Tooling News No.565

SUMITOMO

CARBIDE - CBN - DIAMOND

Global Support, Global Solutions.

Radius Milling Cutter series

SEC-Wave Radius Mill RSC series / RSE series

2021-023 JTA ECO PRODUCT (一社)日本機械工具工業会(JTA) 環境調和製品 ☆☆

(RSE series)

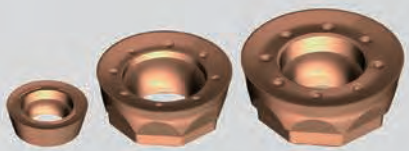
Radius cutters for high-efficiency machining of stainless steel and exotic alloy

Small-diameter Cutter

New **RSC series R3 Insert** (Diameter ø12 to 25mm)

RSE series R5 Insert (Diameter ø25 to 50mm)

R6 Insert (Diameter ø40 to 80mm)



P M K N S H

SUMITOMO ELECTRIC GROUP

RSC series New / RSE series Expansion

■ Features

- Uses new grades for exotic alloy machining
  New ACS1000/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
- RSC series
  Small-diameter high-efficiency radius cutter
  R3 Insert (Diameter ø12 to 25mm)
  The use of 2 coolant holes realises high-efficiency milling while suppressing temperature rise in high-speed milling
  General-purpose grade ACU2500 supports a variety of machining applications
- RSE series
  High-efficiency, high-rigidity radius cutter
  R5 Insert (Diameter ø25 to 50mm)
  R6 Insert (Diameter ø40 to 80mm)
  Special insert design realizing high-efficiency milling of exotic alloys, etc.
  Seating-surface design delivers excellent durability

■ Product Range RSC series New

Type	Cat. No.	Max. Diameter (mm)			
		ø12	ø16	ø20	ø25
Shank	**RSC 06000E○○**	2	3	4	5
Modular	**RSC 06000M○○**	2	3	4	5

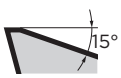
Number in ●● shows the number of teeth

■ Product Range RSE series

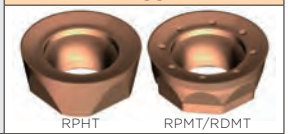
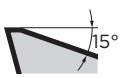
Type	Cat. No.	Max. Diameter (mm)							
		ø25	ø32	ø40	ø42	ø50	ø52	ø63	ø80
Shell	**RSE 10000RS○○**			5		6			
	RSE 12000RS○○			4	4	5 6	5	6	8
	RSE 12000R○○ inch								8
Shank	**RSE 10000E○○**	2 3		3 4					

Number in ●● shows the number of teeth inch Inch Bore

■ Chipbreaker Shape RSC series New

Work Material	P Steel, M Stainless Steel, S Exotic Alloy
Applications	General-purpose to Roughing
Features	Standard
Chipbreaker	**G type**
	
Cutting Edge Cross Section	

■ Chipbreaker Shape RSE series

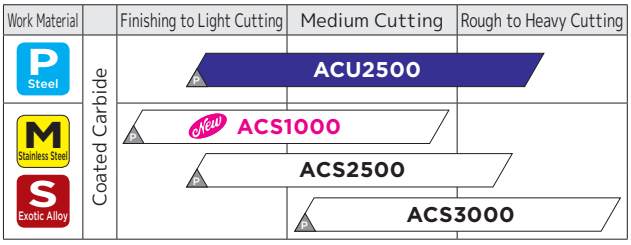
Work Material	M Stainless Steel, S Exotic Alloy
Applications	General-purpose to Roughing
Features	Standard
Chipbreaker	**G type**
	 RPHT RPMT/RDMT
Cutting Edge Cross Section	

■ Grade Features RSC series

Work Material	Grade	Coating Thickness (μm)	Features
P Steel	ACU2500	3	General-purpose grade covering **steel, stainless steel,** and **cast iron** machining Adopts a carbide substrate with excellent fracture resistance and wear resistance, plus a new coating with **excellent wear resistance and chipping resistance,** realizing stable long tool life on various work materials
M Stainless Steel S Exotic Alloy	New ACS1000	3	For high-efficiency milling of **exotic alloys** High-hardness carbide substrate coupled with a chipping-resistant coating **provides long and stable tool life** in high-speed, high-efficiency machining applications
	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 RSC series

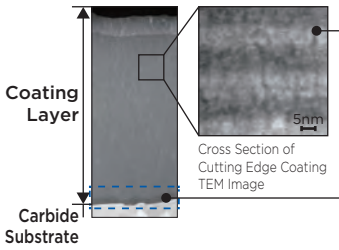
Lineup includes **ACS1000**/**ACS2500**/**ACS3000** grades, ideal for machining titanium alloys, heat-resistant alloys and stainless steel



The letter "P" at the corner of each grade indicates the coating type. P: PVD

Coating Layer Features

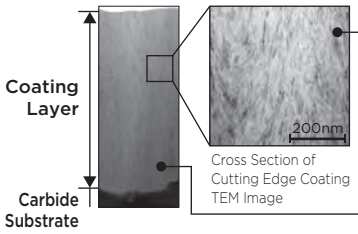
ABSOTECH **PVD**



New Super Multi-Layered Structure
Higher hardness and twice the conventional wear resistance due to a fine crystal structure AlTiCrBN-based nano-layered coating

High Adhesion Strength
Significantly improved coating adhesion has more than twice the chipping resistance of conventional coatings

Applicable Grades: **ACU2500**

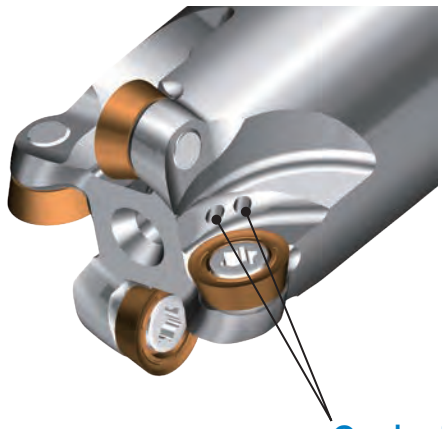


Ultra-fine Grained B Additive Coated Carbide
New AlTiBN coating, with an ultra-fine coating structure, achieves high strength and toughness
Outstanding balance of chipping resistance and wear resistance

High Adhesion Strength
Significantly improved coating adhesion has more than twice the chipping resistance of conventional coatings

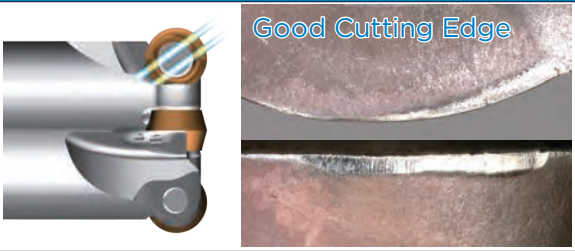
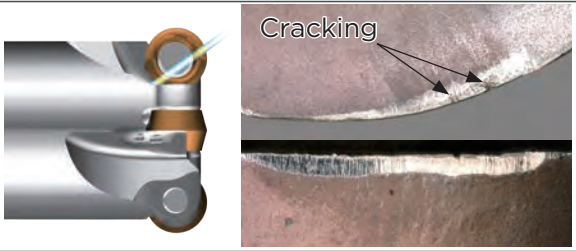
Applicable Grades: ACS1000, ACS2500, ACS3000

■ Optimal Coolant Hole Design RSC series



Coolant supply directed at the front and side of the insert rake face suppresses cutting edge temperature rises and work material adhesion

After milling for 30 minutes

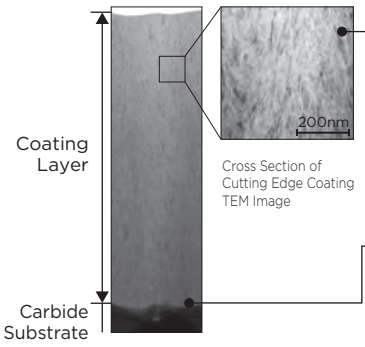
2 coolant holes	1 coolant hole
	

■ Grade Features RSE series

Work Material	Grade	Coating Thickness (μm)	Features
M Stainless Steel / S Exotic Alloy	New ACS1000	3	For high-efficiency milling of **exotic alloys** High-hardness carbide substrate coupled with a chipping-resistant coating **provides long and stable tool life** in high-speed, high-efficiency machining applications
	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**

Coating Layer Features

ABSOTECH PVD



Ultra-fine Grained B Additive Coated Carbide
- New AlTiBN coating, with an ultra-fine coating structure, achieves high strength and toughness
- Outstanding balance of chipping resistance and wear resistance

High Adhesion Strength
Significantly improved coating adhesion has more than twice the chipping resistance of conventional coatings

Applicable Grades: ACS1000, ACS2500, ACS3000

■ Grade Application Range RSE series

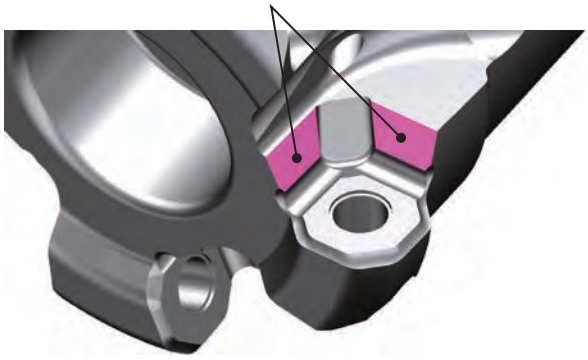
Lineup includes **ACS1000**/**ACS2500**/**ACS3000** grades, ideal for machining titanium alloys, heat-resistant alloys and stainless steel

Work Material		Finishing to Light Cutting	Medium Cutting	Rough to Heavy Cutting
M Stainless Steel / S Exotic Alloy	Coated Carbide	New ACS1000 (P)		
			ACS2500 (P)	
			ACS3000 (P)	

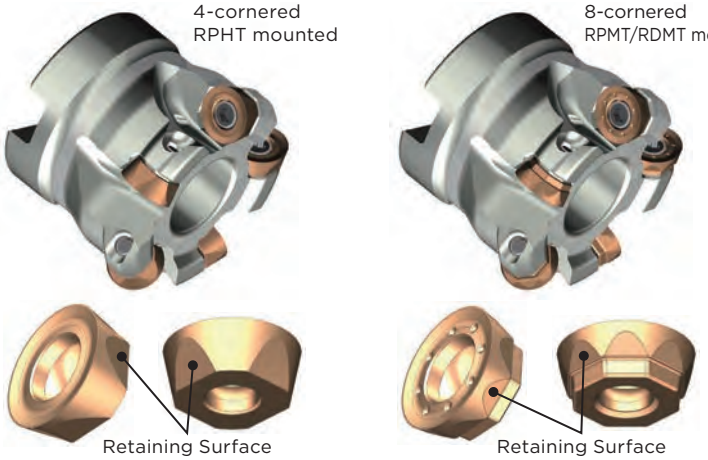
The letter "P" at the corner of each grade indicates the coating type. P: PVD

■ High-rigidity clamp design RSE series

Wide Insert Seat Face Design



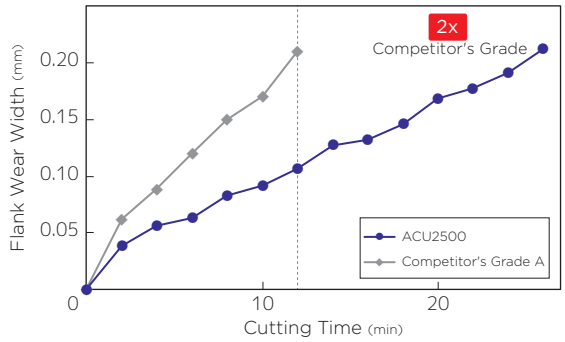
■ Cutter body can be shared by optimizing the seat face/retaining surface design RSE series



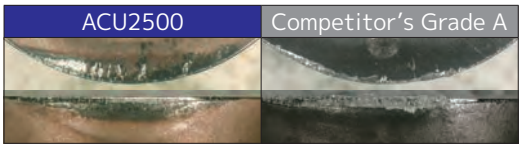
4-cornered ground type inserts or 8-cornered M Class inserts can be used on the same cutter body

RSC series New / RSE series Expansion

■ Cutting Performance RSC series



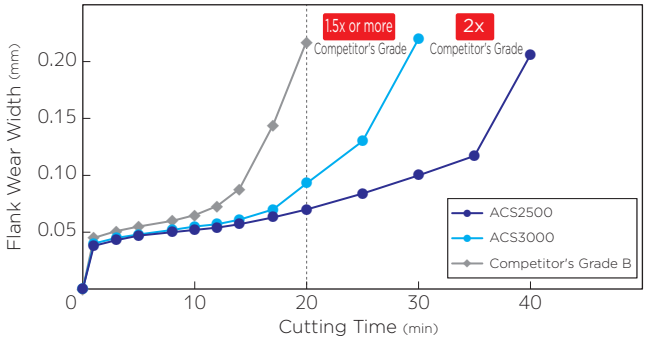
After cutting for 11 minutes



Machine: Vertical Machining Center, Work Material: SKD11 Mild Steel
Tool: RSC 06012E02, Insert: RDMX0601M0EN-G
Cutting Conditions: vc = 200m/min fz = 0.3mm/t ap = 0.9mm ae = 9mm Wet

Superb wear resistance with 2 times longer tool life than competitor's grades

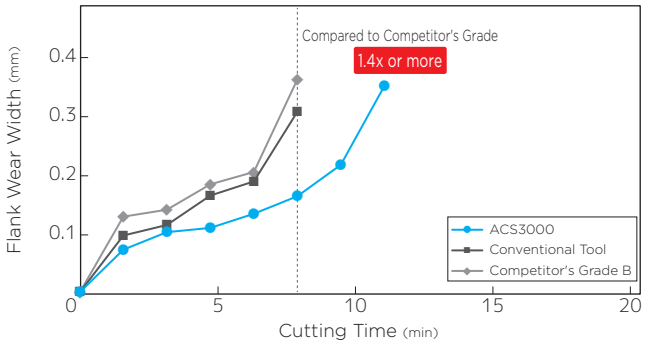
■ Cutting Performance RSE series



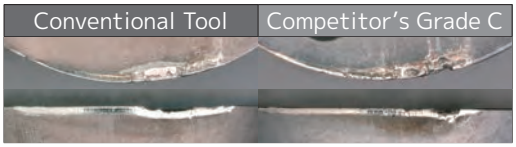
After cutting for 20 minutes

Machine: Vertical Machining Center BT40, Work Material: Ti-6Al-4V
Tool: RSE 12050RS05, Insert: RPHT1204M0EN-G
Cutting Conditions: vc = 70m/min fz = 0.25mm/t ap = 2mm ae = 30mm Wet

Superb wear resistance with 1.5 times longer tool life than conventional grades and competitor's grades



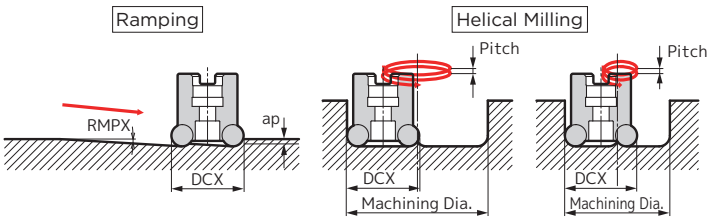
After cutting for 8 minutes



Machine: Vertical Machining Centre BT40, Work Material: Inconel 718 (44HRC)
Tool: RSE 12050RS05, Insert: RPHT1204M0EN-G
Cutting Conditions: vc = 40m/min fz = 0.3mm/t ap = 2mm ae = 30mm Wet

Superb fracture resistance 1.4 times longer tool life than conventional tools and competitor's grades

■ Ramping/Helical Milling Upper Limit



Precautions for Helical Milling

- Above the max. machining diameter, the centre uncut portion can be removed by traverse cutting with the same cutter.
- Below the min. machining diameter, the centre uncut portion cannot be removed with the same cutter.

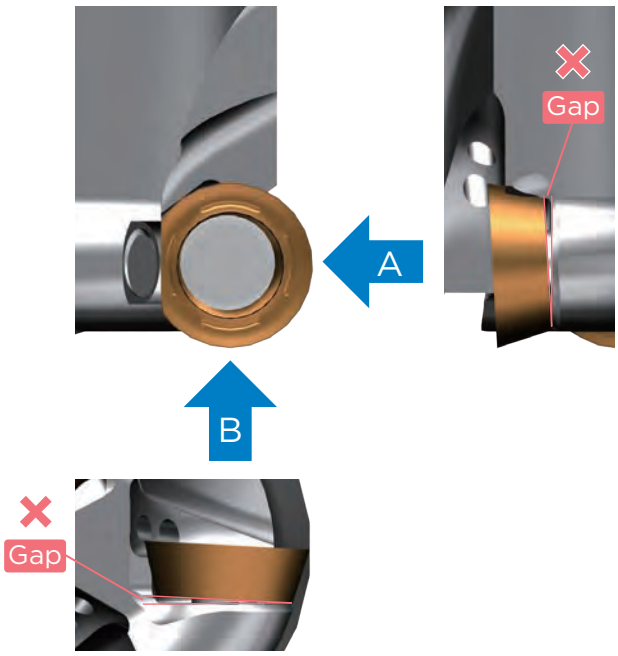
Insert Cat. No.	Max. Dia. DCX (mm)	Ramping	Helical Milling					
		Max. Ramping Angle RMPX (°)	Max. Machining Dia. (mm)	Max. Pitch (mm/rev)	Standard Diameter (mm)	Max. Pitch (mm/rev)	Min. Machining Dia. (mm)	Max. Pitch (mm/rev)
RDMX06··· RSC series	ø12	90	23.0	3.0	18.5	3.0	15.4	3.0
	ø16	14.8	30.8	3.0	26.3	3.0	23.2	3.0
	ø20	9.5	38.8	3.0	34.3	3.0	31.2	3.0
	ø25	6.5	48.8	3.0	44.3	3.0	41.2	3.0
R○○T10··· RSE series	ø25	4.6	48.6	4.8	40.6	3.3	36.3	1.4
	ø32	2.8	62.6	4.6	54.6	2.9	50.3	1.4
	ø40	1.9	78.6	3.9	70.6	2.6	66.3	1.4
	ø50	1.3	98.6	3.4	90.6	2.5	86.3	1.4
R○○T12··· RSE series	ø40	3.4	78.6	6.0	68.6	4.5	62.4	1.6
	ø42	3.1	82.6	6.0	72.6	4.4	66.4	1.6
	ø50	2.3	98.6	6.0	88.6	4.1	82.4	1.6
	ø52	2.2	102.6	6.0	92.6	4.1	86.4	1.6
	ø63	1.6	124.6	5.3	114.6	3.9	108.4	1.6
	ø80	1.1	158.6	4.8	148.6	3.7	142.4	1.6

■ Precautions for Mounting Inserts

(1) Clean the mounting seat surface and fixing parts so that no foreign matter is adhered thereto.

(2) Holding down the insert from the A and B directions, tighten the screw at the recommended torque.

(3) After tightening, check that there are no gaps on the seat surface.



MEMO

RSC 06000E type New

P Steel | M Stainless Steel | S Exotic Alloy

Rake Angle		
	Radial	-4° to 0.6°
	Axial	0°

3mm

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1

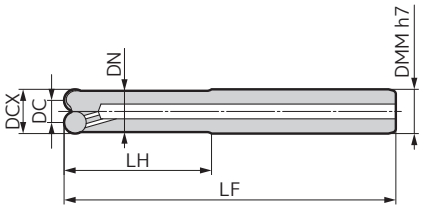
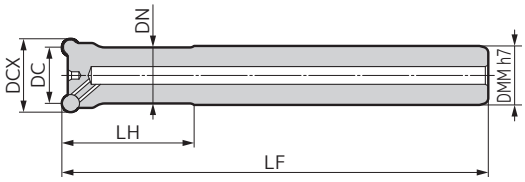


Fig 2



■ Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	No. of Teeth	Weight (kg)	Fig
RSC 06012E02	●	**12**	6	12	11.2	50	130	2	0.10	1
06016E03	●	**16**	10	16	13.3	50	160	3	0.20	1
06020E04	●	**20**	14	20	17.3	50	160	4	0.32	1
06025E05	●	**25**	19	20	19.0	50	160	5	0.35	2

Inserts are sold separately.

■ Identification Code

RSC 06 016 E 03

- RSC: Series Code
- 06: Insert Size
- 016: Dia.
- E: Shank
- 03: No. of Teeth

■ Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
RSC06012E02	BFTX025381IP	**1.2**	TRDR08IP*	SUMI-P*
Other than above	BTFX025051IP			

*Wrenches and anti-seizure cream are sold separately.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item)

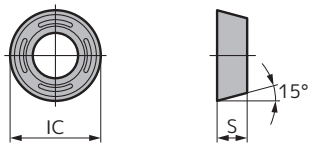
RSC 06000E type New

■ Insert

Dimensions (mm)

Grade Classification		Coated Carbide						
Applicable Process	High-speed/Light Cutting		MS	MS				
	Medium Cutting	PSM	MS	MS	MS			
	Roughing	PSM			MS			
Cat. No.		ACU2500	ACS1000	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Fig
RDMX0601M0EN-G		●	●	●	●	6	1.99	1

Fig 1



■ Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Grade
P	Steel	General Steel	280HB or less	G	150 - **180** - 220	0.20 - **0.35** - 0.50	ACU2500
		Alloy Steel	280HB or less	G	120 - **160** - 200	0.20 - **0.35** - 0.50	ACU2500
		Alloy Steel	42HRC or less	G	100 - **140** - 180	0.10 - **0.20** - 0.30	ACU2500
S	Exotic Alloy	Heat Resistant Alloys: Inconel 718, Inconel 713C, etc.	—	G	30 - **45** - 60	0.08 - **0.10** - 0.20	ACS1000/ACS2500/ACS3000
		Titanium Alloys: Pure Titanium, Ti-6Al-4V, etc.	—	G	30 - **70** - 100	0.10 - **0.15** - 0.20	ACS1000/ACS2500/ACS3000
M	Stainless Steel	Martensitic/Ferritic SUS430, etc.	200HB	G	120 - **150** - 180	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Martensitic Hardened SUS403, etc.	240HB	G	110 - **130** - 160	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Austenitic SUS304, SUS316	180HB	G	130 - **160** - 190	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Duplex Austenitic/Ferritic	230 to 270HB	G	70 - **110** - 180	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Precipitation Hardened Structures	330HB	G	50 - **90** - 160	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
H	Hardened Steel		52HRC or less	G	60 - **80** - 100	0.10 - **0.15** - 0.20	ACU2500

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.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item)

RSC 06000M type New

P Steel | M Stainless Steel | S Exotic Alloy

Rake Angle	Radial	-4° to 0.6°
	Axial	0°

3mm

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1

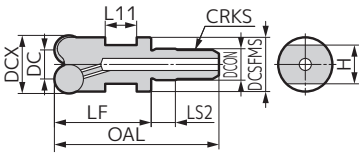
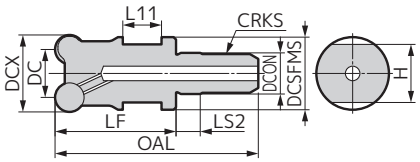


Fig 2



■ Head

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Side Lock Flat L11	Width H	No. of Teeth	Weight (kg)	Fig
RSC 06012M06Z2	●	**12**	6	11.2	6.5	**M6**	34	20	5	6.5	8	2	0.02	1
06016M08Z3	●	**16**	10	15	8.5	**M8**	42	25	5	8	11	3	0.03	2
06020M10Z4	●	**20**	14	19	10.5	**M10**	49	30	5	9	14	4	0.06	2
06025M12Z5	●	**25**	19	23.6	12.5	**M12**	56	35	5	10	17	5	0.11	2

Inserts are sold separately.

■ Identification Code

RSC 06 016 M08 Z3

RSC	06	016	M08	Z3
Series Code	Insert Size	Dia.	Mounting Screw Size	No. of Teeth

■ Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
RSC06012E02	BFTX025381IP	**1.2**	TRDR08IP*	SUMI-P*
Other than above	BFTX025051IP			

*Wrenches and anti-seizure cream are sold separately.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item)

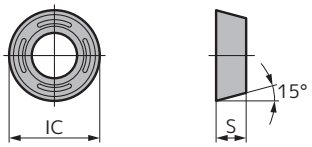
RSC 06000M type New

■ Insert

Dimensions (mm)

Grade Classification		Coated Carbide						
Applicable Process	High-speed/Light Cutting		MS	MS	
	Medium Cutting	PSM	MS	MS	MS
	Roughing	PSM			MS
Cat. No.		ACU2500	ACS1000	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Fig
RDMX0601M0EN-G		●	●	●	●	6	1.99	1

Fig 1



■ Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Grade
P	Steel	General Steel	280HB or less	G	150 - **180** - 220	0.20 - **0.35** - 0.50	ACU2500
		Alloy Steel	280HB or less	G	120 - **160** - 200	0.20 - **0.35** - 0.50	ACU2500
		Alloy Steel	42HRC or less	G	100 - **140** - 180	0.10 - **0.20** - 0.30	ACU2500
S	Exotic Alloy	Heat Resistant Alloys: Inconel 718, Inconel 713C, etc.	—	G	30 - **45** - 60	0.08 - **0.10** - 0.20	ACS1000/ACS2500/ACS3000
		Titanium Alloys: Pure Titanium, Ti-6Al-4V, etc.	—	G	30 - **70** - 100	0.10 - **0.15** - 0.20	ACS1000/ACS2500/ACS3000
M	Stainless Steel	Martensitic/Ferritic SUS430, etc.	200HB	G	120 - **150** - 180	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Martensitic Hardened SUS403, etc.	240HB	G	110 - **130** - 160	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Austenitic SUS304, SUS316	180HB	G	130 - **160** - 190	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Duplex Austenitic/Ferritic	230 to 270HB	G	70 - **110** - 180	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Precipitation Hardened Structures	330HB	G	50 - **90** - 160	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
H	Hardened Steel		52HRC or less	G	60 - **80** - 100	0.10 - **0.15** - 0.20	ACU2500

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.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item)

RSE 10000RS type

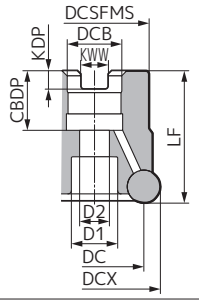
Rake Angle		
Radial	-5°	
Axial	4°	

5mm 4-cornered

1.4mm 8-cornered

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



■ 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 CBDP	Bolt D1	Bolt D2	No. of Teeth	Weight (kg)	Fig
Metric	**RSE 10040RS05**	●	**40**	30	33	40	**16**	8.4	5.6	18	14	9	5	0.16	1
	10050RS06	●	**50**	40	41	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

RSE	10	040	R	S	05
Series Code	Insert Size	Dia.	Feed Direction	Metric Bore	No. of Teeth

■ Parts

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

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item

■ Insert

Dimensions (mm)

Grade Classification		Coated Carbide					
Applicable Process	High-speed/Light Cutting	M S	M S				
	Medium Cutting	M S	M S	M S			
	Roughing			M S			
Cat. No.		New!! ACS1000	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Fig
RPHT10T3M0EN-G		●	●	●	10	3.97	1
RPMT10T3M0EN-G		●	●	●	10	3.97	2
RDMT10T3M0EN-G		●	●	●	10	3.97	3

Fig 1 4-cornered

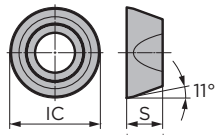


Fig 2 8-cornered

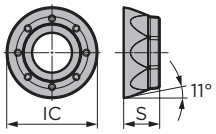
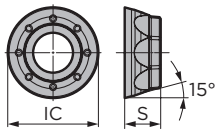


Fig 3 8-cornered



■ Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Grade
S	Exotic Alloy	Heat Resistant Alloys: Inconel 718, Inconel 713C, etc.	—	G	25 - **35** - 50	0.08 - **0.10** - 0.20	ACS1000/ACS2500/ACS3000
		Titanium Alloys: Pure Titanium, Ti-6Al-4V, etc.	—	G	30 - **60** - 90	0.10 - **0.15** - 0.20	ACS1000/ACS2500/ACS3000
M	Stainless Steel	Martensitic/Ferritic SUS430, etc.	200HB	G	115 - **145** - 175	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Martensitic Hardened SUS403, etc.	240HB	G	105 - **130** - 155	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Austenitic SUS304, SUS316	180HB	G	125 - **155** - 190	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Duplex Austenitic/Ferritic	230 to 270HB	G	70 - **110** - 180	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Precipitation Hardened Structures	330HB	G	50 - **90** - 160	0.10 - **0.20** - 0.30	ACS1000/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.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item)

RSE 12000R(S) type

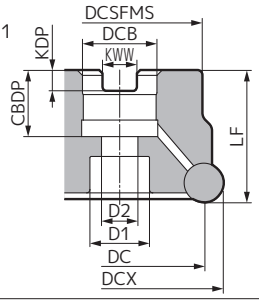
Rake Angle		
Radial	-5°	
Axial	4°	

6mm 4-cornered

1.7mm 8-cornered

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



■ 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 CBDP	Bolt D1	Bolt D2	No. of Teeth	Weight (kg)	Fig
Metric	**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
Inch	**RSE 12080R08**	●	***80**	68	55	50	**25.4**	9.5	6	25	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

RSE	12	050	R	S	05
Series Code	Insert Size	Dia.	Feed Direction	Metric Bore	No. of Teeth

■ Parts

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

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item

RSE 12000R(S) type Expansion

■ Insert

Dimensions (mm)

Grade Classification		Coated Carbide					
Applicable Process	High-speed/Light Cutting	MS	MS				
	Medium Cutting	MS	MS	MS			
	Roughing			MS			
Cat. No.		New! ACS1000	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Fig
RPHT1204M0EN-G		●	●	●	12	4.76	1
RPMT1204M0EN-G		●	●	●	12	4.76	2
RDMT1204M0EN-G		●	●	●	12	4.76	3

Fig 1 4-cornered

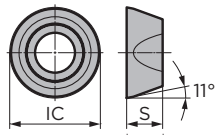


Fig 2 8-cornered

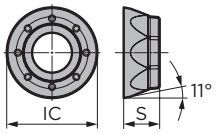
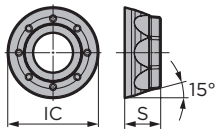


Fig 3 8-cornered



■ Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Grade
S	Exotic Alloy	Heat Resistant Alloys: Inconel 718, Inconel 713C, etc.	—	G	25 - **35** - 50	0.08 - **0.10** - 0.20	ACS1000/ACS2500/ACS3000
		Titanium Alloys: Pure Titanium, Ti-6Al-4V, etc.	—	G	30 - **60** - 90	0.10 - **0.15** - 0.20	ACS1000/ACS2500/ACS3000
M	Stainless Steel	Martensitic/Ferritic SUS430, etc.	200HB	G	115 - **145** - 175	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Martensitic Hardened SUS403, etc.	240HB	G	105 - **130** - 155	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Austenitic SUS304, SUS316	180HB	G	125 - **155** - 190	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Duplex Austenitic/Ferritic	230 to 270HB	G	70 - **110** - 180	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Precipitation Hardened Structures	330HB	G	50 - **90** - 160	0.10 - **0.20** - 0.30	ACS1000/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.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item)

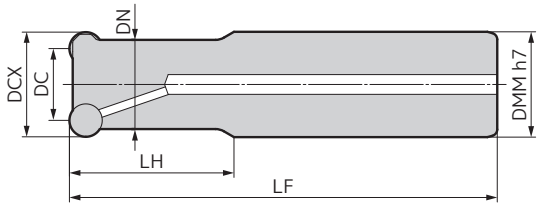
RSE 10000E type

Rake Angle		
Radial	0°	
Axial	4°	

5mm 4-cornered | 1.4mm 8-cornered

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



■ Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	No. 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

RSE	10	032	E	03
Series Code	Insert Size	Dia.	Shank	No. of Teeth

■ Parts

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

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item

RSE 10000E type Expansion

■ Insert

Dimensions (mm)

Grade Classification		Coated Carbide					
Applicable Process	High-speed/Light Cutting	MS	MS				
	Medium Cutting	MS	MS	MS			
	Roughing			MS			
Cat. No.		New! ACS1000	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Fig
RPHT10T3M0EN-G		●	●	●	10	3.97	1
RPMT10T3M0EN-G		●	●	●	10	3.97	2
RDMT10T3M0EN-G		●	●	●	10	3.97	3

Fig 1 4-cornered

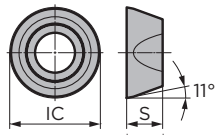


Fig 2 8-cornered

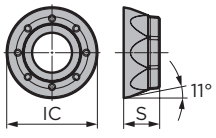
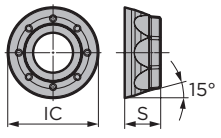


Fig 3 8-cornered



■ Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Grade
S	Exotic Alloy	Heat Resistant Alloys: Inconel 718, Inconel 713C, etc.	—	G	25 - **35** - 50	0.08 - **0.10** - 0.20	ACS1000/ACS2500/ACS3000
		Titanium Alloys: Pure Titanium, Ti-6Al-4V, etc.	—	G	30 - **60** - 90	0.10 - **0.15** - 0.20	ACS1000/ACS2500/ACS3000
M	Stainless Steel	Martensitic/Ferritic SUS430, etc.	200HB	G	115 - **145** - 175	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Martensitic Hardened SUS403, etc.	240HB	G	105 - **130** - 155	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Austenitic SUS304, SUS316	180HB	G	125 - **155** - 190	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Duplex Austenitic/Ferritic	230 to 270HB	G	70 - **110** - 180	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000
		Precipitation Hardened Structures	330HB	G	50 - **90** - 160	0.10 - **0.20** - 0.30	ACS1000/ACS2500/ACS3000

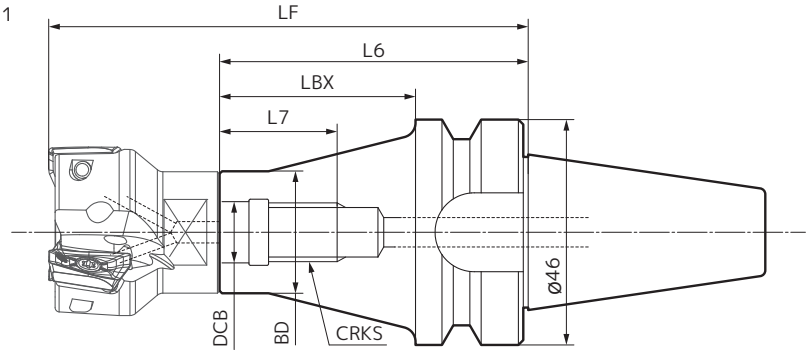
Note
- The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).
- For groove milling, calculate the feed rate at around 70% of the above values.
- The cutting conditions above are a guide. Actual conditions will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

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item)

Modular Tools Expansion

■ BBT Integrated type - SEC-Modular Tools Special Arbors

Fig 1



■ BBT Integrated Arbor

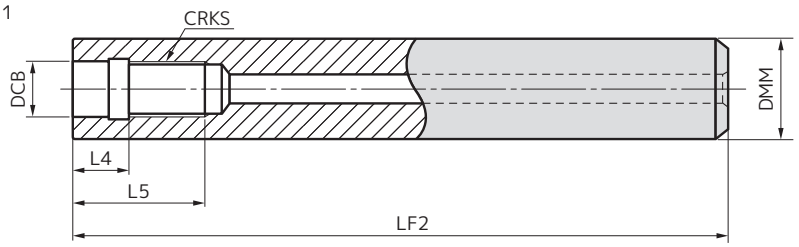
Dimensions (mm)

Cat. No.	Stock	Screw CRKS	Hole Dia. DCB	External Dia. BD	Body Overhang L6	Length LBX	Thread Depth L7	Overhang LF*1	Coolant Hole	Fig
BBT30-M8-50	●	**M8**	8.5	15.9	72	50	18	97	Yes	1
M10-45	●	**M10**	10.5	19.9	67	45	20	97	Yes	1
M12-40	●	**M12**	12.5	24.9	62	40	22	97	Yes	1

*1: Overhang length for LF is with head mounted.
Can also be used with BT30 spindle machines.

■ SEC-Modular Tools - Special Arbors (Carbide Arbor/Steel Arbor)

Fig 1



■ Carbide Arbor

Dimensions (mm)

Cat. No.	Stock	Screw CRKS	Hole Dia. DCB	Shank DMM	Overall Length LF2	Depth L4	Thread Depth L5	Overhang LF*2	Fig
MA10M06L100C	●	**M6**	6.5	10	100	9	15.5	120	1
12M06L100C	●	**M6**	6.5	12	100	9	15.5	120	1
MA15M08L120C	●	**M8**	8.5	15	120	10	18	145	1
15M08L160C	●	**M8**	8.5	15	160	10	18	185	1
16M08L120C	●	**M8**	8.5	16	120	10	18	145	1
16M08L160C	●	**M8**	8.5	16	160	10	18	185	1
MA18M10L150C	●	**M10**	10.5	18	150	10	20	180	1
18M10L200C	●	**M10**	10.5	18	200	10	20	230	1
20M10L150C	●	**M10**	10.5	20	150	10	20	180	1
20M10L200C	●	**M10**	10.5	20	200	10	20	230	1
MA23M12L200C	●	**M12**	12.5	23	200	10	22	235	1
23M12L250C	●	**M12**	12.5	23	250	10	22	285	1
25M12L200C	●	**M12**	12.5	25	200	10	22	235	1
25M12L250C	●	**M12**	12.5	25	250	10	22	285	1

■ Steel Arbor

Dimensions (mm)

Cat. No.	Stock	Screw CRKS	Hole Dia. DCB	Shank DMM	Overall Length LF2	Depth L4	Thread Depth L5	Overhang LF*2	Fig
MA16M08L120S	●	**M8**	8.5	16	120	10	18	145	1
20M10L150S	●	**M10**	10.5	20	150	10	20	180	1
25M12L200S	●	**M12**	12.5	25	200	10	22	235	1

■ Identification Code

MA	15	M08	L120	C
Series Code	Shank Dia.	Mounting Screw Size	Arbor Overall Length	Arbor Material (C: Carbide, S: Steel)

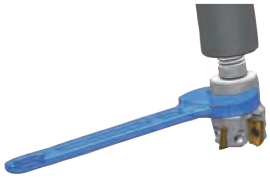
● Set Dimensions (*2)

■ Recommended Tightening Torque (N·m)

***Take care when tightening the head.**

· When mounting the head to an arbor, follow the regulated tightening torque in the table below.
· Check the mounting screw size for the head and arbor beforehand.

Screw Size	Regulated Tightening Torque (N·m)
M6	**8**
M8	**23**
M10	**46**
M12	**60**

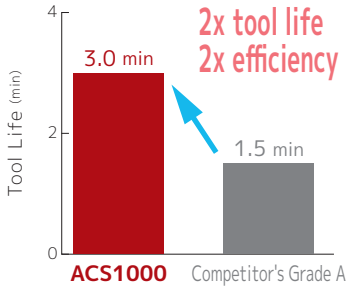


● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item)

■ Application Examples (RSC series)

Inconel 713C Industrial Component

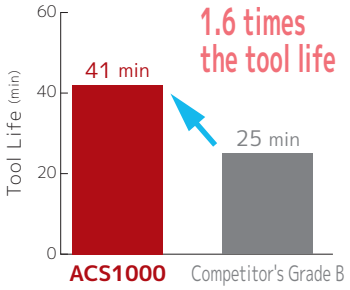
RSC series S



Tool: RSC 06016E03 Insert: RDMX0601M0EN-G
Cutting Conditions: vc = 25m/min, fz = 0.1mm/t, ap = 3.0mm Wet

Inconel 718 Aerospace Component

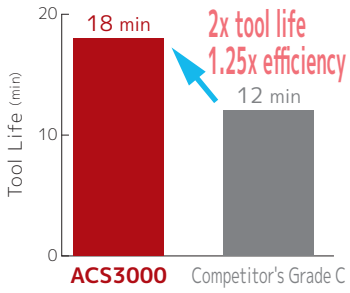
RSC series S



Tool: RSC 06012E02 Insert: RDMX0601M0EN-G
Cutting Conditions: vc = 55m/min, fz = 0.1mm/t, ap = 0.5mm Wet

Inconel 718 Aerospace Component (Machined from Block)

RSC series S

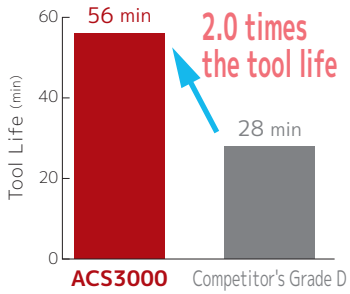


Tool: RSC 06016M08Z3 Insert: RDMX0601M0EN-G
Cutting Conditions: vc = 48m/min, fz = 0.25mm/t, ap = 0.2mm Wet

■ Application Examples (RSE series)

Ti-6Al-4V Aerospace Component

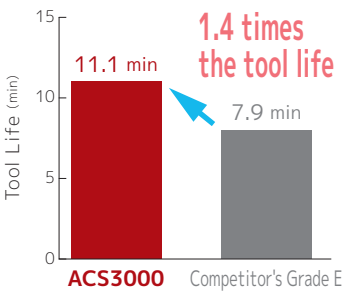
RSE series S



Tool: RSE 12050RS05 Insert: RPHT1204M0EN-G
Cutting Conditions: vc = 60m/min, fz = 0.30mm/t, ap = 3.0mm Wet

Inconel 718 (44HRC) Block Material

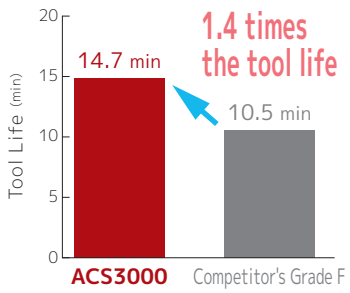
RSE series S



Tool: RSE 12050RS05 Insert: RPHT1204M0EN-G
Cutting Conditions: vc = 40m/min, fz = 0.25mm/t, ap = 2.0mm Wet

Precipitation Hardened Stainless Steel (42HRC) Block Material

RSE series M



Tool: RSE 12050RS05 Insert: RPHT1204M0EN-G
Cutting Conditions: vc = 150m/min, fz = 0.30mm/t, ap = 2.0mm Wet

< SAFETY NOTES >

- 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.
- 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.

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