



# COMPLETE METALWORKING SOLUTIONS

(800) 991-4225

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# MFLN



## Tangential Face Mills for Heavy Milling



### 4-Edged Tangential Inserts for Large Depths of Cut and High Feed Rates

Tough and Reliable 4-edged Inserts for Stable Heavy Milling

Highly Efficient Milling with Large Depths of Cut up to 20 mm and Feed Rates up to 0.016 ipt

Three Different Cutting Lead Angles Available



# MFLN

## 4-Edge Face Mills with Tangential Inserts for Heavy Milling

Tough 4-edge tangential inserts for reliable heavy milling at large D.O.C. and high feed rates  
 Three lead angle options for optimized machining in various applications

### 1 Tough and Reliable Inserts for Stable Heavy Milling

Inserts up to 20mm long offer increased rigidity

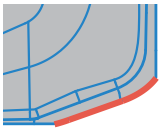
Tangentially mounted inserts provide 2 cutting edges on each side

#### Corner Chamfer

(only available on MFLN90)

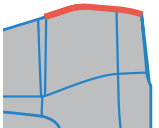
Both general corner-R type and chamfered corner type available

Prevents chattering and insert fracturing



#### Convex cutting edge ridge

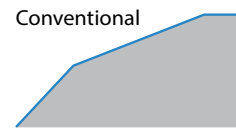
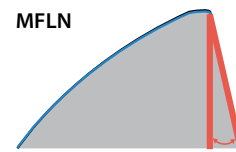
Reduced impact forces when entering the workpiece



#### Obtuse Edge Design

Increases the cutting edge angle only at the tip to maintain both strength and sharpness

Cross-section view of cutting edge



#### Wide Flat Mounting Surface

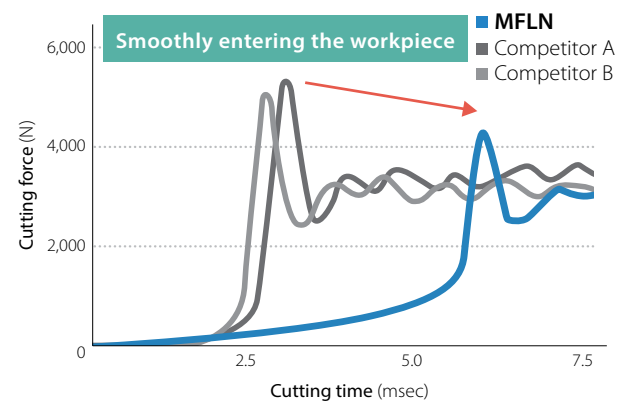
Holds insert firmly in heavy milling applications

### Tangentially mounted inserts increase rigidity



Cutting Forces when Entering the Workpiece (Internal evaluation)

MFLN90 (Insert : Chamfered corner type)



Cutting conditions : Vc = 490 sfm, D.O.C. x ae = 0.197" x 2.95", fz = 0.012 ipt  
 ø125 (1 insert), Dry Workpiece : 1049



## 2 Large D.O.C. and High Feed Rates with 90°, 70°, and 45° Cutting Edge Angles

3 Cutter styles cover a wide variety of machining applications

**MFLN90**  
(Cutting edge angle 90°)



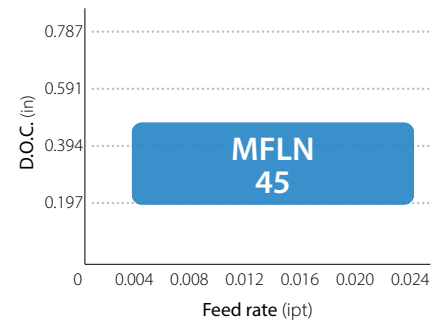
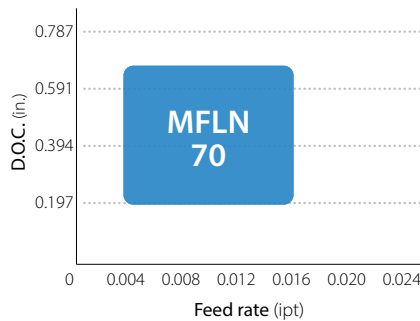
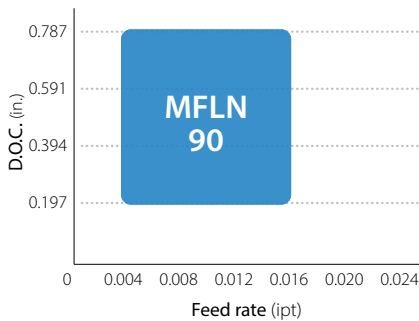
**MFLN70**  
(Cutting edge angle 70°)



**MFLN45**  
(Cutting edge angle 45°)



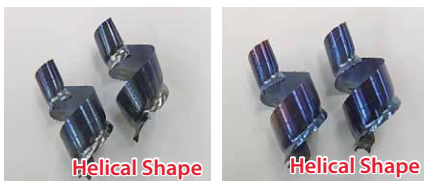
Applicable Range



Chip Comparison (Internal evaluation)

Helix-shaped chips prevent chip recutting and provide stable machining at high feed rates.

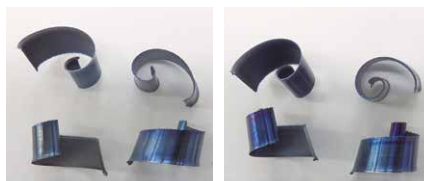
**MFLN90** Stable



Helical Shape  
fz = 0.012 ipt

Helical Shape  
fz = 0.016 ipt

Competitor A Unstable



fz = 0.012 ipt

fz = 0.016 ipt

Competitor B Unstable



fz = 0.012 ipt

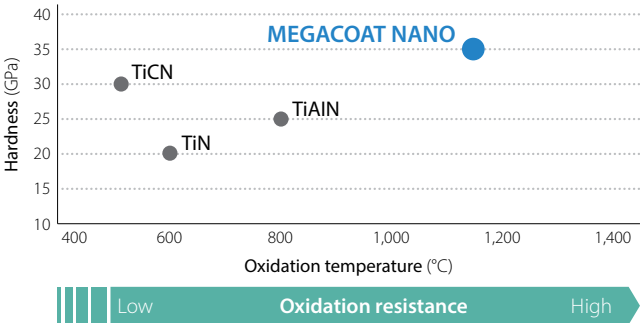
fz = 0.016 ipt

Cutting conditions : Vc = 490 sfm, ap x ae = 0.394" x 3.937", fz = 0.012, 0.016 ipt, ø125mm (1 insert), Dry Workpiece : 1049

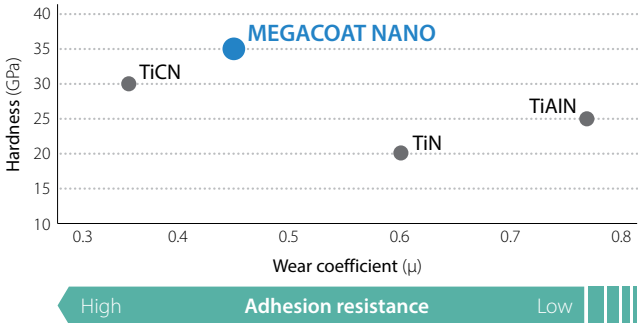
# 3 Stable machining and long tool life with MEGACOAT NANO

"MEGACOAT NANO" coating technology with high hardness (35Gpa) and excellent oxidation resistance (oxidation temperature: 1,150 °C) improves wear resistance and chipping resistance.

Properties of Coating (Wear resistance)



Properties of Coating (Adhesion resistance)



Long tool life with the combination of a tough substrate and a special nano layer coating

Stable machining with excellent wear resistance

- PR1525** : 1st recommendation for wear resistance. Great for scale removal and cast iron machining
- PR1535** : Defect resistant, tough substrate for stable machining

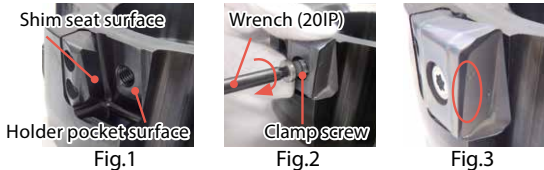


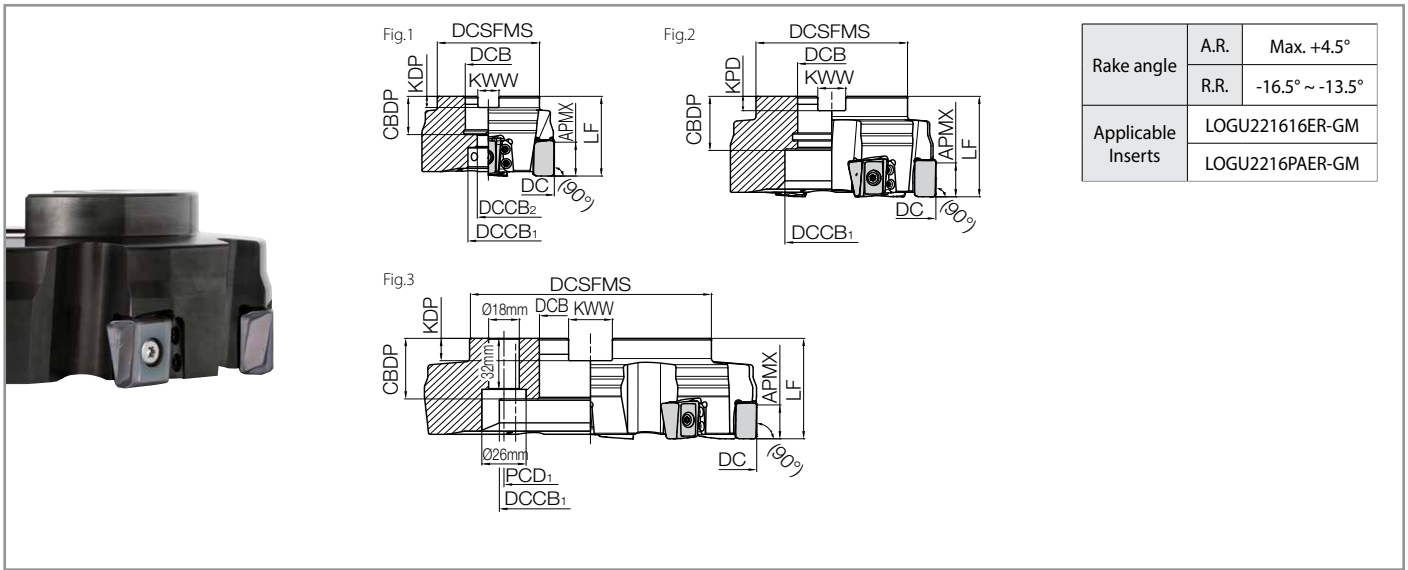
## Insert Description

Insert	Part Number	Dimensions (mm)					MEGACOAT NANO		Applicable Toolholders
		W1	S	D1	INSL	BS	PR1535	PR1525	
		Classification of usage ★ : 1st Recommendation ☆ : 2nd Recommendation		P	Carbon Steel • Alloy Steel	☆	★	MFLN90.. MFLN70.. MFLN45..	
K	Mold Steel	☆	★						
			Gray Cast Iron	☆	★				
			Nodular Cast Iron	☆	★				

## How to mount inserts

1. Completely eliminate chips and dust from the insert mounting side.
2. 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.1,2)
3. Make sure that the identification on the top of the insert is the same in each pocket.(Fig.3)
4. Tighten the wrench (20IP) in while holding parallel to the clamp screw.
5. Tighten the insert clamp screw at an appropriate torque. (Recommended torque: 6.0 N·m)
6. After tightening, check that there is no gap between 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.





Toolholder Dimensions

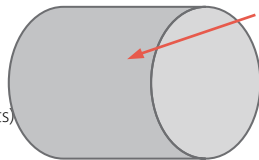
Part Number	Stock	No. of Inserts	Dimensions (mm)											Coolant Hole	Insert	Weight (kg)		
			DC	DCSFMS	DCB	DCCB <sub>1</sub>	DCCB <sub>2</sub>	LF	CBDP	KDP	KWW	APMX	PCD <sub>1</sub>					
Inch Bore Dia.	MFLN 90080R-4T	●	4	80	60	1.000"	24	13	50	1.063"	0.236"	0.375"	20	-	Yes	Fig.1	1.0	
	90100R-4T	●	4	100	70	1.250"	45	50	1.339"	0.315"	0.500"	Fig.2				1.6		
	90125R-6T	●	6	125	89	1.500"	55	63	1.496"	0.394"	0.625"	Fig.2				3.0		
	90160R-7T	●	7	160	110	2.000"	90	-	63	1.496"	0.433"	0.750"			101.6	No	Fig.3	4.6
	90200R-8T	●	8	200	142	1.875"	132	63	1.496"	0.551"	1.000"	7.2						
	90250R-10T	●	10	250	142	1.875"	172	63	1.496"	0.551"	1.000"	10.5						
Metric Bore Dia.	MFLN 90080R-4T-M	●	4	80	60	27	24	13	50	24	7	12.4	20	-	Yes	Fig.1	1.0	
	90100R-4T-M	●	4	100	70	32	45	50	30	8	14.4	Fig.2				1.5		
	90125R-6T-M	●	6	125	89	40	55	63	33	9	16.4	2.9						
	90160R-7T-M	●	7	160	110	40	90	-	63	33	9	16.4			101.6	No	Fig.3	4.5
	90200R-8T-M	●	8	200	142	60	132	63	38	14	25.7	6.9						
	90250R-10T-M	●	10	250	142	60	172	63	38	14	25.7	10.3						

● : Standard Item

Case Study

Roll material, Alloy steel

Vc = 395 sfm  
 D.O.C. = 0.394"  
 fz = 0.011 ipt Dry  
 MFLN90200R-8T-M (ø200mm-8 inserts)  
 LOGU2216PAER-GM PR1525



Chip Removal Volume

**MFLN90**  $v_f = 16.20$  ipm Excellent

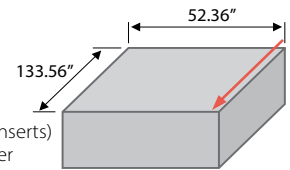
Competitor E  $v_f = 16.20$  ipm

MFLN maintained good cutting edge condition and during scale removal.

(User evaluation)

Machining base FCD600

Vc = 395 sfm  
 D.O.C. = 0.433" x 6.49"  
 fz = 0.025 ipt Dry  
 XMFLN70250R-13T-OH-M (ø250mm-13 Inserts)  
 Fine pitch, internal coolant, custom holder  
 LOGU221616ER-GM PR1525



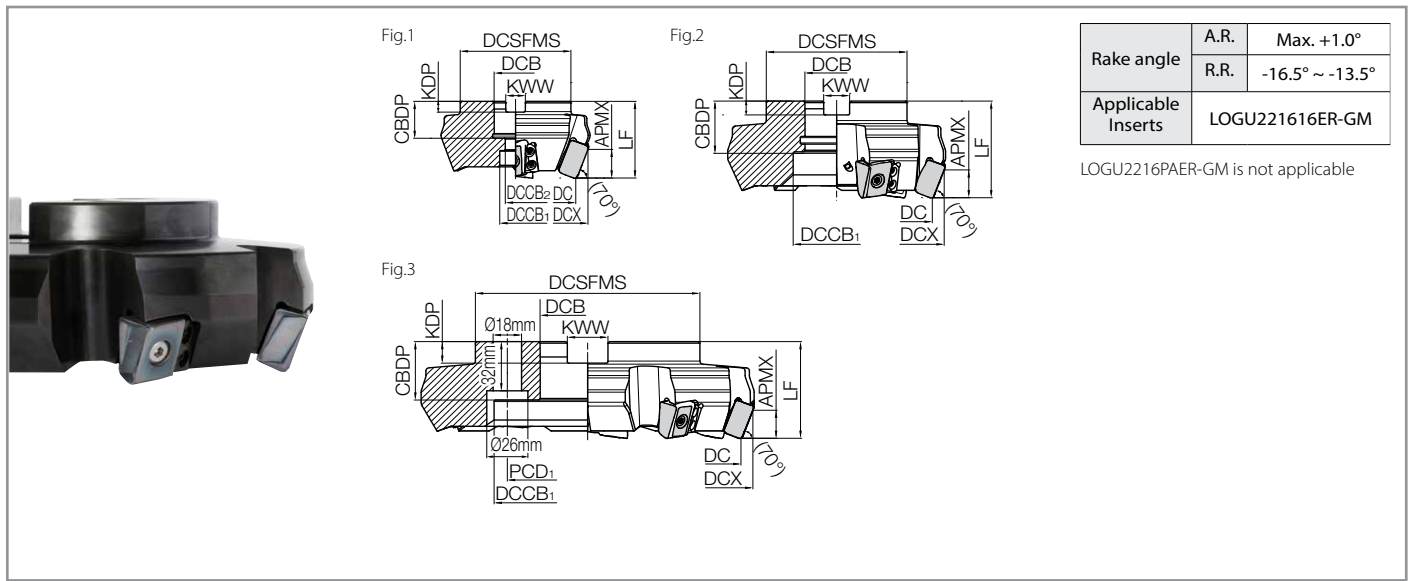
Chip Removal Volume

**MFLN70**  $Q = 2,340$  cc/min Milling Efficiency x1.1

Competitor  $Q = 2,100$  cc/min

MFLN improved machining efficiency with lower cutting force. It can be used for both roughing and finishing applications

(User evaluation)



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (mm)													Coolant Hole	Insert	Weight (kg)
			DC	DCX	DCSFMS	DCB	DCCB <sub>1</sub>	DCCB <sub>2</sub>	LF	CDBP	KDP	KWW	APMX	PCD <sub>1</sub>				
Inch Bore Dia.	MFLN 70080R-4T	●	4	80	93	70	1.000"	20	13	50	1.063"	0.239"	0.375"	17	-	Yes	Fig.1	1.4
	70100R-4T	●	4	100	113	78	1.250"	45	50	1.339"	0.315"	0.500"	Fig.2				2.0	
	70125R-6T	●	6	125	138	89	1.500"	55	-	63	1.496"	0.394"	0.625"	17	-	No	Fig.2	3.5
	70160R-7T	●	7	160	173	110	2.000"	70				0.433"	0.750"				Fig.3	5.8
	70200R-8T	●	8	200	213	142	1.875"	120	-	63	1.496"	0.551"	1.000"	17	101.6	No	Fig.3	8.5
	70250R-10T	●	10	250	263	222		160									160	15.1
Metric Bore Dia.	MFLN 70080R-4T-M	●	4	80	93	70	27	20	13	50	24	7	12.4	17	-	Yes	Fig.1	1.4
	70100R-4T-M	●	4	100	113	78	32	45	50	30	8	14.4	Fig.2				1.9	
	70125R-6T-M	●	6	125	138	89	40	55	-	63	33	9	16.4	17	66.7	No	Fig.3	3.4
	70160R-7T-M	●	7	160	173	110		90									5.3	
	70200R-8T-M	●	8	200	213	142	60	120	-	63	38	14	25.7	17	101.6	No	Fig.3	8.2
	70250R-10T-M	●	10	250	263	222		160									160	14.8

● : Standard Item

### Case Study

#### Forging Die for Automotive Parts

Vc = 295 sfm  
 D.O.C. x ae = ~0.039" x ~3.15"  
 fz = 0.014 ipt Dry  
 MFLN45080R-4T-M (ø80mm-4 Inserts)  
 LOGU221616ER-GM PR1535

Chip Removal Volume

**MFLN45**  
(ø80mm-4 Inserts)

**q=416 cc/min**

**Milling Efficiency**

**x1.2**

Competitor H  
(ø100mm-5 Inserts)

**q=336 cc/min**

MFLN achieved 1.2 times machining efficiency.  
 Quieter machining and good chip shapes

(User evaluation)

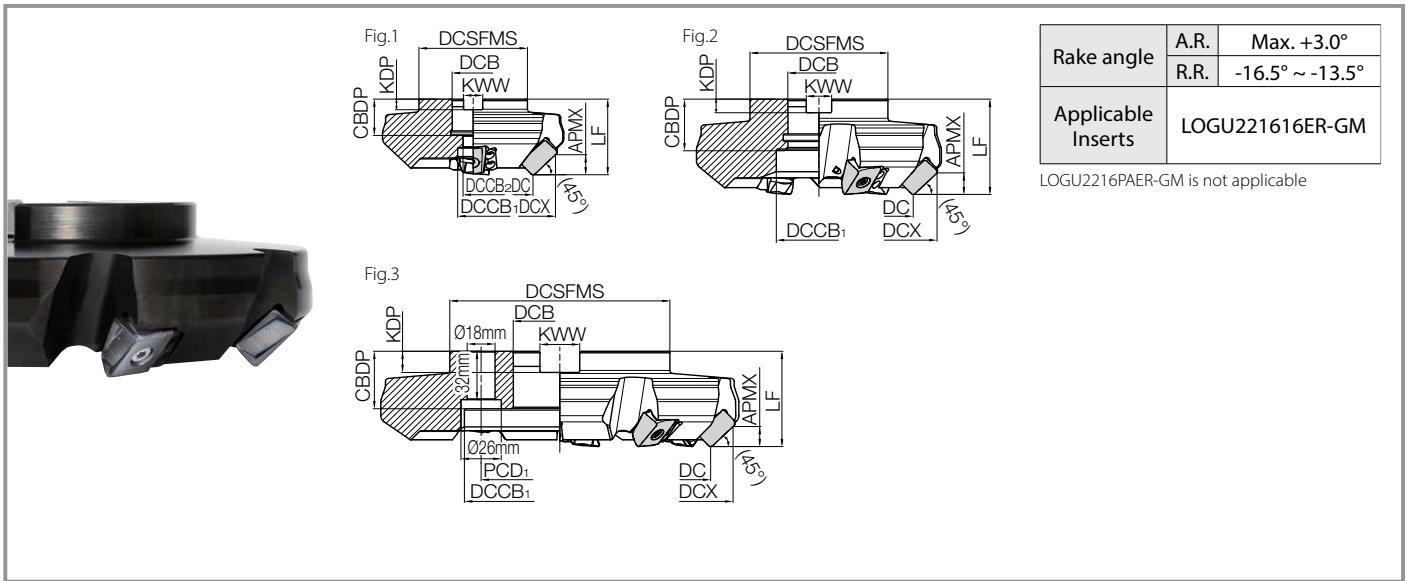
About Applicable Insert

	LOGU221616ER-GM (Corner-R)	LOGU2216PWER-GM (Corner Chamfer)
MFLN 90	✓	✓
MFLN 70	✓	Not applicable
MFLN 45	✓	Not applicable

Max. Revolution (RPM) for Each Cutting Diameter

Cutting Dia. DC (mm)	Max. Revolution (RPM)
ø80	5,970
ø100	4,780
ø125	3,820
ø160	2,990
ø200	2,390
ø250	1,910
ø315	1,520

Common to MFLN90/70/45



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (mm)													Coolant Hole	Insert	Weight (kg)
			DC	DCX	DCSFMS	DCB	DCCB <sub>1</sub>	DCCB <sub>2</sub>	LF	CBDP	KDP	KWW	APMX	PCD <sub>1</sub>				
Inch Bore Dia.	MFLN 45080R-4T	●	4	80	104	70	1.000"	20	13	50	1.063"	0.236"	0.375"	12	-	Yes	Fig.1	2.0
	MFLN 45100R-4T	●	100	124	78	1.250"	45	63	1.339"		0.315"	0.500"	Fig.2				2.7	
	MFLN 45125R-6T	●	125	149	89	1.500"	55		0.394"		0.625"	Fig.2	4.6					
	MFLN 45160R-7T	●	7	160	184	110	2.000"	90	63	1.496"	0.433"	0.750"	101.6		No	Fig.3	10.0	
	MFLN 45200R-8T	●	8	200	224	142	1.875"	124		0.551"	1.000"	17.1						
	MFLN 45250R-10T	●	10	250	274	222	160	160										
Metric Bore Dia.	MFLN 45080R-4T-M	●	4	80	104	70	27	20	13	50	24	7	12.4	12	-	Yes	Fig.1	2.0
	MFLN 45100R-4T-M	●	100	124	78	32	45	63	30		8	14.4	Fig.2				2.7	
	MFLN 45125R-6T-M	●	6	125	149	89	40		55	63	33	9	16.4		66.7	No	Fig.3	4.6
	MFLN 45160R-7T-M	●	7	160	184	110	90	60	38		14	25.7	101.6					No
	MFLN 45200R-8T-M	●	8	200	224	142	124			9.7								
	MFLN 45250R-10T-M	●	10	250	274	222	160	160										

● : Standard Item

Spare Parts

Description	Parts						
	Insert Screw	Wrench	Shim	Clamp Screw	Wrench	Anti-seize Compound	Arbor Bolt
MFLN **080R-4T(-M)							
MFLN **100R-4T(-M)	SB-60200TRP	TTP-20	MAP-2216	SB-40140TR	DTM-15	P-37	HH12X35
MFLN ~	Tightening torque for clamping insert 6.0 N·m		Tightening torque for clamping shim 3.5 N·m				-
MFLN **315R-12T(-M)							

## Recommended Cutting Conditions

★ : 1st Recommendation ☆ : 2nd Recommendation

	Workpiece	D.O.C. (in.)		Feed (fz : ipt)	Recommended Insert Grades (Cutting Speed Vc : sfm)	
		Width of Cut (≤0.5×DC)	Width of Cut (>0.5×DC)		MEGACOAT NANO	
					PR1535	PR1525
MFLN 90	Carbon Steel	~0.709	~0.591	0.004 - <b>0.008</b> - 0.016	☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
	Alloy Steel				☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
	Die Steel				☆ 230 - <b>330</b> - 390	★ 260 - <b>390</b> - 490
	Gray Cast Iron	~0.787	~0.709	0.004 - <b>0.008</b> - 0.016	☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
	Nodular Cast Iron				☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
MFLN 70	Carbon Steel	~0.591	~0.472	0.004 - <b>0.008</b> - 0.016	☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
	Alloy Steel				☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
	Die Steel				☆ 230 - <b>330</b> - 390	★ 260 - <b>390</b> - 490
	Gray Cast Iron	~0.669	~0.591	0.004 - <b>0.008</b> - 0.016	☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
	Nodular Cast Iron				☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
MFLN 45	Carbon Steel	~0.394	~0.315	0.004 - <b>0.012</b> - 0.024	☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
	Alloy Steel				☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
	Die Steel				☆ 230 - <b>330</b> - 390	★ 260 - <b>390</b> - 490
	Gray Cast Iron	~0.474	~0.394	0.004 - <b>0.012</b> - 0.024	☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590
	Nodular Cast Iron				☆ 260 - <b>390</b> - 490	★ 330 - <b>490</b> - 590

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. Dry machining is recommended.

## How to replace the insert shim seat

1. Completely eliminate chips and dust from the shim mounting side.
2. Coat medium strength screw locking adhesive on the screws.
3. Tighten the screw keeping the shim pushed against the pocket surface of toolholder.
4. After tightening both screws temporarily, tighten them with appropriate torque. (Recommended torque:3.5 N·m)
5. Please check that there is no gap between the shim and the pocket surfaces of toolholder.



Fig.1

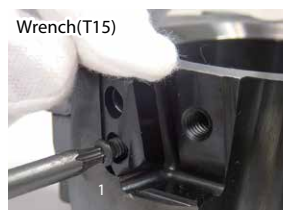


Fig.2



Fig.3



Fig.4



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