

High-efficiency and High-rigidity
Radius Milling Cutter

SEC-Wave Radius Mill **RSE** Series

Rev. 2

**Tough cutter for high-efficiency
machining of stainless steel and
exotic alloy**



CVD Coated Carbide Grade

XCS2000 Now Available!

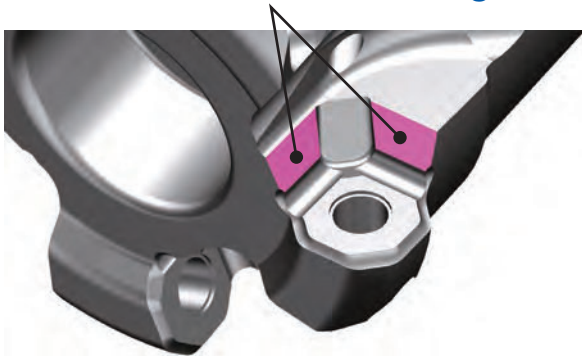


■ Features

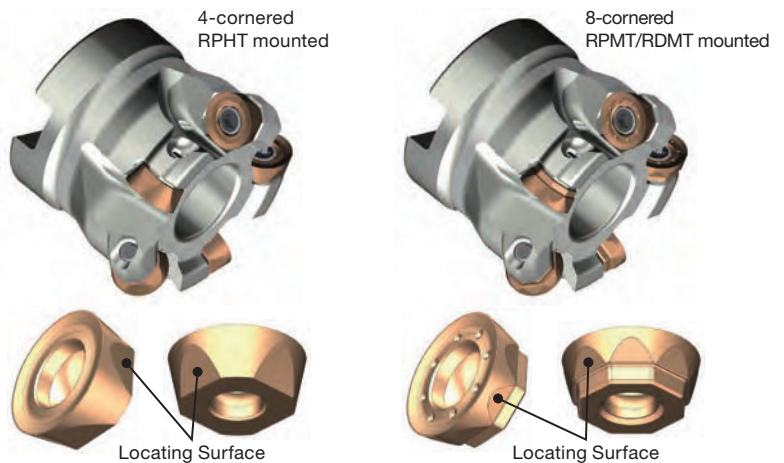
- High-efficiency, high-rigidity radius cutter
Wide insert seat face design achieves high efficiency machining of stainless steel etc.
Designed for superior durability
Ideal for roughing of aerospace components such as turbine blades
- Lineup of ground type and M class inserts
In addition to the 4-cornered ground type inserts, economical 8-cornered M Class inserts are also available
- Uses new grades for exotic alloy machining
New XCS2000/ACS2500/ACS3000 grades achieve stable and long tool life in machining exotic alloys, such as titanium alloys and Ni-based heat-resistant alloys, as well as stainless steel

■ High-rigidity clamp design

Wide Insert Seat Face Design



■ Cutter body can be shared by optimizing the locating surface design



4-cornered Ground type inserts or 8-cornered M Class inserts can be used on the same cutter body

■ Product Range



Type	Cat. No.	Max. Diameter (mm)							
		ø25	ø32	ø40	ø42	ø50	ø52	ø63	ø80
Shell	RSE 10000RS00			5		6			
	RSE 12000RS00			4	4	5 6	5	6	8
	RSE 12000R00 <small>Inch</small>								8
Shank	RSE 10000E00	2 3	3 4						

Number in ● shows the number of teeth Inch Inch Bore

■ Chipbreaker Shape



Work Material	M Stainless Steel, S Exotic Alloy
Applications	General-purpose to roughing
Features	Standard
Chipbreaker	G Type
Cutting Edge Cross Section	

Grade Features

Work Material	Grade	Coating Thickness (μm)	Features
 	XCS2000	4	New coating combining wear and fracture resistance realises superb long tool life in medium to high speed machining of heat resistant alloys and stainless steel .
	ACS2500	3	Coating with excellent wear and adhesion resistance provides outstanding performance especially in machining titanium alloys
	ACS3000	3	High toughness carbide substrate and a coating with excellent chipping resistance provide outstanding stability in a wide range of work materials such as heat-resistant alloys, stainless steel, and titanium alloys

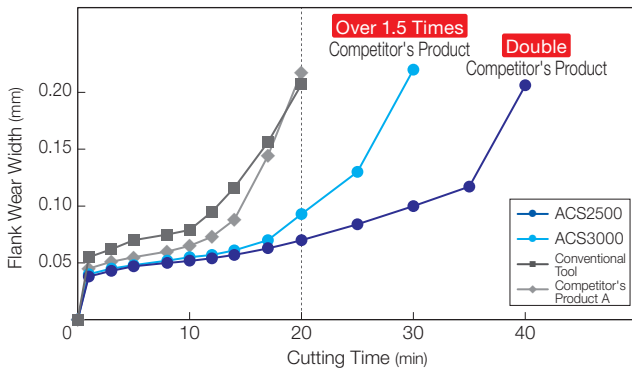
Grade Application Range

Newly developed **XCS2000/ACS2500/ACS3000** grades, ideal for machining titanium alloys, heat-resistant alloys and stainless steel, are now available!

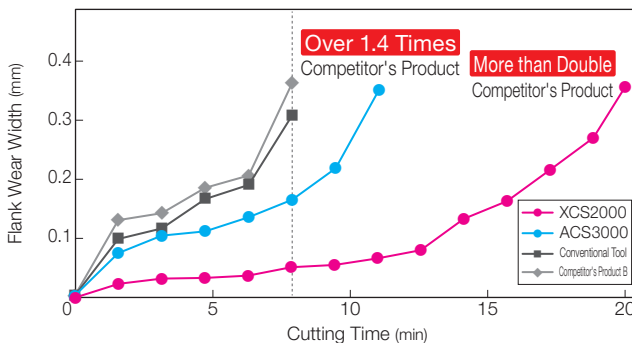
Work Material	Finishing to Light Cutting	Medium Cutting	Rough to Heavy Cutting
 	Coated Carbide	XCS2000	
		ACS2500	
		ACS3000	

The letters "C" and "P" at the end of each grade indicate the coating type. ▽: CVD ▲: PVD

Cutting Performance





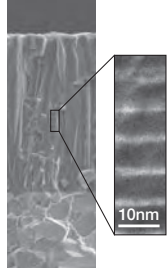
Machine : Vertical Machining Centre BT40, Work Material: Ti-6Al-4V
 Tool : RSE 12050RS05, Insert: RPHT1204MOEN-G
 Cutting conditions : $v_c = 70\text{m/min}$ $f_z = 0.25\text{mm/t}$ $a_p = 2\text{mm}$ $a_e = 30\text{mm}$ Wet



Machine : Vertical Machining Centre BT40, Work Material: Inconel 718 (44HRC)
 Tool : RSE 12050RS05, Insert: RPHT1204MOEN-G
 Cutting conditions : $v_c = 40\text{m/min}$ $f_z = 0.3\text{mm/t}$ $a_p = 2\text{mm}$ $a_e = 30\text{mm}$ Wet

New CVD Coating Layer Features



Al_{0.5}Ti_{0.5}N
Al_{0.9}Ti_{0.1}N

Pure Cubic Crystal AlTiN with High-Al Content



With proprietary structural control technology, differently composed layers of AlTiN are stacked at the nanometre level. With a high-Al composition containing over 80% Al on average, it also maintains a cubic crystalline structure to achieve excellent thermal resistance and high hardness. Vastly improved wear resistance.

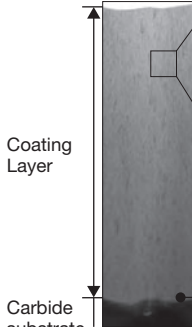
Special Surface Treatment

Proprietary surface treatment introduces high compression stress to the coating, suppressing the development of cracks. Greatly improved fracture and thermal crack resistance.

Applicable Grade: XCS2000

New PVD Coating Layer Features



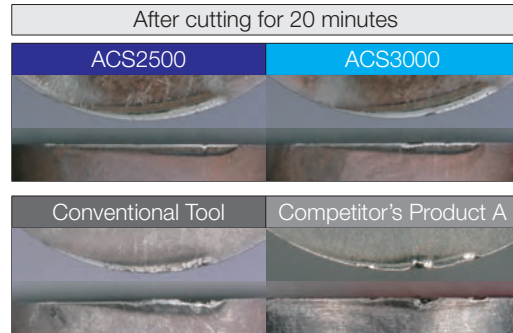
Ultra-fine grained B additive

- New AlTiBN coating, with an ultra-fine coating structure, achieves high strength and toughness
- Outstanding chipping resistance and wear resistance

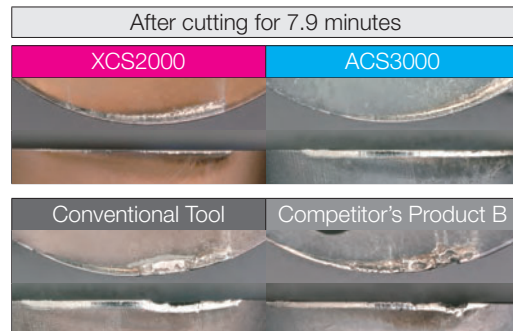
High Adhesion Strength

Significantly improved coating adhesion and more than 2x conventional chipping resistance

Applicable Grades: ACS2500, ACS3000

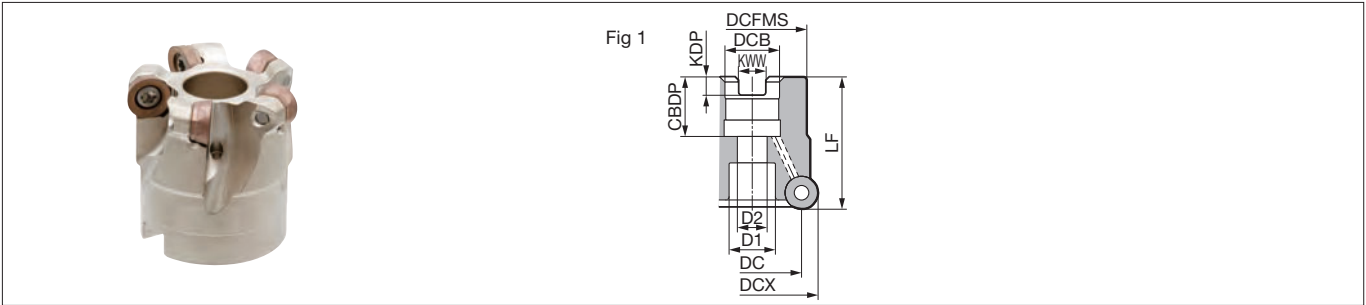


Superb wear resistance for a tool life 1.5 times greater than that of conventional tools and competitor's products



Superb fracture resistance for a tool life 1.4 times greater than that of conventional tools and competitor's products

Rake Angle	Radial	-5°		
	Axial	4°		
			4-cornered	8-cornered



■ Body (Shell Type)

Dimensions (mm)

Metric	Cat. No.	Stock	Max. Dia.	Dia.	Boss	Height	Hole Dia.	Keyway Width	Keyway Depth	Mounting Depth	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
			DCX	DC	DCSFMS	LF	DCB	KWW	KDP	CBDP					
	RSE 10040RS05	●	40	30	33	40	16	8.4	5.6	18	14	9	5	0.16	1
	10050RS06	●	50	40	40	40	22	10.4	6.3	20	18	11	6	0.27	1

Inserts are sold separately.

■ Identification Code

RSE 10 040 R S 05

Series Insert Size Dia. Feed Direction Metric Bore Number of Teeth

■ Parts

Flat Insert Screw	Detachable Wrench		Anti-seizure Cream
	Handle Grip	Bit	
BFTX03584IP	3.0	HPS1015	TRB15IP
			SUMI-P

■ Insert

Dimensions (mm)

Grade Classification		Coated Carbide			Inscribed Circle IC	Thickness S	Fig
Process	High-speed/Light Cutting	<i>New</i> M S	M S				
	Medium Cutting	M S	M S	M S			
	Roughing			M S			
Cat. No.		<i>New</i> XCS2000	ACS2500	ACS3000			
RPHT10T3M0EN-G		●	●	●	10	3.97	1
RPMT10T3M0EN-G		●	●	●	10	3.97	2
RDMT10T3M0EN-G		●	●	●	10	3.97	3

Fig 1 4-cornered

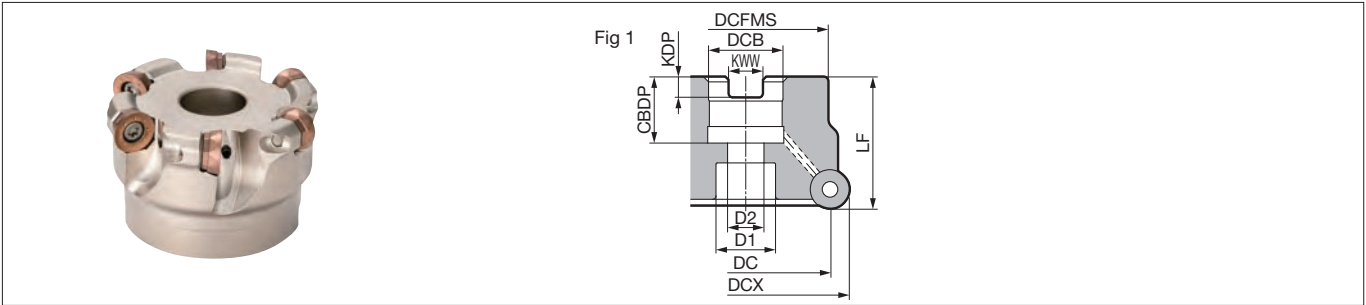
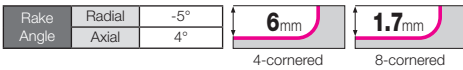
Fig 2 8-cornered

Fig 3 8-cornered

■ Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
S	Exotic Alloy	Heat-Resistant Alloy	—	G	25 - 35 - 50	0.15 - 0.25 - 0.35	XCS2000/ACS2500/ACS3000
		Ti Alloy	—	G	30 - 60 - 90	0.15 - 0.25 - 0.35	ACS2500/ACS3000
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200HB	G	115 - 145 - 175	0.15 - 0.30 - 0.45	XCS2000/ACS2500/ACS3000
		SUS403 and Others (Martensitic/Hardened)	240HB	G	105 - 130 - 155	0.15 - 0.30 - 0.45	XCS2000/ACS2500/ACS3000
		SUS304, SUS316 (Austenitic)	180HB	G	125 - 155 - 190	0.15 - 0.30 - 0.45	XCS2000/ACS2500/ACS3000

Note · The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).
 · For groove milling, calculate the feed rate at around 70% of the above values.
 · The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.



Body (Shell Type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CDBP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
RSE 12040RS04	●	40	28	33	40	16	8.4	5.6	18	13.5	9	4	0.15	1
12042RS04	●	42	30	33	40	16	8.4	5.6	18	14	9	4	0.17	1
12050RS05	●	50	38	41	40	22	10.4	6.3	20	18	11	5	0.24	1
12050RS06	●	50	38	41	40	22	10.4	6.3	20	18	11	6	0.23	1
12052RS05	●	52	40	41	40	22	10.4	6.3	20	18	11	5	0.26	1
12063RS06	●	63	51	50	40	22	10.4	6.3	20	18	11	6	0.47	1
12080RS08	●	*80	68	55	50	27	12.4	7	22	20	14	8	0.89	1
12080R08	●	*80	68	55	50	25.4	12.4	7	22	20	14	8	0.90	1

Inserts are sold separately.

For mounting the ø80mm sized cutters marked with * to an arbor, use a JIS B1176 hexagonal socket bolt (M12 x 30 to 35mm).

Identification Code

RSE 12 050 R S 05

Series Insert Size Dia. Feed Direction Metric Bore Number of Teeth

Parts

Flat Insert Screw		Detachable Wrench		Anti-seizure Cream
		Handle Grip	Bit	
BFTX04095IP	3.0	HPS1015	TRB15IP	SUMI-P

■ Insert

Dimensions (mm)

Grade Classification		Coated Carbide			Inscribed Circle	Thickness	Fig
Process	High-speed/Light Cutting	M	S	S			
		Medium Cutting	M	S	S		
		Roughing			M		
Cat. No.		<i>New</i> XCS2000	ACS2500	ACS3000	IC	S	Fig
RPHT1204M0EN-G		●	●	●	12	4.76	1
RPMT1204M0EN-G		●	●	●	12	4.76	2
RDMT1204M0EN-G		●	●	●	12	4.76	3

Fig 1 4-cornered

Fig 2 8-cornered

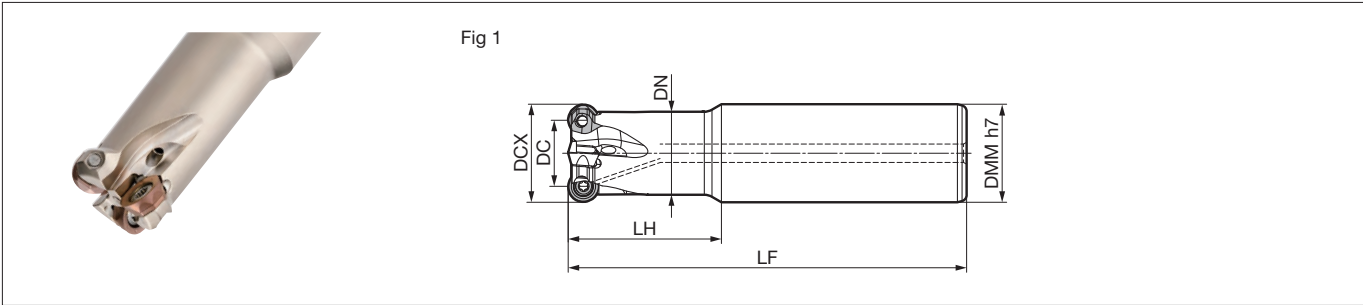
Fig 3 8-cornered

■ Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
S	Exotic Alloy	Heat-Resistant Alloy	—	G	25 - 35 - 50	0.15 - 0.25 - 0.35	XCS2000/ACS2500/ACS3000
		Ti Alloy	—	G	30 - 60 - 90	0.15 - 0.25 - 0.35	ACS2500/ACS3000
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200HB	G	115 - 145 - 175	0.15 - 0.30 - 0.45	XCS2000/ACS2500/ACS3000
		SUS403 and Others (Martensitic/Hardened)	240HB	G	105 - 130 - 155	0.15 - 0.30 - 0.45	XCS2000/ACS2500/ACS3000
		SUS304, SUS316 (Austenitic)	180HB	G	125 - 155 - 190	0.15 - 0.30 - 0.45	XCS2000/ACS2500/ACS3000

Note · The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).
 · For groove milling, calculate the feed rate at around 70% of the above values.
 · The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Rake Angle	Radial	0°		
	Axial	4°		
			4-cornered	8-cornered



■ Body (Shank Type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
RSE 10025E02	●	25	15	25	20.3	50	130	2	0.40	1
10025E03	●	25	15	25	20.3	50	130	3	0.39	1
10032E03	●	32	22	32	27.1	50	130	3	0.68	1
10032E04	●	32	22	32	27.1	50	130	4	0.67	1

Inserts are sold separately.

■ Identification Code

RSE 10 032 E 03

Series Insert Size Dia. Shank Type Number of Teeth

■ Parts

Flat Insert Screw	Wrench	Anti-seizure Cream
BFTX03584IP	3.0 TRDR15IP	SUMI-P

■ **Insert**

Dimensions (mm)

Grade Classification		Coated Carbide			Inscribed Circle IC	Thickness S	Fig
Process	High-speed/Light Cutting	M S	M S				
	Medium Cutting	M S	M S	M S			
	Roughing			M S			
Cat. No.		<i>New</i> XCS2000	ACS2500	ACS3000			
RPHT10T3M0EN-G		●	●	●	10	3.97	1
RPMT10T3M0EN-G		●	●	●	10	3.97	2
RDMT10T3M0EN-G		●	●	●	10	3.97	3

Fig 1 4-cornered

Fig 2 8-cornered

Fig 3 8-cornered

■ **Recommended Cutting Conditions**

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
S	Exotic Alloy	Heat-Resistant Alloy	—	G	25 - 35 - 50	0.15 - 0.25 - 0.35	XCS2000/ACS2500/ACS3000
		Ti Alloy	—	G	30 - 60 - 90	0.15 - 0.25 - 0.35	ACS2500/ACS3000
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200HB	G	115 - 145 - 175	0.15 - 0.30 - 0.45	XCS2000/ACS2500/ACS3000
		SUS403 and Others (Martensitic/Hardened)	240HB	G	105 - 130 - 155	0.15 - 0.30 - 0.45	XCS2000/ACS2500/ACS3000
		SUS304, SUS316 (Austenitic)	180HB	G	125 - 155 - 190	0.15 - 0.30 - 0.45	XCS2000/ACS2500/ACS3000

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MEMO

A large grid of dotted lines for writing a memo. The grid consists of 20 columns and 30 rows of small squares, providing a structured space for text entry.

MEMO

A large grid of dotted lines for writing a memo. The grid consists of 20 columns and 30 rows of small squares, providing a structured space for text.

Sumitomo Electric Cutting Tools Official Apps for iOS/Android



Cutting calculation App

SumiTool Calculator



Grade & chipbreaker comparison App

SumiTool Converter



- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.

< SAFETY NOTES >

- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.

- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

 Sumitomo Electric Industries, Ltd.

Hardmetal Division

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<https://www.sumitool.com/global>