Low Cutting Force 90° Milling Cutter with Double-sided 6-Edge Inserts

MFWN Mini

NEW

Excellent Performance and Durability in a Smaller, Economical Size

6 Usable Cutting Edges Lowers Machining Costs (Depth of cut ~ 5mm)

Additional Fine Pitch, Small Diameter Toolholders Available

Inherits MFWN Series' Unique Design Technology with Fracture-Resistant Inserts and Low Cutting Forces

Cutter: ø 50 to ø 125

End Mill: ø 25 - ø 80

Low Cutting Force 90° Milling Cutter with Double-sided 6-Edge Inserts

MFWN Mini

Introducing Economical Small Diameter MFWN Series Milling Cutters
Additional Fine Pitch, Small Diameter Toolholders Available

1 MFWN Mini Uses Cost-Efficient 6-Edge Inserts

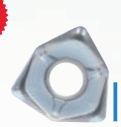
Smaller insert design technology maintains original MFWN cutting performance

Can be used up to 5mm D.O.C.

Smaller Insert Size

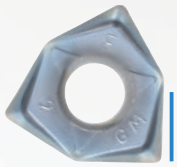
MFWN Mini
05 Size

NEW



D.O.C. ~ 5mm

MFWN
08 Size



D.O.C. ~ 8mm

Increased Versatility

Large small-diameter lineup

High-efficiency machining with fine pitch styles

1 ~ 3 additional flutes

Expanded lineup of smaller diameters

Face Mill ø 50
End Mill ø 25 - ø 40

NEW

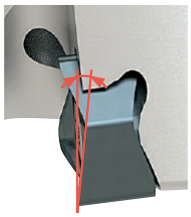
2 Inherits Previous MFWN Series Design Elements with Fracture-Resistant Inserts and Low Cutting Forces

1 Low Cutting Force and High Chattering-Resistance

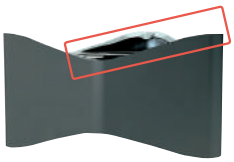
Steep rake angle minimizes cutting forces

Dynamic slant design reduces initial impact when entering the workpiece

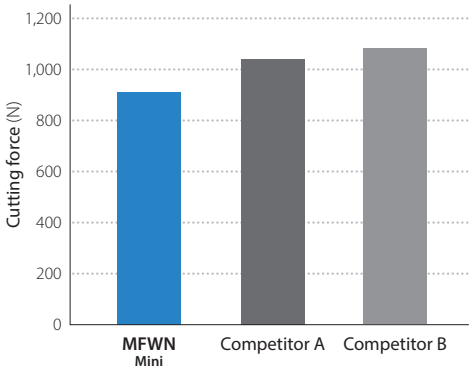
A.R. Max +11°



Dynamic slant design



Cutting force comparison (Internal evaluation)

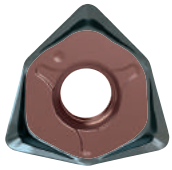


Cutting conditions : Vc = 150 m/min, fz = 0.15 mm/t, ap x ae = 1.5 x 35 mm, Dry
Cutting Dia. ø63 Workpiece : SCM 440

2 Superior Fracture Resistance with Thick Edge Design

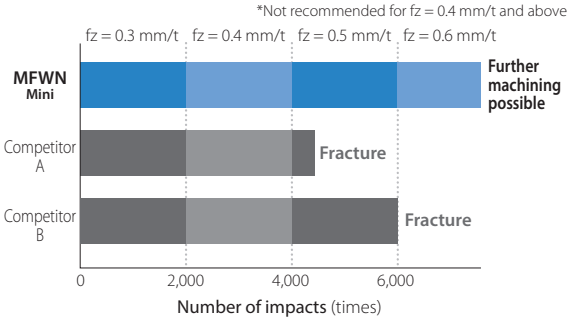
Stable Clamping Strength with Unique Insert Face Design

Cutting Edge Thickness: 5.2mm
(3.1mm at the thinnest point)



Optimized seating surface

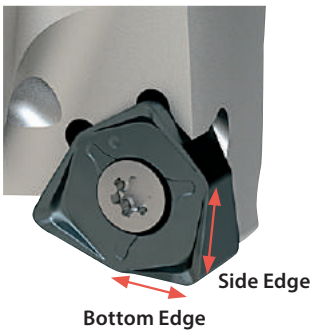
Fracture resistance comparison (Internal evaluation)



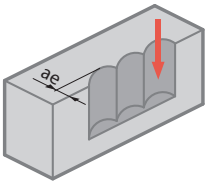
Cutting conditions : Vc = 120 m/min, ap x ae = 1.5 x 30 mm, Dry
Cutting dia. ø63 Workpiece : Mold Steel 37 ~ 43 HRC

3 Neutral Inserts for Various Uses

Symmetrical side and bottom cutting edges provide a wide range of machining applications



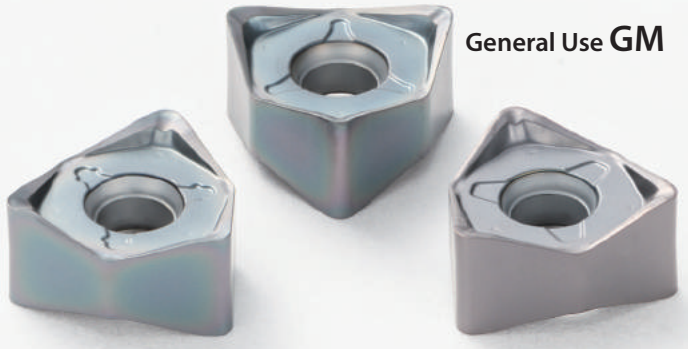
Can be used for plunging applications



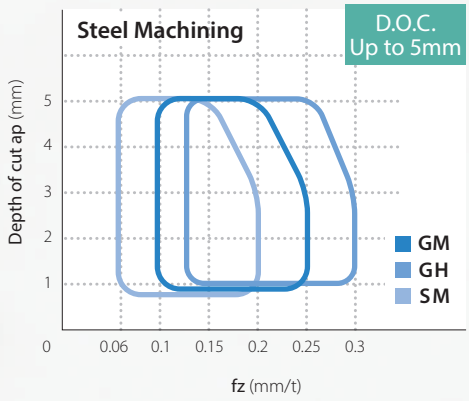
Left-handed Toolholders are also Available (Custom Order)

3 Comprehensive Insert Lineup for Various Machining Applications

Three insert chipbreakers and four grades available



Applicable Chipbreaker Range



Steel, Cast Iron, Stainless Steel and Heat-Resistant Alloy for Machining

MEGACOAT NANO **PR1510 / PR1525 / PR1535**

For hardened materials (60 HRC or less)

MEGACOAT HARD **PR015S** (GH only)

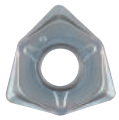
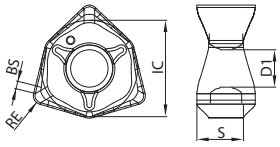
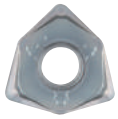
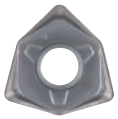
Recommended Cutting Conditions Table ★1st recommendation ☆2nd recommendation

Chipbreaker	Workpiece	fz (mm/t)	Recommended Insert Grade (Cutting speed Vc: m/min)			
			MEGACOAT NANO			MEGACOAT HARD
			PR1535	PR1525	PR1510	PR015S
GM	Carbon Steel (S xx C)	0.1 – **0.2** – 0.25	☆120 – **180** – 250	★120 – **180** – 250	–	–
	Alloy Steel (Supply chain management (SCM), etc.)		☆100 – **160** – 220	★100 – **160** – 220	–	–
	Mold Steel (SKD, etc.)	0.1 – **0.15** – 0.2	☆80 – **140** – 180	★80 – **140** – 180	–	–
	Austenitic Stainless Steel (SUS 304, etc.)	0.1 – **0.15** – 0.2	☆100 – **160** – 200	☆100 – **160** – 200	–	–
	Martensitic Stainless Steel (SUS 403, etc.)		☆150 – **200** – 250	–	–	–
	Precipitation Hardening Stainless Steel (SUS 630, etc.)		★90 – **120** – 150	–	–	–
	Gray Cast Iron (FC)	0.1 – **0.2** – 0.25	–	–	★120 – **180** – 250	–
	Nodular Cast Iron (FCD)	0.1 – **0.15** – 0.2	–	–	★100 – **150** – 200	–
	Ni-Based Heat Resistant Alloy	0.1 – **0.12** – 0.16	☆20 – **30** – 50	–	–	–
SM	Carbon Steel (S xx C)	0.06 – **0.12** – 0.2	☆120 – **180** – 250	☆120 – **180** – 250	–	–
	Alloy Steel (SCM, etc.)		☆100 – **160** – 220	☆100 – **160** – 220	–	–
	Mold Steel (SKD, etc.)	0.06 – **0.08** – 0.15	☆80 – **140** – 180	☆80 – **140** – 180	–	–
	Austenitic Stainless Steel (SUS 304, etc.)	0.06 – **0.12** – 0.2	★100 – **160** – 200	☆100 – **160** – 200	–	–
	Martensitic Stainless Steel		☆150 – **200** – 250	–	–	–
	Precipitation Hardening Stainless Steel (SUS 630, etc.)		☆90 – **120** – 150	–	–	–
	Gray Cast Iron (FC)	0.06 – **0.12** – 0.2	–	–	☆120 – **180** – 250	–
	Nodular Cast Iron (FCD)	0.06 – **0.08** – 0.15	–	–	☆100 – **150** – 200	–
	Ni-Based Heat Resistant Alloy	0.06 – **0.08** – 0.15	★20 – **30** – 50	–	–	–
	Titanium Alloy (Ti -6 Al -4 V)	0.06 – **0.08** – 0.15	★40 – **60** – 80	–	☆40 – **60** – 80	–
GH	Carbon Steel (S × C)	0.15 – **0.2** – 0.3	☆120 – **180** – 250	☆120 – **180** – 250	–	–
	Alloy Steel (SCM, etc.)		☆100 – **160** – 220	☆120 – **160** – 220	–	–
	Mold Steel (SKD, etc.)	0.15 – **0.2** – 0.25	☆80 – **140** – 180	☆80 – **140** – 180	–	–
	Austenitic Stainless Steel (SUS 304, etc.)	0.15 – **0.2** – 0.25	☆100 – **160** – 200	☆100 – **160** – 200	–	–
	Martensitic Stainless Steel (SUS 403, etc.)		☆150 – **200** – 250	–	–	–
	Precipitation Hardening Stainless Steel (SUS 630, etc.)		☆90 – **120** – 150	–	–	–
	Gray Cast Iron (FC)	0.15 – **0.2** – 0.3	–	☆120 – **180** – 250	☆120 – **180** – 250	–
	Nodular Cast Iron (FCD)	0.15 – **0.2** – 0.25	–	☆100 – **150** – 200	☆100 – **150** – 200	–
	Ni-Based Heat Resistant Alloy	0.1 – **0.15** – 0.2	☆20 – **30** – 50	–	–	–
	Hardened Material (60 HRC or less)	0.05 – **0.08** – 0.16	–	–	–	★50 – **80** – 100

The number in bold font is recommended starting 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
When using GH chipbreaker in fine pitch cutters, recommended feed is fz ≦ 0.2 (mm/t).
GH chipbreaker is not recommended for extra fine pitch cutters.

Applicable Inserts

Usage Classification			PR1535	PR1525	PR1510	PR015S
★ : Roughing/1st choice ☆ : Roughing/2nd choice ■ : Finishing/1st choice □ : Finish/2nd choice (When hardness is 45 HRC or less)	P	Carbon Steel / Alloy Steel	☆	★		
		Mold Steel	☆	★		
	M	Austenitic	★	☆		
		Martensitic	★			
		Precipitation Hardening	★			
	K	Gray Cast Iron			★	
		Nodular Cast Iron			★	
	N	Non-ferrous Metal				
	S	Heat-resistant Alloy	★			
		Titanium Alloy	★			
	H	Hardened Material				★

Shape		Description	Dimensions (mm)					MEGACOAT (PVD coating)			
			IC	S	D1	BS	RE	PR1535	PR1525	PR1510	PR015S
 General Use		WNMU 050408EN-GM	8.8	4.2	3.4	0.7	0.8	●	●	●	
 Low Cutting Force		WNMU 050408EN-SM	8.8	4.2	3.4	0.7	0.8	●	●	●	
 Tough Edge		WNMU 050408EN-GH	8.8	4.2	3.4	0.7	0.8	●	●	●	●

● : Standard Stock

PR015S

Long tool life and stable machining for hardened materials

Excellent performance with improved thermal properties and MEGACOAT HARD

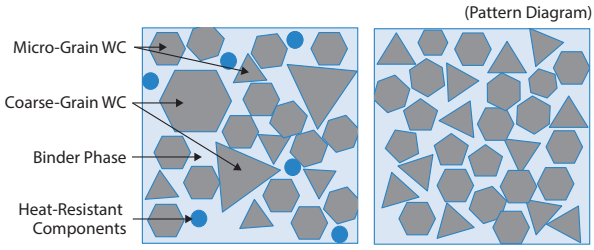
NEW

1 Improvement of Thermal Properties to Reduce Sudden Defects and Boundary Damage in Insert

Improved thermal conductivity by optimum distribution of WC coarse grains (Compared to the previous model)

Resists heat concentration at the cutting edge to promote stable machining

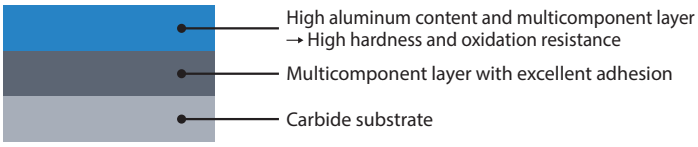
(Pattern Diagram)



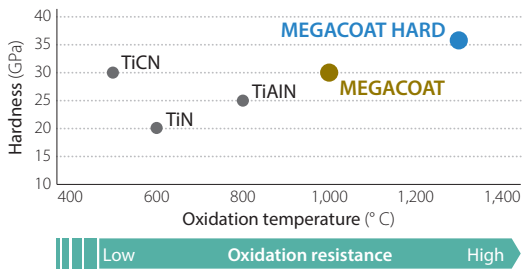
PR015S | Conventional Substrate A

2 Improved wear resistance with MEGACOAT HARD coating

MEGACOAT HARD : High hardness and high heat-resistant PVD layer



Coating Properties (Internal evaluation)



Excellent wear resistance with high-hardness and resists boundary damage with improved thermal properties

Rake Angle (°)	A.R.	R.R.
	(MAX.) +11°	øD = 50 -9° øD = 63 -8° øD = 80-125 -7°

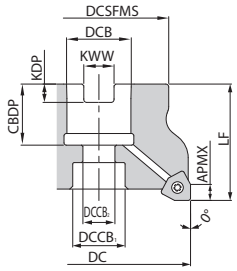


Fig.1

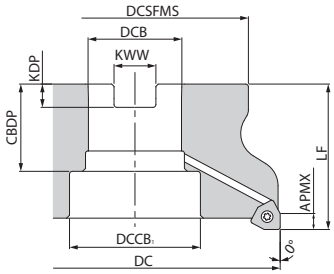


Fig.2

APMX : 5mm

Toolholder Dimensions

Description				Stock	No. of Inserts	Dimensions (mm)									Coolant hole	Shape	Weight (kg)	Max. Revolution (min^{-1})
						DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW				
Bore Dia. Inch spec.	Cross pitch	MFWN	90080R-05-7T	●	7	80	70	25.4	20	13	50	27	6	9.5	Yes	Fig.1	1.3	10,900
			90100R-05-8T	●	8	100	78	31.75	45	-		34	8	12.7	Yes	Fig.2	1.6	9,700
			90125R-05-11T	●	11	125	89	38.1	55		63	38	10	15.9	Yes		2.9	8,700
	Extra cross pitch	MFWN	90080R-05-9T	●	9	80	70	25.4	20	13	50	27	6	9.5	Yes	Fig.1	1.2	10,900
			90100R-05-11T	●	11	100	78	31.75	45	-		34	8	12.7	Yes	Fig.2	1.6	9,700
			90125R-05-14T	●	14	125	89	38.1	55		63	38	10	15.9	Yes		2.8	8,700
Metric spec.	Cross pitch	MFWN	90050R-05-5T-M	●	5	50	48	22	17.5	11	40	21	6.3	10.4	Yes	Fig.1	0.4	13,800
			90063R-05-6T-M	●	6	63			18						Yes		0.5	12,300
			90080R-05-7T-M	●	7	80	70	27	20	13	50	24	7	12.4	Yes		1.2	10,900
			90100R-05-8T-M	●	8	100	78	32	45	-		30	8	14.4	Yes	Fig.2	1.6	9,700
			90125R-05-11T-M	●	11	125	89	40	55		63	33	9	16.4	Yes		2.8	8,700
	Extra cross pitch	MFWN	90050R-05-6T-M	●	6	50	48	22	17.5	11	40	21	6.3	10.4	Yes	Fig.1	0.4	13,800
			90063R-05-7T-M	●	7	63			18						Yes		0.5	12,300
			90080R-05-9T-M	●	9	80	70	27	20	13	50	24	7	12.4	Yes		1.2	10,900
			90100R-05-11T-M	●	11	100	78	32	45	-		30	8	14.4	Yes	Fig.2	1.5	9,700
			90125R-05-14T-M	●	14	125	89	40	55		63	33	9	16.4	Yes		2.7	8,700

Maximum number of revolutions

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 3.
Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.

● : Standard Stock

Parts

Description			Clamp screw	Wrench	Anti-seize compound	Arbor clamp bolt
Cross pitch	MFWN	90050R-05-5T-M	SB-3065TRP	DTPM-8	P-37	HH10×30
		90063R-05-6T-M				HH10×30
		90080R-05-7T(-M)	For clamping insert Tightening torque 1.2 N · m			HH12×35
		90100R-05-8T(-M)				-
		90125R-05-11T(-M)				
Extra cross pitch	MFWN	90050R-05-6T-M	SB-3065TRP	DTPM-8	P-37	HH10×30
		90063R-05-7T-M				HH10×30
		90080R-05-9T(-M)	For clamping insert Tightening torque 1.2 N · m			HH12×35
		90100R-05-11T(-M)				-
		90125R-05-14T(-M)				

Coat anti-seize compound thinly on portion of taper and thread prior to installation.

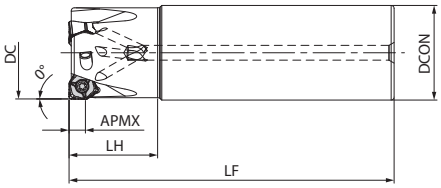


Fig.1

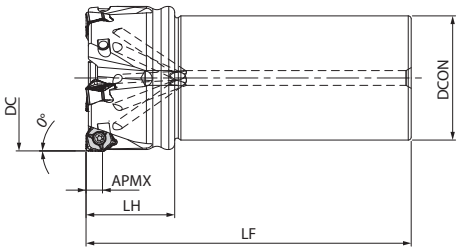


Fig.2

Toolholder Dimensions

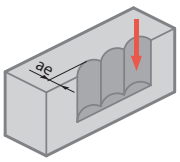
Description		Stock	No. of Inserts	Dimensions (mm)					Rake angle (°)		Coolant hole	Shape	Max. Revolution (min^{-1})	Parts		
				DC	DCON	LF	LH	APMX	A.R. (MAX.)	R.R.				Clamp screw	Wrench	Anti-seize compound
MFWN	90025R-S25-05-2T	●	2	25	25	120	32	5	+11°	-14.5°	Yes	Fig.1	19,500	SB-3065TRP	DTPM-8	P-37
	90032R-S32-05-3T	●	3	32	32	130	40			-12°			17,200			
	90040R-S32-05-4T	●	4	40		150	50			-10°		Fig.2	15,400			
	90050R-S32-05-5T	●	5	50		110	30			-9°			13,800			
	90063R-S32-05-6T	●	6	63						-8°			12,300			
	90080R-S32-05-7T	●	7	80						-7°			10,900			

● : Standard Stock

Caution with Max. Revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 3.
Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.

Vertical Milling (Plunging)



Available for Vertical Milling (Plunging)

Cutting Dia.	Maximum width of cut (ae)
All Description	5 mm

Ramping and helical milling are not recommended due to interference between workpiece and flank face

Applicable Chipbreaker by Cutter Type

Cutter type	Chipbreaker		
	GM	SM	GH
Cross Pitch	○	○	○
Extra Cross Pitch	○	○	△ (fz = 0.2mm/t or less is recommended)

How to mount inserts

1. Completely eliminate chips and dust from the insert mounting side
2. Coat anti-seize compound thinly on portion of taper and thread of clamp screw prior to installation.
   After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the shim seat surface and holder surface (Fig.1)
3. Tighten the wrench in while holding parallel to the clamp screw.
   Recommended tightening torque · · · 1.2 N/m
4. After tightening, check that there is no gap between the contact surface of the insert and the surface of the shim, or between the side surface of insert and the holder surface. If there is a gap, remount the insert using the directions above.

Fig. 1

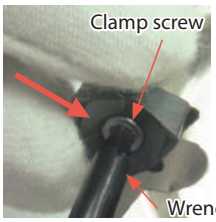
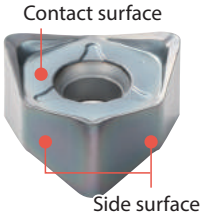


Fig. 2

Fig. 3



90° Cutter 1st Recommendation

Cost-effective Solution with Greater Edge Strength

Low Cutting Force 90° Milling Cutter

MFWN

Economical Double-sided, 6-Edge Inserts with Excellent Fracture Resistance

D.O.C. ap = ~ 5mm

MFWN Mini

MFWN Mini is a great cost-effective solution with excellent versatility

D.O.C. ap = ~ 8mm

MFWN

Large D.O.C.
Excellent fracture resistance

End Mill 1st recommendation

Chatter-Resistant Precision Machining

High-performance End Mill

MEV

New Generation of High Performance, Economical, Multi-functional Milling Cutters

Newly developed vertical triangle inserts with 3 cutting edges

High Performance - Low cutting forces and Higher Rigidity for Excellent Chatter Resistance
Economical - Longer Insert and Holder Tool Life
Multi-functional - Can be Used in Shouldering, Slotting, and Ramping Applications

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CP462 CAT/22.3T2004DNN
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