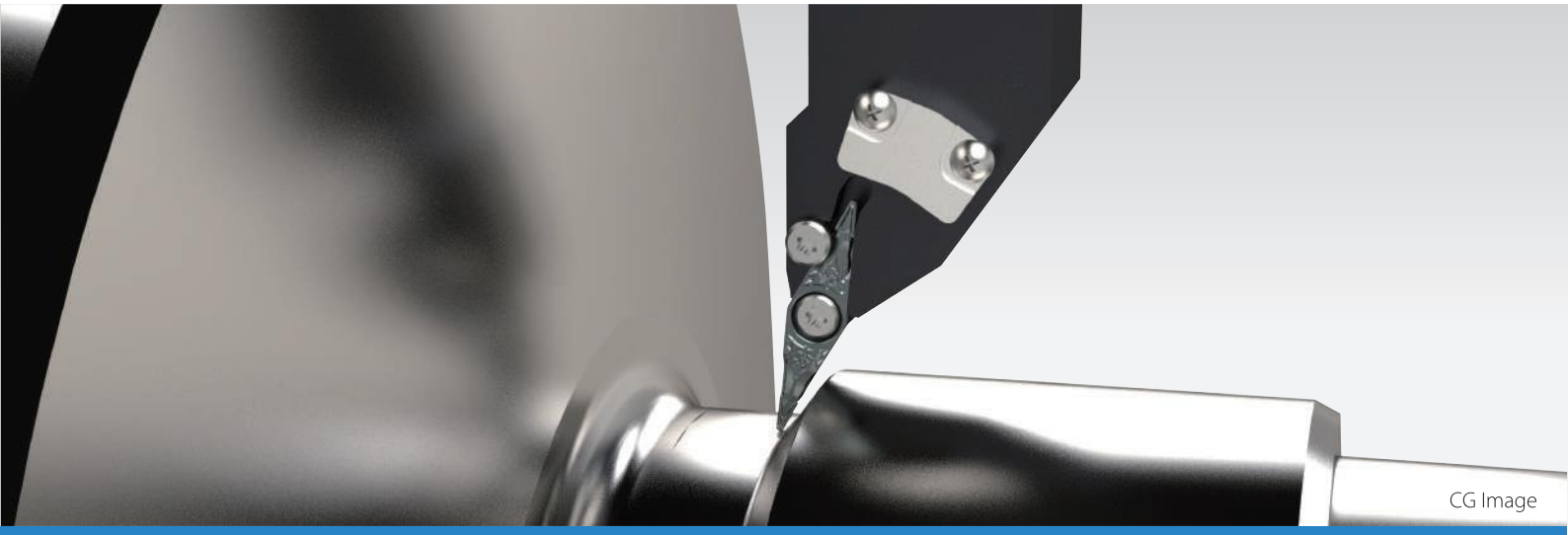
25° Insert Profiling Tools

ZBMT Series

NEW



25° Insert Tip with Greater Maneuverability Shortens Machining Processes and Reduces Costs

Wide lineup of toolholders from external turning to boring bars. Supports a wide range of applications, including copying, undercutting, tapering, V slotting, etc.

Improved dimensional accuracy with unique clamp structure
Firm insert clamping results in high precision and stable machining

Newly developed GF chipbreaker for ZBMT inserts. Reduces chip control issues when machining at minute depths of cut

15° insert tip angle also available

25° Insert Profiling Tools

ZBMT Series

Unique clamping structure and a wide lineup of external toolholders and boring bars. High precision and stable machining in a wide range of applications including copying, undercutting, tapering, V-slotting, spherical machining, and more.

New 25° Inserts Achieve Excellent Results Using a Large Variety of Toolholders

Challenges

Workpiece geometries are becoming more complex and can be difficult to machine with typical 35° V-style inserts.
Specialized tools focusing on shape often sacrifice rigidity, accuracy, or chip control.

Solution

The 25° ZBMT insert adopts a strong and unique clamp mechanism for added rigidity. This rigidity adds precision and stability in a variety of machining applications for shorter cycle times and lower machining costs.

Please contact your Kyocera sales representative for details.

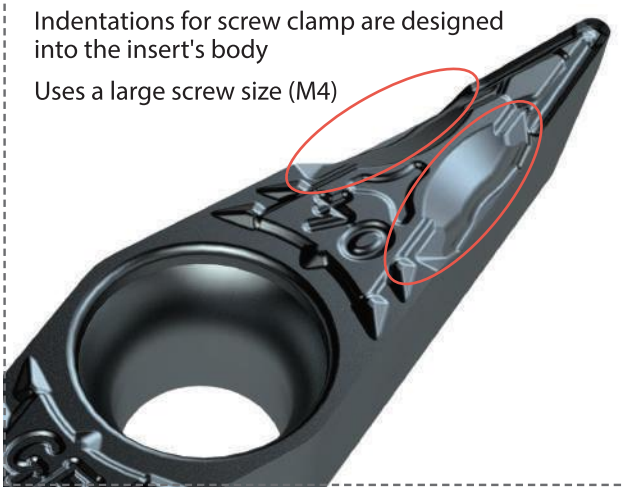
1 Newly Developed Self-Clamping Mechanism Achieves a Higher Rigidity

Side Lock Mechanism

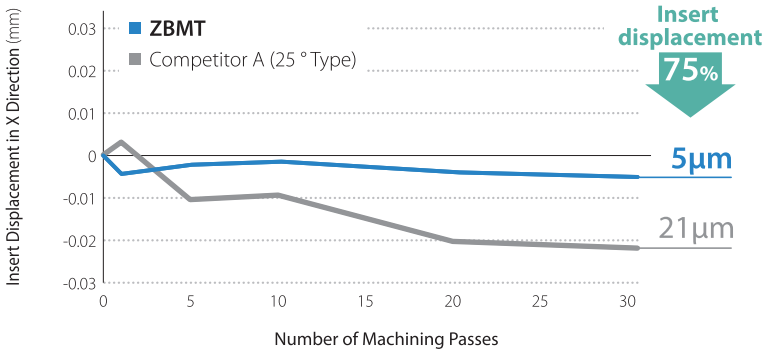
Unique design holds insert at 2 points
Safe even for insert with small tip angle that is difficult to mount

Indentations for screw clamp are designed into the insert's body

Uses a large screw size (M4)



Insert Displacement During Facing Comparison (Internal evaluation)



Cutting Conditions : Vc = 230 m/min, ap = 0.3 mm, f = 0.15 mm/rev, Wet Workpiece SCM435

*The above figures are not guaranteed. It depends on cutting conditions.

Check

By controlling insert displacement,

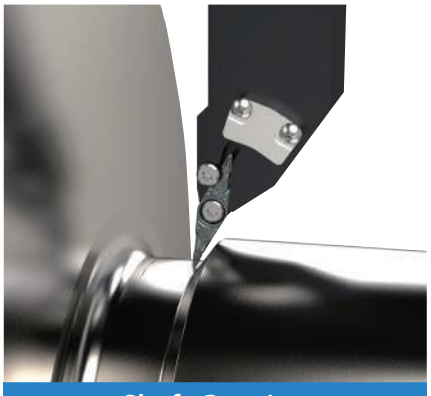
– Machining precision is stabilized and long tool life is enable

– Reduces defect rate due to sudden dimensional deviation

*Please check **P5** for how to attach and detach insert using the new insert clamp

Provides High Quality and Stable Machining in Various Machining Applications

Excellent Performance in Various Machining Applications including Copying, Undercutting, Tapering, V-Slotting, Spherical Machining, etc.



Shaft Copying

Internal Undercutting

End Face Tapering

CG images

2 Unique Holder Design to Meet Customers' Needs

Both boring bars and external toolholders are compatible with internal coolant.

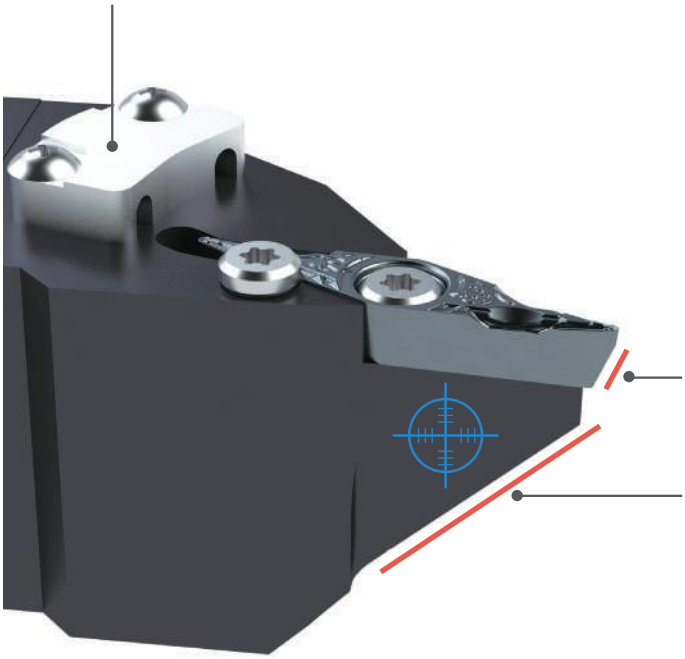
Unique Double Coolant Hole Design

Supplies coolant directly to the cutting edge and provides improved chip evacuation and long tool life (Coolant discharge direction: Fine adjustment possible)

*Though coolant stream hits side clamp screw, machining performance is not affected

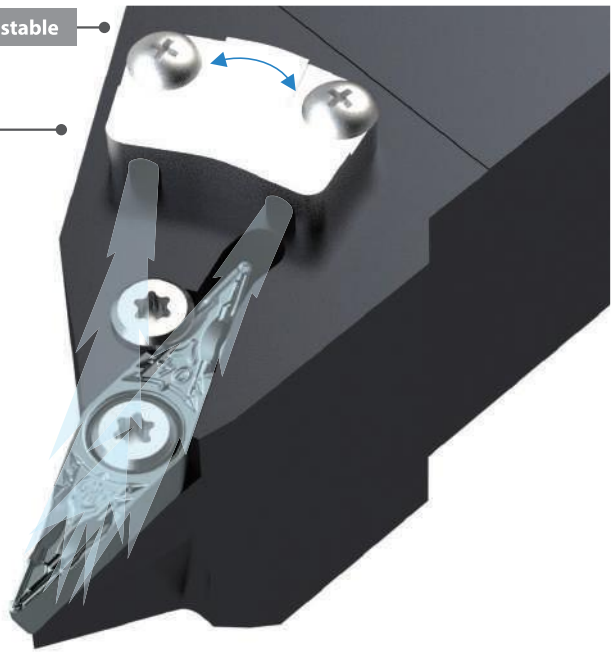
*Pressure resistance: ~ 3 MPa

Uses a clamp with a small thickness that does not prevent chip flow



Fine Tuned and Adjustable

± 4 ° Adjustable Oscillation



Easy to use for Facing

Insert corner : 2-Step Positive Type (20°)

Holder: Tapered shape

Inserts and toolholders have a unique end shape

No additional machining is required when trying to avoid interference with workpiece.

Effective for facing applications

Great Solution

Significant reduction in quality defect costs

(User evaluation)

Suppresses dimensional fluctuations due to insert displacement. Reduces defect rates.

Dimensional defect rate

GF Chipbreaker

Competitor B **100 +/month**

Defect rate Reduction

Cutting Conditions : Vc = 230 m/min, ap = 0.3 mm, f = 0.15 mm/rev, Wet
Workpiece SCM435

GF Chipbreaker chip condition

Customer Feedback

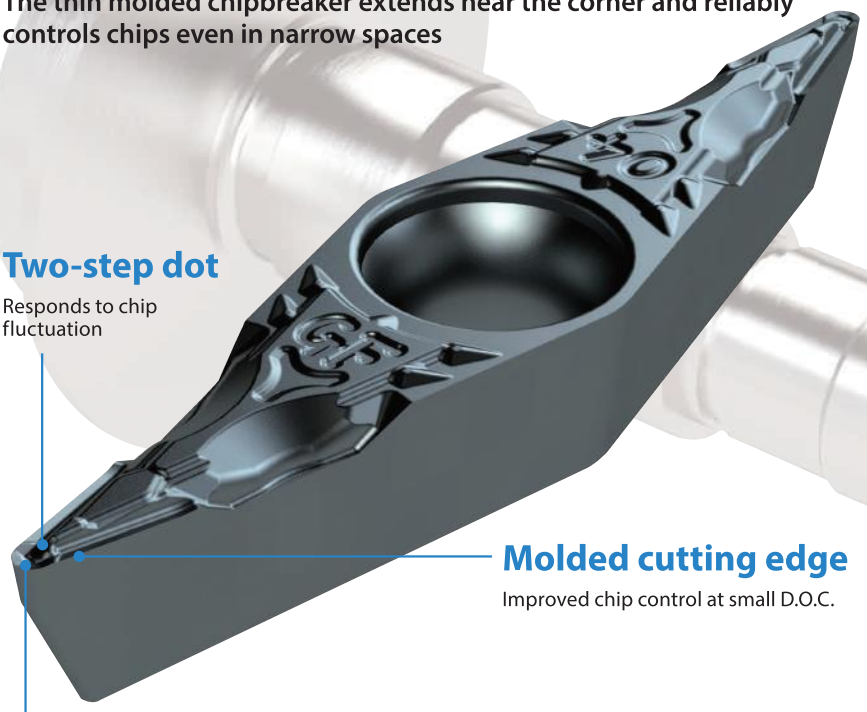
– Some parts require an insert with a tip angle of 25 ° to allow machining.
– The dimensional error of the GC chipbreaker was drastically improved in comparison with the competitors.
– Greatly reduced the cost of quality defects

3 New GF Chipbreaker for ZBMT Reduces Chip Control Issues at minute D.O.C.

GF Chipbreaker

Solving chip control issues leads to high-quality surface finishes

The thin molded chipbreaker extends near the corner and reliably controls chips even in narrow spaces



Two-step dot

Responds to chip fluctuation

Molded cutting edge

Improved chip control at small D.O.C.

Mortar-shaped chipbreaker

Low resistance and excellent chip control even in ductile workpieces

Chip control comparison

(Internal evaluation)

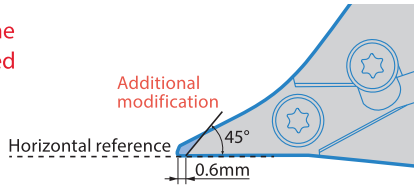
GF Chipbreaker

Competitor A (25 ° Type)

Cutting Conditions : Vc = 230 m/min, f = 0.15 mm/rev, ap = 0.2 - 0.5 mm, Wet Workpiece SCM435 Facing

15° Inserts are also available upon customer requests

To avoid holder interference, additional modifications is required as shown in the figure on the right (Details: **P8**). Also, as shown in the figure below, special order for holders may be required depending on machining application.

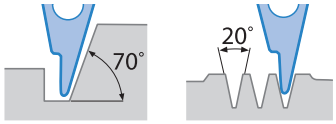


Examples

When using the toolholder in reverse mounting position

When using the toolholder in normal mounting position

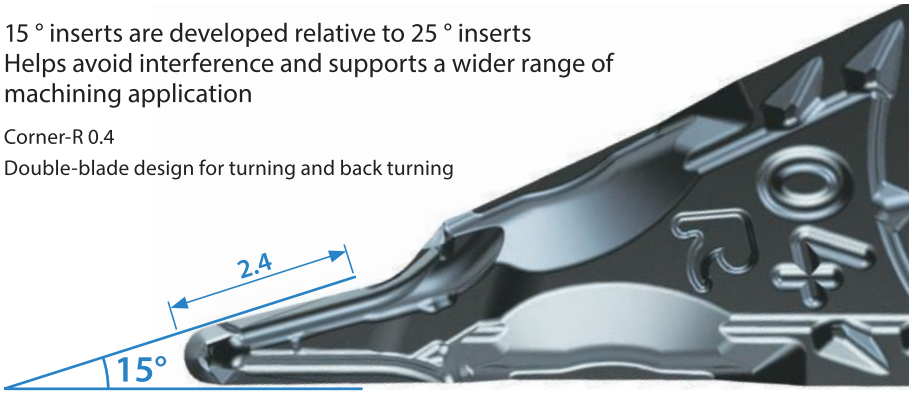
* Holder: Special order specification



15 ° inserts are developed relative to 25 ° inserts
Helps avoid interference and supports a wider range of machining application

Corner-R 0.4

Double-blade design for turning and back turning



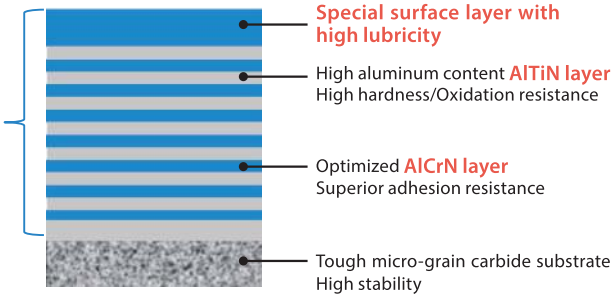
Kyocera's high-performance insert grade

PR1725 First recommendation for steel machining. Excellent surface finish and long tool life

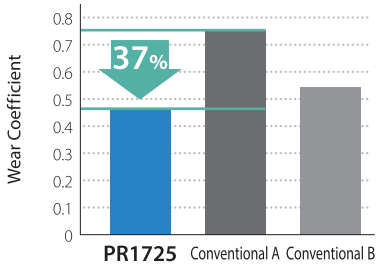
MEGACOAT NANO PLUS

AlTiN/AlCrN Nano laminated film with superior wear resistance and adhesion resistance

<Reduces cracking>
Reduces abnormal damages such as chipping because of increased lamination layer with a thinner gap than conventional coatings.



Wear Coefficient Comparison
(Internal evaluation)



PR1535 The combination of a tough substrate and a special nano coating layer creates long tool life and stable machining in stainless steel machining

MEGACOAT NANO

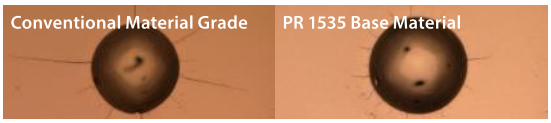
Point 1 An increase in cobalt content yields a substrate with greater toughness *In comparison to our conventional material grade

Point 2 Improved stability by optimization and homogenization of grains in the base material

Point 3 MEGACOAT NANO coating technology for long tool life and stable machining

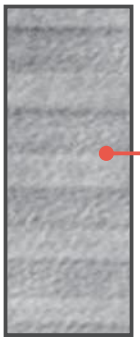
23% Fracture toughness *

Cracking Comparison by Diamond Indenter (Internal evaluation)



Long Cracks Short Cracks

Shock Resistance



Enlarged view

MEGACOAT Base Layer Structure

Point

PR1535 also shows superior performance in steel machining under unstable conditions

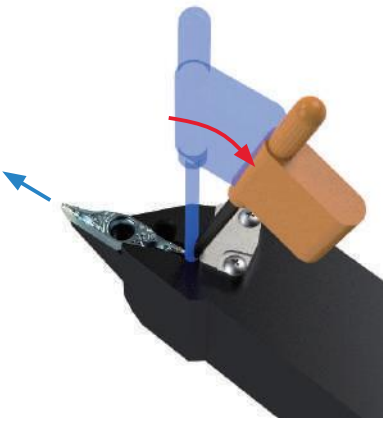
Instructions

When mounting the insert (Tightening torque: 1.2 N · m)

1. Tighten the main screw with the insert pressed against the contact surface with fingertips.

2. Tighten the side screw to complete the installation.

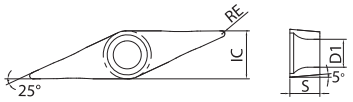
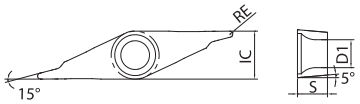
When removing the insert



Remove the two screws and put the wrench into the gap at the back end of the insert. It can be easily removed by pushing out the insert as shown above.

Insert Description

Carbide coating

Shape		Description	Dimensions (mm)				MEGACOAT NANO PLUS	MEGACOAT NANO
			IC	S	D1	RE	PR1725	PR1535
 Tip Angle 25 °		ZBMT 13T302GF	6.35	3.97	5.3	0.2	●	●
		13T304GF				0.4	●	●
		13T308GF				0.8	●	●
 Tip Angle 15 ° (Right Hand R)		ZBMT 13T304R-GF-15D	6.35	3.97	5.3	0.4	●	●

Because insert has a molded shape, the tip angle may be 24 ° depending on the measurement location.

● : Standard Stock

Recommended Cutting Conditions Tables

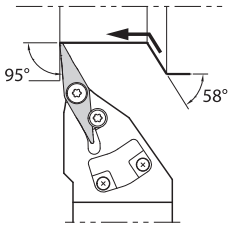
Workpiece	Insert tip angle	Corner-R (RE)	Insert Grade	Vc (m/min)	ap (mm)	f (mm/rev)
Carbon Steel / Alloy Steel	25°	0.2	PR1725	60 - **150** - 200	0.2 - **0.3** - 1.5	0.05 - **0.10** - 0.15
			PR1535	60 - **120** - 180	0.2 - **0.3** - 1.5	0.05 - **0.10** - 0.15
		0.4 / 0.8	PR1725	60 - **150** - 200	0.2 - **0.3** - 2.0	0.05 - **0.15** - 0.25
			PR1535	60 - **120** - 180	0.2 - **0.3** - 2.0	0.05 - **0.15** - 0.25
	15°	0.4	PR1725	60 - **150** - 200	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
			PR1535	60 - **120** - 180	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
Stainless Steel	25°	0.2	PR1725	60 - **150** - 180	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
			PR1535	60 - **120** - 150	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
		0.4 / 0.8	PR1725	60 - **150** - 180	0.2 - **0.3** - 1.0	0.05 - **0.15** - 0.25
			PR1535	60 - **120** - 150	0.2 - **0.3** - 1.0	0.05 - **0.15** - 0.25
	15°	0.4	PR1725	60 - **150** - 180	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
			PR1535	60 - **120** - 150	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15
Cast Iron	25°	0.2	PR1725	60 - **150** - 180	0.2 - **0.3** - 1.5	0.05 - **0.10** - 0.15
		0.4 / 0.8	PR1725	60 - **150** - 180	0.2 - **0.3** - 2.0	0.05 - **0.15** - 0.25
	15°	0.4	PR1725	60 - **150** - 180	0.2 - **0.3** - 1.0	0.05 - **0.10** - 0.15

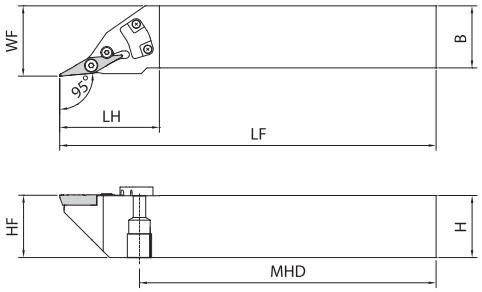
When using machining at ap 1.5 mm or more, reduce the feed by about 50%.

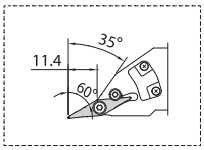
External

SZLB (External/Copying)

Pressure resistance : ~ 3 MPa







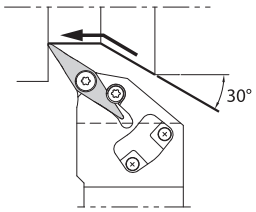
Side Rake Angle : 0 °
Angle of Inclination : 0 °

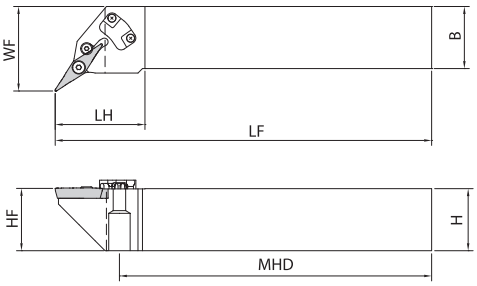
·Right-hand Shown

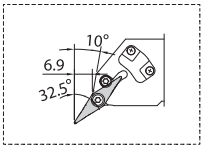
For **ZBMT13T304R-GF-15D**, the right-hand holder (R) is applicable.

SZPB (External/Facing/Copying/Undercutting)

Pressure resistance : ~ 3 MPa





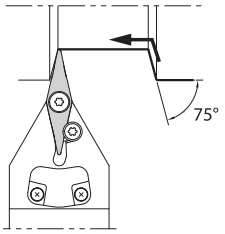


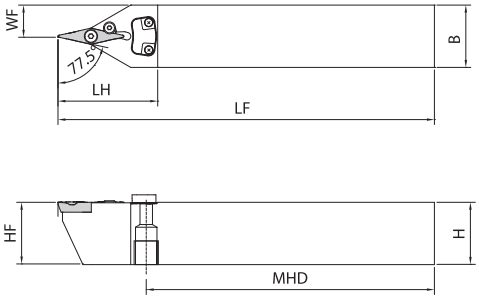
Side Rake Angle : 0 °
Angle of Inclination : 0 °

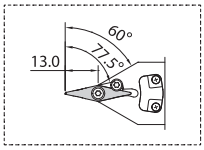
·Right-hand Shown

SZVBN (External/Copying)

Pressure resistance : ~ 3 MPa

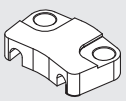
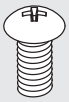
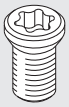
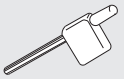






Side Rake Angle : 0 °
Angle of Inclination : 0 °

Toolholder Dimensions

Description		Stock			Dimensions (mm)							Standard Corner-R (RE)	Coolant hole	Parts			
														Clamper	Clamp Screw (For Clamper)	Clamp Screw	Wrench
		R	N	L	H	HF	B	LF	LH	WF	MHD						
SZLB R/L	2020K-13C	●		●	20	20	20	125	40	23	92.6	0.4	Yes	ZCP-13	BH2X6	SB-3079TR	FT-8
	2525M-13C	●		●	25	25	25	150	40	28.2	118						
SZPB R/L	2020K-13C	●		●	20	20	20	125	37	27.2	95	0.4	Yes				
	2525M-13C	●		●	25	25	25	150	36	33.9	124.2						
SZVBN	2020K-13C		●		20	20	20	125	40	10	89.6	0.4	Yes			Recommended tightening torque 1.2 N · m	
	2525M-13C		●		25	25	25	150	40	12.5	114.6						

● : Standard Stock

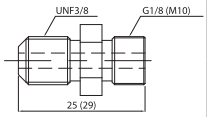
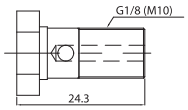
Piping Parts for External Toolholders

JCT series piping parts can be used for machining with internal coolant (Sold separately).

For details, please refer to **the 2020 to 2021 Kyocera general catalog.**

Joint/Banjo Bolt

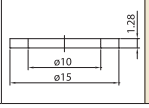
Pressure resistance : ~ 30 MPa

Shape		Description	Stock	Thread Standard Toolholder machine connection side
		J-G1/8-UNF3/8	●	G1/8
		J-M10X1.5-UNF3/8	●	M10X1.5
Banjo Bolt (For Angle Hose) 		BB-G1/8	●	G1/8
		BB-M10X1.5	●	M10X1.5

● : Standard Stock

Washer

Pressure resistance : ~ 30 MPa

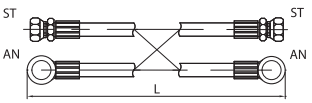
Shape		Description	Stock
		WS-10	●

*When using banjo bolts, two washers are required.

● : Standard Stock

Hose

Pressure resistance : ~ 30 MPa

Shape		Description	Stock	Thread Standard		Dimensions (mm) L
Straight/Straight 		HS-ST-ST-200	●	UNF3/8	UNF3/8	200
		HS-ST-ST-250	●			250
Straight/Angle 		HS-ST-AN-200	●	UNF3/8	– (Banjo Bolt)	200
		HS-ST-AN-250	●			250
Angle/Angle 		HS-AN-AN-200	●	– (Banjo Bolt)	– (Banjo Bolt)	200
		HS-AN-AN-250	●			250

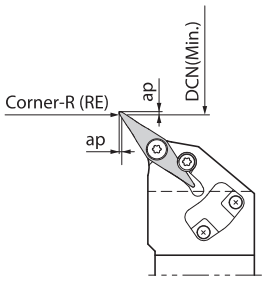
● : Standard Stock

Boring/Facing Available Cutting Diameter and Maximum D.O.C.

Standard Corner-R 0.4 (RE)

Cutting Dia.	Depth (mm)
ø30	0.5
ø50	1.5
ø65	3.0
ø80	6.0
ø100	10.0
ø150	14.0

SZPB Type Cutting Diameter for Undercutting



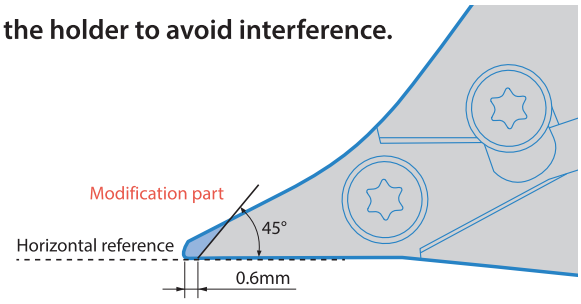
Corner-R (RE)	ap (mm)	DCN (Min.)
0.2	0.5	ø30
	1	ø35
0.4	0.5	ø30
	1	ø35
0.8	0.5	ø110
	1	ø150

How to Modify Toolholder when Using 15 ° Insert

When using 15 ° insert, additional modification is required for the holder to avoid interference.

Recommended Additional Modification

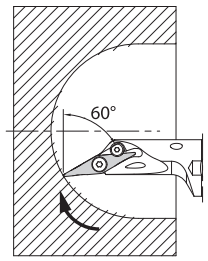
- Set the edge of insert bearing surface at the end of the holder at horizontal reference shown below.
- Modify the holder to 0.6 mm from the tip at an angle of not less than 45 degrees from the horizontal.

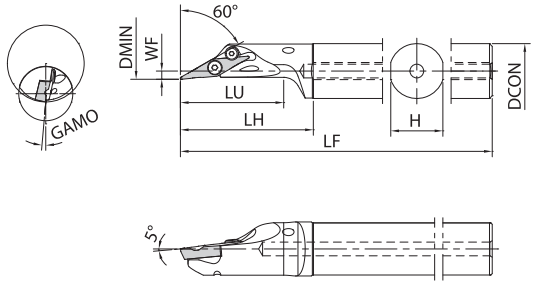


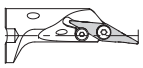
Boring Bar

Maximum overhang length L/D = ~ 5.5

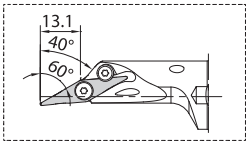
A-SZJB-AE Excellent Bar (Internal Spherical Machining/Internal Facing/Copying)







Left-hand (L) is the above shape

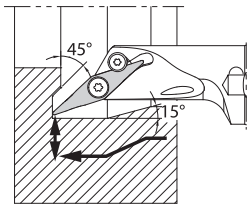


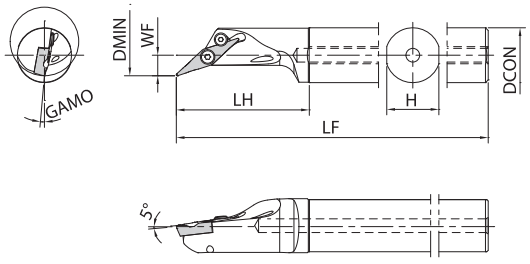
Shank Diameter	Straight Hole Diameter
ø20	ø5
ø25	
ø32	

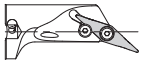
·Right-hand Shown

For **ZBMT13T304R-GF -15D**, the right-hand holder (R) is applicable.

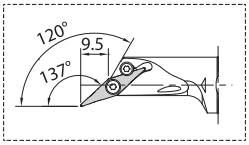
A-SZXB-AE Excellent Bar (Internal Facing/Copying/Undercutting)







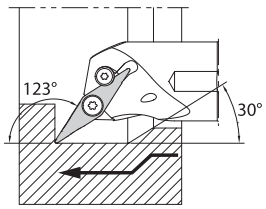
Left-hand (L) is the above shape

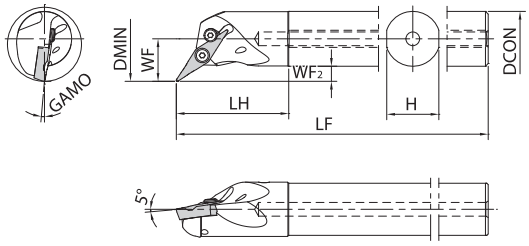


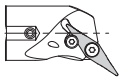
Shank Diameter	Straight Hole Diameter
ø20	ø5
ø25	
ø32	

·Right-hand Shown

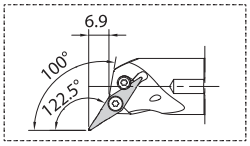
A-SZQB-AE Excellent Bar (Copying/Undercutting)







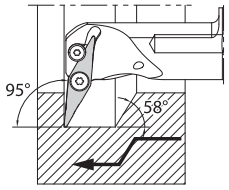
Left-hand (L) is the above shape

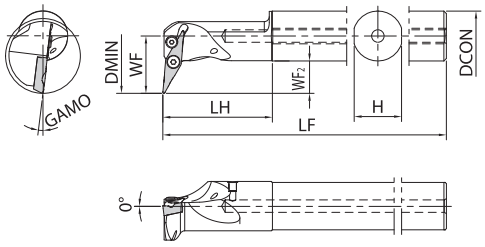


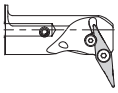
Shank Diameter	Straight Hole Diameter
ø20	ø5
ø25	
ø32	

·Right-hand Shown

A-SZLB-AE Excellent Bar (Copying)







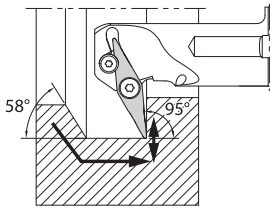
Left-hand (L) is the above shape

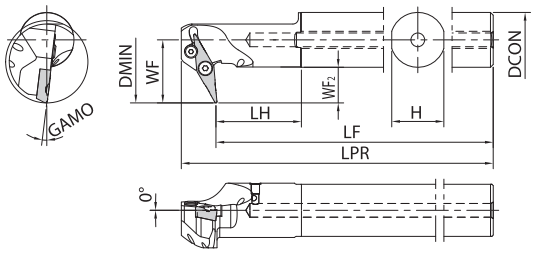
Shank Diameter	Straight Hole Diameter
ø20	ø5
ø25	
ø32	

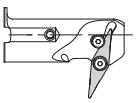
·Right-hand Shown

For **ZBMT13T304R-GF -15D**, the left hand holder (L) is applicable

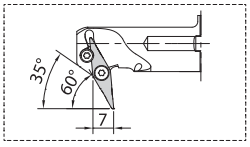
A-SZZB-AE Excellent Bar (Back Boring)







Left-hand (L) is the above shape



Shank Diameter	Straight Hole Diameter
ø20	ø5
ø25	
ø32	

·Right-hand Shown

For **ZBMT13T304R-GF -15D**, the right hand holder (R) is applicable .

Toolholder Dimensions

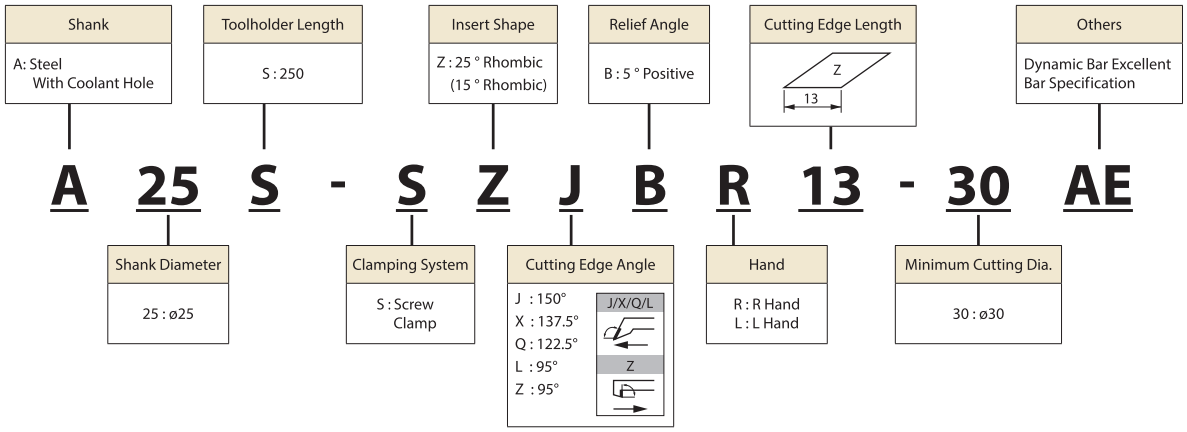
Toolholder Dimensions

	Description	Stock		Minimum Cutting Dia.	Dimensions (mm)								GAMO	Standard Corner-R (RE)	Coolant hole	Parts		
																Clamp Screw	Wrench	Plug
		R	L	DMIN	DCON	H	LPR	LF	LU	LH	WF	WF2						
Excellent Bar	A20R-SZJB R/L13-28AE	●	●	28	20	19		200	37.5	48	3.0	-	5°	0.4	Yes	SB-3079TR	FT-8	HS3X3
	A25S-SZJB R/L13-30AE	●	●	30	25	24	-	250	47	58	3.5	-				Recommended tightening torque 1.2 N · m		HS4X4
	A32S-SZJB R/L13-40AE	●	●	40	32	31		250	61.5	72	3.5	-						
	A20R-SZXB R/L13-25AE	●	●	25	20	19		200	37.5	48	7.5	-	5°	0.4	Yes	SB-3079TR	FT-8	HS3X3
	A25S-SZXB R/L13-30AE	●	●	30	25	24	-	250	45.2	58	7	-				Recommended tightening torque 1.2 N · m		HS4X4
	A32S-SZXB R/L13-40AE	●	●	40	32	31		250	60.2	74	7	-						
	A20R-SZQB R/L13-27AE	●	●	27	20	19		200	-	41	15.5	5.5	5°	0.4	Yes	SB-3079TR	FT-8	HS3X3
	A25S-SZQB R/L13-32AE	●	●	32	25	24	-	250	-	51	18	5.5				Recommended tightening torque 1.2 N · m		HS4X4
	A32S-SZQB R/L13-40AE	●	●	40	32	31		250	-	54	22.5	6.5						
	A20R-SZLB R/L13-30AE	●	●	30	20	19		200	-	42	23	13	7°	0.4	Yes	SB-3079TR	FT-8	HS3X3
	A25S-SZLB R/L13-34AE	●	●	34	25	24	-	250	-	64	25.5	13				Recommended tightening torque 1.2 N · m		HS4X4
	A32S-SZLB R/L13-40AE	●	●	40	32	31		250	-	86	29	13						
	A20R-SZZB R/L13-30AE	●	●	30	20	19	200	187	-	42	23	13	7°	0.4	Yes	SB-3079TR	FT-8	HS3X3
	A25S-SZZB R/L13-34AE	●	●	34	25	24	250	237	-	58	25.5	13				Recommended tightening torque 1.2 N · m		HS4X4
	A32S-SZZB R/L13-40AE	●	●	40	32	31	250	237	-	74	29	13						

Minimum cutting dia. when installing with standard corner-R (RE) insert
When machining with an insert other than the standard corner-R (RE), there may be interference.

● : Standard Stock

Identification System



Unique Cutting Angle A-SZXB-AE (Internal Facing/Copying/Undercutting)

Features

· Chatter-resistant shape

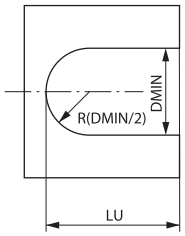
The insert is placed near the center of the shank to ensure the thickness of the lower jaw of the insert.

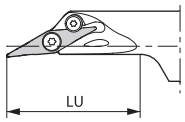
· User-friendly design

The holder width (WF + Neck radius) is small, and it is easy to apply to the narrow gap of the workpiece (Minimum cutting dia. DMIN: Determined by R near the holder edge).

Inner Spherical Machining/Internal Facing/Copying (A-SZJB-AE)

Application Range

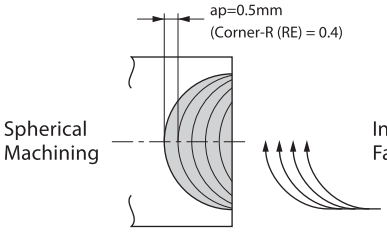


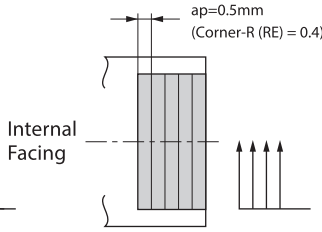


DMIN : ø28 - ø40

Applications

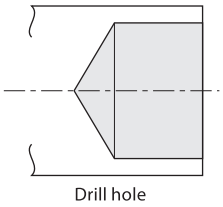
Without pre-drilled hole

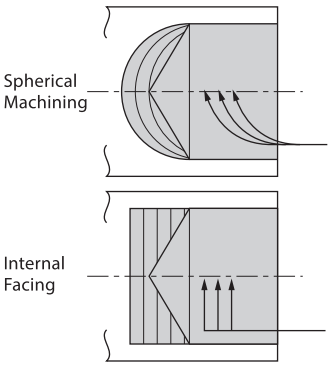




* f should be 0.05 mm/rev or less at internal facing.

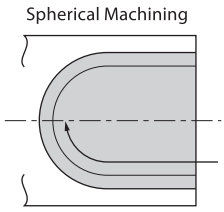
Machining from drilled hole

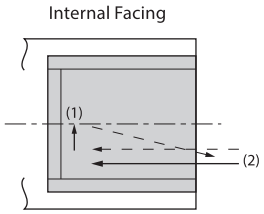




* f should be 0.05 mm/rev or less at internal facing.

Finishing



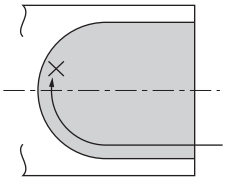


Machining Process

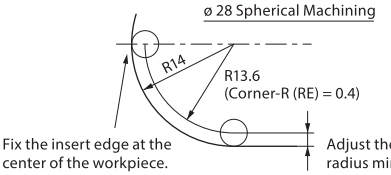
1.Finish the internal face first.

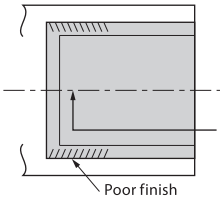
2.Next, finish the internal surface.

Caution



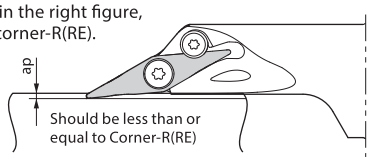
Internal spherical machining and internal facing
(Especially internal spherical machining)
When machining past the center of the workpiece,
insert may break.





This type of machining is possible,
but the chips might scratch the surface.

When internal copying as shown in the right figure,
keep ap less than or equal to the corner-R(RE).



[Burrs may occur, if ap is Corner-R(RE) and more]

CP468 CAT/11.6T2104DNN