KYOCERA

AHB
TOOLING & MACHINERY
COMPLETE METALWORKING SOLUTIONS
(800) 991-4225 www.ahbinc.com
ISO Certified customerservice@ahbinc.com

ZBMT Series

25° Insert Profiling Tools

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

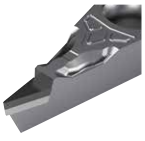
Large lineup of toolholders from external turning and boring bars that support a wide range of applications, including copying, undercutting, tapering, V slotting, etc.

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

GF chipbreaker for ZBMT inserts reduces chip control issues when machining at minute depths of cut

15° insert tip angle also available

NEW



PCD Insert

Cermet Insert

ZBMT Series

25° Insert Profiling Tools

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 with a Wide Variety of Toolholders

Challenges

Workpiece geometries are becoming increasingly 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.

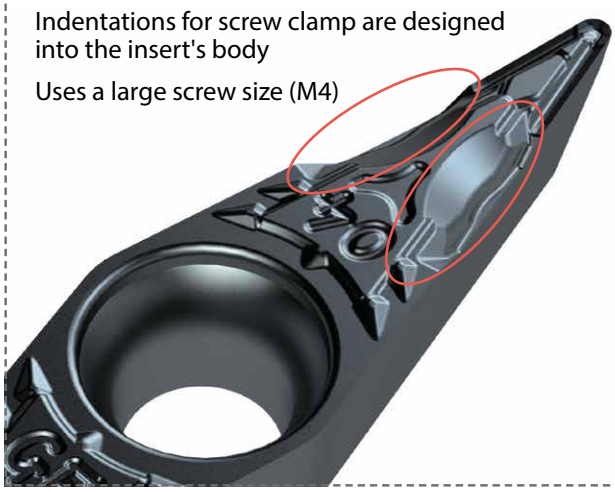
1 Newly Developed Self-Clamping Mechanism Achieves a Higher Rigidity

Side Lock Mechanism

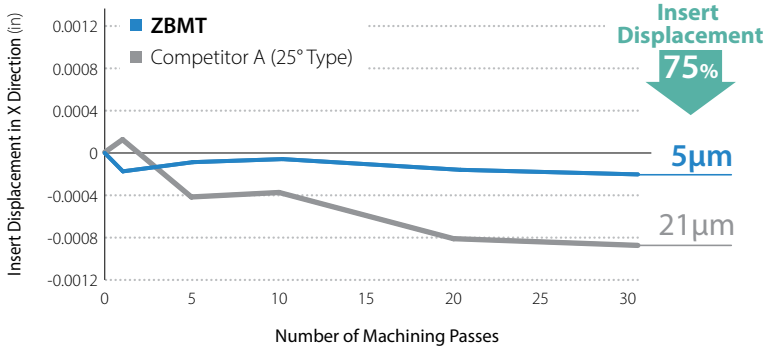
Unique design holds insert at 2 points
Safe even for insert with small tip angle that is difficult to mount

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 = 750 sfm, D.O.C. = 0.012", f = 0.006, Wet Workpiece 4137

*The above figures are not guaranteed and will depend on cutting conditions.

Insert Design

By controlling insert displacement,

- Machining precision is stabilized and long tool life is enable
- Reduces defect rate due to sudden dimensional deviation

*Please check **Page 10** 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.

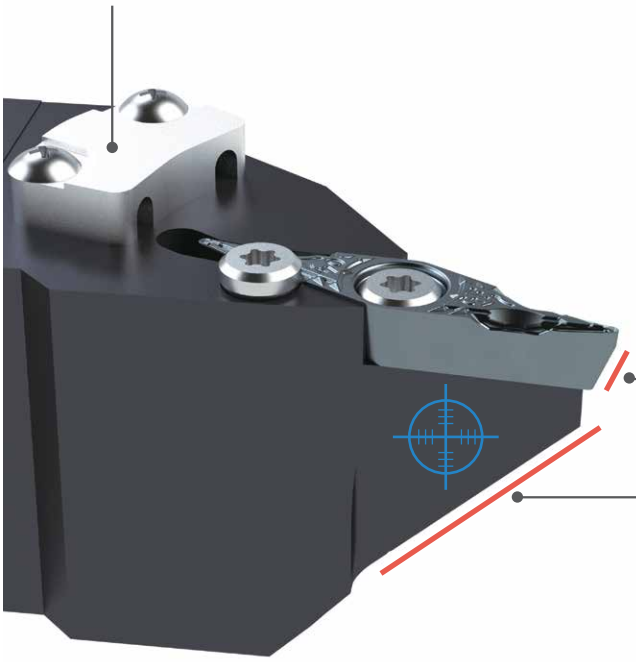
Unique Double Coolant Hole Design

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

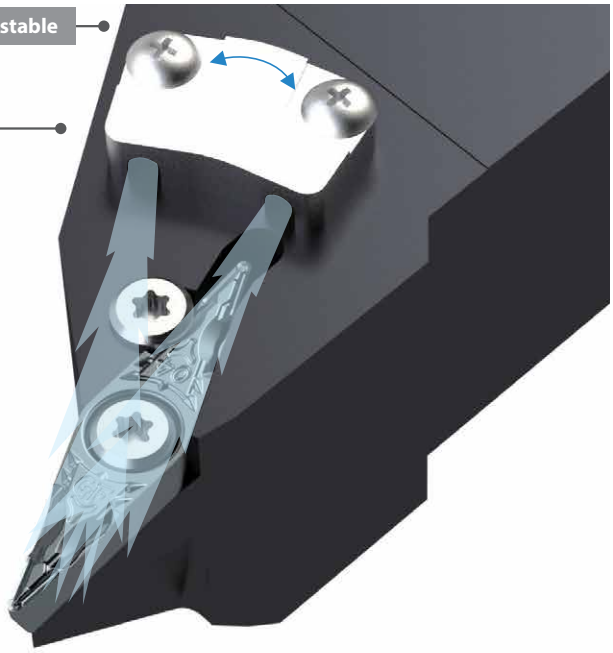
*Pressure resistance: ~ 3 MPa

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

Case Study

Significant reduction in quality defect costs

(User Evaluation)

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

Dimensional defect rate

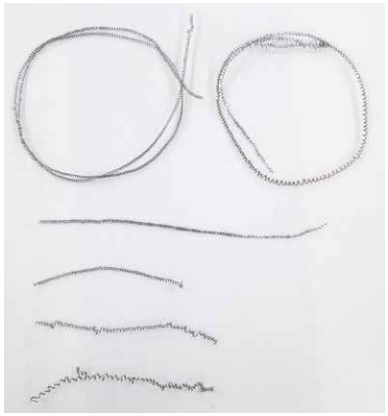
GF Chipbreaker

Competitor B **100 +/month**

Defect rate Reduction

Cutting Conditions : Vc = 750 sfm, D.O.C. = 0.012", f = 0.006 ipr, Wet
Workpiece 4137

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

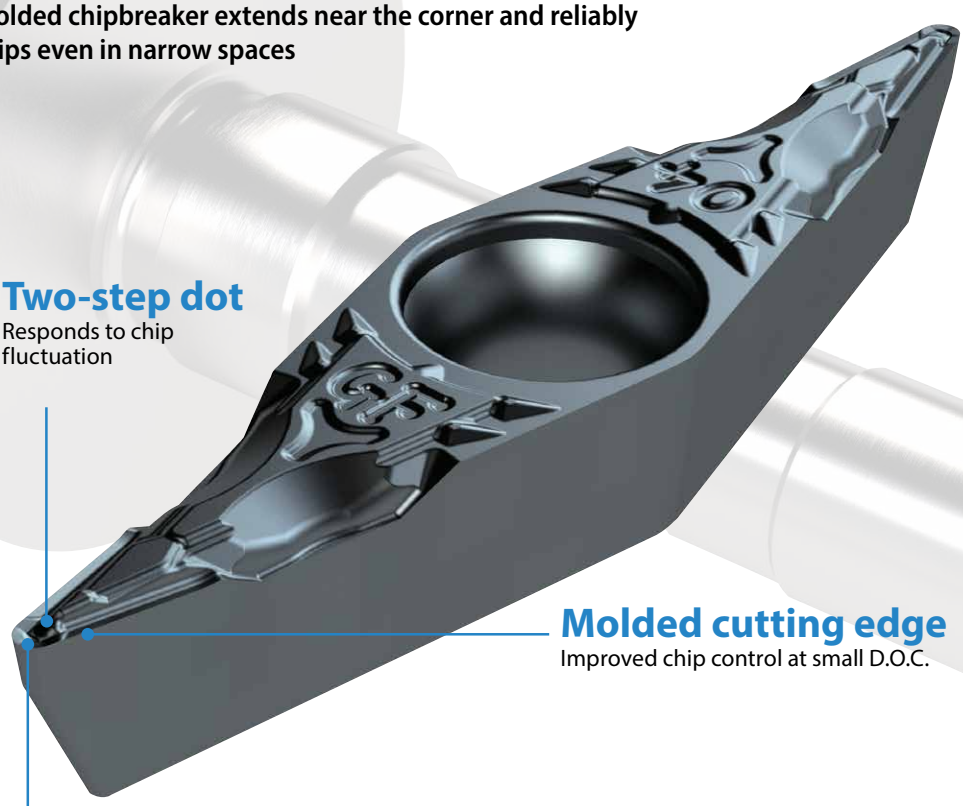
3 New GF Chipbreaker for ZBMT Reduces Chip Control Issues at minute D.O.C.

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

Movie

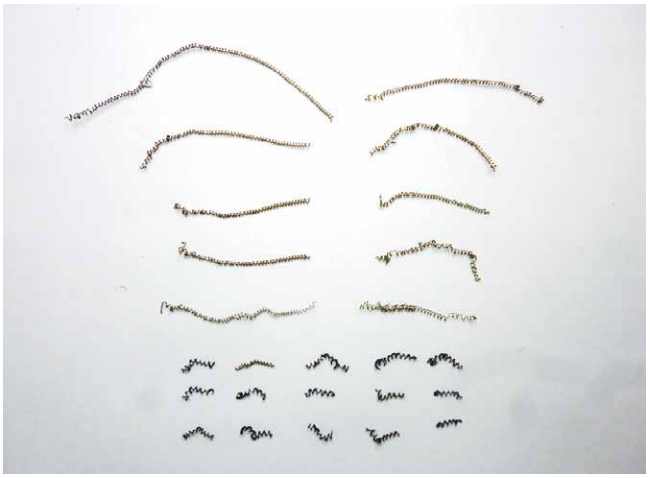


Two-step dot
Responds to chip fluctuation

Molded cutting edge
Improved chip control at small D.O.C.

Circular-shaped chipbreaker
Low resistance and excellent chip control even in ductile workpieces

Chip control comparison (Internal evaluation)



GF Chipbreaker

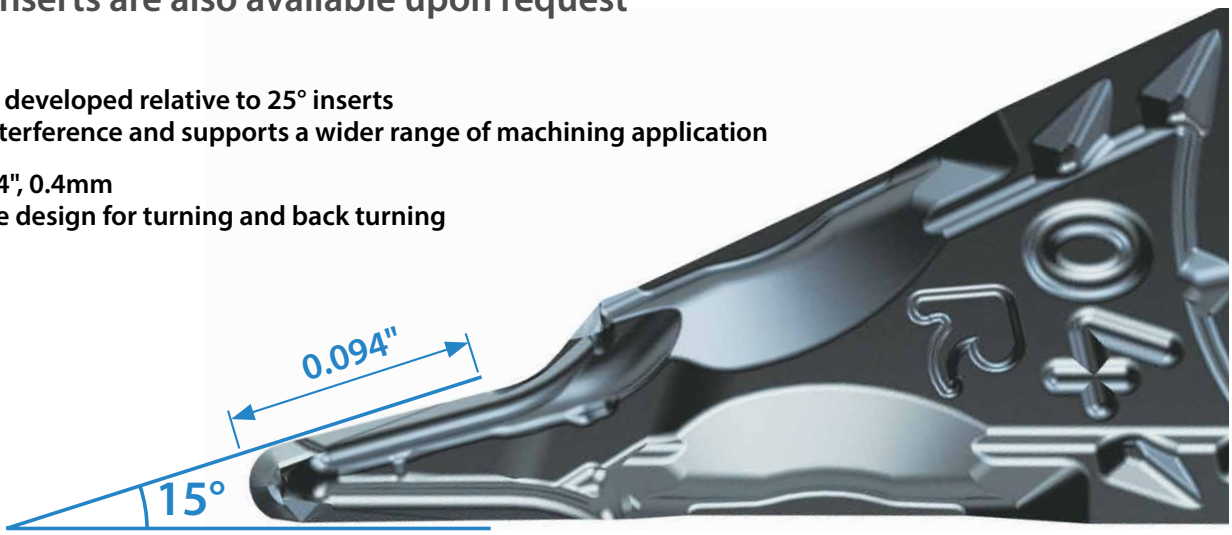
Competitor A (25° Type)

Cutting Conditions : Vc = 750 sfm, f = 0.006 ipr, D.O.C. = 0.008" - 0.020", Wet Workpiece 4137 Facing

4 15° inserts are also available upon request

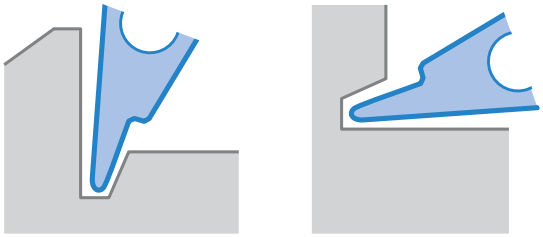
15° inserts are developed relative to 25° inserts
Helps avoid interference and supports a wider range of machining application

- Corner-R 1/64", 0.4mm
- Double-blade design for turning and back turning

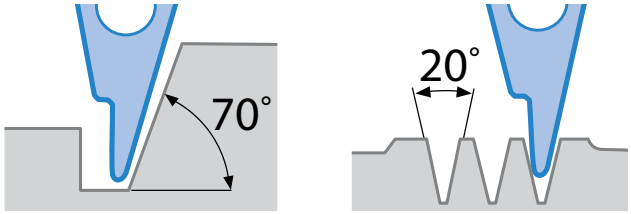


Examples

When using the toolholder in reverse mounting position



When using the toolholder in normal mounting position *Holder: Special order specification



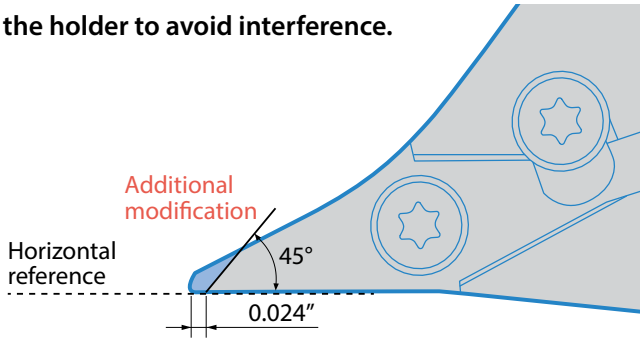
To avoid holder interference, additional modifications are required as shown in the figure below.
Also, as shown in the figure below, special order for holders may be required depending on machining application.

How to Modify Toolholder when Using 15° Insert

When using 15 ° insert, additional modification are 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 0.024" from the tip at an angle no less than 45° from the horizontal.



Kyocera's high-performance insert grades

PVD Coated Carbide

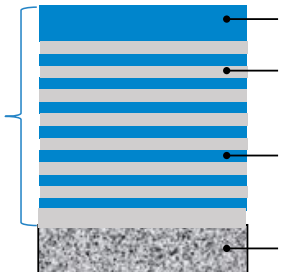
PR1725

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.



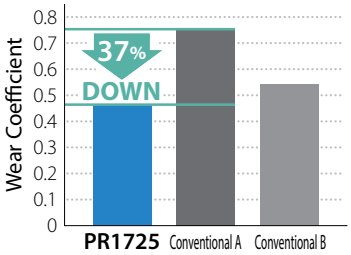
Special surface layer with high lubricity

High aluminum content **AlTiN layer**
High hardness/Oxidation resistance

Optimized **AlCrN layer**
Superior adhesion resistance

Tough micro-grain carbide substrate
High stability

Wear Coefficient Comparison
(Internal evaluation)



Superior Wear and Chipping Resistance

High hardness with nano laminated film layer.
Internal stress optimization reduces chipping

Excellent Surface Finish

Special surface layer with great lubricity reduces adhesion

Applicable to various workpiece materials

Excellent oxidation resistance. Superior high temperature properties maintains good performance in steel, stainless steel and free-cutting steel

High machining stability

Tough micro-grain carbide substrate provides stable machining

PVD Coated Carbide

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

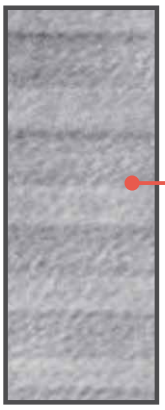
1. An increase in cobalt content yields a substrate with greater toughness
   *In comparison to our conventional material grade
2. Improved stability by optimization and homogenization of grains in the base material
3. MEGACOAT NANO coating technology for long tool life and stable machining

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

NEW

Hybrid Cermet for Steel Machining

PV720 / PV730

New cermet for high quality surface finish machining

NEW

Uncoated CERMET

TN620

Three attributes of the hybrid technology contributes to excellent fracture and wear resistance

1 Kyocera's Leading Cermet Technology

General Use PV720
1st Recommendation
Excellent wear resistance

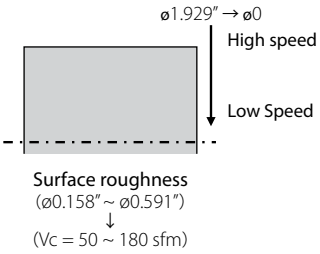
Stability Oriented PV730
Tough Cermet
High stability
Fracture resistance: 2X more than competitors (Internal evaluation)

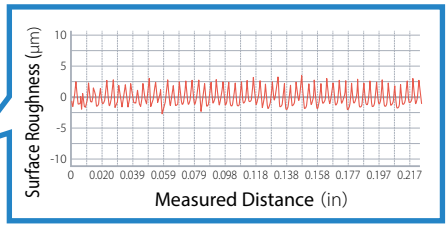
TN620
Non-coated
Cost-efficient

2 High Quality Surface Finish

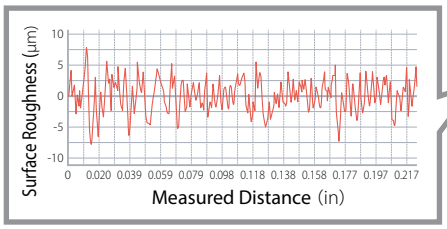
Surface finish comparison (Internal evaluation)

Cutting Conditions: Vc=590 ~ 0 sfm (Constant rate)
D.O.C. = 0.020", f = 0.004 ipr, Wet
CNMG431 type Workpiece: 1010





Excellent Surface Finish



Clouded Surface Finish

Case Studies (ZBMT)

Shaft 1045

Vc = 380 sfm
D.O.C. = 0.002"
f = 0.003 ipr
Wet
ZBMT13T304GF
SZLBR16-3D-C

Number of products

ZBMT (PV720) **135 pcs/edge**

Competitor D **55 pcs/edge**

x2.4 Tool Life

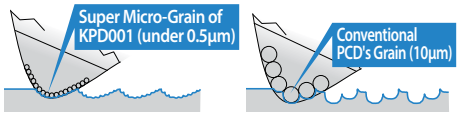
Side Lock Mechanism in ZMBT reduces the displacement in the Z-direction. Improves work efficiency with no dimension correction. Excellent surface finish with PV720.

(User evaluation)

PCD (Polycrystalline Diamond)

KPD001 Excellent Aluminum Alloy Surface Finish with Micro-Grain PCD

1 Good Surface Finish (image)

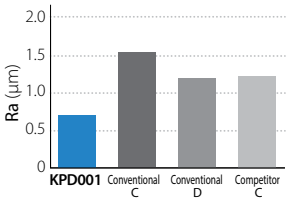


Excellent surface finish of Super Micro-Grain KPD001

Surface finish of Conventional PCD Tool

Surface Finish Comparison

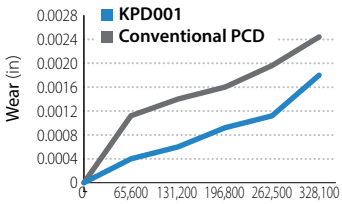
(Internal evaluation)



2 Improved Wear Resistance

Wear Resistance Comparison

(Internal evaluation)



Cutting conditions :
Vc = 1,770 sfm,
D.O.C. = 0.006",
f= 0.009 ipr, Wet
Workpiece 413.0

*Cutting Length = Cutting Length that cutting edge runs on Workpiece Periphery

Case Studies (ZBMT)

Spacer 5052/7175

Vc = 1,770 sfm
ap = 0.004" (Facing) / 0.008" (Internal)
f = 0.002 ipr,
Wet
ZBMT13T304NE
A25S-SZQBR13-32AE

Number of products

ZBMT (KPD001)	**200 pcs/edge**	Dimensional accuracy, Stable
Competitor F	**200 pcs/edge**	Dimentional accuracy, Unstable

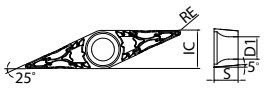
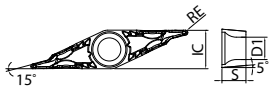
Good
Dimentional accuracy, Cutting Edge

Competitor's products had dimensional fluctuations, but ZBMT has excellent stability even with more than 200 pcs. Good cutting edge condition and high dimensional accuracy with H6 tolerance.

(User evaluation)

Insert Description

Carbide, Cermet, PCD

Shape		Description	Dimensions (in)				MEGACOAT NANO PLUS	MEGACOAT NANO	PVD Coated Cermet (NEW)		Unoated Cermet (NEW)	PCD (NEW)
			IC	S	D1	RE	PR1725	PR1535	PV720	PV730	TN620	KPD001*1
 Tip Angle 25 °		ZBMT 13T302GF	1/4	0.156	0.209	0.008	●	●				
		13T304GF				1/64	●	●	●	●	●	
		13T308GF				1/32	●	●	●	●	●	
 Tip Angle 25 ° 1-edge		ZBMT 13T301NE	1/4	0.156	0.209	0.004						●
		13T302NE				0.008						●
		13T304NE				1/64						●
 Tip Angle 15 ° (Right-Hand R)		ZBMT 13T304R-GF-15D	1/4	0.156	0.209	1/64	●	●				

- Because insert has a molded shape, the tip angle may be 24° depending on the measurement location.
- A PCD insert (KPD001) cannot be reground.
- When a PCD insert (KPD001) enters a workpiece or contacts a wall, keep the feed rate below 50% of normal use to prevent damage to the insert. If feed is not reduced, the edge may defect.

● : Standard Stock
Inserts are sold in 10 piece boxes
*1.PCD Insert (KPD001) is sold in 1 piece boxes

Recommended Cutting Conditions

Workpiece	Insert Tip Angle	Corner-R (RE) (in)	Insert Grade	Vc (sfm)	D.O.C. (in)	f (ipr)
Carbon Steel / Alloy Steel	25°	0.008	**PR1725**	200 - **490** - 660	0.008 - **0.012** - 0.059	0.002 - **0.004** - 0.006
			PR1535	200 - **390** - 590	0.008 - **0.012** - 0.059	0.002 - **0.004** - 0.006
		1/64 | 1/32	**PR1725**	200 - **490** - 660	0.008 - **0.012** - 0.079	0.002 - **0.006** - 0.010
			PR1535	200 - **390** - 590	0.008 - **0.012** - 0.079	0.002 - **0.006** - 0.010
			PV720	460 - **590** - 790	0.008 - **0.012** - 0.059	0.002 - **0.005** - 0.008
			PV730	460 - **590** - 790	0.008 - **0.012** - 0.059	0.002 - **0.005** - 0.008
			TN620	460 - **590** - 790	0.008 - **0.012** - 0.059	0.002 - **0.005** - 0.008
	15°	1/64	**PR1725**	200 - **490** - 660	0.008 - **0.012** - 0.039	0.002 - **0.004** - 0.006
			PR1535	200 - **390** - 590	0.008 - **0.012** - 0.039	0.002 - **0.004** - 0.006
Stainless Steel	25°	0.008	**PR1725**	200 - **490** - 590	0.008 - **0.012** - 0.039	0.002 - **0.004** - 0.006
			PR1535	200 - **390** - 490	0.008 - **0.012** - 0.039	0.002 - **0.004** - 0.006
		1/64 | 1/32	**PR1725**	200 - **490** - 590	0.008 - **0.012** - 0.039	0.002 - **0.006** - 0.010
			PR1535	200 - **390** - 490	0.008 - **0.012** - 0.039	0.002 - **0.006** - 0.010
	15°	1/64	**PR1725**	200 - **490** - 590	0.008 - **0.012** - 0.039	0.002 - **0.004** - 0.006
			PR1535	200 - **390** - 490	0.008 - **0.012** - 0.039	0.002 - **0.004** - 0.006
Cast Iron	25°	0.008	**PR1725**	200 - **490** - 590	0.008 - **0.012** - 0.059	0.002 - **0.004** - 0.006
		1/64 / 1/32	**PR1725**	200 - **490** - 590	0.008 - **0.012** - 0.079	0.002 - **0.006** - 0.010
	15°	1/64	**PR1725**	200 - **490** - 590	0.008 - **0.012** - 0.039	0.002 - **0.004** - 0.006
Non-ferrous Metals (Aluminum alloys)	25°	0.004 | 0.008 | 1/64	**KPD001**	660 - **1,640** - 2,620	0.004 - **0.008** - 0.020	0.001 - **0.002** - 0.003

When machining at D.O.C. 0.059" or more, reduce the feed by about 50%.
A PCD insert (KPD001) can not be reground.
When a PCD insert (KPD001) enters a workpiece or contacts a wall, keep the feed rate below 50% of normal use to prevent damage to the insert.

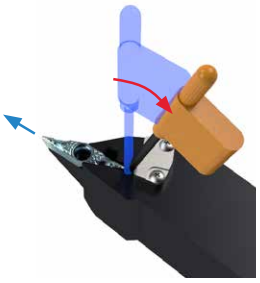
Insert Mounting Instructions

When mounting the insert (Tightening torque: 1.2 Nm)

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

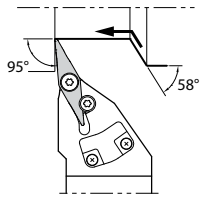


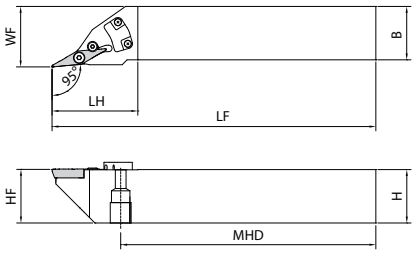
Remove the two screws and put the wrench into the gap at the back end of the insert. It can be easily removed by pushing out the insert as shown above.

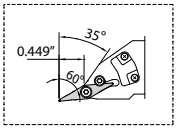
External Turning

SZLB (External/Copying)

Pressure Resistance : ~ 435 psi







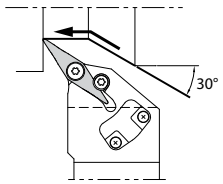
Side Rake Angle : 0 °
Angle of Inclination : 0 °

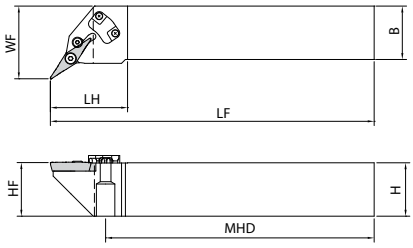
·Right-hand Shown

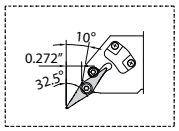
ZBMT13T304R-GF-15D Inserts Compatible with Right-Hand SZLB Holder

SZPB (External/Facing/Copying/Undercutting)

Pressure Resistance : ~ 435 psi





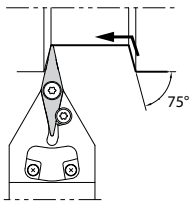


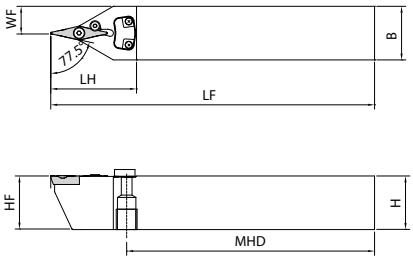
Side Rake Angle : 0 °
Angle of Inclination : 0 °

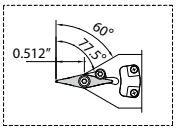
·Right-hand Shown

SZVBN (External/Copying)

Pressure Resistance : ~ 435 psi







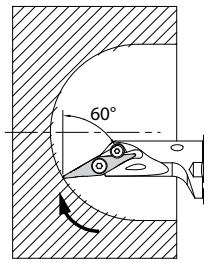
Side Rake Angle : 0 °
Angle of Inclination : 0 °

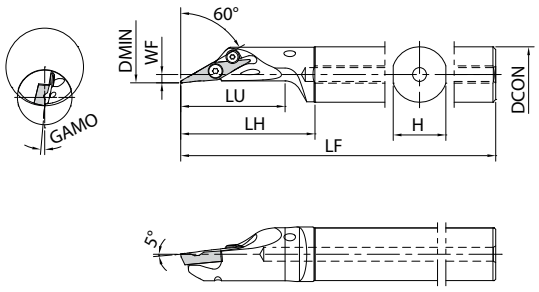
Toolholder Dimensions

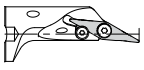
Description		Stock R	Stock N	Stock L	Unit	Dimensions H	HF	B	LF	LH	WF	MHD	Standard Corner-R (RE)	Coolant Hole	Parts: Coolant Block	Parts: Clamp Screw	Parts: Insert Screw	Parts: Wrench
SZLBR/L	**12-3C-C**	●		●	inch	0.750	0.750	0.750	5.039	1.378	0.905	3.760	1/64	Yes	ZCP-13	BH2X6	SB-3079TR	FT-8
	16-3D-C	●		●		1.000	1.000	1.000	6.039	1.575	1.110	4.779						
SZPBR/L	**12-3C-C**	●		●		0.750	0.750	0.750	5.039	1.378	1.071	3.858	1/64	Yes				
	16-3D-C	●		●		1.000	1.000	1.000	6.039	1.378	1.334	5.023						
SZVBN	**12-3C-C**		●			0.750	0.750	0.750	5.039	1.574	0.373	3.645	1/64	Yes			Recommended tightening torque 1.2 Nm	
	16-3D-C		●			1.000	1.000	1.000	6.039	1.574	0.498	4.645						
SZLBR/L	**2020K-13C**	●		●	mm	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						
SZPBR/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 Nm	
	2525M-13C		●			25	25	25	150	40	12.5	114.6						

● : Standard Item

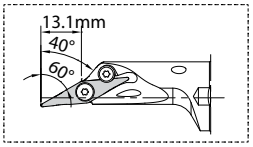
A-SZJB-AE Excellent Bar (Internal Spherical Machining/Internal Facing/Copying)







Left-Hand (L) shown above

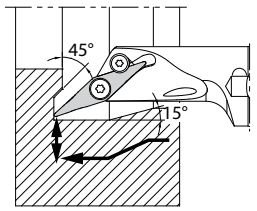


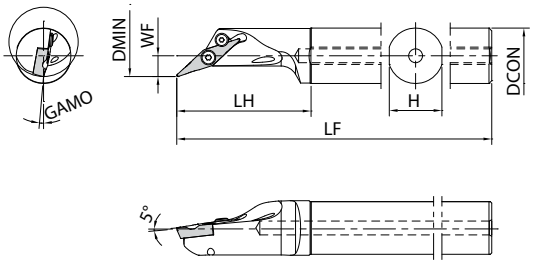
Shank Diameter	Coolan Hole Diameter
Ø20mm	Ø5mm
Ø25mm	
Ø32mm	

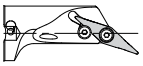
·Right-hand Shown

ZBMT13T304R-GF-15D Inserts Compatible with Right-Hand A-SZJB-AE Holder

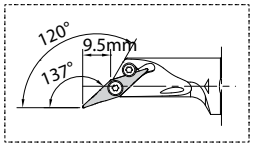
A-SZXB-AE Excellent Bar (Internal Facing/Copying/Undercutting)







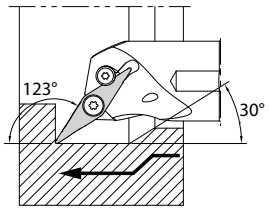
Left-Hand (L) shown above

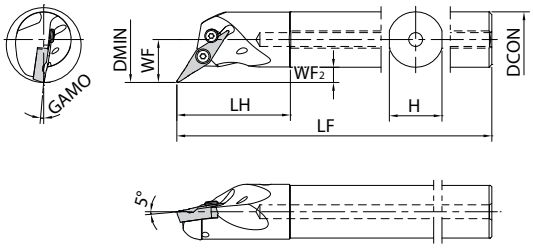


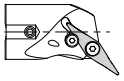
Shank Diameter	Coolan Hole Diameter
Ø20mm	Ø5mm
Ø25mm	
Ø32mm	

·Right-hand Shown

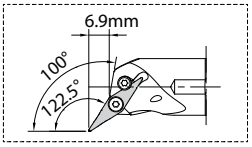
A-SZQB-AE Excellent Bar (Copying/Undercutting)







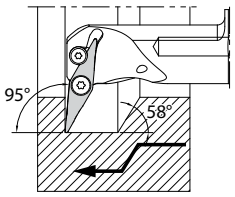
Left-Hand (L) shown above

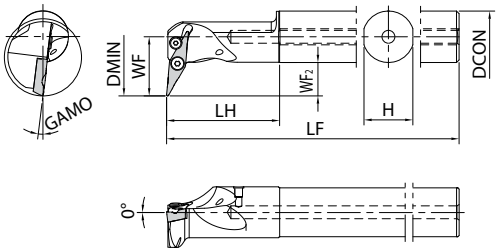


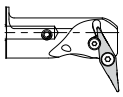
Shank Diameter	Coolan Hole Diameter
Ø20mm	Ø5mm
Ø25mm	
Ø32mm	

·Right-hand Shown

A-SZLB-AE Excellent Bar (Copying)







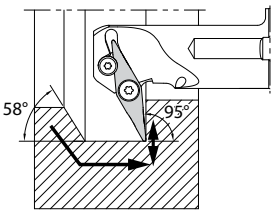
Left-Hand (L) shown above

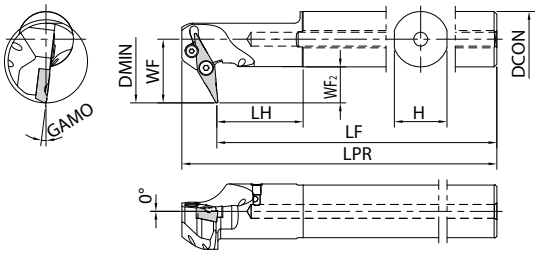
Shank Diameter	Coolan Hole Diameter
Ø20mm	Ø5mm
Ø25mm	
Ø32mm	

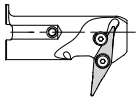
·Right-hand Shown

ZBMT13T304R-GF-15D Inserts Compatible with Left-Hand A-SZLB-AE Holder

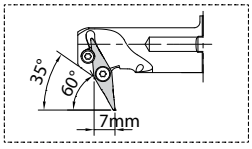
A-SZZB-AE Excellent Bar (Back Boring)







Left-Hand (L) shown above



Shank Diameter	Coolan Hole Diameter
Ø20mm	Ø5mm
Ø25mm	
Ø32mm	

·Right-hand Shown

ZBMT13T304R-GF-15D Inserts Compatible with Right-Hand A-SZZB-AE Holder

Boring Bars

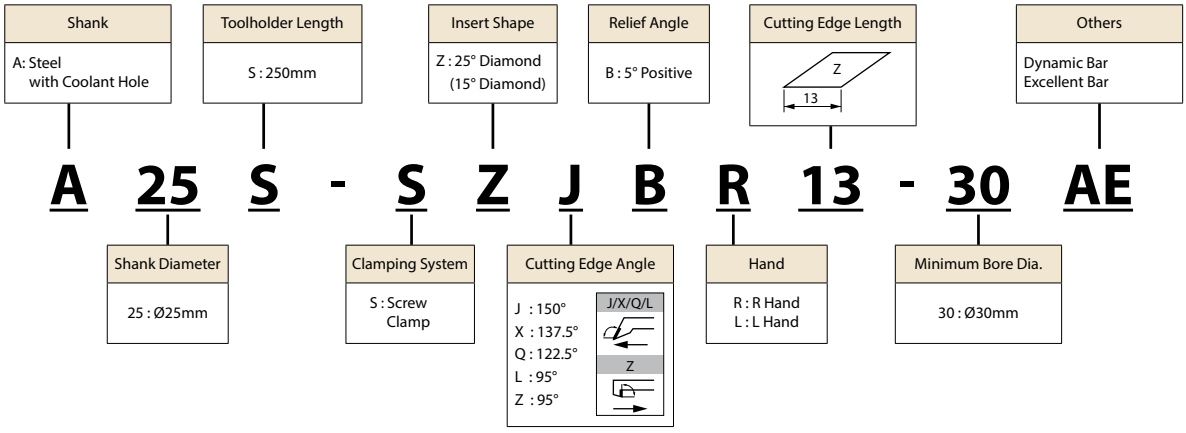
Toolholder Dimensions

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

Minimum bore dia. is when installing with standard corner-R (RE) insert
When machining with an insert other than the standard corner-R (RE), check for interference.

● : Standard Item

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).

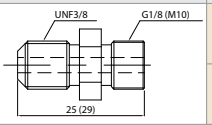
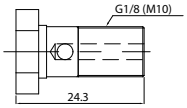
Piping Parts for External Toolholders

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

For details, please refer to **the Kyocera General Catalog.**

Joint/Banjo Bolt

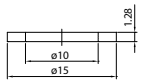
Pressure Resistance : ~ 4,350 psi

Shape		Part Number	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 Item

Washer

Pressure Resistance : ~ 4,350 psi

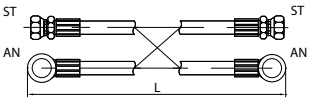
Shape		Part Number	Stock
		WS-10	●

*When using banjo bolts, two washers are required.

● : Standard Item

Hose

Pressure Resistance : ~ 4,350 psi

Shape		Part Number	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

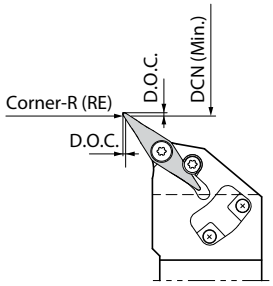
● : Standard Item

Boring/Facing Available Cutting Dia. and Max. D.O.C.

Standard Corner-R 1/64" (RE)

Cutting Dia.	Depth (in)
Ø1.181	0.020
Ø1.969	0.059
Ø2.559	0.118
Ø3.150	0.236
Ø3.937	0.394
Ø5.906	0.551

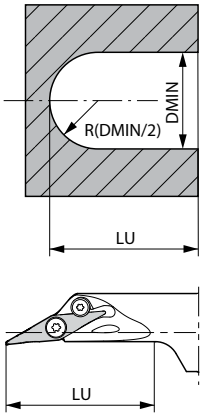
SZPB Type Cutting Diameter for Undercutting



Corner-R (RE)	D.O.C. (in)	DCN (Min)
0.008"	0.020	Ø1.181
	0.039	Ø1.378
1/64"	0.020	Ø1.181
	0.039	Ø1.378
1/32"	0.020	Ø4.331
	0.039	Ø5.906

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

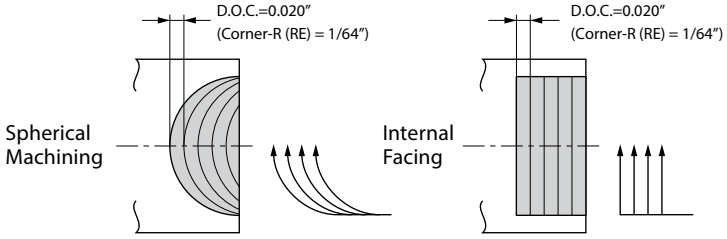
Application Range



DMIN : Ø28mm - Ø40mm

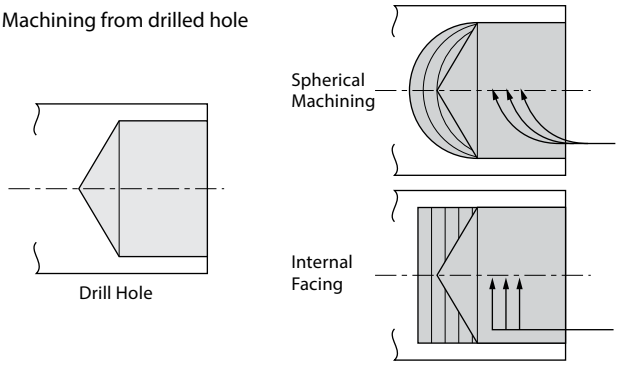
Applications

Without pre-drilled hole



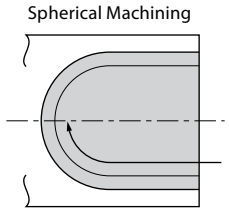
* f should be 0.002 ipr or less during internal facing.

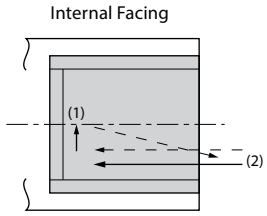
Machining from drilled hole



* f should be 0.002 ipr or less during internal facing.

Finishing

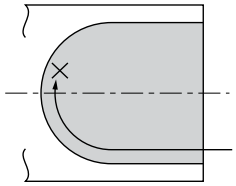




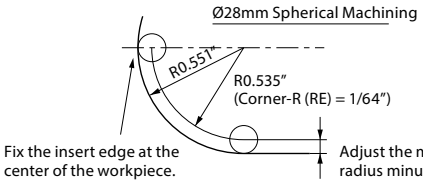
Machining Process

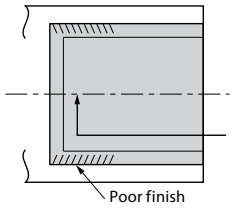
1. Finish the internal face first.
2. Next, finish the internal surface.

Caution



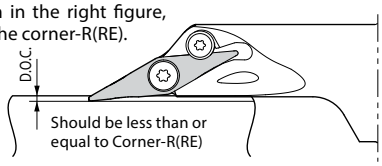
Internal spherical machining and internal facing
(Especially internal spherical machining)
When machining past the center of the workpiece,
insert may break.





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

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



[Burrs may occur, if D.O.C. is Corner-R(RE) and more]

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