KYOCERA

MB45

45° General Purpose Milling Series

Durable and Versatile High Performance Milling Series

Delivers the low cutting force benefits of positive inserts and the fracture resistance benefits of negative inserts, and provides excellent surface finish

Next-generation PR18 Series PVD coating for milling drastically extends tool life

Extended lineup of inserts and grades supports a wide variety of machining applications, including steel, stainless steel, cast iron, aluminum alloys, and heat-resistant alloys

MB45

45° General Purpose Milling Series

Provides high quality and high performance machining solutions with long tool life

Delivers the low cutting force benefits of positive inserts and the fracture resistance benefits of negative inserts, and provides excellent surface finish

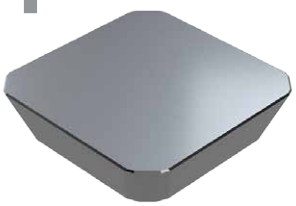
Product Video

Extreme versatility

General-purpose milling cutters must strike a balance between quality, performance, long tool life, economy, and versatility to effectively handle a wide range of machining tasks.

The MB45 achieves all these qualities without compromise. These next-generation cutters are durable, ensuring reliability whether used for general machining applications or for discovering innovative machining solutions.

01



ISO Standard
SEKN Type
(No breaker)

02

Positive (Single-sided) Type

Advantage

Low cutting force

Excellent finished surface and machining accuracy

03

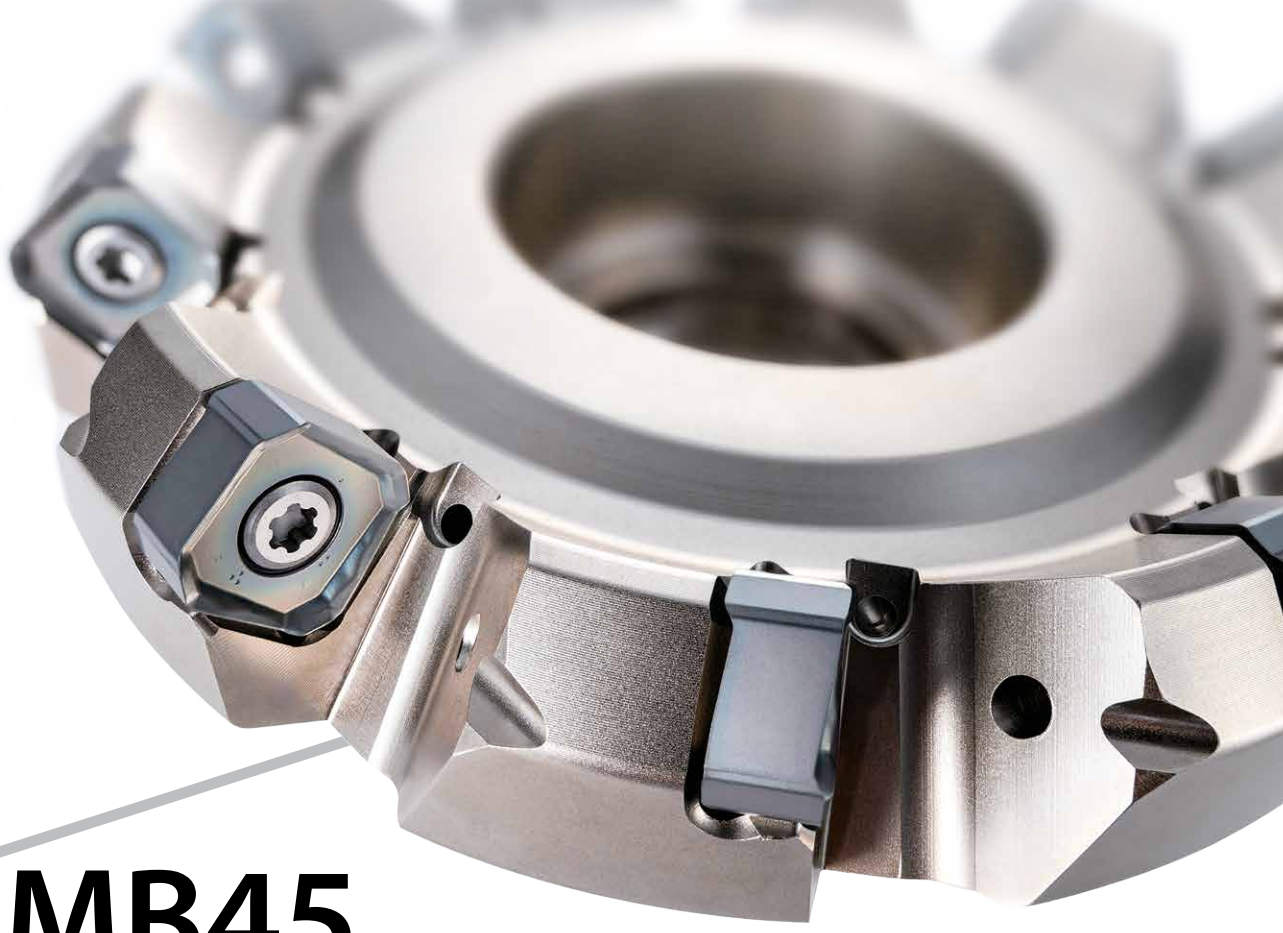
Negative (Double-sided) Type

Advantage

Excellent fracture resistance

Economical with multiple cutting edges

Setting new standards



04

MB45

Delivers the “low cutting force” benefits of positive inserts and the “fracture resistance” benefits of negative inserts

High Quality

High quality results and excellent surface finish

- Lineup of E class inserts
- Long arc wiper edge
- Back coolant hole

High Performance

Unique low cutting force design with fracture resistance

- Double edge structure and helical cutting edge (A.R. max + 13°)

Long Tool Life

Next-generation PVD coating for milling PR18 Series NEW

- Double lamination technology maintains longer tool life
- Double-sided 8-edge design reduces tool costs

Solution

Find new value with excellent versatility

- Integrated tooling: Roughing and finishing with E class inserts
- For a wide variety of machining applications: Small machines (BT30, etc.) with ø40mm cutter
- For a variety of workpieces: Cost-cutting with multiple cutting edges for aluminum machining
- Enhanced Quality: Gain excellent surface finish with Cermet inserts (TN620M)

1 Large insert lineup for a wide variety of machining applications

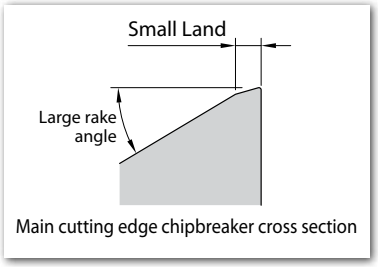
Five insert designs for various machining applications

Economical inserts with 8 cutting edges

General purpose GM insert with E-Class and M-Class options based on required machining accuracy

SM (E Class) - Low Cutting Force

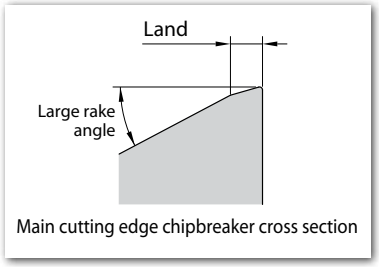
Sharpness oriented with a low cutting force design
-10% cutting resistance compared to general purpose GM insert
Recommended for small machines (BT30)



Main cutting edge chipbreaker cross section

GM (E/M Class) - General Purpose

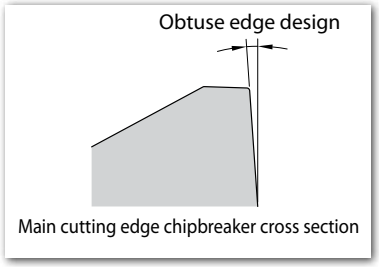
1st recommendation for steel machining
Low cutting force and fracture resistance
E-Class or M-Class options



Main cutting edge chipbreaker cross section

GH (M Class) - Tough Edge

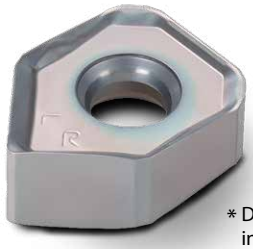
Tough cutting edge and excellent fracture resistance
Obtuse edge design is resistant to chipping
Recommended for intermittent machining



Main cutting edge chipbreaker cross section

W (E-Class) Wiper Insert

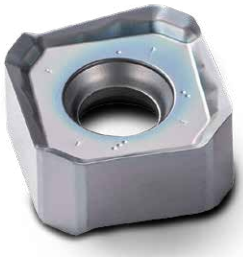
Ultra-long wiper edge (Wiper edge length approx. 8 mm)

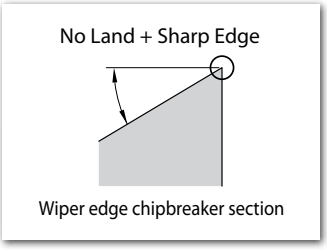


* Double-sided 2-edge insert

AM for Aluminum Alloys

No Land + Sharp Edge Specifications
Excellent sharpness

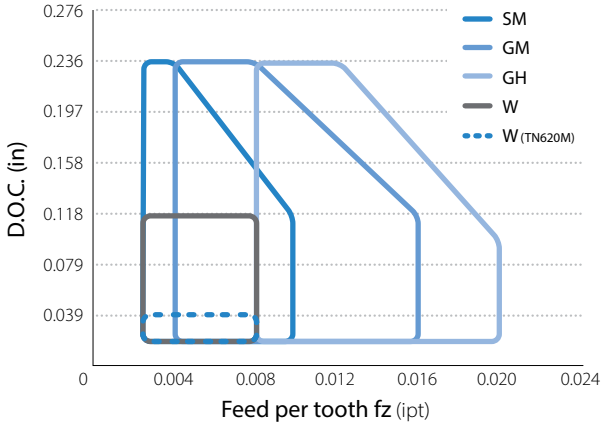




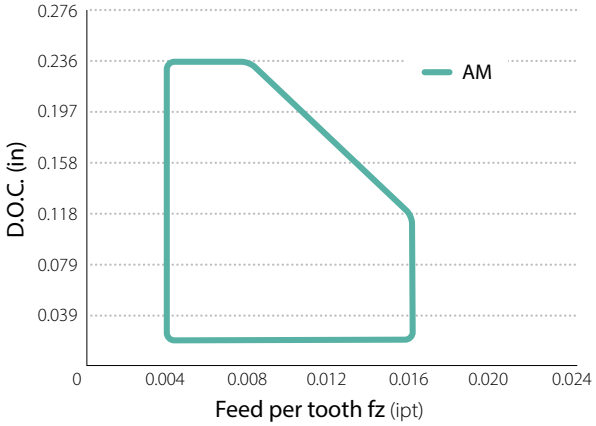
Wiper edge chipbreaker section

Applicable Insert Range

Steel



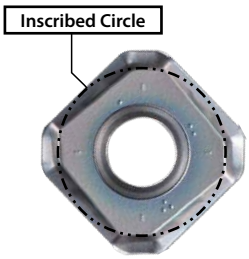
Aluminum alloy



When to use GM (Class E/M)

Selection by machining application

Surface roughness oriented: GM (E-Class)
Cost-effective and surface finish oriented: GM (M-Class)
Efficiency and surface roughness oriented: W (E-Class)

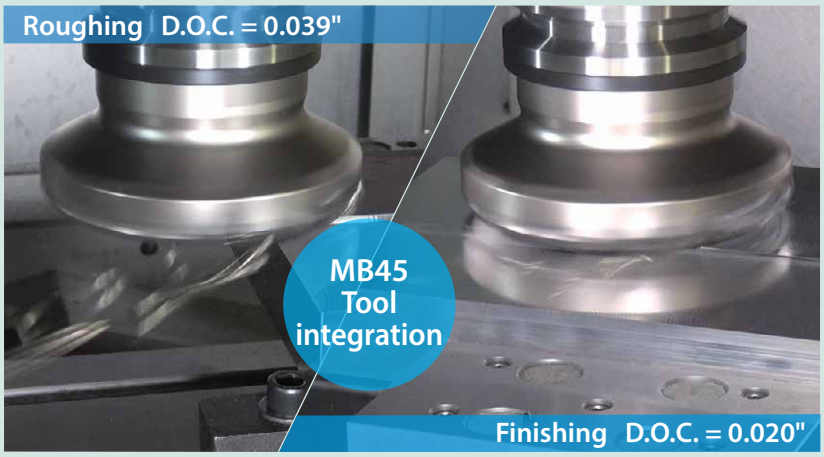


Criteria	GM (E-Class)	GM (M-Class)	W (E-Class) * Wiper
Tolerance	Inscribed Circle Tolerance ±0.0005"	Inscribed Circle Tolerance ±0.0020"	Inscribed Circle Tolerance ±0.0005"
Surface finish	○ Approx. 1.6µmRa	△ Approx. 3.2µmRa	◎ Approx. 0.8µmRa or less
(Gloss)	(○)	(◎)	(◎)
Machining efficiency	○	○	◎
Economy	○	◎	△

*Surface finish is based on internal assessment and varies depending on the machining environment

Solution Tool integration for roughing and finishing with E-Class insert

MB45 Tool integration for roughing and finishing
Reduced tool management and inventory costs



Cutting Conditions: ø5.000" (10 flute) GM (E-Class) Dry Workpiece: 1049
Roughing: Vc = 660 sfm, D.O.C. × ae = 0.098" × 3.347", fz = 0.008 ipt
Finishing: Vc = 820 sfm, D.O.C. × ae = 0.020" × 3.347", fz = 0.006 ipt

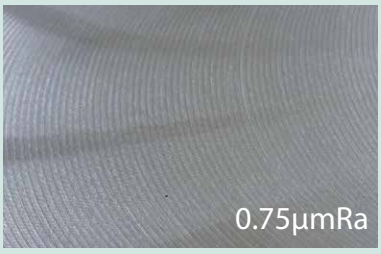
Video

Conventional machining

Tool replacement is needed when roughing and finishing

Chip condition
Good chips in both roughing and finishing

Finished surface condition
Excellent surface finish



(Internal evaluation)

2 7 insert grades available for steel, stainless steel, cast iron, heat-resistant alloys, and aluminum

For steel, stainless steel and cast iron

PR1825/PR1835/PR1810 New development MEGACOAT NANO EX

PR1825 **P**
For Steel (Wear resistance oriented)

PR1835 **M**
For Steel (Stability oriented)
1st Recommendation for stainless steel

PR1810 **K**
For Cast iron

Workpiece	P Steel					M Stainless steel					K Cast iron				
ISO	01	10	20	30	40	01	10	20	30	40	01	10	20	30	40
Grade		Wear resistance oriented PR1825					1st Recommendation PR1835					1st Recommendation PR1810			
		Stability oriented PR1835													

For hardened material

PR015S MEGACOAT HARD PVD coating

For steel Surface finish oriented

TN620M Cermet

For stainless steel and heat-resistant alloys

CA6535 CVD coating

For aluminum machining

PDL025 DLC coating

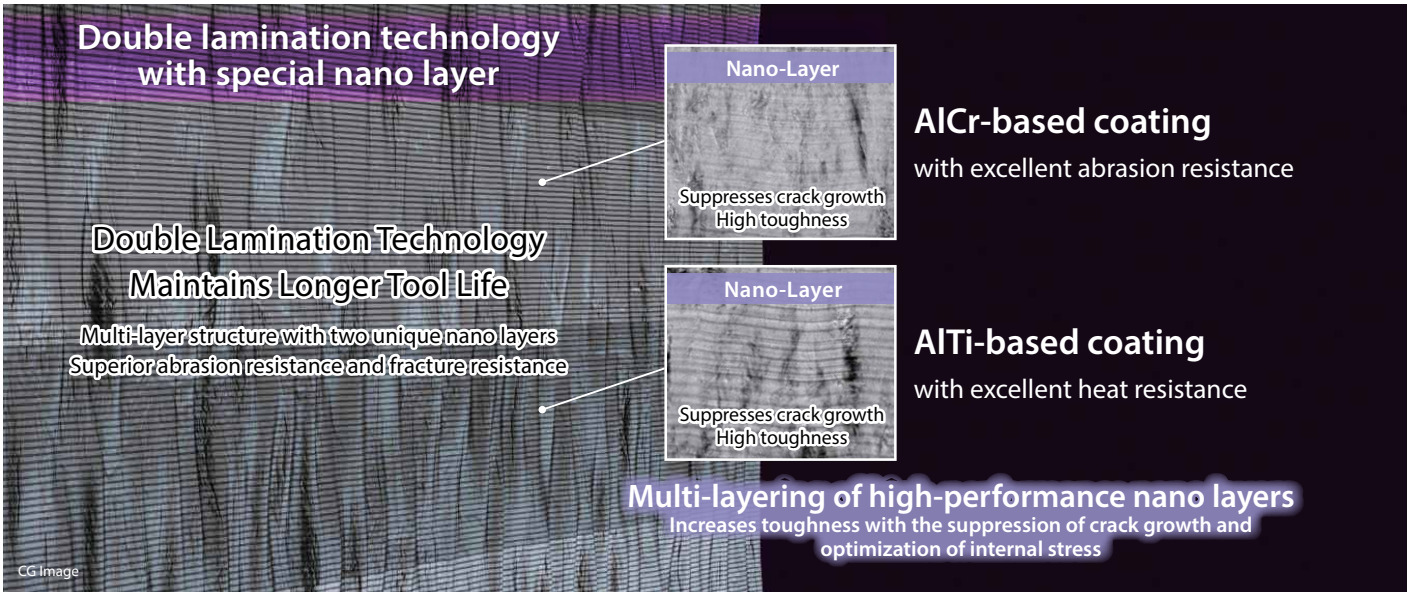
GW25 Non-coated Carbide

Next-generation PVD coating for milling NEW

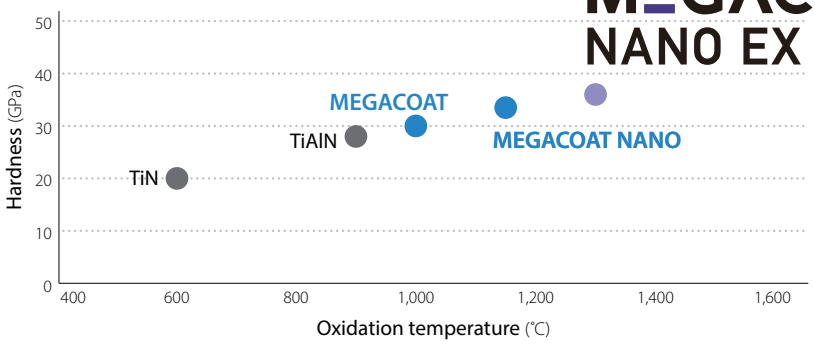
PR18 Series

Kyocera's Nano Layer Coating Technology
Longer Tool Life with Next-generation Coating for Milling

MEGACOAT NANO EX Milling



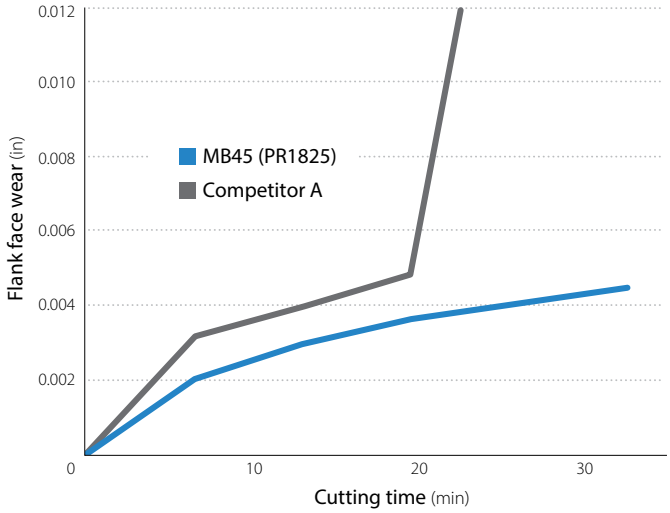
Coating characteristics (Internal evaluation)



MEGACOAT NANO EX | Milling

PR1825 with PVD coating MEGACOAT NANO EX provides long tool life

Wear resistance comparison (Internal evaluation)



Cutting edge condition (after 20 min machining)

MB45(PR1825)

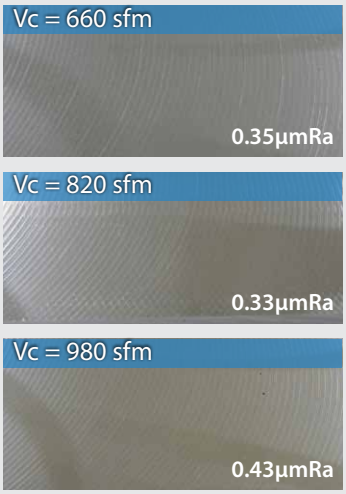
Competitor A

Cutting Conditions: Vc = 390 sfm, D.O.C. = 0.079", ae/DC = 80 %, fz = 0.008 ipt, Dry
Workpiece: D2, ø5.000" BT50

Solution Utilizing Cermet TN620M

Cermet (TN620M) for efficient finishing

Surface finish condition (Internal evaluation)
Superior surface finish



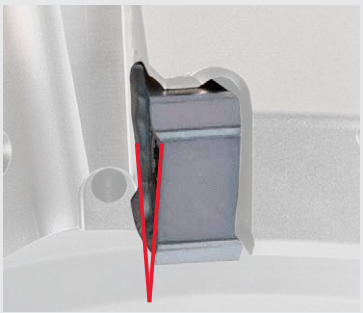
Cutting Conditions: D.O.C.= 0.020" × 3.937"
fz =0.006 ipt, Dry
Workpiece: 1049, ø5.000" (10 flute), GM (TN620M)

3 Low cutting force design with excellent fracture resistance and superior surface finish

Low cutting force and excellent fracture resistance

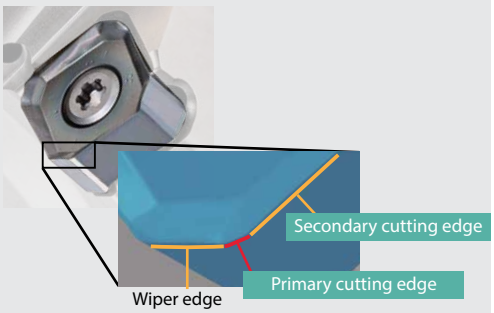
Unique helical cutting edge and double-edge structure

A unique helical cutting edge



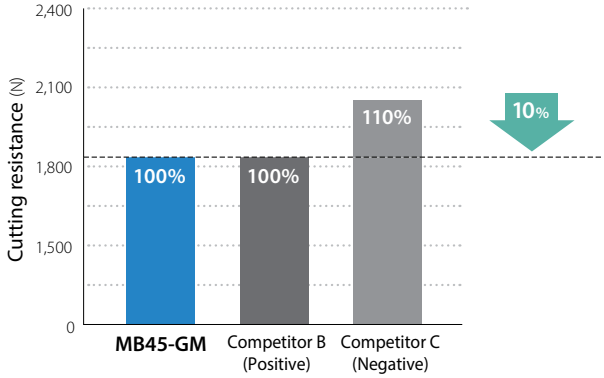
A.R. Ensures a maximum of 13° and suppresses chatter with low cutting force.

Double edge structure



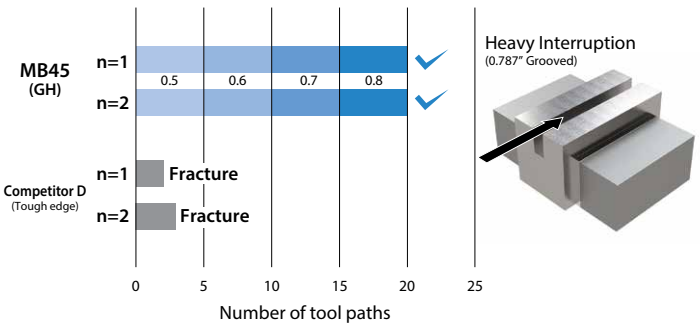
Primary cutting edge generates thin chips
Reduces impact load and greatly reduces vibration when exiting the part

Cutting resistance comparison (Internal evaluation)



Cutting Conditions: Vc = 590 sfm, D.O.C. = 0.118", ae/DC = 80 % Center Cut, fz = 0.012 ipt, Workpiece: 1049

Fracture resistance comparison (Internal evaluation) fz = 0.020 ipt~0.032 ipt

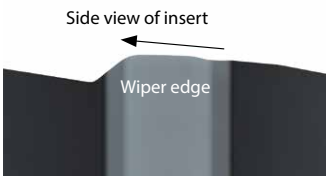


Cutting Conditions: Vc = 330 sfm, D.O.C. × ae = 0.079" × 3.937" mm Center Cut, BT50 Workpiece: 4140HT ø5.000" (10 flute)

High quality — Long arc wiper edge utilizing unique technology

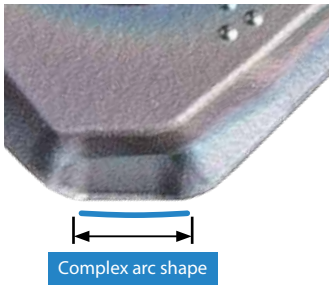
Unique long arc wiper edge

Reduces variation in mounting accuracy and provides superior finished surface quality

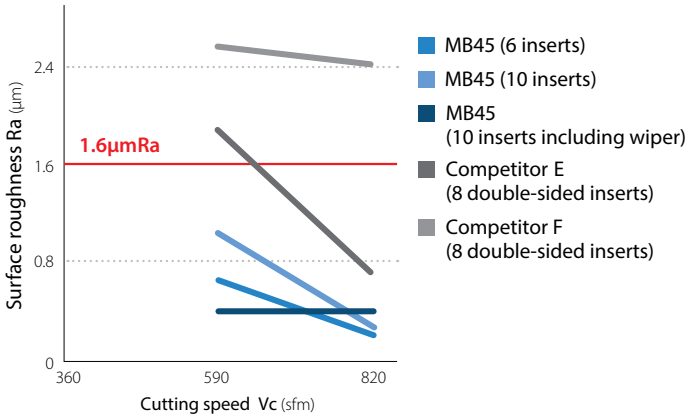


Convex curved shape with wiper edge protruding upward

*GM/SM/AM (E-Class)

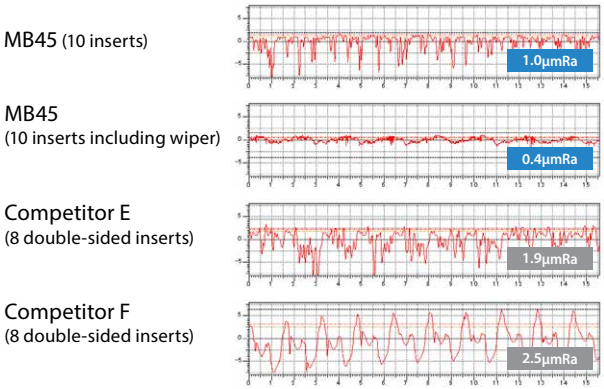


Surface roughness comparison (Internal evaluation)



Cutting Conditions: D.O.C. × ae = 0.039" × 3.937" (Center Cut), fz = 0.008 ipt, Dry
Workpiece: 1049 ø5.000" (6 flute/10 flute) GM (PR1825) BT50

Finishing surface condition (Vc = 820 sfm)



Proprietary long arc wiper edge provides excellent finishing surface quality

Finishing surface quality comparison (Image)

MB45

Long arc wiper edge

Smooth finished surface with small feed joints

Workpiece

General insert

Straight wiper edge

The feed joint is large and the finished surface is stepped.

Workpiece

Solution — Unique back coolant structure delivers excellent finished surface

Smooth chip evacuation reduces scratches and chip clogging on finished surfaces

Reliably supplies coolant to the cutting edge and internal coolant allows for even higher quality surface finish

Unique back coolant structure

Coolant hole

Mounted closer to the cutting edge than before

Control chip outward for excellent chip evacuation to ensure to cool the cutting edge (up to ø5.000").

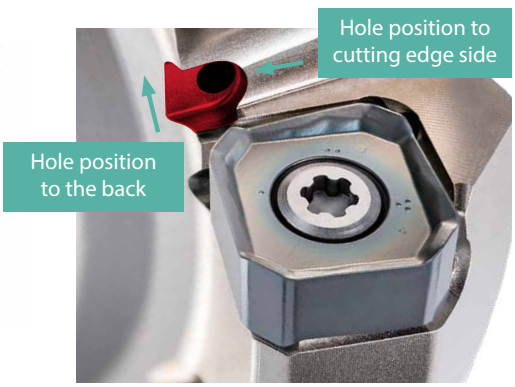
Special grooves in the discharge port

The hole position is on the far side to prevent chip contact

Improves deterioration of chip control and evacuation

* Due to shape restrictions, some toolholders do not have grooves in the discharge port.

Fluid analysis (image)



Toolholder Lineup

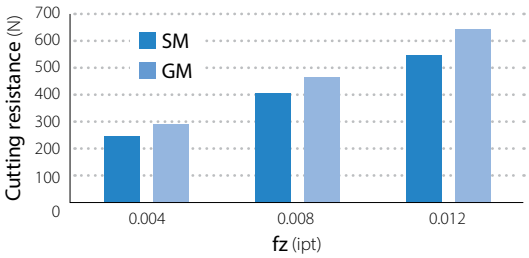
Coarse pitch	Fine pitch	Extra fine pitch	End Mill
			
Recommended for workpieces or machines with low rigidity (such as sheet machining or BT30) Economical	1st recommendation Good balance of stability, machining accuracy and efficiency Supports a wide range of machining areas	Recommended for highly rigid workpiece and machine	Compatible with milling chucks (Face mill is generally recommended) *Shank size: ø1.25" / ø32mm
Cutting diameter ø2.000" to ø5.000" (inch) ø40mm to ø315mm (metric) *ø315mm: Made to order	Cutting diameter ø2.000" to ø5.000" (inch) ø40mm to ø315mm (metric) *ø315mm: Made to order	Cutting diameter ø2.000" to ø5.000" (inch) ø40mm to ø250mm (metric)	Cutting diameter ø1.500" to ø2.500" (inch) ø40mm to ø80mm (metric)

Compatible with smaller machines

Lineup of coarse pitch ø40mm
Works well on small machines such as BT30

Recommendation for small machines:
Low cutting force SM
Cutting resistance is about 10% less than general-purpose GM

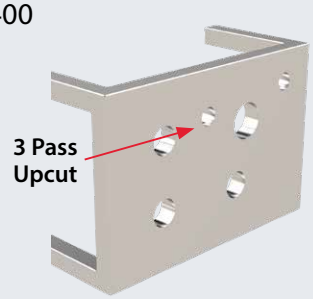
Cutting resistance comparison (Internal evaluation)



Cutting Conditions: Vc = 490 sfm, D.O.C. = 0.039", ae/Dc = 80%, Dry, BT50 Workpiece: 1049

Case studies — Excellent performance even under unstable machining conditions

Cradle SS400



Vc = 520 sfm
D.O.C. x ae= 0.003"x5.12", Wet

Machining efficiency

MB45 ø160mm 12 flute GM(PR1825) — **Vf = 760 sfm** (fz = 0.008 ipt)

Competitor G ø160mm 8 flute — **Vf = 620 sfm** (fz = 0.010 ipt)

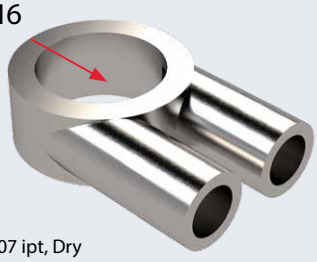
Machining efficiency 1.2x

MB45 shows stable machining in an environment prone to deflection and chatter.
Increasing the number of inserts improves efficiency.
Improved joints between machining passes.

(User evaluation)

Case studies — Achieves 1.6x longer tool life under the same machining conditions

Housing 316



Vc = 300 sfm
D.O.C. = 0.079", fz = 0.007 ipt, Dry

Number of parts

MB45 ø63mm 5 flute GM(PR1825) — **30 pcs per corner**

Competitor H ø63mm 5 flute — **18 pcs per corner**

Tool life 1.6x

MB45 shows stable machining without chattering.
Wear on the cutting edge proceeds normally and shows 1.6x tool life than competitor.

(User evaluation)

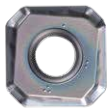
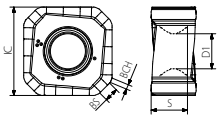
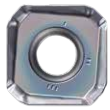
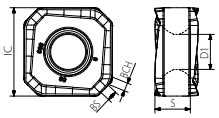
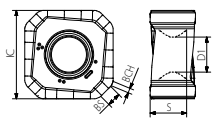
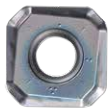
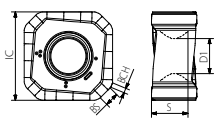
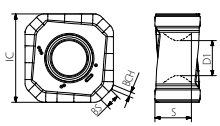
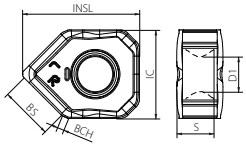
Recommended Cutting Conditions ★ 1st Recommendation ☆ 2nd Recommendation

Chipbreaker	Workpiece	Feed fz (ipt)	Recommended Insert Grade (Vc: sfm)							
			MEGACOAT NANO EX (PVD coating)			MEGACOAT HARD (PVD coating)	CVD coating	Cermet	DLC coating	Carbide
			PR1835	PR1825	PR1810	PR015S	CA6535	TN620M	PDL025	GW25
General GM	Carbon Steel	0.004 – **0.008** – 0.016 (0.002 – **0.005** – 0.008)	☆ 390 – **590** – 820	★ 390 – **590** – 820	–	–	–	★ 660 – **820** – 980	–	–
	Alloy Steel	0.004 – **0.008** – 0.016 (0.002 – **0.005** – 0.008)	☆ 330 – **520** – 720	★ 330 – **520** – 720	–	–	–	★ 590 – **720** – 820	–	–
	Mold steel	0.004 – **0.008** – 0.016 (0.002 – **0.003** – 0.006)	☆ 260 – **460** – 590	★ 260 – **460** – 590	–	–	–	★ 490 – **590** – 720	–	–
	Austenitic stainless steel	0.004 – **0.008** – 0.016	☆ 330 – **520** – 660	☆ 330 – **520** – 660	–	–	–	–	–	–
	Martensitic stainless steel	0.004 – **0.008** – 0.016	☆ 490 – **660** – 820	–	–	–	☆ 590 – **790** – 980	–	–	–
	Precipitation hardened stainless steel	0.004 – **0.008** – 0.012	★ 300 – **390** – 490	–	–	–	–	–	–	–
	Gray cast iron	0.004 – **0.008** – 0.016	–	–	★ 390 – **590** – 820	–	–	–	–	–
	Ductile cast iron	0.004 – **0.008** – 0.014	–	–	★ 330 – **490** – 660	–	–	–	–	–
	Ni-based heat resistant alloys	0.004 – **0.005** – 0.008	☆ 70 – **100** – 160	–	–	–	★ 70 – **100** – 160	–	–	–
Low Cutting Force SM	Carbon Steel	0.002 – **0.005** – 0.010	☆ 390 – **590** – 820	☆ 390 – **590** – 820	–	–	–	–	–	–
	Alloy Steel	0.002 – **0.005** – 0.010	☆ 330 – **520** – 720	☆ 330 – **520** – 720	–	–	–	–	–	–
	Mold steel	0.002 – 0.004 – 0.008	☆ 260 – **460** – 590	☆ 260 – **460** – 590	–	–	–	–	–	–
	Austenitic stainless steel	0.002 – **0.005** – 0.010	★ 330 – **520** – 660	☆ 330 – **520** – 660	–	–	–	–	–	–
	Martensitic stainless steel	0.002 – **0.005** – 0.010	☆ 490 – **660** – 820	–	–	–	★ 590 – **790** – 980	–	–	–
	Precipitation hardened stainless steel	0.002 – **0.005** – 0.010	☆ 300 – **390** – 490	–	–	–	–	–	–	–
	Gray cast iron	0.002 – **0.005** – 0.010	–	–	☆ 390 – **590** – 820	–	–	–	–	–
	Ductile cast iron	0.002 – **0.004** – 0.008	–	–	☆ 330 – **490** – 660	–	–	–	–	–
	Ni-based heat resistant alloys	0.002 – **0.004** – 0.006	☆ 70 – **100** – 160	–	–	–	☆ 70 – **100** – 160	–	–	–
	Titanium alloy	0.002 – **0.003** – 0.006	★ 130 – **200** – 260	–	–	–	–	–	–	–
Tough Edge GH	Carbon Steel	0.008 – **0.012** – 0.020	☆ 390 – **590** – 820	☆ 390 – **590** – 820	–	–	–	–	–	–
	Alloy Steel	0.008 – **0.012** – 0.020	☆ 330 – **520** – 720	☆ 390 – **520** – 720	–	–	–	–	–	–
	Mold steel	0.008 – **0.012** – 0.018	☆ 260 – **460** – 590	☆ 260 – **460** – 590	–	–	–	–	–	–
	Austenitic stainless steel	0.008 – **0.012** – 0.016	☆ 330 – **520** – 660	☆ 330 – **520** – 660	–	–	–	–	–	–
	Martensitic stainless steel	0.008 – **0.012** – 0.016	☆ 490 – **660** – 820	–	–	–	☆ 590 – **790** – 980	–	–	–
	Precipitation hardened stainless steel	0.008 – **0.012** – 0.016	☆ 300 – **390** – 490	–	–	–	–	–	–	–
	Gray cast iron	0.008 – **0.012** – 0.020	–	–	☆ 390 – **590** – 820	–	–	–	–	–
	Ductile cast iron	0.008 – **0.012** – 0.018	–	–	☆ 330 – **490** – 660	–	–	–	–	–
	Ni-based heat resistant alloys	0.004 – **0.008** – 0.012	☆ 70 – **100** – 160	–	–	–	☆ 70 – **100** – 160	–	–	–
	Hardened material	0.002 – **0.004** – 0.008	–	–	–	★ 160 – **260** – 330	–	–	–	–
AM	Aluminum alloy	0.004 – **0.008** – 0.016	–	–	–	–	–	–	★ 660 – **1970** – 2950	☆ 660 – **1640** – 2620

The numbers **in bold font** are **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-based heat resistant alloy and titanium alloy. When choosing wet machining for other workpieces, reduce the cutting speed to 70% or less.
When machining aluminum, be sure to use within recommended conditions. Do not rotate more than the maximum speed listed on the main unit.
Dry machining is recommended for cermet.

Applicable Inserts

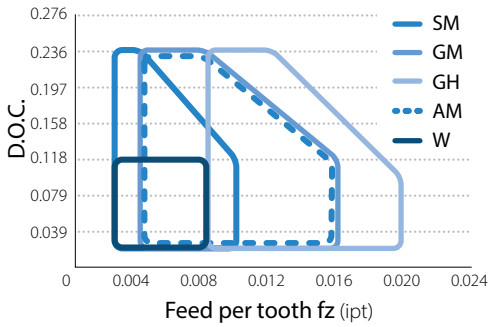
Usage Classification											
	P	Steel	★	☆				■		
		Mold steel	★	☆				■		
★: Roughing/ 1st recommendation ☆: Roughing/ 2nd recommendation ■: Finishing/ 1st recommendation □: Finishing/ 2nd recommendation (Hardened material is 40 HRC or less)	M	Austenitic stainless steel	☆	★						
		Martensitic stainless steel		☆			★			
		Precipitation hardened stainless steel		★						
	K	Gray cast iron			★					
		Ductile cast iron			★					
	N	Nonferrous metal							★	☆
	S	Heat resistant alloys (Ni-based heat resistant alloys)					★			
		Titanium alloy		★						
	H	Hardened material				★				

Shape		Description	Dimensions (in)						MEGACOAT NANO EX NEW			MEGACOAT HARD	CVD Coated	Cermet	DLC Coated	Carbide
			IC	S	BCH	BS	D1	INSL	PR1825	PR1835	PR1810	PR015S	CA6535	TN620M	PDL025	GW25
 General Purpose (M-Class)		SNMU1406ANER-GM	0.579	0.239	0.031	0.091	0.228	-	●	●	●		●	●		
 Tough Edge (M-Class)		SNMU1406ANER-GH	0.579	0.232	0.055	0.067	0.228	-	●	●	●	●	●			
 General Purpose (E-Class)		SNEU1406ANER-GM	0.579	0.239	0.031	0.091	0.228	-	●	●	●		●	●		
 Low cutting force (E-Class)		SNEU1406ANER-SM	0.579	0.239	0.031	0.091	0.228	-	●	●			●			
 Aluminum and non-ferrous metals (E-Class)		SNEU1406ANFR-AM	0.579	0.239	0.031	0.091	0.228	-							●	●
 Wiper Insert (E-Class 2-edge)		SNEU1406ANEN-W	0.579	0.242	0.043	0.346	0.228	0.764	●	●	●		●	●		

●: Standard Stock

Applicable Chipbreaker Range

Carbide coating



Cermet

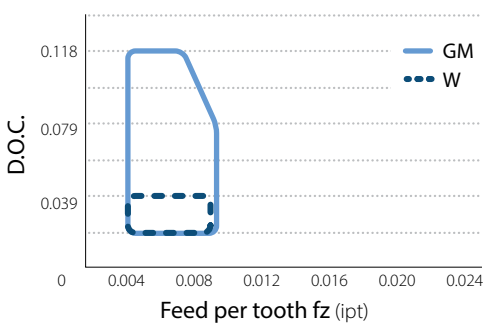


Fig.1

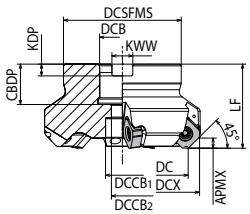
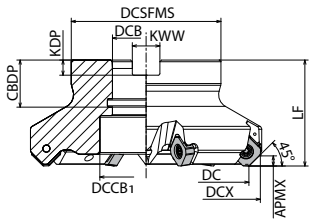


Fig.2



Toolholder Dimensions

Description			Stock	Number of inserts	Dimensions (in)											A.R. MAX (°)	R.R. (°)	Coolant hole	Max RPM	Drawing
					DC	DCX	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX					
Inch Bore Dia.	Coarse Pitch	MB45- 2000R-14T3C	●	3	2.000	2.492	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313	0.236	13	-12	Yes	11,300	Fig.1
		2500R-14T4C	●	4	2.500	2.992	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313					10,100	
		3000R-14T5C	●	5	3.000	3.492	2.250	1.000	0.866	0.551	1.969	1.063	0.236	0.382					9,200	
		4000R-14T5C	●	5	4.000	4.492	3.750	1.500	2.047	-	1.969	1.417	0.394	0.626					8,000	Fig.2
		5000R-14T6C	●	6	5.000	5.492	3.750	1.500	2.047	-	2.480	1.417	0.394	0.626					7,100	
	Fine Pitch	MB45- 2000R-14T4C	●	4	2.000	2.492	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313	0.236	13	-12	Yes	11,300	Fig.1
		2500R-14T5C	●	5	2.500	2.992	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313					10,100	
		3000R-14T6C	●	6	3.000	3.492	2.250	1.000	0.866	0.551	1.969	1.063	0.236	0.382					9,200	
		4000R-14T8C	●	8	4.000	4.492	3.750	1.500	2.047	-	1.969	1.417	0.394	0.626					8,000	Fig.2
		5000R-14T10C	●	10	5.000	5.492	3.750	1.500	2.047	-	2.480	1.417	0.394	0.626					7,100	
	Extra Fine Pitch	MB45- 2000R-14T5C	●	5	2.000	2.492	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313	0.236	13	-12	Yes	11,300	Fig.1
		2500R-14T6C	●	6	2.500	2.992	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313					10,100	
		3000R-14T8C	●	8	3.000	3.492	2.250	1.000	0.866	0.551	1.969	1.063	0.236	0.382					9,200	
		4000R-14T10C	●	10	4.000	4.492	3.750	1.500	2.047	-	1.969	1.417	0.394	0.626					8,000	Fig.2
		5000R-14T13C	●	13	5.000	5.492	3.750	1.500	2.047	-	2.480	1.417	0.394	0.626					7,100	

Maximum number of revolutions
Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 11.
Do not use the face mill or end mill at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.
Spare Parts below.

●: Standard Stock

Spare Parts (Inch)

Description			Parts			
			Insert Screw	Wrench	Anti-seize Compound	Arbor Bolt
						
Face Mills	MB45-	2000R-14T...	SB-50110TRP	TTP-20	P-37	HH3/8-1.25(H)
		2500R-14T...				HH3/8-1.25(H)
		3000R-14T...				HH1/2-1.25(H)
		4000R-14T... ≀ 5000R-14T...	Insert clamp tightening torque 4.5 N•m			-
End Mills	MB45-	1500S125-14T2C	SB-50110TRP	TTP-20	P-37	-
		1500S125-14T3C				
		2000S125-14T3C				
		2500S125-14T4C	Insert clamp tightening torque 4.5 N•m			

Coat anti-seize compound thinly on portion of taper and thread prior to installation.
(H) Optional coolant-thru bolt available.

MB45 Face Mills (Metric)

Fig.1

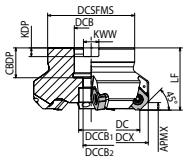


Fig.2

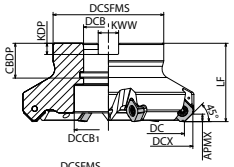


Fig.3

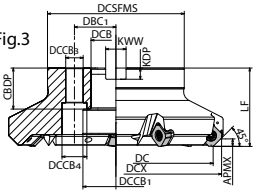
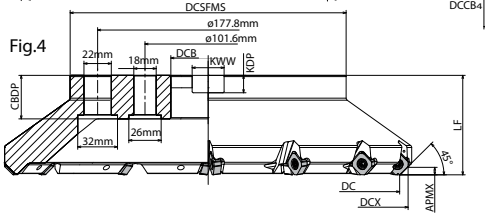


Fig.4



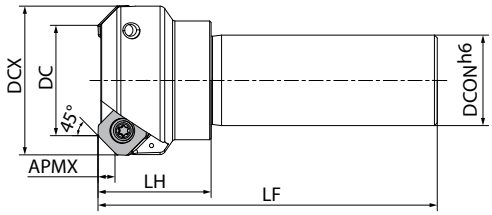
Toolholder Dimensions

		Description	Stock	Number of Inserts	Dimensions (mm)														A.R. MAX (°)	R.R.(°)	Coolant hole	Max RPM	Drawing
					DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DCCB3	DCCB4	DBC1	LF	CBDP	KDP	KWW	APMX					
Inch Bore Diameter	Coarse Pitch	MB45- 080R-14T5C	●	5	80	93	70	1.000"	20	13				50	1.063"	0.236"	0.375"					9,000	Fig.1
		100R-14T5C	●	5	100	113	78	1.250"	45		-	-	-		1.339"	0.315"	0.500"				Yes	8,000	
		125R-14T6C	●	6	125	138	89	1.500"	55					63	1.496"	0.394"	0.625"					7,200	Fig.2
		160R-14T7	●	7	160	173	110	2.000"	70	-						0.433"	0.750"	6	13	-12		6,300	
		200R-14T8	●	8	200	213	140	1.875"	110		18	26	101.6			0.551"	1.000"				No	5,700	Fig.3
		250R-14T10	●	10	250	263																5,100	
		315R-14T14	MTO	14	315	328	222		-		-	-	-	80								4,500	Fig.4
	Fine Pitch	MB45- 080R-14T6C	●	6	80	93	70	1.000"	20	13				50	1.063"	0.236"	0.375"					9,000	Fig.1
		100R-14T8C	●	8	100	113	78	1.250"	45		-	-	-		1.339"	0.315"	0.500"				Yes	8,000	
		125R-14T10C	●	10	125	138	89	1.500"	55					63	1.496"	0.394"	0.625"					7,200	Fig.2
		160R-14T12	●	12	160	173	110	2.000"	70	-						0.433"	0.750"	6	13	-12		6,300	
		200R-14T14	●	14	200	213	140	1.875"	110		18	26	101.6			0.551"	1.000"				No	5,700	Fig.3
		250R-14T16	●	16	250	263																5,100	
		315R-14T18	MTO	18	315	328	222		-		-	-	-	80								4,500	Fig.4
	Extra Fine Pitch	MB45- 080R-14T8C	●	8	80	93	70	1.000"	20	13				50	1.063"	0.236"	0.375"					9,000	Fig.1
		100R-14T10C	●	10	100	113	78	1.250"	45		-	-	-		1.339"	0.315"	0.500"			-12	Yes	8,000	
		125R-14T13C	●	13	125	138	89	1.500"	55					63	1.496"	0.394"	0.625"					7,200	Fig.2
		160R-14T16	●	16	160	173	110	2.000"	70	-						0.433"	0.750"	6	13	-13		6,300	
		200R-14T18	●	18	200	213	140	1.875"	110		18	26	101.6			0.551"	1.000"				No	5,700	Fig.3
		250R-14T20	●	20	250	263														-12		5,100	
Metric Bore Diameter	Coarse Pitch	MB45- 040R-14T2C-M	●	2	40	54	38	16	13.5	9				40	19	6.3	10.4					12,700	Fig.1
		050R-14T3C-M	●	3	50	63	48	22	18	11					21							11,400	
		063R-14T4C-M	●	4	63	76	50				-	-	-									10,100	
		080R-14T5C-M	●	5	80	93	70	27	20	13				50	24	7	12.4				Yes	9,000	
		100R-14T5C-M	●	5	100	113	78	32	45						30	8	14.4					8,000	Fig.2
		125R-14T6C-M	●	6	125	138	89	40	55						33	9	16.4	6	13	-12		7,200	
		160R-14T7-M	●	7	160	173	110			-	14	20	66.7	63								6,300	
		200R-14T8-M	●	8	200	213	142	60	110		18	26	101.6		35	14	25.7				No	5,700	Fig.3
		250R-14T10-M	●	10	250	263																5,100	
		315R-14T14-M	MTO	14	315	328	222		-		-	-	-	80								4,500	Fig.4
	Fine Pitch	MB45- 040R-14T3C-M	●	3	40	54	38	16	13.5	9				40	19	5.6	8.4					12,700	Fig.1
		040R-14T3C-22M	●				47	22	12	-					21	6.3	10.4						
		050R-14T4C-M	●	4	50	63	48		18	11												11,400	
		063R-14T5C-M	●	5	63	76	50				-	-	-								Yes	10,100	
		080R-14T6C-M	●	6	80	93	70	27	20	13				50	24	7	12.4					9,000	
		100R-14T8C-M	●	8	100	113	78	32	45						30	8	14.4					8,000	Fig.2
		125R-14T10C-M	●	10	125	138	89	40	55					63	33	9	16.4	6	13	-12		7,200	
		160R-14T12-M	●	12	160	173	110			-	14	20	66.7									6,300	
		200R-14T14-M	●	14	200	213	142	60	110		18	26	101.6		35	14	25.7				No	5,700	Fig.3
		250R-14T16-M	●	16	250	263																5,100	
		315R-14T18-M	MTO	18	315	328	222		-		-	-	-	80								4,500	Fig.4
	Extra Fine Pitch	MB45- 040R-14T4C-M	●	4	40	54	38	16	13.5	9				40	19	5.6	8.4					12,700	Fig.1
		040R-14T4C-22M	●				47	22	12	-					21	6.3	10.4					11400	
		050R-14T5C-M	●	5	50	63	48		18	11												11,400	
		063R-14T6C-M	●	6	63	76	50				-	-	-							-12	Yes	10,100	
		080R-14T8C-M	●	8	80	93	70	27	20	13				50	24	7	12.4	6	13			9,000	
		100R-14T10C-M	●	10	100	113	78	32	45						30	8	14.4					8,000	Fig.2
		125R-14T13C-M	●	13	125	138	89	40	55					63	33	9	16.4					7,200	
		160R-14T16-M	●	16	160	173	110			-	14	20	66.7							-13		6,300	
		200R-14T18-M	●	18	200	213	142	60	110		18	26	101.6		35	14	25.7				No	5,700	Fig.3
		250R-14T20-M	●	20	250	263														-12		5,100	

Maximum number of revolutions

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 11.
Do not use the face mill or end mill at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.
Spare Parts on page 15.

●: Standard Stock MTO: Made to order



Toolholder Dimensions

Description		Stock	Number of Inserts	Dimensions (in)						A.R. MAX (°)	R.R.(°)	Coolant hole	Max RPM
				DC	DCX	DCON	LH	LF	APMX				
MB45-	1500S125-14T2C	●	2	1.500	1.992	1.250	1.575	4.724	0.236	13	-12	Yes	12,700
	1500S125-14T3C	●	3	1.500	1.992								11,400
	2000S125-14T3C	●	3	2.000	2.492								10,100
	2500S125-14T4C	●	4	2.500	2.992								9,000

Description		Stock	Number of Inserts	Dimensions (mm)						A.R. MAX (°)	R.R.(°)	Coolant hole	Max RPM
				DC	DCX	DCON	LH	LF	APMX				
MB45-	40S32-14T2C	●	2	40	53	32	40	120	6	13	-12	Yes	12,700
	50S32-14T3C	●	3	50	63								11,400
	63S32-14T4C	●	4	63	76								10,100
	80S32-14T5C	●	5	80	93								9,000

Maximum number of revolutions
Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 11.
Do not use the face mill or end mill at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.
Spare Parts below.

●: Standard Stock

Spare Parts (Metric)

Description			Parts				
			Insert Screw	Wrench	Anti-seize Compound	Arbor Bolt	Differential Screw
							
Face Mills	Inch Bore Dia.	MB45- 080R-14T...	SB-50110TRP	TTP-20	P-37	HH1/2-1.25(H)	-
		100R-14T... ≀ 315R-14T...				-	-
	Metric Bore Dia.	MB45- 040R/050R-14T...-M				HH8X25(H)	-
		040R/050R-14T...-22M				-	W10X31
		063R-14T...-M				HH10X30(H)	-
		080R-14T...-M				HH12X35(H)	-
		100R-14T...-M ≀ 315R-14T...-M				-	-
End Mills		MB45- 40S32-14T2C	SB-50110TRP	TTP-20	P-37	-	-
		50S32-14T3C					
		63S32-14T4C					
		80S32-14T5C					

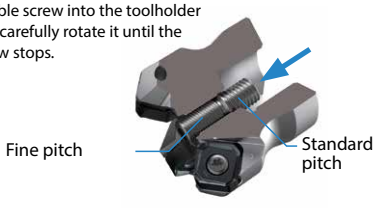
Insert clamp tightening torque 4.5 N·m

Insert clamp tightening torque 4.5 N·m

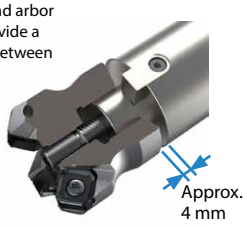
Coat anti-seize compound thinly on portion of taper and thread prior to installation.
(H) Optional coolant-thru bolt available.

How to Install Differential Screw

1. Insert the fine pitch side of the double screw into the toolholder and carefully rotate it until the screw stops.



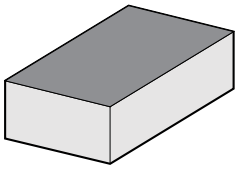
2. To ensure that the holder and arbor are securely connected, provide a clearance of approx. 4mm between the holder and arbor before tightening the screws.



3. Rotate the screw until there is no clearance, and check the holder is attached to the arbor.

Precautions

Applications



Facing

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.
3. 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).
4. Tighten the wrench in a direction parallel to the clamp screw.
   Recommended tightening torque · · · 4.5 N·m
5. 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.

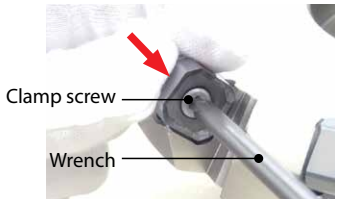


Fig.1

Defining the machining diameter (DC)

With respect to the machining diameter (DC) specified in ISO*, the numerical value of the machining diameter (Fig. 2) where the plane surface is finished depends on the insert. Please be careful.

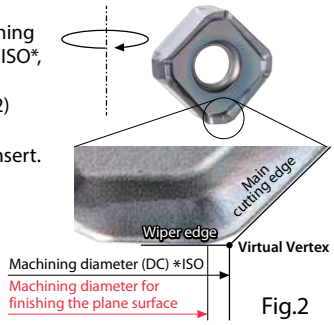


Fig.2

Machining diameter at which the plane surface is finished (for ø125mm)

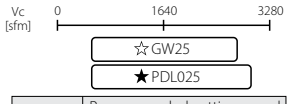
	GM	GH	SM	AM
Difference to machining diameter (DC)	-1.1	-2.0	-1.1	-1.1
Machining diameter (mm) at which the plane surface is finished *Dimensional tolerance $^{0}_{-0.2}$mm	123.9	123.0	123.9	123.9

*GH has a larger double-edge size, so the machining diameter at which the plane surface is finished is smaller than other inserts.

Precautions when machining

Precautions when machining aluminum

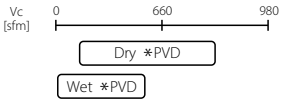
- Be sure to use within recommended conditions.
- Do not rotate more than the maximum speed listed on the main unit.
  *The number of revolutions listed on the holder is the maximum number of revolutions without load.



	Recommended cutting speed [sfm]
PDL025	660 ~ 1970 ~ 2950
GW25	660 ~ 1640 ~ 2620

Precautions for wet machining of steel

For wet machining, select PR1835 and use a cutting speed of 70% or less of the recommended condition as a guide.



MB45-125R-14T10C
SCREW:SB-50110TRP WRENCH:
MAX 7,200 RPM
Rotating at maximum speed is prohibited.

How to use a wiper insert

1. Use when the feed amount per revolution [ipr] becomes large. The table below shows the standard feed amount per revolution and the number of wipers installed.

Feed per rotation	Number of wiper inserts	Pocket for wiper insert
0.079 < f [ipr] ≤ 0.157	1 pc	Pocket with "Single dot" (Fig. 3)
0.157 < f [ipr]	2 pcs	"Single dot" and "Double dots" pockets (Figs. 3, 4) * Only holders with 12 or more inserts have "Double dots"

2. Chipbreaker recommended for use with wiper insert

	GM chipbreaker	GH chipbreaker	SM chipbreaker	AM chipbreaker
Wiper Insert	✓	Not recommended	✓	Not recommended

3. Install the wiper insert correctly as shown in Fig. 5.
   * Fig. 6 shows the insert incorrectly attached to the holder.

Fig. 3

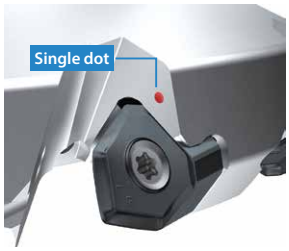
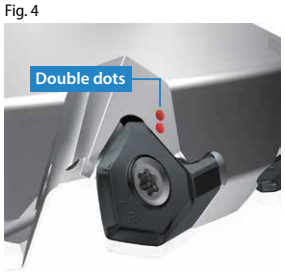


Fig. 4



"Double dots" are placed in the diagonal pocket of "Single dot"
* For only holders with 12 or more inserts

Fig. 5

Fig. 6

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