



M-SIX (MFWN)

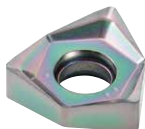
High Efficiency Milling Cutter



Double-Sided 6-edge Milling Cutter

Sharp Cutting due to Lower Cutting Forces
Resistant to Chattering and Applicable to Long Overhang
MEGACOAT NANO Coated Insert Grade for Long Tool Life

NEW DLC Coated Insert Grade
for Aluminum Machining
New Grade PDL025



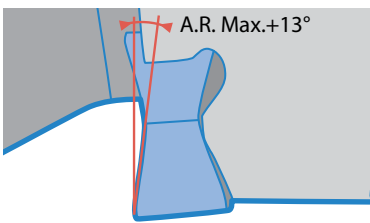
M-Six (MFWN)

Low Cutting Forces for Reduced Chattering and Superior Fracture Resistance
Wide Application Range and Now Includes PDL025 DLC Coated Inserts for Aluminum

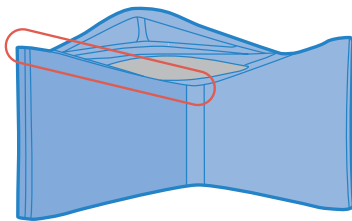
1 Sharp Cutting due to Lower Cutting Forces

Low Cutting Force due to Steep Rake Angle

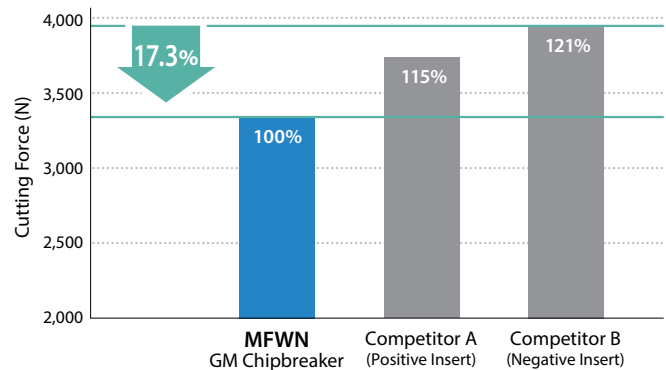
Dynamic Slant Design Reduces Initial Impact when Cutting Edge Enters the Workpiece



Dynamic Slant Design



Cutting Force Comparison (In-house Evaluation)



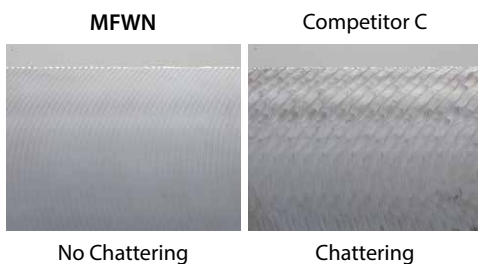
Cutting Force is the Resultant Force of the Principal Force and the Feed Force

Cutting Conditions: $V_c = 590$ sfm, D.O.C. \times ae = $0.275'' \times 0.400''$, fz = 0.008 ipt
Workpiece: 1049 Cutter Dia. $\varnothing 5.000''$

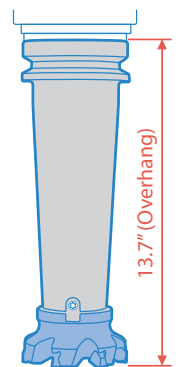
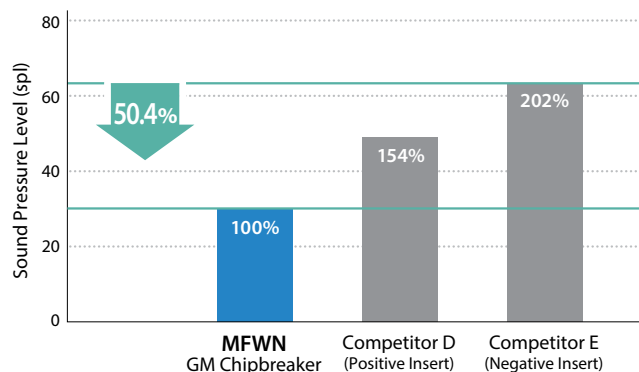
2 Reduced Chattering Even with Extended Milling Adapters

Resistant to Chattering due to Low Cutting Force Design and applicable to long overhang

Surface Roughness Comparison (In-house Evaluation)



Cutting Noise Comparison (In-house Evaluation)

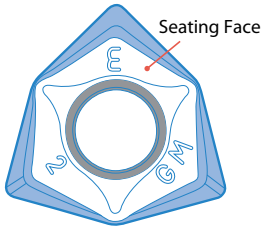
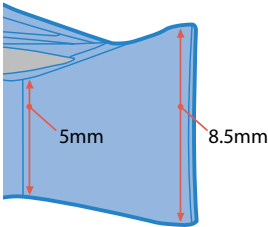


Cutting Conditions: $V_c = 660$ sfm, D.O.C. \times ae = $0.118'' \times 0.590''$, fz = 0.004 ipt
Workpiece: 1049 Cutter Dia. $\varnothing 3.000''$ (7 Inserts)

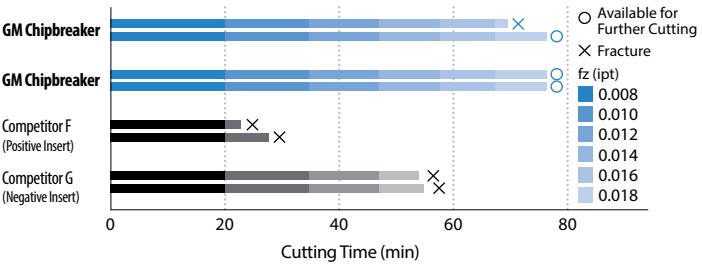
3 Superior Fracture Resistance with Thick Edge Design

Cutting Edge Thickness: 5 - 8.5mm

Stable Clamping with the Unique Insert Face Design



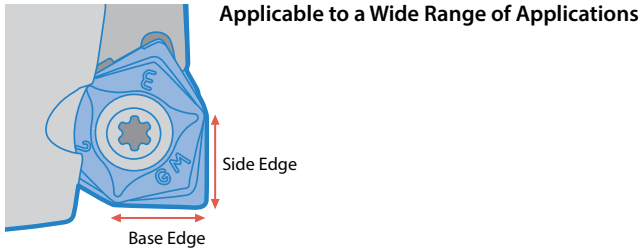
Fracture Resistance Comparison (In-house Evaluation)



Cutting Conditions: Vc = 330 sfm, D.O.C. x ae = 0.080" x 4.000", fz = 0.004 - 0.018 ipt, Dry Workpiece: 4140H (38 - 42HS) Interrupted with a Slot in the Workpiece

4 Neutral Inserts

Available for Shouldering and Facing
Neutral Inserts are Applicable to Left-hand Cutters (Custom Order)

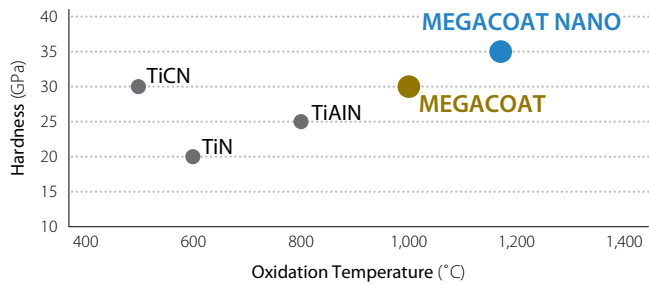


5 MEGACOAT NANO Coated Insert Grade for Long Tool Life

PR1525 for steel, PR1510 for cast iron and PR1535 for Ni-base heat-resistant alloy, titanium alloy and precipitation-hardened stainless steel

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

Coating Property

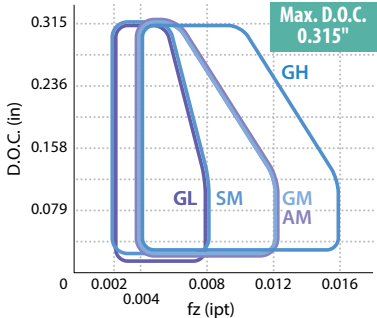


Low Oxidation Resistance High

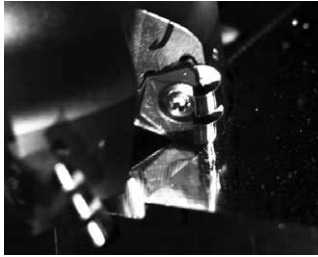
6 Extensive Insert Lineup Covering Various Applications

Chipbreaker	Applications	Shape
GM	General Purpose	
SM	Low Cutting Force	
GH	Heavy Milling	
GL	Surface-Finish Oriented	
AM	Aluminum / Non-ferrous Metals	

Application Range

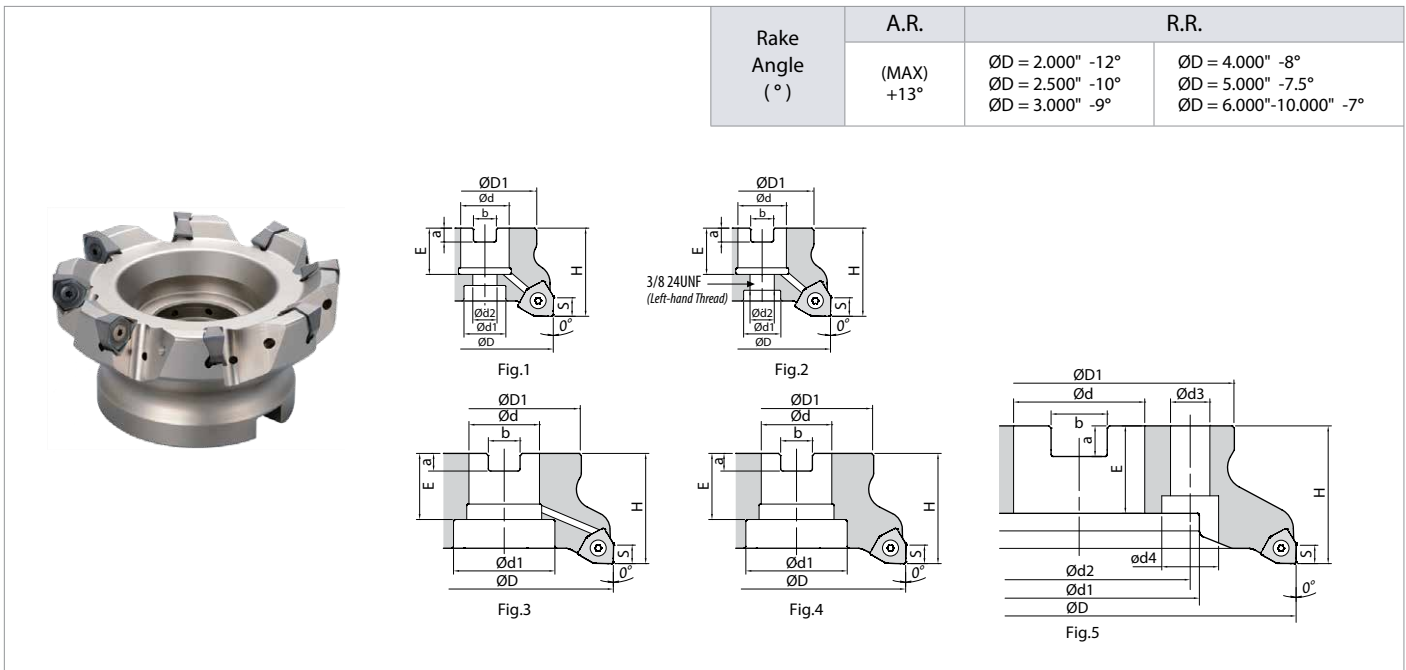


Smooth Chip Evacuation



Properly Curled Chips (The Photo was Taken by a High Speed Camera)

Face Mills (Inch Size)



Rake Angle (°)	A.R.	R.R.	
	(MAX) +13°	ØD = 2.000" -12° ØD = 2.500" -10° ØD = 3.000" -9°	ØD = 4.000" -8° ØD = 5.000" -7.5° ØD = 6.000"-10.000" -7°

Toolholder Dimensions (Inch Size)

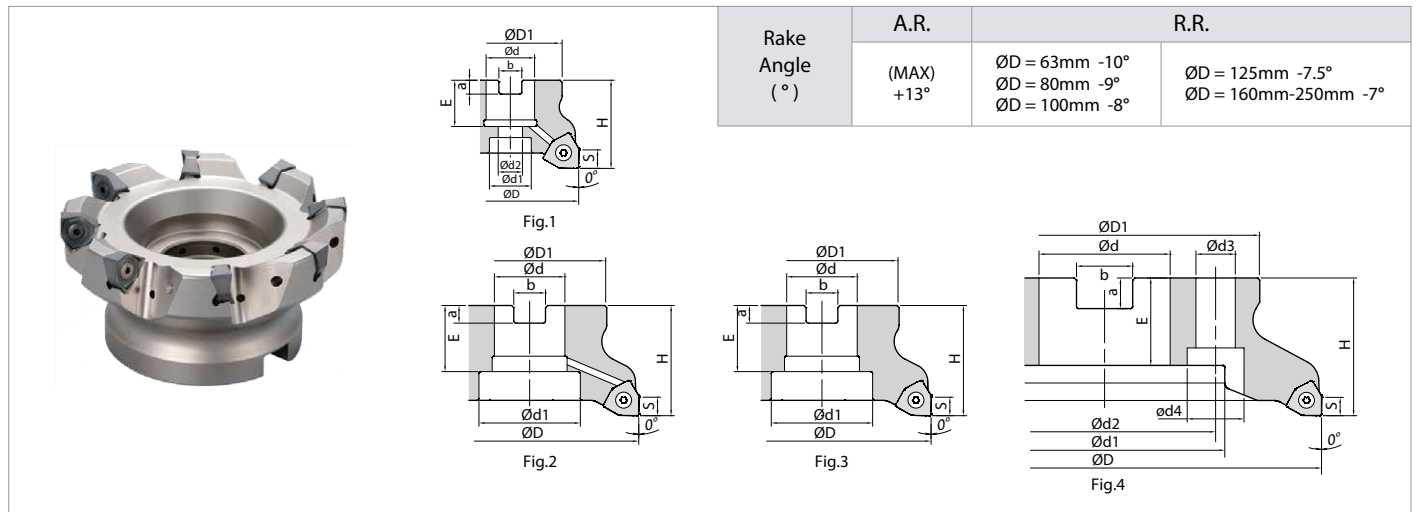
Description	Stock	No. of Inserts	Dimensions (in)										Drawing	Weight (kg)	Shim	Coolant Hole			
			ØD	ØD1	Ød	Ød1	Ød2	H	E	a	b	S					Ød3	Ød4	
Coarse Pitch	MFWN 902500R-3T	●	3	2.500	1.890	0.750	0.669	0.433	1.575	0.750	0.187	0.312	0.315	-	-	Fig.1	0.4	×	✓
	903000R-4T	●	4	3.000	2.283	1.000	0.875	0.551	1.968	1.063	0.236	0.381		-	-	Fig.1	0.8		
	904000R-5T	●	5	4.000	2.756	1.500	2.047	-	1.968	1.142	0.393	0.625		-	-	Fig.3	1.1		
	905000R-6T	●	6	5.000	3.425	1.500	2.175	-	2.480	1.496	0.393	0.625		-	-	Fig.3	2.5		
	906000R-8T	●	8	6.000	4.016	2.000	2.835	-	2.480	1.496	0.433	0.752		-	-	Fig.4	3.4		
	908000R-10T	●	10	8.000	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.008		0.709	1.024	Fig.5	6.0		
	9010000R-12T	●	12	10.000	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.008		0.709	1.024	Fig.5	8.2		
Fine Pitch	NEW MFWN 902000R-4T	●	4	2.000	1.752	0.750	0.500	3/8 24UNF	1.968	0.830	0.187	0.312	0.315	-	-	Fig.2	0.4	×	✓
	902500R-4T	●	4	2.500	1.890	0.750	0.669	0.433	1.575	0.750	0.187	0.312		-	-	Fig.1	0.5		
	903000R-5T	●	5	3.000	2.283	1.000	0.875	0.551	1.968	1.063	0.236	0.381		-	-	Fig.1	0.8		
	904000R-7T	●	7	4.000	2.756	1.500	2.047	-	1.968	1.142	0.393	0.625		-	-	Fig.3	1.0		
	905000R-8T	●	8	5.000	3.425	1.500	2.175	-	2.480	1.496	0.393	0.625		-	-	Fig.3	2.5		
	906000R-10T	●	10	6.000	4.016	2.000	2.835	-	2.480	1.496	0.433	0.752		-	-	Fig.4	3.5		
	908000R-12T	●	12	8.000	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.008		0.709	1.024	Fig.5	6.2		
	9010000R-14T	●	14	10.000	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.008		0.709	1.024	Fig.5	8.4		
Extra-Fine Pitch	MFWN 902500R-5T	●	5	2.500	1.890	0.750	0.669	0.433	1.575	0.750	0.187	0.312	0.315	-	-	Fig.1	0.4	×	✓
	903000R-7T	●	7	3.000	2.283	1.000	0.875	0.551	1.968	1.063	0.236	0.381		-	-	Fig.1	0.8		
	904000R-9T	●	9	4.000	2.756	1.500	2.047	-	1.968	1.142	0.393	0.625		-	-	Fig.3	1.0		
	905000R-12T	●	12	5.000	3.425	1.500	2.175	-	2.480	1.496	0.393	0.625		-	-	Fig.3	2.4		
	906000R-14T	●	14	6.000	4.016	2.000	2.835	-	2.480	1.496	0.433	0.752		-	-	Fig.4	3.4		
	908000R-16T	●	16	8.000	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.008		0.709	1.024	Fig.5	6.1		
	9010000R-18T	●	18	10.000	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.008		0.709	1.024	Fig.5	8.4		

Spare Parts see [Page 6](#)

Applicable Inserts see [Page 8](#)

● : U.S. Stock

Face Mills (Metric Size)



Toolholder Dimensions (Metric Size)


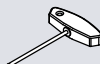






Description	Stock	No. of Inserts	Dimensions (mm)										S	Ød3	Ød4	Drawing	Weight (kg)	Shim	Coolant Hole				
			ØD	ØD1	Ød	Ød1	Ød2	H	E	a	b												
Bore Dia. Inch Spec	Coarse Pitch	MFWN 90080R-4T	○	4	80	60	1.000"	20	13	50	27	6	0.375"	8			Fig.1	1.0	✓	✓			
		90100R-5T	○	5	100	70	1.250"	46	-	50	34	8	0.500"				Fig.2	1.3					
		90125R-6T	○	6	125	87	1.500"	55	-	63	38	10	0.625"				Fig.2	2.6					
		90160R-8T	○	8	160	102	2.000"	72	-	63	38	11	0.750"				Fig.3	3.9					
		90200R-10T	○	10	200	142	1.875"	110	101.6	63	40	14	1.000"				Fig.4	6.3			×		
		90250R-12T	○	12	250	142	1.875"	110	101.6	63	40	14	1.000"				Fig.4	8.7					
	Fine Pitch	MFWN 90080R-5T	○	5	80	60	1.000"	20	13	50	27	6	0.375"	8			Fig.1	1.0	×	✓			
		90100R-7T	○	7	100	70	1.250"	46	-	50	34	8	0.500"				Fig.2	1.4					
		90125R-8T	○	8	125	87	1.500"	55	-	63	38	10	0.625"				Fig.2	2.7					
		90160R-10T	○	10	160	102	2.000"	72	-	63	38	11	0.750"				Fig.3	4.0					
		90200R-12T	○	12	200	142	1.875"	110	101.6	63	40	14	1.000"				18	26			Fig.4	6.6	×
		90250R-14T	○	14	250	142	1.875"	110	101.6	63	40	14	1.000"				18	26			Fig.4	8.9	
	Extra-Fine Pitch	MFWN 90080R-7T	●	7	80	60	1.000"	20	13	50	27	6	0.375"	8			Fig.1	1.1	×	✓			
		90100R-9T	○	9	100	70	1.250"	46	-	50	34	8	0.500"				Fig.2	1.3					
		90125R-12T	○	12	125	87	1.500"	55	-	63	38	10	0.625"				Fig.2	2.7					
		90160R-14T	○	14	160	102	2.000"	72	-	63	38	11	0.750"				Fig.3	4.1					
		90200R-16T	○	16	200	142	1.875"	110	101.6	63	40	14	1.000"				18	26			Fig.4	6.7	×
		90250R-18T	○	18	250	142	1.875"	110	101.6	63	40	14	1.000"				18	26			Fig.4	9.1	
Metric	Coarse Pitch	MFWN 90063R-3T-M	○	3	63	47	22	19	11	40	21	6.3	10.4	8			Fig.1	0.5	✓	✓			
		90080R-4T-M	○	4	80	60	27	20	13	50	24	7	12.4				Fig.1	1.0					
		90100R-5T-M	○	5	100	70	32	46	-	50	30	8	14.4				Fig.2	1.3					
		90125R-6T-M	○	6	125	87	40	55	-	63	33	9	16.4				Fig.2	2.5					
		90160R-8T-M	○	8	160	102	40	68	66.7	63	32	9	16.4				14	20			Fig.4	3.8	×
		90200R-10T-M	○	10	200	142	60	110	101.6	63	40	14	25.7				18	26			Fig.4	6.0	
	Fine Pitch	MFWN 90063R-4T-M	○	4	63	47	22	19	11	40	21	6.3	10.4	8			Fig.1	0.5	×	✓			
		90080R-5T-M	●	5	80	60	27	20	13	50	24	7	12.4				Fig.1	1.0					
		90100R-7T-M	●	7	100	70	32	46	-	50	30	8	14.4				Fig.2	1.3					
		90125R-8T-M	○	8	125	87	40	55	-	63	33	9	16.4				Fig.2	2.6					
		90160R-10T-M	○	10	160	102	40	68	66.7	63	32	9	16.4				14	20			Fig.4	3.9	×
		90200R-12T-M	○	12	200	142	60	110	101.6	63	40	14	25.7				18	26			Fig.4	6.3	
	Extra-Fine Pitch	MFWN 90063R-5T-M	●	5	63	47	22	19	11	40	21	6.3	10.4	8			Fig.1	0.5	×	✓			
		90080R-7T-M	○	7	80	60	27	20	13	50	24	7	12.4				Fig.1	1.1					
		90100R-9T-M	●	9	100	70	32	46	-	50	30	8	14.4				Fig.2	1.3					
		90125R-12T-M	○	12	125	87	40	55	-	63	33	9	16.4				Fig.2	2.6					
		90160R-14T-M	●	14	160	102	40	68	66.7	63	32	9	16.4				14	20			Fig.4	3.9	×
		90200R-16T-M	○	16	200	142	60	110	101.6	63	40	14	25.7				18	26			Fig.4	6.4	
90250R-18T-M	○	18	250	142	60	110	101.6	63	40	14	25.7	18	26	Fig.4	8.8								


Spare Parts see [Page 6](#)

Applicable Inserts see [Page 8](#)

● : U.S. Stock ○ : World Express (Shipping: 7-10 Business Days)

Face Mill Spare Parts (Inch Size)

Description		Spare Parts							
		Insert Screw	Wrench		Shim	Shim Screw	Wrench	Anti-Seize Compound	Arbor Bolt
			TTW* ¹	DTM					
									
Coarse Pitch	MFWN 902500R-3T	SB-50140TR	TTW-15 (TT-15)	-	MFWN-90	SPW-7050	LW-5	P-37	HH3/8-1.25 (HH3/8-1.25H)
	903000R-4T								HH1/2-1.25 (HH1/2-1.25H)
	904000R-5T ~ 901000R-12T								-
	Recommended Torque for Insert Clamp 4.2 N-m								Recommended Torque for Insert Clamp 6.0 N-m
Fine Pitch	MFWN 902000R-4T	SB-50140TR	TTW-15 (TT-15)	-	-	-	-	P-37	XNS610* ²
	902500R-4T								HH3/8-1.25 (HH3/8-1.25H)
	903000R-5T								HH1/2-1.25 (HH1/2-1.25H)
	904000R-7T ~ 901000R-14T								-
	Recommended Torque for Insert Clamp 4.2 N-m								
Extra-Fine Pitch	MFWN 902500R-5T	SB-50140TR	TTW-15 (TT-15)	-	-	-	-	P-37	HH3/8-1.25 (HH3/8-1.25H)
	903000R-7T								SB-40140TRN
	904000R-9T ~ 901000R-18T	Recommended Torque for Insert Clamp 3.5 N-m						-	
									-


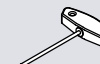






 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.


Recommended Cutting Conditions see [Page 9](#)

If through spindle coolant is required, please order arbor bolt in () separately.

*¹ TTW-15 wrenches will replace older TT-15 wrenches. Either model is compatible. *² Differential screw (3/8-24UNF)

Face Mill Spare Parts (Metric Size)

Description		Spare Parts									
		Insert Screw	Wrench		Shim	Shim Screw	Wrench	Anti-Seize Compound	Arbor Bolt		
			TTW* ¹	DTM							
											
Coarse Pitch	MFWN 90063R-3T-M	SB-50140TR	TTW-15 (TT-15)	-	MFWN-90	SPW-7050	LW-5	P-37	HH10-30 (HH10-1.25H)		
	90080R-4T-(M)								HH12-35 (HH12-35H)		
	90100R-5T-(M) ~ 90250R-12T-(M)								-		
	Recommended Torque for Insert Clamp 4.2 N-m								Recommended Torque for Insert Clamp 6.0 N-m		
Fine Pitch	MFWN 90063R-4T-M	SB-50140TR	TTW-15 (TT-15)	-	-	-	-	P-37	HH10-30 (HH10-1.25H)		
	90080R-5T-(M)								HH12-35 (HH12-35H)		
	90100R-7T-(M) ~ 90250R-14T-(M)								-		
	Recommended Torque for Insert Clamp 4.2 N-m										
Extra-Fine Pitch	MFWN 90063R-5T-M	SB-50140TR	TTW-15 (TT-15)	-	-	-	-	P-37	HH10-30 (HH10-1.25H)		
	90080R-7T-(M)								SB-40140TRN	-	DTM-15
	90100R-9T-(M) ~ 90250R-18T-(M)	Recommended Torque for Insert Clamp 3.5 N-m						-			
									-		

 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

Recommended Cutting Conditions see [Page 9](#)

If through spindle coolant is required, please order arbor bolt in () separately.

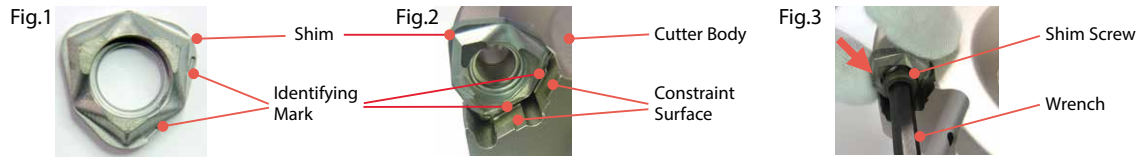
*¹ TTW-15 wrenches will replace older TT-15 wrenches. Either model is compatible.

How to Replace the Shim (for Coarse Pitch)

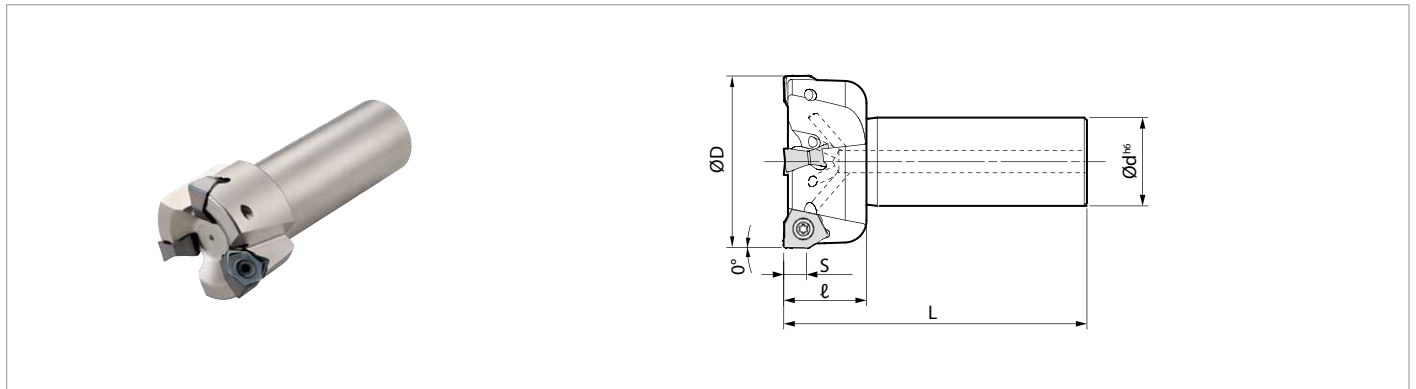
1. Be sure to remove dust and chips from the insert mounting pocket
2. The shim must be mounted in the proper direction. While aligning the surface of the shim with the mark on it to the corresponding constraint surface (see Fig. 1) and lightly pressing the shim toward the constraint surface of the pocket 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



End Mills (with Coolant Hole)



Toolholder Dimensions

Description	Stock	Unit	No. of Inserts	Dimensions					Rake Angle (°)		Coolant Hole	Spare Parts			
				ØD	Ød	L	ℓ	S	A.R. (Max)	R.R.		Screw Clamp	Wrench* ¹	Anti-Seize Compound	
MFWN 90200R-W125-3T	●	inch	3	2.000							-12°	✓	SB-50140TR	TTW-15 (TT-15)	P-37
902500R-W125-4T	●		4	2.500	1.250	3.600	1.180	0.315	+13°	-10°					
903000R-W125-5T	●		5	3.000						-8°					
MFWN 90050R-S32-3T	○	mm	3	50							-12°	✓	SB-50140TR	TTW-15 (TT-15)	P-37
90063R-S32-4T	○		4	63	32	110	30	8	+13°	-10°					
90080R-S32-5T	○		5	80						-9°					






Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

● : U.S. Stock ○ : World Express (Shipping: 7-10 Business Days)

*1 TTW-15 wrenches will replace older TT-15 wrenches. Either model is compatible.

Applicable Inserts see [Page 8](#)

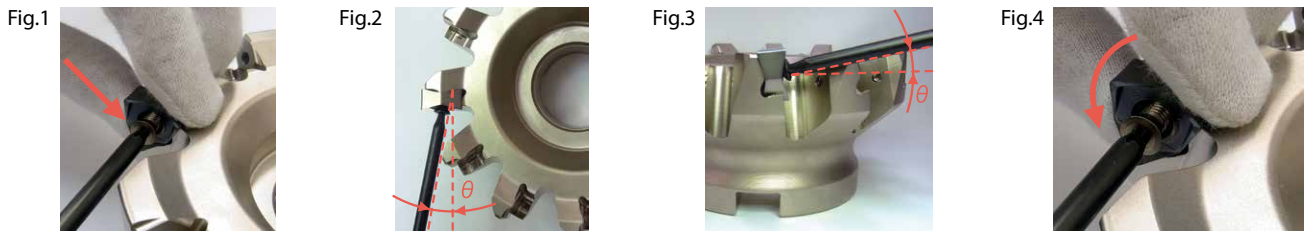
Applicable Inserts

Usage Classification	P	Carbon Steel / Alloy Steel		★						
		Mold Steel		★						
★ Roughing / 1st Choice ☆ Roughing / 2nd Choice ■ Finishing / 1st Choice □ Finishing / 2nd Choice (When hardness is under 45HRC)	M	Austenitic Stainless Steel		★	☆					
		Martensitic Stainless Steel		☆			★			
		Precipitation Hardened Stainless Steel		★						
	K	Gray Cast Iron					★			
		Ductile Cast Iron					★			
	N	Non-Ferrous Metals							★	☆
	S	Heat Resistant Alloy (Ni-base)		☆				★		
		Titanium Alloy (Ti-6Al-4V)		★						
	H	Hardened Materials					□			
	Insert	Description	Dimensions (in)		MEGACOAT NANO			CVD Coated Carbide	DLC Coated Carbide	Carbide
rε			Z	PR1535	PR1525	PR1510	CA6535	PDL025	GW25	
 General Purpose	WNMU 080604EN-GM	1/64	0.067	●	●	●	○			
	080608EN-GM	1/32	0.051	●	●	●	●			
 Low Cutting Force	WNMU 080608EN-SM	1/32	0.051	●	●	●	●			
 Tough Edge (Heavy Milling)	WNMU 080608EN-GH	1/32	0.051	●	●	●	○			
 Surface Finish Oriented Ground Tolerance	WNEU 080608EN-GL	1/32	0.059	○	●	●	○			
 Aluminum / Non-Ferrous Metals (3-edge)	WNGT 080608FN-AM	1/32	0.061					●	●	

● : U.S. Stock ○ : World Express (Shipping: 7-10 Business Days)
 Recommended Cutting Conditions see [Page 9](#)

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 4.2N-m for M5 screw (SB-50140TR) and 3.5N-m 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



Recommended Cutting Conditions ★ 1st Recommendation ☆ 2nd Recommendation

Chipbreaker	Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade (Vc sfm)					
			MEGACOAT NANO			CVD Coated Carbide	DLC Coated Carbide	Carbide
			PR1535	PR1525	PR1510	CA6535	PDL025	GW25
GM	Carbon Steel	0.004 – 0.008 – 0.012	☆ 390 – 590 – 820	★ 390 – 590 – 820	-	-	-	-
	Alloy Steel	0.004 – 0.008 – 0.012	☆ 330 – 520 – 720	★ 330 – 520 – 720	-	-	-	-
	Mold Steel	0.004 – 0.006 – 0.010	☆ 260 – 460 – 590	★ 260 – 460 – 590	-	-	-	-
	Austenitic Stainless Steel	0.004 – 0.006 – 0.010	☆ 330 – 520 – 660	☆ 330 – 520 – 660	-	-	-	-
	Martensitic Stainless Steel	0.004 – 0.006 – 0.010	☆ 490 – 660 – 820	-	-	☆ 590 – 790 – 980	-	-
	Precipitation Hardened Stainless Steel	0.004 – 0.006 – 0.010	★ 300 – 390 – 490	-	-	-	-	-
	Gray Cast Iron	0.004 – 0.008 – 0.012	-	-	★ 390 – 590 – 820	-	-	-
	Nodular Cast Iron	0.004 – 0.006 – 0.010	-	-	★ 330 – 490 – 660	-	-	-
	Ni-base Heat Resistant Alloy	0.004 – 0.005 – 0.008	☆ 70 – 100 – 160	-	-	★ 70 – 130 – 160	-	-
SM *(GL)	Carbon Steel	0.002 – 0.005 – 0.008	☆ 390 – 590 – 820	☆ 390 – 590 – 820	-	-	-	-
	Alloy Steel	0.002 – 0.005 – 0.008	☆ 330 – 520 – 720	☆ 330 – 520 – 720	-	-	-	-
	Mold Steel	0.002 – 0.003 – 0.006	☆ 260 – 460 – 590	☆ 260 – 460 – 590	-	-	-	-
	Austenitic Stainless Steel	0.002 – 0.005 – 0.008	☆ 330 – 520 – 660	☆ 330 – 520 – 660	-	-	-	-
	Martensitic Stainless Steel	0.002 – 0.005 – 0.008	☆ 490 – 660 – 820	-	-	★ 590 – 790 – 980	-	-
	Precipitation Hardened Stainless Steel	0.002 – 0.005 – 0.008	★ 300 – 390 – 490	-	-	-	-	-
	Gray Cast Iron	0.002 – 0.005 – 0.008	-	-	☆ 390 – 590 – 820	-	-	-
	Nodular Cast Iron	0.002 – 0.003 – 0.006	-	-	☆ 330 – 490 – 660	-	-	-
	Ni-base Heat Resistant Alloy	0.002 – 0.004 – 0.006	☆ 70 – 100 – 160	-	-	☆ 70 – 130 – 160	-	-
Titanium Alloy	0.002 – 0.003 – 0.006	★ 130 – 200 – 260	-	-	-	-	-	
GH	Carbon Steel	0.008 – 0.012 – 0.016	☆ 390 – 590 – 820	☆ 390 – 590 – 820	-	-	-	-
	Alloy Steel	0.008 – 0.012 – 0.016	☆ 330 – 520 – 720	☆ 330 – 520 – 720	-	-	-	-
	Mold Steel	0.006 – 0.008 – 0.012	☆ 260 – 460 – 590	☆ 260 – 460 – 590	-	-	-	-
	Austenitic Stainless Steel	0.008 – 0.010 – 0.012	☆ 330 – 520 – 660	☆ 330 – 520 – 660	-	-	-	-
	Martensitic Stainless Steel	0.008 – 0.010 – 0.012	☆ 490 – 660 – 820	-	-	☆ 590 – 790 – 980	-	-
	Precipitation Hardened Stainless Steel	0.008 – 0.010 – 0.012	☆ 300 – 390 – 490	-	-	-	-	-
	Gray Cast Iron	0.008 – 0.012 – 0.016	-	-	☆ 390 – 590 – 820	-	-	-
	Nodular Cast Iron	0.006 – 0.008 – 0.012	-	-	☆ 330 – 490 – 660	-	-	-
	Ni-base Heat Resistant Alloy	0.006 – 0.008 – 0.010	☆ 70 – 100 – 160	-	-	☆ 70 – 130 – 160	-	-
AM	Non-ferrous Material	0.004 – 0.008 – 0.012	-	-	-	-	★ 660 – 1970 – 2950	☆ 660 – 1640 – 2620

The figures in bold font represent the center value of the recommended cutting conditions.
Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation

Machining with coolant is recommended for Ni-base Heat-resistant alloy and Titanium Alloy *GL chipbreaker is recommended for surface finish oriented milling
When using GH chipbreaker for fine pitch cutters, recommended feed is $f_z \leq 0.012$ ipt
GH chipbreaker is not recommended for extra fine pitch cutter

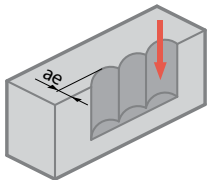
Applicable Chipbreaker

Cutter	Chipbreaker			
	GM	SM (GL)	GH	AM
Coarse Pitch (with Shim)	✓	✓	✓	✓
Fine Pitch (without Shim)	✓	✓	✓ (fz ≤ 0.012 ipt Recommended)	✓
Extra Fine Pitch (without Shim)	✓	✓	Not Recommended	Not Recommended

Cutter Type and Insert Selection Guide

Purpose	Cutter			Chipbreaker				
	Coarse Pitch	Fine Pitch	Extra Fine Pitch	GM	SM	GH	GL	AM
General Milling for Steel and Alloy Steel		✓		✓				
Steel and Alloy Steel (to prevent chattering due to low rigidity machine or poor clamping power)	✓				✓			
Productivity Oriented (D.O.C. ≥ 0.158" fz ≥ 0.010 ipt)	✓					✓		
Surface Roughness Oriented	✓	✓					✓	
General Milling for Stainless Steel		✓			✓			
Stainless Steel (to prevent chattering due to low rigidity machine or poor clamping power)	✓				✓			
Cast Iron Milling (Improved Efficiency)			✓	✓				
Cast Iron (D.O.C. ≥ 0.158" fz ≥ 0.010 ipt)	✓					✓		
General Milling for Aluminum Alloys		✓						✓
Aluminum Alloys (to prevent chattering due to low rigidity)	✓							✓

Plunge Milling



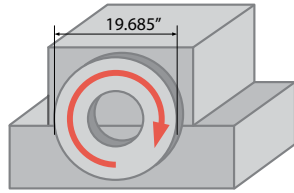
Cutting Dia.	MAX. Width of Cut (ae)
All Items	0.315"



NOT available for ramping or helical milling, due to interference between workpiece and insert.

Case Studies

Machine Part (No.50)



$V_c = 560$ sfm
 $f_z = 0.007$ ipt ($V_f = 19.685$ in/min)
 $a_p \times a_e = 0.098" \times 5.118"$ Wet
 MFWN90160R-8T (8 Inserts)
 WNMU080608EN-GM PR1510

Chip Removal Rate

PR1510

163cc/min

Efficiency

x2.3

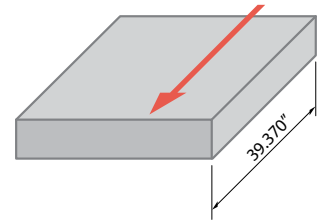
Competitor A
 (Positive Cutter)

68cc/min

Competitor A continued to cut under low cutting conditions as the workpiece was slipping due to unstable chucking. With MFWN, stable cutting was possible at higher feed rates.

(User Evaluation)

Frame (No.45)



$V_c = 490$ sfm
 $f_z = 0.009$ ipt ($V_f = 28.150$ in/min)
 $a_p \times a_e = 0.158" \times 6.299"$ Dry
 MFWN90160R-10T (10 Inserts)
 WNMU080608EN-GM PR1510

Chip Removal Rate

PR1510

458cc/min

Efficiency

x1.6

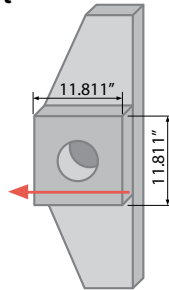
Competitor B
 (Negative Cutter)

282cc/min

While Competitor B could not improve the cutting conditions due to chattering, MFWN improved conditions by 160% with NO chattering.

(User Evaluation)

Construction Equipment Part (Manganese Steel)



$V_c = 490$ sfm
 $f_z = 0.008$ ipt ($V_f = 26.299$ in/min)
 $a_p \times a_e = 0.039" \times 3.937"$ Dry
 MFWN90100R-7T (7 Inserts)
 WNMU080608EN-GM PR1525

Machining Efficiency

PR1525

2pcs/edge

Tool Life

x2

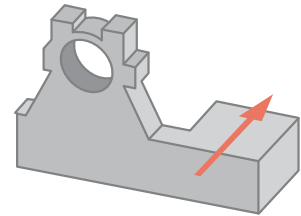
Competitor C
 (Negative Cutter)

1pc/edge

Despite instability with the long overhang of the workpiece, MFWN doubled tool life and improved efficiency by 150%.

(User Evaluation)

Machine Part (Structural Steel)



$V_c = 740$ sfm
 $f_z = 0.006$ ipt ($V_f = 39.370$ in/min)
 $a_p \times a_e = 0.059" \times 3.150"$ Dry
 MFWN90080R-7T (7 Inserts)
 WNMU080608EN-GM PR1525

Machining Efficiency

PR1525

3pcs/edge

Tool Life

x3

Competitor D
 (Positive Cutter)

1pc/edge

MFWN tripled tool life under the same cutting conditions as Competitor D.

(User Evaluation)



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