

RM6



Double-Sided 6-Corner Shoulder Milling Tool

Milling tool series for high quality surface finish and cost efficiency

■ Higher Productivity

Designed to provide high speed and feed improves chip removal rates

■ Improved Perpendicularity

True perpendicular milling

■ Superior Clamping Stability

Powerful clamping thanks to strong clamping screws and 3-side flank supporting system



Double-Sided 6-Corner Shoulder Milling Tool

RM6

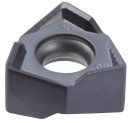
Mold making companies are required to keep up with the demands of the accelerated development of Industrial structures.

RM6, KORLOY's new Rich Mill Series for shouldering responds to these demands by employing double-sided inserts with six perpendicular corners to achieve cost efficiency.

It features strong clamping screws, 3-side supporting system, and wide clamping areas which enable powerful clamping force. This facilitates stable machining at high speed and feed, and delivers higher productivity.

Wide minor cutting edges and optimized multi-stepped relief surfaces of the RM6 provide exceptional bottom surface finish. The RM6 achieves perpendicularity and improved flank surface finish. The chip breaker design high rake and high helix angle were applied to the inserts for stable cutting performance in hard-to-cut materials or high hardened workpieces, achieving an increase in tool life.

KORLOY's RM6 is one of the most advanced shouldering solutions available to meet the demand of the mold making market today.



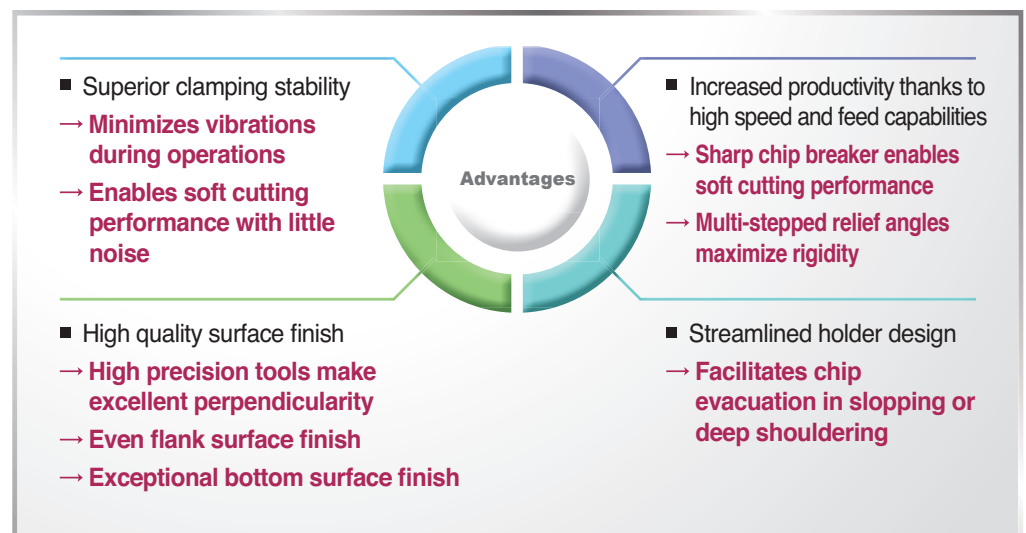
Insert



Cutter



Shank



Code System

[Insert shape]

W	N	G	X	08	06	08	P	N	S	R	-	MM
Insert shape W : W Type	Tolerance G : G class	Cutting edge length 08 : 8.2mm	Nose radius 08 : R0.8	Relief angle of minor cutting edge N : 0°	Hand R : Right-handed							
Relief angle of major cutting edge N : 0°	Cross section type X : X Type	Cutting edge height 06 : 6.4mm	Approach angle P : 90°	Edge preparation S : Negative land honed E : Honing	Chip breaker MM : For general cutting ML : For light cutting							

Code System

[Shank Type]

RM	6	P	S	050	R - 2	W	32 - 120 - WN08
Rich MILL		Approach angle P : 90°		Machining diameter 050 : Ø50mm	No. of teeth 2 : Two teeth	Shank dia. 032 : Ø32mm	Available Inserts WN08 : WNGX08
	No. of available corners 6 : Six corners		Type S : Shank	Oil hole & Hand R : With oil hole, right-handed NR : Without oil hole, right-handed	Shank type W : Weldon C : Cylinder	Overall length 120 : 120mm	

[Cutters type]

RM	6	P	C	M	063	R	22 - 7 - WN08
Rich MILL		Approach angle P : 90°		Arbor type M : Metric A : Inch Unmarked : Asian		Oil hole & Hand R : With oil hole, right-handed NR : Without oil hole, right-handed	No. of teeth 7 : Seven teeth
	No. of available corners 6 : Six corners		Type C : Cutter	Machining diameter 063 : Ø63mm	Internal diameter 22 : 22mm	Available Inserts WN08 : WNGX08	

RM6 Features

- **Stable clamping** - 3 clamping surfaces on the side and strong clamping screws
→ Improves cutting stability
- **High quality results** - High precision, excellent perpendicularity, outstanding surface finish on the flank, accurate tolerance
- **High productivity** - High rake angle and sharp cutting edges for lower cutting resistance
→ Ideal for high speed and high feed machining

Insert Features

Higher clamping stability

- Wide clamping areas and strong clamping screws for rigid clamping

High rake angle chip breaker

- Maintains stable clamping
- Induces smooth chip flow
→ Increases insert life

Wide minor cutting edges

- Improved surface finish
- Enable multi purpose machining incl. plunging

High rake cutting edges

- Improved machinability and reduces cutting resistance

Max. ap

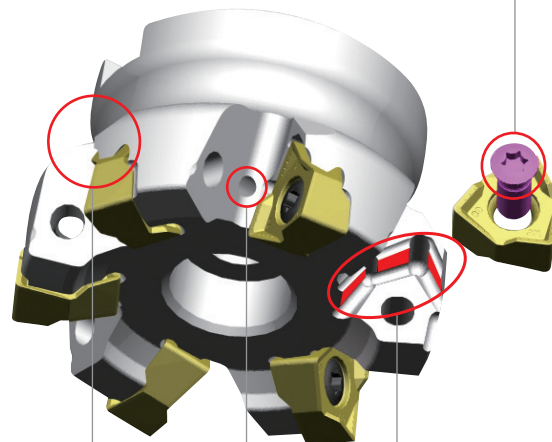
- WNGX08 : 8.2mm
- WNGX04 : 4.3mm

3-level flank relief surface

- Enhances rigidity and enables stable clamping
→ Improves cutting stability

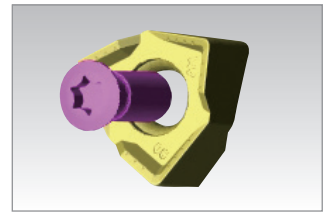
➤ Cutter Features

- 3-side supporting system, strong clamping screws, and wide seat areas
→ **Improve clamping stability**
→ **Reduce tool vibrations and cutting resistance**
- Optimized H/D design with curved surface for smooth chip flow
→ **Facilitates chip evacuation in slopping or deep shouldering**



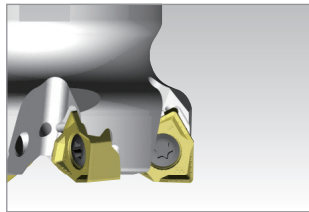
Strong clamping screws

- Strong clamping screws enable rigid clamping



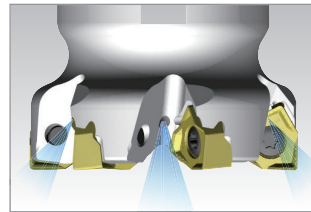
Streamlined holder design

- Improved chip evacuation in deep shouldering and slotting



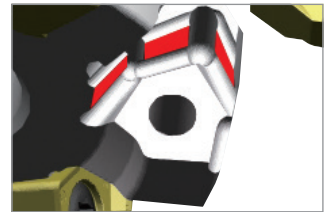
Through coolant system

- Improved chip flow and tool life thanks to insert cooling



3-side supporting system

- Stable tool life



➤ Chip Breaker Features

- Chip breaker **MA**


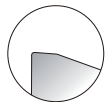
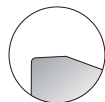


- Chip breaker **ML**



- Chip breaker **MM**



Chip breaker	Cutting edge	Application	Features
MA		For aluminum	<ul style="list-style-type: none"> ■ MA : Milling Aluminum ■ Sharp cutting edges for excellent cutting performance in aluminum machining ■ Buffed surface for excellent chip flow and welding resistance
ML		For light cutting	<ul style="list-style-type: none"> ■ ML : Milling Light ■ Chip breaker design of low cutting resistance, ideal for light cutting and machining hard-to-cut materials ■ Excellent tool life and quality results
MM		For general cutting	<ul style="list-style-type: none"> ■ MM : General shouldering operations ■ Chip breaker design ideal for general shoulder milling and most applications

➡ Performance Evaluation

■ Workpiece	42CrMo4(DIN), SCM440(KS), 4140(AISI), 300(L)x200(W)x100(H), Steel rectangular tube
■ Cutting conditions	vc(m/min)=250, fz(mm/t)=0.2, ap(mm)=4, ae(mm)=10, Dry
■ Machining method	Facing
■ Tools	Insert WNGX080608PNSR-MM(PC5300) Holder RM6PCM063R-22-6-WN08

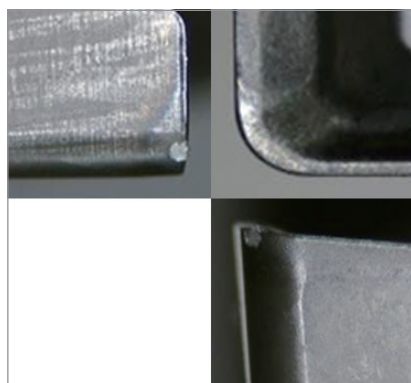
- Chipping resistance has improved thanks to stable clamping even at high speed

→ **Minimized unexpected tool breakage**

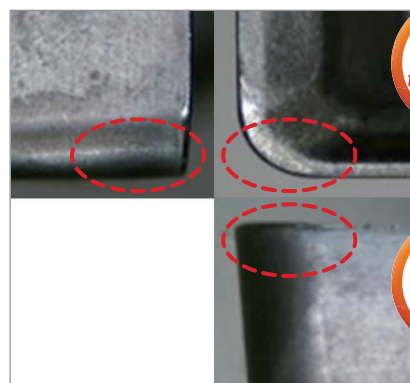
- Sharp cutting edges and streamlined chip breaker design

→ **Minimized cutting resistance**

Wear resistance evaluation



[Competitor]



[RM6]

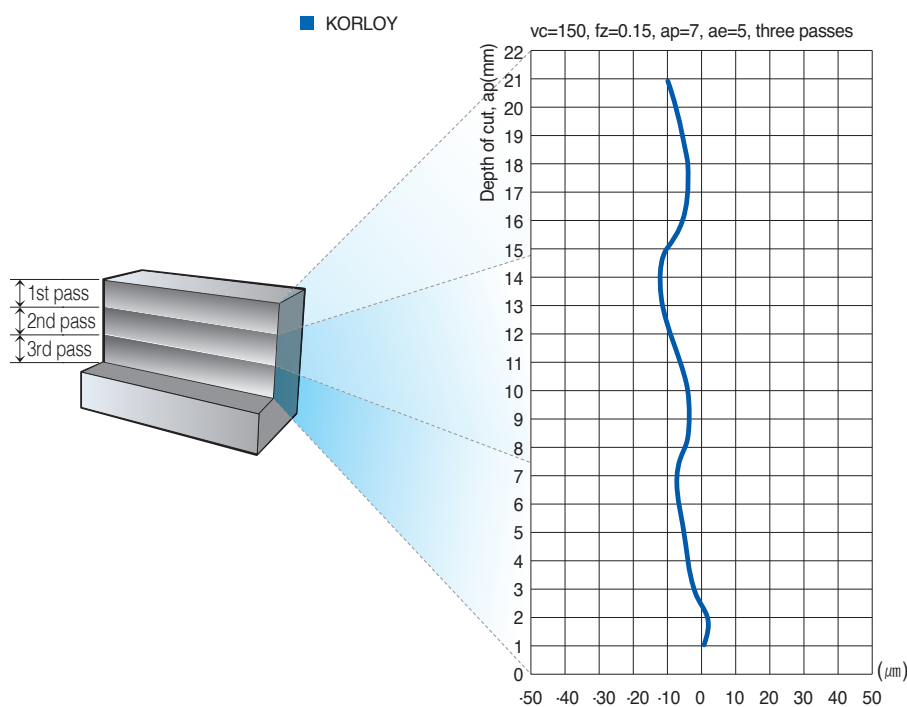
Improved resistance to chipping

Minimized cutting resistance

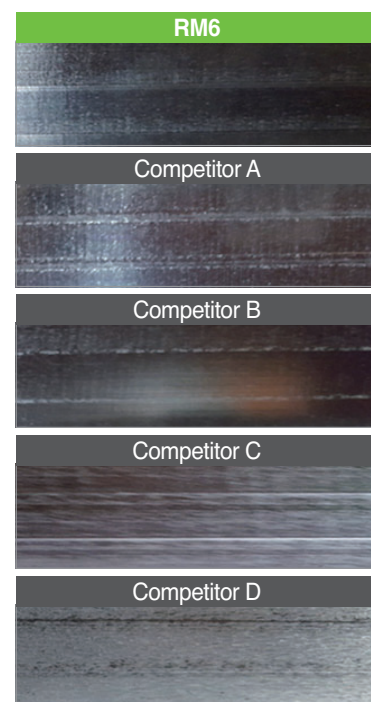
➡ Perpendicularity Evaluation

■ Workpiece	C45(ISO), SM45C(KS), 1045(AISI), 300(L)x200(W)x100(H), Steel rectangular tube
■ Cutting conditions	vc(m/min)=150, fz(mm/t)=0.15, ap(mm)=7, ae(mm)=5, Dry
■ Machining method	Perpendicularity, flank surface finish, and unevenness were measured after three passes of 7mm each, and 21mm in total
■ Tools	Insert WNGX080608PNSR-MM(PC5300) Holder RM6PCM063R-22-6-WN08

Perpendicularity evaluation

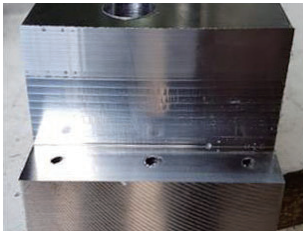


[Comparison graph of measured perpendicularities]



[Comparison pictures of flank surface finish]

➤ Application Examples



Carbon steel [C45(ISO), HB180]

- Cutting conditions $vc(m/min)=250$, $fz(mm/t)=0.12$, $ap(mm)=7$, $ae(mm)=2$, Dry
- Machining method Shouldering
- Tools
Insert WNGX080608PNSR-MM(PC5300)
Holder RM6PS032R-2W32-120-WN08



➤ 50% longer tool life compared to the competitor



Cold forged tool steel [X100CrMoV5 1(DIN), HB255]

- Cutting conditions $vc(m/min)=235$, $fz(mm/t)=0.28$, $ap(mm)=2$, $ae(mm)=5$, Dry
- Machining method Shouldering
- Tools
Insert WNGX080608PNER-ML(PC5300)
Holder RM6PCM063R-22-6-WN08



➤ 64% longer tool life compared to the competitor



Cast iron [600-3(ISO), HB230]

- Cutting conditions $vc(m/min)=226$, $fz(mm/t)=0.19$, $ap(mm)=1$, $ae(mm)=75$, Dry
- Machining method Facing
- Tools
Insert WNGX080608PNER-ML(PC5400)
Holder RM6PCM080R-27-7-WN08



➤ 20% longer tool life compared to the competitor



➤ Grade Guideline per Workpiece Type

Workpiece		P		M	K	N
		Carbon steel	Alloy steel	Stainless steel	Cast iron	Non ferrous metal
Shape	1st recommended	MM	MM	ML	ML	MA
	2nd recommended	ML	ML	-	MM	MA
Grade	High speed milling	PC3600	PC3600	PC5300	PC6510	H01
	General milling	PC5400	PC5300	PC5400	PC5300	H01
	Interrupted milling	PC5400	PC5400	PC5400	PC5400	H01

➤ Recommended Cutting Conditions

➤ WNGX04

Workpiece		Grade	WNGX040304PNSR-MM			WNGX040304PNER-ML			WNGX040304PNFR-MA		
			vc (m/min)	fz (mm/t)	max. ap(mm)	vc (m/min)	fz (mm/t)	max. ap(mm)	vc (m/min)	fz (mm/t)	max. ap(mm)
P	Steel	PC3600	160~270	0.25~0.05	4.3	160~270	0.20~0.05	4.3	-	-	4.3
		PC5300	150~240	0.25~0.05	4.3	150~240	0.25~0.05	4.3	-	-	4.3
		PC5400	130~210	0.25~0.05	4.3	130~210	0.25~0.05	4.3	-	-	4.3
M	Stainless steel	PC5300	90~150	0.20~0.05	4.3	90~150	0.10~0.05	4.3	-	-	4.3
		PC5400	70~120	0.20~0.05	4.3	70~120	0.10~0.05	4.3	-	-	4.3
K	Cast iron	PC6510	140~230	0.30~0.08	4.3	140~230	0.25~0.08	4.3	-	-	4.3
		PC5300	120~200	0.30~0.08	4.3	120~200	0.25~0.08	4.3	-	-	4.3
N	Non ferrous metal	H01	-	-	4.3	-	-	4.3	500~1000	0.2~0.05	4.3

※ The above data refer to general cutting conditions and can be adjustable up to 300m/min and 0.4mm/t depending on user environment.

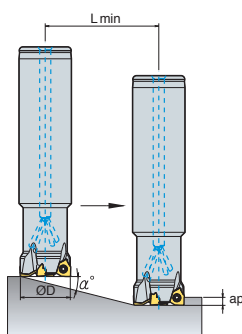
➤ WNGX08

Workpiece		Grade	WNGX080608PNSR-MM			WNGX080608PNER-ML			WNGX080608PNFR-MA		
			vc (m/min)	fz (mm/t)	max. ap(mm)	vc (m/min)	fz (mm/t)	max. ap(mm)	vc (m/min)	fz (mm/t)	max. ap(mm)
P	Steel	PC3600	160~270	0.25~0.05	8.2	160~270	0.20~0.05	8.2	-	-	8.2
		PC5300	150~240	0.25~0.05	8.2	150~240	0.25~0.05	8.2	-	-	8.2
		PC5400	130~210	0.25~0.05	8.2	130~210	0.25~0.05	8.2	-	-	8.2
M	Stainless steel	PC5300	90~150	0.20~0.05	8.2	90~150	0.10~0.05	8.2	-	-	8.2
		PC5400	70~120	0.20~0.05	8.2	70~120	0.10~0.05	8.2	-	-	8.2
K	Cast iron	PC6510	140~230	0.30~0.08	8.2	140~230	0.25~0.08	8.2	-	-	8.2
		PC5300	120~200	0.30~0.08	8.2	120~200	0.25~0.08	8.2	-	-	8.2
N	Non ferrous metal	H01	-	-	8.2	-	-	8.2	500~1000	0.2~0.05	8.2

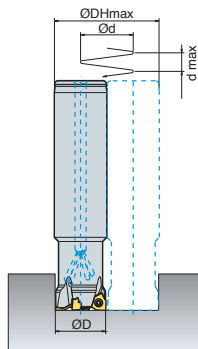
※ The above data refer to general cutting conditions and can be adjustable up to 300m/min and 0.4mm/t depending on user environment.

Ramping

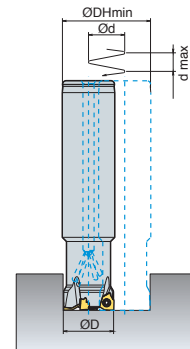
1. Ramping



2. Helical cutting for blind holes



3. Helical cutting for through holes



(mm)

Designation		Tool Dia. ØD	Depth of cut ap	1. Ramping		2. Helical cutting for blind holes				3. Helical cutting for through holes	
				Max. rake angle α°	Lmin	Min. machining Dia. Ø DHmin	Max. pitch dmax	Max. machining Dia. Ø DHmax	Max. pitch dmax	Min. machining Dia. Ø DHmin	Max. pitch dmax
RM6PS	032R-2W32-120-WN08	32	8	4.6	99.5	54	4.5	62	5.2	38.5	3.2
	040R-3W32-120-WN08	40	8	4.2	109	69	5.3	78	6.0	54.5	4.2
	050R-4W32-120-WN08	50	8	4.0	114.5	89	6.5	98	7.2	74.5	5.5
RM6PCM	063R-22-6-WN08	63	8	4.0	114.5	115	8.0	124	8.0	100.5	7.4
	080R-27-7-WN08	80	8	3.5	131	149	8.0	158	8.0	134.5	8.0
	100R-32-8-WN08	100	8	2.6	176.5	189	8.0	198	8.0	174.5	8.0
	125R-40-11-WN08	125	8	1.8	255	239	8.0	248	8.0	224.5	7.8

* Lmin = ap/tan(α°)

Lmin : Cutting length at min. rake angle

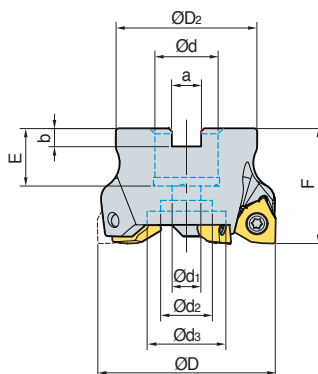
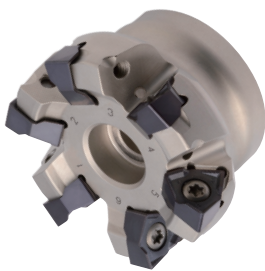
ap : Axial depth of cut

α° : Available rake angle for ramping



Available Inserts

(mm)

Shape	Designation	Coated				Uncoated H01	Dimensions (mm)				Figure
		PC3600	PC5300	PC5400	PC6510		d	t	r	Max. ap	
	WNGX	040304PNFR-MA					7.0	3.46	0.4	4.3	
		040308PNFR-MA					7.0	3.46	0.8	4.3	
		040312PNFR-MA					7.0	3.46	1.2	4.3	
		040316PNFR-MA					7.0	3.46	1.6	4.3	
		080604PNFR-MA					13.0	6.4	0.4	8.2	
		080608PNFR-MA				●	13.0	6.4	0.8	8.2	
		080612PNFR-MA					13.0	6.4	1.2	8.2	
		080616PNFR-MA					13.0	6.4	1.6	8.2	
		080620PNFR-MA					13.0	6.4	2.0	8.2	
	WNGX	040304PNER-ML					7.0	3.46	0.4	4.3	
		040308PNER-ML					7.0	3.46	0.8	4.3	
		040312PNER-ML					7.0	3.46	1.2	4.3	
		040316PNER-ML					7.0	3.46	1.6	4.3	
		080604PNER-ML	●	●	●		13.0	6.4	0.4	8.2	
		080608PNER-ML	●	●	●		13.0	6.4	0.8	8.2	
		080612PNER-ML					13.0	6.4	1.2	8.2	
		080616PNER-ML					13.0	6.4	1.6	8.2	
		080620PNER-ML					13.0	6.4	2.0	8.2	
	WNGX	040304PNSR-MM					7.0	3.46	0.4	4.3	
		040308PNSR-MM					7.0	3.46	0.8	4.3	
		040312PNSR-MM					7.0	3.46	1.2	4.3	
		040316PNSR-MM					7.0	3.46	1.6	4.3	
		080604PNSR-MM	●	●			13.0	6.4	0.4	8.2	
		080608PNSR-MM	●	●			13.0	6.4	0.8	8.2	
		080612PNSR-MM					13.0	6.4	1.2	8.2	
		080616PNSR-MM					13.0	6.4	1.6	8.2	
		080620PNSR-MM					13.0	6.4	2.0	8.2	



(mm)




Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	
RM6PCM	040R-16-6-WN04	6	40	35	16	9	14	-	8.4	5.6	19	40	4.3	0.19
	040R-16-7-WN04	7	40	35	16	9	14	-	8.4	5.6	19	40	4.3	0.19
	050R-22-8-WN04	8	50	42	22	11	18	-	10.4	6.3	20	40	4.3	0.28
	050R-22-9-WN04	9	50	42	22	11	18	-	10.4	6.3	20	40	4.3	0.28
	063R-22-10-WN04	10	63	49	22	11	18	-	10.4	6.3	20	40	4.3	0.47
	063R-22-11-WN04	11	63	49	22	11	18	-	10.4	6.3	20	40	4.3	0.47
	050R-22-4-WN08	4	50	42	22	11	18	-	10.4	6.3	20	40	8.2	0.28
	050R-22-5-WN08	5	50	42	22	11	18	-	10.4	6.3	20	40	8.2	0.27
	063R-22-5-WN08	5	63	49	22	11	18	-	10.4	6.3	20	40	8.2	0.45
	063R-22-6-WN08	6	63	49	22	11	18	-	10.4	6.3	20	40	8.2	0.45
	080R-27-7-WN08	7	80	57	27	14	20	35	12.4	7	23	50	8.2	0.90
	080R-27-9-WN08	9	80	57	27	14	20	35	12.4	7	23	50	8.2	0.89
	100R-32-8-WN08	8	100	67	32	18	26	42	14.4	8	25	50	8.2	1.47
	100R-32-11-WN08	11	100	67	32	18	26	42	14.4	8	25	50	8.2	1.45
	125R-40-11-WN08	11	125	90	40	22	32	52	16.4	10	29	63	8.2	2.94
	125R-40-14-WN08	14	125	90	40	22	32	52	16.4	10	29	63	8.2	2.91
RM6PC	080R-25.4-7-WN08	7	80	57	25.4	14	20	35	9.5	6	25	50	8.2	0.91
	080R-25.4-9-WN08	9	80	57	25.4	14	20	35	9.5	6	25	50	8.2	0.91
	100R-31.75-8-WN08	8	100	67	31.75	18	26	42	12.7	8	32	63	8.2	1.69
	100R-31.75-11-WN08	11	100	67	31.75	18	26	42	12.7	8	32	63	8.2	1.73
	125R-38.1-11-WN08	11	125	90	38.1	22	32	52	15.9	9	35	63	8.2	1.98
	125R-38.1-14-WN08	14	125	90	38.1	22	32	52	15.9	9	35	63	8.2	2.90

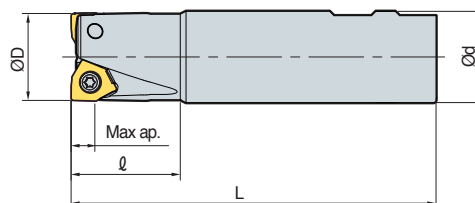
Available Arbors

Cutter designation		NC arbors
RM6PCM	040R-16-6-WN04	BT□□-FMC16-□□
	040R-16-7-WN04	
	050R-22-8-WN04	
	050R-22-9-WN04	BT□□-FMC22-□□
	063R-22-10-WN04	
	063R-22-11-WN04	
	050R-22-4-WN08	
	050R-22-5-WN08	
	063R-22-5-WN08	
	063R-22-6-WN08	

Cutter designation		NC arbors
RM6PCM	080R-27-7-WN08	BT□□-FMC27-□□
	080R-27-9-WN08	
	100R-32-8-WN08	
	100R-32-11-WN08	BT□□-FMC32-□□
	125R-40-11-WN08	
RM6PC	125R-40-14-WN08	BT□□-FMC40-□□
	080R-25.4-7-WN08	BT□□-FMA25.4-□□
	080R-25.4-9-WN08	
	100R-31.75-8-WN08	BT□□-FMA31.75-□□
	100R-31.75-11-WN08	
	125R-38.1-11-WN08	BT□□-FMA38.1-□□
	125R-38.1-14-WN08	

Parts

Specification		Screw 	Wrench 	Wrench 
WNGX04	Ø40 ~ Ø63	ETNA02506	TW07S	-
WNGX08	Ø50 ~ Ø125	FTNA0512	-	TW20-100



(mm)

	Designation		ØD	Ød	l	L	ap	
RM6PS	020R-2W20-110-WN04	2	20	20	35	110	4.3	0.22
	020R-3W20-110-WN04	3	20	20	35	110	4.3	0.22
	025R-3W25-110-WN04	3	25	25	35	110	4.3	0.36
	025R-4W25-110-WN04	4	25	25	35	110	4.3	0.35
	032R-5W32-110-WN04	5	32	32	35	110	4.3	0.60
	032R-6W32-110-WN04	6	32	32	35	110	4.3	0.60
	032R-2W32-120-WN08	3	32	32	40	120	8.2	0.65
	040R-3W32-120-WN08	3	40	32	40	120	8.2	0.69
	040R-4W32-120-WN08	4	40	32	40	120	8.2	0.69
	050R-4W32-120-WN08	4	50	32	40	120	8.2	0.76
	050R-5W32-120-WN08	5	50	32	40	120	8.2	0.76

Parts

Specification		Screw 	Wrench 	Wrench
WNGX04	Ø20 ~ Ø32	ETNA02506	TW07S	-
WNGX08	Ø32 ~ Ø50	FTNA0512	-	TW20-100



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