4	

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

Recommended Cutting Condition

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC	
	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
CED						
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	
	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
CED				
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

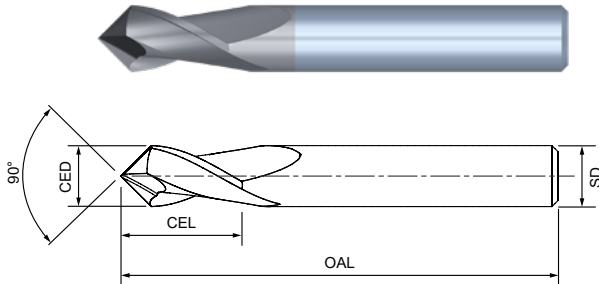
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	○	●	●	○

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.

SMG Carbide - Drill Point End Mill

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	4	12	4	55	2
	6	16	6	66	
	8	21	8	79	
	10	25	10	89	
	12	30	12	102	

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

Recommended Cutting Condition

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC	
	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
CED						
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	
	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
CED				
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

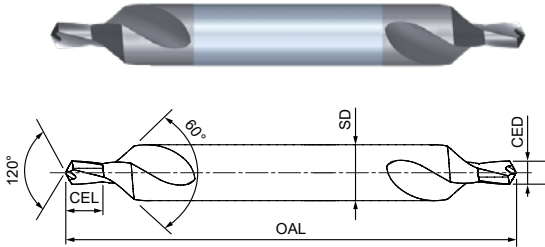
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	●	●	●	○

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2. Please select the suitable coolant fluid.
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5. If vibrations occur during cutting process, adjust and reduce the cutting speed.

SMG Carbide - Countersink Center Drill

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

(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	3	4.8	8	50	2
	4	6	10	56	
	5	7.5	12	63	

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

Recommended Cutting Condition

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC	
	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
CED						
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	
	Speed RPM/ min	Feed (mm/rev)	Speed RPM/ min	Feed (mm/rev)
CED				
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

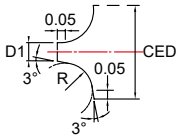
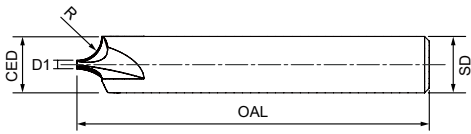
P			M	K	H		
G1	G2	G3	G4	G5	G14	G15	G16
●	●	●	○	●	●	●	○

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SMG Carbide - Corner Rounding End Mill

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	1.5	2.9	6	6	58	3
	2R	1.9	6	6	66	
	2.5R	3	8	8	66	
	3R	2.2	8	8	73	
	3.5R	2.9	10	10	75	
	4R	2.2	10	10	75	
	4.5R	2.9	12	12	76	
	5R	1.8	12	12	76	

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

Recommended Cutting Condition

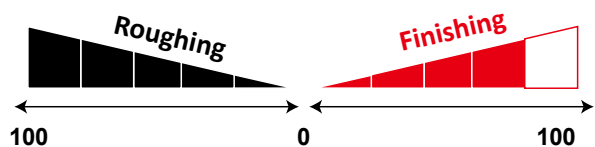
Corner Rounding

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	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	
	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
●	●	●	○	○	●	○

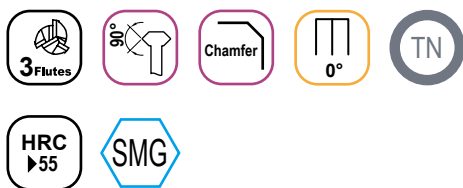
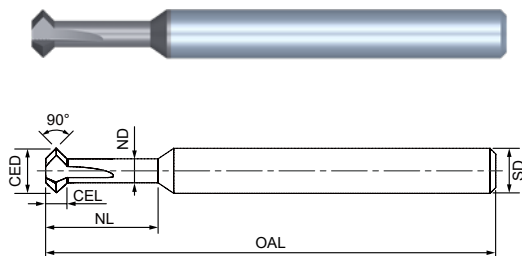


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2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and working conditions.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

SMG Carbide - Front-Back Chamfer End Mill

VF100⁺ - 11903TN

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



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

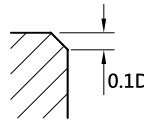
h5 (unit : mm)

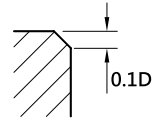
Code No.	CED	CEL	SD	OAL	NL	ND	Flute
VF100 ⁺ -11903TN	1.5	0.63	3	45	4	0.9	3
	2	0.83	3	45	5	1.2	
	2.5	1.03	3	45	6.5	1.5	
	3	1.23	3	45	7.5	1.8	
	3.5	1.5	4	45	8.5	2.1	
	4	1.7	4	53	10	2.4	
	4.5	2.1	5	53	11.5	2.5	
	5	2.3	5	53	12.5	2.8	
	5.5	2.5	6	53	13.5	3.1	
	6	2.9	6	53	15	3.2	

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

Recommended Cutting Condition

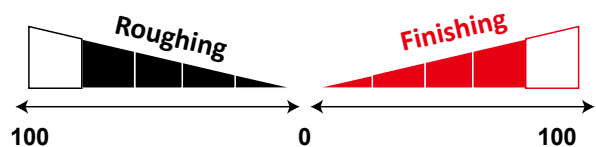
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	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
●	●	●	○	○	●	○

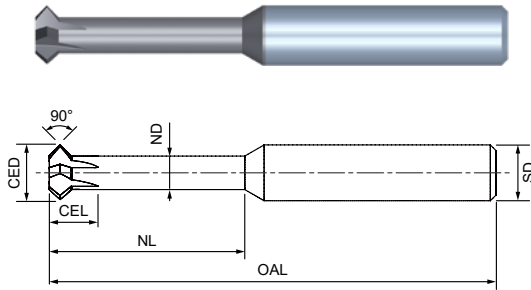


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

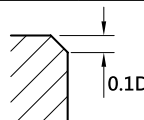
Code No.	CED	CEL	SD	OAL	NL	ND	Flute
VF100 ⁺ -11903TN	3	1.23	3	45	12	1.8	3
	3.4	1.5	4	53	14	2	
	3.5	1.5	4	53	14	2.1	
	4	1.7	4	53	16	2.4	
	4.4	2.1	5	53	18	2.4	
	4.5	2.1	5	53	18	2.5	
	5	2.3	5	53	20	2.8	
	5.5	2.5	6	65	22	3.1	
6	2.9	6	65	24	3.2		
VF100 ⁺ -11904TN	8	3.4	8	65	28	4.8	4
VF100 ⁺ -11905TN	10	3.8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

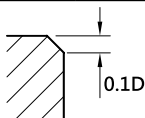
Code No.	CED	CEL	SD	OAL	NL	ND	Flute
VF100 ⁺ -11903TN	3	1.23	4	75	12	1.8	3
	4	1.7	4	75	15	2.4	
	5	2.3	5	75	18	2.8	
	6	2.9	6	100	18	3.2	
VF100 ⁺ -11904TN	8	3.4	8	100	24	4.8	4
VF100 ⁺ -11905TN	10	3.8	10	100	33	6.4	5
VF100 ⁺ -11906TN	12	4.4	12	100	42	7.8	6

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

Recommended Cutting Condition

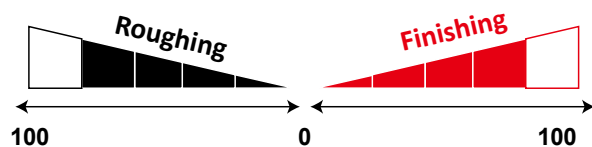
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	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
●	●	●	○	○	●	○

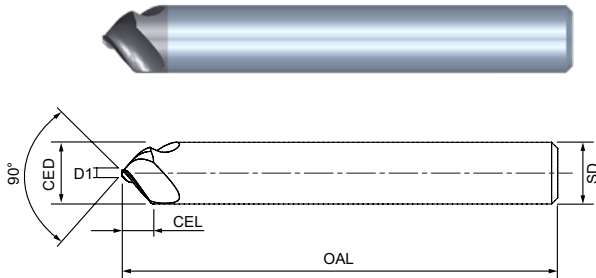


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - 3-Flute Spiral Chamfer Mill

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)

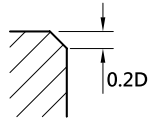
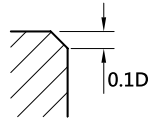
Code No.	CED	CEL	SD	OAL	D1	Flute
CF400 ⁺ -40903TN	4	1.8	4	50	0.4	3
	6	2.7	6	50	0.6	
	8	3.6	8	60	0.8	
	10	4.5	10	72	1	
	12	5.4	12	75	1.2	

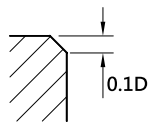
Code No.	CED	CEL	SD	OAL	D1	Flute
CF400 ⁺ -40903TN	4	1.8	4	50	0.4	3
	6	2.7	6	57	0.6	
	8	3.6	8	63	0.8	
	10	4.5	10	72	1	
	12	5.4	12	83	1.2	

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

Recommended Cutting Condition

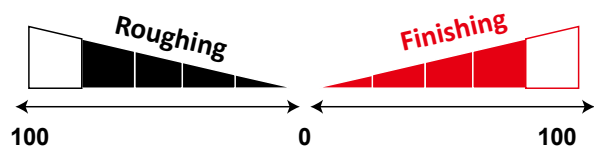
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	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	ap: 0.2D		ap: 0.1D		ap: 0.1D		ap: 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	
	Speed RPM/ min	Feed mm/ min
CED	ap: 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
●	●	●	○	○	●	●	○



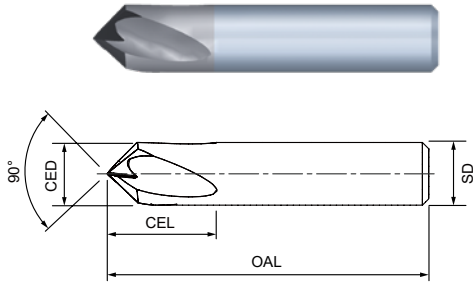
1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - 3-Flute Chamfer Mill

CF300⁺ - 40903TN

◆ 3-Flute / V 90°

◆ 45° Chamfering



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

h5 (unit : mm)

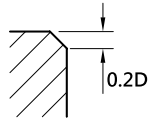
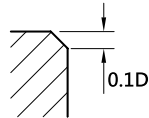
Code No.	CED	CEL	SD	OAL	Flute
CF300 ⁺ -40903TN	4	10	4	45	3
	6	10	6	45	
	8	15	8	52	
	10	15	10	52	

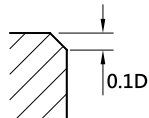
Code No.	CED	CEL	SD	OAL	Flute
CF300 ⁺ -40903TN	4	10	4	50	3
	6	10	6	57	
	8	15	8	63	
	10	15	10	72	

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

Recommended Cutting Condition

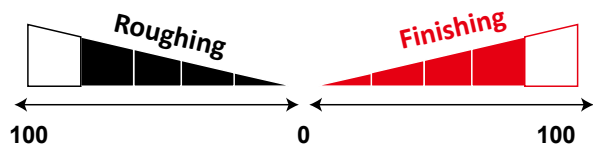
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	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
●	●	●	○	○	●	●	○

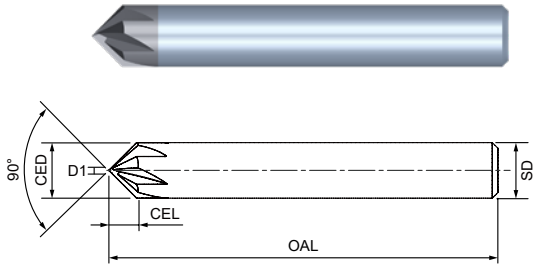


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - 6-Flute Chamfer Mill

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)

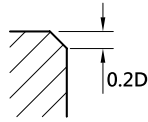
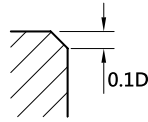
Code No.	CED	CEL	SD	OAL	D1	Flute
CF300 ⁺ -40906TN	4	1.9	4	50	0.2	6
	6	2.5	6	50	0.2	
	8	3.5	8	60	0.2	
	10	4	10	70	0.2	
	12	5	12	75	0.2	

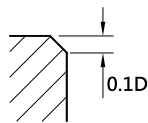
Code No.	CED	CEL	SD	OAL	D1	Flute
CF300 ⁺ -40906TN	4	1.9	4	50	0.2	6
	6	2.5	6	57	0.2	
	8	3.5	8	63	0.2	
	10	4	10	72	0.2	
	12	5	12	83	0.2	

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

Recommended Cutting Condition

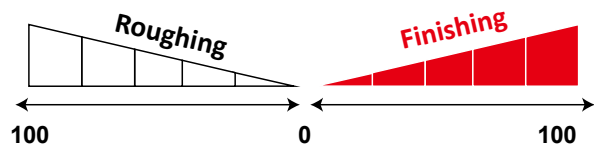
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	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	ap: 0.2D		ap: 0.1D		ap: 0.1D		ap: 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	
	Speed RPM/ min	Feed mm/ min
CED	ap: 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
●	●	●	○	○	●	●	○

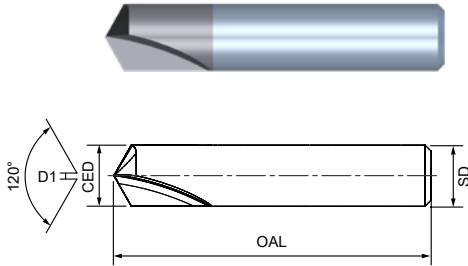


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - 2-Flute Chamfer Mill

CF300⁺ - 41202TN

- ◆ 2-Flute / V 120°
- ◆ 30° Chamfering



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

h5 (unit : mm)

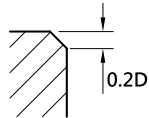
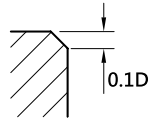
Code No.	CED	SD	OAL	D1	Flute
CF300 ⁺ -41202TN	4	4	45	0.2	2
	6	6	45	0.2	
	8	8	52	0.2	
	10	10	52	0.2	

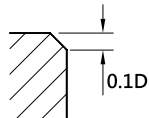
Code No.	CED	SD	OAL	D1	Flute
CF300 ⁺ -41202TN	4	4	50	0.2	2
	6	6	57	0.2	
	8	8	63	0.2	
	10	10	72	0.2	

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

Recommended Cutting Condition

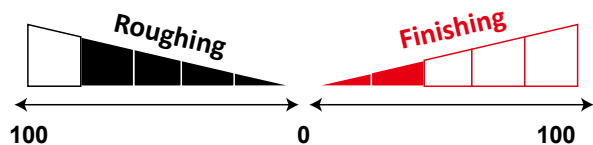
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	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	
	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
●	●	●	○	○	●	●	○

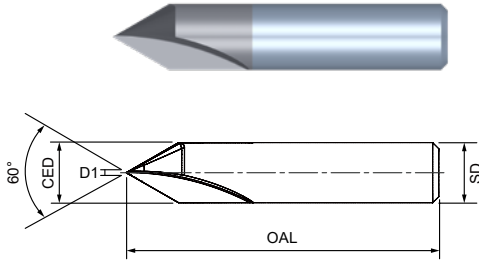


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - 2-Flute Chamfer Mill

CF300⁺ - 40602TN

- ◆ 2-Flute / V 60°
- ◆ 60° Chamfering



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

h5 (unit : mm)

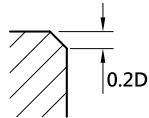
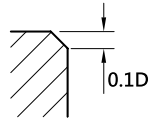
Code No.	CED	SD	OAL	D1	Flute
CF300 ⁺ -40602TN	4	4	45	0.2	2
	6	6	45	0.2	
	8	8	52	0.2	
	10	10	52	0.2	

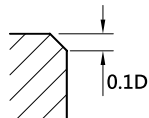
Code No.	CED	SD	OAL	D1	Flute
CF300 ⁺ -40602TN	4	4	50	0.2	2
	6	6	57	0.2	
	8	8	63	0.2	
	10	10	72	0.2	

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

Recommended Cutting Condition

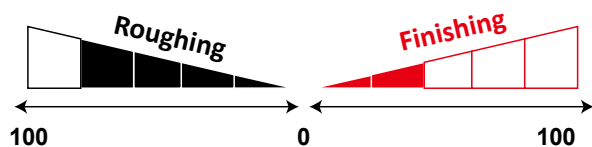
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	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	
	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
●	●	●	○	○	●	●	○

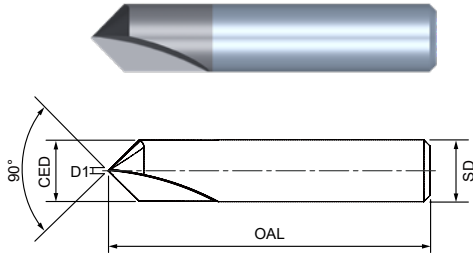


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

SMG Carbide - 2-Flute Chamfer Mill

CF300⁺ - 40902TN

- ◆ 2-Flute / V 90°
- ◆ 45° Chamfering



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

h5 (unit : mm)

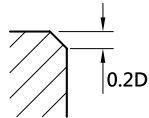
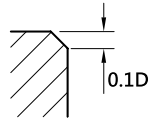
Code No.	CED	SD	OAL	D1	Flute
CF300 ⁺ -40902TN	4	4	45	0.2	2
	6	6	45	0.2	
	8	8	52	0.2	
	10	10	52	0.2	

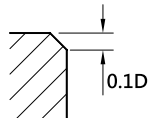
Code No.	CED	SD	OAL	D1	Flute
CF300 ⁺ -40902TN	4	4	50	0.2	2
	6	6	57	0.2	
	8	8	63	0.2	
	10	10	72	0.2	

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

Recommended Cutting Condition

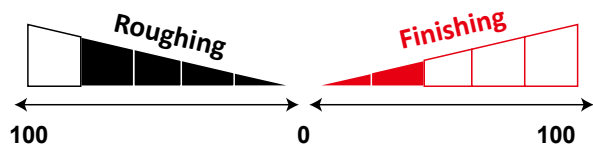
Chamfering

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Gray Cast Iron Malleable cast iron	
	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	
	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
●	●	●	○	○	●	●	○

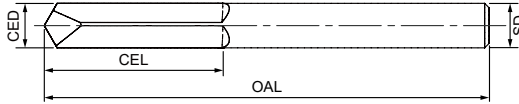


1. Please select high rigid tool holder and collet chuck during machining.
2. Please select the suitable coolant fluid.
3. For dry cutting, please use air blow for chip removal and cooling.
4. These cutting data are for reference only. Please adjust the cutting speed according to machine capability and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

UMG Carbide - Drill for removing broken taps

HCD⁺

- ◆ V 60° Drill Point / Hard Cut Drill
- ◆ For Broken Tap Removal



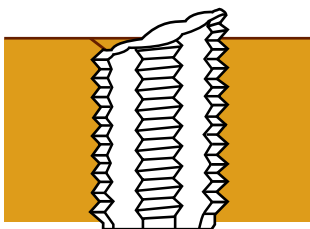
CED Tolerance(mm)	
2~3	0~-0.014
3~6	0~-0.018

h5 (unit : mm)

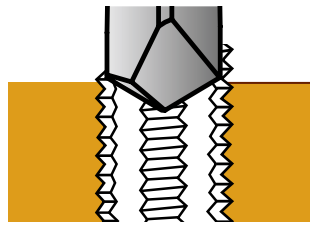
Code No.	CED	CEL	SD	OAL
Hard Cut Drill ⁺	2	10	2	30
	3	14	3	40
	4	18	4	45
	5	20	5	50
	6	28	6	60

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

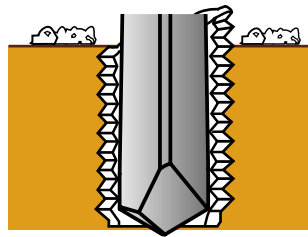
Instruction of removing broken taps/drill bit by hard cut drill.



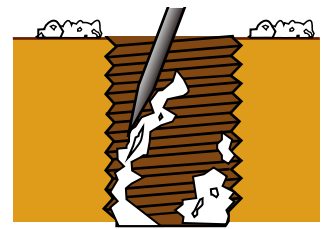
Remove or grind the taps/drill to create a flat surface as possible



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 scribe

Recommended Cutting Condition

Drilling

Work Material	Mild Steel Carbon Steel		Alloyed Steel 25~35HRC		Hardened Steel 35~45HRC		Hardened Steel 45~55HRC	
	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





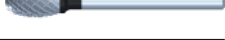




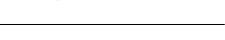

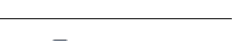
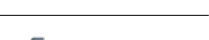

Work Material	Gray Cast Iron Malleable cast iron		Stainless Steel Cast steel	
	Speed RPM/ min	Feed mm/ min	Speed RPM/ min	Feed mm/ min
CED	Manual Feed		Manual Feed	
2	2,500	Manual Feed	1,500	Manual Feed
3	2,500	Manual Feed	1,500	Manual Feed
4	2,500	Manual Feed	1,500	Manual Feed
5	2,500	Manual Feed	1,500	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.

Industrial Grade Rotary Burrs

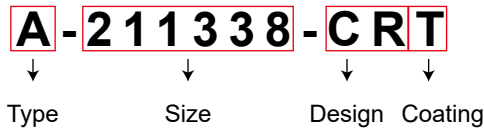
Appearance	Code No	Description	Size	Page.
	Type-A	Type A - Cylinder / Flat End	Ø1.5~Ø25	248
	Type-B	Type B - Cylinder / with End Cut	Ø1.5~Ø25	250
	Type-C	Type C - Ball Nose Cylinder	Ø2~Ø20	252
	Type-D	Type D - Spherical Ball	Ø2~Ø25	254
	Type-E	Type E - Oval shape	Ø3~Ø20	256
	Type-F	Type F - Ball Nose 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

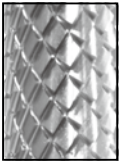
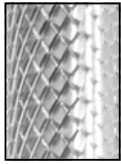
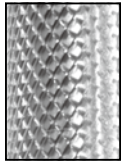
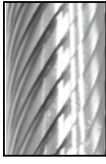
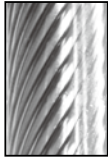
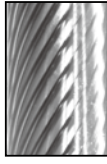
Coding Principle

Series Number

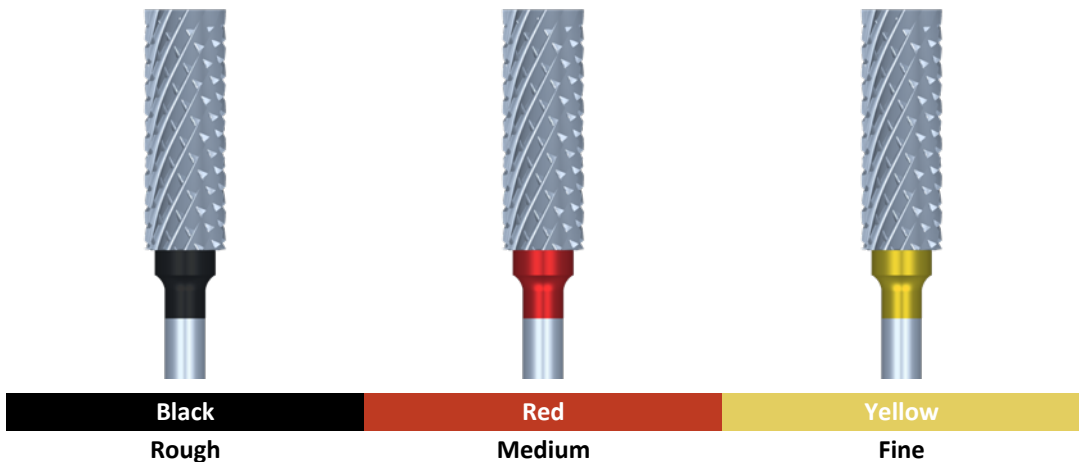
Optional Coating



Teeth Type

Double Cut Teeth			
	CR-Rough	CM-Medium	CF-Fine
Single Cut Teeth			
	SR-Rough	SM-Medium	SF-Fine

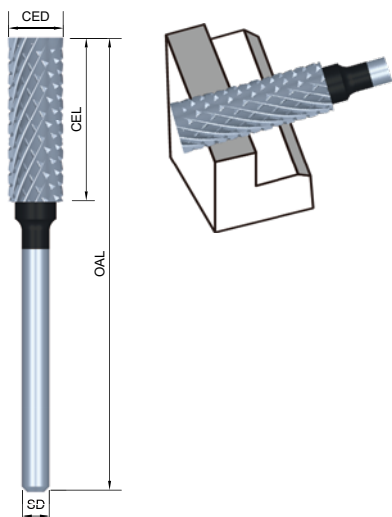
Teeth Type's Colors



Rotary Burrs

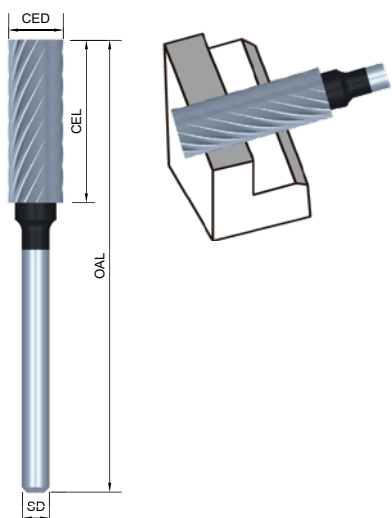
Type : A

◆ Cylinder



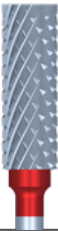
CR 1. (unit : mm)

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)

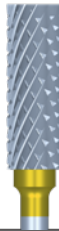
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
A-314338-SR	3	14	3	38	V	
A-618650-SR	6	18	6	50	V	
A-820665-SR	8	20	6	65		V
A-1020665-SR	10	20	6	65		V
A-1225670-SR	12	25	6	70		V
A-1625670-SR	16	25	6	70		V
A-2025670-SR	20	25	6	70		V



2. (unit : mm)

CM


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



3. (unit : mm)

CF


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



2. (unit : mm)

SM

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



3. (unit : mm)

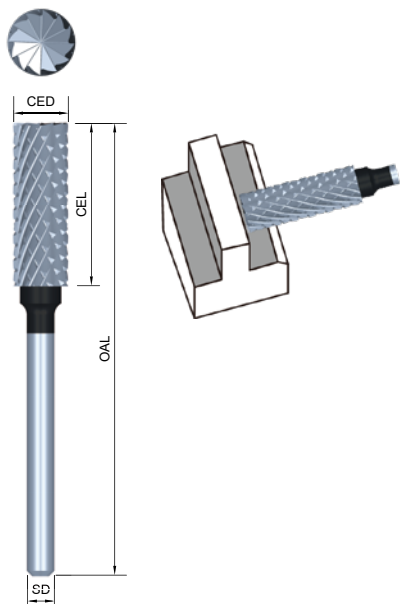
SF

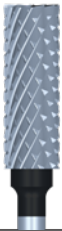
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
A-1.56338-SF	1.5	6	3	38	V	
A-211338-SF	2	11	3	38	V	
A-314338-SF	3	14	3	38	V	
A-414650-SF	4	14	6	50	V	
A-618650-SF	6	18	6	50	V	
A-820665-SF	8	20	6	65		V
A-1020665-SF	10	20	6	65		V
A-1225670-SF	12	25	6	70		V
A-1625670-SF	16	25	6	70		V

Rotary Burrs

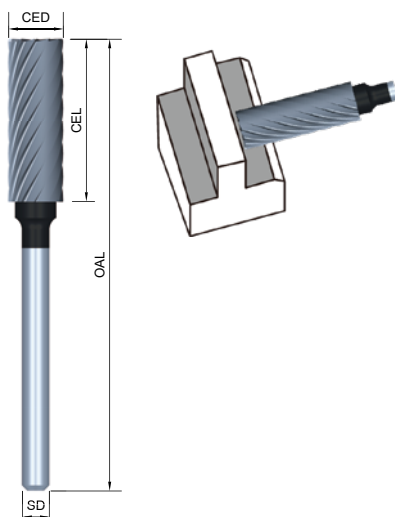
Type : B


◆ Cylinder+End Cut



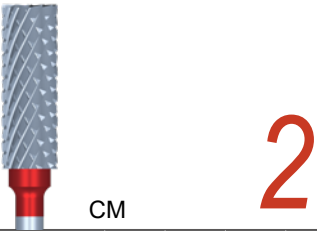

1. (unit : mm)

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



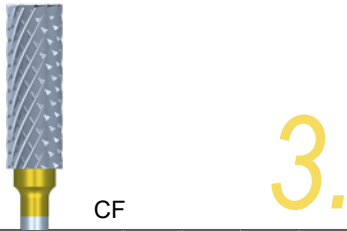

1. (unit : mm)

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



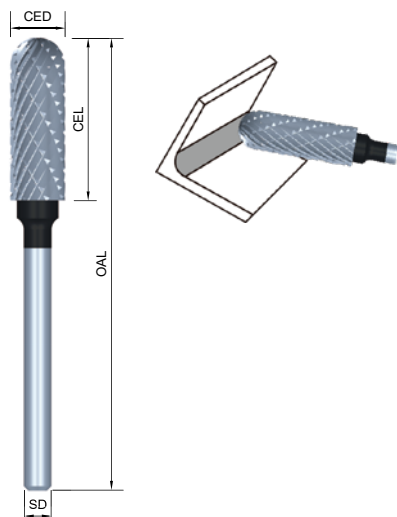
SF 3 (unit : mm)

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

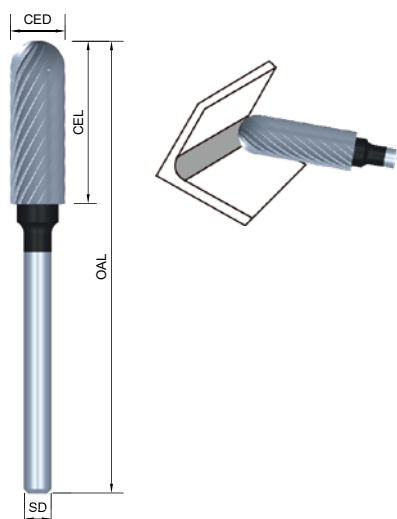
Type : C

◆ Ball Nosed Cylinder



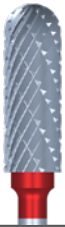
CR (unit : mm)

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



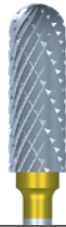
SR (unit : mm)

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




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




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



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



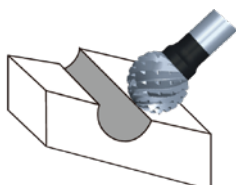
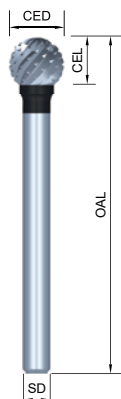
3. (unit : mm)


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**

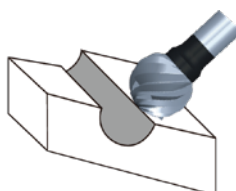
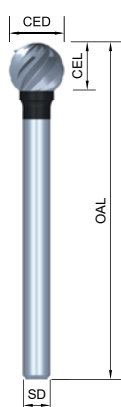
◆ Ball





1.

CR (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




1.


SR (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




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




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



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



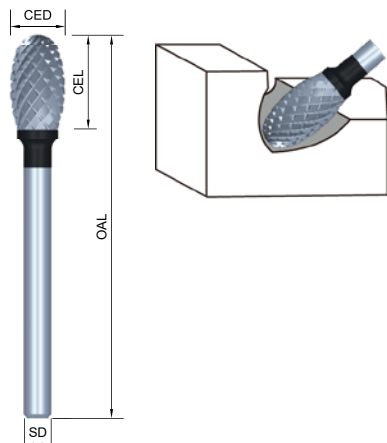
3. (unit : mm)

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**

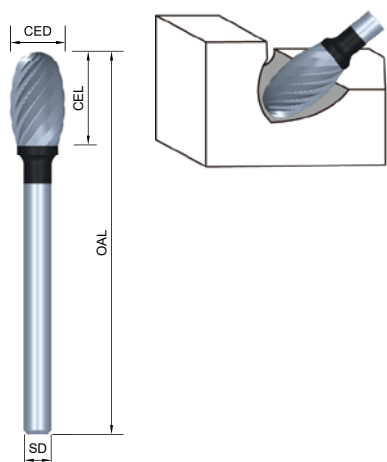
◆ Oval



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



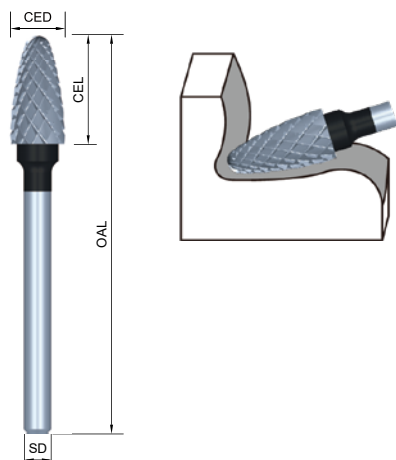
SF **3.** (unit : mm)

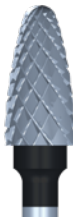
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
E-36338-SF	3	6	3	38	V	
E-610650-SF	6	10	6	50	V	
E-815665-SF	8	15	6	65		V
E-1016665-SF	10	16	6	65		V
E-1222670-SF	12	22	6	70		V
E-1625670-SF	16	25	6	70		V

Rotary Burrs

Type : F

◆ Ball Nosed Tree



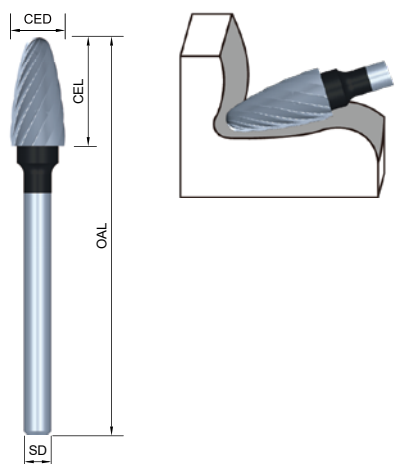



CR

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



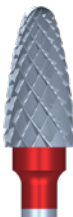


SR

1.

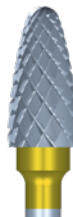
(unit : mm)

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



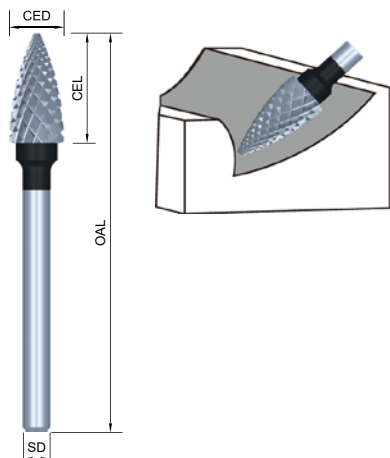
SF **3.** (unit : mm)

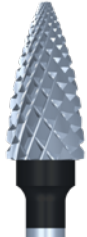
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
F-314338-SF	3	14	3	38	V	
F-618650-SF	6	18	6	50	V	
F-820665-SF	8	20	6	65		V
F-1020665-SF	10	20	6	65		V
F-1225670-SF	12	25	6	70		V
F-1625670-SF	16	25	6	70		V

Rotary Burrs

Type : **G**

◆ Tree



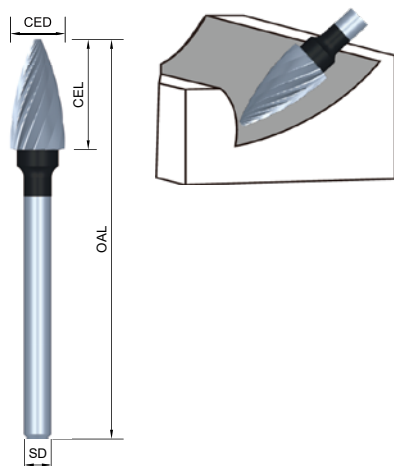



CR

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



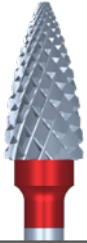


SR

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



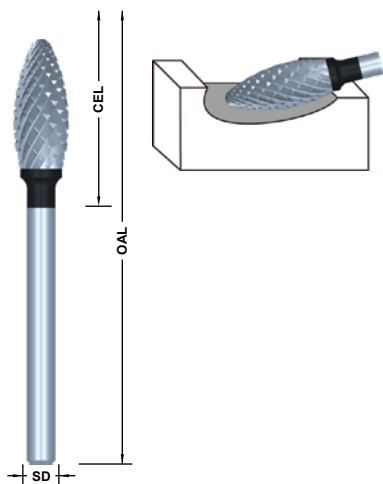
SF **3.** (unit : mm)

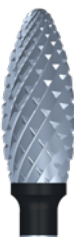
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
G-314338-SF	3	14	3	38	V	
G-618650-SF	6	18	6	50	V	
G-820665-SF	8	20	6	65		V
G-1020665-SF	10	20	6	65		V
G-1225670-SF	12	25	6	70		V
G-1625670-SF	16	25	6	70		V

Rotary Burrs

Type : **H**

◆ Flame

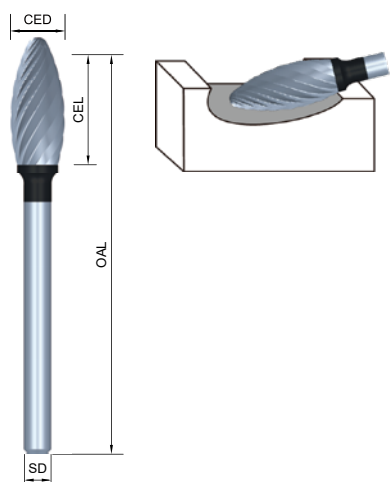





CR

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



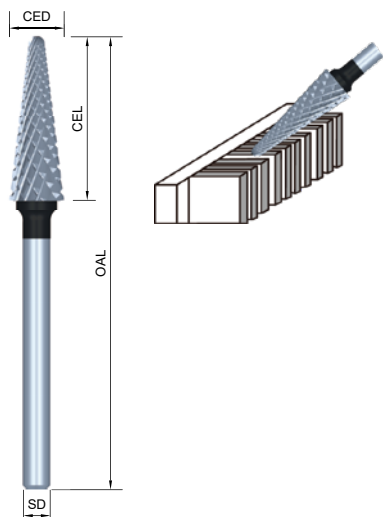
SF **3.** (unit : mm)

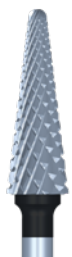
Product Model	CED	CEL	SD	OAL	Solid Carbide	Brazed
H-36338-SF	3	6	3	38	V	
H-614650-SF	6	14	6	50	V	
H-820665-SF	8	20	6	65		V
H-1020665-SF	10	20	6	65		V
H-1232677-SF	12	32	6	77		V
H-1636681-SF	16	36	6	81		V

Rotary Burrs

Type : L

◆ Ball Nosed Cone



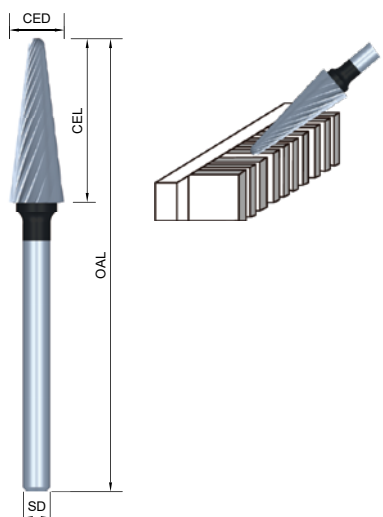



CR

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



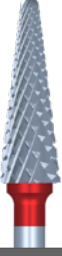


SR

1.

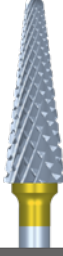
(unit : mm)

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



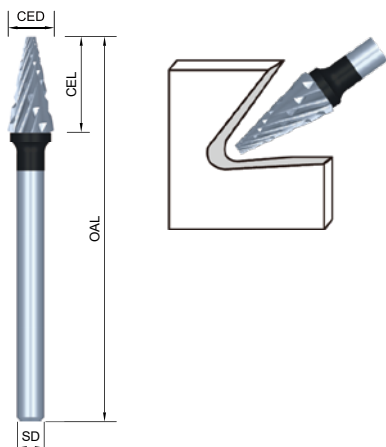
SF **3.** (unit : mm)


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

Rotary Burrs

Type : **M**

◆ Cone



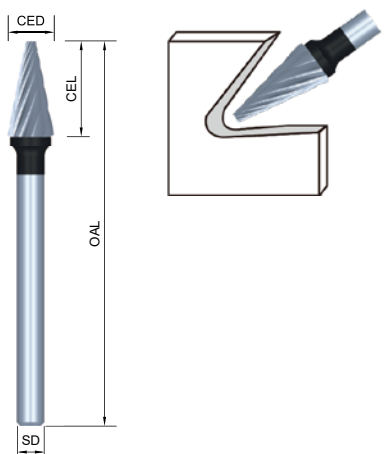



CR

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

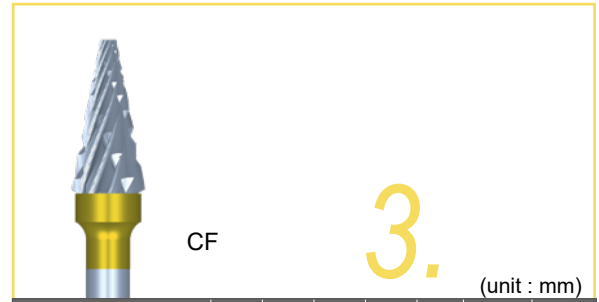


CM

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

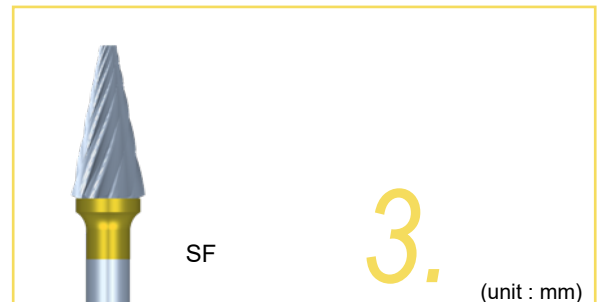


SM

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.

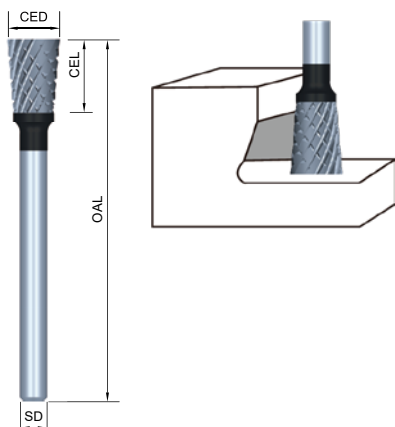
(unit : mm)

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

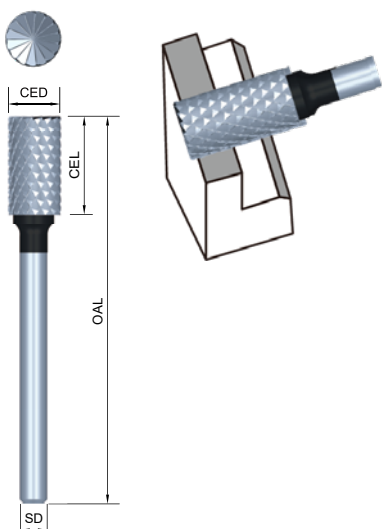
◆ Inverted Cone



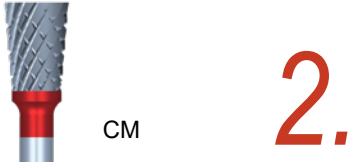
Product Model	CED	CEL	SD	OAL	a°	Solid Carbide	Brazed
N-35338-10-CR	3	5	3	38	10°	V	
N-68650-10-CR	6	8	6	50	10°	V	
N-1010665-10-CR	10	10	6	65	10°		V
N-1213665-16-CR	12	13	6	65	16°		V
N-1619665-16-CR	16	19	6	65	16°		V
N-2016665-28-CR	20	16	6	65	28°		V

Type : O

◆ Cylinder-Corner Radius



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



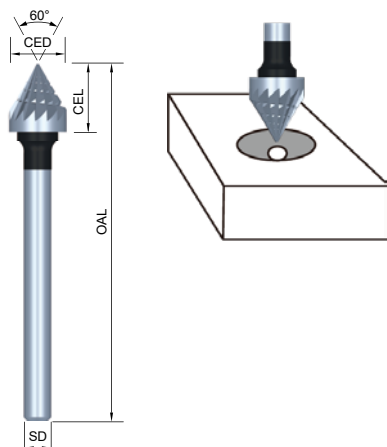
SF 3. (unit : mm)

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

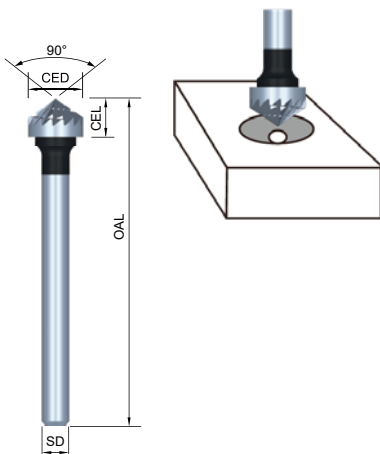
◆ Countersink 60°




Product Model	CED	CEL	SD	OAL	1. (unit : mm)	
					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°




Product Model	CED	CEL	SD	OAL	1. (unit : mm)	
					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

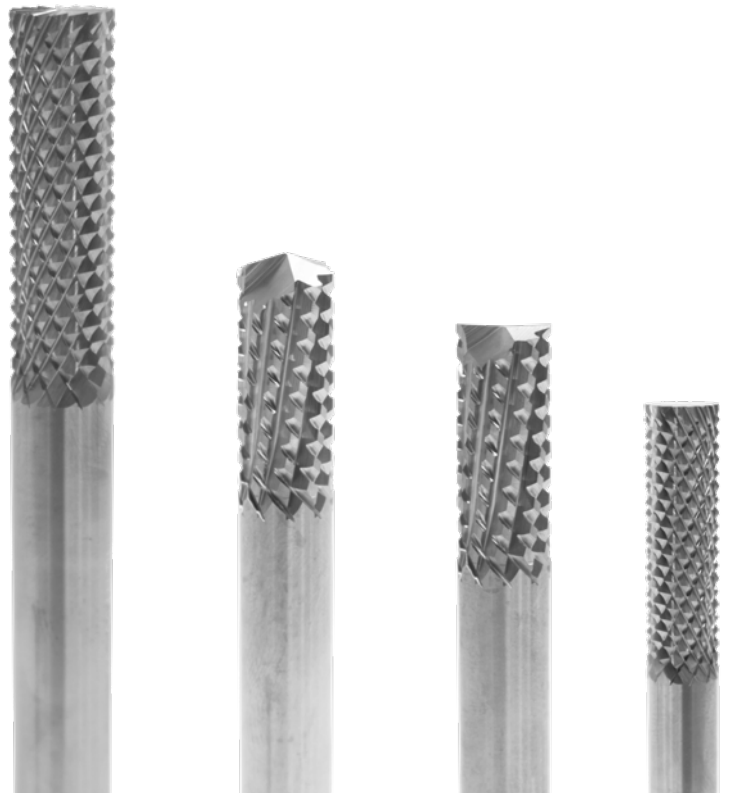


SM **2.** (unit : mm)

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



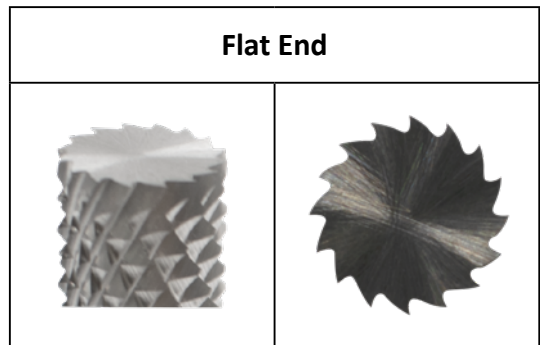
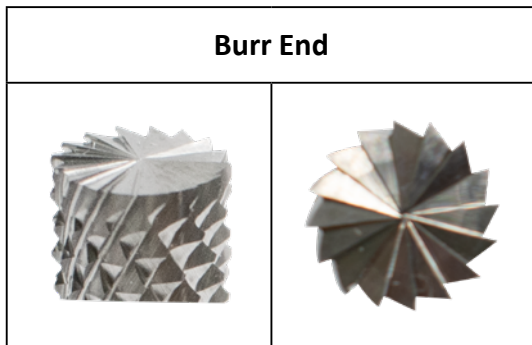
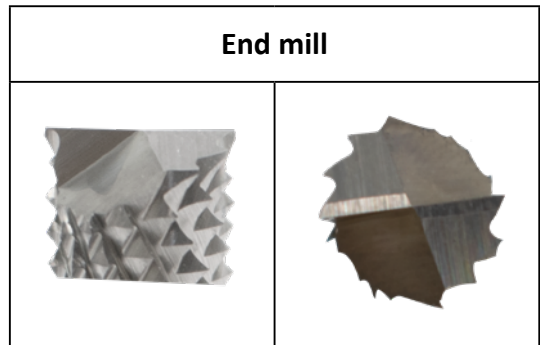
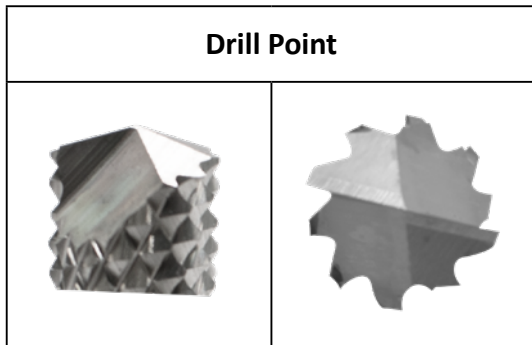
COMPOSITE FIBERGLASS



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

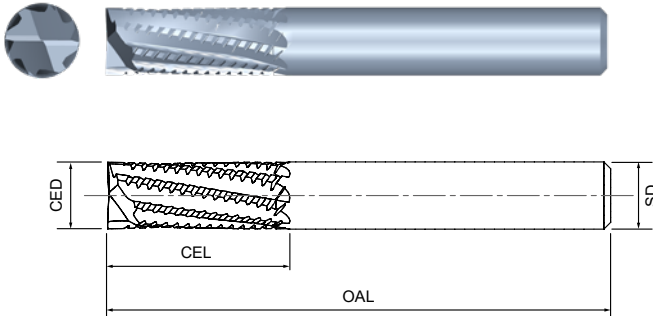
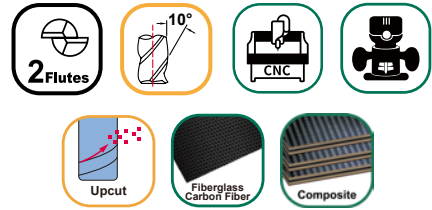
Type of End Cutting



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

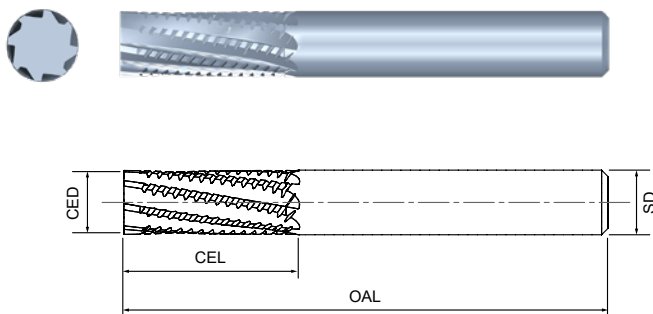
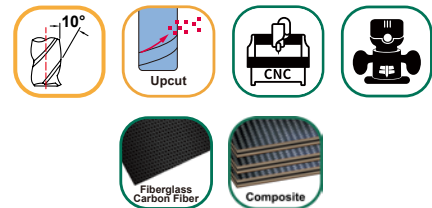
unit: inch

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

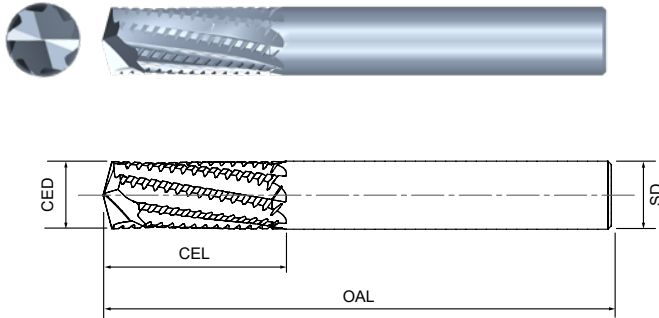
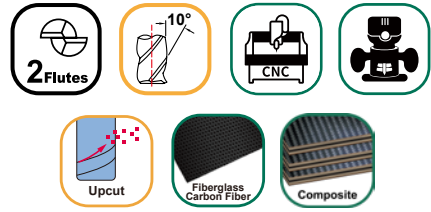
unit: inch

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

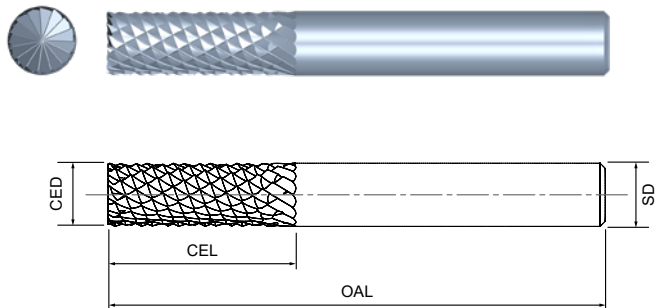
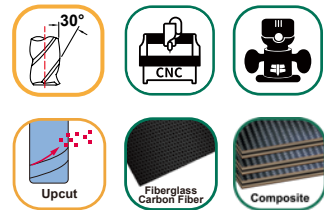
unit: inch

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

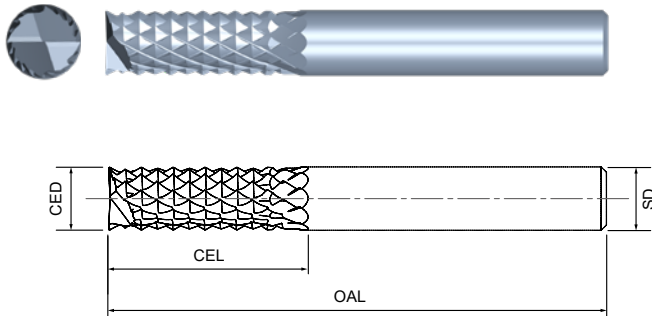
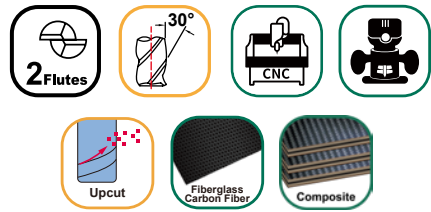
unit: inch

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

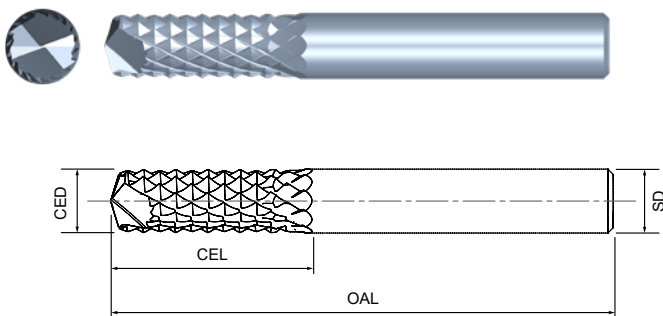
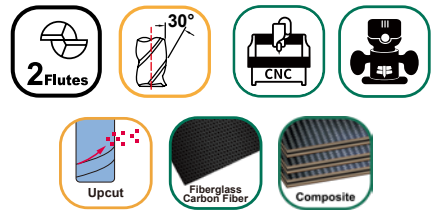
unit: inch

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

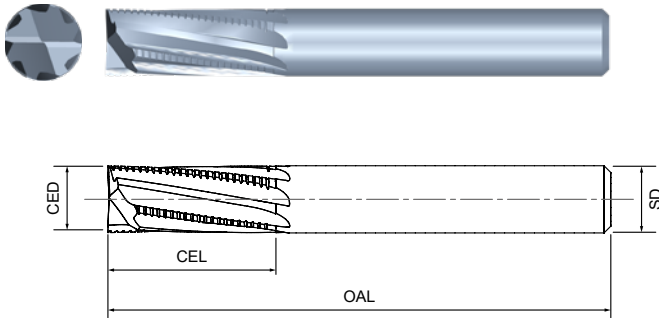
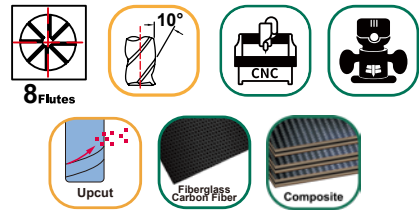
unit: inch

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

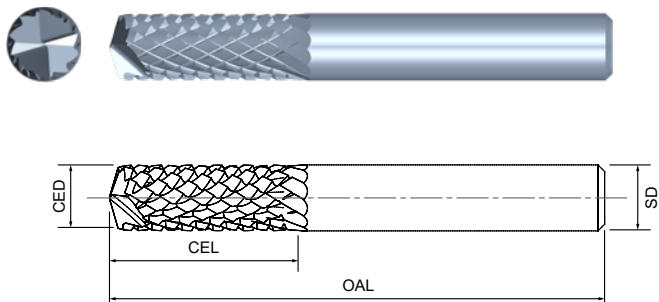
unit: inch

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