P M K N S H

Radius Mill for Exotic Alloys

„Wave Radius Mill“ RSX Series

SUMITOMO

CARBIDE - CBN - DIAMOND

Wave Radius Mill
RSX Series

Features

The Wave Radius Mill RSX Series is developed for exotic alloys as well as for stainless steel machining.
In combination with the new ACM-grades a high tool life can be achieved.
E-class tolerance inserts guarantee good run-out.

Characteristics

Smooth cutting action and low vibration machining provided based on the high rake angle design and high rigidity body.
High reliability achieved with ACM100 / ACM200 / ACM300 adopted for exotic alloy machining.
Insert positioning mechanism ensures accurate and secure location.

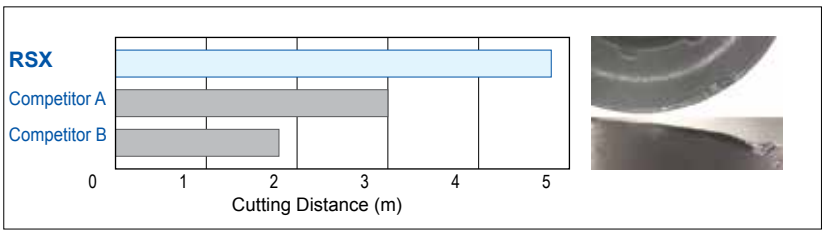
Series

Image	Series	Insert Size	Cat. No.	External Diameter (mm)										
				ø25	ø32	ø40	ø50	ø52	ø63	ø66	ø80	ø100	ø125	ø160
Shank Type 	Standard	10	RSX 10000 ES	●	●									
		12	RSX 12000 ES		●									
	Fine Pitch	10	RSXF 10000 ES	●	●									
		12	RSXF 12000 ES		●									
Shell Type 	Standard	10	RSX 10000 RS			●	●	●						
		12	RSX 12000 RS			●	●	●	●	●	●	●		
		16	RSX 16000 RS						●		●	●	●	
	Fine Pitch	10	RSXF 10000 RS			●	●	●						
		12	RSXF 12000 RS			●	●	●	●	●	●	●		
		16	RSXF 16000 RS						●		●	●	●	❑
Modular Type 	Standard	10	RSX 10000 M	●	●									
		12	RSX 12000 M		●	●								
	Fine Pitch	10	RSXF 10000 M	●	●									
		12	RSXF 12000 M		●	●								

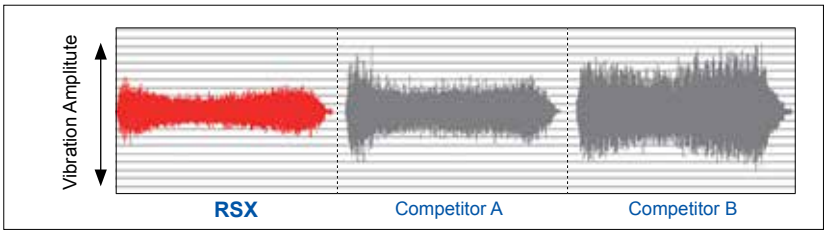
● Euro stock
❑ Delivery on request

Cutting Performance

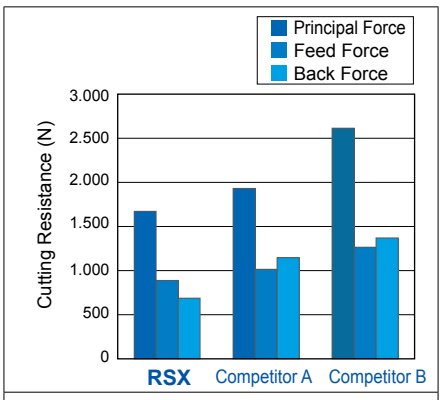
Tool Life Comparison (Fracture Resistance)



Cutting Vibration Comparison



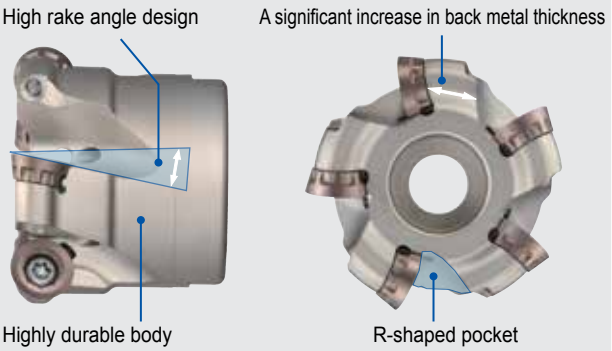
Cutting Resistance Comparison



Work Material: X5CrNiS1810
Tool: Ø50
Cutting Data: v_c = 200m/min, f_t = 0,5mm/t, a_p = 2,0mm, a_e= 10,0mm, Wet

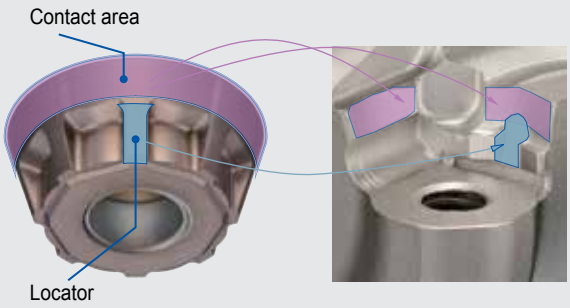
Low Cutting Resistance, Less Vibration

Low cutting resistance and low vibration machining have been achieved with super high rake angle design + high rigidity body.



High Operability

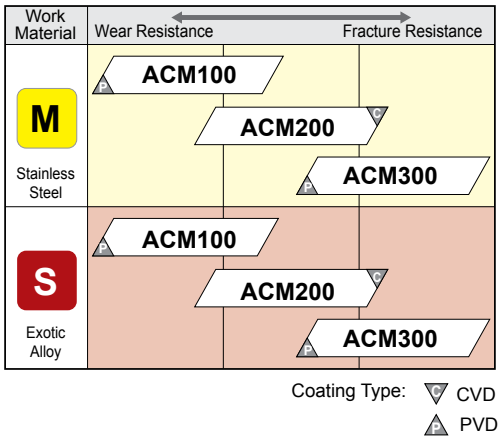
Ease of corner control has been achieved with the adoption of a unique positioning mechanism that is highly precise and highly operable.



Insert size of 12 and 16mm uses a maximum of 8 corners and an insert size of 10mm uses a maximum of 4 corners.

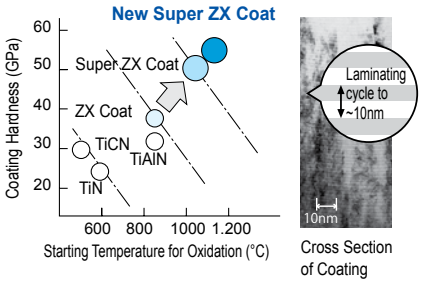
Stable and Long Tool Life

A long life ensured with the adoption of the ACM series and significant improvements have been made in processing exotic alloy and stainless steel machining.



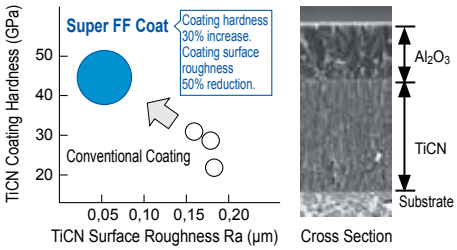
Coating Type: CVD / PVD

ACM100/ACM300



Cross Section of Coating

ACM200



Cross Section of Coating

New Super ZX Coat

The product series with a coating film hardness approximately 40% higher and an oxidation onset temperature 200°C higher than conventional products.
Enables machining at least 1,5 times faster and more efficiently than conventional products.
A product life at least twice as long as that of conventional products achieved under the same machining conditions.

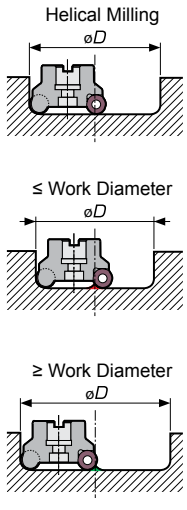
Super FF Coat

Smooth coating surface provides excellent adhesion and chipping resistance.
Improved coating adhesion strength.
Harder than conventional coatings with hugh improvements in wear resistance.
High speed, high effiency machining of more than 1,5 times than of conventional grades possible.
Achieving more than double the tool life of conventional grades under the same cutting conditions.

Various Machining Use

Various types of processing, such as mould engraving, slant milling and helical processing.

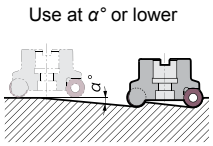
Helical Milling



Center uncut portion cannot be removed by traverse cutting with the same cutter.

Center uncut portion can be removed by traverse cutting with the same cutter.

Ramping



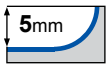
Recommended Values for Helical and Ramping

Insert Cat. No.	Helical				Taper
	Cutter ØDc	Work Diameter			Ramping Angle α°(max)
		Min.	Optimal Ø	Max.	
RDET10...	25	33,0	40	49	10°30'
	32	46,0	54	63	6°45'
	40	62,0	70	79	4°30'
	50	82,0	90	99	3°15'
	52	86,0	94	103	3°10'
RDET12...	32	41,5	52	63	12°30'
	40	57,5	68	79	8°00'
	50	77,5	88	99	5°30'
	52	81,5	92	103	5°15'
	63	103,5	114	125	4°00'
	66	109,5	120	131	3°45'
	80	137,5	148	159	2°50'
	100	177,5	188	199	2°10'
RDET16...	63	96,0	110	125	6°00'
	80	130,0	144	159	4°10'
	100	170,0	184	199	3°00'
	125	220,0	234	249	2°20'

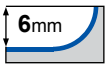
Wave Radius Mill
RSX(F)10000RS/12000RS/16000RS

Milling of exotic alloys and stainless steel

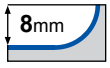
Rake Angle		
	Radial	-5°
	Axial	10°



(10000RS)



(12000RS)



(16000RS)

Body – Dimensions

Fig. 1

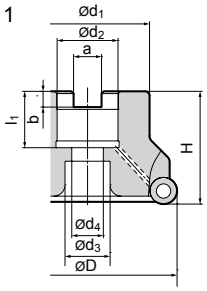


Fig. 2

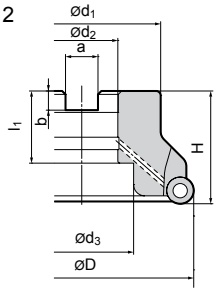
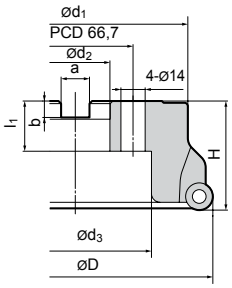


Fig. 3



Body (RSX10000RS, Standard)

Cat. No.	Stock	Dimensions (mm)									No. of teeth	Weight (kg)	Fig.
		øD	ød1	H	ød2	a	b	l1	ød3	ød4			
RSX 10040RS	●	40	34	40	16	8,4	5,6	18	14	9	4	0,2	1
10050RS	●	50	40	40	22	10,4	6,3	20	18	11	5	0,3	1
10052RS	●	52	40	40	22	10,4	6,3	20	18	11	5	0,4	1

Body (RSXF10000RS, Fine Pitch

RSXF 10040RS	●	40	34	40	16	8,4	5,6	18	14	9	5	0,2	1
10050RS	●	50	40	40	22	10,4	6,3	20	18	11	6	0,3	1
10052RS	●	52	40	40	22	10,4	6,3	20	18	11	6	0,3	1

Body (RSX12000RS, Standard)

RSX 12040RS	●	40	32	40	16	8,4	5,6	18	13,5	9	3	0,2	1
12050RS	●	50	40	40	22	10,4	6,3	20	18	11	4	0,3	1
12052RS	●	52	40	40	22	10,4	6,3	20	18	11	4	0,3	1
12063RS	●	63	40	40	22	10,4	6,3	20	18	11	5	0,4	1
12066RS	●	66	55	50	27	12,4	7,0	25	20	14	6	0,7	1
12080RS	●	80	55	50	27	12,4	7,0	25	20	14	6	1,0	1
12100RS	●	100	70	50	32	14,4	8,5	32	46	-	6	1,4	2

Body (RSXF12000RS, Fine Pitch)

RSXF 12040RS	●	40	32	40	16	8,4	5,6	18	13,5	9	4	0,2	1
12050RS	●	50	40	40	22	10,4	6,3	20	18	11	5	0,3	1
12052RS	●	52	40	40	22	10,4	6,3	20	18	11	5	0,3	1
12063RS	●	63	40	40	22	10,4	6,3	20	18	11	6	0,4	1
12066RS	●	66	55	50	27	12,4	7,0	25	20	14	7	0,7	1
12080RS	●	80	55	50	27	12,4	7,0	25	20	14	7	0,9	1
12100RS	●	100	70	50	32	14,4	8,5	32	46	-	10	1,3	2

Body (RSX16000RS, Standard)

RSX 16063RS	●	63	50	40	22	10,4	6,3	20	18	11	4	0,5	1
16080RS	●	80	55	50	27	12,4	7,0	25	20	14	5	0,9	1
16100RS	●	100	70	50	32	14,4	8,5	32	46	-	6	1,3	2
16125RS	●	125	80	63	40	16,4	9,5	29	52	29	6	2,6	1

Body (RSXF16000RS, Fine Pitch)

RSXF 16063RS	●	63	50	40	22	10,4	6,3	20	18	11	5	0,4	1
16080RS	●	80	55	50	27	12,4	7,0	25	20	14	6	0,8	1
16100RS	●	100	70	50	32	14,4	8,5	32	46	-	7	1,3	2
16125RS	●	125	80	63	40	16,4	9,5	29	52	29	8	2,5	1
16160RS	❑	160	130	63	40	16,4	9,5	29	88	-	10	4,8	3

● Euro stock
❑ Delivery on request

Cutter Identification

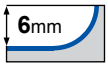
RSX	F	12	040	R	S
Cutter Series	Fine Pitch Type	Insert Size	Cutter Diameter	Cutting Direction	Metric

Wave Radius Mill
RSX(F)10000ES/12000ES

Milling of exotic alloys and stainless steel

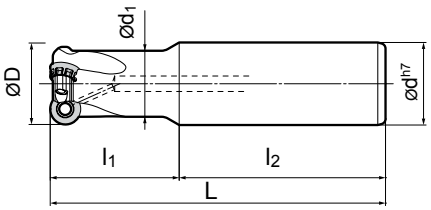
Rake Angle		
	Radial	-5°~ -8°
	Axial	10°

(10000ES)



(12000ES)

Body – Dimensions



Body (RSX10000ES, Standard)

Cat. No.	Stock	Dimensions (mm)						No. of teeth	Weight (kg)
		ØD	Ød	Ød1	l1	l2	L		
RSX 10025ES	●	25	25	20,3	50	80	130	2	0,4
10032ES	●	32	32	27,1	50	80	130	3	0,7

Body (RSX12000ES, Standard)

Cat. No.	Stock	Dimensions (mm)						No. of teeth	Weight (kg)
		ØD	Ød	Ød1	l1	l2	L		
RSX 12032ES	●	32	32	25,6	50	80	130	2	0,7

Body (RSX10000ES, Fine Pitch)

Cat. No.	Stock	Dimensions (mm)						No. of teeth	Weight (kg)
		ØD	Ød	Ød1	l1	l2	L		
RSXF 10025ES	●	25	25	20,3	50	80	130	3	0,4
10032ES	●	32	32	27,1	50	80	130	4	0,7

Body (RSX12000ES, Fine Pitch)

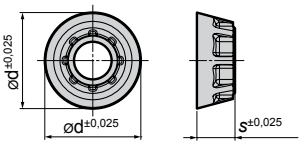
Cat. No.	Stock	Dimensions (mm)						No. of teeth	Weight (kg)
		ØD	Ød	Ød1	l1	l2	L		
RSXF 12032ES	●	32	32	25,6	50	80	130	3	0,7

● Euro stock

Inserts

Application	Grade		
High Speed/Light Cut	MS	MS	
General Purpose	MS	MS	MS
Roughing			MS

Cat. No.	ACM100	ACM200	ACM300	Dimens. ød (IC)	Dimens. S	Applicable Cutters
RDET 10T3M0EN G	●	●	●	10	3,97	RSX(F) 10000RS
10T3M0EN H	●	●	●	10	3,97	RSX(F) 10000ES
RDET 1204M0EN G	●	●	●	12	4,76	RSX(F) 12000RS
1204M0EN H	●	●	●	12	4,76	RSX(F) 12000ES
RDET 1606M0EN G	●	●	●	16	6,5	RSX(F) 16000RS
1606M0EN H	●	●	●	16	6,5	



Cutting Edge Cross Section

G - Type **H** - Type

M0: IC is metric

● Euro stock

Spare Parts

Applicable Cutters		Wrench	Screw	Recommended Tightening Torque (N·m)
RSX(F)	10000RS/ES	TRDR15IP	BFTX03584IP	**3,0**
RSX(F)	12000RS/ES		BFTX0409IP	**3,0**
RSX(F)	16000RS/ES	TRDR20IP	BFTX0511IP	**5,0**

Cutter Identification

RSX	F	10	025	ES
Cutter Series	Fine Pitch Type	Insert Size	Cutter Diameter	Endmill Type

Recommended Cutting Conditions

Min.-**Optimum**-Max.

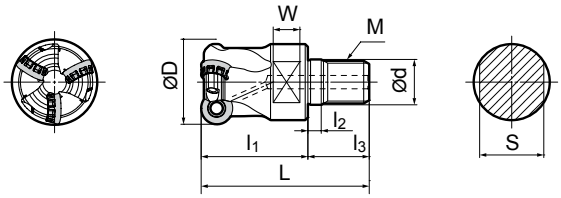
ISO	Work Material			Hardness	Cutting Speed v_c (m/min)	Feed Rate f_t (mm/t)	Grade
M	Stain-less Steel	Cr Based	Ferritic	200HB	150-**180**-200	0,15-**0,25**-0,35	ACM300
			Martensitic	200-330HB	80-**120**-180	0,15-**0,25**-0,35	ACM300
		Cr-Ni Based	Austenitic	200HB	150-**180**-200	0,15-**0,25**-0,35	ACM300
			Austenitic, ferritic	230-270HB	80-**120**-180	0,15-**0,25**-0,35	ACM200
			Precipitation hardening	330HB	60-**100**-160	0,15-**0,25**-0,35	ACM200
S	Heat resistant alloy		Ni based material	250-350HB	20- **30**- 40	0,10-**0,20**-0,30	ACM100 ACM200
	Titanium		Pure Titanium	(Rm400)	60- **80**-100	0,10-**0,20**-0,30	
			$\alpha + \beta$ alloy system	(Rm1050)	40- **50**- 60	0,10-**0,20**-0,30	

Wave Radius Mill
RSX(F)10000M/12000M

Modular Tools

Rake Angle		
	Radial	-5°~ -8°
	Axial	10°

(10000M) (12000M)



Body (RSX10000M, Standard)

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
		ØD	Ød	M	L	l_1	l_2	l_3	W	S		
RSX 10025M12Z2	●	25	12,5	M12	56	35	5	21	10	19	2	0,1
10032M16Z3	●	32	17,0	M16	63	40	5	23	10	24	3	0,2

Body (RSX12000M, Standard)

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
		ØD	Ød	M	L	l_1	l_2	l_3	W	S		
RSX 12032M16Z2	●	32	17,0	M16	63	40	5	23	10	24	2	0,2
12040M16Z3	●	40	17,0	M16	63	40	5	23	10	24	3	0,3

Body (RSX10000M, Fine Pitch)

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
		ØD	Ød	M	L	l_1	l_2	l_3	W	S		
RSXF 10025M12Z3	●	25	12,5	M12	56	35	5	21	10	19	3	0,1
10032M16Z4	●	32	17,0	M16	63	40	5	23	10	24	4	0,2

Body (RSX12000M, Fine Pitch)

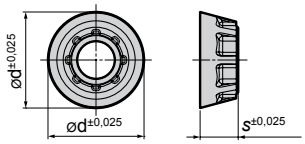
Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
		ØD	Ød	M	L	l_1	l_2	l_3	W	S		
RSXF 12032M16Z3	●	32	17,0	M16	63	40	5	23	10	24	3	0,2
12040M16Z4	●	40	17,0	M16	63	40	5	23	10	24	4	0,3

● Euro stock

Inserts

Application	Grade		
High Speed/Light Cut	MS	MS	
General Purpose	MS	MS	MS
Roughing			MS

Cat. No.	ACM100	ACM200	ACM300	Dimens. ød (IC)	Dimens. S	Applicable Cutters
RDET 10T3M0EN G	●	●	●	10	3,97	RSX(F)10000M
10T3M0EN H	●	●	●	10	3,97	
RDET 1204M0EN G	●	●	●	12	4,76	RSX(F)12000M
1204M0EN H	●	●	●	12	4,76	



Cutting Edge Cross Section

G - Type **H** - Type

M0: IC is metric

● Euro stock

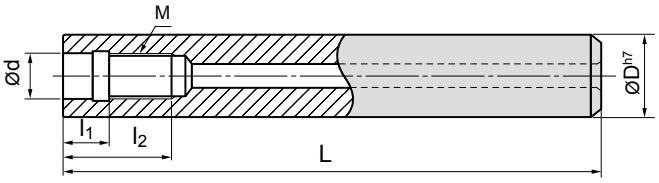
Spare Parts

Applicable Cutters	Wrench	Screw	Recommended Tightening Torque (N·m)
RSX(F) 10000M	TRDR15IP	BFTX03584IP	**3,0**
RSX(F) 12000M		BFTX0409IP	**3,0**

Cutter Identification

RSX	F	10	025	M12	Z3
Cutter Series	Fine Pitch Type	Insert Size	Cutter Diameter	Mounting Screw Size	No. of Teeth

Special Arbors for Modular Tools



Carbide Arbor

Cat. No.	Stock	Dimensions (mm)						
		M	Ød	ØD	L	l_1	l_2	L_M
MA 23M12L200C	●	M12	12,5	23	200	10	22	235
MA 23M12L250C	●	M12	12,5	23	250	10	22	285
MA 25M12L200C	●	M12	12,5	25	200	10	22	235
MA 25M12L250C	●	M12	12,5	25	250	10	22	285
MA 28M16L200C	●	M16	17,0	28	200	10	24	240
MA 28M16L300C	●	M16	17,0	28	300	10	24	340
MA 32M16L200C	●	M16	17,0	32	200	10	24	240
MA 32M16L300C	●	M16	17,0	32	300	10	24	340

Steel Arbor

Cat. No.	Stock	Dimensions (mm)						
		M	Ød	ØD	L	l_1	l_2	L_M
MA 25M12L200S	●	M12	12,5	25	200	10	22	235
MA 32M16L200S	●	M16	17,0	32	200	10	24	240

● Euro stock

Modular Tool System

Arbor Identification

MA	23	M12	L200	C
Cutter Series	Shank Diameter	Mounting Screw Size	Arbor Length	Material: C: Carbide S: Steel

Recommended Tightening Torque

Screw Size	Recommended Tightening Torque (N·m)	Tool Dimensions	
		W	S
M12	80	10	19
M16	90	10	24

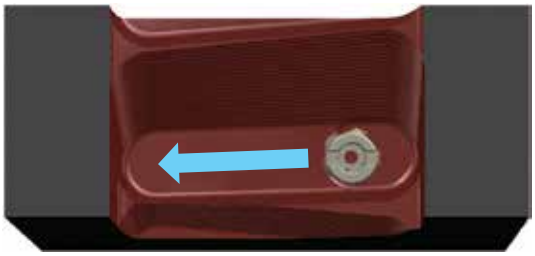
Notes about tightening the head:

When attaching the cutter head to an arbor, follow the recommended tightening torque (table left).
Confirm the mounting screw size for the head and the arbor before assembly.

Wave Radius Mill
RSX Series

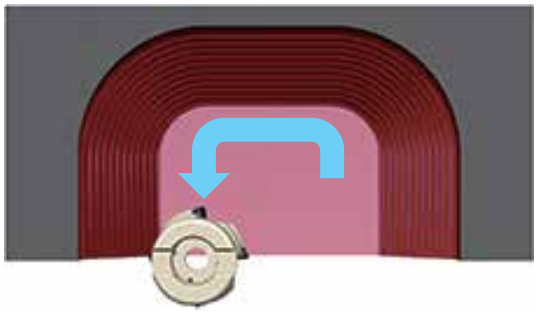
Application Example

Generator parts / X12CrNi25-21



	Detail	RSX Type	Competitor
Tool	Body	RSXF12050RS	Cutter Ø50
	Insert	RDET1204M0EN G	Ø12
	Diameter (mm)	Ø50	Ø50
	No. of Teeth	5	5
	Grade	ACM300 (PVD)	(CVD)
Cutting Conditions	Cutting Speed (m/min)	300	300
	Feed (mm/t)	0,35	0,35
	Axial Cutting Depth (mm)	2,0	2,0
	Cutting Width (mm)	50,0	50,0
	Coolant	Air Blow	Air Blow
Results	Ensuring a life approximately 1,2 times longer than competitor's.		

Generator parts / Inconel 718



	Detail	RSX Type	Competitor
Tool	Body	RSX12050RS	Cutter Ø50
	Insert	RDET1204M0EN G	Ø12
	Diameter (mm)	Ø50	Ø50
	No. of Teeth	4	5
	Grade	ACM200 (CVD)	(CVD)
Cutting Conditions	Cutting Speed (m/min)	70	50
	Feed (mm/t)	0,45	0,15
	Axial Cutting Depth (mm)	1,5	1,5
	Cutting Width (mm)	50,0	50,0
	Coolant	Dry	Dry
Results	Ensuring a life approximately 2 times longer than competitor's.		

SUMITOMO
CARBIDE - CBN - DIAMOND

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