















## Variable Unequal Flute, Heavy Duty, Vibration-Suppression End Mill

			Spec.	Cutting Data
	<b>UCEM-4C</b>	Variable Unequal 4-Flute-General Economical End Mill	P6	P54
	<b>UCERM-4C</b>	Variable Unequal 4-Flute-General Economical Corner Radius End Mill	P6	P55
	<b>UHCEM-4C</b>	Variable Unequal 4-Flute-High Speed For Prehardened Steel End Mill	P7	P56
	<b>UHCERM-4C</b>	Variable Unequal 4-Flute-High Speed Corner Radius For Prehardened Steel End Mill	P7	P56
	<b>UACEM-3</b>	Variable Unequal 3-Flute-Heavy Duty Series For Non-Ferrous End Mill	P8	P57
	<b>XCE-3C</b>	3-Flute Right Left Balancing Helix For CFRP, DFRP, Aluminum End Mill	P8	--
	<b>SCE-4C</b>	4-Flute Left Hand Helix-Right Hand Cut For Non-Ferrous End Mill	P9	P58
	<b>SSCE-4</b>	Variable Unequal Super Micro Grain Carbide 4-Flute End Mill For Stainless Steel	P9	P90




## Solid Carbide End Mill

			Spec.	Cutting Data
	<b>CE-2C</b>	Fine Micro Grain Solid Carbide 2-Flute End Mill	P11	P59
	<b>CE-4C</b>	Fine Micro Grain Solid Carbide 4-Flute End Mill	P12	P59
	<b>CEM-3C</b>	Fine Micro Grain Solid Carbide 3-Flute High Helix End Mill	P13	P60
	<b>CEM-4C</b>	Fine Micro Grain Solid Carbide 4-Flute High Helix End Mill	P13	P59
	<b>CEL-2C</b>	Fine Micro Grain Solid Carbide 2-Flute End Mill Long Flute	P14	P60
	<b>CEL-4C</b>	Fine Micro Grain Solid Carbide 4-Flute End Mill Long Flute	P14	P61
	<b>CEP-2C</b>	Fine Micro Grain Solid Carbide 2-Flute End Mill Long Shank	P15	P62
	<b>CEP-4C</b>	Fine Micro Grain Solid Carbide 4-Flute End Mill Long Shank	P15	P62
	<b>CEB-2C</b>	Fine Micro Grain Solid Carbide 2-Flute Ball End Mill	P16	P63
	<b>CEB-4C</b>	Fine Micro Grain Solid Carbide 4-Flute Ball End Mill	P16	P63
	<b>CEBP-2C</b>	Fine Micro Grain Solid Carbide 2-Flute Ball End Mill Long Shank	P17	P64
	<b>CEBP-4C</b>	Fine Micro Grain Solid Carbide 4-Flute Ball End Mill Long Shank	P17	P65

## Solid Carbide End Mill

			Spec.	Cutting Data
	<b>CER-2C</b>	Fine Micro Grain Solid Carbide 2-Flute Corner Radius End Mill	P18	P66
	<b>CER-4C</b>	Fine Micro Grain Solid Carbide 4-Flute Corner Radius End Mill	P18	P66
	<b>CERP-2C</b>	Fine Micro Grain Solid Carbide 2-Flute Corner Radius End Mill Long Shank	P19	P66
	<b>CERP-4C</b>	Fine Micro Grain Solid Carbide 4-Flute Corner Radius End Mill Long Shank	P19	P66
	<b>CED-2C</b>	Fine Micro Grain Solid Carbide 2-Flute Rib Processing End Mill	P20	P67
	<b>CEDB-2C</b>	Fine Micro Grain Solid Carbide 2-Flute Rib Processing Ball End Mill	P21	P67
	<b>CEO-3C</b>	Fine Micro Grain Solid Carbide 3-Flute Roughing End Mill Fine Pitch, Round Profile	P22	P68
	<b>CEO-4C</b>	Fine Micro Grain Solid Carbide 4-Flute Roughing End Mill Fine Pitch, Round Profile	P22	P68
	<b>CT-2C</b>	Fine Micro Grain Solid Carbide 2-Flute Tapered End Mill	P23	P69
	<b>CTL-2C</b>	Fine Micro Grain Solid Carbide 2-Flute Tapered End Mill Long Flute	P24	P69
	<b>CTNB-2C</b>	Fine Micro Grain Solid Carbide 2-Flute Tapered Neck Ball End Mill	P25	P70
	<b>CE-1</b>	Fine Micro Grain Solid Carbide 1-Flute End Mill (Aluminum, Plastic, Wood)	P25	--
	<b>ACE-3</b>	Fine Micro Grain Solid Carbide 3-Flute End Mill (Aluminum, Graphite, or Non-Ferrous)	P26	P71
	<b>ACEL-3</b>	Fine Micro Grain Solid Carbide 3-Flute End Mill Long Flute (Aluminum, Graphite, or Non-Ferrous)	P26	P72
	<b>ACEB-2</b>	Fine Micro Grain Solid Carbide 2-Flute Ball End Mill (Aluminum, Copper, Graphite, or Non-Ferrous)	P27	P73

## Super Micro Grain Carbide End Mill

			Spec.	Cutting Data
	<b>HCE-2C</b>	Super Micro Grain Carbide 2-Flute End Mill	P28	P74
	<b>HCE-4C</b>	Super Micro Grain Carbide 4-Flute End Mill	P28	P74
	<b>HCEL-2C</b>	Super Micro Grain Carbide 2-Flute End Mill Long Flute	P29	P75

Spec.

Cutting Data

	<b>HCEL-4C</b>	Super Micro Grain Carbide 4-Flute End Mill Long Flute	P29	P75
	<b>HCEM-6,8C</b>	Super Micro Grain Carbide 6,8-Flute End Mill	P30	P76
	<b>HCEML-6,8C</b>	Super Micro Grain Carbide 6,8-Flute End Mill Long Flute	P30	P76
	<b>HCEB-2C</b>	Super Micro Grain Carbide 2-Flute Ball End Mill	P31	P77
	<b>HCEB-4C</b>	Super Micro Grain Carbide 4-Flute Ball End Mill	P31	P77
	<b>HCEBP-2C</b>	Super Micro Grain Carbide 2-Flute Ball End Mill Long Shank	P32	P78
	<b>HCER-4C</b>	Super Micro Grain Carbide 4-Flute Corner Radius End Mill	P32	P78
	<b>HCERP-4C</b>	Super Micro Grain Carbide 4-Flute Corner Radius End Mill Long Shank	P33	P79
	<b>HCED-2C</b>	Super Micro Grain Carbide 2-Flute Rib Processing End Mill	P33	P79
	<b>HCEDB-2C</b>	Super Micro Grain Carbide 2-Flute Rib Processing Ball End Mill	P34	P80









### Ultra Fine Micro Grain Carbide End Mill

Spec.









Cutting Data

	<b>HHCE-2C</b>	Ultra Fine Micro Grain Carbide 2-Flute End Mill	P35	P80
	<b>HHCE-4C</b>	Ultra Fine Micro Grain Carbide 4-Flute End Mill	P35	P81
	<b>HHCEL-4C</b>	Ultra Fine Micro Grain Carbide 4-Flute End Mill Long Flute	P36	P81
	<b>HHCEB-2C</b>	Ultra Fine Micro Grain Carbide 2-Flute Ball End Mill	P36	P82
	<b>HHCEB-4C</b>	Ultra Fine Micro Grain Carbide 4-Flute Ball End Mill	P37	P82
	<b>HHCEBP-2C</b>	Ultra Fine Micro Grain Carbide 2-Flute Ball End Mill Long Shank	P37	P83
	<b>HHCER-4C</b>	Ultra Fine Micro Grain Carbide 4-Flute Corner Radius End Mill	P38	P83
	<b>HHCERP-4C</b>	Ultra Fine Micro Grain 4-Flute Corner Radius End Mill Long Shank	P38	P84
	<b>HHCED-2C</b>	Ultra Fine Micro Grain Carbide 2-Flute Rib Processing End Mill	P39	P84
	<b>HHCEDB-2C</b>	Ultra Fine Micro Grain Carbide 2-Flute Rib Processing Ball End Mill	P40	P85

## HSS End Mill

			Spec.	Cutting Data
	<b>HS-2C</b>	HSS 2-Flute End Mill	P41	P86
	<b>HS-3C</b>	HSS 3-Flute High Helix End Mill	P42	P87
	<b>HS-4C</b>	HSS 4-Flute End Mill	P42	P87
	<b>HSL-2C</b>	HSS 2-Flute End Mill Long Flute	P43	P86
	<b>HSL-4C</b>	HSS 4-Flute End Mill Long Flute	P44	P87
	<b>HSB-2C</b>	HSS 2-Flute Ball End Mill	P44	--
	<b>HSR-4C</b>	HSS Roughing End Mill Fine Pitch, Round Profile	P45	P88
	<b>HSRL-4C</b>	HSS Roughing End Mill Long Flute Fine Pitch, Round Profile	P45	P88

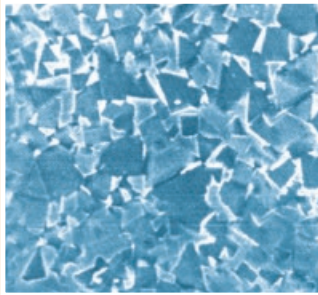
## Super Micro Grain Carbide End Mill (Special Milling Cutter)

			Spec.	Cutting Data
	<b>CCA</b>	Fine Micro Grain Solid Carbide 2-Flute Multi Function End Mill	P46	--
	<b>CDA</b>	Fine Micro Grain Solid Carbide 2-Flute Position Sport Drill/NC Drill	P47	--
	<b>MRM</b>	Solid Carbide Machine Reamer, Straight Shank H7	P48	P91
	<b>SX</b>	Changeable Head Into Anti-Vibration Bar For Longer Length	P49	
	<b>Solid Carbide Anti-Vibration Bar For Ex-Changeable Tools Head Holder</b>		P50	
	<b>Solid Carbide Extension Collet Chuck Holder</b>		P51	
	<b>End Mill Re-Sharpener</b>		P52/P53	
	<b>Special Made Step Drill &amp; End Mill Inquiry Form</b>		P92	



# Material

ISO-Range: K30~K40



### Chemical Data

Co (%) : 10  
WC incl.Dopling (%) : 90

### Physical Data

Density (g/cm<sup>3</sup>) : 14.5

### Hardness

HV30 (N/mm<sup>2</sup>) : 1610  
HRA : 92.1

### Transverse Rupture Strength

(N/mm<sup>2</sup>) : >3600

### Metallographic Data

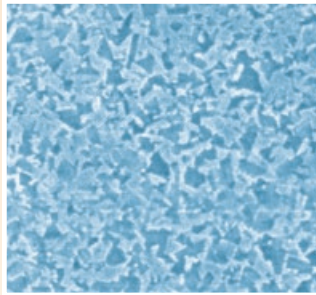
#### Porosity

<10μm A : ≤02  
>10μm B : ○○  
C : ○○

#### Microstructure

Tungsten Carbide α : Ø06μm  
Binding Phase β : unif.distr.  
Mixed Carbide γ : —  
Eta Phase η : —

ISO-Range: K20~K30



### Chemical Data

Co (%) : 12  
WC incl.Dopling (%) : 87

### Physical Data

Density (g/cm<sup>3</sup>) : 13.9

### Hardness

HV30 (N/mm<sup>2</sup>) : 1700  
HRA : 92.4

### Transverse Rupture Strength

(N/mm<sup>2</sup>) : >3900

### Metallographic Data

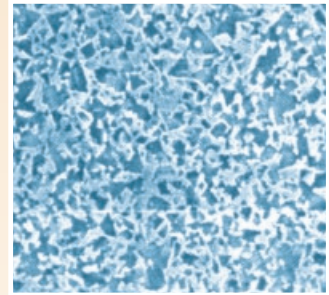
#### Porosity

<10μm A : ≤02  
>10μm B : ○○  
C : ○○

#### Microstructure

Tungsten Carbide α : Ø04μm  
Binding Phase β : unif.distr.  
Mixed Carbide γ : —  
Eta Phase η : —

ISO-Range: K40~K50



### Chemical Data

Co (%) : 9  
WC incl.Dopling (%) : 91

### Physical Data

Density (g/cm<sup>3</sup>) : 14.3

### Hardness

HV30 (N/mm<sup>2</sup>) : 1950  
HRA : 93.7

### Transverse Rupture Strength

(N/mm<sup>2</sup>) : >3900

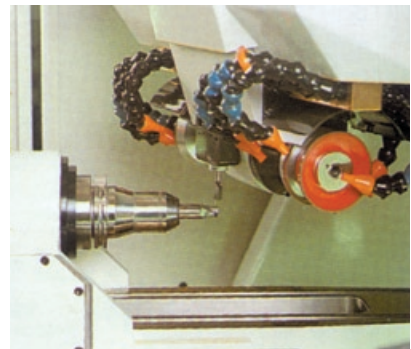
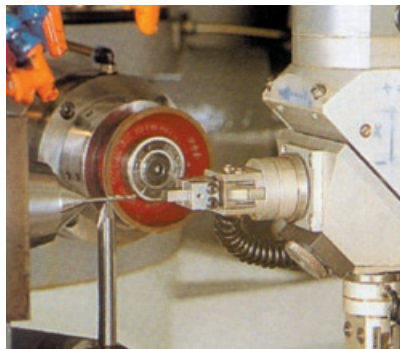
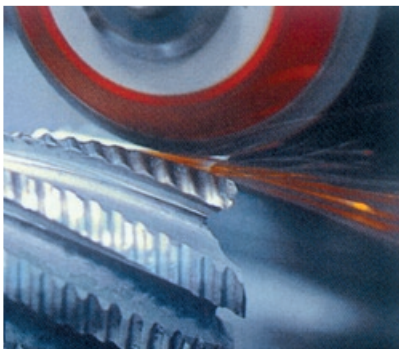
### Metallographic Data

#### Porosity

<10μm A : ≤02  
>10μm B : ○○  
C : ○○

#### Microstructure

Tungsten Carbide α : Ø02μm  
Binding Phase β : unif.distr.  
Mixed Carbide γ : —  
Eta Phase η : —



# CARBIDE MATERIAL REFERENCE

<p><b>Explanation</b></p>	<ul style="list-style-type: none"> <li>● Grain Size: Indicate the original grain size of tungsten carbide. The smaller grain size, the better, it will bind together and will be harder and more resistant against friction.</li> <li>● Cobalt Percentage : As the binder for carbide rods. In general, the higher cobalt percentage will lead a poor hardness for the carbide rods but with better traverse strength.</li> <li>● Hardness: For tungsten carbide, it is usually marked by Rockwell scale standard A(HRA) to distinguish it's hardness. The higher, the harder it will be for the carbide rods.</li> </ul>
<p><b>Fine Micro Grain Carbide "C" Series</b></p>	<ul style="list-style-type: none"> <li>● Grade : Super Grain Size: 0.6um Cobalt Percentage: 10% Hardness: HRA 92.1</li> <li>● General materials &lt; 50 HRC.</li> </ul>
<p><b>Super Micro Grain Carbide (For "H" Series)</b></p>	<ul style="list-style-type: none"> <li>● Grade : Ultrafine Grain Size: 0.4um~0.5um Cobalt Percentage: 12% Hardness: HRA 92.4</li> <li>● Special ultrafine carbide grade for HC machining with high hardness and high strength against friction.</li> <li>● For machining hard and ultra-hard materials &lt; 60 HRC.</li> </ul>
<p><b>Ultra fine Micro Grain Carbide (For "HH" Series)</b></p>	<ul style="list-style-type: none"> <li>● Grade: Ultra fine Grain Size: 0.2um~0.4um Cobalt Percentage: 9% Hardness: HRA 93.7</li> <li>● Special ultrafine carbide grade for HHC machining with high hardness and high strength against friction.</li> <li>● For machining harden and ultra-hard materials &gt; 65 HRC.</li> </ul>










# COATING REFERENCE

<p><b>Explanation</b></p>	<ul style="list-style-type: none"> <li>• Surface Hardness: Usually marked by Victor Scale standard(HV). The higher, the harder and better for difficult machining steels and other hard metals.</li> <li>• Coefficient Friction Ratio : The lower number, the better for the chip ejection.</li> <li>• Max.service Temperature(°C): The higher, the better for environments which require machining in high Temperature or long time.</li> <li>• Coating structure: Monolayer has a stable structure and better strength against cutting force. Multilayer has the benefits for dispersing the cutting to prevent breakup and affect the tool body.</li> </ul>										
<p><b>C1 Coating</b></p>	<ul style="list-style-type: none"> <li>• Surface Hardness: 3500 HV Coefficient Friction Ratio: 0.4 Max. service Temp.: 800°C color: blue-grey Coating Structure: Duel layer</li> <li>• Coating properties contain optimized ratio of hardness/internal stress and higher thermal and chemical stability. This coating has a good sliding surface which improves chip ejection and high wear resistance. Suitable for HC machining and difficult machining steels.</li> </ul>										
<p><b>C2 Coating</b></p>	<ul style="list-style-type: none"> <li>• Surface Hardness: 3300 HV Coefficient Friction Ratio: 0.35-0.4 Max. service Temp.: 1100°C color: blue-grey Coating Structure: Duel layer (TiAlN + AlCrN)</li> <li>• High performance coating devised explicitly for solid carbide tools used in roughing and finishing of hardened steels &gt;60 HRC. Coating properties contain great mechanical strength, excellent hot hardness and very high oxydation resistance.</li> </ul>										
<p><b>C3 coating</b></p>	<ul style="list-style-type: none"> <li>• Surface Hardness: 3000 HV Coefficient Friction Ratio: 0.4 Max. service Temp.: 1200°C color: violet-blue Coating Structure: Multilayer</li> <li>• High performance coating devised explicitly for solid carbide tools used in roughing and finishing of hardened steels &gt;65 HRC. Coating.</li> </ul>										
<p><b>T1</b></p>	<ul style="list-style-type: none"> <li>• Surface Hardness: 2800 HV Coefficient Friction Ratio: 0.4 Max. service Temp.: 1000°C color: silver Coating Structure: Multilayer Thickness(μ):3~4μDry and Wet Coolant, Cutting performance of soft material improved by 2~3 times than AlTiN Coating.</li> <li>• Coating application             <ul style="list-style-type: none"> <li>■ Dry Cutting, Wet Cutting, General Cutting, High Speed Cutting.</li> <li>■ Cast Iron, Stainless, Titanium Alloy, Carbon steel, Copper, Aluminum, etc.</li> </ul> </li> <li>• Coating advantage             <ul style="list-style-type: none"> <li>■ Improve the tooling and mold life</li> <li>■ Improve productivity and product quality</li> <li>■ Better Surface finish</li> <li>■ Mold Release forces</li> <li>■ Cutting Condition improved</li> </ul> </li> <li>• Comparison             <ul style="list-style-type: none"> <li>■ Coating with T1 element in tools promotion ensure the coating quality, cutting performance and the quality of endmill material.</li> </ul> <table border="1" data-bbox="488 1447 1254 1536"> <thead> <tr> <th>ST Coating</th> <th>Typical Thickness(μ)</th> <th>Microhardness HV</th> <th>Max Service Temp.( C )</th> <th>Friction Coefficient</th> </tr> </thead> <tbody> <tr> <td>T1</td> <td>1.7</td> <td>4200</td> <td>1100</td> <td>0.5</td> </tr> </tbody> </table> </li> <li>• Conclusion: T1 coating contain Si element cutting tools can solve the problem for machining in SUS and Prehardened material and change the traditional process. Improving the productivity Reducing the time and cost.</li> </ul>	ST Coating	Typical Thickness(μ)	Microhardness HV	Max Service Temp.( C )	Friction Coefficient	T1	1.7	4200	1100	0.5
ST Coating	Typical Thickness(μ)	Microhardness HV	Max Service Temp.( C )	Friction Coefficient							
T1	1.7	4200	1100	0.5							
<p><b>Diamond coating</b></p>	<ul style="list-style-type: none"> <li>• Surface Hardness: 8000~10000 HV Coefficient Friction Ratio: 0.15-0.2 Max. service Temp.: 600°C color: light grey Coating Structure: Monolayer</li> <li>• Only applicable on cemented tungsten carbide. Ideal for non-ferrous metals and graphite machining. Extremely high hardness.</li> </ul>										
<p><b>Diamond Like coating</b></p>	<ul style="list-style-type: none"> <li>• Surface Hardness: 2500 HV Coefficient Friction Ratio: 0.1-0.2 Max. service Temp.: 350°C color: dark grey Coating Structure: Monolayer</li> <li>• For aluminum processing and non ferrous materials. Coating properties contain high wear resistance and excellent sliding properties to against chip adhesion while cutting.</li> </ul>										






# COATING REFERENCE




## Performance rating of end mills

-  Variable Unequal Flute
-  General tool for universal application of a wide range of materials and hard steels  $\leq 50$  HRC.
-  High-performance type for machining of aluminum, magnesium, copper alloys, non-ferrous.. etc.
-  High-performance tool for HC / HPC of a wide range of materials and hard steels  $\leq 60$  HRC.
-  High-performance tool for HSC of hardened steels  $\leq 65$  HRC.
-  Hss-Co8-High speed steel-fine pitch profile, general application with TiCN Coated.
-  Special type for the machining of Stainless Steel, Titanium, Alloy, Inconel.





## Form of the corner of the cutting edges

-  The corner between front cutting edge and circumferential cutting edge is executed sharp-edged.
-  Ball nose tool.
-  A corner radius form.





## Point angle and helix angle

-  Point angle is 90 degree.
-  Helix angle for cutting flute form. (20°, 30°, 35°, 40°, 45°, 55°)
-  No of flute type.





## Cutting tool substrate material

-  Fine micro carbide. Co 10%, 0.6 grain, For universal applications.
-  Super micro grain carbide 0.4 grain 12% Co, For HC - HPC applications.
-  Ultra fine micro grain carbide. WC average grain size 0.2  $\mu\text{m}$ . For 9% Co ,harden machining - HC,HPC,HHC,HRC 65.
-  High speed steel 8% Co.

## Performance and application

-  These tools are suitable for high-speed cutting ( HC )
-  These tools are suitable for high-hard cutting ( HHC )
-  These tools are suitable for high-performance cutting ( HPC )
-  The maximum hardness of the material to be machined is indicated in Rockwell (HRC) from 30°-65°

## Application suitability

-  Material type.
-  Coating spec type.
-  The tool has good to adequate suitability for this material. Conditional application.
-  The tool is particularly suitable for this material. Main application.

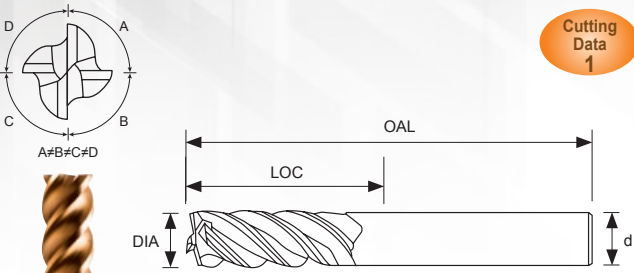


# *U-series*

*Variable Unequal Flute  
Running With Interpolation*

# UCEM-4C

Variable Unequal 4-Flute-General Economical End Mill



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03

U Shape gush design to performace heavy-duty & high feed operation.  
Better chip control to flow smoothly & obtain higher rigidity.  
Apply in all conventional & CNC machines.  
Wide application of working material : carbon steel, preharden steel, stainless, nickel base alloy.



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened					Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
●	●	●					○	●	●

Unit : mm

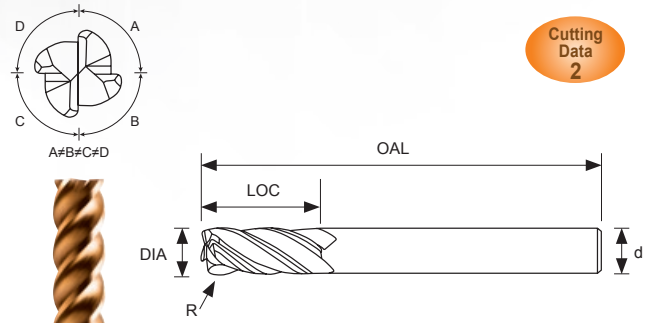
Model No.	DIA	LOC	d	OAL
UCEM-4020AC	2	6	4	50
UCEM-4030AC	3	8	4	50
UCEM-4040AC	4	11	4	50
UCEM-4050C	5	13	6	50
UCEM-4060C	6	16	6	50
UCEM-4070C	7	16	8	60
UCEM-4080C	8	20	8	60
UCEM-4090C	9	20	10	75
UCEM-4100C	10	30	10	75
UCEM-4110C	11	30	12	75
UCEM-4120C	12	32	12	75

**Remark:**

- \* Good For Super Finishing Surface With Side Allowance < 0.1mm Depth of Cut
- \* Uncoated Is Recommendable & Effective For Non-Ferrous Material By Comparing To General 4-Flute Standard Type.
- \* High Feed With Interpolation Programming Matter For Full Cutting Length Depth With Min Side Allowance.

# UCERM-4C

Variable Unequal 4-Flute-General Economical Corner Radius End Mill



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03
R	±0.01



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened					Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
●	●	●					○	●	●

Unit : mm

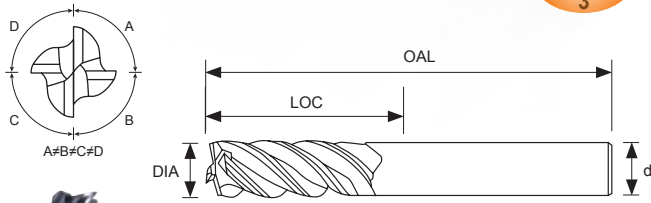
Model No.	DIA	Corner	LOC	d	OAL
UCERM4030-02AC	3	0.2R	8	4	50
UCERM4030-05AC	3	0.5R	8	4	50
UCERM4040-02AC	4	0.2R	11	4	50
UCERM4040-05AC	4	0.5R	11	4	50
UCERM4040-10AC	4	1R	11	4	50
UCERM4050-02C	5	0.2R	13	6	50
UCERM4050-05C	5	0.5R	13	6	50
UCERM4050-10C	5	1R	13	6	50
UCERM4060-02C	6	0.2R	15	6	50
UCERM4060-05C	6	0.5R	15	6	50
UCERM4060-10C	6	1R	15	6	50
UCERM4080-05C	8	0.5R	20	8	60
UCERM4080-10C	8	1R	20	8	60
UCERM4080-15C	8	1.5R	20	8	60
UCERM4080-20C	8	2R	20	8	60
UCERM4100-05C	10	0.5R	25	10	75
UCERM4100-10C	10	1R	25	10	75
UCERM4100-15C	10	1.5R	25	10	75
UCERM4100-20C	10	2R	25	10	75
UCERM4120-05C	12	0.5R	30	12	75
UCERM4120-10C	12	1R	30	12	75
UCERM4120-15C	12	1.5R	30	12	75
UCERM4120-20C	12	2R	30	12	75

U Series  
Variable Unequal Flute, Heavy Duty, Vibration-Suppression End Mill

# UHCEM-4C

Variable Unequal 4-Flute-High Speed For Prehardened Steel End Mill  
 Inheritance of power Vibration-Suppression from Chattering  
 to realise stable milling progression

Cutting  
Data  
3



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre- harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	●	●	○				

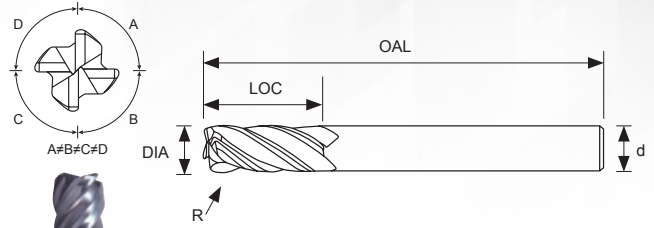
Unit : mm

Model No.	DIA	LOC	d	OAL
UHCEM-4030AC	3	8	4	50
UHCEM-4040AC	4	11	4	50
UHCEM-4050C	5	13	6	50
UHCEM-4060C	6	16	6	50
UHCEM-4080C	8	20	8	60
UHCEM-4100C	10	30	10	75
UHCEM-4120C	12	32	12	75

# UHCERM-4C

Variable Unequal 4-Flute-High Speed Corner Radius For  
 Prehardened Steel End Mill  
 Inheritance of power Vibration-Suppression from Chattering  
 to realise stable milling progression

Cutting  
Data  
3



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03
R	±0.01



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre- harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	●	●	○				

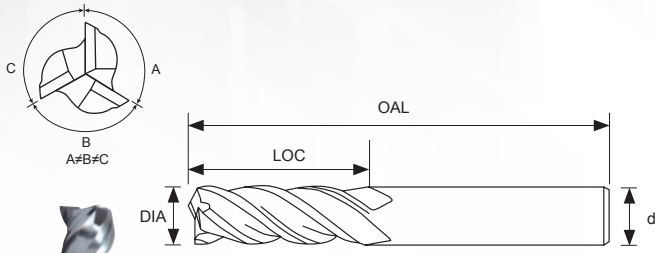
Unit : mm

Model No.	DIA	Corner	LOC	d	OAL
UHCERM4030-02AC	3	0.2R	8	4	50
UHCERM4030-05AC	3	0.5R	8	4	50
UHCERM4040-02AC	4	0.2R	11	4	50
UHCERM4040-05AC	4	0.5R	11	4	50
UHCERM4040-10AC	4	1R	11	4	50
UHCERM4050-02C	5	0.2R	13	6	50
UHCERM4050-05C	5	0.5R	13	6	50
UHCERM4050-10C	5	1R	13	6	50
UHCERM4060-02C	6	0.2R	15	6	50
UHCERM4060-05C	6	0.5R	15	6	50
UHCERM4060-10C	6	1R	15	6	50
UHCERM4080-05C	8	0.5R	20	8	60
UHCERM4080-10C	8	1R	20	8	60
UHCERM4080-15C	8	1.5R	20	8	60
UHCERM4080-20C	8	2R	20	8	60
UHCERM4100-05C	10	0.5R	25	10	75
UHCERM4100-10C	10	1R	25	10	75
UHCERM4100-15C	10	1.5R	25	10	75
UHCERM4100-20C	10	2R	25	10	75
UHCERM4120-05C	12	0.5R	30	12	75
UHCERM4120-10C	12	1R	30	12	75
UHCERM4120-15C	12	1.5R	30	12	75
UHCERM4120-20C	12	2R	30	12	75

# UACEM-3

Variable Unequal 3-Flute-Heavy Duty Series For Non-Ferrous End Mill  
 Inheritance of power Vibration-Suppression from Chattering  
 to realise stable milling progression

Cutting Data  
4



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



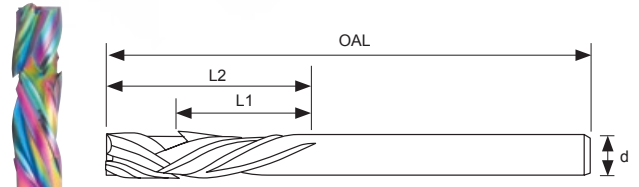
Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
	-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
							●	●

Unit : mm

Model No.	DIA	LOC	d	OAL
UACEM-3030A	3	9	4	50
UACEM-3040A	4	12	4	50
UACEM-3050	5	15	6	50
UACEM-3060	6	18	6	50
UACEM-3080	8	20	8	60
UACEM-3100	10	30	10	75
UACEM-3120	12	32	12	75

# XCE-3C

3-Flute Right Left Balancing Helix For CFRP, DFRP, Aluminum End Mill



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
	-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
							●	●

Unit : mm

Model No.	DIA	L1 LOC	L2 LOC	d	OAL
XCE-3030C	3	6	12	6	60
XCE-3040C	4	8	15	6	60
XCE-3060C	6	12	21	6	75
XCE-3080C	8	15	26	8	100
XCE-3100C	10	21	34	10	100
XCE-3120C	12	24	39	12	100

U Series  
Variable Unequal Flute, Heavy Duty, Vibration-Suppression End Mill

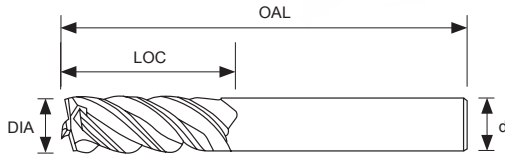


# SCE-4C

4-Flute Left Hand Helix-Right Hand Cut For Non-Ferrous End Mill



Cutting Data 5



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	○	○	○	○	○	○	●	●

Unit : mm

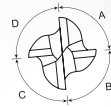
Model No.	DIA	LOC	d	OAL
SCE-4030C	3	8	6	50
SCE-4040C	4	11	6	50
SCE-4060C	6	16	6	50
SCE-4080C	8	20	8	75
SCE-4100C	10	25	10	75
SCE-4120C	12	30	12	75

\*S-DLC Coating Subjected To Special Offer

# SSCE-4C SUS

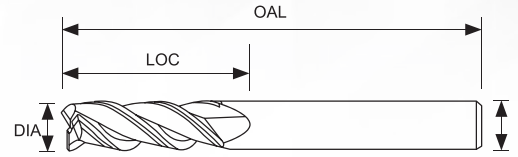
Special For Stainless Steel Application

4-Flute Variable Unequal Super Micro Grain Carbide End Mill



A=C  
D=B

Cutting Data 54



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Unit : mm

Model No.	DIA	LOC	d	OAL
SSCE-4010AC	1	3	4	50
SSCE-4015AC	1.5	4	4	50
SSCE-4020AC	2	6	4	50
SSCE-4025AC	2.5	8	4	50
SSCE-4030AC	3	8	4	50
SSCE-4030C	3	8	6	50
SSCE-4040AC	4	11	4	50
SSCE-4040C	4	11	6	50
SSCE-4050C	5	13	6	50
SSCE-4060C	6	16	6	50
SSCE-4080C	8	20	8	60
SSCE-4100C	10	30	10	75
SSCE-4120C	12	32	12	75
SSCE-4160C	16	40	16	100
SSCE-4200C	20	45	20	100

U Series  
Variable Unequal Flute, Heavy Duty, Vibration-Suppression End Mill



# Solid Carbide End Mill



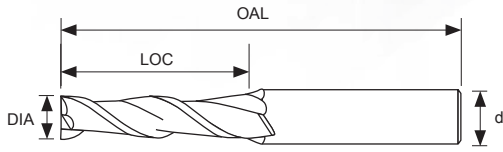
# CE-2C

Fine Micro Grain Solid Carbide 2-Flute End Mill

Unit : mm



Cutting Data 6



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)							
Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC			
●	●	○					

Unit : mm

Model No.	DIA	LOC	d	OAL
CE-2002AC	0.2	0.4	4	50
CE-2003AC	0.3	0.6	4	50
CE-2004AC	0.4	0.8	4	50
CE-2005AC	0.5	1	4	50
CE-2006AC	0.6	1.2	4	50
CE-2007AC	0.7	1.4	4	50
CE-2008AC	0.8	1.6	4	50
CE-2009AC	0.9	1.8	4	50
CE-2010AC	1	3	4	50
CE-2010C	1	3	6	50
CE-2011AC	1.1	3	4	50
CE-2012AC	1.2	3	4	50
CE-2013AC	1.3	3	4	50
CE-2014AC	1.4	3	4	50
CE-2015AC	1.5	4	4	50
CE-2015C	1.5	4	6	50
CE-2016AC	1.6	4	4	50
CE-2017AC	1.7	4	4	50
CE-2018AC	1.8	4	4	50
CE-2019AC	1.9	4	4	50
CE-2020AC	2	6	4	50
CE-2020C	2	6	6	50
CE-2021AC	2.1	6	4	50
CE-2022AC	2.2	6	4	50
CE-2023AC	2.3	6	4	50
CE-2024AC	2.4	6	4	50
CE-2025AC	2.5	8	4	50
CE-2025C	2.5	8	6	50
CE-2026AC	2.6	8	4	50

Model No.	DIA	LOC	d	OAL
CE-2027AC	2.7	8	4	50
CE-2028AC	2.8	8	4	50
CE-2029AC	2.9	8	4	50
CE-2030BC	3	8	3	50
CE-2030AC	3	8	4	50
CE-2030C	3	8	6	50
CE-2035AC	3.5	10	4	50
CE-2035C	3.5	10	6	50
CE-2040AC	4	11	4	50
CE-2040C	4	11	6	50
CE-2045C	4.5	13	6	50
CE-2050C	5	13	6	50
CE-2055C	5.5	13	6	50
CE-2060C	6	16	6	50
CE-2065C	6.5	16	8	60
CE-2070C	7	16	8	60
CE-2075C	7.5	19	8	60
CE-2080C	8	20	8	60
CE-2085C	8.5	20	10	75
CE-2090C	9	20	10	75
CE-2095C	9.5	25	10	75
CE-2100C	10	25	10	75
CE-2105C	10.5	25	12	75
CE-2110C	11	30	12	75
CE-2115C	11.5	30	12	75
CE-2120C	12	32	12	75

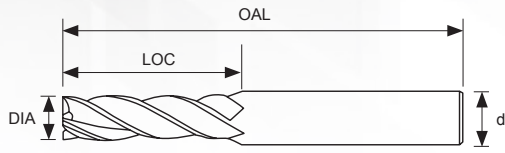
# CE-4C

Fine Micro Grain Solid Carbide 4-Flute End Mill

Unit : mm



Cutting Data 7



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
●	●	○							

Unit : mm

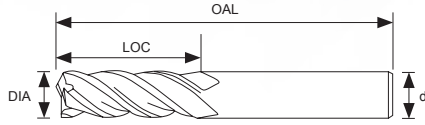
Model No.	DIA	LOC	d	OAL
CE-4010AC	1	3	4	50
CE-4010C	1	3	6	50
CE-4015AC	1.5	4	4	50
CE-4015C	1.5	4	6	50
CE-4020AC	2	6	4	50
CE-4020C	2	6	6	50
CE-4025AC	2.5	8	4	50
CE-4025C	2.5	8	6	50
CE-4030BC	3	8	3	50
CE-4030AC	3	8	4	50
CE-4030C	3	8	6	50
CE-4035AC	3.5	10	4	50
CE-4035C	3.5	10	6	50
CE-4040AC	4	11	4	50
CE-4040C	4	11	6	50
CE-4045C	4.5	13	6	50
CE-4050C	5	13	6	50
CE-4055C	5.5	13	6	50
CE-4060C	6	16	6	50
CE-4065C	6.5	16	8	60
CE-4070C	7	16	8	60
CE-4075C	7.5	19	8	60
CE-4080C	8	20	8	60
CE-4085C	8.5	20	10	75
CE-4090C	9	20	10	75
CE-4095C	9.5	20	10	75
CE-4100C	10	30	10	75
CE-4105C	10.5	30	12	75

Model No.	DIA	LOC	d	OAL
CE-4110C	11	30	12	75
CE-4115C	11.5	30	12	75
CE-4120C	12	32	12	75
CE-4160C	16	40	16	100
CE-4200C	20	45	20	100

# CEM-3C

Fine Micro Grain Solid Carbide 3-Flute High Helix End Mill

Cutting Data 8



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

Model No.	DIA	LOC	d	OAL
CEM-3010AC	1	3	4	50
CEM-3015AC	1.5	4	4	50
CEM-3020AC	2	6	4	50
CEM-3025AC	2.5	8	4	50
CEM-3030BC	3	8	3	50
CEM-3030AC	3	8	4	50
CEM-3035AC	3.5	10	4	50
CEM-3040AC	4	11	4	50
CEM-3010C	1	3	6	50
CEM-3015C	1.5	4	6	50
CEM-3020C	2	6	6	50
CEM-3025C	2.5	8	6	50
CEM-3030C	3	8	6	50
CEM-3035C	3.5	10	6	50
CEM-3040C	4	11	6	50
CEM-3045C	4.5	13	6	50
CEM-3050C	5	13	6	50
CEM-3055C	5.5	13	6	50
CEM-3060C	6	16	6	50
CEM-3065C	6.5	16	8	60
CEM-3070C	7	16	8	60
CEM-3075C	7.5	19	8	60
CEM-3080C	8	20	8	60
CEM-3085C	8.5	20	10	75
CEM-3090C	9	20	10	75
CEM-3095C	9.5	25	10	75
CEM-3100C	10	30	10	75
CEM-3105C	10.5	30	12	75
CEM-3110C	11	30	12	75
CEM-3115C	11.5	30	12	75
CEM-3120C	12	32	12	75

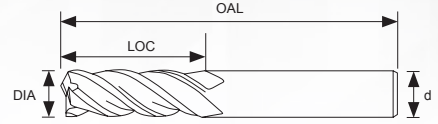
Remark:

\* Uncoated Is Available For Non-Ferrous Material.

# CEM-4C

Fine Micro Grain Solid Carbide 4-Flute High Helix End Mill

Cutting Data 7



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

Model No.	DIA	LOC	d	OAL
CEM-4010AC	1	3	4	50
CEM-4015AC	1.5	4	4	50
CEM-4020AC	2	6	4	50
CEM-4025AC	2.5	8	4	50
CEM-4030C	3	8	6	50
CEM-4040C	4	11	6	50
CEM-4050C	5	13	6	50
CEM-4060C	6	16	6	50
CEM-4080C	8	20	8	60
CEM-4100C	10	30	10	75
CEM-4120C	12	32	12	75
CEM-4160C	16	40	16	100
CEM-4200C	20	45	20	100

Remark:

\* Uncoated Is Available For Non-Ferrous Material.

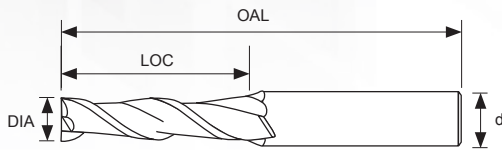


# CEL-2C

Fine Micro Grain Solid Carbide 2-Flute End Mill Long Flute



Cutting Data 9



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



\*Note: For long series tools RPM & feed reduce 50%

Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

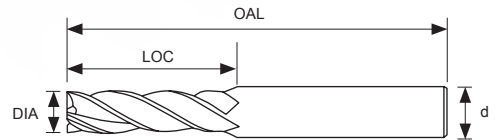
Model No.	DIA	LOC	d	OAL
CEL-2010AC	1	6	4	50
CEL-2015AC	1.5	9	4	50
CEL-2020AC	2	12	4	50
CEL-2030C	3	15	6	60
CEL-2040C	4	20	6	75
CEL-2050C	5	25	6	75
CEL-2060C	6	30	6	75
CEL-2080C	8	40	8	100
CEL-2100C	10	40	10	100
CEL-2120C	12	50	12	100
CEL-2160C	16	60	16	150
CEL-2200C	20	90	20	200

# CEL-4C

Fine Micro Grain Solid Carbide 4-Flute End Mill Long Flute



Cutting Data 10



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



\*Note: For long series tools RPM & feed reduce 50%

Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

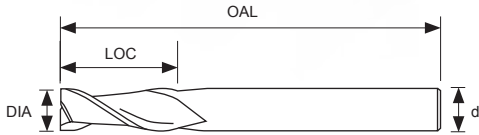
Model No.	DIA	LOC	d	OAL
CEL-4010AC	1	6	4	50
CEL-4015AC	1.5	9	4	50
CEL-4020AC	2	12	4	50
CEL-4030C	3	15	6	60
CEL-4040C	4	20	6	75
CEL-4050C	5	25	6	75
CEL-4060C	6	30	6	75
CEL-4080C	8	40	8	100
CEL-4100C	10	40	10	100
CEL-4120C	12	50	12	100
CEL-4160C	16	60	16	150
CEL-4200C	20	90	20	200

# CEP-2C

Fine Micro Grain Solid Carbide 2-Flute End Mill Long Shank



Cutting Data 11



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

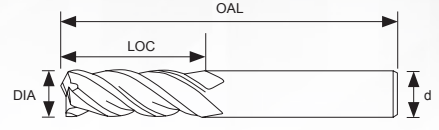
Model No.	DIA	LOC	d	OAL
CEP-2030BC	3	8	3	75
CEP-2040AC	4	11	4	75
CEP-2060C	6	16	6	100
CEP-2080C	8	20	8	100
CEP-2080C-150	8	20	8	150
CEP-2100C	10	25	10	100
CEP-2100C-150	10	25	10	150
CEP-2120C	12	32	12	100
CEP-2120C-150	12	32	12	150

# CEP-4C

Fine Micro Grain Solid Carbide 4-Flute End Mill Long Shank



Cutting Data 12



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

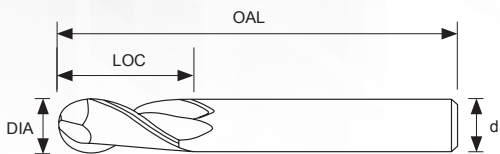
Model No.	DIA	LOC	d	OAL
CEP-4030BC	3	8	3	75
CEP-4040AC	4	11	4	75
CEP-4060C	6	16	6	100
CEP-4080C	8	20	8	100
CEP-4080C-150	8	20	8	150
CEP-4100C	10	30	10	100
CEP-4100C-150	10	30	10	150
CEP-4120C	12	32	12	100
CEP-4120C-150	12	32	12	150

# CEB-2C

Fine Micro Grain Solid Carbide 2-Flute Ball End Mill



Cutting Data 13



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

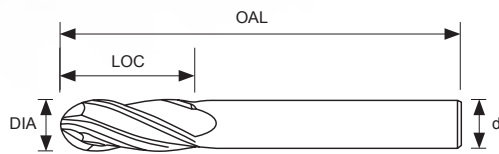
Model No.	DIA	LOC	d	OAL
CEB-2003AC	0.3 (0.15R)	0.6	4	50
CEB-2004AC	0.4 (0.2R)	0.8	4	50
CEB-2005AC	0.5 (0.25R)	1.0	4	50
CEB-2006AC	0.6 (0.3R)	1.2	4	50
CEB-2007AC	0.7 (0.35R)	1.4	4	50
CEB-2008AC	0.8 (0.4R)	1.6	4	50
CEB-2009AC	0.9 (0.45R)	1.8	4	50
CEB-2010AC	1 (0.5R)	2	4	50
CEB-2010C	1 (0.5R)	2	6	50
CEB-2011AC	1.1 (0.55R)	2.2	4	50
CEB-2012AC	1.2 (0.6R)	2.4	4	50
CEB-2013AC	1.3 (0.65R)	2.6	4	50
CEB-2014AC	1.4 (0.7R)	2.8	4	50
CEB-2015AC	1.5 (0.75R)	3	4	50
CEB-2015C	1.5 (0.75R)	3	6	50
CEB-2016AC	1.6 (0.8R)	3.2	4	50
CEB-2017AC	1.7 (0.85R)	3.4	4	50
CEB-2018AC	1.8 (0.9R)	3.6	4	50
CEB-2019AC	1.9 (0.95R)	3.8	4	50
CEB-2020AC	2 (1R)	4	4	50
CEB-2020C	2 (1R)	4	6	50
CEB-2025AC	2.5 (1.25R)	5	4	50
CEB-2030BC	3 (1.5R)	6	3	50
CEB-2030AC	3 (1.5R)	6	4	50
CEB-2030C	3 (1.5R)	6	6	50
CEB-2035AC	3.5 (1.75R)	7	4	50
CEB-2035C	3.5 (1.75R)	7	6	50
CEB-2040AC	4 (2R)	8	4	50
CEB-2040C	4 (2R)	8	6	50
CEB-2050C	5 (2.5R)	10	6	50
CEB-2060C	6 (3R)	12	6	50
CEB-2070C	7 (3.5R)	14	8	60
CEB-2080C	8 (4R)	16	8	60
CEB-2090C	9 (4.5R)	18	10	75
CEB-2100C	10 (5R)	20	10	75
CEB-2110C	11 (5.5R)	22	12	75
CEB-2120C	12 (6R)	24	12	75
CEB-2160C	16 (8R)	32	16	100
CEB-2200C	20 (10R)	40	20	100

# CEB-4C

Fine Micro Grain Solid Carbide 4-Flute Ball End Mill



Cutting Data 14



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

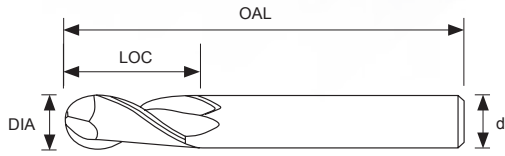
Model No.	DIA	LOC	d	OAL
CEB-4020AC	2 (1R)	4	4	50
CEB-4030AC	3 (1.5R)	6	4	50
CEB-4030C	3 (1.5R)	6	6	50
CEB-4040AC	4 (2R)	8	4	50
CEB-4040C	4 (2R)	8	6	50
CEB-4050C	5 (2.5R)	10	6	50
CEB-4060C	6 (3R)	12	6	50
CEB-4070C	7 (3.5R)	14	8	60
CEB-4080C	8 (4R)	16	8	60
CEB-4090C	9 (4.5R)	18	10	75
CEB-4100C	10 (5R)	20	10	75
CEB-4110C	11 (5.5R)	22	12	75
CEB-4120C	12 (6R)	24	12	75
CEB-4160C	16 (8R)	32	16	100
CEB-4200C	20 (10R)	40	20	100

# CEBP-2C

Fine Micro Grain Solid Carbide 2-Flute Ball End Mill Long Shank



Cutting Data 15



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

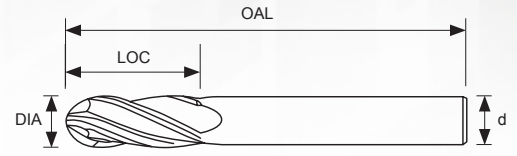
Model No.	DIA	LOC	d	OAL
CEBP-2020C	2 (1R)	4	6	75
CEBP-2030C	3 (1.5R)	6	6	75
CEBP-2030BC	3 (1.5R)	6	3	75
CEBP-2040C	4 (2R)	8	6	75
CEBP-2040AC	4 (2R)	8	4	75
CEBP-2050C	5 (2.5R)	10	6	75
CEBP-2060C-75	6 (3R)	12	6	75
CEBP-2060C	6 (3R)	12	6	100
CEBP-2060C-150	6 (3R)	12	6	150
CEBP-2080C	8 (4R)	16	8	100
CEBP-2080C-150	8 (4R)	16	8	150
CEBP-2100C	10 (5R)	20	10	100
CEBP-2100C-150	10 (5R)	20	10	150
CEBP-2100C-200	10 (5R)	20	10	200
CEBP-2120C	12 (6R)	24	12	100
CEBP-2120C-150	12 (6R)	24	12	150
CEBP-2120C-200	12 (6R)	24	12	200
CEBP-2160C	16 (8R)	32	16	150
CEBP-2160C-200	16 (8R)	32	16	200
CEBP-2200C	20 (10R)	40	20	150

# CEBP-4C

Fine Micro Grain Solid Carbide 4-Flute Ball End Mill Long Shank



Cutting Data 16



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

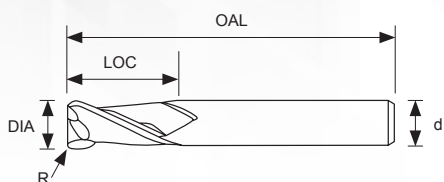
Model No.	DIA	LOC	d	OAL
CEBP-4030C	3 (1.5R)	6	6	75
CEBP-4040C	4 (2R)	8	6	75
CEBP-4050C	5 (2.5R)	10	6	75
CEBP-4060C	6 (3R)	12	6	75
CEBP-4080C	8 (4R)	16	8	100
CEBP-4100C	10 (5R)	20	10	100
CEBP-4120C	12 (6R)	24	12	100
CEBP-4160C	16 (8R)	32	16	150
CEBP-4200C	20 (10R)	40	20	150

# CER-2C

Fine Micro Grain Solid Carbide 2-Flute Corner Radius End Mill



Cutting Data 17



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03
R	$\pm 0.01$



Work Material (● Most Suitable / ○ Suitable)							
Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC			
●	●	○					

Unit : mm

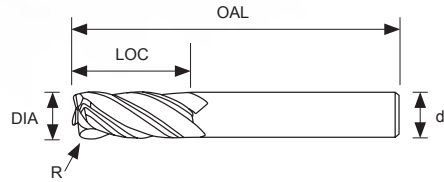
Model No.	DIA	Corner	LOC	d	OAL
CER2010-02AC	1	0.2R	3	4	50
CER2015-02AC	1.5	0.2R	4	4	50
CER2020-02AC	2	0.2R	6	4	50
CER2020-05AC	2	0.5R	6	4	50
CER2025-02AC	2.5	0.2R	8	4	50
CER2030-02BC	3	0.2R	8	3	50
CER2030-05BC	3	0.5R	8	3	50
CER2030-10BC	3	1R	8	3	50
CER2040-02AC	4	0.2R	10	4	50
CER2040-05AC	4	0.5R	10	4	50
CER2040-10AC	4	1R	10	4	50
CER2040-15AC	4	1.5R	10	4	50
CER2050-02C	5	0.2R	13	6	50
CER2050-05C	5	0.5R	13	6	50
CER2050-10C	5	1R	13	6	50
CER2060-02C	6	0.2R	15	6	50
CER2060-05C	6	0.5R	15	6	50
CER2060-10C	6	1R	15	6	50
CER2060-15C	6	1.5R	15	6	50
CER2060-20C	6	2R	15	6	50
CER2080-05C	8	0.5R	20	8	60
CER2080-10C	8	1R	20	8	60
CER2080-15C	8	1.5R	20	8	60
CER2080-20C	8	2R	20	8	60
CER2080-30C	8	3R	20	8	60
CER2100-05C	10	0.5R	25	10	75
CER2100-10C	10	1R	25	10	75
CER2100-15C	10	1.5R	25	10	75
CER2100-20C	10	2R	25	10	75
CER2100-30C	10	3R	25	10	75
CER2120-05C	12	0.5R	30	12	75
CER2120-10C	12	1R	30	12	75
CER2120-15C	12	1.5R	30	12	75
CER2120-20C	12	2R	30	12	75
CER2120-30C	12	3R	30	12	75

# CER-4C

Fine Micro Grain Solid Carbide 4-Flute Corner Radius End Mill



Cutting Data 18



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03
R	$\pm 0.01$



Work Material (● Most Suitable / ○ Suitable)							
Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC			
●	●	○					

Unit : mm

Model No.	DIA	Corner	LOC	d	OAL
CER4010-02AC	1	0.2R	3	4	50
CER4015-02AC	1.5	0.2R	4	4	50
CER4020-02AC	2	0.2R	6	4	50
CER4020-05AC	2	0.5R	6	4	50
CER4030-02BC	3	0.2R	8	3	50
CER4030-05BC	3	0.5R	8	3	50
CER4030-10BC	3	1R	8	3	50
CER4030-02AC	3	0.2R	8	4	50
CER4030-05AC	3	0.5R	8	4	50
CER4030-10AC	3	1R	8	4	50
CER4040-02AC	4	0.2R	10	4	50
CER4040-05AC	4	0.5R	10	4	50
CER4040-10AC	4	1R	10	4	50
CER4040-15AC	4	1.5R	10	4	50
CER4050-02C	5	0.2R	13	6	50
CER4050-05C	5	0.5R	13	6	50
CER4050-10C	5	1R	13	6	50
CER4060-02C	6	0.2R	15	6	50
CER4060-05C	6	0.5R	15	6	50
CER4060-10C	6	1R	15	6	50
CER4060-15C	6	1.5R	15	6	50
CER4060-20C	6	2R	15	6	50
CER4080-05C	8	0.5R	20	8	60
CER4080-10C	8	1R	20	8	60
CER4080-15C	8	1.5R	20	8	60
CER4080-20C	8	2R	20	8	60
CER4080-30C	8	3R	20	8	60
CER4100-05C	10	0.5R	25	10	75
CER4100-10C	10	1R	25	10	75
CER4100-15C	10	1.5R	25	10	75
CER4100-20C	10	2R	25	10	75
CER4100-30C	10	3R	25	10	75
CER4120-05C	12	0.5R	30	12	75
CER4120-10C	12	1R	30	12	75
CER4120-15C	12	1.5R	30	12	75
CER4120-20C	12	2R	30	12	75
CER4120-30C	12	3R	30	12	75

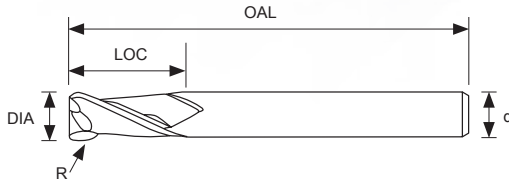


# CERP-2C

Fine Micro Grain Solid Carbide 2-Flute Corner Radius End Mill Long Shank



Cutting Data 17



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03
R	$\pm 0.01$



Work Material (● Most Suitable / ○ Suitable)							
Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC			
●	●	○					

Unit : mm

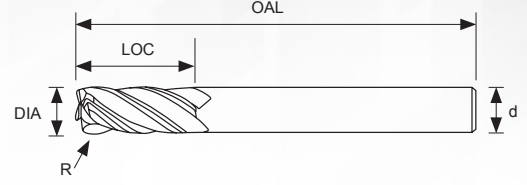
Model No.	DIA	Corner	LOC	d	OAL
CERP2030-02BC	3	0.2R	8	3	75
CERP2030-05BC	3	0.5R	8	3	75
CERP2030-10BC	3	1R	8	3	75
CERP2040-02AC	4	0.2R	10	4	75
CERP2040-05AC	4	0.5R	10	4	75
CERP2040-10AC	4	1R	10	4	75
CERP2040-15AC	4	1.5R	10	4	75
CERP2060-02C	6	0.2R	15	6	100
CERP2060-05C	6	0.5R	15	6	100
CERP2060-10C	6	1R	15	6	100
CERP2060-15C	6	1.5R	15	6	100
CERP2060-20C	6	2R	15	6	100
CERP2080-05C	8	0.5R	20	8	100
CERP2080-10C	8	1R	20	8	100
CERP2080-15C	8	1.5R	20	8	100
CERP2080-20C	8	2R	20	8	100
CERP2080-30C	8	3R	20	8	100
CERP2100-05TL	10	0.5R	25	10	100
CERP2100-10TL	10	1R	25	10	100
CERP2100-15TL	10	1.5R	25	10	100
CERP2100-20TL	10	2R	25	10	100
CERP2100-30TL	10	3R	25	10	100
CERP2120-05TL	12	0.5R	30	12	100
CERP2120-10TL	12	1R	30	12	100
CERP2120-15TL	12	1.5R	30	12	100
CERP2120-20TL	12	2R	30	12	100
CERP2120-30TL	12	3R	30	12	100

# CERP-4C

Fine Micro Grain Solid Carbide 4-Flute Corner Radius End Mill Long Shank



Cutting Data 18



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03
R	$\pm 0.01$



Work Material (● Most Suitable / ○ Suitable)							
Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC			
●	●	○					

Unit : mm

Model No.	DIA	Corner	LOC	d	OAL
CERP4030-02BC	3	0.2R	8	3	75
CERP4030-05BC	3	0.5R	8	3	75
CERP4030-10BC	3	1R	8	3	75
CERP4040-02AC	4	0.2R	10	4	75
CERP4040-05AC	4	0.5R	10	4	75
CERP4040-10AC	4	1R	10	4	75
CERP4040-15AC	4	1.5R	10	4	75
CERP4060-02C-75	6	0.2R	15	6	75
CERP4060-05C-75	6	0.5R	15	6	75
CERP4060-10C-75	6	1R	15	6	75
CERP4060-15C-75	6	1.5R	15	6	75
CERP4060-02C	6	0.2R	15	6	100
CERP4060-05C	6	0.5R	15	6	100
CERP4060-10C	6	1R	15	6	100
CERP4060-15C	6	1.5R	15	6	100
CERP4060-20C	6	2R	15	6	100
CERP4080-05C	8	0.5R	20	8	100
CERP4080-10C	8	1R	20	8	100
CERP4080-15C	8	1.5R	20	8	100
CERP4080-20C	8	2R	20	8	100
CERP4080-30C	8	3R	20	8	100
CERP4100-05C	10	0.5R	25	10	100
CERP4100-10C	10	1R	25	10	100
CERP4100-15C	10	1.5R	25	10	100
CERP4100-20C	10	2R	25	10	100
CERP4100-30C	10	3R	25	10	100
CERP4120-05C	12	0.5R	30	12	100
CERP4120-10C	12	1R	30	12	100
CERP4120-15C	12	1.5R	30	12	100
CERP4120-20C	12	2R	30	12	100
CERP4120-30C	12	3R	30	12	100

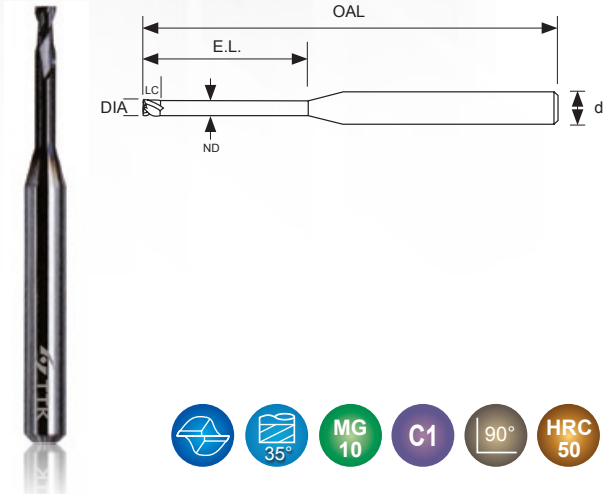
# CED-2C

Fine Micro Grain Solid Carbide 2-Flute Rib Processing End Mill

Unit : mm



Cutting Data 19



Work Material (● Most Suitable / ○ Suitable)							
Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC			
●	●	○					

Unit : mm

Model No.	DIA	LOC	Effective Length	d	OAL
CED2003-1AC	0.3	0.6	1	4	50
CED2003-2AC	0.3	0.6	2	4	50
CED2003-3AC	0.3	0.6	3	4	50
CED2004-2AC	0.4	0.7	2	4	50
CED2004-4AC	0.4	0.7	4	4	50
CED2004-6AC	0.4	0.7	6	4	50
CED2005-2AC	0.5	0.75	2	4	50
CED2005-4AC	0.5	0.75	4	4	50
CED2005-6AC	0.5	0.75	6	4	50
CED2006-2AC	0.6	0.9	2	4	50
CED2006-4AC	0.6	0.9	4	4	50
CED2006-6AC	0.6	0.9	6	4	50
CED2007-4AC	0.7	1.1	4	4	50
CED2007-6AC	0.7	1.1	6	4	50
CED2008-4AC	0.8	1.2	4	4	50
CED2008-6AC	0.8	1.2	6	4	50
CED2008-8AC	0.8	1.2	8	4	50
CED2009-6AC	0.9	1.4	6	4	50
CED2009-8AC	0.9	1.4	8	4	50
CED2009-10AC	0.9	1.4	10	4	50
CED2010-6AC	1.0	1.5	6	4	50
CED2010-8AC	1.0	1.5	8	4	50
CED2010-10AC	1.0	1.5	10	4	50
CED2010-12AC	1.0	1.5	12	4	50
CED2012-6AC	1.2	1.8	6	4	50
CED2012-8AC	1.2	1.8	8	4	50
CED2012-10AC	1.2	1.8	10	4	50
CED2012-12AC	1.2	1.8	12	4	50
CED2014-6AC	1.4	2.1	6	4	50
CED2014-10AC	1.4	2.1	10	4	50
CED2014-16ATL	1.4	2.1	16	4	50
CED2015-6AC	1.5	2.3	6	4	50
CED2015-8AC	1.5	2.3	8	4	50
CED2015-10AC	1.5	2.3	10	4	50
CED2015-12AC	1.5	2.3	12	4	50
CED2015-14AC	1.5	2.3	14	4	50

Model No.	DIA	LOC	Effective Length	d	OAL
CED2015-16AC	1.5	2.3	16	4	50
CED2015-18AC	1.5	2.3	18	4	50
CED2015-20AC	1.5	2.3	20	4	50
CED2016-6AC	1.6	2.4	6	4	50
CED2016-8AC	1.6	2.4	8	4	50
CED2016-10AC	1.6	2.4	10	4	50
CED2016-12AC	1.6	2.4	12	4	50
CED2016-14AC	1.6	2.4	14	4	50
CED2016-16AC	1.6	2.4	16	4	50
CED2016-18AC	1.6	2.4	18	4	50
CED2018-8AC	1.8	2.7	8	4	50
CED2018-14AC	1.8	2.7	14	4	50
CED2018-20AC	1.8	2.7	20	4	50
CED2020-6AC	2.0	3	6	4	50
CED2020-8AC	2.0	3	8	4	50
CED2020-10AC	2.0	3	10	4	50
CED2020-12AC	2.0	3	12	4	50
CED2020-14AC	2.0	3	14	4	50
CED2020-16AC	2.0	3	16	4	50
CED2020-18AC	2.0	3	18	4	50
CED2020-20AC	2.0	3	20	4	50
CED2025-8AC	2.5	4	8	4	50
CED2025-10AC	2.5	4	10	4	50
CED2025-12AC	2.5	4	12	4	50
CED2025-16AC	2.5	4	16	4	50
CED2025-20AC	2.5	4	20	4	50
CED2030-8C	3.0	4.5	8	6	50
CED2030-10C	3.0	4.5	10	6	50
CED2030-12C	3.0	4.5	12	6	50
CED2030-16C	3.0	4.5	16	6	60
CED2030-20C	3.0	4.5	20	6	60
CED2030-25C	3.0	4.5	25	6	75

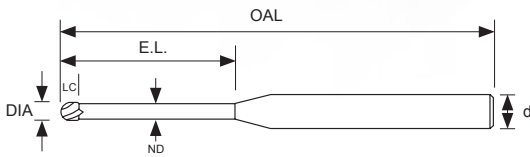
# CEDB-2C

Fine Micro Grain Solid Carbide 2-Flute Rib Processing Ball End Mill

Unit : mm



Cutting Data 20



DIA	TOLERANCE
R	±0.01



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

Unit : mm

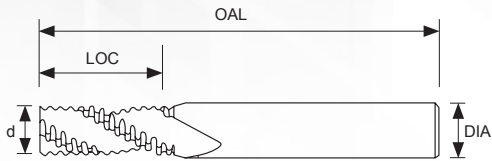
Model No.	DIA	LOC	Effective Length	d	OAL
CEDB2005-2AC	0.5(0.25R)	0.75	2	4	50
CEDB2005-4AC	0.5(0.25R)	0.75	4	4	50
CEDB2005-6AC	0.5(0.25R)	0.75	6	4	50
CEDB2006-4AC	0.6(0.3R)	0.9	4	4	50
CEDB2006-6AC	0.6(0.3R)	0.9	6	4	50
CEDB2008-4AC	0.8(0.4R)	1.2	4	4	50
CEDB2008-6AC	0.8(0.4R)	1.2	6	4	50
CEDB2008-8AC	0.8(0.4R)	1.2	8	4	50
CEDB2010-6AC	1.0(0.5R)	1.5	6	4	50
CEDB2010-8AC	1.0(0.5R)	1.5	8	4	50
CEDB2010-10AC	1.0(0.5R)	1.5	10	4	50
CEDB2010-12AC	1.0(0.5R)	1.5	12	4	50
CEDB2012-8AC	1.2(0.6R)	1.8	8	4	50
CEDB2012-12AC	1.2(0.6R)	1.8	12	4	50
CEDB2014-6AC	1.4(0.7R)	2.1	6	4	50
CEDB2014-10AC	1.4(0.7R)	2.1	10	4	50
CEDB2014-16AC	1.4(0.7R)	2.1	16	4	50
CEDB2015-8AC	1.5(0.75R)	2.3	8	4	50
CEDB2015-12AC	1.5(0.75R)	2.3	12	4	50
CEDB2015-16AC	1.5(0.75R)	2.3	16	4	50
CEDB2015-20AC	1.5(0.75R)	2.3	20	4	50
CEDB2016-8AC	1.6(0.8R)	2.4	8	4	50
CEDB2016-12AC	1.6(0.8R)	2.4	12	4	50
CEDB2016-16AC	1.6(0.8R)	2.4	16	4	50
CEDB2016-20AC	1.6(0.8R)	2.4	20	4	50
CEDB2018-8AC	1.8(0.9R)	2.7	8	4	50
CEDB2018-14AC	1.8(0.9R)	2.7	14	4	50
CEDB2018-20AC	1.8(0.9R)	2.7	20	4	50
CEDB2020-4AC	2.0(1R)	3	4	4	50

Model No.	DIA	LOC	Effective Length	d	OAL
CEDB2020-6AC	2.0(1R)	3	6	4	50
CEDB2020-8AC	2.0(1R)	3	8	4	50
CEDB2020-10AC	2.0(1R)	3	10	4	50
CEDB2020-12AC	2.0(1R)	3	12	4	50
CEDB2020-16AC	2.0(1R)	3	16	4	50
CEDB2020-20AC	2.0(1R)	3	20	4	50
CEDB2030-10C	3.0(1.5R)	4.5	10	6	50
CEDB2030-16C	3.0(1.5R)	4.5	16	6	60
CEDB2030-20C	3.0(1.5R)	4.5	20	6	60
CEDB2030-25C	3.0(1.5R)	4.5	25	6	75

# CEO-3C

Fine Micro Grain Solid Carbide 3-Flute Roughing End Mill  
Fine Pitch, Round Profile

Cutting Data 21



DIA	TOLERANCE
$\varnothing < 6$	0 ~ -0.105
$8 < \varnothing < 10$	0 ~ -0.130
$12 < \varnothing < 16$	0 ~ -0.160
$\varnothing < 20$	0 ~ -0.195



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

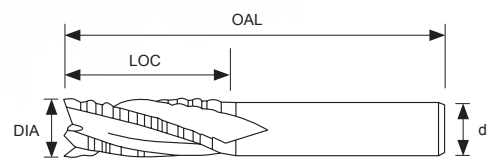
Unit : mm

Model No.	DIA	LOC	d	OAL
CEO-3060C	6	16	6	50
CEO-3080C	8	19	8	60
CEO-3100C	10	25	10	75
CEO-3120C	12	30	12	75
CEO-3160C	16	35	16	100
CEO-3200C	20	45	20	100

# CEO-4C

Fine Micro Grain Solid Carbide 4-Flute Roughing End Mill  
Fine Pitch, Round Profile

Cutting Data 21



DIA	TOLERANCE
$\varnothing < 6$	0 ~ -0.105
$8 < \varnothing < 10$	0 ~ -0.130
$12 < \varnothing < 16$	0 ~ -0.160
$\varnothing < 20$	0 ~ -0.195



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○						

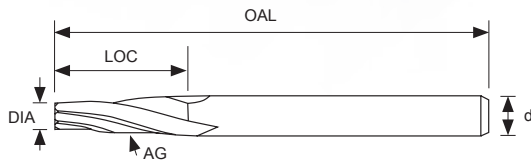
Unit : mm

Model No.	DIA	LOC	d	OAL
CEO-4060C	6	16	6	50
CEO-4080C	8	19	8	60
CEO-4100C	10	25	10	75
CEO-4120C	12	30	12	75
CEO-4160C	16	35	16	100
CEO-4200C	20	45	20	100

# CT-2C

Fine Micro Grain Solid Carbide 2-Flute Tapered End Mill

Unit : mm



Cutting Data 22

DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)							
Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC			
●	●	○					

Unit : mm

Model No.	Front End Dia	Flute Length	Leaging Angle	Rear End Dia	d	OAL
CT2010-005AC	1.0	4	0.5°	1.07	4	50
CT2010-010AC	1.0	4	1°	1.14	4	50
CT2010-015AC	1.0	4	1.5°	1.21	4	50
CT2010-020AC	1.0	4	2°	1.28	4	50
CT2010-025AC	1.0	4	2.5°	1.35	4	50
CT2010-030AC	1.0	4	3°	1.42	4	50
CT2010-050AC	1.0	4	5°	1.70	4	50
CT2010-070AC	1.0	4	7°	1.98	4	50
CT2010-100AC	1.0	4	10°	2.41	4	50
CT2015-005AC	1.5	5	0.5°	1.59	4	50
CT2015-010AC	1.5	5	1°	1.67	4	50
CT2015-015AC	1.5	5	1.5°	1.76	4	50
CT2015-020AC	1.5	5	2°	1.85	4	50
CT2015-025AC	1.5	5	2.5°	1.93	4	50
CT2015-030AC	1.5	5	3°	2.02	4	50
CT2015-050AC	1.5	5	5°	2.37	4	50
CT2015-070AC	1.5	5	7°	2.73	4	50
CT2015-100AC	1.5	5	10°	3.26	4	50
CT2020-005AC	2.0	6	0.5°	2.10	4	50
CT2020-010AC	2.0	6	1°	2.21	4	50
CT2020-015AC	2.0	6	1.5°	2.31	4	50
CT2020-020AC	2.0	6	2°	2.41	4	50
CT2020-025AC	2.0	6	2.5°	2.52	4	50
CT2020-030AC	2.0	6	3°	2.62	4	50
CT2020-050AC	2.0	6	5°	3.05	4	50
CT2020-070AC	2.0	6	7°	3.47	4	50
CT2020-100AC	2.0	6	10°	4.11	4	50
CT2025-005AC	2.5	8	0.5°	2.64	4	50
CT2025-010AC	2.5	8	1°	2.78	4	50
CT2025-015AC	2.5	8	1.5°	2.91	4	50
CT2025-020AC	2.5	8	2°	3.05	4	50
CT2025-025AC	2.5	8	2.5°	3.20	4	50
CT2025-030AC	2.5	8	3°	3.33	4	50
CT2025-050AC	2.5	8	5°	3.90	4	50
CT2025-070C	2.5	8	7°	4.46	6	50
CT2025-100C	2.5	8	10°	5.32	6	50

Model No.	Front End Dia	Flute Length	Leaging Angle	Rear End Dia	d	OAL
CT2030-005C	3.0	10	0.5°	3.17	6	50
CT2030-010C	3.0	10	1°	3.35	6	50
CT2030-015C	3.0	10	1.5°	3.52	6	50
CT2030-020C	3.0	10	2°	3.69	6	50
CT2030-025C	3.0	10	2.5°	3.87	6	50
CT2030-030C	3.0	10	3°	4.05	6	50
CT2030-050C	3.0	10	5°	4.75	6	50
CT2030-070C	3.0	10	7°	5.46	6	50
CT2030-100C	3.0	10	10°	6.53	6	50
CT2040-005C	4	15	0.5°	4.26	6	50
CT2040-010C	4	15	1°	4.52	6	50
CT2040-015C	4	15	1.5°	4.79	6	50
CT2040-020C	4	15	2°	5.04	6	50
CT2040-025C	4	15	2.5°	5.31	6	50
CT2040-030C	4	15	3°	5.57	6	50
CT2040-050C	4	15	5°	6.62	8	60
CT2040-070C	4	15	7°	7.68	8	60
CT2050-005C	5	20	0.5°	5.34	6	60
CT2050-010C	5	20	1°	5.70	6	60
CT2050-015C	5	20	1.5°	6.04	6	60
CT2050-020C	5	20	2°	6.39	8	60
CT2050-025C	5	20	2.5°	6.74	8	60
CT2050-030C	5	20	3°	7.10	8	60
CT2050-050C	5	20	5°	8.50	10	75
CT2050-070C	5	20	7°	9.91	10	75
CT2060-005C	6	20	0.5°	6.35	8	60
CT2060-010C	6	20	1°	6.70	8	60
CT2060-015C	6	20	1.5°	7.05	8	60
CT2060-020C	6	20	2°	7.40	8	60
CT2060-025C	6	20	2.5°	7.75	8	60
CT2060-030C	6	20	3°	8.10	8	60
CT2060-050C	6	20	5°	9.50	10	75
CT2060-070C	6	20	7°	10.91	12	75
CT2080-005C	8	25	0.5°	8.44	10	75
CT2080-010C	8	25	1°	8.87	10	75
CT2080-015C	8	25	1.5°	9.31	10	75
CT2080-020C	8	25	2°	9.74	10	75
CT2080-025C	8	25	2.5°	10.18	12	75
CT2080-030C	8	25	3°	10.62	12	75
CT2080-050C	8	25	5°	12.37	12	100
CT2100-005C	10	35	0.5°	10.61	12	100
CT2100-010C	10	35	1°	11.22	12	100
CT2100-015C	10	35	1.5°	11.83	12	100
CT2100-020C	10	35	2°	12.44	12	100
CT2100-025C	10	35	2.5°	13.06	16	100
CT2100-030C	10	35	3°	13.67	16	100
CT2100-050C	10	35	5°	16.12	16	100



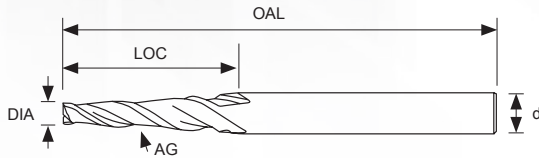
# CTL-2C

Fine Micro Grain Solid Carbide 2-Flute Tapered End Mill Long Flute

Unit : mm



Cutting Data 23



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



\*Note: For long series tools RPM & feed reduce 50%

Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
	-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
●	●	○						

Unit : mm

Model No.	Front End Dia	Flute Length	Leaging Angle	Rear End Dia	d	OAL
CTL2010-005AC	1.0	10	0.5°	1.17	4	50
CTL2010-010AC	1.0	10	1°	1.35	4	50
CTL2010-015AC	1.0	10	1.5°	1.52	4	50
CTL2010-020AC	1.0	10	2°	1.70	4	50
CTL2010-025AC	1.0	10	2.5°	1.87	4	50
CTL2010-030AC	1.0	10	3°	2.05	4	50
CTL2010-050AC	1.0	10	5°	2.74	4	50
CTL2010-070AC	1.0	10	7°	3.44	4	50
CTL2015-005AC	1.5	10	0.5°	1.67	4	50
CTL2015-010AC	1.5	10	1°	1.85	4	50
CTL2015-015AC	1.5	10	1.5°	2.02	4	50
CTL2015-020AC	1.5	10	2°	2.2	4	50
CTL2015-025AC	1.5	10	2.5°	2.37	4	50
CTL2015-030AC	1.5	10	3°	2.55	4	50
CTL2015-050AC	1.5	10	5°	3.24	4	50
CTL2015-070AC	1.5	10	7°	3.94	4	50
CTL2020-005AC	2.0	13	0.5°	2.22	4	50
CTL2020-010AC	2.0	13	1°	2.45	4	50
CTL2020-015AC	2.0	13	1.5°	2.68	4	50
CTL2020-020AC	2.0	13	2°	2.90	4	50
CTL2020-025AC	2.0	13	2.5°	3.13	4	50
CTL2020-030AC	2.0	13	3°	3.36	4	50
CTL2020-050C	2.0	13	5°	4.27	6	50
CTL2020-070C	2.0	13	7°	5.17	6	50
CTL2025-005AC	2.5	15	0.5°	2.76	4	50
CTL2025-010AC	2.5	15	1°	3.03	4	50
CTL2025-015AC	2.5	15	1.5°	3.29	4	50
CTL2025-020AC	2.5	15	2°	3.56	4	50
CTL2025-025AC	2.5	15	2.5°	3.81	4	50
CTL2025-030C	2.5	15	3°	4.07	6	50
CTL2025-050C	2.5	15	0.5°	5.13	6	50
CTL2030-005C	3.0	20	1°	3.35	6	60

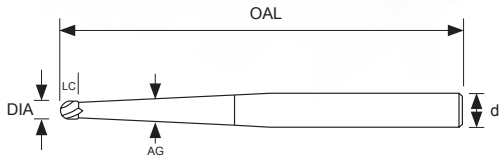
Model No.	Front End Dia	Flute Length	Leaging Angle	Rear End Dia	d	OAL
CTL2030-010C	3.0	20	1.5°	3.70	6	60
CTL2030-015C	3.0	20	2°	4.05	6	60
CTL2030-020C	3.0	20	2°	4.39	6	60
CTL2030-025C	3.0	20	2.5°	4.65	6	60
CTL2030-030C	3.0	20	3°	5.1	6	60
CTL2030-050C	3.0	20	5°	6.5	8	60
CTL2040-005C	4	25	0.5°	4.44	6	60
CTL2040-010C	4	25	1°	4.88	6	60
CTL2040-015C	4	25	1.5°	5.13	6	60
CTL2040-020C	4	25	2°	5.75	6	60
CTL2040-025C	4	25	2.5°	6.19	8	60
CTL2040-030C	4	25	3°	6.62	8	60
CTL2040-050C	4	25	5°	8.38	10	75
CTL2050-005C	5	30	0.5°	5.52	8	75
CTL2050-010C	5	30	1°	6.05	8	75
CTL2050-015C	5	30	1.5°	6.57	8	75
CTL2050-020C	5	30	2°	7.09	8	75
CTL2050-025C	5	30	2.5°	7.62	8	75
CTL2050-030C	5	30	3°	8.14	10	75
CTL2050-050C	5	30	5°	10.25	12	75
CTL2060-005C	6	35	0.5°	6.61	8	75
CTL2060-010C	6	35	1°	7.22	8	75
CTL2060-015C	6	35	1.5°	7.83	8	75
CTL2060-020C	6	35	2°	8.44	10	75
CTL2060-025C	6	35	2.5°	9.05	10	100
CTL2060-030C	6	35	3°	9.67	10	100
CTL2060-050C	6	35	5°	12.12	12	100

# CTNB-2C

Fine Micro Grain Solid Carbide 2-Flute Tapered Neck Ball End Mill



Cutting Data 24



DIA	TOLERANCE
R	±0.01



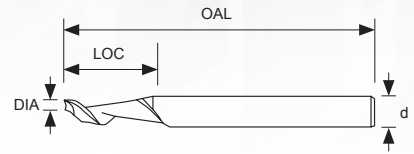
Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
	-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
●	●	○						

Unit : mm

Model No.	DIA	LOC	Leaving Angle	d	OAL
CTNB2010-010C	1 (0.5R)	2	1°	6	75
CTNB2015-010C	1.5 (0.75R)	3	1°	6	75
CTNB2020-010C	2 (1R)	4	1°	6	75
CTNB2020-050C	2 (1R)	12	5°	8	100
CTNB2030-010C	3 (1.5R)	6	1°	6	75
CTNB2030-050C	3 (1.5R)	8	5°	8	100
CTNB2040-010C	4 (2R)	8	1°	6	75
CTNB2040-050C	4 (2R)	10	5°	8	100
CTNB2060-050C	6 (3R)	12	5°	10	100
CTNB2060-030C	6 (3R)	16	3°	12	150
CTNB2080-050C	8 (4R)	16	5°	12	100
CTNB2080-030C	8 (4R)	20	3°	12	150

# CE-1

Fine Micro Grain Solid Carbide 1-Flute End Mill (Aluminum, Plastic, Wood)



DIA	TOLERANCE
∅ < 1	-0 ~ -0.02
1 < ∅ < 12	-0 ~ -0.02
12 < ∅	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
	-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
							●	●

Unit : mm

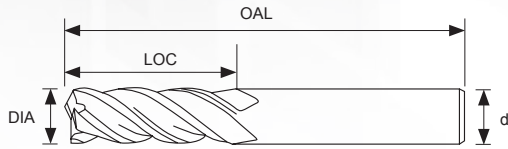
Model No.	DIA	LOC	d	OAL
CE-10100B	1	4	3	50
CE-10150B	1.5	6	3	50
CE-10200	2	8	2	50
CE-10201	2	8	2	60
CE-10202B	2	8	3	50
CE-10250B	2.5	8	3	50
CE-10251B	2.5	8	3	60
CE-10300B	3	10	3	50
CE-10301B	3	10	3	60
CE-10302	3	10	6	80
CE-10310	3.17	12.7	6.35	60
CE-10400A	4	12	4	60
CE-10401A	4	20	4	70
CE-10402A	4	30	4	80
CE-10403	4	12	6	60
CE-10470	4.765	15.9	6.35	70
CE-10500C	5	16	5	70
CE-10501C	5	30	5	80
CE-10600	6	16	6	60
CE-10601	6	25	6	75
CE-10602	6	30	6	75
CE-10604	6	38	6	100
CE-10630	6.35	15.8	6.35	70
CE-10800	8	22	8	75
CE-10801	8	38	8	100
CE-11000	10	30	10	80
CE-11200	12	30	12	100

# ACE-3

Fine Micro Grain Solid Carbide 3-Flute End Mill  
(Aluminum, Graphite, or Non-Ferrous)



Cutting Data 25



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
							●	●

Unit : mm

Model No.	DIA	LOC	d	OAL
ACE-3010A	1	3	4	50
ACE-3015A	1.5	4	4	50
ACE-3020A	2	6	4	50
ACE-3030B	3	9	3	50
ACE-3030A	3	9	4	50
ACE-3030	3	9	6	50
ACE-3040A	4	12	4	50
ACE-3040	4	12	6	50
ACE-3050	5	15	6	50
ACE-3060	6	18	6	50
ACE-3080	8	20	8	60
ACE-3100	10	30	10	75
ACE-3120	12	32	12	75
ACE-3160	16	45	16	100
ACE-3200	20	45	20	100

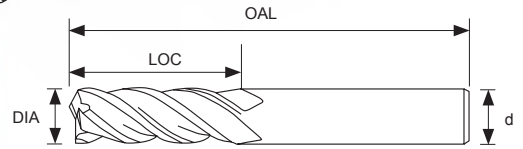
\*Diamond Like Coating (DLC) is offered in optional by inquiry.

# ACEL-3

Fine Micro Grain Solid Carbide 3-Flute End Mill Long Flute  
(Aluminum, Graphite, or Non-Ferrous)



Cutting Data 26



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



\*Note: For long series tools RPM & feed reduce 50%

Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
							●	●

Unit : mm

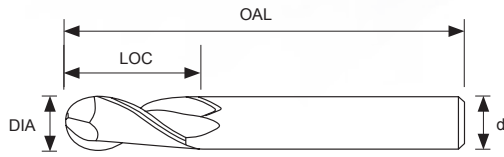
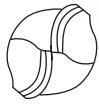
Model No.	DIA	LOC	d	OAL
ACEL-3030	3	12	6	60
ACEL-3040	4	16	6	60
ACEL-3050	5	20	6	60
ACEL-3060	6	25	6	75
ACEL-3080	8	32	8	75
ACEL-3100	10	45	10	100
ACEL-3120	12	45	12	100
ACEL-3160	16	65	16	150
ACEL-3200	20	75	20	150

\*Diamond Like Coating (DLC) is offered in optional by inquiry.

# ACEB-2

Fine Micro Grain Solid Carbide 2-Flute Ball End Mill  
(Aluminum, Copper, Graphite, or Non-Ferrous)

Cutting  
Data  
27



DIA	TOLERANCE
R	±0.01



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
	-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
							●	●

Unit : mm

Model No.	DIA	LOC	d	OAL
ACEB-2010A	1 (0.5R)	2	4	50
ACEB-2015A	1.5 (0.75R)	3	4	50
ACEB-2020A	2 (1R)	4	4	50
ACEB-2025A	2.5 (1.25R)	5	4	50
ACEB-2030A	3 (1.5R)	6	4	50
ACEB-2040A	4 (2R)	8	4	50
ACEB-2050	5 (2.5R)	10	6	50
ACEB-2060	6 (3R)	12	6	50
ACEB-2080	8 (4R)	16	8	60
ACEB-2100	10 (5R)	20	10	75
ACEB-2120	12 (6R)	24	12	75

\*Diamond Like Coating (DLC) is offered in optional by inquiry.

Good Design & Quality



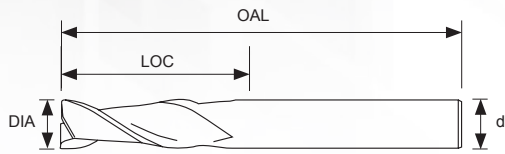
Solid Carbide End Mill

# HCE-2C

Super Micro Grain Carbide 2-Flute End Mill



Cutting Data 28



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	●	●	○	○			

Unit : mm

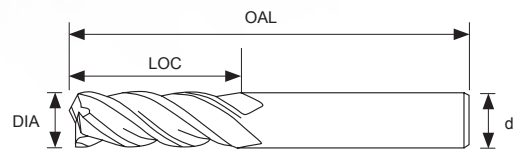
Model No.	DIA	LOC	d	OAL
HCE-2002AC	0.2	0.4	4	50
HCE-2003AC	0.3	0.6	4	50
HCE-2004AC	0.4	0.7	4	50
HCE-2005AC	0.5	0.8	4	50
HCE-2006AC	0.6	0.9	4	50
HCE-2007AC	0.7	1.4	4	50
HCE-2008AC	0.8	1.6	4	50
HCE-2009AC	0.9	1.8	4	50
HCE-2010AC	1	3	4	50
HCE-2010C	1	3	6	50
HCE-2015AC	1.5	4	4	50
HCE-2015C	1.5	4	6	50
HCE-2020AC	2	6	4	50
HCE-2020C	2	6	6	50
HCE-2025AC	2.5	8	4	50
HCE-2025C	2.5	8	6	50
HCE-2030BC	3	8	3	50
HCE-2030AC	3	8	4	50
HCE-2035C	3.5	10	6	50
HCE-2040AC	4	11	4	50
HCE-2040C	4	11	6	50
HCE-2045C	4.5	13	6	50
HCE-2050C	5	13	6	50
HCE-2055C	5.5	13	6	50
HCE-2060C	6	16	6	50
HCE-2070C	7	16	8	60
HCE-2080C	8	21	8	60
HCE-2090C	9	25	10	75
HCE-2100C	10	26	10	75
HCE-2110C	11	28	12	75
HCE-2120C	12	30	12	75

# HCE-4C

Super Micro Grain Carbide 4-Flute End Mill



Cutting Data 29



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	●	●	○	○			

Unit : mm

Model No.	DIA	LOC	d	OAL
HCE-4010AC	1	3	4	50
HCE-4010C	1	3	6	50
HCE-4015AC	1.5	4	4	50
HCE-4015C	1.5	4	6	50
HCE-4020AC	2	6	4	50
HCE-4020C	2	6	6	50
HCE-4025AC	2.5	8	4	50
HCE-4025C	2.5	8	6	50
HCE-4030AC	3	8	4	50
HCE-4030C	3	8	6	50
HCE-4035AC	3.5	8	4	50
HCE-4040AC	4	11	4	50
HCE-4040C	4	11	6	50
HCE-4045C	4.5	13	6	50
HCE-4050C	5	13	6	50
HCE-4055C	5.5	13	6	50
HCE-4060C	6	16	6	50
HCE-4065C	6.5	16	8	60
HCE-4070C	7	17	8	60
HCE-4080C	8	21	8	60
HCE-4085C	8.5	26	10	75
HCE-4090C	9	26	10	75
HCE-4095C	9.5	26	10	75
HCE-4100C	10	30	10	75
HCE-4110C	11	30	12	75
HCE-4120C	12	32	12	75
HCE-4160C	16	46	16	100
HCE-4200C	20	46	20	100
HCE-4250C	25	50	25	100

Super Micro Grain Carbide End Mill

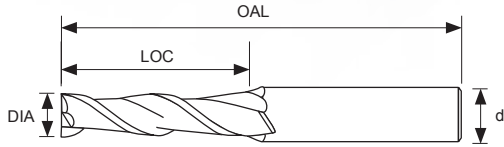


# HCEL-2C

Super Micro Grain Carbide 2-Flute End Mill Long Flute



Cutting Data 30



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



\*Note: For long series tools RPM & feed reduce 50%

Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
●	●	●	●	○	○				

Unit : mm

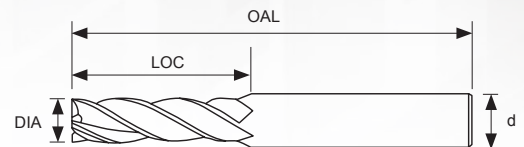
Model No.	DIA	LOC	d	OAL
HCEL-2010AC	1	5	4	50
HCEL-2015AC	1.5	6	4	50
HCEL-2020C	2	8	6	50
HCEL-2025C	2.5	10	6	50
HCEL-2030C	3	12	6	60
HCEL-2035C	3.5	14	6	60
HCEL-2040C	4	16	6	60
HCEL-2045C	4.5	16	6	60
HCEL-2050C	5	20	6	60
HCEL-2055C	5.5	20	6	60
HCEL-2060C	6	25	6	75
HCEL-2070C	7	26	8	75
HCEL-2080C-75	8	26	8	75
HCEL-2080C	8	36	8	100
HCEL-2100C	10	40	10	100
HCEL-2110C	11	40	12	100
HCEL-2120C	12	46	12	100

# HCEL-4C

Super Micro Grain Carbide 4-Flute End Mill Long Flute



Cutting Data 31



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



\*Note: For long series tools RPM & feed reduce 50%

Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
●	●	●	●	○	○				

Unit : mm

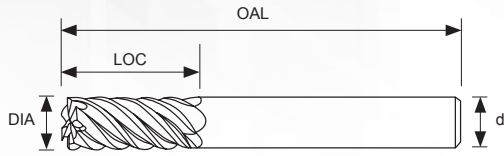
Model No.	DIA	LOC	d	OAL
HCEL-4010AC	1	5	4	50
HCEL-4015AC	1.5	6	4	50
HCEL-4020AC	2	9	4	50
HCEL-4025AC	2.5	10	4	50
HCEL-4030C	3	12	6	50
HCEL-4035C	3.5	14	6	50
HCEL-4040C	4	16	6	60
HCEL-4045C	4.5	18	6	60
HCEL-4050C	5	25	6	75
HCEL-4060C	6	25	6	75
HCEL-4080C	8	35	8	100
HCEL-4100C	10	40	10	100
HCEL-4120C	12	45	12	100

# HCEM-6,8C

Super Micro Grain Carbide 6,8-Flute End Mill



Cutting Data 32



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
●	●	●	●	○	○	○			

Unit : mm

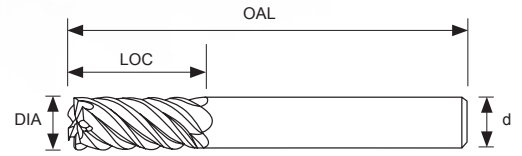
Model No.	DIA	LOC	d	OAL
HCEM-6060C	6	15	6	50
HCEM-6080C	8	20	8	60
HCEM-6100C	10	30	10	75
HCEM-6120C	12	32	12	75
HCEM-6160C	16	40	16	100
HCEM-8200C	20	45	20	100
HCEM-8250C	25	45	25	100

# HCEML-6,8C

Super Micro Grain Carbide 6,8-Flute End Mill Long Flute



Cutting Data 33



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
●	●	●	●	○	○	○			

Unit : mm

Model No.	DIA	LOC	d	OAL
HCEML-6060C	6	25	6	75
HCEML-6080C	8	30	8	75
HCEML-6100C	10	40	10	100
HCEML-6120C	12	45	12	100
HCEML-6160C	16	65	16	150
HCEML-8200C	20	75	20	150
HCEML-8250C	25	80	25	150

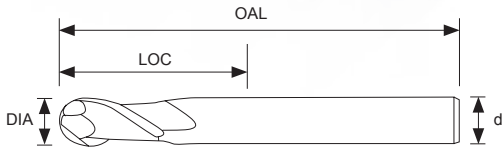
Super Micro Grain Carbide End Mill

# HCEB-2C

Super Micro Grain Carbide 2-Flute Ball End Mill



Cutting Data 34



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
●	●	●	●	○	○				

Unit : mm

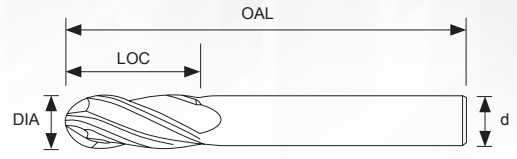
Model No.	DIA	LOC	d	OAL
HCEB-2003AC	0.3 (0.15R)	0.6	4	50
HCEB-2004AC	0.4 (0.2R)	0.7	4	50
HCEB-2005AC	0.5 (0.25R)	0.8	4	50
HCEB-2006AC	0.6 (0.3R)	0.9	4	50
HCEB-2007AC	0.7 (0.35R)	1.4	4	50
HCEB-2008AC	0.8 (0.4R)	1.6	4	50
HCEB-2009AC	0.9 (0.45R)	1.8	4	50
HCEB-2010AC	1 (0.5R)	2	4	50
HCEB-2010C	1 (0.5R)	2	6	50
HCEB-2015AC	1.5 (0.75R)	3	4	50
HCEB-2015C	1.5 (0.75R)	3	6	50
HCEB-2020AC	2 (1R)	4	4	50
HCEB-2020C	2 (1R)	4	6	50
HCEB-2025AC	2.5 (1.25R)	5	4	50
HCEB-2025C	2.5 (1.25R)	5	6	50
HCEB-2030AC	3 (1.5R)	6	4	50
HCEB-2030BC	3 (1.5R)	6	3	50
HCEB-2030C	3 (1.5R)	6	6	50
HCEB-2035AC	3.5 (1.75R)	7	4	50
HCEB-2040AC	4 (2R)	8	4	50
HCEB-2040C	4 (2R)	8	6	50
HCEB-2050C	5 (2.5R)	10	6	50
HCEB-2060C	6 (3R)	12	6	50
HCEB-2070C	7 (3.5R)	14	8	60
HCEB-2080C	8 (4R)	16	8	60
HCEB-2090C	9 (4.5R)	18	10	75
HCEB-2100C	10 (5R)	20	10	75
HCEB-2120C	12 (6R)	24	12	75
HCEB-2160C	16 (8R)	32	16	100
HCEB-2200C	20 (10R)	40	20	150

# HCEB-4C

Super Micro Grain Carbide 4-Flute Ball End Mill



Cutting Data 35



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
●	●	●	●	○	○				

Unit : mm

Model No.	DIA	LOC	d	OAL
HCEB-4010AC	1 (0.5R)	2	4	50
HCEB-4020AC	2 (1R)	4	4	50
HCEB-4025AC	2.5 (1.25R)	5	4	50
HCEB-4030AC	3 (1.5R)	6	4	50
HCEB-4040AC	4 (2R)	8	4	50
HCEB-4045C	4.5 (2.25R)	9	6	50
HCEB-4050C	5 (2.5R)	10	6	50
HCEB-4060C	6 (3R)	12	6	50
HCEB-4070C	7 (3.5R)	14	8	60
HCEB-4080C	8 (4R)	16	8	60
HCEB-4100C	10 (5R)	20	10	75
HCEB-4120C	12 (6R)	24	12	75
HCEB-4160C	16 (8R)	32	16	100

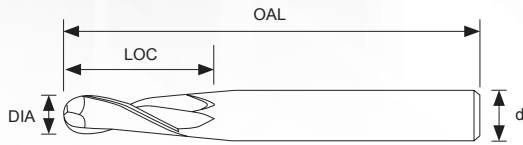
Super Micro Grain Carbide End Mill

# HCEBP-2C

Super Micro Grain Carbide 2-Flute Ball End Mill Long Shank



Cutting Data 36



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
●	●	●	●	○	○				

Unit : mm

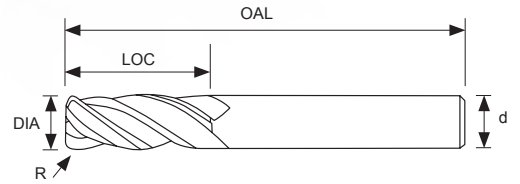
Model No.	DIA	LOC	d	OAL
HCEBP-2010C	1 (0.5R)	2	6	75
HCEBP-2015C	1.5 (0.75R)	3	6	75
HCEBP-2020C	2 (1R)	4	6	75
HCEBP-2030C	3 (1.5R)	6	6	75
HCEBP-2040C	4 (2R)	8	6	75
HCEBP-2050C	5 (2.5R)	10	6	75
HCEBP-2060C	6 (3R)	12	6	75
HCEBP-2060C-100	6 (3R)	12	6	100
HCEBP-2080C	8 (4R)	16	8	100
HCEBP-2100C	10 (5R)	20	10	100
HCEBP-2100C-150	10 (5R)	20	10	150
HCEBP-2120C	12 (6R)	24	12	100
HCEBP-2120C-150	12 (6R)	24	12	150

# HCER-4C

Super Micro Grain Carbide 4-Flute Corner Radius End Mill



Cutting Data 37



DIA	TOLERANCE
∅ < 1	-0 ~ -0.02
1 < ∅ < 12	-0 ~ -0.02
12 < ∅	-0 ~ -0.03
R	±0.01



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
●	●	●	●	○	○				

Unit : mm

Model No.	DIA	Corner	LOC	d	OAL
HCER4010-02AC	1	0.2R	3	4	50
HCER4015-02AC	1.5	0.2R	4	4	50
HCER4020-02AC	2	0.2R	6	4	50
HCER4020-05AC	2	0.5R	6	4	50
HCER4030-02BC	3	0.2R	8	3	50
HCER4030-05BC	3	0.5R	8	3	50
HCER4030-10BC	3	1R	8	3	50
HCER4030-02AC	3	0.2R	8	4	50
HCER4030-05AC	3	0.5R	8	4	50
HCER4030-10AC	3	1R	8	4	50
HCER4040-02AC	4	0.2R	10	4	50
HCER4040-05AC	4	0.5R	10	4	50
HCER4040-10AC	4	1R	10	4	50
HCER4060-02C	6	0.2R	16	6	50
HCER4060-05C	6	0.5R	16	6	50
HCER4060-10C	6	1R	16	6	50
HCER4060-20C	6	2R	16	6	50
HCER4080-02C	8	0.2R	20	10	75
HCER4080-05C	8	0.5R	20	8	75
HCER4080-10C	8	1R	20	8	75
HCER4080-20C	8	2R	20	8	75
HCER4100-05C	10	0.5R	25	10	75
HCER4100-10C	10	1R	25	10	75
HCER4100-15C	10	1.5R	25	10	75
HCER4100-20C	10	2R	25	10	75
HCER4100-30C	10	3R	25	10	75
HCER4120-05C	12	0.5R	30	12	75
HCER4120-10C	12	1R	30	12	75
HCER4120-15C	12	1.5R	30	12	75
HCER4120-20C	12	2R	30	12	75
HCER4120-30C	12	3R	30	12	75

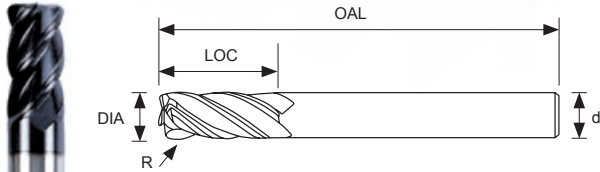
Super Micro Grain Carbide End Mill

# HCERP-4C

Super Micro Grain Carbide 4-Flute Corner Radius End Mill Long Shank



Cutting Data 38



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03
R	$\pm 0.01$



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	●	●	○	○			

Unit : mm

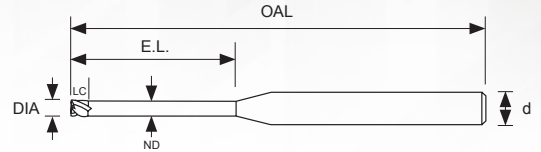
Model No.	DIA	Corner	LOC	d	OAL
HCERP4030-02BC	3	0.2R	8	3	75
HCERP4030-05BC	3	0.5R	8	3	75
HCERP4030-10BC	3	1R	8	3	75
HCERP4040-02AC	4	0.2R	10	4	75
HCERP4040-05AC	4	0.5R	10	4	75
HCERP4040-10AC	4	1R	10	4	75
HCERP4040-15AC	4	1.5R	10	4	75
HCERP4060-02C-75	6	0.2R	15	6	75
HCERP4060-05C-75	6	0.5R	15	6	75
HCERP4060-10C-75	6	1R	15	6	75
HCERP4060-15C-75	6	1.5R	15	6	75
HCERP4060-02C	6	0.2R	15	6	100
HCERP4060-05C	6	0.5R	15	6	100
HCERP4060-10C	6	1R	15	6	100
HCERP4060-15C	6	1.5R	15	6	100
HCERP4060-20C	6	2R	15	6	100
HCERP4080-05C	8	0.5R	20	8	100
HCERP4080-10C	8	1R	20	8	100
HCERP4080-15C	8	1.5R	20	8	100
HCERP4080-20C	8	2R	20	8	100
HCERP4080-30C	8	3R	20	8	100
HCERP4100-05C	10	0.5R	25	10	100
HCERP4100-10C	10	1R	25	10	100
HCERP4100-15C	10	1.5R	25	10	100
HCERP4100-20C	10	2R	25	10	100
HCERP4100-30C	10	3R	25	10	100
HCERP4120-05C	12	0.5R	30	12	100
HCERP4120-10C	12	1R	30	12	100
HCERP4120-15C	12	1.5R	30	12	100
HCERP4120-20C	12	2R	30	12	100
HCERP4120-30C	12	3R	30	12	100

# HCED-2C

Super Micro Grain Carbide 2-Flute Rib Processing End Mill



Cutting Data 39



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	●	●	○	○			

Unit : mm

Model No.	DIA	LOC	Effective Length	d	OAL
HCED2005-2AC	0.5	0.75	2	4	50
HCED2005-4AC	0.5	0.75	4	4	50
HCED2005-6AC	0.5	0.75	6	4	50
HCED2010-6AC	1	1.5	6	4	50
HCED2010-8AC	1	1.5	8	4	50
HCED2010-10AC	1	1.5	10	4	50
HCED2010-12AC	1	1.5	12	4	50
HCED2015-6AC	1.5	2.3	6	4	50
HCED2015-8AC	1.5	2.3	8	4	50
HCED2015-10AC	1.5	2.3	10	4	50
HCED2015-12AC	1.5	2.3	12	4	50
HCED2015-16AC	1.5	2.3	16	4	50
HCED2015-20AC	1.5	2.3	20	4	50
HCED2020-6AC	2	3	6	4	50
HCED2020-8AC	2	3	8	4	50
HCED2020-10AC	2	3	10	4	50
HCED2020-12AC	2	3	12	4	50
HCED2020-16AC	2	3	16	4	50
HCED2020-20AC	2	3	20	4	50
HCED2025-8AC	2.5	4	8	4	50
HCED2025-12AC	2.5	4	12	4	50
HCED2025-16AC	2.5	4	16	4	50
HCED2025-20AC	2.5	4	20	4	50
HCED2030-10C	3	4.5	10	6	50
HCED2030-12C	3	4.5	12	6	50
HCED2030-16C	3	4.5	16	6	60
HCED2030-20C	3	4.5	20	6	60
HCED2030-25C	3	4.5	25	6	75
HCED2040-12C	4	6	12	6	50
HCED2040-16C	4	6	16	6	60
HCED2040-20C	4	6	20	6	75
HCED2040-25C	4	6	25	6	75
HCED2040-30C	4	6	30	6	75
HCED2040-35C	4	6	35	6	75

Super Micro Grain Carbide End Mill

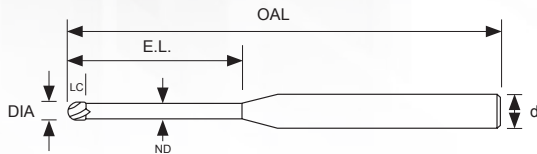


# HCEDB-2C

Super Micro Grain Carbide 2-Flute Rib Processing Ball End Mill



Cutting Data 40



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy	
	-45HRC	-50HRC	-55HRC	-60HRC				
●	●	●	●	○	○			

Unit : mm

Model No.	DIA	LOC	Effective Length	d	OAL
HCEDB2005-2AC	0.5 (0.25R)	0.75	2	4	50
HCEDB2005-4AC	0.5 (0.25R)	0.75	4	4	50
HCEDB2005-6AC	0.5 (0.25R)	0.75	6	4	50
HCEDB2006-2AC	0.6 (0.3R)	0.9	2	4	50
HCEDB2006-4AC	0.6 (0.3R)	0.9	4	4	50
HCEDB2006-6AC	0.6 (0.3R)	0.9	6	4	50
HCEDB2008-4AC	0.8 (0.4R)	1.2	4	4	50
HCEDB2008-6AC	0.8 (0.4R)	1.2	6	4	50
HCEDB2008-8AC	0.8 (0.4R)	1.2	8	4	50
HCEDB2010-6AC	1 (0.5R)	1.5	6	4	50
HCEDB2010-8AC	1 (0.5R)	1.5	8	4	50
HCEDB2010-10AC	1 (0.5R)	1.5	10	4	50
HCEDB2010-12AC	1 (0.5R)	1.5	12	4	50
HCEDB2015-6AC	1.5 (0.75R)	2.3	6	4	50
HCEDB2015-8AC	1.5 (0.75R)	2.3	8	4	50
HCEDB2015-10AC	1.5 (0.75R)	2.3	10	4	50
HCEDB2015-12AC	1.5 (0.75R)	2.3	12	4	50
HCEDB2020-8AC	2 (1R)	3	8	4	50
HCEDB2020-10AC	2 (1R)	3	10	4	50
HCEDB2020-12AC	2 (1R)	3	12	4	50
HCEDB2020-16AC	2 (1R)	3	16	4	50
HCEDB2020-20AC	2 (1R)	3	20	4	50
HCEDB2030-10C	3 (1.5R)	4.5	10	6	50
HCEDB2030-12C	3 (1.5R)	4.5	12	6	50
HCEDB2030-16C	3 (1.5R)	4.5	16	6	60
HCEDB2030-20C	3 (1.5R)	4.5	20	6	60
HCEDB2030-25C	3 (1.5R)	4.5	25	6	75
HCEDB2040-12C	4 (2R)	6	12	6	50
HCEDB2040-16C	4 (2R)	6	16	6	60
HCEDB2040-20C	4 (2R)	6	20	6	75
HCEDB2040-25C	4 (2R)	6	25	6	75
HCEDB2040-30C	4 (2R)	6	30	6	75

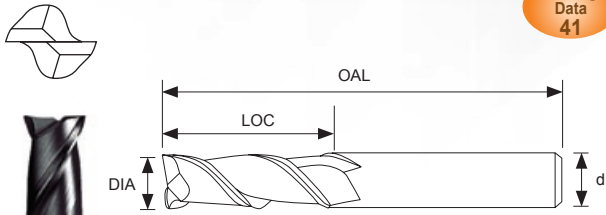
Good Design & Quality



# HHCE-2C

Ultra Fine Micro Grain Carbide 2-Flute End Mill

Cutting Data 41



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
	-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
○	○	○	●	●	●			

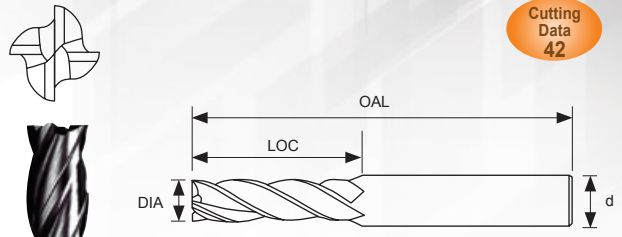
Unit : mm

Model No.	DIA	LOC	d	OAL
HHCE-2002AC	0.2	0.4	4	50
HHCE-2003AC	0.3	0.6	4	50
HHCE-2004AC	0.4	0.8	4	50
HHCE-2005AC	0.5	1.1	4	50
HHCE-2006AC	0.6	1.2	4	50
HHCE-2007AC	0.7	1.4	4	50
HHCE-2008AC	0.8	1.6	4	50
HHCE-2009AC	0.9	1.8	4	50

# HHCE-4C

Ultra Fine Micro Grain Carbide 4-Flute End Mill

Cutting Data 42



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
	-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
○	○	○	●	●	●			

Unit : mm

Model No.	DIA	LOC	d	OAL
HHCE-4010AC	1	2.5	4	50
HHCE-4015AC	1.5	3	4	50
HHCE-4020AC	2	5	4	50
HHCE-4025AC	2.5	6	4	50
HHCE-4030AC	3	7.5	4	50
HHCE-4035AC	3.5	8	4	50
HHCE-4040AC	4	10	4	50
HHCE-4045C	4.5	10	6	50
HHCE-4050C	5	12	6	50
HHCE-4055C	5.5	12.5	6	60
HHCE-4060C	6	15	6	60
HHCE-4070C	7	20	8	60
HHCE-4080C	8	20	8	60
HHCE-4100C	10	25	10	75
HHCE-4120C	12	30	12	75
HHCE-4140C	14	30	16	80
HHCE-4160C	16	45	16	100
HHCE-4200C	20	50	20	100
HHCE-4250C	25	55	25	100

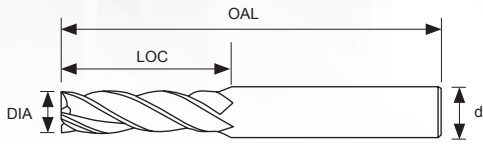
Ultra Fine Micro Grain Carbide End Mill

# HHCEL-4C

Ultra Fine Micro Grain Carbide 4-Flute End Mill Long Flute



Cutting Data 43



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



\*Note: For long series tools RPM & feed reduce 50%

Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
○	○	○	●	●	●				

Unit : mm

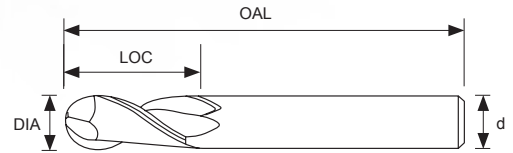
Model No.	DIA	LOC	d	OAL
HHCEL-4010AC	1	4	4	50
HHCEL-4015AC	1.5	6	4	50
HHCEL-4020AC	2	8	4	50
HHCEL-4030C	3	12	6	60
HHCEL-4040C	4	16	6	60
HHCEL-4050C	5	20	6	75
HHCEL-4060C	6	25	6	75
HHCEL-4070C	7	30	8	75
HHCEL-4080C	8	30	8	75
HHCEL-4100C	10	40	10	100
HHCEL-4120C	12	45	12	100
HHCEL-4140C	14	45	16	100
HHCEL-4160C	16	65	16	150
HHCEL-4200C	20	75	20	150
HHCEL-4250C	25	80	25	150

# HHCEB-2C

Ultra Fine Micro Grain Carbide 2-Flute Ball End Mill



Cutting Data 44



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy	
		-45HRC	-50HRC	-55HRC	-60HRC				
○	○	○	●	●	●				

Unit : mm

Model No.	DIA	LOC	d	OAL
HHCEB-2003AC	0.3 (0.15R)	0.6	4	50
HHCEB-2004AC	0.4 (0.2R)	0.8	4	50
HHCEB-2005AC	0.5 (0.25R)	1.0	4	50
HHCEB-2006AC	0.6 (0.3R)	1.2	4	50
HHCEB-2007AC	0.7 (0.35R)	1.4	4	50
HHCEB-2008AC	0.8 (0.4R)	1.6	4	50
HHCEB-2010AC	1 (0.5R)	1.5	4	50
HHCEB-2015AC	1.5 (0.75R)	2.5	4	50
HHCEB-2020AC	2 (1R)	3	4	50
HHCEB-2025AC	2.5 (1.25R)	4	4	50
HHCEB-2030BC	3 (1.5R)	5	3	50
HHCEB-2030AC	3 (1.5R)	5	4	50
HHCEB-2030C	3 (1.5R)	5	6	50
HHCEB-2040AC	4 (2R)	6	4	50
HHCEB-2040C	4 (2R)	6	6	50
HHCEB-2050C	5 (2.5R)	8	6	60
HHCEB-2060C	6 (3R)	9	6	60
HHCEB-2070C	7 (3.5R)	14	8	60
HHCEB-2080C	8 (4R)	16	8	60
HHCEB-2090C	9 (4.5R)	18	10	75
HHCEB-2100C	10 (5R)	20	10	75
HHCEB-2120C	12 (6R)	24	12	75

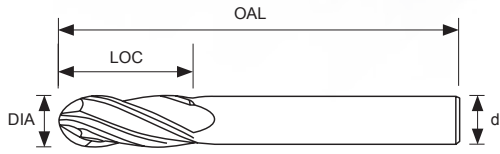
Ultra Fine Micro Grain Carbide End Mill

# HHCEB-4C

Ultra Fine Micro Grain Carbide 4-Flute Ball End Mill



Cutting Data 45



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
○	○	○	●	●	●			

Unit : mm

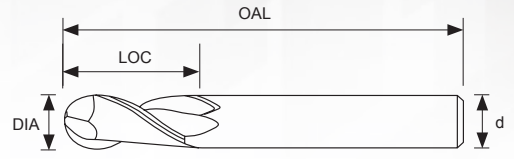
Model No.	DIA	LOC	d	OAL
HHCEB-4010AC	1 (0.5R)	2	4	50
HHCEB-4015AC	1.5 (0.75R)	3	4	50
HHCEB-4020AC	2 (1R)	4	4	50
HHCEB-4030BC	3 (1.5R)	5.5	3	50
HHCEB-4030AC	3 (1.5R)	5.5	4	50
HHCEB-4040AC	4 (2R)	6	4	50
HHCEB-4040C	4 (2R)	6	6	50
HHCEB-4050C	5 (2.5R)	9	6	50
HHCEB-4060C	6 (3R)	9	6	60
HHCEB-4080C	8 (4R)	16	8	75
HHCEB-4100C	10 (5R)	20	10	75
HHCEB-4120C	12 (6R)	24	12	75

# HHCEBP-2C

Ultra Fine Micro Grain Carbide 2-Flute Ball End Mill Long Shank



Cutting Data 46



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
○	○	○	●	●	●			

Unit : mm

Model No.	DIA	LOC	d	OAL
HHCEBP-2020C	2 (1R)	4	6	75
HHCEBP-2030C	3 (1.5R)	5	6	75
HHCEBP-2040C	4 (2R)	6	6	75
HHCEBP-2050C	5 (2.5R)	8	6	75
HHCEBP-2060C	6 (3R)	9	6	100
HHCEBP-2080C	8 (4R)	16	8	100
HHCEBP-2100C	10 (5R)	20	10	100
HHCEBP-2120C	12 (6R)	24	12	100

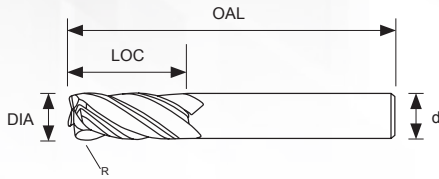
Ultra Fine Micro Grain Carbide End Mill

# HH CER-4C

Ultra Fine Micro Grain Carbide 4-Flute Corner Radius End Mill



Cutting Data 47



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03
R	$\pm 0.01$



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened					Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
○	○	○	●	●	●				

Unit : mm

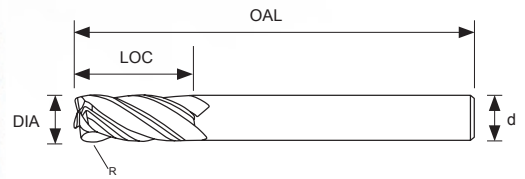
Model No.	DIA	Corner	LOC	d	OAL
HH CER-4030-02AC	3	0.2R	8	4	50
HH CER-4030-05AC	3	0.5R	8	4	50
HH CER-4030-10AC	3	1R	8	4	50
HH CER-4040-02AC	4	0.2R	10	4	50
HH CER-4040-05AC	4	0.5R	10	4	50
HH CER-4040-10AC	4	1R	10	4	50
HH CER-4060-02C	6	0.2R	16	6	75
HH CER-4060-05C	6	0.5R	16	6	75
HH CER-4060-10C	6	1R	16	6	75
HH CER-4060-20C	6	2R	16	6	75
HH CER-4080-05C	8	0.5R	20	8	75
HH CER-4080-10C	8	1R	20	8	75
HH CER-4080-20C	8	2R	20	8	75
HH CER-4100-05C	10	0.5R	25	10	75
HH CER-4100-10C	10	1R	25	10	75
HH CER-4100-15C	10	1.5R	25	10	75
HH CER-4100-20C	10	2R	25	10	75
HH CER-4100-30C	10	3R	25	10	75
HH CER-4120-05C	12	0.5R	30	12	75
HH CER-4120-10C	12	1R	30	12	75
HH CER-4120-15C	12	1.5R	30	12	75
HH CER-4120-20C	12	2R	30	12	75
HH CER-4120-30C	12	3R	30	12	75

# HH CERP-4C

Ultra Fine Micro Grain 4-Flute Corner Radius End Mill Long Shank



Cutting Data 48



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03
R	$\pm 0.01$



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened					Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
○	○	○	●	●	●				

Unit : mm

Model No.	DIA	Corner	LOC	d	OAL
HH CERP4030-02BC	3	0.2R	8	3	75
HH CERP4030-05BC	3	0.5R	8	3	75
HH CERP4030-10BC	3	1R	8	3	75
HH CERP4040-02AC	4	0.2R	10	4	75
HH CERP4040-05AC	4	0.5R	10	4	75
HH CERP4040-10AC	4	1R	10	4	75
HH CERP4040-15AC	4	1.5R	10	4	75
HH CERP4060-02C	6	0.2R	15	6	100
HH CERP4060-05C	6	0.5R	15	6	100
HH CERP4060-10C	6	1R	15	6	100
HH CERP4060-15C	6	1.5R	15	6	100
HH CERP4080-05C	8	0.5R	20	8	100
HH CERP4080-10C	8	1R	20	8	100
HH CERP4080-15C	8	1.5R	20	8	100
HH CERP4080-20C	8	2R	20	8	100
HH CERP4080-30C	8	3R	20	8	100
HH CERP4100-05C	10	0.5R	25	10	100
HH CERP4100-10C	10	1R	25	10	100
HH CERP4100-15C	10	1.5R	25	10	100
HH CERP4100-20C	10	2R	25	10	100
HH CERP4100-30C	10	3R	25	10	100
HH CERP4120-05C	12	0.5R	30	12	100
HH CERP4120-10C	12	1R	30	12	100
HH CERP4120-15C	12	1.5R	30	12	100
HH CERP4120-20C	12	2R	30	12	100
HH CERP4120-30C	12	3R	30	12	100

Ultra Fine Micro Grain Carbide End Mill



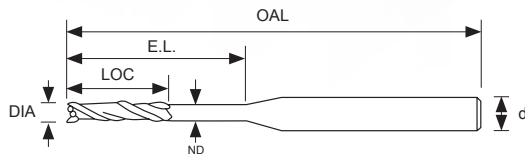
# HHCED-2C

Ultra Fine Micro Grain Carbide 2-Flute Rib Processing End Mill

Unit : mm



Cutting Data 49



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
○	○	○	●	●	●			

Unit : mm

Model No.	DIA	LOC	Effective Length	d	OAL
HHCED2005-2AC	0.5	0.75	2	4	50
HHCED2005-4AC	0.5	0.75	4	4	50
HHCED2005-6AC	0.5	0.75	6	4	50
HHCED2006-2AC	0.6	0.9	2	4	50
HHCED2006-4AC	0.6	0.9	4	4	50
HHCED2006-6AC	0.6	0.9	6	4	50
HHCED2007-4AC	0.7	1.1	4	4	50
HHCED2007-6AC	0.7	1.1	6	4	50
HHCED2008-4AC	0.8	1.2	4	4	50
HHCED2008-6AC	0.8	1.2	6	4	50
HHCED2008-8AC	0.8	1.2	8	4	50
HHCED2010-6AC	1	1.5	6	4	50
HHCED2010-8AC	1	1.5	8	4	50
HHCED2010-10AC	1	1.5	10	4	50
HHCED2010-12AC	1	1.5	12	4	50
HHCED2010-16AC	1	1.5	16	4	50
HHCED2015-6AC	1.5	2.3	6	4	50
HHCED2015-8AC	1.5	2.3	8	4	50
HHCED2015-10AC	1.5	2.3	10	4	50
HHCED2015-12AC	1.5	2.3	12	4	50
HHCED2015-14AC	1.5	2.3	14	4	50
HHCED2015-16AC	1.5	2.3	16	4	50
HHCED2015-18AC	1.5	2.3	18	4	50
HHCED2015-20AC	1.5	2.3	20	4	50
HHCED2020-6AC	2	3	6	4	50
HHCED2020-8AC	2	3	8	4	50
HHCED2020-10AC	2	3	10	4	50
HHCED2020-12AC	2	3	12	4	50

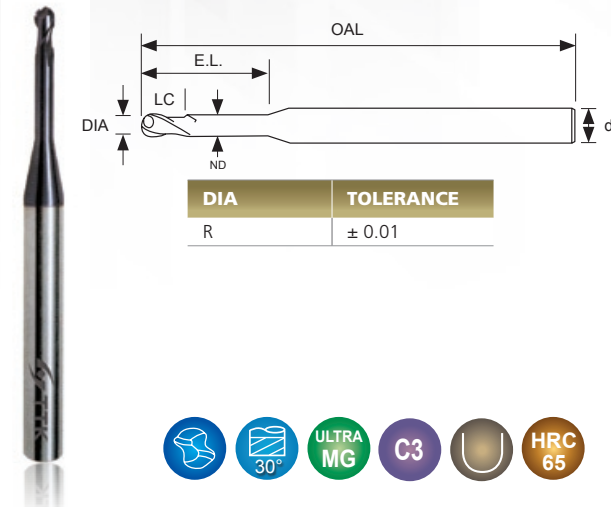
Model No.	DIA	LOC	Effective Length	d	OAL
HHCED2020-14AC	2	3	14	4	50
HHCED2020-16AC	2	3	16	4	50
HHCED2020-18AC	2	3	18	4	50
HHCED2020-20AC	2	3	20	4	50
HHCED2025-8AC	2.5	4	8	4	50
HHCED2025-10AC	2.5	4	10	4	50
HHCED2025-12AC	2.5	4	12	4	50
HHCED2025-14AC	2.5	4	14	4	50

# HHCEDB-2C

Ultra Fine Micro Grain Carbide 2-Flute Rib Processing Ball End Mill



Cutting Data  
50



DIA	TOLERANCE
R	± 0.01



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre- harden steel	High-hardened					Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
○	○	○	●	●	●				

Unit : mm

Model No.	DIA	LOC	Effective Length	d	OAL
HHCEDB2005-2AC	0.5 (0.25R)	0.75	2	4	50
HHCEDB2005-4AC	0.5 (0.25R)	0.75	4	4	50
HHCEDB2005-6AC	0.5 (0.25R)	0.75	6	4	50
HHCEDB2006-2AC	0.6 (0.3R)	0.9	2	4	50
HHCEDB2006-4AC	0.6 (0.3R)	0.9	4	4	50
HHCEDB2006-6AC	0.6 (0.3R)	0.9	6	4	50
HHCEDB2008-4AC	0.8 (0.4R)	1.2	4	4	50
HHCEDB2008-6AC	0.8 (0.4R)	1.2	6	4	50
HHCEDB2008-8AC	0.8 (0.4R)	1.2	8	4	50
HHCEDB2010-6AC	1 (0.5R)	1.5	6	4	50
HHCEDB2010-8AC	1 (0.5R)	1.5	8	4	50
HHCEDB2010-10AC	1 (0.5R)	1.5	10	4	50
HHCEDB2010-12AC	1 (0.5R)	1.5	12	4	50
HHCEDB2015-6AC	1.5 (0.75R)	2.3	6	4	50
HHCEDB2015-8AC	1.5 (0.75R)	2.3	8	4	50
HHCEDB2015-10AC	1.5 (0.75R)	2.3	10	4	50
HHCEDB2015-12AC	1.5 (0.75R)	2.3	12	4	50
HHCEDB2015-14AC	1.5 (0.75R)	2.3	14	4	50
HHCEDB2015-16AC	1.5 (0.75R)	2.3	16	4	50
HHCEDB2015-18AC	1.5 (0.75R)	2.3	18	4	50
HHCEDB2015-20AC	1.5 (0.75R)	2.3	20	4	50
HHCEDB2020-8AC	2 (1R)	3	8	4	50
HHCEDB2020-10AC	2 (1R)	3	10	4	50
HHCEDB2020-12AC	2 (1R)	3	12	4	50
HHCEDB2020-14AC	2 (1R)	3	14	4	50
HHCEDB2020-16AC	2 (1R)	3	16	4	50
HHCEDB2020-18AC	2 (1R)	3	18	4	50
HHCEDB2020-20AC	2 (1R)	3	20	4	50

Unit : mm

Model No.	DIA	LOC	Effective Length	d	OAL
HHCEDB2025-8AC	2.5 (1.25R)	4	8	4	50
HHCEDB2025-12AC	2.5 (1.25R)	4	12	4	50
HHCEDB2025-16AC	2.5 (1.25R)	4	16	4	50
HHCEDB2030-10C	3 (1.5R)	4.5	10	6	50
HHCEDB2030-12C	3 (1.5R)	4.5	12	6	50
HHCEDB2030-16C	3 (1.5R)	4.5	16	6	60
HHCEDB2030-20C	3 (1.5R)	4.5	20	6	60
HHCEDB2030-25C	3 (1.5R)	4.5	25	6	75
HHCEDB2040-12C	4 (2R)	6	12	6	50
HHCEDB2040-16C	4 (2R)	6	16	6	60
HHCEDB2040-20C	4 (2R)	6	20	6	75
HHCEDB2040-25C	4 (2R)	6	25	6	75
HHCEDB2040-30C	4 (2R)	6	30	6	75

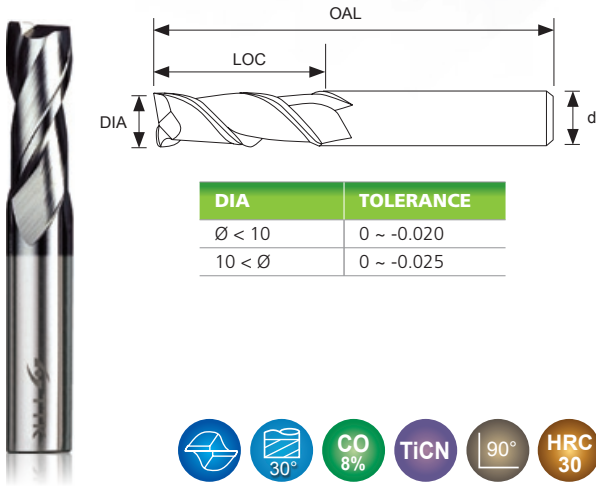
# HS-2C

HSS 2-Flute End Mill

Unit : mm



Cutting Data 51



DIA	TOLERANCE
$\varnothing < 10$	0 ~ -0.020
$10 < \varnothing$	0 ~ -0.025



Cutter	Work Material (● Most Suitable / ○ Suitable)							
	Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC	-65HRC		
Uncoated	●	○					○	○
Coated	●	○					○	○

Unit : mm

Model No.	DIA	LOC	d	OAL
HS-2015C	1.5	4.5	6	50
HS-2020C	2	7	6	50
HS-2025C	2.5	7	6	50
HS-2030C	3	9	6	50
HS-2035C	3.5	12	8	60
HS-2040C	4	12	8	60
HS-2045C	4.5	15	8	60
HS-2050C	5	15	8	60
HS-2055C	5.5	15	8	60
HS-2060C	6	15	8	60
HS-2060AC	6	15	6	60
HS-2065C	6.5	20	10	65
HS-2070C	7	20	10	65
HS-2075C	7.5	20	10	65
HS-2080C	8	20	10	65
HS-2080AC	8	20	8	65
HS-2085C	8.5	25	10	75
HS-2090C	9	25	10	75
HS-2095C	9.5	25	10	75
HS-2100C	10	25	10	75
HS-2110C	11	30	12	80
HS-2120C	12	30	12	80
HS-2130C	13	35	12	90
HS-2140C	14	35	16	90
HS-2150C	15	40	16	95
HS-2160C	16	40	16	95

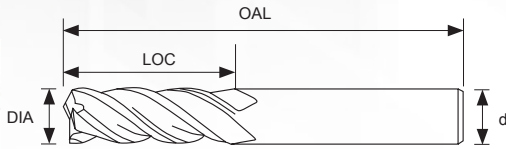
Model No.	DIA	LOC	d	OAL
HS-2170C	17	40	20	105
HS-2180C	18	40	20	105
HS-2190C	19	45	20	110
HS-2200C	20	45	20	110
HS-2210C	21	45	20	110
HS-2220C	22	45	20	110
HS-2230C	23	50	25	120
HS-2240C	24	50	25	120
HS-2250C	25	50	25	120
HS-2260C	26	50	25	120
HS-2270C	27	55	25	125
HS-2280C	28	55	25	125
HS-2290C	29	55	25	125
HS-2300C	30	55	25	125
HS-2310C	31	60	32	145
HS-2320C	32	60	32	145
HS-2330C	33	60	32	145
HS-2340C	34	60	32	145
HS-2350C	35	60	32	145
HS-2360C	36	60	32	145
HS-2370C	37	65	32	150
HS-2380C	38	65	32	150
HS-2390C	39	65	32	150
HS-2400C	40	65	32	150
HS-2420C	42	65	32	150

# HS-3C

HSS 3-Flute High Helix End Mill



Cutting Data 52



DIA	TOLERANCE
∅ < 10	0 ~ -0.020
10 < ∅	0 ~ -0.025



Cutter	Work Material (● Most Suitable / ○ Suitable)								
	Carbon steel, Alloy steel	Pre-harden steel		High-hardened			Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
Uncoated	●	○						○	○
Coated	●	○						○	○

Unit : mm

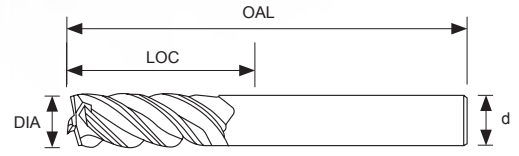
Model No.	DIA	LOC	d	OAL
HS-3060C	6	15	8	60
HS-3070C	7	20	10	65
HS-3080C	8	20	10	65
HS-3090C	9	25	10	75
HS-3100C	10	25	10	75
HS-3110C	11	30	12	80
HS-3120C	12	30	12	80
HS-3130C	13	35	12	90
HS-3140C	14	35	16	90
HS-3150C	15	40	16	95
HS-3160C	16	40	16	95
HS-3170C	17	40	20	105
HS-3180C	18	40	20	105
HS-3190C	19	45	20	110
HS-3200C	20	45	20	110
HS-3250C	25	50	25	120
HS-3300C	30	55	25	125

# HS-4C

HSS 4-Flute End Mill



Cutting Data 52



DIA	TOLERANCE
∅ < 10	0 ~ +0.020
10 < ∅	0 ~ +0.025



Cutter	Work Material (● Most Suitable / ○ Suitable)								
	Carbon steel, Alloy steel	Pre-harden steel		High-hardened			Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
Uncoated	●	○						○	○
Coated	●	○						○	○

Unit : mm

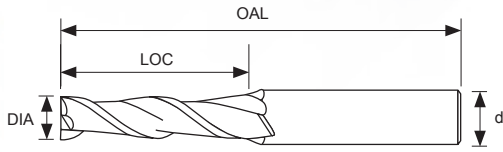
Model No.	DIA	LOC	d	OAL
HS-4020TC	2	7	6	50
HS-4025TC	2.5	7	6	50
HS-4030TC	3	9	6	50
HS-4035TC	3.5	12	8	60
HS-4040TC	4	12	8	60
HS-4045TC	4.5	15	8	60
HS-4050TC	5	15	8	60
HS-4055TC	5.5	15	8	60
HS-4060TC	6	15	8	60
HS-4065TC	6.5	20	10	65
HS-4070TC	7	20	10	65
HS-4075TC	7.5	20	10	65
HS-4080TC	8	20	10	65
HS-4085TC	8.5	25	10	75
HS-4090TC	9	25	10	75
HS-4095TC	9.5	25	10	75
HS-4100TC	10	25	10	75
HS-4110TC	11	30	12	80
HS-4120TC	12	30	12	80
HS-4130TC	13	35	12	90
HS-4140TC	14	35	16	90
HS-4150TC	15	40	16	95
HS-4160TC	16	40	16	95
HS-4170TC	17	40	20	105
HS-4180TC	18	40	20	105
HS-4190TC	19	45	20	110
HS-4200TC	20	45	20	110
HS-4210TC	21	45	20	110
HS-4220TC	22	45	20	110
HS-4230TC	23	50	25	120
HS-4240TC	24	50	25	120
HS-4250TC	25	50	25	120
HS-4260TC	26	50	25	120
HS-4270TC	27	55	25	125
HS-4280TC	28	55	25	125
HS-4290TC	29	55	25	125
HS-4300TC	30	55	25	125
HS-4310TC	31	60	32	145
HS-4320TC	32	60	32	145
HS-4330TC	33	60	32	145
HS-4340TC	34	60	32	145
HS-4350TC	35	60	32	145
HS-4360TC	36	60	32	145
HS-4370TC	37	65	32	150
HS-4380TC	38	65	32	150
HS-4390TC	39	65	32	150
HS-4400TC	40	65	32	150
HS-4420TC	42	65	32	150

# HSL-2C

HSS 2-Flute End Mill Long Flute



Cutting Data 51



DIA	TOLERANCE
$\varnothing < 10$	0 ~ -0.020
$10 < \varnothing$	0 ~ -0.025



\*Note: For long series tools RPM & feed reduce 50%

Cutter	Work Material (● Most Suitable / ○ Suitable)									
	Carbon steel, Alloy steel	Pre-harden steel	High-hardened					Stainless steel	Copper alloy	Aluminum alloy
			-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
Uncoated	●	○						○	○	
Coated	●	○						○	○	

Unit : mm

Model No.	DIA	LOC	d	OAL
HSL-2020C	2	10	6	60
HSL-2030C	3	15	6	60
HSL-2040C	4	20	8	60
HSL-2050C	5	25	8	65
HSL-2060C	6	25	8	65
HSL-2060AC	6	25	6	65
HSL-2070C	7	35	10	80
HSL-2080C	8	35	10	80
HSL-2090C	9	45	10	95
HSL-2100C	10	45	10	95
HSL-2110C	11	55	12	105
HSL-2120C	12	55	12	105
HSL-2130C	13	55	12	110
HSL-2140C	14	55	16	110
HSL-2150C	15	65	16	120
HSL-2160C	16	65	16	120
HSL-2170C	17	65	20	130
HSL-2180C	18	65	20	130
HSL-2190C	19	75	20	140
HSL-2200C	20	75	20	140
HSL-2210C	21	75	20	140
HSL-2220C	22	75	20	140
HSL-2230C	23	90	25	160
HSL-2240C	24	90	25	160
HSL-2250C	25	90	25	160
HSL-2260C	26	90	25	160
HSL-2270C	27	90	25	160
HSL-2280C	28	90	25	160
HSL-2290C	29	90	25	160
HSL-2300C	30	90	25	160
HSL-2310C	31	105	32	190

Unit : mm

Model No.	DIA	LOC	d	OAL
HSL-2320C	32	105	32	190
HSL-2330C	33	105	32	190
HSL-2340C	34	105	32	190
HSL-2350C	35	105	32	190
HSL-2360C	36	105	32	190
HSL-2370C	37	125	32	210
HSL-2380C	38	125	32	210
HSL-2390C	39	125	32	210
HSL-2400C	40	125	32	210

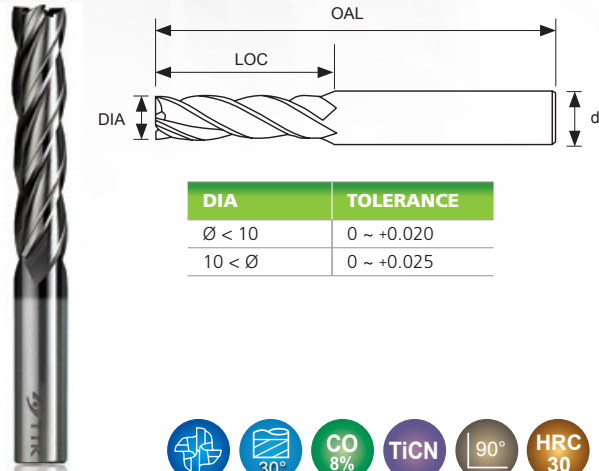


# HSL-4C

HSS 4-Flute End Mill Long Flute



Cutting Data 52



DIA	TOLERANCE
Ø < 10	0 ~ +0.020
10 < Ø	0 ~ +0.025



\*Note: For long series tools RPM & feed reduce 50%

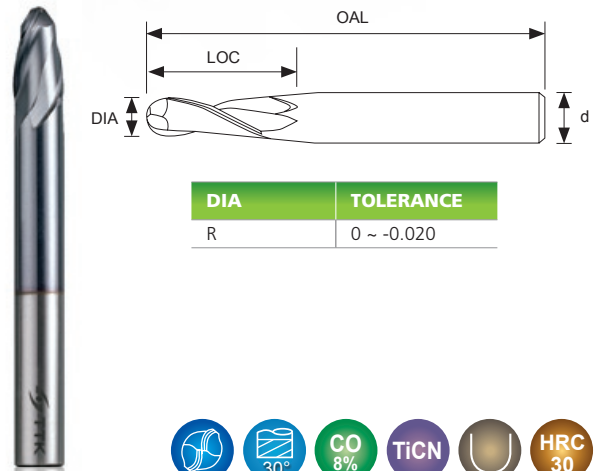
Cutter	Work Material (● Most Suitable / ○ Suitable)									
	Carbon steel, Alloy steel	Pre-harden steel	High-hardened					Stainless steel	Copper alloy	Aluminum alloy
			-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
Uncoated	●	○						○	○	
Coated	●	○						○	○	

Unit : mm

Model No.	DIA	LOC	d	OAL
HSL-4030C	3	15	6	60
HSL-4040C	4	20	8	60
HSL-4050C	5	25	8	65
HSL-4060C	6	25	8	65
HSL-4070C	7	35	10	80
HSL-4080C	8	35	10	80
HSL-4090C	9	45	10	95
HSL-4100C	10	45	10	95
HSL-4110C	11	55	12	105
HSL-4120C	12	55	12	105
HSL-4130C	13	55	12	110
HSL-4140C	14	55	16	110
HSL-4150C	15	65	16	120
HSL-4160C	16	65	16	120
HSL-4170C	17	65	20	130
HSL-4180C	18	65	20	130
HSL-4190C	19	75	20	140
HSL-4200C	20	75	20	140
HSL-4210C	21	75	20	140
HSL-4220C	22	75	20	140
HSL-4230C	23	90	25	160
HSL-4240C	24	90	25	160
HSL-4250C	25	90	25	160
HSL-4260C	26	90	25	160
HSL-4270C	27	90	25	160
HSL-4280C	28	90	25	160
HSL-4290C	29	90	25	160
HSL-4300C	30	90	25	160
HSL-4310C	31	105	32	190
HSL-4320C	32	105	32	190
HSL-4330C	33	105	32	190
HSL-4340C	34	105	32	190
HSL-4350C	35	105	32	190
HSL-4360C	36	105	32	190
HSL-4370C	37	125	32	210
HSL-4380C	38	125	32	210
HSL-4390C	39	125	32	210
HSL-4400C	40	125	32	210

# HSB-2C

HSS 2-Flute Ball End Mill



DIA	TOLERANCE
R	0 ~ -0.020



Cutter	Work Material (● Most Suitable / ○ Suitable)									
	Carbon steel, Alloy steel	Pre-harden steel	High-hardened					Stainless steel	Copper alloy	Aluminum alloy
			-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
Uncoated	●	○						○	○	
Coated	●	○						○	○	

Unit : mm

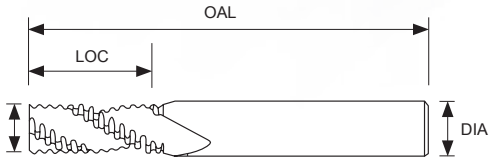
Model No.	DIA	LOC	d	OAL
HSB-2020C	2 (1R)	4	6	55
HSB-2030C	3 (1.5R)	6	6	70
HSB-2040C	4 (2R)	8	6	70
HSB-2050C	5 (2.5R)	10	6	80
HSB-2060C	6 (3R)	12	6	90
HSB-2070C	7 (3.5R)	14	6	90
HSB-2080C	8 (4R)	16	8	100
HSB-2090C	9 (4.5R)	18	8	100
HSB-2100C	10 (5R)	20	10	100
HSB-2110C	11 (5.5R)	22	10	100
HSB-2120C	12 (6R)	24	12	110
HSB-2130C	13 (6.5R)	26	12	110
HSB-2140C	14 (7R)	28	12	110
HSB-2150C	15 (7.5R)	30	16	110
HSB-2160C	16 (8R)	32	16	140
HSB-2180C	18 (9R)	36	16	150
HSB-2200C	20 (10R)	40	20	160
HSB-2250C	25 (12.5R)	50	25	180

# HSR-4C

HSS Roughing End Mill Fine Pitch, Round Profile



Cutting Data 53



DIA	TOLERANCE
6 < $\varnothing$ < 10	0 ~ +0.150
10 < $\varnothing$ < 18	0 ~ +0.180
18 < $\varnothing$ < 30	0 ~ +0.210
30 < $\varnothing$ < 40	0 ~ +0.250



Cutter	Work Material (● Most Suitable / ○ Suitable)									
	Carbon steel, Alloy steel	Pre-harden steel	High-hardened					Stainless steel	Copper alloy	Aluminum alloy
			-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
Uncoated	●	○						○	○	
Coated	●	○						○	○	

Unit : mm

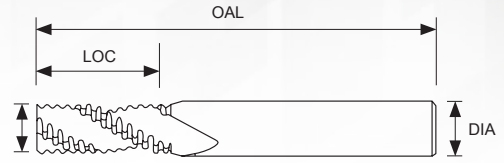
Model No.	DIA	LOC	d	OAL	T
HSR-4060C	6	15	8	60	4
HSR-4070C	7	20	10	65	4
HSR-4080C	8	20	10	65	4
HSR-4090C	9	25	10	75	4
HSR-4100C	10	25	10	75	4
HSR-4110C	11	30	12	80	4
HSR-4120C	12	30	12	80	4
HSR-4130C	13	35	12	90	4
HSR-4140C	14	35	16	90	4
HSR-4150C	15	40	16	95	4
HSR-4160C	16	40	16	95	4
HSR-4180C	18	40	20	105	4
HSR-4200C	20	45	20	110	4
HSR-5220C	22	45	20	110	5
HSR-5250C	25	50	25	120	5
HSR-5280C	28	55	25	120	5
HSR-5300C	30	55	25	125	5
HSR-6320C	32	60	32	145	6
HSR-6350C	35	60	32	145	6
HSR-6400C	40	65	32	150	6

# HSRL-4C

HSS Roughing End Mill Long Flute Fine Pitch, Round Profile



Cutting Data 53



DIA	TOLERANCE
6 < $\varnothing$ < 10	0 ~ +0.150
10 < $\varnothing$ < 18	0 ~ +0.180
18 < $\varnothing$ < 30	0 ~ +0.210
30 < $\varnothing$ < 40	0 ~ +0.250



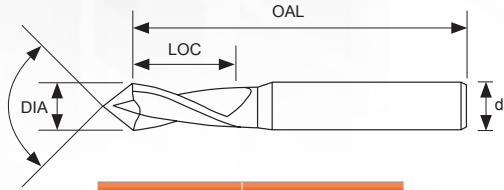
Cutter	Work Material (● Most Suitable / ○ Suitable)									
	Carbon steel, Alloy steel	Pre-harden steel	High-hardened					Stainless steel	Copper alloy	Aluminum alloy
			-45HRC	-50HRC	-55HRC	-60HRC	-65HRC			
Uncoated	●	○						○	○	
Coated	●	○						○	○	

Unit : mm

Model No.	DIA	LOC	d	OAL	T
HSRL-4060C	6	24	8	68	4
HSRL-4080C	8	35	10	80	4
HSRL-4100C	10	45	10	95	4
HSRL-4120C	12	55	12	105	4
HSRL-4140C	14	55	16	110	4
HSRL-4160C	16	65	16	120	4
HSRL-4180C	18	65	20	125	4
HSRL-4200C	20	75	20	140	4
HSRL-5220C	22	75	20	140	5
HSRL-5250C	25	90	25	160	5
HSRL-5280C	28	90	25	160	5
HSRL-5300C	30	90	25	160	5
HSRL-6320C	32	105	32	190	6
HSRL-6350C	35	105	32	190	6
HSRL-6400C	40	125	32	210	6

# CCA

Fine Micro Grain Solid Carbide 2-Flute Multi Function End Mill



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)									
Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy		
		-45HRC	-50HRC	-55HRC					
●	●	○	○		○	●	●		

Unit : mm

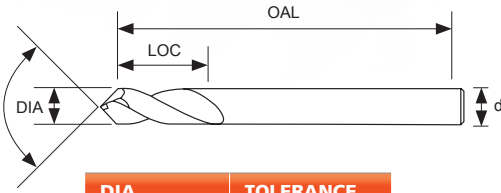
Model No.	DIA	LOC	d	Angle	OAL
CCA-2030AC-60	3	6	4	60°	50
CCA-2030AC-90	3	6	4	90°	50
CCA-2030AC-120	3	6	4	120°	50
CCA-2040C-60	4	8	6	60°	50
CCA-2040C-90	4	8	6	90°	50
CCA-2040C-120	4	8	6	120°	50
CCA-2050C-60	5	10	6	60°	50
CCA-2050C-90	5	10	6	90°	50
CCA-2050C-120	5	10	6	120°	50
CCA-2060C-60	6	12	8	60°	60
CCA-2060C-90	6	12	8	90°	60
CCA-2060C-120	6	12	8	120°	60
CCA-2080C-60	8	16	10	60°	75
CCA-2080C-90	8	16	10	90°	75
CCA-2080C-120	8	16	10	120°	75
CCA-2100C-60	10	20	12	60°	75
CCA-2100C-90	10	20	12	90°	75
CCA-2100C-120	10	20	12	120°	75
CCA-2120C-60	12	25	12	60°	75
CCA-2120C-90	12	25	12	90°	75
CCA-2120C-120	12	25	12	120°	75
CCA-2140C-60	14	28	14	60°	80
CCA-2140C-90	14	28	14	90°	80
CCA-2140C-120	14	28	14	120°	80
CCA-2160C-60	16	32	16	60°	100
CCA-2160C-90	16	32	16	90°	100
CCA-2160C-120	16	32	16	120°	100
CCA-2200C-60	20	35	20	60°	100
CCA-2200C-90	20	35	20	90°	100
CCA-2200C-120	20	35	20	120°	100

Cutting Style	60°	90°	120°
<b>CENTERING - SPOTTING</b> 	×	●	●
<b>INTERPOLATION DRILLING</b> 	●	●	●
<b>COUNTOURING</b> 	●	●	●
<b>V - GROOVING</b> 	×	●	●
<b>LONGITUDINAL CHAMFERS</b> 	●	●	●
<b>DRILLING</b> 	×	●	●
<b>CHAMFERING</b> 	●	●	●
<b>DIRECT CHAMFERS</b> 	×	●	●
<b>ENGRAVING</b> 	●	×	×

Angle Mill

# CDA

Fine Micro Grain Solid Carbide 2-Flute Position Sport Drill/NC Drill



DIA	TOLERANCE
$\varnothing < 1$	-0 ~ -0.02
$1 < \varnothing < 12$	-0 ~ -0.02
$12 < \varnothing$	-0 ~ -0.03



Work Material (● Most Suitable / ○ Suitable)								
Carbon steel, Alloy steel	Pre-harden steel	High-hardened				Stainless steel	Copper alloy	Aluminum alloy
		-45HRC	-50HRC	-55HRC	-60HRC			
●	●	○					●	●

Unit : mm

Model No.	DIA	LOC	d	d	OAL
CDA-2030B-90	3	10	3	90°	50
CDA-2030B-120	3	10	3	120°	50
CDA-2040A-90	4	12	4	90°	50
CDA-2040A-120	4	12	4	120°	50
CDA-2060-90	6	20	6	90°	60
CDA-2060-120	6	20	6	120°	60
CDA-2080-90	8	25	8	90°	60
CDA-2080-120	8	25	8	120°	60
CDA-2100-90	10	25	10	90°	75
CDA-2100-120	10	25	10	120°	75
CDA-2120-90	12	30	12	90°	75
CDA-2120-120	12	30	12	120°	75
CDA-2160-90	16	35	16	90°	100
CDA-2160-120	16	35	16	120°	100
CDA-2200-90	20	40	20	90°	100
CDA-2200-120	20	40	20	120°	100

*Good Design & Quality*



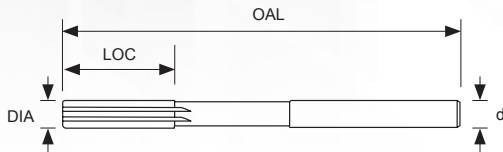
Super Micro Grain Carbide End Mill

# MRM

Solid Carbide Machine Reamer, Straight Shank H7



Cutting Data 57



DIA	TOLERANCE
SIZE	H7



Work Material (● Most Suitable / ○ Suitable)

Carbon steel, Alloy steel	Pre-harden steel	High-hardened			Stainless steel	Copper alloy	Aluminum alloy
	-45HRC	-50HRC	-55HRC	-60HRC			
●	○				○	●	●

Unit : mm

Model No.	DIA	LOC	T	d	OAL
MRM-010	1	6	4	1	34
MRM-011	1.1	7	4	1.1	36
MRM-012	1.2	7	4	1.2	38
MRM-013	1.3	7	4	1.3	38
MRM-014	1.4	8	4	1.4	40
MRM-015	1.5	9	4	1.5	38
MRM-016	1.6	9	4	1.6	43
MRM-017	1.7	9	4	1.7	43
MRM-018	1.8	10	4	1.8	46
MRM-019	1.9	10	4	1.9	46
MRM-020	2	11	4	2	53
MRM-021	2.1	15	4	2.1	66
MRM-022	2.2	12	4	2.2	53
MRM-023	2.3	12	4	2.3	53
MRM-024	2.4	14	4	2.4	57
MRM-025	2.5	14	4	2.5	57
MRM-026	2.6	14	4	2.6	57
MRM-027	2.7	15	4	2.7	61
MRM-028	2.8	15	4	2.8	61
MRM-029	2.9	15	4	2.9	61
MRM-030	3	15	4	3	61
MRM-031	3.1	16	4	3.1	65
MRM-032	3.2	16	4	3.2	65
MRM-033	3.3	16	4	3.3	65
MRM-034	3.4	18	4	3.4	70
MRM-035	3.5	18	4	3.5	70
MRM-036	3.6	18	4	3.6	70
MRM-037	3.7	18	4	3.7	70
MRM-038	3.8	19	4	3.8	75
MRM-039	3.9	19	4	3.9	75
MRM-040	4	19	4	4	75
MRM-041	4.1	19	4	4.1	75
MRM-042	4.2	19	4	4.2	75
MRM-043	4.3	21	4	4.3	80
MRM-044	4.4	21	4	4.4	80
MRM-045	4.5	21	4	4.5	80
MRM-046	4.6	21	4	4.6	80

Unit : mm

Model No.	DIA	LOC	T	d	OAL
MRM-047	4.7	21	4	4.7	80
MRM-048	4.8	23	4	4.8	86
MRM-049	4.9	23	4	4.9	86
MRM-050	5	23	4	5	86
MRM-051	5.1	23	4	5.1	86
MRM-052	5.2	23	4	5.2	86
MRM-053	5.3	23	4	5.3	86
MRM-054	5.4	26	4	5.4	93
MRM-055	5.5	26	4	5.5	93
MRM-056	5.6	26	4	5.6	93
MRM-057	5.7	26	4	5.7	93
MRM-058	5.8	26	4	5.8	93
MRM-059	5.9	26	4	5.9	93
MRM-060	6	26	4	6	93
MRM-061	6.1	28	4	6.1	101
MRM-062	6.2	28	4	6.2	101
MRM-063	6.3	28	4	6.3	101
MRM-064	6.4	28	4	6.4	101
MRM-065	6.5	28	4	6.5	101
MRM-066	6.6	28	4	6.6	101
MRM-067	6.7	31	4	6.7	101
MRM-068	6.8	31	4	6.8	101
MRM-069	6.9	31	4	6.9	101
MRM-070	7	31	6	7	109
MRM-071	7.1	31	6	7.1	109
MRM-072	7.2	31	6	7.2	109
MRM-073	7.3	31	6	7.3	109
MRM-074	7.4	31	6	7.4	109
MRM-075	7.5	31	6	7.5	109
MRM-076	7.6	33	6	7.6	117
MRM-077	7.7	33	6	7.7	117
MRM-078	7.8	33	6	7.8	117
MRM-079	7.9	33	6	7.9	117
MRM-080	8	33	6	8	117
MRM-081	8.1	33	6	8.1	117
MRM-082	8.2	33	6	8.2	117
MRM-083	8.3	33	6	8.3	117
MRM-084	8.4	33	6	8.4	117
MRM-085	8.5	33	6	8.5	117
MRM-086	8.6	36	6	8.6	125
MRM-087	8.7	36	6	8.7	125
MRM-088	8.8	36	6	8.8	125
MRM-089	8.9	36	6	8.9	125
MRM-090	9	36	6	9	125
MRM-091	9.1	36	6	9.1	125
MRM-092	9.2	36	6	9.2	125
MRM-093	9.3	36	6	9.3	125
MRM-094	9.4	36	6	9.4	125
MRM-095	9.5	36	6	9.5	125
MRM-096	9.6	38	6	9.6	133
MRM-097	9.7	38	6	9.7	133
MRM-098	9.8	38	6	9.8	133
MRM-099	9.9	38	6	9.9	133
MRM-100	10	38	6	10	133
MRM-101	10.1	38	6	10.1	133
MRM-102	10.2	38	6	10.2	133
MRM-103	10.3	38	6	10.3	133
MRM-104	10.4	38	6	10.4	133
MRM-105	10.5	38	6	10.5	133
MRM-106	10.6	38	6	10.6	133
MRM-107	10.7	41	6	10.7	142
MRM-108	10.8	41	6	10.8	142
MRM-109	10.9	41	6	10.9	142
MRM-110	11	41	6	11	142
MRM-111	11.1	41	6	11.1	142
MRM-112	11.2	41	6	11.2	142
MRM-113	11.3	41	6	11.3	142
MRM-114	11.4	41	6	11.4	142
MRM-115	11.5	41	6	11.5	142
MRM-116	11.6	41	6	11.6	142
MRM-117	11.7	41	6	11.7	142
MRM-118	11.8	41	6	11.8	142
MRM-119	11.9	44	6	11.9	151
MRM-120	12	44	6	12	151



# SX

Changeable Head Into Anti-Vibration Bar For Longer Length

## 4 Flute with Coner Radius

Unit : mm



Model No.	D Dia x Corner R	l Flute-Lengh	d Neck Dia	M Tread Size
HR-100054	10 x 0.5R	10	9.7	M05
HR-100104	10 x 1R	10	9.7	M05
HR-100204	10 x 2R	10	9.7	M05
HR-120054	12 x 0.5R	12	11.7	M06
HR-120104	12 x 1R	12	11.7	M06
HR-120204	12 x 2R	12	11.7	M06
HR-160104	16 x 1R	16	15.7	M08
HR-160204	16 x 2R	16	15.7	M08
HR-200104	20 x 1R	20	19.5	M10
HR-200204	20 x 2R	20	19.5	M10
HR-200304	20 x 3R	20	19.5	M10
HR-250104	25 x 1R	25	24.5	M12
HR-250204	25 x 2R	25	24.5	M12
HR-250304	25 x 3R	25	24.5	M12

## 4 Flute End Mill

Unit : mm



Model No.	D Dia x Corner R	l Flute-Lengh	d Neck Dia	M Tread Size
HD-1004	10	10	9.7	M05
HD-1204	12	12	11.7	M06
HD-1604	16	16	15.7	M08
HD-2004	20	20	19.5	M10
HD-2504	25	25	24.5	M12

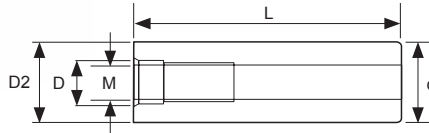
## 2 Flute Ball Nose

Unit : mm



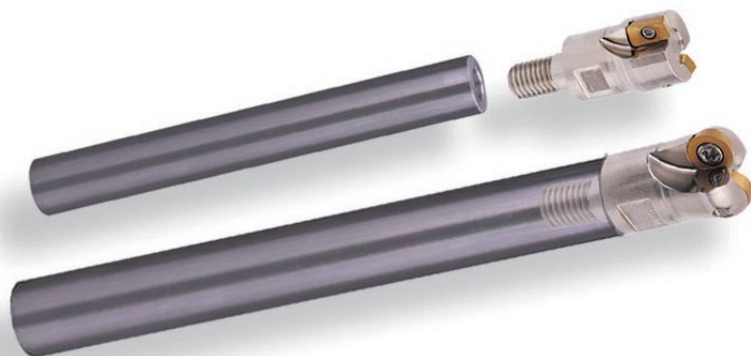
Model No.	D Dia x Corner R	l Flute-Lengh	d Neck Dia	M Tread Size
HB-1002	10	10	9.7	M05
HB-1202	12	12	11.7	M06
HB-1602	16	16	15.7	M08
HB-2002	20	20	19.5	M10
HB-2502	25	25	24.5	M12

# Solid Carbide Anti-Vibration Bar For Ex-Changeable Tools Head Holder Straight Shank



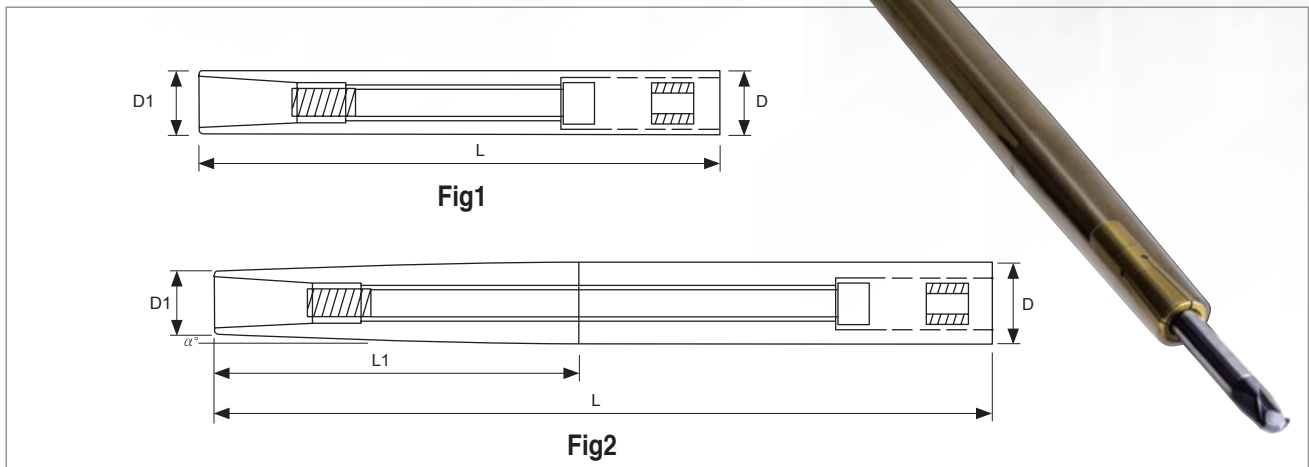
Model No.	Specification				
	d	D2	D	M	L
CE06-060-M3	6	6	3.5	3	60
CE06-120-M3					120
CE08-060-M4	8	8	4.5	4	60
CE08-100-M4					100
CE08-120-M4					120
CE10-075-M5	10	10	5.5	5	75
CE10-100-M5					100
CE10-150-M5					150
CE11-100-M6	11	11	6.5	6	100
CE11-150-M6					150
CE12-075-M6	12	12	6.5	6	75
CE12-100-M6					100
CE12-150-M6					150
CE12-200-M6					200
CE15-100-M8	15	15	8.5	8	100
CE15-150-M8					150
CE15-200-M8					200
CE16-100-M8	16	16	8.5	8	100
CE16-150-M8					150
CE16-200-M8					200
CE16-250-M8					250
CE19-100-M10	19	19	10.5	10	100
CE19-150-M10					150
CE19-200-M10					200
CE20-100-M10	20	20	10.5	10	100
CE20-150-M10					150
CE20-200-M10					200
CE20-250-M10					250
CE20-300-M10					300

Model No.	Specification				
	d	D2	D	M	L
CE24-150-M12	24	24	12.5	12	150
CE24-200-M12					200
CE24-250-M12					250
CE25-100-M12	25	25	12.5	12	100
CE25-150-M12					150
CE25-200-M12					200
CE25-250-M12					250
CE25-300-M12					300
CE25-350-M12					350
CE31-200-M16	31	31	17	16	200
CE31-250-M16					250
CE31-300-M16					300
CE31-400-M16					400
CE32-150-M16	32	32	17	16	150
CE32-200-M16					200
CE32-250-M16					250
CE32-300-M16					300
CE32-350-M16					350
CE32-400-M16	400				



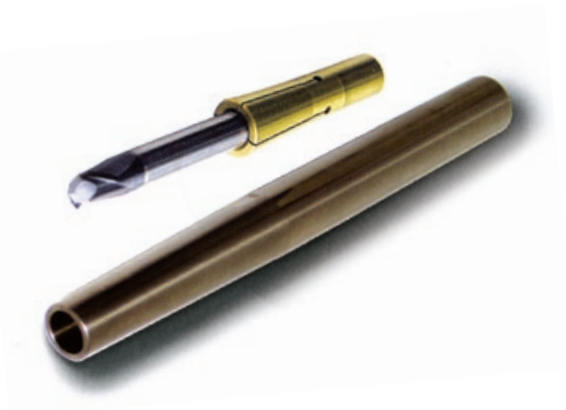
# Solid Carbide Extension Collet Chuck Holder

Make by high density Tungsten Carbide.  
 It's outstanding hardness is advantageous to minimal wearing on tool.  
 Significant extends the depth on high cavity operation.



Model No.	Specification					Range	Collet	Fig	
	D	D1	$\theta$	L	L1				
CE08A-DC4-100	8	8	-	100	-	3 ~ 4	DC4	1	
CE10A-DC4-150	10	10	-	150	-			1	
CE12-DC4-150	12	10	1	150	60			2	
CE16-DC4-200	16	10	1.8°	200	100			2	
CE12A-DC6-150	12	12	-	150	-	3 ~ 6	DC6	1	
CE16-DC6-150	16	12.5	1.7°	150	60			2	
CE16-DC6-200	16	12.5	1.2°	200	90			2	
CE20-DC6-250	20	12.8	1.9°	250	100			2	
CE20A-UC10-150	20	20	-	150	-	3 ~ 10	UC10	1	
CE20A-UC10-200	20	20	-	200	-			1	
CE25-UC10-250	25	23	0.5°	250	120			2	
CE25-UC10-300	25	23	0.5°	300	120				2
									2

## Collet



Unit : mm

Model No.	Size	Collet
DC4-3	3	DC4
DC4-4	4	
DC6-3	3	DC6
DC6-4	4	
DC6-6	6	
UC10-3	3	UC10
UC10-4	4	
UC10-6	6	
UC10-8	8	
UC10-10	10	



# END MILL RE-SHARPENER

## GH-413 / GH-1225

**EASY**

**ECONOMIC**

**EFFICIENT**



4 Flutes



3 Flutes



2 Flutes



for 2 and 4 Flute End Mill



for 3 Flute End Mill





Magnified Part

Fixed Block  
(Harden treatment to protect the alignment base)

Alignment Knob

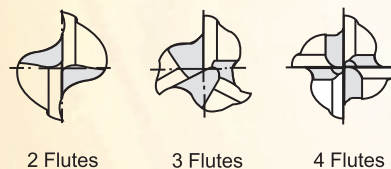
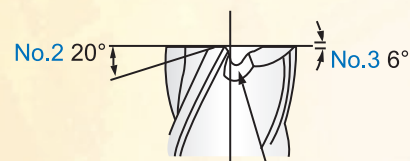
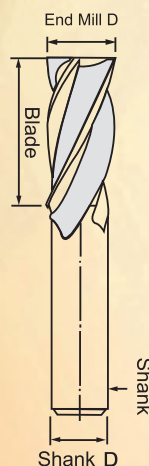
Alignment Base

Alignment Block

2. NO.2 FOR SCREW RADIAL ANGLE 20°

3. NO.3 FOR CUTTING ANGLE 6, THIS OVAL SHAPED HOLE ALLOWS HOLDER UNIT TO MOVE ON AXIS TO GRIND ALL SURFACE OF END MILL.

1. NO.1 FOR END MILL FLAT SLOT ANGLE 30°



**GH413- 4-13mm, GH1225-12-25mm**  
**For End Mill Re-sharpener, 2,3 and 4 Flutes**  
**Precision, Efficiency, Easy Operation, Short**  
**Processing Time, Grinding Diameter from**  
**GH413- 4-13mm, GH1225-12-25mm.**

- 1. High Efficiency, High Quality Grinding Slip, Good Grinding Results
- 2. Tolerance : ±0.02mm
- 3. Operation : Easy and Fast

Patent		M321829			Unit: cm
Model	Capacity	Motor / Speed	Weight	L X W X H	
GH-413	4mm - 13mm	450 w / 6000 rpm	17kgs	310 x 260 x 290	
GH-1225	12mm - 25mm	1000 w / 4500rpm	30kgs	360 x 290 x 340	
Axial angles	Third angle 6°	Primary angle 20°	Second angle 30°		
Power	AC 110 V / AC 220 V 50 / 60 HZ				

**STANDARD ACCESSORIES** ✕SDC (Carbide) CBN (High Speed)

Cable	1 SET
Fuse	2 PCS
Hex. key wrench	1 PCS 4mm
Diamond wheel	GH-413 SDC300# (4mm~5mm, carbide end mill) Carbide
	GH-413 SDC300# (6mm~13mm, carbide end mill) Carbide
	GH-1225 CBN150# (12mm~25mm, High Speed end mill) HSS
	GH-1225 SDC150# (12mm~25mm, carbide end mill) Carbide
ER chuck	2, 4 flutes chuck *1 set 3 flutes chuck *1 set
ER collet	GH-413 4 ~ 13mm(10pcs) / GH-1225 12,16,18,20,22,25mm(6pcs)

**OPTION ACCESSORIES**

Diamond wheel	GH-413 CBN300# (4mm~5mm, High Speed end mill) HSS
	GH-413 CBN270# (6mm~13mm, High Speed end mill) HSS
	GH-413 CBN270# (4mm~13mm, High Speed end mill) 2 flutes HSS
	GH-413 SDC300# (4mm~13mm, carbide end mill) 2 flutes Carbide
	GH-1225 CBN150# (12mm~25mm, High Speed end mill) 2 flutes HSS
	GH-1225 SDC150# (12mm~25mm, carbide end mill) 2 flutes Carbide



# Cutting Data

*These are recommended values which depend on the condition of the machine, fixture, lubricating cooling & clamping holder system  
They may have to be adapted.*



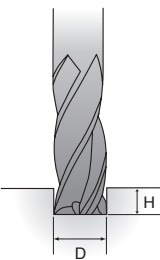
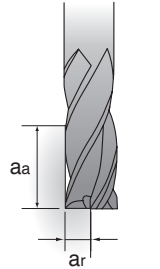




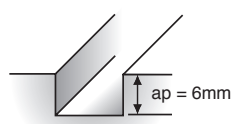
# UCEM-4C

## Variable Unequal 4-Flute-General Economical End Mill

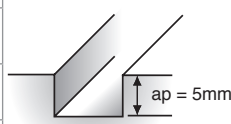
Cutting Condition										
Working Material	Carbon Steels Cast Irons SS-,S-C,FC-		Alloy Steels Prehardened Steels		Temp.ered Steels Hardened Steels		Stainless Steels		Nickel Alloys Titanium Alloys	
Hardness Grade	HB 150~250		HRC 25~35		HRC 40~50		—		HRC 20~45	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
2	9000	720	6000	430	4000	320	5500	320	2600	120
4	6600	800	4500	450	3000	380	4000	320	2000	120
6	4800	960	3000	480	2500	380	3000	480	1200	120
8	3600	1000	2200	610	2000	400	2000	520	1000	140
10	2800	1000	1800	610	1500	400	1700	550	800	160
12	2400	950	1500	550	1200	380	1500	500	700	140
aa	1.5D									
ar	0.1D		0.05D		0.1D		0.05D			
H	1D		0.2D		0.3D		0.2D			

High Efficient Slotting of S50C	
Tool	UCEM-4060
Work Material	S50C
Milling Speed	70 m/min (3700min <sup>-1</sup> )
Feed	710 m/min (0.048mm/t)
Milling Method	Slotting
Milling Depth	ap = 6mm
Coolant	Water Soluble



High Efficient Slotting of SUS304	
Tool	UCEM-4100
Work Material	SUS304
Milling Speed	50 m/min (1600min <sup>-1</sup> )
Feed	460 m/min (0.72mm/t)
Milling Method	Slotting
Milling Depth	ap = 5mm
Coolant	Water Soluble

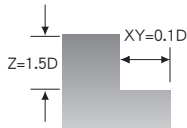
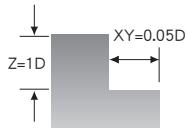


### Remark: Best Tool For Finishing With

- < 0.1mm allowance depth on side with full cutting length (Vibration Free & No Lining )
- Heavy duty cutting-running with Helical interpolation matter than tool is never broken and getting lesser force.
- Pls use interpolation cycle programming matter for optimize result.

# UCERM-4C

## Variable Unequal 4-Flute-General Economical Corner Radius End Mill

Cutting Condition								
Working Material	Carbon Steels		Alloy Steels		Prehardened Steels		Hardened Steel	
Material Code	S45C,S50C		NAK 80		SKD 61		SKD11	
Hardness Grade	HRC <20~40		HRC 40~50		HRC 50~60		up HRC 60	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
6	4300	780	3200	580	2200	380	1100	160
8	3200	780	2400	580	1600	380	800	160
10	2600	780	1900	580	1300	380	650	160
12	2100	780	1600	580	1000	380	530	160
Depth of cut	Side Milling below HRC 45 				Side Milling up HRC 45 			

# UHCEM-4C/UHCERM-4C

## Variable Unequal 4-Flute-High Speed/Corner Radius For Prehardened Steel End Mill

Side Milling																								
Working Material	Mild steels Carbon steels Cast Iron		Alloy steels Tool steels		Hardened steels Prehardened steels (Free cutting)		Hardened steels Stainless Steels		Hardened steels Titanium alloys Heat resistant alloy steels		Hardened steels													
Material Code	SS400,S55C,FC250 (-750N/mm <sup>2</sup> )		SCM,SKT, SKS,SKD		SKT,SKD Nak55,HPM1		SUS304,SKD		—		—													
Hardness Grade			~HRC 30		HRC 30~38		HRC 38~45		HRC 45~55		HRC 55~60													
Cutting speed	100 mm/min		78 mm/min		66 mm/min		62 mm/min		60 mm/min		30 mm/min													
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min												
3	10600	975	8300	760	7000	560	6600	555	6035	485	3200	190												
4	7950	1000	6200	820	5250	565	4950	590	4750	515	2400	190												
5	6350	1050	4950	845	4200	590	3950	630	3800	535	1900	190												
6	5300	1250	4150	945	3500	700	3300	660	3200	545	1600	190												
8	4000	1250	3100	895	2650	660	2450	640	2400	555	1200	175												
10	3200	1100	2500	855	2100	605	1950	590	1900	525	955	160												
12	2650	1100	2050	850	1750	565	1650	535	1600	475	795	160												
Depth of cut	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤1.5D</td> <td>≤0.2D</td> </tr> </table>						ap	ae	≤1.5D	≤0.2D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤1.5D</td> <td>≤0.1D</td> </tr> </table>		ap	ae	≤1.5D	≤0.1D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤1.5D</td> <td>≤0.05D</td> </tr> </table>				ap	ae	≤1.5D	≤0.05D
ap	ae																							
≤1.5D	≤0.2D																							
ap	ae																							
≤1.5D	≤0.1D																							
ap	ae																							
≤1.5D	≤0.05D																							

Slot Milling												
Working Material	Mild steels Carbon steels Cast Iron		Alloy steels Tool steels		Hardened steels Prehardened steels (Free cutting)		Hardened steels Stainless Steels		Hardened steels Titanium alloys Heat resistant alloy steels		Hardened steels	
Material Code	SS400,S55C,FC250 (-750N/mm <sup>2</sup> )		SCM,SKT, SKS,SKD		SKT,SKD Nak55,HPM1		SUS304,SKD		—		—	
Hardness Grade			~HRC 30		HRC 30~38		HRC 38~45		HRC 45~55		HRC 55~60	
Cutting speed	100 mm/min		78 mm/min		66 mm/min		62 mm/min		60 mm/min		30 mm/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
3	8500	705	6350	959	5850	455	5500	400	4450	320	2100	110
4	6350	705	4750	675	4400	455	4150	450	3350	360	1600	120
5	5100	715	3800	660	3500	475	3300	475	2650	385	1250	125
6	4250	715	3200	560	2900	500	2750	495	2250	400	1050	125
8	3200	660	2400	550	2200	545	2050	515	1650	415	795	125
10	2550	610	1900	535	1750	475	1650	470	1350	380	635	115
12	2100	610	1600	475	1450	450	1400	440	1100	355	530	115
Depth of cut	$a_p \leq 1D$						$a_p \leq 0.5D$		$a_p \leq 0.2D$			

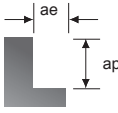
# UACEM-3

## Variable Unequal 3-Flute-Heavy Duty Series For Non-Ferrous End Mill

Cutting Condition									
Working Material	Aluminum			Aluminum Alloy			Aluminum Cast		
Cutting speed	290 mm/min			330 mm/min			220 mm/min		
DIA mm	RPM	feed		RPM	feed		RPM	feed	
		Slotting	Side Milling		Slotting	Side Milling		Slotting	Side Milling
	min <sup>-1</sup>	mm/min		min <sup>-1</sup>	mm/min		min <sup>-1</sup>	mm/min	
3	19000	1050	1850	19000	1300	2000	19000	1000	1800
4	19000	1350	2000	19000	1600	2350	18000	1200	1900
5	18900	1350	2300	19000	2000	2900	14300	1200	1950
6	16000	1450	2300	18000	2350	3350	12000	1200	1950
8	11500	1600	2300	13500	2500	3350	9000	1200	2000
10	9000	1600	2300	10800	2500	3600	7000	1200	2000
12	8000	1800	2500	9000	2500	3900	6000	1300	2000
Depth of cut									

# SCE-4C

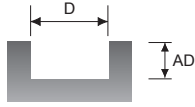
## 4-Flute Left Hand Helix-Right Hand Cut For Non-Ferrous End Mill

Side Milling				
Working Material	Aluminum A7075		Aluminum A5052	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
3	19108	1376	21231	2357
4	14331	1505	15924	2341
6	9554	1376	10616	2357
8	7166	1333	7962	1815
10	5732	1427	6369	1815
12	4777	1433	5308	1831
Depth of cut	ap: 1.5D		ae: 0.015D	
				

Cutting Data  
6

## CE-2C

### Fine Micro Grain Solid Carbide 2-Flute End Mill

Cutting Condition															
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Stainless Steel		Cast Iron		
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SUS304		FC/FCD		
Hardness Grade	HRC <20		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~60		—		—		
Cutting Speed	68M/min		54M/min		45M/min		27M/min		20M/min		54M/min		79M/min		
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	
1	20000	120	17100	100	14400	65	8000	50	6000	35	17100	100	25200	270	
2	10800	155	8640	120	7200	85	4320	65	3240	45	8640	120	12600	290	
3	7560	155	5760	135	4680	90	3000	65	2230	45	5760	135	8640	290	
4	5400	165	4320	135	3600	100	2160	65	1620	50	4320	135	6480	290	
5	4500	180	3420	135	2880	100	1800	75	1350	55	3420	135	5040	325	
6	3600	180	2880	135	2340	100	1440	75	1080	55	2880	135	4320	360	
8	2700	180	2160	155	1800	110	1080	75	810	55	2160	155	3240	360	
10	2160	180	1710	155	1440	120	870	75	650	55	1710	155	2520	380	
12	1800	180	1440	155	1200	120	720	75	540	55	1440	155	2160	400	
Depth of cut	AD=0.5D(D<3, AD≤0.25D)						AD=0.1D(D<3, AD≤0.05D)						AD=0.5D(D<3, AD≤0.25D)		
															

Cutting Data  
7

## CE-4C / CEM-4C

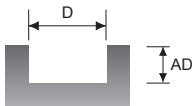
### Fine Micro Grain Solid Carbide / High Helix 4-Flute End Mill

Cutting Condition															
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Stainless Steel		Cast Iron		
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SUS304		FC/FCD		
Hardness Grade	HRC <20		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~60		—		—		
Cutting Speed	68M/min		54M/min		45M/min		27M/min		20M/min		54M/min		79M/min		
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	
3	7560	490	5760	345	4680	165	3020	200	2300	150	5760	345	8640	900	
4	5400	490	4320	345	3600	165	2160	200	1620	150	4320	345	6480	1080	
5	4500	490	3420	345	2880	165	1800	200	1350	150	3420	345	5040	1080	
6	3600	490	2880	345	2340	165	1440	200	1080	150	2880	345	4320	1080	
8	2700	490	2160	345	1800	175	1080	200	810	150	2160	345	3240	1080	
10	2160	505	1710	360	1440	175	860	210	650	155	1710	360	2520	1170	
12	1800	505	1440	360	1200	175	720	210	540	155	1440	360	2160	1260	
Depth of cut	AD=1.5D, RD≤0.1D						AD=1.5D, RD≤0.05D						AD=1.5D, RD≤0.1D		
															



Cutting Data 8

## CEM-3C Fine Micro Grain Solid Carbide 3-Flute High Helix End Mill

Cutting Condition						
Working Material	Alloy Steel /Tool Steel		Hardened Steel		Hardened Steel	
Material Code	SCM,SKT,SKD		SKT,SKD		SKT,SKD	
Hardness Grade	HRC 40~50		HRC 50~60		HRC 60~65	
Cutting Speed	27M/min		18M/min		16M/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
3	2880	75	1890	75	1710	70
4	2160	80	1440	80	1300	75
5	1710	80	1170	80	1040	70
6	1440	155	990	110	860	90
8	1080	155	720	110	650	90
10	860	155	580	90	520	75
12	720	155	480	80	430	65
Depth of cut	AD=0.1D					
						

Cutting Data 9

## CEL-2C Fine Micro Grain Solid Carbide 2-Flute End Mill Long Flute

Cutting Condition												
Working Material	Alumimium		Cast Iron		Medium Carbon steels Mild Steel		Prehardened Stainless, Die & Alloy Steel		Prehardened Stainless, Die & Alloy Steel		(50~60HRC) Hardened Steels	
Hardness Grade	—		—		—		~HRC 30		HRC 30~40		HRC 40~50	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1	32000	200	14000	140	13000	75	7500	30	7000	15	4800	8
1.5	22000	200	10000	150	8500	90	6500	35	5000	20	3200	11
2	16000	300	7000	160	6300	100	5000	60	4000	30	2400	16
3	12000	300	5000	160	4300	100	3200	80	2600	30	1600	16
4	8000	300	4000	160	3200	100	2400	80	2000	30	1200	16
5	6500	300	3000	200	2500	100	2000	80	1600	30	1000	16
6	5300	300	2500	235	2200	100	1600	80	1300	30	800	16
8	4000	300	2000	235	1600	100	1200	80	1000	30	600	16
10	3200	300	1500	235	1300	100	1000	80	800	30	500	16
12	2700	300	1200	235	1100	100	800	80	700	30	400	16
16	2000	300	900	235	800	100	700	85	500	38	300	12
20	1600	300	700	235	600	100	500	85	400	38	300	10
												

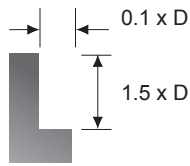
• Note: For long series Tools RPM & Feed reduce 50%.

# CEL-4C

## Fine Micro Grain Solid Carbide 4-Flute End Mill Long Flute

### Cutting Condition

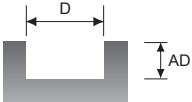
Working Material	Alumimium		Cast Iron		Medium Carbon steels Mild Steel		Prehardened Stainless, Die & Alloy Steel		Prehardened Stainless, Die & Alloy Steel		50~60HRC Hardened Steels	
Hardness Grade	—		—		—		~HRC 30		HRC 30~40		HRC 40~50	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1	32000	450	14000	175	11000	85	8000	60	8000	35	4800	14
1.5	22000	450	10000	175	7500	85	5300	60	5500	35	3200	14
2	16000	450	7000	250	5500	85	4000	60	4000	35	2400	14
3	12000	450	5000	300	4500	150	3500	120	3100	45	1600	25
4	10000	475	3500	300	3500	175	2700	120	2300	45	1200	25
5	7500	475	2800	300	2800	200	2100	125	1900	45	1000	25
6	6300	475	2500	300	2400	200	1700	125	1600	45	800	25
8	5000	500	1800	300	1800	200	1300	125	1200	45	600	25
10	4000	500	1400	315	1400	225	1000	125	1000	45	500	25
12	3000	560	1200	315	1200	225	900	125	800	45	400	25
16	2300	560	900	375	900	250	700	140	600	45	300	25
20	1900	560	700	375	700	250	500	150	500	45	300	25



● Note: For long series Tools RPM & Feed reduce 50%.

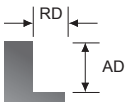
## CEP-2C

## Fine Micro Grain Solid Carbide 2-Flute End Mill Long Shank

Cutting Condition												
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Stainless Steel		Cast Iron	
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SUS304		FC/FCD	
Hardness Grade	HRC <20		HRC 25~35		HRC 35~45		HRC 45~50		—		—	
Cutting Speed	68M/min		54M/min		45M/min		27M/min		54M/min7		79M/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
3	7,560	155	5,760	135	4,680	90	3,000	65	5,760	135	8,640	290
4	5,400	165	4,320	135	3,600	100	2,160	65	4,320	135	6,480	290
5	4,500	180	3,420	135	2,880	100	1,800	75	3,420	135	5,040	325
6	3,600	180	2,880	135	2,340	100	1,440	75	2,880	135	4,320	360
8	2,700	180	2,160	155	1,800	110	1,080	75	2,160	155	3,240	360
10	2,160	180	1,710	155	1,440	120	870	75	1,710	155	2,520	380
12	1,800	180	1,440	155	1,200	120	720	75	1,440	155	2,160	400
Depth of cut	AD=0.5D(D<3, AD≤0.25D) 						AD=0.1D (D<3, AD≤0.05D)		AD=0.5D(D<3, AD≤0.25D)			

## CEP-4C

## Fine Micro Grain Solid Carbide 4-Flute End Mill Long Shank

Cutting Condition												
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Stainless Steel		Cast Iron	
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SUS304		FC/FCD	
Hardness Grade	HRC <20		HRC 25~35		HRC 35~45		HRC 45~50		—		—	
Cutting Speed	68M/min		54M/min		45M/min		27M/min		54M/min7		79M/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
3	7,560	490	5,760	345	4,680	165	3,020	200	5,760	345	8,640	900
4	5,400	490	4,320	345	3,600	165	2,160	200	4,320	345	6,480	1,080
5	4,500	490	3,420	345	2,880	165	1,800	200	3,420	345	5,040	1,080
6	3,600	490	2,880	345	2,340	165	1,440	200	2,880	345	4,320	1,080
8	2,700	490	2,160	345	1,800	175	1,080	200	2,160	345	3,240	1,080
10	2,160	505	1,710	360	1,440	175	860	210	1,710	360	2,520	1,170
12	1,800	505	1,440	360	1,200	175	720	210	1,440	360	2,160	1,260
Depth of cut	AD=1.5D, RD≤0.1D 						AD=1.5D, RD≤0.05D		AD=1D, RD≤0.1D			

## CEB-2C

### Fine Micro Grain Solid Carbide 2-Flute Ball End Mill

Cutting Condition																
Working Material	Copper, Copper Alloy				Mild Steels, Carbon Steels				Hardened Steels, Prehardened Steels, Stainless Steels							
Material Code					SS400,S55C,FC250,NAK55				SKT,SKD61,NAK80,HPM1,DH							
Hardness Grade					~HRC 32				HRC 33~41				HRC 42~50			
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	Depth Of Cut		RPM min <sup>-1</sup>	Feed mm/min	Depth Of Cut		RPM min <sup>-1</sup>	Feed mm/min	Depth Of Cut		RPM min <sup>-1</sup>	Feed mm/min	Depth Of Cut	
			ap	pf			ap	pf			ap	pf			ap	pf
1(0.5R)	50000	2680	0.020	0.050	50000	2240	0.020	0.050	50000	2000	0.020	0.050	47500	1800	0.020	0.050
2(1.0R)	31500	2680	0.040	0.100	25000	2240	0.040	0.100	24500	2000	0.040	0.100	23500	1800	0.040	0.100
4(2.0R)	15500	3264	0.080	0.200	15500	2,720	0.080	0.200	15000	2200	0.080	0.200	13500	1960	0.080	0.200
6(3.0R)	10500	4128	0.120	0.300	13500	3,440	0.300	0.600	11500	2200	0.300	0.600	9500	1800	0.120	0.300
8(4.0R)	7900	3072	0.160	0.400	10000	2,560	0.400	0.800	8950	1680	0.400	0.800	7150	1360	0.160	0.400
10(5.0R)	6300	2496	0.200	0.500	8250	2,080	0.500	1.000	7150	1360	0.500	1.000	5700	1080	0.200	0.500
12(6.0R)	5250	2064	0.240	0.600	6850	1,720	0.500	2.400	5950	1120	0.500	2.400	4750	880	0.240	0.600
16(8.0R)	4950	1240	0.320	0.800	4110	1,032	0.500	3.200	4460	840	0.500	3.200	3560	656	0.320	0.800
20(10.0R)	3950	992	0.400	1.000	3290	824	0.500	4.000	3570	672	0.500	4.000	2850	528	0.320	1.000

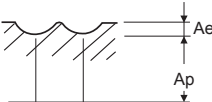
Depth of cut

## CEB-4C

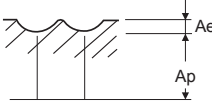
### Fine Micro Grain Solid Carbide 4-Flute Ball End Mill

Cutting Condition								
Working Material	Copper, Copper Alloy		Mild Steels, Carbon Steels		Alloy Steel / Tool Steel			
Material Code			SS400, S55C, FC250, NAK55		SKT, SKD61, NAK80, HPM1, DH			
Hardness Grade			~HRC 32		HRC 33~41		HRC 42~50	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
2(1.0R)	31500	4020	25000	3360	24500	3000	23500	2700
4(2.0R)	15500	4896	15500	4080	15000	3300	13500	2940
6(3.0R)	10500	6192	13500	5160	11500	3300	9500	2700
8(4.0R)	7900	4608	10000	3840	8950	2520	7150	2040
10(5.0R)	6300	3744	8250	3120	7150	2040	5700	1620
12(6.0R)	5250	3096	6850	2580	5950	1680	4750	1320
16(8.0R)	4950	1860	4110	1548	4460	1260	3560	984
20(10.0R)	3950	1488	3290	1236	3570	1008	2850	792

Depth of cut

Cutting Condition - General Cutting						
Working Material	Non-Alloyed Steels Alloy Steels Cast Iron		Alloy Steels Heat Resistant Steels		Hardened Steels	
Hardness Grade	HRC30		HRC30 ~ 40		HRC40 ~ 55	
Strength	~1000N/mm <sup>2</sup>		1000 ~ 1250N/mm <sup>2</sup>		1500N/mm <sup>2</sup>	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
2(1.0R)	15100	865	11200	565	4900	175
2.5(1.25R)	15100	865	11200	565	4900	175
3(1.5R)	13800	780	10500	530	4750	175
4(2.0R)	11000	850	8800	610	4410	205
5(2.5R)	9600	945	7600	665	3860	205
6(3.0R)	8900	1150	7200	955	3340	220
8(4.0R)	7500	1500	6050	1060	2590	255
10(5.0R)	6700	1750	5300	1170	2140	260
12(6.0R)	6150	2000	4900	1280	1840	280
16(8.0R)	5000	1950	3900	1220	1420	280
20(10.0R)	4350	1900	3400	1200	1170	290
Depth of cut	Ae: D1~D6=0.2mm D8~D20=0.3mm Ap: 0.2 XD				Ae: D1~D6=0.2mm D8~D20=0.3mm Ap: 0.1 XD	

● Please reduce cutting speed around 20 ~ 30% from the above table.

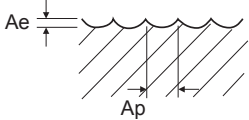
Cutting Condition - High Speed Cutting				
Working Material	Non-Alloyed Steels Alloy Steels Cast Iron		Alloy Steels Heat Resistant Steels	
Hardness Grade	HRC45		HRC30 ~ 40	
Strength	~1500N/mm <sup>2</sup>		1500 ~ 2000N/mm <sup>2</sup>	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
2(1.0R)	22000	1700	22000	1080
2.5(1.25R)	22000	2000	20000	1130
3(1.5R)	22000	2300	17800	1200
4(2.0R)	22000	3350	14300	1300
5(2.5R)	22000	4150	12600	1380
6(3.0R)	22000	4600	11000	1440
8(4.0R)	17500	4600	8800	1440
10(5.0R)	14700	4450	7350	1380
12(6.0R)	12800	4450	6400	1330
16(8.0R)	10000	4000	5000	1150
20(10.0R)	8350	3650	4150	1060
Depth of cut	Ae: D1~D6=0.2mm D8~D20=0.3mm Ap: 0.2 XD			

● Please reduce cutting speed around 20 ~ 30% from the above table.

## CEBP-4C

### Fine Micro Grain Solid Carbide 4-Flute Ball End Mill Long Shank

#### Cutting Condition - General Cutting

Working Material	Non-Alloyed Steels Alloy Steels Cast Iron		Alloy Steels Heat Resistant Steels		Hardened Steels	
Hardness Grade	~HRC30		HRC30 ~ 40		HRC45 ~ 65	
Strength	~1000N/mm <sup>2</sup>		1000 ~ 1250N/mm <sup>2</sup>		~1500N/mm <sup>2</sup>	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
3(1.5R)	13100	1020	10000	690	4520	220
4(2.0R)	10500	1110	8400	800	4200	270
5(2.5R)	9140	1230	7300	870	3680	270
6(3.0R)	7780	1260	6300	950	3160	280
8(4.0R)	5260	1430	4420	990	2100	280
10(5.0R)	4620	1530	3780	1070	1780	280
12(6.0R)	3780	1350	2940	990	1360	280
16(8.0R)	2740	1380	2320	980	1160	280
20(10.0R)	2100	1260	1900	950	840	280
Depth of cut	Ae: D1~D6=0.2mm D8~D20=0.3mm Ap: 0.2 XD				Ae: D1~D6=0.2mm D8~D20=0.3mm Ap: 0.1 XD	

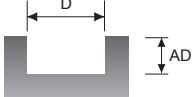
#### Cutting Condition - High Speed Cutting

Working Material	Non-Alloyed Steels Alloy Steels Cast Iron		Alloy Steels Heat Resistant Steels	
Hardness Grade	~HRC45		HRC45 ~ 65	
Strength	~1500N/mm <sup>2</sup>		1500N/mm <sup>2</sup> ~ 2000N/mm <sup>2</sup>	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
3(1.5R)	21000	1500	17000	780
4(2.0R)	21000	2210	13660	870
5(2.5R)	21000	2700	12000	900
6(3.0R)	21000	3470	10500	940
8(4.0R)	15760	4260	7880	1110
10(5.0R)	13660	4580	6300	1260
12(6.0R)	10500	3950	5260	1260
16(8.0R)	8200	3950	3780	1060
20(10.0R)	6300	3780	2940	790
Depth of cut	Ae: D1~D6=0.2mm D8~D20=0.3mm Ap: 0.05 XD			



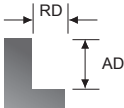
## CER-2C/CERP-2C

### Fine Micro Grain Solid Carbide 2-Flute Corner Radius End Mill / Long Shank

Cutting Condition															
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Stainless Steel		Cast Iron		
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SUS304		FC/FCD		
Hardness Grade	HRC<20		HRC20~30		HRC30~40		HRC45~55		HRC55~60		—		—		
Cutting Speed	95M/min		75M/min		63M/min		38M/min		28M/min		75M/min		110M/min		
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	
1	22400	140	19150	110	16130	70	8960	60	6720	40	19150	110	28220	300	
2	12100	180	9680	140	8060	100	4840	70	3630	50	9680	140	14110	330	
3	8460	180	6450	150	5240	100	3360	70	2500	50	6450	150	9680	330	
4	6050	180	4840	150	4030	110	2420	70	1820	60	4840	150	7260	330	
5	5040	200	3830	150	3220	110	2020	80	1510	60	3830	150	5650	360	
6	4030	200	3220	150	2620	110	1620	80	1210	60	3220	150	4840	400	
8	3020	200	2420	180	2020	120	1210	80	900	60	2420	180	3630	400	
10	2420	200	1910	180	1620	140	980	80	730	60	1910	180	2820	420	
12	2020	200	1620	180	1340	140	810	80	610	60	1620	180	2420	450	
Depth of cut	AD=0.5D(D<3, AD≤0.25D) 						AD=0.1D(D<3, AD≤0.05D)				AD=0.5D(D<3, AD≤0.25D)				

## CER-4C/CERP-4C

### Fine Micro Grain Solid Carbide 4-Flute Corner Radius End Mill /Long Shank

Cutting Condition															
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Stainless Steel		Cast Iron		
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SUS304		FC/FCD		
Hardness Grade	HRC <20		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~60		—		—		
Cutting Speed	94M/min		75M/min		63M/min		37M/min		28M/min		75M/min		110M/min		
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	
3	5,040	550	6,450	380	5,240	180	3,380	220	2,580	170	6450	380	9680	1010	
4	6,050	550	4,840	380	4,030	180	2,420	220	1820	170	4840	380	7260	1210	
5	5,040	550	3,830	380	3,220	180	2,020	220	1510	170	3830	380	5650	1210	
6	4,030	550	3,220	380	2,620	180	1,620	220	1210	170	3220	380	4840	1210	
8	3,020	550	2,420	380	2,020	200	1,210	220	900	170	2420	380	3630	1210	
10	2,420	570	1,910	400	1,620	200	960	230	730	180	1910	400	2820	1310	
12	2,020	570	1,620	400	1,340	200	810	230	610	180	1620	400	2420	1410	
Depth of cut	AD=1.5D, RD≤0.1D 						AD=1D, RD≤0.05D				AD=1.5D, RD≤0.1D				

## CED-2C

### Fine Micro Grain Solid Carbide 2-Flute Rib Processing End Mill

Cutting Condition													
Working Material		Copper, Copper Alloy			Mild Steels, Carbon Steels			Hardened Steels, Prehardened Steels, Stainless Steels					
Material Code					SS400,S55C,FC250,NAK55			SKD61,NAK80,HPM1,DH					
Hardness Grade					~HRC 32			HRC 33~41			HRC 42~50		
DIA mm	Effective Length	RPM min <sup>-1</sup>	Feed mm/min	ap	RPM min <sup>-1</sup>	Feed mm/min	ap	RPM min <sup>-1</sup>	Feed mm/min	ap	RPM min <sup>-1</sup>	Feed mm/min	ap
0.5	4	33500	384	0.025	28000	320	0.021	28000	256	0.018	25000	200	0.014
0.6	6	26500	240	0.022	22000	200	0.018	22000	160	0.015	20000	120	0.012
0.8	8	31000	432	0.041	26000	360	0.034	26000	320	0.028	21000	240	0.022
1.0	10	23000	576	0.036	19000	480	0.030	18000	400	0.028	15000	240	0.020
1.2	10	24000	672	0.060	20000	560	0.050	19000	560	0.040	14000	320	0.040
1.5	12	19000	768	0.072	16000	640	0.060	15000	560	0.050	12000	320	0.040
1.6	12	18000	768	0.084	15000	640	0.070	15000	560	0.060	11000	320	0.050
1.8	14	17000	768	0.096	14000	640	0.080	14000	560	0.060	10000	400	0.050
2.0	18	15500	768	0.084	13000	640	0.070	12000	560	0.060	9000	400	0.050
3.0	10	12000	1040	0.348	10000	880	0.290	10000	800	0.240	8000	560	0.190

Depth of cut

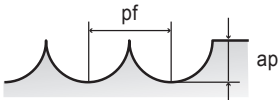


## CEDB-2C


### Fine Micro Grain Solid Carbide 2-Flute Rib Processing Ball End Mill

Cutting Condition																	
Working Material		Copper, Copper Alloy				Mild Steels, Carbon Steels				Hardened Steels, Prehardened Steels, Stainless Steels							
Material Code						SS400,S55C,FC250,NAK55				SKT,SKD61,NAK80,HPM1,DH							
Hardness Grade						~HRC 32				HRC 33~41				HRC 42~50			
DIA mm	Effective Length	RPM min <sup>-1</sup>	Feed mm/min	Depth Of Cut		RPM min <sup>-1</sup>	Feed mm/min	Depth Of Cut		RPM min <sup>-1</sup>	Feed mm/min	Depth Of Cut		RPM min <sup>-1</sup>	Feed mm/min	Depth Of Cut	
				ap	pf			ap	pf			ap	pf			ap	pf
0.5(0.25R)	4	27000	360	0.040	0.050	27000	240	0.020	0.025	27000	160	0.020	0.020	27000	160	0.010	0.010
0.6(0.3R)	6	25000	180	0.045	0.120	20000	120	0.030	0.060	20000	120	0.030	0.040	20000	120	0.020	0.020
1(0.5R)	8	21000	360	0.075	0.150	19000	240	0.050	0.075	16000	160	0.050	0.060	16000	160	0.030	0.030
1.2(0.6R)	8	20000	360	0.090	0.240	17000	240	0.060	0.120	14000	160	0.060	0.100	14000	160	0.060	0.060
1.5(0.75R)	12	17000	360	0.120	0.240	15000	240	0.080	0.120	12000	200	0.080	0.090	12000	200	0.050	0.060
1.6(0.8R)	12	16500	360	0.120	0.240	14000	240	0.080	0.120	11000	200	0.080	0.080	11000	200	0.050	0.050
2(1.0R)	12	14000	600	0.150	0.560	13000	400	0.100	0.280	10000	240	0.100	0.280	10000	240	0.100	0.200
3(1.5R)	16	10000	360	0.200	0.840	8500	240	0.150	0.420	6500	200	0.150	0.360	6500	200	0.150	0.300

Depth of cut



Side Milling										
Working Material	Cast iron, FC,FCD		Mild steels, Carbon steels		Alloy steel, Tool Steels		Prehardened steels		Stainless steels	
Material Code	—		SS400, S55C (~750N/mm <sup>2</sup> )		SCM,SKT,SKS,SKD		SKT,SKD,NAK55,HPM		SUS304,SKD	
Hardness Grade	—		—		~HRC 20~30		HRC 30~48			
Cutting Speed	100~140m/min		80~120m/min		70~100m/min		50~80m/min		35~65m/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
6	6350	760	5300	640	4500	360	3450	280	2650	210
8	4750	760	4000	640	3400	410	2600	310	2000	240
10	3800	760	3200	640	2700	430	2050	330	1600	260
12	3200	770	2650	640	2250	450	1700	340	1350	270
14	2750	770	2250	650	1950	470	1500	360	1150	280
16	2400	770	2000	640	1700	780	1300	360	1000	280
20	1900	760	1600	610	1350	470	1050	350	800	260
Depth of cut	 <p>XY=0.4D Z=1.5D</p>					<p>XY=0.3D Z=1.5D</p>				

Slot Milling										
Working Material	Cast iron, FC,FCD		Mild steels, Carbon steels		Alloy steel, Tool Steels		Prehardened steels		Stainless steels	
Material Code	—		SS400, S55C (~750N/mm <sup>2</sup> )		SCM,SKT,SKS, SKD		SKT,SKD,NAK55,HPM		SUS304,SKD	
Hardness Grade	—		—		~HRC 20~30		HRC 30~48			
Cutting Speed	100~140m/min		80~120m/min		70~100m/min		50~80m/min		35~65m/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
6	5300	640	4500	540	3700	300	2900	230	2400	190
8	4000	640	3400	540	2800	340	2200	260	1800	220
10	3200	640	2700	540	2250	360	1750	280	1450	230
12	2650	640	2250	540	1850	370	1450	290	1200	240
14	2250	630	1950	570	1600	380	1250	300	1000	240
16	2000	640	1700	540	1400	390	1100	310	900	250
20	1600	640	1350	510	1100	390	900	300	700	230
Depth of cut	 <p>Z=0.75D</p>					<p>Z=0.5D</p>				

## CT-2C

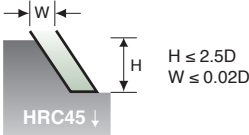
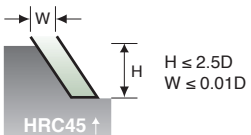
### Fine Micro Grain Solid Carbide 2-Flute Tapered End Mill

Cutting Condition						
Working Material	Carbon Steels, Alloy Steels		Alloy Steels, Tool Steels		Hardened Steels	
Material Code	S45C, FC, FCD, SCM, S50C, SKS...		SCR, SNCN, SKD11, SKD61, NAK80		SKD11	
Hardness Grade	~HRC 30		~HRC 50		~HRC 60	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1	12000	65	6800	40	2500	15
1.5	9600	70	5200	45	2000	15
2	7500	85	4000	48	1500	18
2.5	6800	100	3700	60	1700	20
4	6500	120	1800	60	6000	20
6	2500	150	1600	80	550	25
8	2000	150	1200	80	450	25
10	1500	150	1000	80	350	25
Depth of cut	 <p>HRC45 ↓  <math>H \leq 2.5D</math>  <math>W \leq 0.02D</math></p>		 <p>HRC45 ↑  <math>H \leq 2.5D</math>  <math>W \leq 0.01D</math></p>			

• Note: For standard series (CT), cutting condition increased by 50% proportionally.

## CTL-2C

### Fine Micro Grain Solid Carbide 2-Flute Tapered End Mill Long Flute

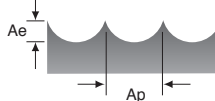
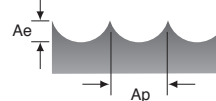
Cutting Condition						
Working Material	Carbon Steels, Alloy Steels		Alloy Steels, Tool Steels		Hardened Steels	
Material Code	S45C, FC, FCD, SCM, S50C, SKS...		SCR, SNCN, SKD11, SKD61, NAK80		SKD11	
Hardness Grade	~HRC 30		~HRC 50		~HRC 60	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1	12000	65	6800	40	2500	15
1.5	9600	70	5200	45	2000	15
2	7500	85	4000	48	1500	18
2.5	6800	100	3700	60	1700	20
4	6500	120	1800	60	6000	20
6	2500	150	1600	80	550	25
Depth of cut	 <p>HRC45 ↓  <math>H \leq 2.5D</math>  <math>W \leq 0.02D</math></p>		 <p>HRC45 ↑  <math>H \leq 2.5D</math>  <math>W \leq 0.01D</math></p>			

• Note: For long series Tools RPM & Feed reduce 50%.

# CTNB-2C

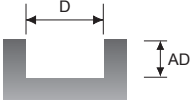
## Fine Micro Grain Solid Carbide 2-Flute Tapered Neck Ball End Mill

Cutting Conditions - General Cutting						
Working Material	Heat Resistant Steel Alloy Steel		Hardened Steel		Hardened Steel	
Hardness Grade	30~40HRC		40~50HRC		50~60HRC	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1(0.5R)	10180	160	16000	370	16000	320
2(1R)	9250	260	11500	640	11300	590
3(1.5R)	8000	370	10200	880	9800	850
4(2R)	6720	420	8500	880	8200	850
5(2.5R)	5840	460	7500	880	7200	850
6(3R)	5040	500	6900	920	6500	880
Depth of cut	 <p>Ae <math>\Phi 1\sim\Phi 6 = 0.2\text{mm}</math>  <math>\Phi 8\sim\Phi 12 = 0.3\text{mm}</math>            Ap: <math>0.2 \times D</math></p>		 <p>Ae <math>\Phi 1\sim\Phi 4 = 0.05 \times D</math>  <math>\Phi 5\sim\Phi 8 = 0.25\text{mm}</math>  <math>\Phi 10\sim\Phi 12 = 0.30\text{mm}</math>            Ap: <math>0.1 \times D</math></p>			

Cutting Condition - High Speed Cutting						
Working Material	Heat Resistant Steel Alloy Steel		Hardened Steel		Hardened Steel	
Hardness Grade	30~40HRC		40~50HRC		50~60HRC	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1(0.5R)	20000	520	16000	620	16000	550
2(1R)	16800	590	11500	850	11400	980
3(1.5R)	16800	800	10200	1400	9800	1300
4(2R)	16800	1180	8500	1350	8200	1300
5(2.5R)	16800	1440	7500	1320	7200	1250
6(3R)	16800	1850	6900	1400	6600	1350
Depth of cut	 <p>Ae <math>\Phi 1\sim\Phi 6 = 0.2\text{mm}</math>  <math>\Phi 8\sim\Phi 12 = 0.3\text{mm}</math>            Ap: <math>0.5 \times D</math></p>		 <p>Ae <math>\Phi 1\sim\Phi 4 = 0.05 \times D</math>  <math>\Phi 5\sim\Phi 8 = 0.25\text{mm}</math>  <math>\Phi 10\sim\Phi 12 = 0.30\text{mm}</math>            Ap: <math>0.05 \times D</math></p>			

## ACE-3

Fine Micro Grain Solid Carbide 3-Flute End Mill (Aluminum, Graphite, or Non-Ferrous)

Cutting Condition				
Working Material	Aluminum Alloys		Copper Alloys	
Material Code	A5052		—	
Cutting Speed	140M/min		150M/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
3	16000	1200	16000	1100
4	12000	1000	12000	900
5	9600	900	9600	800
6	8000	820	8000	650
8	6000	750	6000	600
10	4800	680	4800	550
12	4000	620	4000	500
Depth of cut	AD=0.1D 			



# ACEL-3

Fine Micro Grain Solid Carbide 3-Flute End Mill Long Flute (Aluminum, Graphite, or Non-Ferrous)

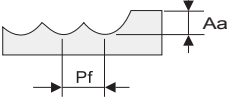
Side Milling		
Working Material	Aluminum Non-Ferrous Metals	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min
3	7000	455
4	7000	546
5	7000	651
6	7000	756
8	5600	861
10	5600	1050
12	5600	882
14	4200	1106
16	4200	1211
18	2800	910
20	2800	956

Slot Milling		
Working Material	Aluminum Non-Ferrous Metals	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min
3	7000	350
4	7000	441
5	7000	504
6	7000	606
8	5600	700
10	5600	854
12	5600	1050
14	4200	903
16	4200	945
18	2800	700
20	2800	805

• Please reduce cutting speed around 20 ~ 30% from the above table.

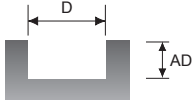
## ACEB-2

Fine Micro Grain Solid Carbide 2-Flute Ball End Mill (Aluminum, Copper, Graphite, or Non-Ferrous)

Cutting Condition								
Working Material	Aluminum Alloys		Copper Alloys					
Material Code	A5052		—					
Cutting Speed	100~200(M/min)		70~110(M/min)					
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min				
2(1.0R)	21420	1485	17190	630				
4(2.0R)	10800	1485	8550	810				
6(3.0R)	7200	1485	5760	810				
8(4.0R)	5400	1485	4320	810				
10(5.0R)	7320	1485	3420	810				
12(6.0R)	3780	1485	2880	810				
16(8.0R)	2980	1170	1790	500				
Depth of cut	<table border="1"> <tr> <td>Aa</td> <td>Pf</td> </tr> <tr> <td>0.02D</td> <td>0.05D</td> </tr> </table>		Aa	Pf	0.02D	0.05D		
Aa	Pf							
0.02D	0.05D							

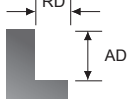
Cutting Data 28

## HCE-2C Super Micro Grain Carbide 2-Flute End Mill

Cutting Conditions															
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Stainless Steel		Cast Iron		
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SUS304		FC/FCD		
Hardness Grade	HRC<20		HRC 20~30		HRC 30~40		HRC 40~50		HRC 50~60		—		—		
Cutting Speed	136M/min		107M/min		90M/min		55M/min		41M/min		107M/min		158M/min		
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	
1	40000	180	34200	150	28800	97	16000	75	12000	52	34200	150	50400	405	
2	21600	232	17280	180	14400	127	8640	97	6480	67	17280	180	25200	435	
3	15120	232	11520	202	9360	135	6000	97	4460	67	11520	202	17280	435	
4	10800	247	8640	202	7200	150	4320	97	3240	75	8640	202	12960	435	
5	9000	270	6840	202	5760	150	3600	112	2700	82	6840	202	10080	487	
6	7200	270	5760	202	4680	150	2880	112	2160	82	5760	202	8640	540	
8	5400	270	4320	232	3600	165	2160	112	1620	82	4320	232	6480	540	
10	4320	270	3420	232	2880	180	1740	112	1300	82	3420	232	5040	570	
12	3600	270	2880	232	2400	180	1440	112	1080	82	2880	232	4320	600	
14	3600	300	2720	255	2280	195	1440	120	1080	90	2720	255	4000	660	
16	3120	330	2400	270	2000	210	1260	135	940	97	2400	270	3600	720	
18	3120	330	2120	270	1760	210	1260	135	940	97	2120	270	3200	720	
20	2400	330	1920	270	1600	210	960	135	720	97	1920	270	2,80	720	
Depth of cut	AD=0.3D(D<3, AD≤0.15D)						AD=0.06D(D<3, AD≤0.03D)						AD=0.3D(D<3, AD≤0.15D)		
															

Cutting Data 29

## HCE-4C Super Micro Grain Carbide 4-Flute End Mill

Cutting Conditions															
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Stainless Steel		Cast Iron		
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SUS304		FC/FCD		
Hardness Grade	HRC <20		HRC 20~30		HRC 30~40		HRC 40~50		HRC 50~60		—		—		
Cutting Speed	136M/min		107M/min		90M/min		54M/min		41M/min		107M/min		158M/min		
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	
3	15120	735	11520	517	9360	247	6040	300	4600	225	11520	517	17280	1350	
4	10800	735	8640	517	7200	247	4320	300	3240	225	8640	517	12960	1620	
5	9000	735	6840	517	5760	247	3600	300	2700	225	6840	517	10080	1620	
6	7200	735	5760	517	4680	247	2880	300	2160	225	5760	517	8640	1620	
8	5400	735	4320	517	3600	262	2160	300	1620	225	4320	517	6480	1620	
10	4320	757	3420	540	2880	262	1720	315	1300	232	3420	540	5040	1755	
12	3600	757	2880	540	2400	262	1440	315	1080	232	2880	540	4320	1890	
14	3600	840	2720	600	2280	285	1440	345	1080	255	2720	600	4000	2100	
16	3120	900	2400	630	2000	300	1240	360	940	270	2400	630	3600	2250	
18	3120	900	2120	630	1760	300	1120	360	940	270	2120	630	3200	2250	
20	2400	900	1920	630	1600	300	960	360	720	270	1920	630	2800	2400	
Depth of cut	AD=1.5D, RD=0.06D						AD=1D, RD=0.03D						AD=1.5D, RD=0.06D		
															

Cutting Data

Cutting  
Data  
30

## HCEL-2C

### Super Micro Grain Carbide 2-Flute End Mill Long Flute

Cutting Condition										
Working Material (HRC)	Below HRC30°		HRC30°~35°		HRC35°~40°		HRC40°~45°		HRC45°~65°	
	DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>
1	6400	240	5920	200	5560	180	5200	160	4200	152
2	5920	480	5560	260	5120	240	4460	232	3600	200
3	4800	440	4400	400	3920	360	3600	320	3120	200
4	4600	640	3920	540	3600	380	3400	300	2800	272
5	4000	800	3800	680	3560	520	3120	320	2200	240
6	4000	800	3600	660	3280	480	3040	380	2000	220
8	2600	880	2400	720	1800	600	1600	480	1000	260
10	1520	760	1200	600	1000	440	800	360	640	200
12	1280	720	1080	600	1000	480	800	400	480	180

• Note: For long series tools RPM & Feed reduce 50%.

Cutting  
Data  
31

## HCEL-4C

### Super Micro Grain Carbide 4-Flute End Mill Long Flute

Cutting Condition										
Working Material (HRC)	Below HRC30°		HRC30°~35°		HRC35°~40°		HRC40°~45°		HRC45°~65°	
	DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>
1	8000	300	7400	250	6950	225	6500	200	5250	190
2	7400	350	6950	325	6400	300	5575	290	4500	250
3	6000	550	5500	500	4900	450	4500	400	3900	250
4	5750	800	4900	675	4500	475	4250	375	3500	340
5	5000	1000	4750	850	4450	650	3900	500	2750	300
6	5000	1000	4500	825	4100	600	3800	475	2500	275
8	3250	1100	3000	1000	2250	750	2000	600	1250	325
10	1900	950	1500	750	1250	550	1000	450	800	250
12	1600	900	1350	750	1250	600	1000	500	600	225

• Note: For long series tools RPM & Feed reduce 50%.

Cutting  
Data  
32

## HCEM-6,8C

### Super Micro Grain Carbide 6,8-Flute End Mill

Cutting Condition					
Working Material (HRC)	HRC 30°~50°		HRC 50°~55°		
	DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
	6	8320	2714	4160	1358
	8	4640	2714	2400	1358
	10	3360	2668	2000	1358
	12	2480	2246	1520	1123
	16	1440	1685	1080	842
	20	612	576	504	456
	25	468	360	342	216

Cutting  
Data  
33

## HCEML-6,8C

### Super Micro Grain Carbide 6,8-Flute End Mill Long Flute

Cutting Condition					
Working Material (HRC)	HRC 30°~50°		HRC 50°~55°		
	DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
	6	3080	1086	1664	543
	8	2240	1086	1248	543
	10	1800	1067	998	543
	12	1320	899	832	449
	16	680	570	624	337
	20	510	480	420	380
	25	390	300	285	180

Cutting Data 34

## HCEB-2C Super Micro Grain Carbide 2-Flute Ball End Mill

Cutting Condition														
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Stainless Steel		Cast Iron	
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SUS304		FC/FCD	
Hardness Grade	HRC <20		HRC 20~30		HRC 30~40		HRC 40~50		HRC 50~60		—		—	
Cutting Speed	144M/min		107M/min		68M/min		57M/min		43M/min		107M/min7		144M/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1(0.5R)	72000	675	64800	570	43200	435	28800	270	21600	202	64800	570	90000	1110
2(1.0R)	41040	900	32400	735	23400	570	16400	360	12320	270	32400	735	45720	1350
4(2.0R)	23040	1080	17280	840	12600	652	9200	435	6920	324	17280	840	23040	1545
6(3.0R)	15120	1350	11520	900	7560	675	6040	540	4540	405	11520	900	15120	1890
8(4.0R)	11520	1350	8640	900	5760	675	4600	540	3460	405	8640	900	11520	1890
10(5.0R)	9180	1350	6840	900	4320	675	3660	540	2760	405	6840	900	9180	1890
12(6.0R)	7560	1350	5760	930	3600	705	3040	540	2280	405	5760	930	7560	2025
16(8.0R)	6400	1500	4800	1020	3120	780	2560	600	1920	450	4800	1020	6400	2250
20(10.0R)	5200	1500	3840	1020	2600	780	2080	600	1650	450	3840	1020	5200	2250
Depth of cut	Aa=0.03D, Pf=0.06D 													

Cutting Data 35

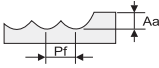
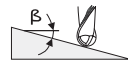
## HCEB-4C Super Micro Grain Carbide 4-Flute Ball End Mill

Cutting Condition						
Working Material (HRC)	HRC 30°		HRC 30°~45°		HRC 45°~65°	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1(0.5R)	23040	864	18720	576	15120	547
2(1.0R)	21312	1008	16056	835	12960	720
3(1.5R)	17280	1584	12960	1152	11232	720
4(2.0R)	16560	2304	12240	1080	10080	979
5(2.5R)	14400	2880	11232	1440	7920	864
6(3.0R)	14400	2880	10944	1368	7200	792
8(4.0R)	9360	3168	5760	1728	3600	936
10(5.0R)	5472	2736	2880	1296	2304	720
12(6.0R)	4608	2592	2880	1440	1728	648



## HCEBP-2C

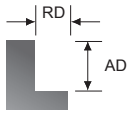
### Super Micro Grain Carbide 2-Flute Ball End Mill Long Shank

Cutting Condition																
Working Material	Cast Iron		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Hardened Steel							
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SKT,SKD							
Hardness Grade	--		HRC 20~30		HRC 30~40		HRC 40~50		HRC 50~60							
Cutting Speed	190M/min		185M/min		135M/min		120M/min		90M/min							
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min						
1(0.5R)	39600	2220	39600	2220	37620	1780	25340	1150	19800	790						
2(1.0R)	24950	2770	19800	2220	18620	1780	13460	1230	9900	79						
3(1.5R)	16630	2770	13070	2220	12280	1780	8710	1230	6700	790						
4(2.0R)	14260	2930	12280	2700	10700	1940	8710	1500	6300	870						
5(2.5R)	12280	3170	11880	3210	8710	1820	7920	1660	6020	950						
6(3.0R)	11880	3800	10690	3410	7520	1780	7520	1780	5220	910						
8(4.0R)	9110	2900	7920	2540	5660	1340	5540	1340	3920	700						
10(5.0R)	7520	2380	6540	2060	4510	1070	4510	1070	3130	560						
12(6.0R)	6300	1980	5430	1700	3770	870	3770	870	2620	470						
Depth of cut			<table border="1"> <tr> <td>Aa</td> <td>Pf</td> </tr> <tr> <td>0.02D</td> <td>0.05D</td> </tr> </table>		Aa	Pf	0.02D	0.05D								
Aa	Pf															
0.02D	0.05D															

- When  $\beta$  is less than  $15^\circ$  milling speed and feed speed in the table can be increased 1.0~1.2 times.

## HCER-4C

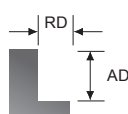
### Super Micro Grain Carbide 4-Flute Corner Radius End Mill

Cutting Condition										
Working Material	Cast Iron		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Hardened Steel	
Material Code	FC,FCD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SKT,SKD	
Hardness Grade	--		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~60	
Cutting Speed	189M/min		128M/min		108M/min		65M/min		48M/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
3	20740	1620	13820	620	11230	300	7250	360	5520	270
4	15550	1940	10370	620	8640	300	5180	360	3890	270
5	12100	1940	8210	620	6910	300	4320	360	3240	270
6	10370	1940	6910	620	5620	300	3460	360	2590	270
8	7780	1940	5180	620	4320	310	2590	360	1940	270
10	6050	2100	4100	650	3460	310	2060	380	1560	280
12	5180	2270	3460	650	2880	310	1730	380	1300	280
Depth of cut	AD=1.5D RD=0.06D				AD=1.5D RD=0.06D		AD=1D RD=0.03D			

Cutting Data 38

## HCERP-4C

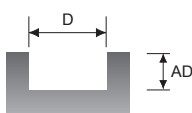
### Super Micro Grain Carbide 4-Flute Corner Radius End Mill Long Shank

Cutting Condition															
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Stainless Steel		Cast Iron		
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SUS304		FC/FCD		
Hardness Grade	HRC <20		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~60		—		—		
Cutting Speed	94M/min		75M/min		63M/min		37M/min		28M/min		75M/min		110M/min		
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	
3	10580	690	8060	480	6550	230	4230	280	3220	210	8060	480	12100	1260	
4	7560	690	6050	480	5040	230	3020	280	2270	210	6050	480	9070	1510	
5	6300	690	4790	480	4030	230	2520	280	1890	210	4790	480	7060	1510	
6	5040	690	4030	480	3280	230	2020	280	1510	210	4030	480	6050	1510	
8	3780	690	3020	480	2520	245	1510	280	1130	210	3020	480	4540	1510	
10	3020	710	2390	500	2020	245	1200	290	910	220	2390	500	3530	1640	
12	2520	710	2020	500	1680	245	1010	290	760	220	2020	500	3020	1760	
Depth of cut	AD=1.5D, PD≤0.1D						AD=1D, PD≤0.05D						AD=1.5D, PD≤0.1D		
															

Cutting Data 39

## HCED-2C

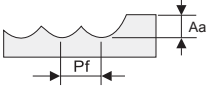
### Super Micro Grain Carbide 2-Flute Rib Processing End Mill

Cutting Condition															
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Copper Aluminum		Stainless Steel		Cast Iron		
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SUS304		FC/FCD		
Hardness Grade	HRC <20		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~60		—		—		
Cutting Speed	102M/min		81M/min		67M/min		40M/min		30M/min		80M/min		118M/min		
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	
1	11340	130	25650	110	21600	70	1200	60	9000	40	25650	110	37800	300	
2	16200	170	12960	130	10800	90	6480	70	4860	50	12960	130	18900	320	
3	11340	170	8640	150	7020	100	4500	70	3350	50	8640	150	12960	320	
4	8100	180	6480	150	5400	110	3240	70	2430	60	6480	150	9720	320	
5	6750	200	5130	150	4320	110	2700	80	2030	60	5130	150	7560	360	
Depth of cut	AD=0.3D(D<3, AD≤0.15D)						AD=0.06D(D<3, AD≤0.03D)						AD=0.3D(D<3, AD≤0.15D)		
															

Cutting Data 40

## HCEDB-2C

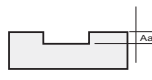
### Super Micro Grain Carbide 2-Flute Rib Processing Ball End Mill

Cutting Condition														
Working Material	Carbon Steel / Tool Steel		Alloy Steel / Tool Steel		Alloy Steel / Tool Steel		Hardened Steel		Copper Aluminum		Stainless Steel		Cast Iron	
Material Code	S45C,S50C,SCM		SCM,SKT,SKD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SUS304		FC/FCD	
Hardness Grade	HRC <20		HRC 20~30		HRC 30~40		HRC 40~50		HRC 50~60		—		—	
Cutting Speed	180M/min		158M/min		109M/min		79M/min		60M/min		158M/min		214M/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1(0.5R)	54000	675	48600	570	32400	435	21600	270	16200	202	48600	570	67500	1100
2(1.0R)	30780	900	24300	735	17550	570	12300	360	9240	270	24300	735	34290	1350
4(2.0R)	17280	1080	12960	840	9450	652	6900	435	5190	324	12960	840	17280	1545
Depth of cut	Aa=0.03D, Pf=0.06D 													

Cutting Data 41


## HHCE-2C

### Ultra Fine Micro Grain Carbide 2-Flute End Mill

Cutting Condition																							
Working Material	Cast Iron		Alloy Steel / Tool Steel		Hardened Steel		Hardened Steel		Hardened Steel														
Material Code	FC/FCD		SKT,SKD		SKT,SKD		SKT,SKD		SKT,SKD														
Hardness Grade	—		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~60														
Cutting Speed	118M/min		118M/min		108M/min		68M/min		48M/min														
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min													
1	29900	540	28310	510	25245	405	18910	270	12570	120													
2	15740	550	15345	520	13365	405	9800	270	6630	120													
3	10490	600	10490	570	8415	405	6290	280	4750	140													
4	8670	560	8670	560	7080	400	5100	270	3720	135													
6	6290	530	6290	530	5250	530	3660	250	2630	130													
8	4750	530	4750	530	3960	380	2770	250	1980	130													
10	3760	530	3760	530	3170	380	2230	250	1580	130													
12	3170	530	3170	530	2620	380	1840	250	1340	130													
Depth of cut	 <table border="1" style="display: inline-table; margin-right: 20px;"> <tr><th colspan="2">Aa</th></tr> <tr><td>D ≤ ∅ 3</td><td>0.15D</td></tr> <tr><td>∅ 3 &lt; D</td><td>0.2D</td></tr> </table> <table border="1" style="display: inline-table;"> <tr><th colspan="2">Aa</th></tr> <tr><td>D ≤ ∅ 6</td><td>0.1D</td></tr> <tr><td>∅ 6 &lt; D</td><td>0.15D</td></tr> </table>											Aa		D ≤ ∅ 3	0.15D	∅ 3 < D	0.2D	Aa		D ≤ ∅ 6	0.1D	∅ 6 < D	0.15D
Aa																							
D ≤ ∅ 3	0.15D																						
∅ 3 < D	0.2D																						
Aa																							
D ≤ ∅ 6	0.1D																						
∅ 6 < D	0.15D																						

Cutting Data 42

## HHCE-4C Ultra Fine Micro Grain Carbide 4-Flute End Mill

Cutting Condition																												
Working Material	Cast Iron		Alloy Steel /Tool Steel		Hardened Steel		Hardened Steel		Hardened Steel																			
Material Code	FC/FCD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SKT,SKD																			
Hardness Grade	—		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~60																			
Cutting Speed	158M/min		139M/min		139M/min		118M/min		98M/min																			
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min																		
3	16830	1935	14750	1580	14750	1440	12570	1040	10490	630																		
4	12570	1840	10990	1485	10990	1340	9460	980	7875	570																		
5	10100	1640	8810	1440	8810	1240	7580	910	6290	530																		
6	8415	1540	7380	1340	7380	1140	6290	830	5250	500																		
8	6290	1440	5500	1240	5500	1040	4750	760	3960	500																		
10	5050	1440	4410	1240	4410	1040	3760	760	3170	500																		
12	4210	1440	3660	1240	3660	1040	3170	760	2630	500																		
Depth of cut	<table border="1"> <tr><td></td><td>Aa</td><td>Ar</td></tr> <tr><td>D &lt; ø 6</td><td>1.0D</td><td>0.02D</td></tr> <tr><td>ø 6 ≤ D</td><td>1.0D</td><td>0.05D</td></tr> </table>			Aa	Ar	D < ø 6	1.0D	0.02D	ø 6 ≤ D	1.0D	0.05D			<table border="1"> <tr><td></td><td>Aa</td><td>Ar</td></tr> <tr><td>D &lt; ø 6</td><td>1.0D</td><td>0.01D</td></tr> <tr><td>ø 6 ≤ D</td><td>1.0D</td><td>0.02D</td></tr> </table>			Aa	Ar	D < ø 6	1.0D	0.01D	ø 6 ≤ D	1.0D	0.02D				
	Aa	Ar																										
D < ø 6	1.0D	0.02D																										
ø 6 ≤ D	1.0D	0.05D																										
	Aa	Ar																										
D < ø 6	1.0D	0.01D																										
ø 6 ≤ D	1.0D	0.02D																										

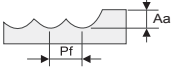
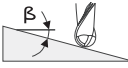
Cutting Data 43

## HHCEL-4C Ultra Fine Micro Grain Carbide 4-Flute End Mill Long Flute

Cutting Condition										
Working Material (HRC)	Below HRC30°		HRL 30°~35°		HRL 35°~40°		HRL 40°~45°		HRL 45°~65°	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1	8000	300	7400	250	6950	225	6500	200	5250	190
2	7400	350	6950	325	6400	300	5575	290	4500	250
3	6000	550	5500	500	4900	450	4500	400	3900	250
4	5750	800	4900	675	4500	475	4250	375	3500	340
5	5000	1000	4750	850	4450	650	3900	500	2750	300
6	5000	1000	4500	825	4100	600	3800	475	2500	275
8	3250	1100	3000	1000	2250	750	2000	600	1250	325
10	1900	950	1500	750	1250	550	1000	450	800	250
12	1600	900	1350	750	1250	600	1000	500	600	225

## HHCEB-2C

### Ultra Fine Micro Grain Carbide 2-Flute Ball End Mill

Cutting Condition														
Working Material	Cast Iron		Alloy Steel /Tool Steel		Hardened Steel		Hardened Steel		Hardened Steel					
Material Code	FC/FCD		(SCM, SKT, SKD)		(SKT, SKD)		(SKT, SKD)		(SKT, SKD)					
Hardness Grade	—		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~60					
Cutting Speed	240M/min		230M/min		170M/min		155M/min		115M/min					
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min				
1(0.5R)	49500	2770	49500	2770	47030	2230	31680	1440	24750	990				
2(1.0R)	31185	3465	24750	2770	23270	2230	16830	1540	12380	990				
3(1.5R)	20790	3465	16335	2770	15350	2230	10890	1540	8370	990				
4(2.0R)	17820	3660	15345	3370	13370	2430	10890	1880	7875	1090				
5(2.5R)	15345	3960	14850	4010	10890	2280	9900	2080	7520	1190				
6(3.0R)	14850	4750	13365	4260	9405	2230	9405	2230	6530	1140				
8(4.0R)	11385	3620	9900	3170	7080	1680	6920	1680	4905	880				
10(5.0R)	9405	2970	8170	2570	5640	1340	5640	1340	3915	700				
12(6.0R)	7875	2475	6790	2130	4710	1090	4710	1090	3270	585				
Depth of cut	<table border="1"> <tr> <td>Aa</td> <td>Pf</td> </tr> <tr> <td>0.02D</td> <td>0.05D</td> </tr> </table>		Aa	Pf	0.02D	0.05D								
Aa	Pf													
0.02D	0.05D													

- When  $\beta$  is less than  $15^\circ$  milling speed and feed speed in the table can be increased 1.0~1.2 times.

## HHCEB-4C

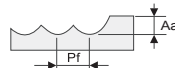
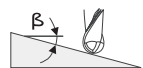
### Ultra Fine Micro Grain Carbide 4-Flute Ball End Mill

Cutting Condition						
Working Material (HRC)	HRC 30°		HRC 30°~45°		HRC 45°~65°	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
1(0.5R)	23040	864	18720	576	15120	547
2(1.0R)	21312	1008	16056	835	12960	720
3(1.5R)	17280	1584	12960	1152	11232	720
4(2.0R)	16560	2304	12240	1080	10080	979
5(2.5R)	14400	2880	11232	1440	7920	864
6(3.0R)	14400	2880	10944	1368	7200	792
8(4.0R)	9360	3168	5760	1728	3600	936
10(5.0R)	5472	2736	2880	1296	2304	720
12(6.0R)	4608	2592	2880	1440	1728	648

Cutting Data 46

## HHCEBP-2C

### Ultra Fine Micro Grain Carbide 2-Flute Ball End Mill Long Shank

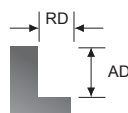
Cutting Condition														
Working Material	Cast Iron		Alloy Steel /Tool Steel		Hardened Steel		Hardened Steel		Hardened Steel					
Material Code	FC/FCD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SKT,SKD					
Hardness Grade	—		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~60					
Cutting Speed	240M/min		230M/min		170M/min		155M/min		115M/min					
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min				
1(0.5R)	49500	2770	49500	2770	47030	2230	31680	1440	24750	990				
2(1.0R)	31185	3465	24750	2770	23270	2230	16830	1540	12380	990				
3(1.5R)	20790	3465	16335	2770	15350	2230	10890	1540	8370	990				
4(2.0R)	17820	3660	15345	3370	13370	2430	10890	1880	7875	1090				
5(2.5R)	15345	3960	14850	4010	10890	2280	9900	2080	7520	1190				
6(3.0R)	14850	4750	13365	4260	9405	2230	9405	2230	6530	1140				
8(4.0R)	11385	3620	9900	3170	7080	1680	6920	1680	4905	880				
10(5.0R)	9405	2970	8170	2570	5640	1340	5640	1340	3915	700				
12(6.0R)	7875	2475	6790	2130	4710	1090	4710	1090	3270	585				
Depth of cut			<table border="1"> <tr> <td>Aa</td> <td>Pf</td> </tr> <tr> <td>0.02D</td> <td>0.05D</td> </tr> </table>		Aa	Pf	0.02D	0.05D						
Aa	Pf													
0.02D	0.05D													

- When  $\beta$  is less than  $15^\circ$  milling speed and feed speed in the table can be increased 1.0~1.2 times.

Cutting Data 47

## HH CER-4C

### Ultra Fine Micro Grain Carbide 4-Flute Corner Radius End Mill

Cutting Condition										
Working Material	Cast Iron		Alloy Steel /Tool Steel		Hardened Steel		Hardened Steel		Hardened Steel	
Material Code	FC/FCD		SCM,SKT,SKD		SKT,SKD		SKT,SKD		SKT,SKD	
Hardness Grade	—		HRC 20~30		HRC 30~40		HRC 45~55		HRC 55~80	
Cutting Speed	237M/min		161M/min		135M/min		81M/min		61M/min	
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min
3	25920	2025	17280	775	14040	370	9060	450	6900	337
4	19440	2430	12960	775	10800	370	6480	450	4860	337
5	15120	2430	10260	775	8640	370	5400	450	4050	337
6	12960	2430	8640	775	7020	370	4320	450	3240	337
8	9720	2430	6480	775	5400	393	3240	450	2430	337
10	7560	2630	5130	810	4320	393	2580	472	1950	348
12	6480	2835	4320	810	3600	393	2160	472	1620	348
Depth of cut	AD=1.5D RD=0.06D				AD=1.5D RD=0.06D		AD=1D RD=0.03D			



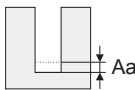
## HHCERP-4C

Ultra Fine Micro Grain Carbide 4-Flute Corner Radius End Mill Long Shank

Cutting Condition						
Working Material (HRC)	HRC30°		HRC50°		HRC60°	
	DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>
6-0.5R	8280	2160	6340	1440	3310	540
6-1R	9520	2484	7290	1660	3810	620
8-0.5R	6574	2580	4066	1290	2930	623
8-1R	7560	2972	4676	1485	3365	716
10-0.5R	4810	2128	2432	836	1254	440
10-1R	4810	2432	2797	960	1442	507
10-1.5R	5020	2553	2918	1003	1505	530
10-2R	5434	2766	3162	1088	1630	573
12-0.5R	3534	2205	1675	722	990	403
12-1R	4064	2535	1923	1083	1136	464
12-1.5R	4240	2645	2006	1085	1186	484
12-2R	4594	2865	2174	1087	1284	524

## HHCED-2C

Ultra Fine Micro Grain Carbide 2-Flute Rib Processing Flute End Mill

Cutting Condition															
Working Material	Cast Iron			Alloy Steel /Tool Steel			Hardened Steel			Hardened Steel			Hardened Steel		
Material Code	FC/FCD			(SCM,SKT,SKD)			(SKT,SKD)			(SKT,SKD)			(SKT,SKD)		
Hardness Grade	—			HRC 20~30			HRC 30~40			HRC 45~55			HRC 55~60		
Cutting Speed	67M/min			59M/min			59M/min			42M/min			25 M/min		
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	RPM min <sup>-1</sup>	Feed mm/min	
0.5/(2)	25200	360	0.049	25200	270	0.045	25200	135	0.038	18900	45	0.019	13500	27	0.009
0.5/(4)	21600	225	0.023	21600	180	0.021	21600	90	0.018	16200	27	0.009	13500	27	0.009
1/(6)	19800	630	0.07	18000	540	0.07	17100	450	0.06	10800	135	0.03	7200	45	0.014
1/(8)	16200	360	0.05	15300	315	0.04	14400	270	0.04	9000	90	0.02	7200	45	0.014
1.5/(8)	11700	360	0.11	10800	315	0.1	9900	270	0.08	6300	90	0.04	4500	45	0.021
2/(8)	9900	630	0.29	9000	540	0.26	9000	450	0.22	5400	135	0.11	3600	90	0.06
2/(10)	8100	360	0.26	7200	315	0.24	8100	270	0.2	4500	90	0.1	2700	45	0.05
2/(12)	8100	360	0.14	7200	315	0.13	8100	270	0.11	4500	90	0.06	2700	45	0.03
Depth of cut															

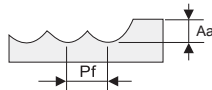
# HHCEDB-2C

## Ultra Fine Micro Grain Carbide 2-Flute Rib Processing Ball End Mill

### Cutting Condition

Working Material	Cast Iron				Alloy Steel /Tool Steel				Hardened Steel				Hardened Steel				Hardened Steel			
Material Code	FC/FCD				(SCM, SKT, SKD)				(SKT, SKD)				(SKT, SKD)				(SKT, SKD)			
Hardness Grade	—				HRC 20~30				HRC 30~40				HRC 45~55				HRC 55~80			
Cutting Speed	79M/min				79M/min				73M/min				56M/min				31M/min			
DIA mm	RPM min <sup>-1</sup>	Feed mm/min	Aa	Pf	RPM min <sup>-1</sup>	Feed mm/min	Aa	Pf	RPM min <sup>-1</sup>	Feed mm/min	Aa	Pf	RPM min <sup>-1</sup>	Feed mm/min	Aa	Pf	RPM min <sup>-1</sup>	Feed mm/min	Aa	Pf
0.6(R0.3)/(3)	27000	360	0.03	0.12	27000	360	0.03	0.12	22500	225	0.03	0.12	21600	180	0.03	0.06	15300	135	0.02	0.04
0.6(R0.3)/(4)	27000	360	0.03	0.12	27000	360	0.03	0.12	22500	225	0.03	0.12	21600	180	0.03	0.06	15300	135	0.02	0.04
0.8(R0.4)/(4)	24300	540	0.04	0.16	24300	540	0.04	0.16	20700	405	0.04	0.16	18900	270	0.04	0.08	13050	180	0.04	0.08
0.8(R0.4)/(6)	21600	360	0.04	0.12	21600	360	0.04	0.12	18900	225	0.04	0.12	17100	180	0.02	0.04	10800	135	0.02	0.04
1(R0.5)/(6)	18900	360	0.05	0.2	18900	360	0.05	0.2	17100	270	0.05	0.2	14400	180	0.05	0.1	10350	135	0.05	0.1
1(R0.5)/(8)	18900	360	0.05	0.15	18900	360	0.05	0.15	17100	270	0.05	0.15	4400	180	0.03	0.05	10350	135	0.03	0.05
1.5(R0.75)/(9)	15300	540	0.08	0.3	15300	540	0.08	0.3	13500	270	0.08	0.3	10800	225	0.08	0.15	7200	180	0.08	0.15
1.5(R0.75)/(12)	15300	540	0.08	0.23	15300	540	0.08	0.23	13500	270	0.08	0.23	10800	225	0.08	0.15	7200	180	0.08	0.15
2(R1)/(12)	12600	630	0.1	0.4	12600	630	0.1	0.4	11700	450	0.1	0.4	9000	270	0.1	0.2	4950	180	0.1	0.2
2(R1)/(12)	12600	630	0.1	0.3	12600	630	0.1	0.3	11700	450	0.1	0.3	9000	270	0.06	0.1	4950	180	0.06	0.1
3(R1.5)/(12)	9000	540	0.15	0.6	9000	540	0.15	0.6	7650	270	0.15	0.6	5850	225	0.15	0.3	2700	135	0.15	0.3
3(R1.5)/(25)	9000	540	0.15	0.6	9000	540	0.15	0.6	7650	270	0.15	0.6	5850	225	0.09	0.15	2700	135	0.09	0.15
4(R2)/(25)	6300	540	0.2	0.8	6300	540	0.2	0.8	5400	360	0.2	0.8	4500	225	0.2	0.4	2250	90	0.2	0.4
4(R2)/(30)	6300	540	0.2	0.8	6300	540	0.2	0.8	5400	360	0.2	0.8	4500	225	0.12	0.2	2250	90	0.12	0.2

Depth of cut



# HSS 2-Flute End Mill

## HS-2/HSL-2/HS-2TC/HSL-2TC

Side Milling																		
Working Material	Carbon Steel			Alloy, Tool Steel			Mold, Heat Resistant Steel			Stainless Steel			Non-Ferrous Metal Aluminum, Aluminum Alloy			Non-Ferrous Metal Copper, Copper Alloy		
Material Code	S45C, S50C			SCM, SNCM, SK			SKD			SUS			—			—		
Cutting Speed	V=20~30m/min			V=15~20m/min			V=10~15m/min			V=10~15m/min			V=50~70m/min			V=40~60m/min		
DIA mm	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min
2	5600	110	66	4000	70	42	3300	52	31	3200	42	25	12000	450	270	10000	340	204
4	2800	125	75	2000	80	48	1700	58	35	1600	48	29	6000	500	300	5200	380	228
6	1900	135	81	1300	85	51	1100	62	37	1100	50	30	4000	540	324	3500	410	246
8	1400	140	84	1000	90	54	840	64	38	800	52	31	3000	560	336	2600	420	252
10	1100	145	87	800	90	54	670	68	41	640	54	32	2400	580	348	2100	435	261
12	800	100	60	700	80	48	550	60	36	500	53	32	2000	570	342	1700	430	258
16	650	100	60	500	60	36	400	60	36	420	52	31	1600	560	336	1400	420	252
20	560	90	54	400	78	47	330	58	35	320	48	29	1200	500	300	1000	380	228
25	420	85	51	350	60	36	260	45	27	260	35	21	1000	400	240	850	300	180
30	370	80	48	270	50	30	220	38	23	210	30	18	800	320	192	700	240	144
40	280	55	33	200	32	20	170	25	15	160	20	12	600	220	132	530	160	96

Depth of cut

Slot Milling																		
Working Material	Carbon Steel			Alloy, Tool Steel			Mold, Heat Resistant Steel			Stainless Steel			Non-Ferrous Metal Aluminum, Aluminum Alloy			Non-Ferrous Metal Copper, Copper Alloy		
Material Code	S45C, S50C			SCM, SNCM, SK			SKD			SUS			—			—		
Cutting Speed	V=20~30m/min			V=15~20m/min			V=10~15m/min			V=10~15m/min			V=50~70m/min			V=40~60m/min		
DIA mm	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-2TC Feed mm/min	HSL-2TC Feed mm/min
2	3360	66	40	2400	42	25	2000	31	19	1920	25	15	7200	270	162	6000	204	122
4	1680	75	45	1200	48	29	1020	35	22	960	29	17	3600	300	180	3120	228	137
6	1140	81	49	780	51	31	660	37	22	660	30	18	2400	324	195	2100	246	148
8	840	84	50	600	54	32	500	38	23	480	31	19	1800	336	200	1560	252	150
10	660	87	52	480	54	32	400	41	25	384	32	19	1440	348	210	1260	261	156
12	480	60	36	420	48	29	330	36	22	300	31	19	1200	342	205	1020	258	155
16	390	60	36	300	36	22	240	36	22	252	31	19	940	336	200	840	252	150
20	336	54	32	240	47	29	200	35	21	192	29	17	720	300	180	600	228	137
25	252	51	31	210	36	22	160	27	16	156	21	13	600	240	144	510	180	108
30	222	48	29	162	30	18	132	23	14	126	18	11	480	192	115	420	144	86
40	168	33	20	120	20	12	100	15	9	96	12	8	360	132	80	318	96	58

Depth of cut

\* HS-2: Value as data x0.85    \* HSL-2: Value as data x0.7    \* HSL-2TC: Value as data x0.8

## HSS 3 & 4-Flute End Mill

HS-4/HSL-4/HS-3/HS-4TC/HSL-4TC/HS-3TC

Side Milling																		
Working Material	Carbon Steel			Alloy, Tool Steel			Mold, Heat Resistant Steel			Stainless Steel			Non-Ferrous Metal Aluminum, Aluminum Alloy			Non-Ferrous Metal Copper, Copper Alloy		
Material Code	S45C, S50C			SCM, SNCM, SK			SKD			SUS			—			—		
Cutting Speed	V=20~30m/min			V=15~20m/min			V=10~15m/min			V=10~15m/min			V=50~70m/min			V=40~60m/min		
DIA mm	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min
2	5600	154	92	4000	98	57	3300	72	43	3200	58	35	12000	630	378	10000	476	285
4	2800	175	105	2000	112	67	1700	81	49	1600	67	49	6000	700	420	5200	532	319
6	1900	189	113	1300	119	71	1100	86	51	1100	70	42	4000	756	453	3500	574	344
8	1400	196	117	1000	126	75	840	89	53	800	72	43	3000	784	470	2600	588	352
10	1100	203	121	800	126	75	670	95	57	640	75	44	2400	812	487	2100	609	365
12	800	140	84	700	112	67	550	84	50	500	75	44	2000	798	478	1700	602	361
16	650	126	84	500	84	50	400	84	50	420	72	42	1600	784	470	1400	588	352
20	560	129	75	400	109	65	330	81	49	320	67	40	1200	700	420	1000	532	319
25	420	119	71	350	84	50	260	64	37	260	49	29	1000	560	336	850	420	252
30	370	112	67	270	70	42	220	53	32	210	42	25	800	448	268	700	336	201
40	280	77	46	200	44	28	170	35	21	160	28	16	600	308	184	530	224	134

Depth of cut

Slot Milling																		
Working Material	Carbon Steel			Alloy, Tool Steel			Mold, Heat Resistant Steel			Stainless Steel			Non-Ferrous Metal Aluminum, Aluminum Alloy			Non-Ferrous Metal Copper, Copper Alloy		
Material Code	S45C, S50C			SCM, SNCM, SK			SKD			SUS			—			—		
Cutting Speed	V=20~30m/min			V=15~20m/min			V=10~15m/min			V=10~15m/min			V=50~70m/min			V=40~60m/min		
DIA mm	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HS-TC Feed mm/min	HSL-TC Feed mm/min
2	3360	66	40	2400	42	25	2000	31	19	1920	25	15	7200	270	162	6000	204	122
4	1680	75	45	1200	48	29	1020	35	22	960	29	17	3600	300	180	3120	228	137
6	1140	81	49	780	51	31	660	37	22	660	30	18	2400	324	195	2100	246	148
8	840	84	50	600	54	32	500	38	23	480	31	19	1800	336	200	1560	252	150
10	660	87	52	480	54	32	400	41	25	384	32	19	1440	348	210	1260	261	156
12	480	60	36	420	48	29	330	36	22	300	31	19	1200	342	205	1020	258	155
16	390	60	36	300	36	22	240	36	22	252	31	19	940	336	200	840	252	150
20	336	54	32	240	47	29	200	35	21	192	29	17	720	300	180	600	228	137
25	252	51	31	210	36	22	160	27	16	156	21	13	600	240	144	510	180	108
30	222	48	29	162	30	18	132	23	14	126	18	11	480	192	115	420	144	86
40	168	33	20	120	20	12	100	15	9	96	12	8	360	132	80	318	96	58

Depth of cut

\* HS-4: Value as data x0.85 \* HSL-4: Value as data x0.7 \* HS-3: Value as data \* HSL-4TC: Value as data x0.8  
 \* HS-3TC: Value as data x1.2

# HSS Roughing End Mill

## HSR/HSRL/HSR-TC/HSRL-TC

Side Milling												
Working Material	Carbon Steel			Alloy Steel			Tool Steel			Hardening Steel		
Material Code	S45C,S50C			SNCM,SCM			SKD,SUS304			SKD,NAK		
DIA mm	R.P.M. min <sup>-1</sup>	HSR-TC Feed mm/min	HSRL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HSR-TC Feed mm/min	HSRL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HSR-TC Feed mm/min	HSRL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HSR-TC Feed mm/min	HSRL-TC Feed mm/min
6	2240	112	67	1890	105	63	1400	100	60	1190	35	21
8	1680	140	84	1386	126	76	1120	112	67	882	42	25
10	1330	154	92	1134	133	80	840	112	67	700	42	25
12	1120	154	92	945	140	84	700	134	81	588	50	30
16	910	203	122	756	182	109	560	168	100	441	56	34
20	700	224	134	592	203	122	434	156	94	350	63	38
25	532	212	127	441	168	100	350	140	84	280	56	34
30	448	190	115	390	161	96	294	133	80	238	42	25
40	322	168	100	280	147	88	224	133	80	168	42	25
Depth of cut												

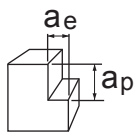
Slot Milling												
Working Material	Carbon Steel			Alloy Steel			Tool Steel			Hardening Steel		
Material Code	S45C,S50C			SNCM,SCM			SKD,SUS304			SKD,NAK		
DIA mm	R.P.M. min <sup>-1</sup>	HSR-TC Feed mm/min	HSRL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HSR-TC Feed mm/min	HSRL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HSR-TC Feed mm/min	HSRL-TC Feed mm/min	R.P.M. min <sup>-1</sup>	HSR-TC Feed mm/min	HSRL-TC Feed mm/min
6	2240	112	67	1890	105	63	1400	100	60	1190	35	21
6	2240	106	64	1890	77	50	1400	56	34	1190	35	21
8	1680	112	67	1386	91	55	1120	78	48	882	42	25
10	1330	117	70	1134	94	56	840	78	48	700	42	25
12	1120	123	74	945	97	57	700	78	48	588	42	25
16	910	145	86	756	126	76	560	112	67	441	56	34
20	700	156	94	592	133	80	434	112	67	350	63	38
25	532	134	81	441	112	67	350	106	64	280	56	34
30	448	123	74	390	105	63	294	90	53	238	42	25
40	322	100	60	280	84	50	224	73	43	168	42	25
Depth of cut												

\* HSR: Value as data x 0.85 \* HSRL: Value as data x 0.7 \* HSRL-TC: Value as data x 0.8

General Side Milling

Dc	(~30 HRC) Carbon steel , Alloy steels Cast iron		(30~40 HRC) Tool steels pre-hardened steels		Stainless Steels		Titanium alloy		Super heat-resistant steels	
	ap=1Dc, ae=0.5Dc		ap=1Dc, ae=0.5Dc		ap=1Dc, ae=0.5Dc		ap=1Dc, ae=0.1Dc		ap=1Dc, ae=0.05Dc	
	RPM <sup>-1</sup>	Feed mm/min	RPM <sup>-1</sup>	Feed mm/min	RPM <sup>-1</sup>	Feed mm/min	RPM <sup>-1</sup>	Feed mm/min	RPM <sup>-1</sup>	Feed mm/min
1	31,700	750	22,200	350	19,100	300	12,700	150	9,400	75
1.5	21,100	770	14,800	360	12,600	300	8,500	160	6,300	78
2	15,800	800	11,000	370	9,500	310	6,400	160	4,700	81
2.5	12,600	820	8,800	380	7,500	320	5,000	160	3,700	82
3	10,500	850	7,300	390	6,300	340	4,100	160	3,100	85
4	7,900	900	5,500	420	4,700	350	3,100	170	2,300	90
5	6,300	950	4,400	440	3,700	370	2,500	190	1,800	93
6	5,200	940	3,600	430	3,100	370	2,100	190	1,500	95
8	3,800	950	2,800	440	2,300	370	1,600	190	1,100	95
10	3,000	950	2,200	430	1,800	370	1,300	200	1,000	99
12	2,600	860	1,800	400	1,500	340	1,100	180	800	86
16	1,900	810	1,300	370	1,100	320	800	160	600	82
20	1,500	760	1,100	340	1,000	310	600	140	500	80

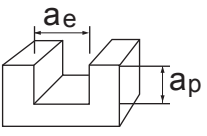
Depth of cut



General Slot Milling

Dc	(~30 HRC) Carbon steel , Alloy steels Cast iron		(30~40 HRC) Tool steels pre-hardened steels		Stainless Steels		Titanium alloy		Super heat-resistant steels	
	ap=1Dc		ap=1Dc		ap=1Dc		ap=0.5Dc		ap=0.5Dc	
	RPM <sup>-1</sup>	Feed mm/min	RPM <sup>-1</sup>	Feed mm/min	RPM <sup>-1</sup>	Feed mm/min	RPM <sup>-1</sup>	Feed mm/min	RPM <sup>-1</sup>	Feed mm/min
1	28,500	350	19,000	180	17,400	120	11,000	50	6,300	18
1.5	19,000	380	12,600	210	11,600	130	7,300	50	4,100	20
2	14,200	420	9,400	220	8,700	150	5,600	70	3,100	22
2.5	11,400	460	7,500	240	6,900	160	4,500	70	2,400	23
3	9,400	490	6,300	260	5,700	170	3,700	80	2,000	25
4	7,100	570	4,700	300	4,300	200	2,800	90	1,500	30
5	5,600	630	3,700	330	3,400	230	2,200	100	1,200	34
6	4,700	710	3,100	360	2,800	250	1,900	110	1,000	40
8	3,500	710	2,300	360	2,100	250	1,400	110	700	36
10	2,800	720	1,800	340	1,700	260	1,100	110	600	35
12	2,300	640	1,500	320	1,400	230	900	100	500	32
16	1,700	600	1,200	330	1,100	220	700	100	400	33
20	1,300	550	1,000	320	900	220	600	100	300	29

Depth of cut





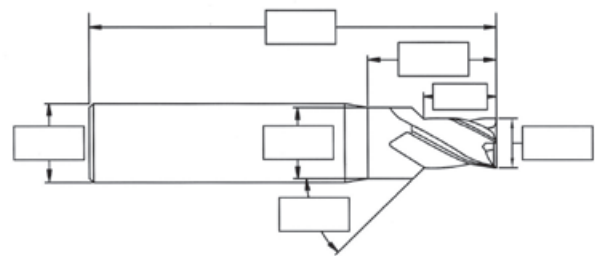
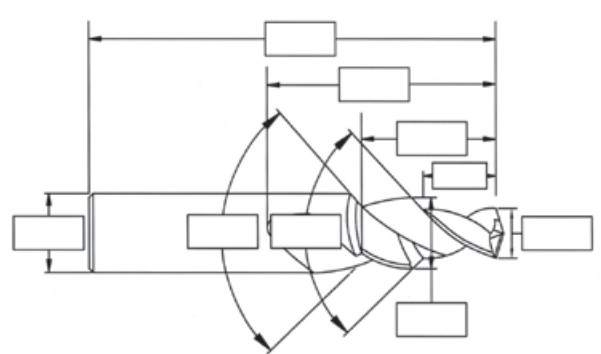
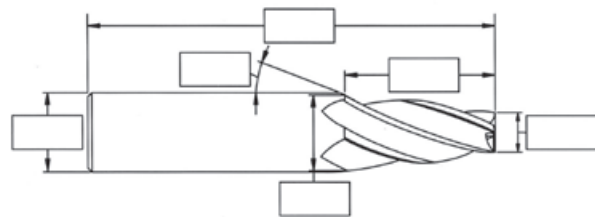
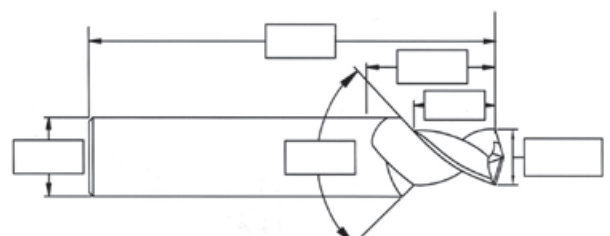
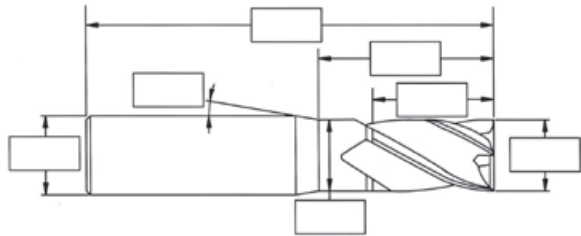
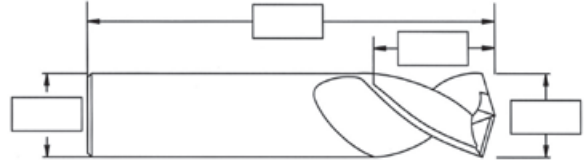
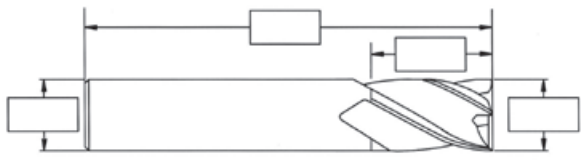
Cutting Conditions								
Cutting speed	Working Material	N/mm2	HB	Φ1	Φ2	Φ3	Φ4	Φ6
Vc 10-18	Non-alloyed steel	≤700	≤700	0.052~0.056	0.083~0.009	0.011~0.125	0.14~0.15	0.17~0.19
Vc 10-18	~24HRC Low-alloyed steel	700~100	210~300	0.052~0.056	0.083~0.009	0.011~0.125	0.14~0.15	0.17~0.19
Vc 8-15	~30HRC High-alloyed steel	>1000	>300	0.034~0.044	0.055~0.07	0.078~0.1	0.09~0.12	0.12~0.15
Vc 5-10	30~38HRC Hardened steel			0.034~0.044	0.055~0.07	0.078~0.1	0.09~0.12	0.12~0.15
Vc 5-8	38~48HRC Hardened steel			0.025	0.04	0.56	0.067	0.084
Vc 5-10	Stainless Steel	500~950	250~320	0.03~0.45	0.05~0.07	0.07~0.1	0.08~0.12	0.10~0.15
Vc 10-18	Cast iron		180~280	0.053~0.068	0.085~0.105	0.11~0.15	0.14~0.17	0.17~0.22
Vc 15-20	Aluminum		Si 0.5~12%	0.06~0.085	0.095~0.135	0.13~0.19	0.16~0.23	0.2~0.285
Vc 15-25	Copper		180~250	0.047~0.069	0.075~0.11	0.105~0.155	0.125~0.185	0.16~0.23
Vc 25-50	Plastic			0.047	0.075	0.105	0.125	0.16
Vc 30-60	Composite Material			0.047	0.075	0.105	0.125	0.16
Vc 20-30	Titanium	700~1250	210~370	0.019~0.028	0.03~0.045	0.042~0.063	0.05~0.076	0.063~0.095
Vc 15-20	Nickel	900~1200	260~350	0.019~0.028	0.03~0.045	0.042~0.063	0.05~0.076	0.063~0.095
Vc 5-10	Heat-resistant Steel	900~1400	210~400	0.031~0.044	0.05~0.07	0.07~0.01	0.085~0.12	0.105~0.15

Cutting Conditions								
Cutting speed	Working Material	Φ8	Φ10	Φ12	Φ16	Φ20	Φ25	Φ30
Vc 10-18	Non-alloyed steel	0.20~0.23	0.24~0.26	0.27~0.3	0.32~0.35	0.36~0.39	0.42~0.46	0.46~0.5
Vc 10-18	~24HRC Low-alloyed steel	0.20~0.23	0.24~0.26	0.27~0.3	0.32~0.35	0.36~0.39	0.42~0.46	0.46~0.5
Vc 8-15	~30HRC High-alloyed steel	0.14~0.18	0.16~0.20	0.18~0.23	0.21~0.27	0.24~0.31	0.28~0.36	0.30~0.39
Vc 5-10	30~38HRC Hardened steel	0.14~0.18	0.16~0.20	0.18~0.23	0.21~0.27	0.24~0.31	0.28~0.36	0.30~0.39
Vc 5-8	38~48HRC Hardened steel	0.101	0.116	0.133	0.153	0.176	0.203	0.223
Vc 5-10	Stainless Steel	0.12~0.18	0.14~0.20	0.16~0.23	0.19~0.27	0.22~0.31	0.25~0.36	0.27~0.39
Vc 10-18	Cast iron	0.21~0.26	0.24~0.3	0.28~0.35	0.32~0.4	0.37~0.46	0.43~0.53	0.47~0.58
Vc 15-20	Aluminum	0.24~0.34	0.275~0.39	0.32~0.45	0.36~0.52	0.42~0.6	0.48~0.68	0.53~0.73
Vc 15-25	Copper	0.19~0.28	0.22~0.32	0.25~0.37	0.29~0.42	0.33~0.485	0.38~0.56	0.42~0.62
Vc 25-50	Plastic	0.19	0.22	0.25	0.285	0.33	0.38	0.42
Vc 30-60	Composite Material	0.19	0.22	0.25	0.285	0.33	0.38	0.42
Vc 20-30	Titanium	0.076~0.113	0.09~0.13	0.1~0.15	0.115~0.17	0.13~0.2	0.15~0.23	0.167~0.25
Vc 15-20	Nickel	0.075~0.115	0.09~0.13	0.1~0.15	0.115~0.175	0.13~0.2	0.15~0.23	0.17~0.25
Vc 5-10	Heat-resistant Steel	0.125~0.18	0.145~0.2	0.167~0.235	0.19~0.27	0.22~0.31	0.25~0.355	0.28~0.39

# Special Made Step Drill & End Mill Inquiry Form

Customers: \_\_\_\_\_  
 Tel: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Contact: \_\_\_\_\_ Ext: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

Date: \_\_\_\_\_  
 Material to be cut: \_\_\_\_\_ Hardness: \_\_\_\_\_  
 Work type Dp: \_\_\_\_\_ mm Coolant holes:  yes  no  
 Quantities, pcs: \_\_\_\_\_  coating  uncoating



Corner of cutting angle:	<input type="checkbox"/> 90°	<input type="checkbox"/> R	<input type="checkbox"/> U	<input type="checkbox"/> 0.05-0.15 45°	Point angle:	<input type="checkbox"/> 118°	<input type="checkbox"/> 135°	<input type="checkbox"/> 140°	<input type="checkbox"/> 150°
Teeth:	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	Point type:	<input type="checkbox"/> 2	<input type="checkbox"/> 2	
Helix angle:	<input type="checkbox"/> 0°	<input type="checkbox"/> 15°	<input type="checkbox"/> 30°	<input type="checkbox"/> 35°	<input type="checkbox"/> 45°	Teeth:	<input type="checkbox"/> 2	<input type="checkbox"/> 3	

**Remarks: Items Not Printed In Catalogue. Please Ask For Special Quote.**



**WEL-SPRING MARKETING CO., LTD.**

6F-1, NO.53, CHUNG HSIN ROAD, SEC.4,

SAN CHUNG DISTRICT, NEW TAIPEI CITY, TAIWAN 241

TEL: +886-2-89829636, 89829686

FAX: +886-2-89829687

<http://www.welttk.com.tw>

E-mail: [info@welttk.com.tw](mailto:info@welttk.com.tw)