



# MEF

## High Efficiency Bolt Countersink End Mill

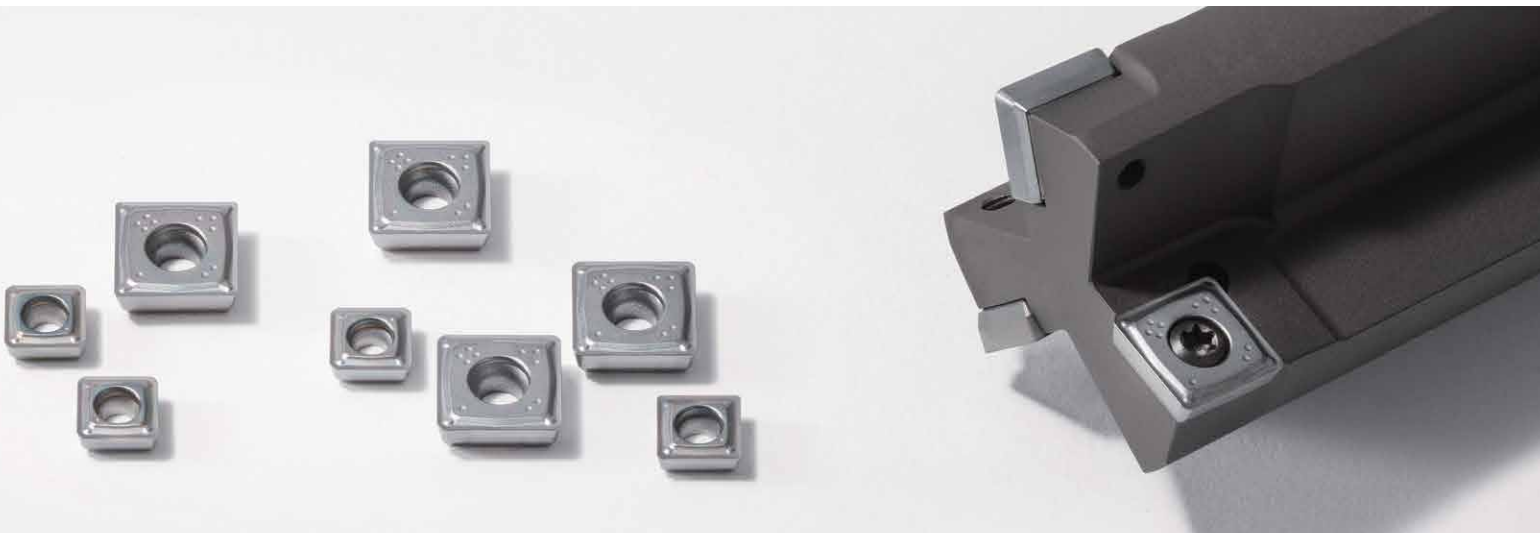
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### High Efficiency and Stable Machining Performance

For countersinking and boring of bolts with hexagon holes (M6 to M30)

Economical inserts with 4 cutting edges

New GM chipbreaker provides low cutting force and superior chip control

New grade PR18 series MEGACOAT NANO EX extends tool life

Custom-made varieties available for various applications



# MEF

High Efficiency Bolt Countersink End Mill

For countersinking and boring of bolts with hexagon holes (M6 to M30)

Economical inserts with 4 cutting edges

## 1 New GM chipbreaker provides high-efficiency and stable machining

Excellent chip control for a wide range of machining. Provides stable machining with a low cutting force design

NEW



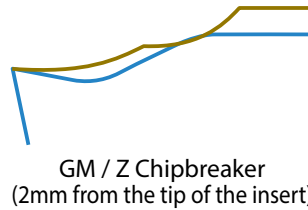
General Purpose  
1st Recommendation

GM Chipbreaker



Tough edge

Z Chipbreaker



GM / Z Chipbreaker  
(2mm from the tip of the insert)

### Conventional Challenges

- Poor chip evacuation can lead to entanglement.
- Feed rate cannot increase due to high cutting force.
- Chatter occurs when deep hole making.

### GM Chipbreaker



Variable chipbreaker width  
considering speed difference  
of inner and outer periphery  
⇒ Stable chip control at high D.O.C.

Bump at corners  
⇒ Stable chip control  
at low D.O.C.

### Chip samples by GM chipbreaker

Case1	Vc = 390 sfm fz = 0.004 ipt	D.O.C. = 0.177" ø26mm 1045	Case2	Vc = 260 sfm fz = 0.006 ipt	D.O.C. = 0.138" ø30mm 1045
0.394"					
Case3	Vc = 390 sfm fz = 0.004 ipt	D.O.C. = 0.039" ø26mm 1049	Case4	Vc = 390 sfm fz = 0.006 ipt	D.O.C. = 0.039" ø26mm 1049

Achieves excellent chip control under various machining conditions  
(User/internal evaluation)

## 2 New Grade PR18 series Provides extended tool life

NEW

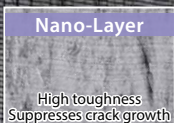


**MEGACOAT**  
NANO EX | Milling

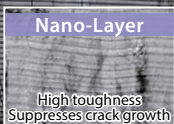
Double lamination technology  
maintains longer tool life

Multi-layer structure with two unique nano layers  
Superior abrasion resistance and fracture resistance

### Special Nano Layer x Multilayer Lamination



AlCr-based coating  
with excellent abrasion resistance



AlTi-based coating  
with excellent heat resistance

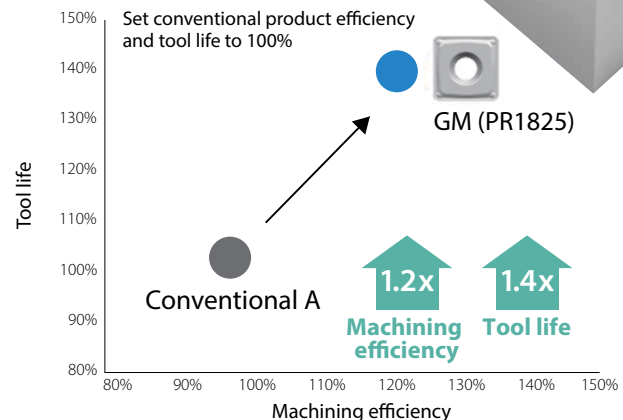
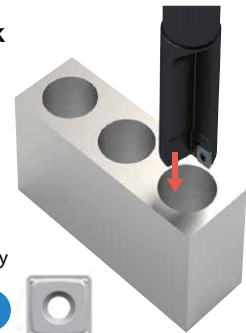
Multi-layering of high-performance nano layers  
Increases toughness with the suppression of crack growth  
and optimization of internal stress

CG Image

### Case study

#### Alloy Steel / Copper Alloy Block



Vc = 330 sfm  
D.O.C. x H = 0.032" x 2.953"  
Vf = 8.858 ipm  
Wet (Internal and external)  
SPMT090308EN-GM PR1825  
Custom-made toolholder



GM chipbreaker (PR1825) provided stable machining with increased cutting speed and feed rate. Reduced chip clogging and extended tool life.

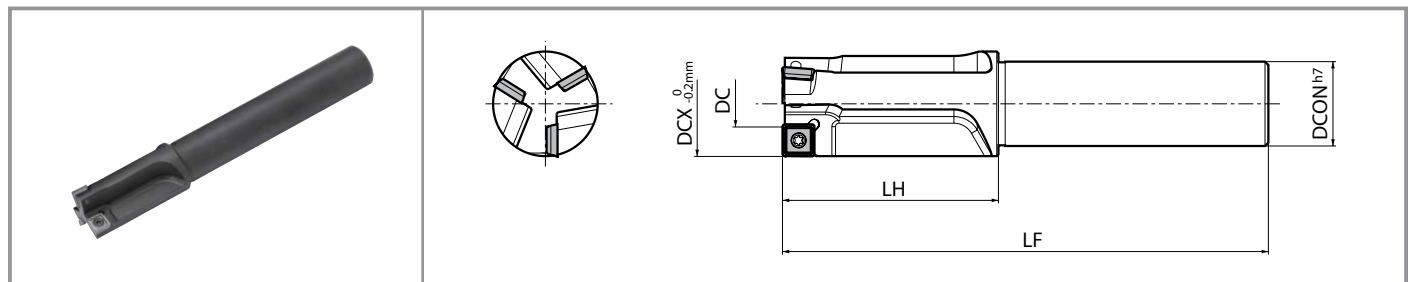
(User evaluation)

# Applicable Inserts

Shape	Description	Dimensions (in)				Angle (°)	Carbide				Applicable Toolholder
		IC	S	D1	RE		MEGACOAT NANO EX (PVD)			Carbide	
						PR1825	PR1835	PR1810	KW10		
 General Purpose	SPMT 060204EN-GM	6.35	2.38	2.5	0.4	11	●	●	●	-	MEF(11~25)-S..
	060208EN-GM				0.8		●	●	●	-	
	SPMT 090304EN-GM	9.525	3.18	3.4	0.4	11	●	●	●	-	MEF(26~48)-S..
	090308EN-GM				0.8		●	●	●	-	
 Tough Edge	SPMT 060204E-Z	6.35	2.38	2.5	0.4	11	●	-	●	●	MEF(11~25)-S..
	060208E-Z				0.8		●	-	●	●	
	SPMT 090304E-Z	9.525	3.18	3.4	0.4	11	●	-	●	●	MEF(26~48)-S..
	090308E-Z				0.8		●	-	●	●	

● : Standard Stock

## MEF Toolholder



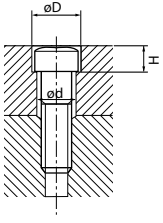
## Toolholder Dimensions

Description	Stock	Number of Inserts	Dimensions (in)					Standard Corner-R (RE)	A.R. (°)	R.R. (°)	Objective Bolt Size	Coolant Hole	Parts		Applicable insert
			DC	DCX	DCON	LF	LH						Clamp Screw	Wrench	
MEF 11-S10	●	1	3	11	10	103	23	0.4	+5	-13	M6	No	SB-2250TR	DT-7	SPMT060204EN-GM SPMT060208EN-GM SPMT060204E-Z SPMT060208E-Z
			4.5	14	12	108	28								
	●	2	7.3	17.5	16	115	35								
			7.7	18		117	38								
	●	3	9.5	20	20	120	40								
			11.4	22		124	44								
			12.4	23		126	46								
			13.4	24		128	48								
MEF 26-S25	●	3	9.8	26	25	132	52	0.8	+5	-13	M16	No	SB-3080TR	DT-10	SPMT090304EN-GM SPMT090308EN-GM SPMT090304E-Z SPMT090308E-Z
			10.6	27		134	54								
	●	4	11.5	28	32	136	56								
			12.6	29		138	58								
	●	4	13.5	30	32	140	60								
			15.5	32		144	64								
			18.4	35		150	70								
			22.5	39		158	78								
●	4	26.2	43	32	166	86									
		31.3	48		176	96									

MEF11 only has DC = 3.0mm regardless of corner-R (RE).

● : Standard Stock

## Bolt Countersink (Hexagon socket head cap screw)



Nominal Screw Size	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
øD (mm)	11	14	17.5	20	23	26	29	32	35	39	43	48
H (mm)	6.5	8.6	10.8	13	15.2	17.5	19.5	21.5	23.5	25.5	29	32
ød (mm)	6.6	9	11	14	16	18	20	22	24	26	30	33
Applicable End Mill	MEF11	MEF14	MEF17	MEF20	MEF23	MEF26	MEF29	MEF32	MEF35	MEF39	MEF43	MEF48

## Recommended Cutting Conditions ★:1st Recommendation ☆:2nd Recommendation

Workpiece Material	fz (ipt)	Recommended insert grade (Vc : sfm)			
		MEGACOAT NANO EX			Carbide
		PR1825	PR1835	PR1810	KW10
Carbon Steel	0.004	★ 390 – 590 – 720	☆ 390 – 590 – 720	–	–
Alloy Steel	0.004	★ 390 – 590 – 720	☆ 390 – 590 – 720	–	–
Mold Steel	0.002 – 0.003 – 0.004	★ 330 – 490 – 590	☆ 330 – 490 – 590	–	–
Stainless Steel	0.002 – 0.003 – 0.004	–	★ 260 – 390 – 590	–	–
Cast Iron	0.004 – 0.006	–	–	★ 330 – 590 – 720	☆ 260 – 330 – 390
Non-ferrous Metal	0.004 – 0.006	–	–	–	★ 330 – 660 – 980

For more details on points at bolt countersinking and other cautions, see the KYOCERA general product catalog.

## Custom-Made Toolholders

### Custom-made according to the application

We offer custom-made tools to meet your various needs. Please contact your local sales representative for details.

### Custom-made example

- Customizable: Machining diameter / Number of inserts / Internal coolant
- Customized for machining applications such as simultaneous chamfering and multi-stage machining.



### KYOCERA Precision Tools

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