



General Features

The popular WRC type has been redesigned.

The WRCX Type SEC WaveRadius Mill is a versatile, high efficiency cutter that is suited to carving dies, slant milling, helical milling, and a variety of other applications.

A full lineup of inserts allows it to handle a wide variety of work materials from steel to non-ferrous metals.

Characteristics

- Durable body with special surface treatment offers significantly improved tool life and reliability.
- Superb vibration resistance with anti-vibration edge design.
- All sizes come with coolant holes preventing chip build-up and jamming.
- Sturdy screw clamp with torx plus insert attachment ensures stable machining.

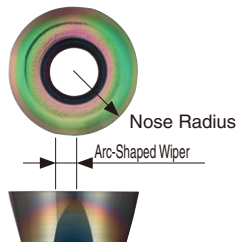
Wide Insert Lineup

- In addition to conventional WRC type inserts, the new lineup includes non-ferrous metal inserts and surfing inserts.

Non-Ferrous Metal Insert

QPET ○○○○○○ **PPFR-S**

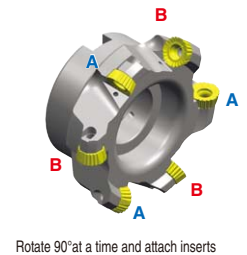
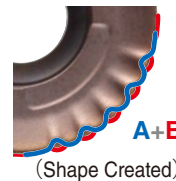
- Good surface roughness with arc-shaped wiper
- Sharp corners
- Four-cornered insert



Surfing Insert

QPMT ○○○○○○ **PPER-R**

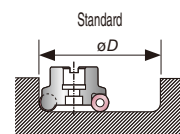
- Cutting edges feature unique rippled design
- Four-cornered insert
- *Use in combinations that alternate **cutting edge A** and **cutting edge B**.
(Only useable on cutters with an even number of cutting edges)



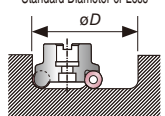
Rotate 90° at a time and attach inserts

Usage Precautions

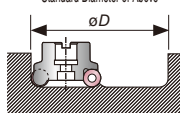
Helical Milling



Standard Diameter or Less



Standard Diameter or Above

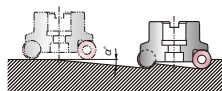


Center uncut portion cannot be removed by traverse cutting with the same cutter

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

Taper Milling

- Use at α° or lower.



Series

	Type	External (mm)	No. of Teeth
Shell Type	WRCX(F) 12000R(S)	$\phi 40\text{--}\phi 80$	4-6
	WRCX(F) 16000R(S)	$\phi 63\text{--}\phi 100$	3-6
	WRCX 20000R(S)	$\phi 125\text{--}\phi 160$	5-6
Endmill Type	WRCX 08000E	$\phi 20\text{--}\phi 25$	2-3
	WRCX 10000E	$\phi 25\text{--}\phi 32$	2-3
	WRCX 16000E	$\phi 40\text{--}\phi 50$	2-3
Modular Type	WRCX 08000M	$\phi 20\text{--}\phi 25$	2-3
	WRCX 10000M	$\phi 25\text{--}\phi 32$	2-3
	WRCX 12000M	$\phi 40$	4

- Maximum Allowable Revolution Speed when Milling Non-Ferrous Metal (Units: min^{-1})

Cutter External Diameter ϕD_c (mm)	Insert Cat. No.		
	QPET10.....S	QPET12.....S	QPET16.....S
25	28,000		
32	25,000		
40		22,000	15,000
50		20,000	14,000
63		18,000	13,000
80		16,000	12,000
100			10,000

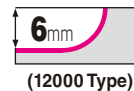
* Even if the speed used is within the maximum allowable revolution speeds listed above, abnormal vibrations may occur due to machine rigidity or other factors. Therefore it is advisable to start operation at half the maximum allowable revolution speed and increase the speed gradually while checking for abnormalities.

Recommended Values for Helical and Taper Milling

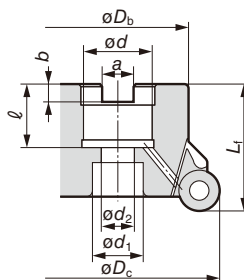
Insert Cat. No.	Cutter External Diameter ϕD_c	Helical (Dimensions mm)			Taper Max. Ramping Angle α° (max)
		Min.	Standard	Max.	
QP□□08○○○○	20	25	32	39	13°
	25	35	42	49	8°20'
QP□□10○○○○	25	32	40	48	13°10'
	32	46	54	62	8°
QP□□12○○○○	40	57	68	79	10°
	50	77	88	99	7°30'
	63	103	114	125	5°10'
	80	137	148	159	3°50'
QP□□16○○○○	40	49	64	79	19°30'
	50	69	84	99	12°
	63	95	110	125	8°
	80	129	144	159	5°30'
	100	169	184	199	4°
QP□□20○○○○	125	212	230	248	3°30'
	160	282	300	318	2°30'

WRCX(F)12000 Type

Rake Angle	Radial	0°
	Axial	-3°



Milling for Steel, Stainless Steel, Cast Iron and Non-Ferrous Alloys



■ Body (WRCX12000)

Cat. No.		Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
			ϕD_c	ϕD_b	L_f	ϕd	a	b	ℓ	ϕd_1	ϕd_2		
Metric	WRCX 12040RS	●	40	36	40	16	8.4	5.6	18	13.5	9	4	0.2
	12050RS	●	50	40	40	22	10.4	6.3	20	18	11	4	0.2
	12063RS	●	63	40	40	22	10.4	6.3	20	18	11	5	0.4
	12080RS	●	*80	55	50	27	12.4	7.0	25	20	13.5	6	0.9

Inserts are not included.

■ Body (WRCXF12000) Fine Pitch Type

Cat. No.		Stock	Dimensions (mm)								No. of Teeth	Weight (kg)	
			ϕD_c	ϕD_b	L_f	ϕd	a	b	ℓ	ϕd_1			ϕd_2
Metric	WRCXF 12050RS	●	50	40	40	22	10.4	6.3	20	18	11	5	0.2
	12063RS	●	63	40	40	22	10.4	6.3	20	18	11	6	0.4

Inserts are not included.



*Please use JIS B1176 hexagonal bolt for securing cutter to the arbor.

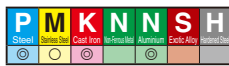
■ Inserts

P Steel **M** Stainless Steel **K** Cast Iron **N** Non-Ferrous Metal **S** Exotic Alloy **H** Hardened Steel

Grade		Coated Carbide					Carbide	DLC				
Application	High Speed/Light	P		K			K N	N				
	General Purpose	P M	P M	K				N				
	Roughing	P M	P M		K							
Usage	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Dimensions (mm)			Fig
General Purpose ^{*1}	QPMT 120440 PPEN		●	●	●	●	—	—	12	4.0	4.76	1
	120440 PPEN-H		●	●	●	●	—	—	12	4.0	4.76	1
Non-Ferrous Metal	QPET 120460 PPFR-S	—	—	—	—	—	●	●	12	6.0	4.76	2
Surfing	QPMT 120460 PPER-R		●	●			—	—	12	6.0	4.76	3

Rake Angle	Radial	0°
	Axial	-3°

(16000 Type)



SEC-WaveRadius Mill

WRCX(F)16000 Type

Milling for Steel, Stainless Steel, Cast Iron and Non-Ferrous Alloys



Fig 1

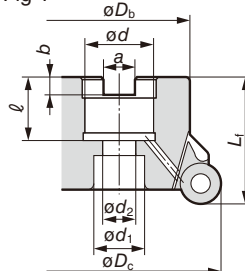
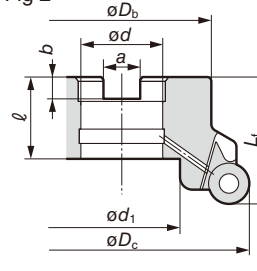


Fig 2



Body (WRCX16000)

Cat. No.		Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Fig
			$\varnothing D_c$	$\varnothing D_b$	L_f	$\varnothing d$	a	b	ℓ	$\varnothing d_1$	$\varnothing d_2$			
Metric	WRCX 16063RS	●	63	50	40	22	10.4	6.3	20	18	11	3	0.4	1
	16080RS	●	*80	55	50	27	12.4	7.0	25	20	13.5	4	0.8	1
	16100RS	●	100	70	50	32	14.4	8.5	32	46	—	5	1.2	2
Imperial	WRCX 16080R	●	*80	55	50	25.4	9.5	6.0	25	20	13	4	0.8	1
	16100R	●	*100	70	63	31.75	12.7	8.0	32	46	17	5	1.4	1

Inserts are not included.

Body (WRCXF16000) Fine Pitch Type

Cat. No.		Stock	Dimensions (mm)								No. of Teeth	Weight (kg)	Fig	
			$\varnothing D_c$	$\varnothing D_b$	L_f	$\varnothing d$	a	b	ℓ	$\varnothing d_1$				$\varnothing d_2$
Metric	WRCXF 16063RS	●	63	50	40	22	10.4	6.3	20	18	11	4	0.4	1
	16080RS	●	*80	55	50	27	12.4	7.0	25	20	13.5	5	0.7	1
	16100RS	●	100	70	50	32	14.4	8.5	32	46	—	6	1.2	2

Inserts are not included.



*Please use JIS B1176 hexagonal bolt ($\phi 80$: M12x30 to 35mm, $\phi 100$: M16x40 to 45mm) for securing $\phi 80/\phi 100$ cutter to the arbour.

Inserts

P Steel **M** Stainless Steel **K** Cast Iron **N** Non-Ferrous Metal **S** Exotic Alloy **H** Hardened Steel

Grade		Coated Carbide		Carbide	DLC	Dimensions (mm)			Fig
Application		High Speed/Light	General Purpose	Roughing					
Usage	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	
General Purpose	QPMT 160660 PPEN	●	●	●	●	—	—	—	1
	160660 PPEN-H	●	●	●	●	—	—	—	1
Anti-Vibration	QPMT 160608 PPEN	●	●	●	●	—	—	—	1
	160608 PPEN-CP	●	●	●	●	—	—	—	2
Non-Ferrous Metal	QPET 160680 PPFR-S	—	—	—	—	●	●	—	3
Surfing	QPMT 160680 PPER-R	●	●	—	—	—	—	—	4

Fig 1

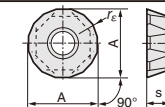


Fig 2

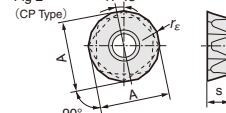
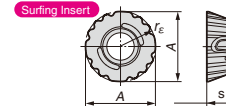


Fig 3



Fig 4



*1 -H: Strong edge. *2: When using anti-vibration inserts, 08 type and 08-CP type inserts must be set in alternating fashion.

Spare Parts

screw	Spanner	Anti-seize Cream
BFTX0511P	5.0 TRDR20IP	SUMI-P

Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

External Diameter: $\phi 40$ to $\phi 80$ mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
P	Carbon Steel	180 to 280HB	100-160-200	0.20-0.40-0.60	ACP200
	Alloy Steel	180 to 280HB	100-140-180	0.20-0.30-0.40	ACP200
M	Stainless Steel	—	80-120-160	0.10-0.20-0.30	ACP300
K	Cast Iron	250HB	80-120-160	0.10-0.20-0.40	ACK200
N	Non-Ferrous Metal	—	200-500-1000	0.10-0.30-0.40	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

External Diameter: $\phi 100$ to $\phi 160$ mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
P	Carbon Steel	180 to 280HB	150-200-250	0.30-0.40-0.60	ACP200
	Alloy Steel	180 to 280HB	100-160-200	0.10-0.30-0.50	ACP200
M	Stainless Steel	—	160-180-200	0.15-0.20-0.30	ACP300
K	Cast Iron	250HB	100-150-200	0.10-0.15-0.20	ACK200
N	Non-Ferrous Metal	—	200-500-1000	0.20-0.40-0.60	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

Milling Cutters

Face Milling

Radius

Multi-Purpose

Shoulder Milling

R/Copying

Groove/T-Slot

Chamfering

Aluminium/Light Alloys

High-Speed Cast Iron

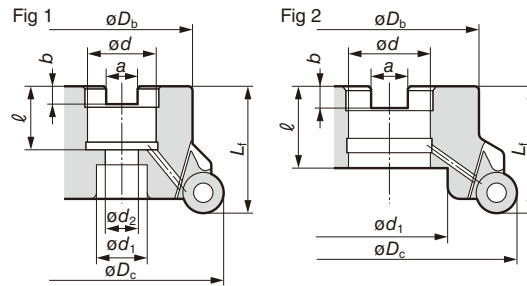
WRCX20000 Type

Rake Angle	Radial	0°
	Axial	-3°

10mm
(20000 Type)



Milling for Steel, Stainless Steel, Cast Iron and Non-Ferrous Alloys



■ Body (WRCX20000)

Cat. No.		Stock	Dimensions (mm)								No. of Teeth	Weight (kg)	Fig	
			$\varnothing D_c$	$\varnothing D_b$	L_f	$\varnothing d$	a	b	ℓ	$\varnothing d_1$				$\varnothing d_2$
Imperial	WRCX 20125R	●	125	80	63	38.1	15.9	10.0	35.5	55	30	5	2.3	1
	20160R	●	160	100	63	50.8	19.1	11.0	38	72	—	6	4.0	2

Inserts are not included.

■ Inserts

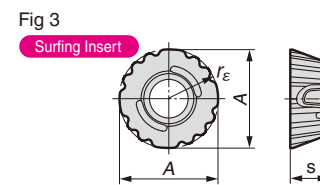
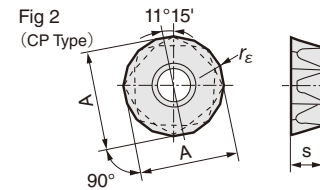
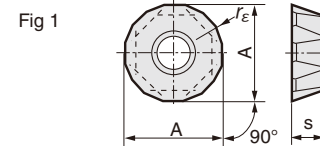
P Steel **M** Stainless Steel **K** Cast Iron **N** Non-Ferrous Metal **S** Exotic Alloy **H** Hardened Steel

Grade		Coated Carbide					Cermet	DLC					
Application		High Speed/Light	P		K			N					
		General Purpose	P	P	K			N					
		Roughing	P	P	K								
Usage	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Dimensions (mm)			Fig	
		A	r _ε	s									
General Purpose ^{*1}	QPMT 200670 PPEN	●	●	●	●	—	—	—	20	7.0	6.5	1	
	200670 PPEN-H	●	●	●	●	—	—	—	20	7.0	6.5	1	
Anti-Vibration ^{*2}	QPMT 200608 PPEN	●	●	●	●	—	—	—	20	0.8	6.5	1	
	200608 PPEN-CP	●	●	●	●	—	—	—	20	0.8	6.5	2	
Surfing	QPMT 2006100 PPER-R	●	●				—	—	20	10.0	6.5	3	

Fig 1

Fig 2
(CP Type)

Fig 3
Surfing Insert



*1 -H: Strong edge. *2: When using anti-vibration inserts, 08 type and 08-CP type inserts must be set in alternating fashion.

■ Spare Parts

screw	Spanner	Anti-seize Cream
		
BFTX0615IP 7.5	TRDR25IP	SUMI-P

 Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

External Diameter: $\phi 100$ to $\phi 160$ mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
P	Carbon Steel	180 to 280HB	150-200-250	0.30-0.40-0.60	ACP200
	Alloy Steel	180 to 280HB	100-160-200	0.10-0.30-0.50	ACP200
M	Stainless Steel	—	160-180-200	0.15-0.20-0.30	ACP300
K	Cast Iron	250HB	100-150-200	0.10-0.15-0.20	ACK200

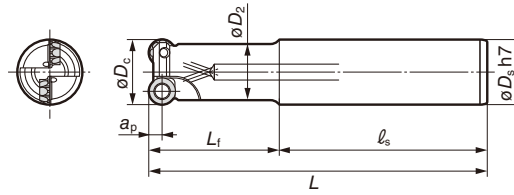
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

Rake Angle	Radial Axial	0° -3°	4mm (08000E Type)	5mm (10000E Type)	8mm (16000E Type)	P Steel	M Stainless Steel	K Cast Iron	N Non-Ferrous Metal	S Exotic Alloy	H Hardened Steel
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SEC-Wave Radius Mill

WRCX08000E / 10000E / 16000E Type

Milling for Steel, Stainless Steel, Cast Iron and Non-Ferrous Alloys



Modular Type **H131**

Body (WRCX08000E) Insert: A=8 Type

Cat. No.	Stock	Dimensions(mm)							No. of Teeth	Weight (kg)
		ϕD_c	ϕD_s	ϕD_2	a_p	L_f	L_s	L		
WRCX 08020ES	●	20	20	18	4	50	80	130	2	0.2
08020EM	●	20	20	18	4	100	80	180	2	0.3
08020EL	●	20	20	18	4	130	120	250	2	0.5
WRCX 08025ES	●	25	25	21	4	50	80	130	3	0.4
08025EM	●	25	25	21	4	100	80	180	3	0.5
08025EL	●	25	25	21	4	130	120	250	3	0.7

Inserts are not included.

Body (WRCX10000E) Insert: A=10 Type

Cat. No.	Stock	Dimensions (mm)							No. of Teeth	Weight (kg)
		ϕD_c	ϕD_s	ϕD_2	a_p	L_f	L_s	L		
WRCX 10025ES	●	25	25	21	5	50	80	130	2	0.4
10025EM	●	25	25	21	5	100	80	180	2	0.5
10025EL	●	25	25	21	5	130	120	250	2	0.7
WRCX 10032ES	●	32	32	28	5	50	80	130	3	0.7
10032EM	●	32	32	28	5	120	80	200	3	1.0
10032EL	●	32	32	28	5	180	120	300	3	1.5

Inserts are not included.

Body (WRCX16000E) Insert: A=16 Type

Cat. No.	Stock	Dimensions (mm)							No. of Teeth	Weight (kg)
		ϕD_c	ϕD_s	ϕD_2	a_p	L_f	L_s	L		
WRCX 16040ES	●	40	32	31.3	8	50	120	170	2	0.9
16040EM	●	40	32	31.3	8	50	200	250	2	1.4
WRCX 16050ES	●	50	32	40.8	8	50	120	170	3	1.0
16050EM	●	50	32	40.8	8	50	200	250	3	1.5

Inserts are not included.

Inserts

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel

Grade		Coated Carbide		Carbide	DLC								
Application	High Speed/Light												
	General Purpose												
	Roughing												
Usage	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Dimensions (mm)			Fig	Applicable Cutters
									A	r _ε	s		
General Purpose	QPMT 080330 PPEN		●	●	●	●	—	—	8	3.0	3.18	1	WRCX08000E Type
	080330 PPEN-H		●	●	●	●	—	—	8	3.0	3.18	1	
	QPMT 10T335 PPEN		●	●	●	●	—	—	10	3.5	3.97	1	WRCX10000E Type
	10T335 PPEN-H		●	●	●	●	—	—	10	3.5	3.97	1	
	QPMT 160660 PPEN		●	●	●	●	—	—	16	6.0	6.5	1	WRCX16000E Type
	160660 PPEN-H		●	●	●	●	—	—	16	6.0	6.5	1	
Anti-Vibration	QPMT 160608 PPEN		●	●	●	●	—	—	16	0.8	6.5	1	WRCX16000E Type
*2	160608 PPEN-CP		●	●	●	●	—	—	16	0.8	6.5	2	
Non-Ferrous Metal	QPET 10T350 PPFR-S	—	—	—	—	—	●	●	10	5.0	3.97	3	WRCX10000E Type
	QPET 160680 PPFR-S	—	—	—	—	—	●	●	16	8.0	6.5	3	WRCX16000E Type
Surfing	QPMT 160680 PPER-R		●	●			—	—	16	8.0	6.5	4	WRCX16000E Type

*1 -H: Strong edge. *2: When using anti-vibration inserts, 08 type and 08-CP type inserts must be set in alternating fashion.

Recommended Cutting Conditions

External Diameter: $\phi 20$ to $\phi 32$ mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
P	Carbon Steel	180 to 280HB	80-120-160	0.10-0.30-0.40	ACP200
	Alloy Steel	180 to 280HB	60-100-140	0.10-0.20-0.30	ACP200
M	Stainless Steel	—	60-100-120	0.10-0.15-0.20	ACP300
K	Cast Iron	250HB	60-80-120	0.10-0.20-0.30	ACK200
N	Non-Ferrous Metal	—	200-500-1000	0.10-0.20-0.30	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

External Diameter: $\phi 40$ to $\phi 50$ mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
P	Carbon Steel	180 to 280HB	100-160-200	0.20-0.40-0.60	ACP200
	Alloy Steel	180 to 280HB	100-140-180	0.20-0.30-0.40	ACP200
M	Stainless Steel	—	80-120-160	0.10-0.20-0.30	ACP300
K	Cast Iron	250HB	80-120-160	0.10-0.20-0.40	ACK200
N	Non-Ferrous Metal	—	200-500-1000	0.10-0.30-0.40	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

Fig 1

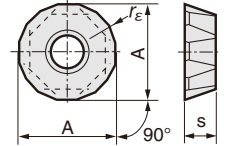


Fig 2 (CP Type)

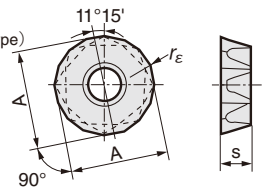


Fig 3

Non-Ferrous Metal

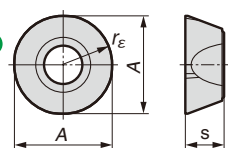
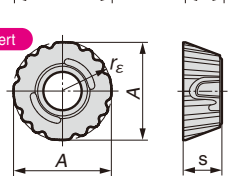


Fig 4

Surfing Insert



H
Milling
Cutters

Face
Milling

Radius

Multi-
Purpose

Shoulder
Milling

R/Copying

Groove/
T-Slot

Chamfering

Aluminum/
Light Alloys

High-Speed
Cast Iron