

THE NEW VALUE FRONTIER



Cutter for cast iron with adjustable  
cutting edge height

**MFK-SF**

# MFK-SF



High speed and high precision machining of cast iron

High speed multi-edge cutter for cast iron

Adjustable cutting edge height for improved surface roughness

NEW



CBN wiper insert

Cutter for cast iron with adjustable cutting edge height

# MFK-SF

Adjustable cutting edge height for improved surface roughness

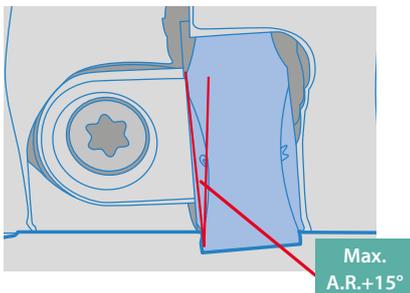
High speed and high precision machining of cast iron

## 1 Adjustable cutting edge height for high precision machining

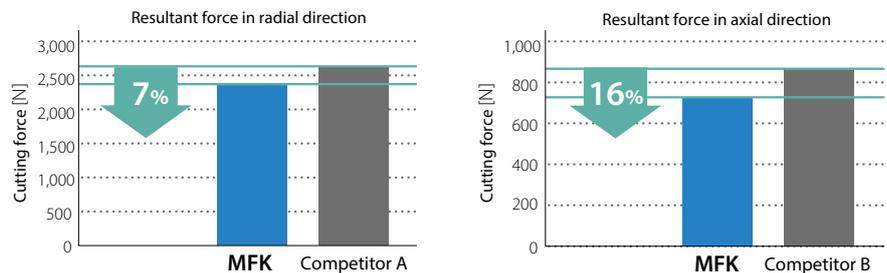
Multi-edge cutter with adjustable cutting edge height. High speed and high precision machining of cast iron by combining ceramic insert and CBN wiper insert.

## 2 Special insert structure designed for high efficiency machining

Low cutting forces with helical cutting edge design

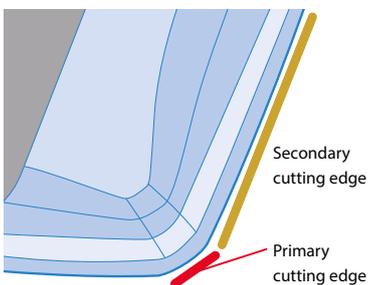


Cutting force comparison (In-house evaluation)

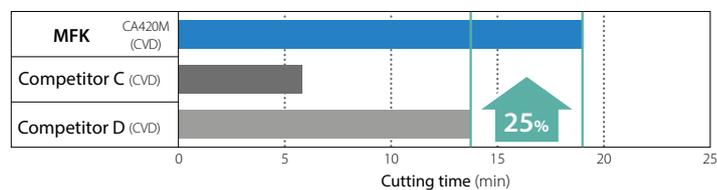


Cutting conditions:  $V_c = 180$  m/min,  $f_z = 0.3$  mm/t,  $a_p \times a_e = 3.0 \times 62$  mm, Dry, Workpiece : GGG60,  $\phi 125$

Tough and reliable dual angle edge design

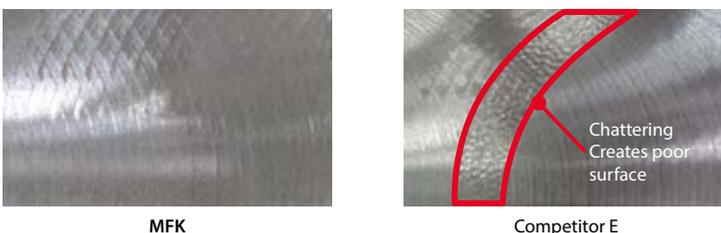


Fracture resistance comparison (In-house evaluation)



Cutting conditions:  $V_c = 300$  m/min,  $f_z = 0.5$  mm/t,  $a_p = 2.0$  mm, wet, workpiece: 450-10S (4 bores)

Surface finish comparison (In-house evaluation)



Cutting conditions:  $V_c = 180$  m/min,  $f_z = 0.3$  mm/t,  $a_p \times a_e = 3 \times 78$  mm, dry, workpiece: GGG60

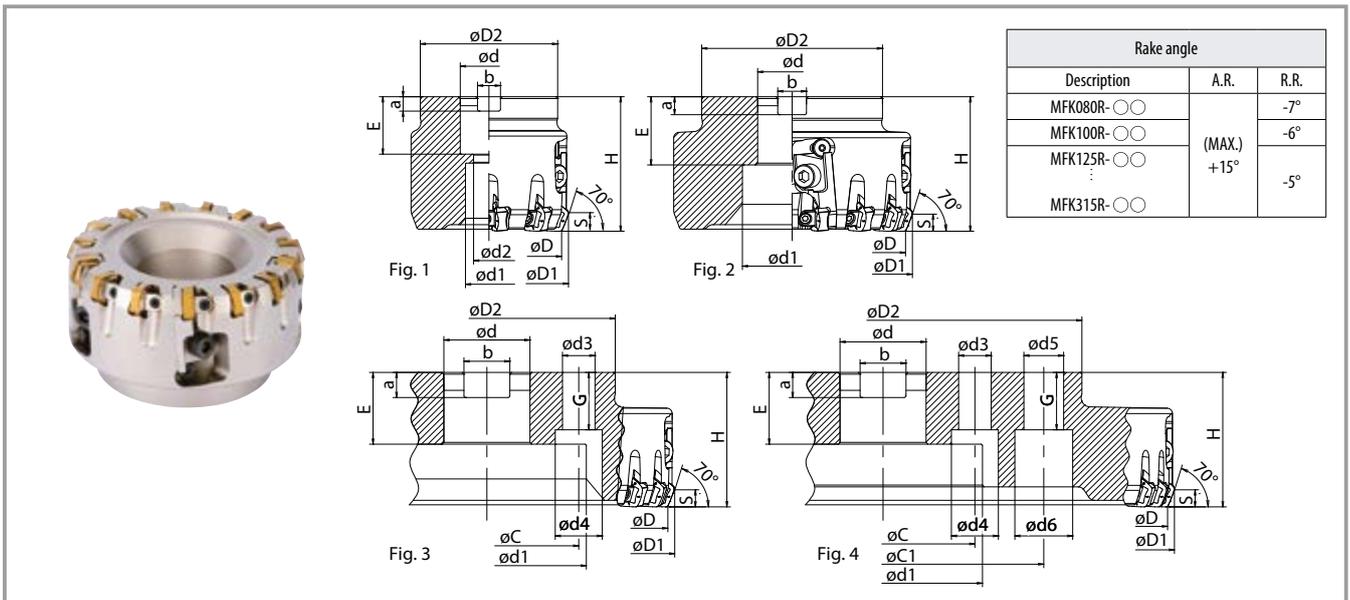
Burr comparison (In-house evaluation)

Sharp cutting prevents burr formation



← Cutting direction

# MFK-SF face mill



## Toolholder dimensions

Description	Availability	No. of inserts	* Dimensions (mm)																	Drawing	Weight (kg)			
			øD	øD1	øD2	ød	ød1	ød2	H	E	a	b	s	ød3	ød4	ød5	ød6	øC	øC1			G		
MFK080R-11-9T-M-SF	●	9(3)	80	89	76	27	20	13	75	24	7	12.4	6.0	-	-	-	-	-	-	-	Fig. 1	2.21		
MFK100R-11-12T-M-SF	●	12(4)	100	109	96	32	26	17		28	8	14.4											14	20
MFK125R-11-15T-M-SF	●	15(5)	125	134	100	40	55	-	75	33	9	16.4	6.0	14	20	-	-	-	-	-	-	Fig. 3	6.99	
MFK160R-11-18T-M-SF	●	18(6)	160	169																				60
MFK200R-11-24T-M-SF	●	24(8)	200	209	142	60	110	-	75	35	14	25.7	6.0	18	26	22	32	-	-	-	-	-	Fig. 3	16.35
MFK250R-11-30T-M-SF	●	30(10)	250	259																				
MFK315R-11-39T-M-SF	●	39(13)	315	324	220																		Fig. 4	28.14

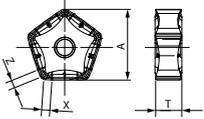
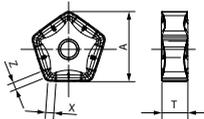
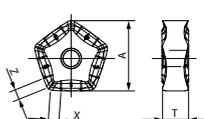
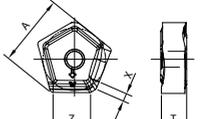
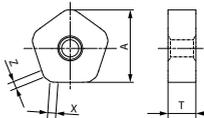
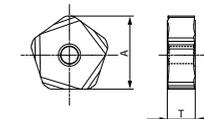
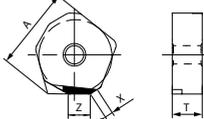
\* Numbers in parentheses ( ) are the number of adjustable cutting edge pockets  
Please install wiper inserts in the adjustable cutting edge pockets.

● : Available

## Spare parts

Description	Spare parts							
	Wedge	Wedge screw	Wrench	Cartridge	Cartridge clamp screw	Wrench	Adjustment screw	Mounting bolt
MFK080R-11-9T-SF	C09N	W6X18N	TT-15	CR-MFK70R	HH8X25	LW-6	AJ-519TR	HH16X40
MFK100R-11-12T-SF								-
MFK125R-11-15T-SF								
MFK160R-11-18T-SF								
MFK200R-11-24T-SF								
MFK250R-11-30T-SF								
MFK315R-11-39T-SF								
MFK080R-11-9T-M-SF	C09N	W6X18N	TT-15	CR-MFK70R	HH8X25	LW-6	AJ-519TR	HH12X35
MFK100R-11-12T-M-SF								HH16X40
MFK125R-11-15T-M-SF								-
MFK160R-11-18T-M-SF								
MFK200R-11-24T-M-SF								
MFK250R-11-30T-M-SF								
MFK315R-11-39T-M-SF								

# Applicable inserts

Insert		Description	Dimensions (mm)				CVD Coated Carbide	MEGACOAT NANO		Silicon Nitride Ceramic	CVD Silicon Nitride Ceramic	CBN
			A	T	X	Z		PR1510	PR1525			
		PNMG1106XNEN-GM	17.23	6.35	2.0	2.0	●	●	●	—	—	—
General use												
		PNMG1106XNEN-GH	17.23	6.35	2.0	2.0	●	●	●	—	—	—
Tough edge												
		PNEG1106XNEN-GL	17.18	6.35	2.6	2.6	●	●	●	—	—	—
Surface finish oriented												
		PNEG1106XNER-W	18.02	6.35	2.0	10.0	●	●	●	—	—	—
Wiper insert (2-edge)												
		PNEA1106XNTN-T01020	16.94	6.5	1.5	1.5	—	—	—	●	●	—
High speed												
		PNEG1106XNTR-T00515	17.07	6.35	—	—	—	—	—	●	●	—
High speed (with chipbreaker)												
		PNEG1106XNTR-T01015W	18.06	6.5	1.7	4.8	—	—	—	—	—	●
Wiper insert (2-edge)												

● : Available

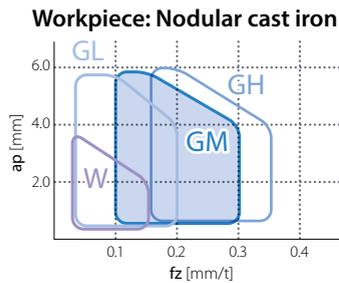
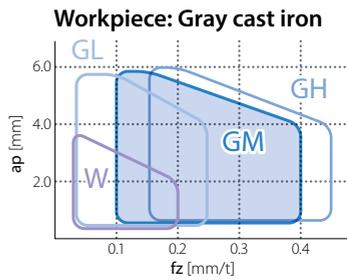
PNEG1106XNER-W Inserts are sold in 5 piece boxes

PNEG1106XNTR-T01015W Inserts are sold in 1 piece boxes

## Recommended conditions ★ 1st recommendation ☆ 2nd recommendation

Workpiece material	Insert grade	Cutting speed Vc (m/min)	Chipbreaker	Feed per tooth fz (mm/t)				
				0.06	0.1	0.2	0.3	0.4
Gray cast iron	CA420M	170-230-300	GM ★			● 0.25		
	PR1510	120-180-250	GH ☆				● 0.3	
	PR1525		GL		● 0.12			
Nodular cast iron	CA420M	150-200-250	GM ★			● 0.2		
	PR1510	100-150-200	GH ☆				● 0.25	
	PR1525		GL		● 0.1			

## Recommended application range



Notes:

- When using W (wiper), please use together with GM or GH. (Not recommended for use with GL)
- When using wiper, do not exceed  $fz = 0.2$  or insert corner may be damaged. The main cutting edge of W (wiper) insert is receding from that of GM and GH. Therefore, the feed rate for the insert next to W (wiper) is double that of other inserts.

## Recommended conditions (Ceramic / CBN) ★ 1st recommendation ☆ 2nd recommendation

### Without chipbreaker

Workpiece material	Insert grade	Cutting speed Vc (m/min)	Edge preparation	Feed per tooth fz (mm/t)				
				0.05	0.1	0.2	0.3	0.4
Gray cast iron	KS6050 ★ CS7050 ☆	600-900-1,200	0.10 × 20°		● 0.1			
Nodular cast iron	KS6050 ☆ CS7050 ★	400-600-900						

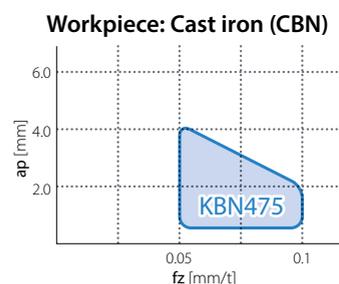
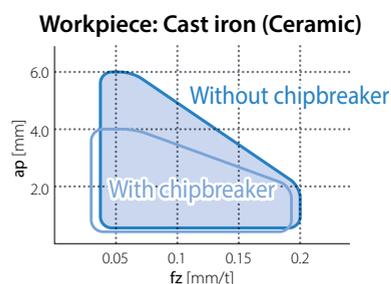
### With chipbreaker

Workpiece material	Insert grade	Cutting speed Vc (m/min)	Edge preparation	Feed per tooth fz (mm/t)				
				0.06	0.1	0.2	0.3	0.4
Gray cast iron	KS6050 ★ CS7050 ☆	600-900-1,200	0.05 × 15°		● 0.1			
Nodular cast iron	KS6050 ☆ CS7050 ★	400-600-900						

### CBN wiper insert

Workpiece material	Insert grade	Cutting speed Vc (m/min)	Edge preparation	Feed per tooth fz (mm/t)				
				0.05	0.1	0.2	0.3	0.4
Gray cast iron	KBN475	600-900-1,200	0.10 × 15°		● 0.1			
Nodular cast iron		400-600-900						

## Recommended application range (Ceramic / CBN)

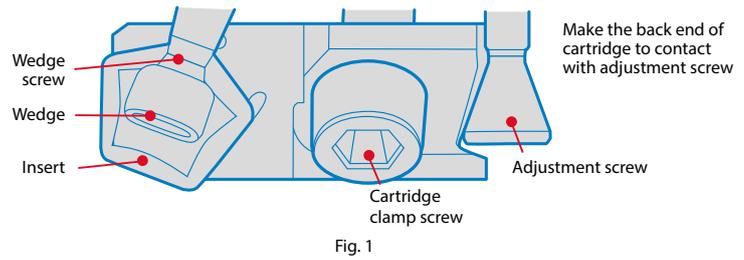


When Using CBN wiper inserts

- Please use CBN wiper inserts together with ceramic inserts. Feed rate should be under  $fz = 0.1$  mm/t.
- The main cutting edge of CBN wiper insert is slightly higher than that of ceramic inserts. Therefore, the feed rate for the inserts next to CBN wiper inserts is double that of other inserts.

# How to adjust cutting edge height

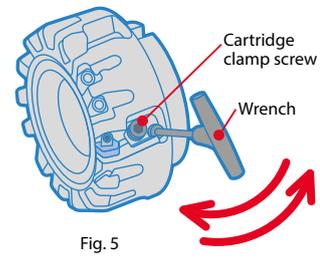
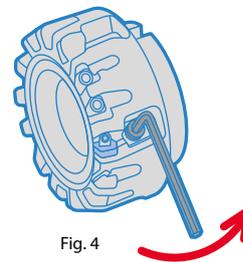
1. Assemble all related parts into the cutter.
2. Make sure the back end of cartridge makes contact with adjustment screw (Fig. 1), and pull them lightly inwards (Fig. 2).  
Tighten the cartridge clamp screw temporary.



3. Install the insert (Fig. 3), and tighten the wedge screw temporary.  
Temporarily tighten the screw with a 40 to 45 degree rotation after the wedge contacts the insert.



4. Loosen the cartridge clamp screw (Fig. 4).
5. Adjust the extruding amount with adjustment screw (Fig. 5).
6. Tighten the wedge screw and firmly fix the insert.  
(Recommended tightening torque: 6 Nm)
7. Tighten the cartridge clamp screw firmly.  
(Recommended tightening torque: 10 Nm)



## Notes

1. Follow steps 1-7 above for adjustment.
2. To adjust the edge height adjust the wedge screw and loosen the cartridge clamp screw.  
Tightening the adjustment screw with the clamp screw fixed firmly may damage the adjustment screw.
3. The adjusted edge height difference must be within 5  $\mu\text{m}$ .