



M-Six

M F W N Milling Cutter

■ **SIX ADVANTAGES**

For High Efficiency Milling

■ **MEGACOAT NANO**

Extended tool life by new
MEGACOAT NANO insert coating
technology reduces cutting costs



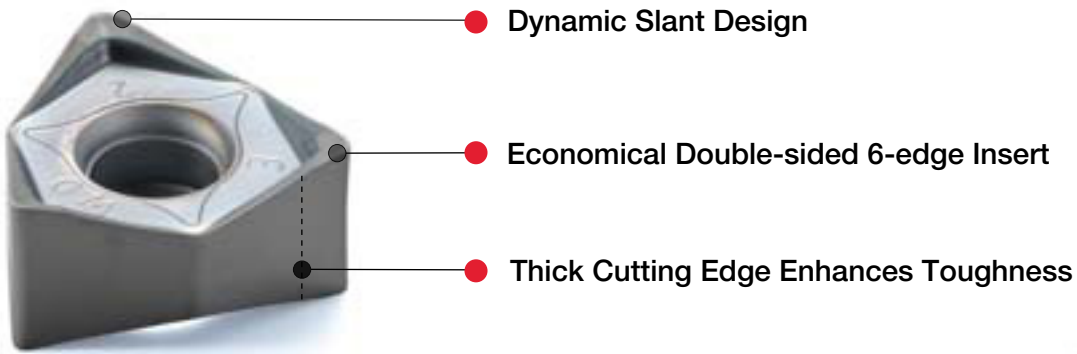
Double-Sided 6-Edge Insert
Tough Cutting Edge Due to Wide Design

M-Six MFWN Milling Cutter

6 Advantages for High Efficiency Milling

Double-sided, 6-edge insert, 90° cutters
Low cutting force for reduced chattering

90°
Cutting Edge Angle

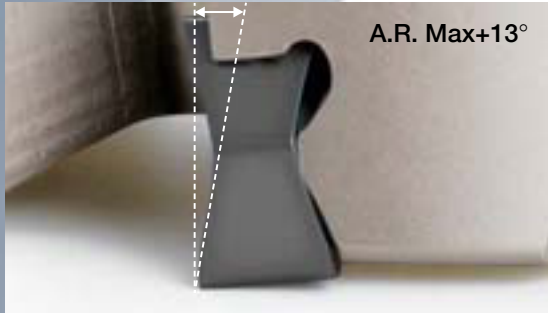


M-Six MFWN Milling Cutter

Advantage 1

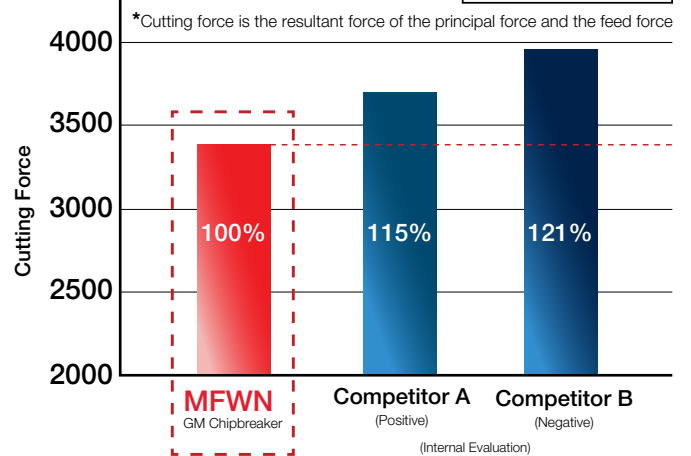
Sharp Cutting Due to Lower Cutting Forces

- Low cutting forces due to steep rake angle

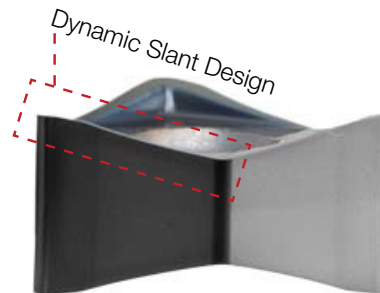


Cutting Condition
 Vc = 590sfm
 apxae = .275" x .400"
 fz = .008ipt
 Workpiece Material: S50C
 Ø 125mm Cutter

● Cutting Force Comparison



Advantage 2

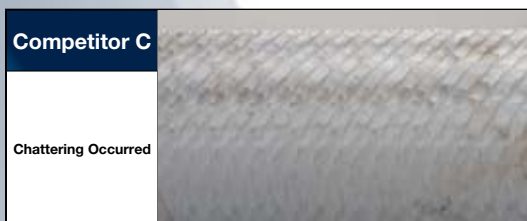
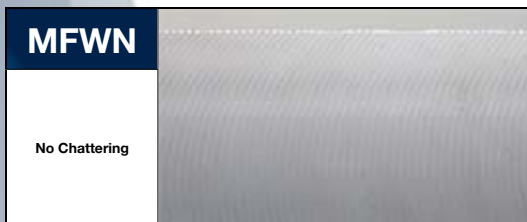


- Dynamic Slant Design reduces shock when cutting edge enters the workpiece

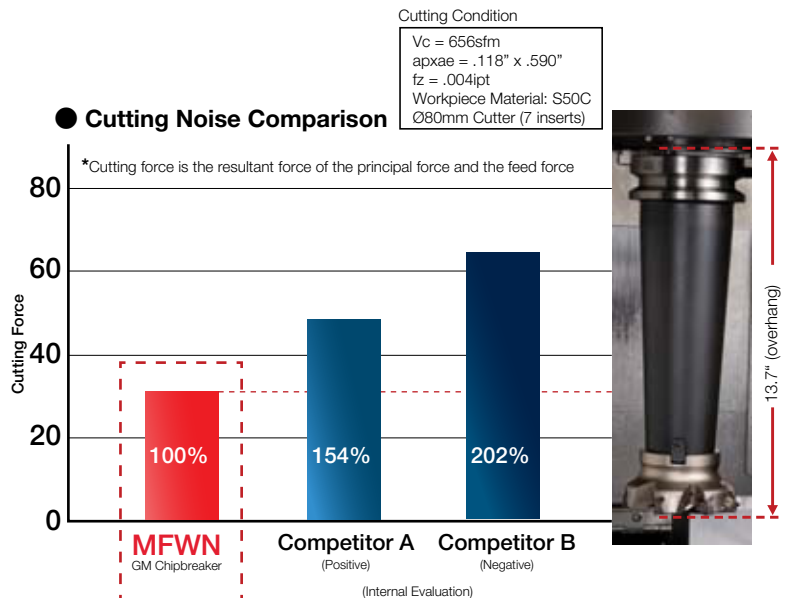
Reduced Chattering

Even with Extended Milling Adapters

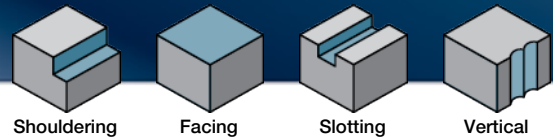
- Surface Roughness Comparison



- Cutting Noise Comparison

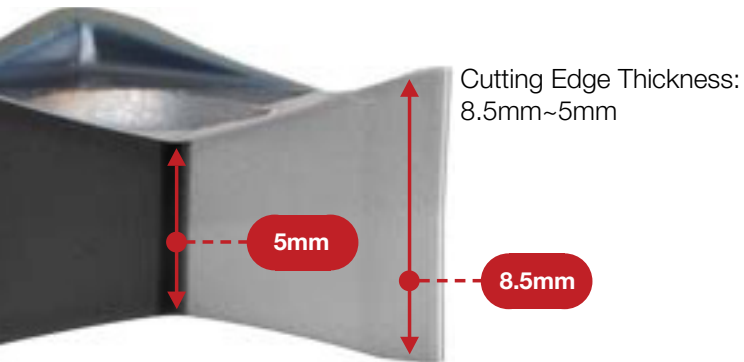


M-Six MFWN Milling Cutter



Advantage 3

Superior Fracture Resistance due to Thick Edge Design



● Fracture Resistance Comparison

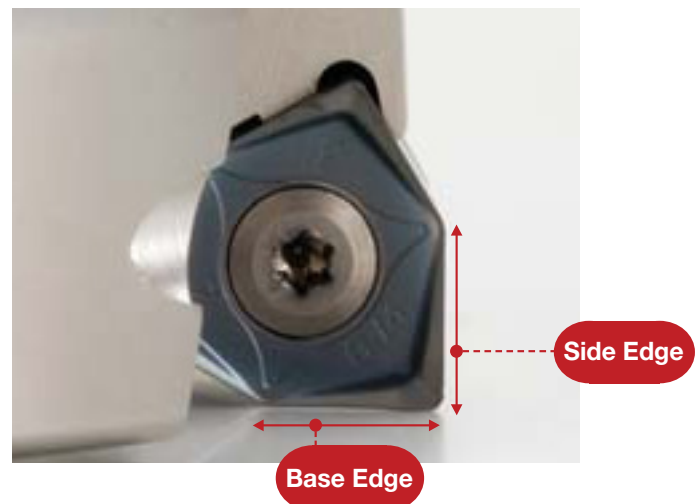


Advantage 4

Neutral Inserts

Available for Shouldering and Facing
 Neutral inserts are applicable for left-hand cutters (custom order)

Applicable to a Wide Range of Applications



Advantage 5

MEGACOAT NANO

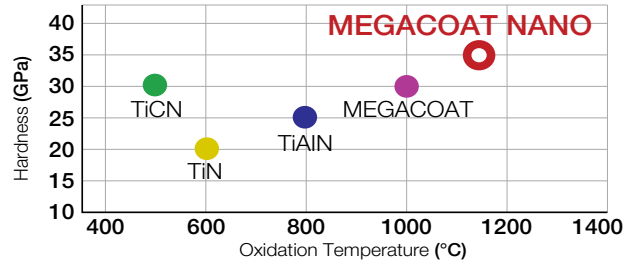


Extended Tool Life by New MEGACOAT NANO Technology

PR1525 for steel and stainless steel

PR1510 for cast iron

Prevents wear and fracture with high hardness (35GPa) and superior oxidation resistance (oxidation temperature: 1,150°C)

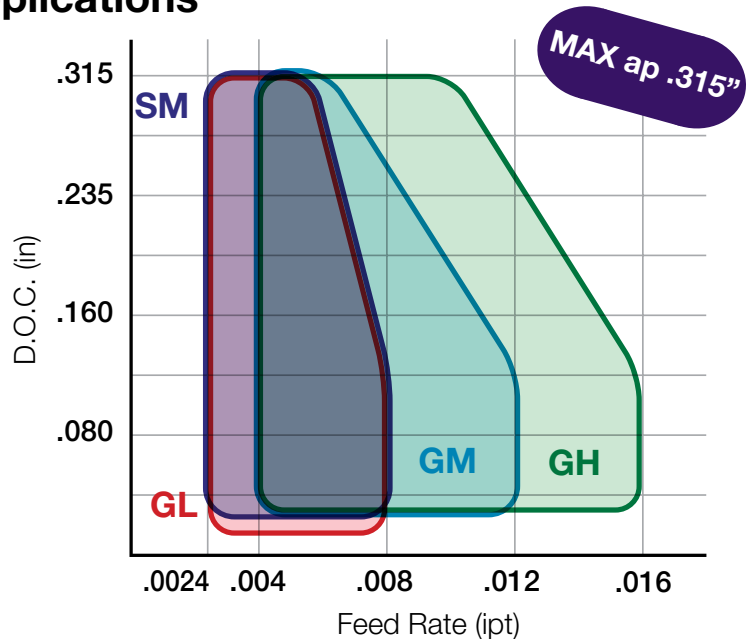


low **Oxidation Resistance** high

Advantage 6

4 Chipbreakers for Various Applications

Chipbreaker	Application	Shape
GM	General Purpose	
SM	Low Cutting Force	
GH	Heavy Milling	
GL	Surface-Finish Oriented	



Smooth Chip Evacuation

Properly Curled Chips

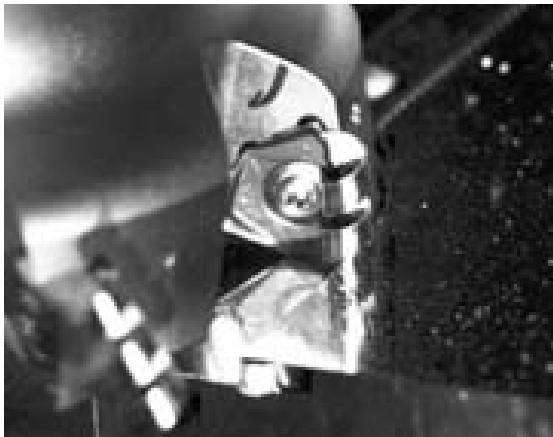
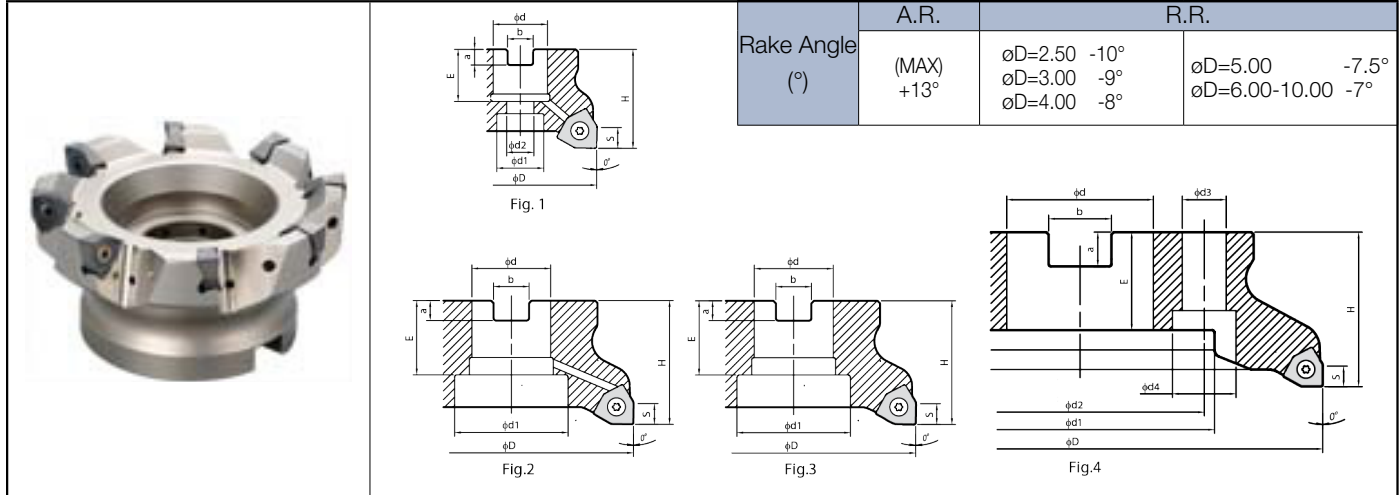


Photo taken by high-speed camera

M-Six MFWN Milling Cutter

M-Six Face Mill (Inch-Size)

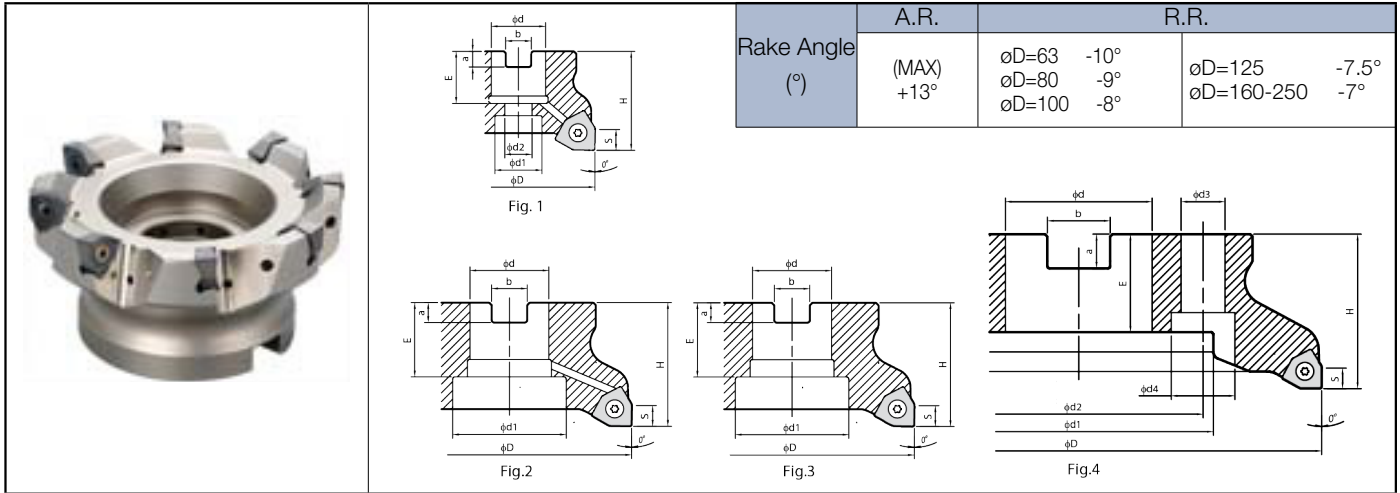


Toolholder Dimension (Inch-Size)

Description	Stock	No. of insert	Dimension (inch)											Drawing	Weight (kg)	Shim	Coolant Hole			
			ØD	Ød	Ød1	Ød2	H	E	a	b	S	Ød3	Ød4							
Coarse pitch	MFWN 902500R-3T	●	3	2.50	0.75	0.669	0.433	1.575	0.750	0.187	0.312	0.315	-	-	Fig.1	0.4	Yes			
	903000R-4T	●	4	3.00	1.00	0.875	0.551	1.968	1.063	0.236	0.381				Fig.1	0.8				
	904000R-5T	●	5	4.00	1.50	2.047	-	1.968	1.142	0.393	0.625				Fig.2	1.1				
	905000R-6T	●	6	5.00	1.50	2.175	-	2.480	1.496	0.393	0.625				Fig.2	2.5				
	906000R-8T	●	8	6.00	2.00	2.835	-	2.480	1.496	0.433	0.752				Fig.3	3.4				
	908000R-10T	●	10	8.00	2.50	3.937	4.000	2.480	1.575	0.551	1.008				0.709	1.024			Fig.4	6.0
	9010000R-12T	●	12	10.00	2.50	3.937	4.000	2.480	1.575	0.551	1.008								Fig.4	8.2
Fine pitch	MFWN 902500R-4T	●	4	2.50	0.75	0.669	0.433	1.575	0.750	0.187	0.312	0.315	-	-	Fig.1	0.5	Yes			
	903000R-5T	●	5	3.00	1.00	0.875	0.551	1.968	1.063	0.236	0.381				Fig.1	0.8				
	904000R-7T	●	7	4.00	1.50	2.047	-	1.968	1.142	0.393	0.625				Fig.2	1.0				
	905000R-8T	●	8	5.00	1.50	2.175	-	2.480	1.496	0.393	0.625				Fig.2	2.5				
	906000R-10T	●	10	6.00	2.00	2.835	-	2.480	1.496	0.433	0.752				Fig.3	3.5				
	908000R-12T	●	12	8.00	2.50	3.937	4.000	2.480	1.575	0.551	1.008				0.709	1.024			Fig.4	6.2
	9010000R-14T	●	14	10.00	2.50	3.937	4.000	2.480	1.575	0.551	1.008								Fig.4	8.4
Extra fine pitch	MFWN 902500R-5T	●	5	2.50	0.75	0.669	0.433	1.575	0.750	0.187	0.312	0.315	-	-	Fig.1	0.4	Yes			
	903000R-7T	●	7	3.00	1.00	0.875	0.551	1.968	1.063	0.236	0.381				Fig.1	0.8				
	904000R-9T	●	9	4.00	1.50	2.047	-	1.968	1.142	0.393	0.625				Fig.2	1.0				
	905000R-12T	●	12	5.00	1.50	2.175	-	2.480	1.496	0.393	0.625				Fig.2	2.4				
	906000R-14T	●	14	6.00	2.00	2.835	-	2.480	1.496	0.433	0.752				Fig.3	3.4				
	908000R-16T	●	16	8.00	2.50	3.937	4.000	2.480	1.575	0.551	1.008				0.709	1.024			Fig.4	6.1
	9010000R-18T	●	18	10.00	2.50	3.937	4.000	2.480	1.575	0.551	1.008								Fig.4	8.4

● : Stock Std.

M-Six MFWN Milling Cutter












Toolholder Dimension (Metric-Size)

	Description	Stock	No. of insert	Dimension (mm)										Drawing	Weight (kg)	Shim	Coolant Hole	
				ØD	Ød	Ød1	Ød2	H	E	a	b	S	Ød3					Ød4
Metric	Coarse pitch	MFWN 90063R-3T-M	○	3	63	22	19	11	40	21	6.3	10.4	8			fig.1	0.5	Yes
		90080R-4T-M	○	4	80	27	20	13	50	24	7	12.4				fig.2	1.0	
		90100R-5T-M	○	5	100	32	46	-	30	8	14.4	1.3						
		90125R-6T-M	○	6	125	40	55	66.7	33	9	16.4	2.5						
		90160R-8T-M	○	8	160		68		32	3.8								
		90200R-10T-M	○	10	200	60	110	101.6	40	14	25.7	6.0						
	90250R-12T-M	○	12	250	18				26	8.4								
	Fine pitch	MFWN 90063R-4T-M	○	4	63	22	19	11	40	21	6.3	10.4	8			fig.1	0.5	Yes
		90080R-5T-M	○	5	80	27	20	13	50	24	7	12.4				fig.2	1.0	
		90100R-7T-M	○	7	100	32	46	-	30	8	14.4	1.3						
		90125R-8T-M	○	8	125	40	55	66.7	33	9	16.4	2.6						
		90160R-10T-M	○	10	160		68		32	3.9								
		90200R-12T-M	○	12	200	60	110	101.6	40	14	25.7	6.3						
	90250R-14T-M	○	14	250	18				26	8.7								
	Extra fine pitch	MFWN 90063R-5T-M	○	5	63	22	19	11	40	21	6.3	10.4	8			fig.1	0.5	Yes
		90080R-7T-M	○	7	80	27	20	13	50	24	7	12.4				fig.2	1.1	
		90100R-9T-M	○	9	100	32	46	-	30	8	14.4	1.3						
		90125R-12T-M	○	12	125	40	55	66.7	33	9	16.4	2.6						
90160R-14T-M		○	14	160	68		32		3.9									
90200R-16T-M		○	16	200	60	110	101.6	40	14	25.7	6.4							
90250R-18T-M	○	18	250	18				26	8.8									
Bore Dia. Inch Spec	Coarse pitch	MFWN 90080R-4T	○	4	80	1.00"	20	13	50	27	6	0.375"	8			fig.1	1.0	Yes
		90100R-5T	○	5	100	1.25"	46	-	34	8	0.500"	fig.2				1.3		
		90125R-6T	○	6	125	1.50"	55	-	38	10	0.625"					2.6		
		90160R-8T	○	8	160	2.00"	72	-	38	11	0.750"	3.9						
	Fine pitch	MFWN 90080R-5T	○	5	80	1.00"	20	13	50	27	6	0.375"	8			fig.1	1.0	Yes
		90100R-7T	○	7	100	1.25"	46	-	34	8	0.500"	fig.2				1.4		
		90125R-8T	○	8	125	1.50"	55	-	38	10	0.625"					2.7		
		90160R-10T	○	10	160	2.00"	72	-	38	11	0.750"	4.0						
	Extra fine pitch	MFWN 90080R-7T	○	7	80	1.00"	20	13	50	27	6	0.375"	8			fig.1	1.1	Yes
		90100R-9T	○	9	100	1.25"	46	-	34	8	0.500"	fig.2				1.3		
		90125R-12T	○	12	125	1.50"	55	-	38	10	0.625"					2.7		
		90160R-14T	○	14	160	2.00"	72	-	38	11	0.750"	4.1						

M-Six MFWN Milling Cutter

Spare Parts (inch-size)









Description		Spare Parts							
		Insert Screw	Wrench		Shim	Shim Screw	Wrench	Anti-seize Compound	Arbor bolt
			TT	DTM					
									
Coarse pitch	MFWN 902500R-3T	SB-50140TR	TT-15	-	MFWN-90	SPW-7050	LW-5	MP-1	HH3/8-1.25 (HH3/8-1.25H)
	MFWN 903000R-4T								HH1/2-1.25 (HH1/2-1.25H)
	MFWN 904000R-5T } 901000R-12T								for Insert Screw Recommended torque 4.2N·m
Fine pitch	MFWN 902500R-4T	SB-50140TR	TT-15	-	-	-	-	MP-1	HH3/8-1.25 (HH3/8-1.25H)
	MFWN 903000R-5T								HH1/2-1.25 (HH1/2-1.25H)
	MFWN 904000R-7T } 901000R-14T								for Insert Screw Recommended torque 4.2N·m
Extra fine pitch	MFWN 902500R-5T	SB-50140TR	TT-15	-	-	-	-	MP-1	HH3/8-1.25 (HH3/8-1.25H)
	MFWN 903000R-7T	SB-40140TRN	-	DTM-15					HH1/2-1.25 (HH1/2-1.25H)
	MFWN 904000R-9T } 901000R-18T	for Insert Screw Recommended torque 3.5N·m	-	-					-


 Coat Anti-seize Compound (MP-1) thinly on portion of taper and thread when insert is fixed.


Recommended Cutting Conditions  Page 10

*If through spindle coolant is required please order arbor bolt in () seperately.

Spare Parts (metric-size)

Description		Spare Parts							
		Insert Screw	Wrench		Shim	Shim Screw	Wrench	Anti-seize Compound	Arbor bolt
			TT	DTM					
									
Coarse pitch	MFWN 90063R-3T-M	SB-50140TR	TT-15	-	MFWN-90	SPW-7050	LW-5	MP-1	HH10×30 (HH10×30H)
	MFWN 90080R-4T-(M)								HH12×35 (HH12×35H)
	MFWN 90100R-5T-(M) } 90250R-12T-(M)								for Insert Screw Recommended torque 4.2N·m
Fine pitch	MFWN 90063R-4T-M	SB-50140TR	TT-15	-	-	-	-	MP-1	HH10×30 (HH10×30H)
	MFWN 90080R-5T-(M)								HH12×35 (HH12×35H)
	MFWN 90100R-7T-(M) } 90250R-14T-(M)								for Insert Screw Recommended torque 4.2N·m
Extra fine pitch	MFWN 90063R-5T-M	SB-50140TR	TT-15	-	-	-	-	MP-1	HH10×30 (HH10×30H)
	MFWN 90080R-7T-(M)	SB-40140TRN	-	DTM-15					HH12×35 (HH12×35H)
	MFWN 90100R-9T-(M) } 90250R-18T-(M)	for Insert Screw Recommended torque 3.5N·m	-	-					-

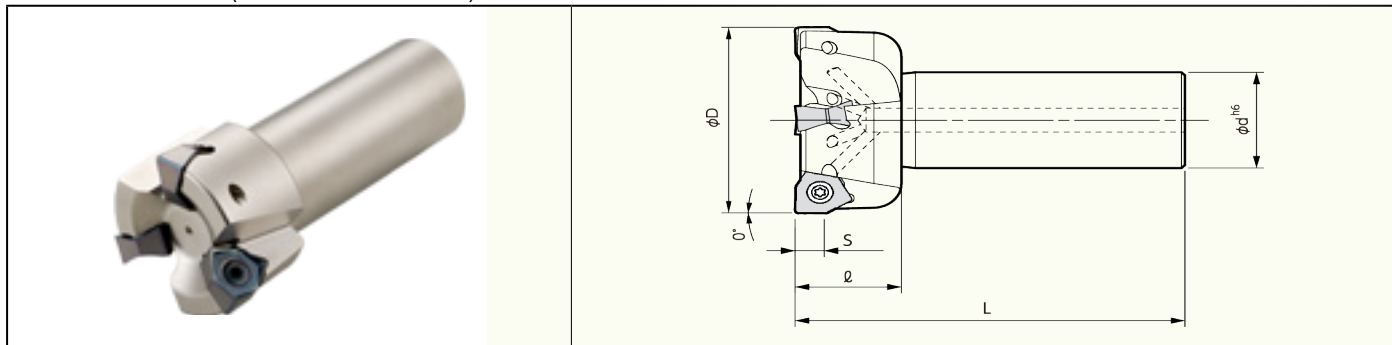
 Coat Anti-seize Compound (MP-1) thinly on portion of taper and thread when insert is fixed.

Recommended Cutting Conditions  Page 10

*If through spindle coolant is required please order arbor bolt in () seperately.

M-Six MFWN Milling Cutter

M-Six End Mill (with coolant hole)







Toolholder Dimension

Description	Stock	No. of inserts	Unit	ØD	Ød	L	ℓ	S	Rake Angle (°)		Coolant Hole	Spare Parts		
									A.R. (Max)	R.R.		Clamp Screw	Wrench	Anti-seize Compound
MFWN 90200R-W125-3T	●	3	(in)	2.00	1.25	3.60	1.18	0.315	+13°	-12°	Yes	SB-50140TR	TT-15	MP-1
902500R-W125-4T	●	4		2.50						Recommended Torque 4.2Nm				
903000R-W125-5T	●	5		3.00										
MFWN 90050R-S32-3T	○	3	(mm)	50	32	110	30	8	+13°	-12°	Yes	SB-50140TR	TT-15	MP-1
90063R-S32-4T	○	4		63						Recommended Torque 4.2Nm				
90080R-S32-5T	○	5		80										

● : Stock Std. ○ : World Express

Applicable Inserts

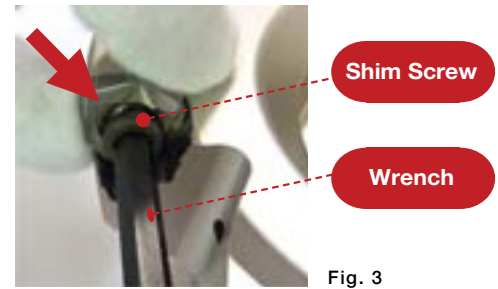
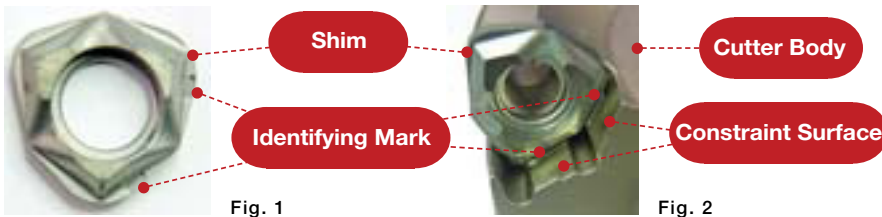
Classification of Usage	P	Carbon Steel / Alloy Steel		★	
		Mold Steel		★	
★ Roughing / 1st Choice ☆ Roughing / 2nd Choice ■ Finishing / 1st Choice □ Finishing / 2nd Choice (In case hardness is under 45HRC)	M	Stainless Steel		★	
	K	Gray Cast Iron			★
		Nodular Cast Iron			★
	N	Non-ferrous Metals			
	S	Heat-resistant Alloys		★	
		Titanium Alloys			★
	H	Hard Materials		□	
Insert	Description	MEGACOAT NANO			
		PR1525	PR1510		
 General Purpose	WNMU 080608EN-GM	●	●		
 Low Cutting Force	WNMU 080608EN-SM	●	●		
 Tough Edge (Heavy Milling)	WNMU 080608EN-GH	●	●		
 Surface-Finish Oriented Ground Tolerance	WNEU 080608EN-GL	●	●		

● : Stock Std.

M-Six MFWN Milling Cutter

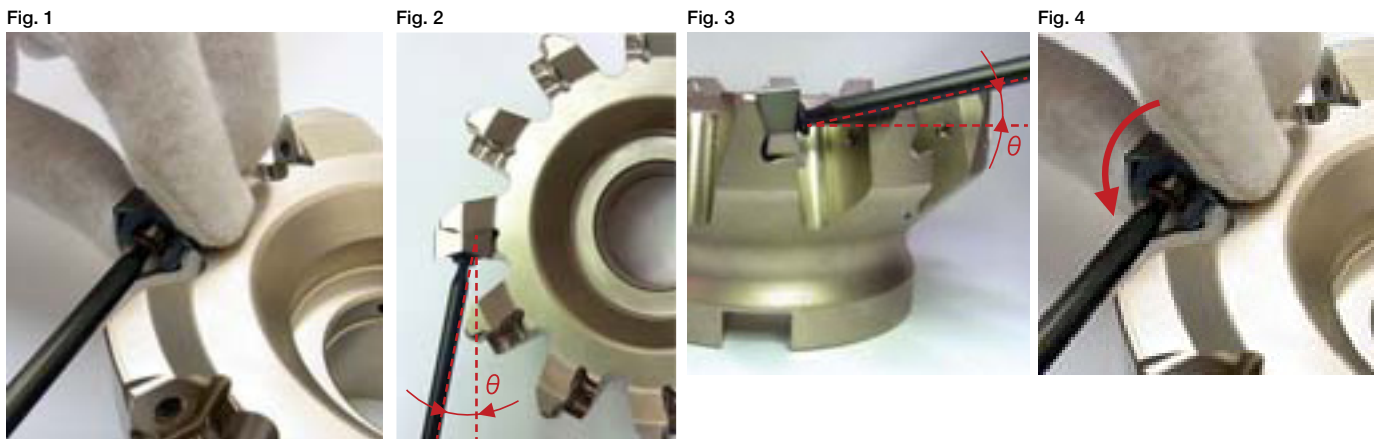
How to Replace the Shim (for coarse pitch)

1. Be sure to remove dust and chips from the insert mounting pocket
2. The shim must be mounted in the proper direction. While aligning the surface of the shim with the mark on it to the corresponding constraint surface (See Fig. 1) and lightly pressing the shim toward the constraint surface of the pocket wall (See Fig. 2), insert the screw into the hole of the shim and tighten (See Fig. 3). When tightening screw, make sure that the screw is vertical to the pocket floor (See Fig 3). Recommended torque is 6.0Nm.
3. After tightening the screw make sure that there is no clearance between the shim seat surface and the pocket floor. If there is any clearance, remove the shim and mount it again according to the above steps.



How to Mount the Insert

1. Be sure to remove dust and chips from the insert mounting pocket
2. After applying anti-seize compound on portion of taper and thread, attach the screw to the front end of the wrench. While lightly pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten. (See Fig. 1)
3. When tightening the screw, make sure that the wrench is parallel to the screw. Remember that the screw hole of the holder for Extra Fine pitch is angled to the pocket floor. (See Fig. 2 and Fig. 3)
4. Be careful not to tighten the screw with excessive torque. Recommended torque is 4.2Nm for M5 screws (SB-50140TR) and 3.5Nm for M4 screw (SB-40140TRN)
5. After tightening the screw, make sure that there is no clearance between the insert seat surface and the pocket floor of the holder or between the insert side surfaces and the constraint surface of the holder. If there is any clearance, remove the insert and mount it again according to the above steps.
6. To index the cutting edge of the insert, turn the insert counterclockwise. (See Fig. 4) The insert corner identification number is stamped on the top surface of the insert.





Kyocera Industrial Ceramics Corp.
Cutting Tool Division

100 Industrial Park Road ■ Hendersonville, NC 28792
Email: cuttingtools@kyocera.com
Website: www.kyocera.com/cuttingtools
Distributor Website: <http://mykicc.kyocera.com>
Customer Service: 800.823.7284 - Option 1
Technical Support: 800.823.7284 - Option 2



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