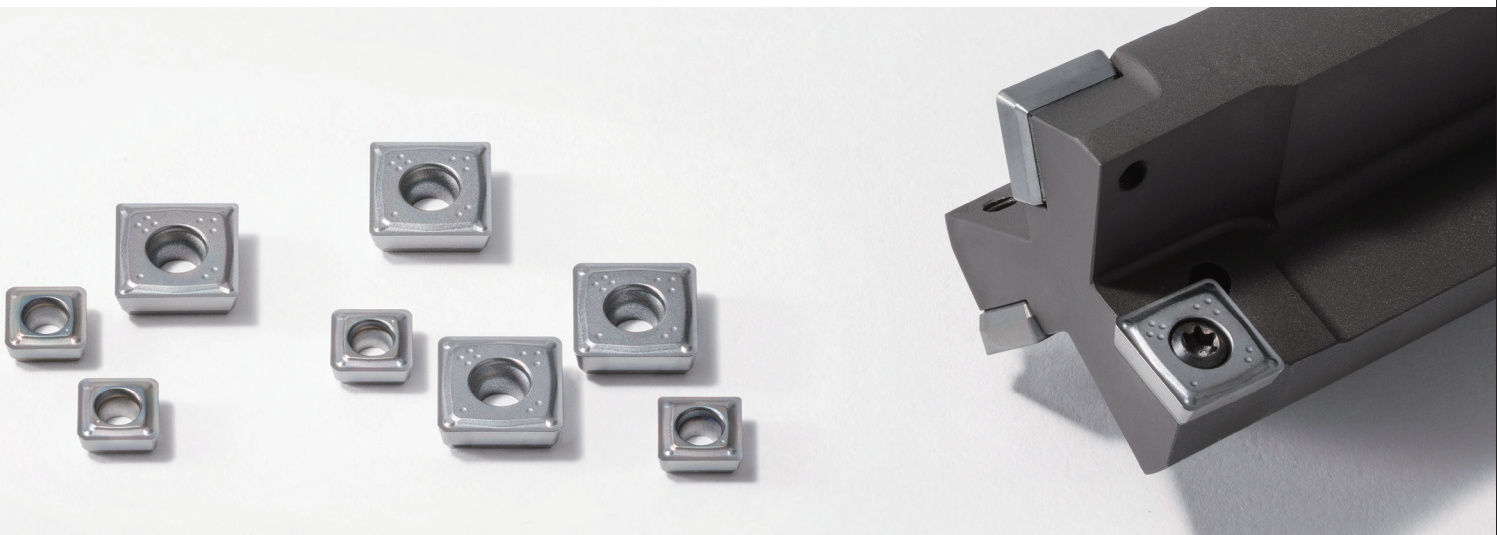


High Efficiency Bolt Countersink End Mill

MEF**Expanded Offering**

Solve countersink machining challenges. New chipbreaker provides high efficiency and stable machining

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

Can be custom-made for various applications



High Efficiency Bolt Countersink End Mill

MEF

Expanded Offering

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

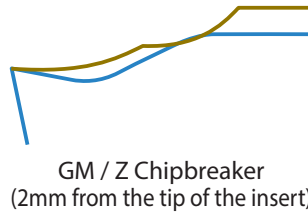
NEW



General Purpose
1st Recommendation
GM Chipbreaker



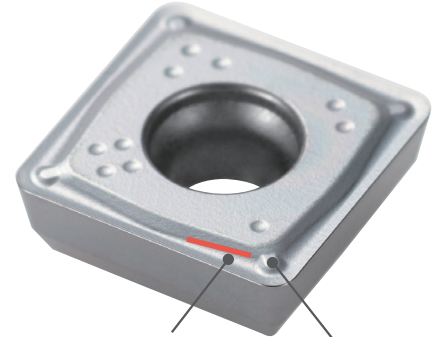
Tough edge
Z Chipbreaker



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 = 120 m/min fz = 0.10 mm/t	ap = 4.5 mm ø26 S45C	Case2	Vc = 80m/min fz = 0.15 mm/t	ap = 3.5 mm ø30 S45C
Case3	Vc = 120 m/min fz = 0.10 mm/t	ap = 1.0 mm ø26 S50C	Case4	Vc = 120 m/min fz = 0.15 mm/t	ap = 1.0 mm ø26 S50C

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

Nano-Layer
AlCr-based coating with excellent abrasion resistance
High toughness
Suppresses crack growth

Nano-Layer
AlTi-based coating with excellent heat resistance
High toughness
Suppresses crack growth

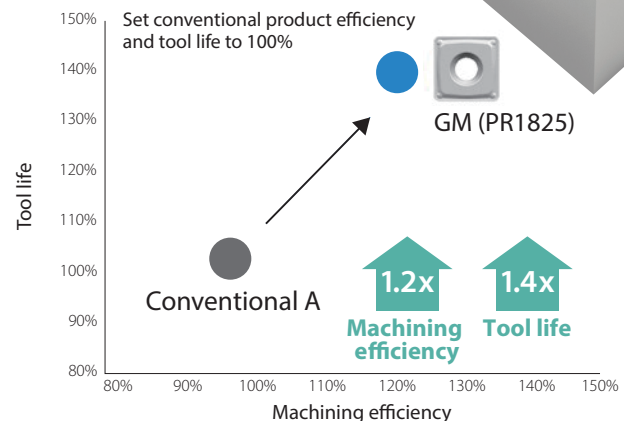
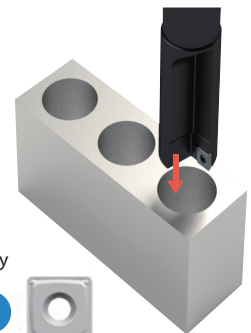
Multi-layering of high-performance nano layers
Increases toughness with the suppression of crack growth and optimization of internal stress

CG Image

Case study

Alloy Steel/Copper Alloy Block



Vc = 100m/min
ap x H = 0.8x75mm
Vf = 225mm/min
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.

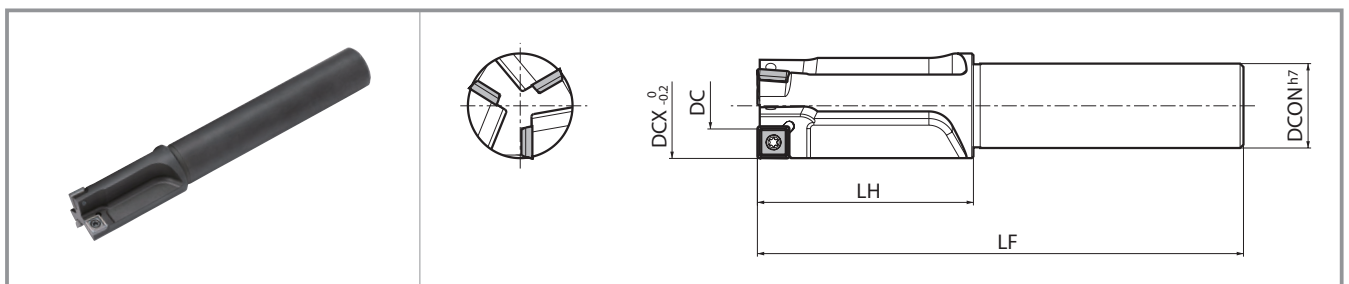
(User evaluation)

Applicable insert

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..	
	SPMT 060208EN-GM				0.8		●	●	●	-		
	SPMT 090304EN-GM	9.525	3.18	3.4	0.4	11	●	●	●	-		MEF(26~48)-S..
	SPMT 090308EN-GM				0.8		●	●	●	-		
 Tough edge	SPMT 060204E-Z	6.35	2.38	2.5	0.4	11	●	-	●	●	MEF(11~25)-S..	
	SPMT 060208E-Z				0.8		●	-	●	●		
	SPMT 090304E-Z	9.525	3.18	3.4	0.4	11	●	-	●	●	MEF(26~48)-S..	
	SPMT 090308E-Z				0.8		●	-	●	●		

● : Standard stock

Toolholder dimensions



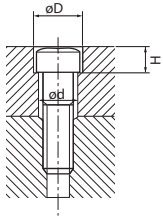
Toolholder dimensions

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				M8				
	●	2	7.3	17.5	16	115	35				M10				
	●		7.7	18		117	38				-				
	●	3	9.5	20	20	120	40				M12				
	●		11.4	22		124	44				-				
	●		12.4	23		126	46				M14				
	●		13.4	24		128	48				-				
	●		14.4	25		130	50				-				
MEF 26-S25	●	3	9.8	26	25	132	52	0.8	+5	-13	No	SB-3080TR	DT-10	SPMT090304EN-GM SPMT090308EN-GM SPMT090304E-Z SPMT090308E-Z	
	●		10.6	27		134	54								-
	●		11.5	28		136	56								-
	●	4	12.6	29	32	138	58								M18
	●		13.5	30		140	60								-
	●		15.5	32		144	64								M20
	●		18.4	35		150	70								M22
	●		22.5	39		158	78								M24
	●		26.2	43		166	86								M27
	●	4	31.3	48	176	96	M30								

MEF11 only has DC=3.0 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(mm/t)	Recommended insert grade (Vc:m/min)			
		MEGACOAT NANO EX			Carbide
		PR1825	PR1835	PR1810	KW10
Carbon steel	0.1 – 0.12 – 0.15	★ 120 – 180 – 220	☆ 120 – 180 – 220	–	–
Alloy steel	0.1 – 0.12 – 0.15	★ 120 – 180 – 220	☆ 120 – 180 – 220	–	–
Mold steel	0.05 – 0.08 – 0.1	★ 100 – 150 – 180	☆ 100 – 150 – 180	–	–
Stainless Steel	0.05 – 0.08 – 0.1	–	★ 80 – 120 – 180	–	–
Cast iron	0.1 – 0.15 – 0.2	–	–	★ 100 – 180 – 220	☆ 80 – 100 – 120
Non-ferrous metal	0.1 – 0.15 – 0.2	–	–	–	★ 100 – 200 – 300

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

About 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.

