KYOCERA

AHB
TOOLING & MACHINERY

COMPLETE METALWORKING SOLUTIONS

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KPK Series

High-Performance Cut-Off Solutions

Unique Design for Superior Performance in Cut-Off Operations

- Easy insert replacement
- Strong clamping mechanism for added safety and security
- Long tool life and stable machining with unique chipbreaker designs
- Jet coolant-through styles available (JCT)

KPK Series

High-Performance Cut-Off Solutions

Easy Insert Replacement Reduces Downtime
High-Performance, Long Tool Life and Stable Machining with Strong Clamping Mechanism

CUT-OFF SOLUTIONS

During cut-off operations, insert cutting widths of only a few millimeters are used to cut to the center of the workpiece.

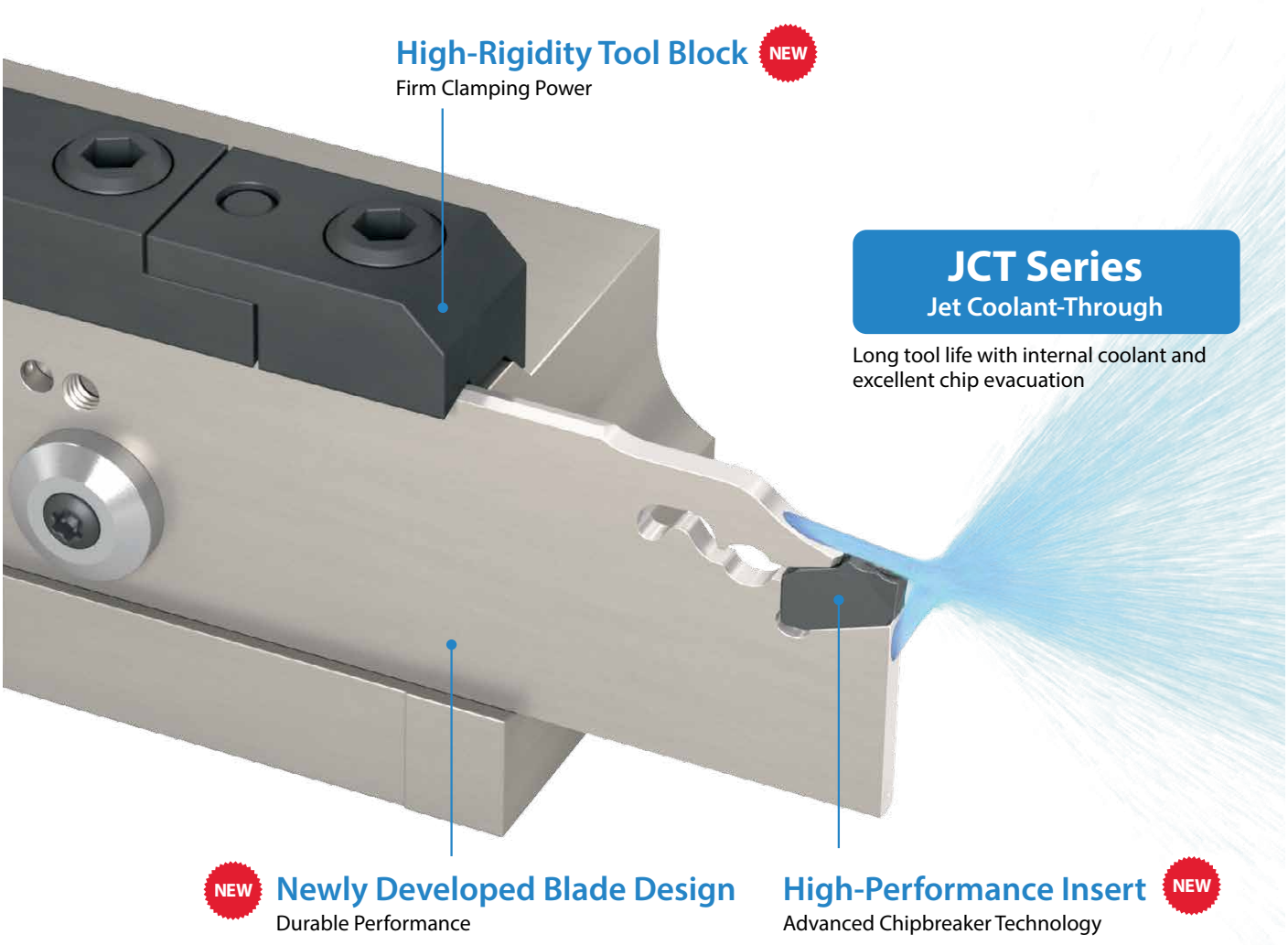
This is usually the final process and is often the bottleneck. Stable tool life without sacrificing productivity is required.

CHALLENGE

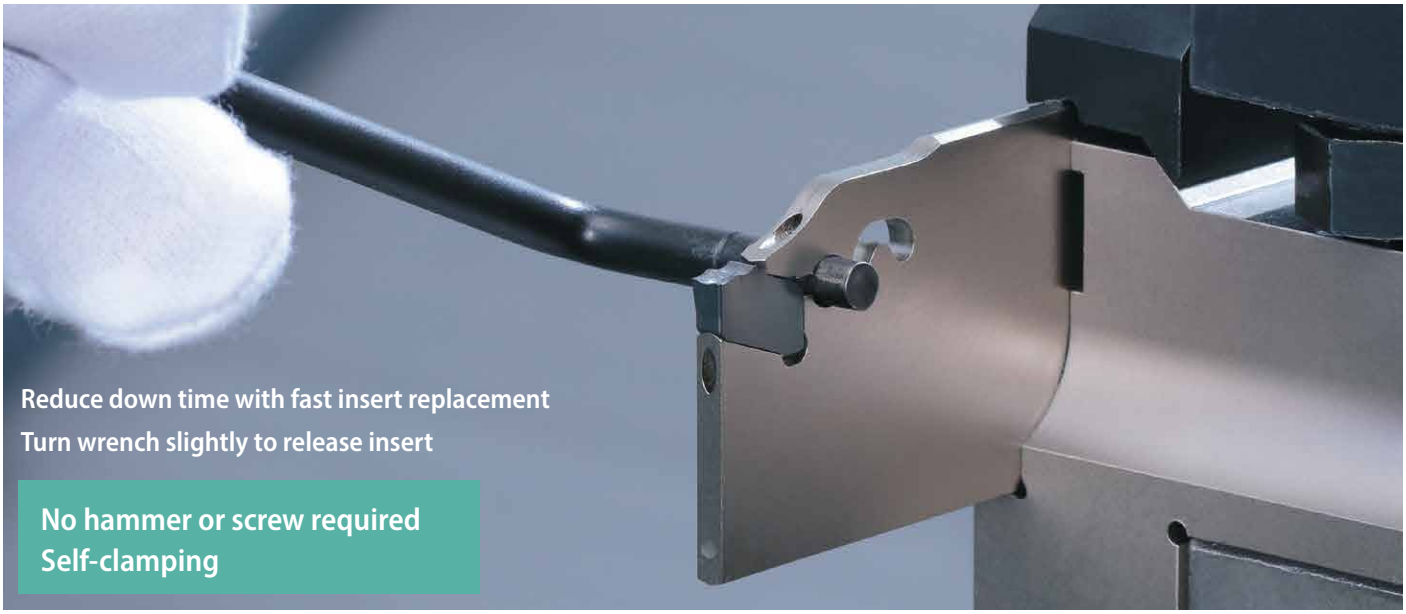
Due to the narrow insert and blade widths, rigidity is difficult to achieve. Cutting speed reaches zero at the center of the workpiece, increasing cutting load. Chip control issues and tool damage are common problems.

SOLUTION

The KPK Series features new insert, blade, and tool block designs for rigid, safe, and secure cut-off operations.

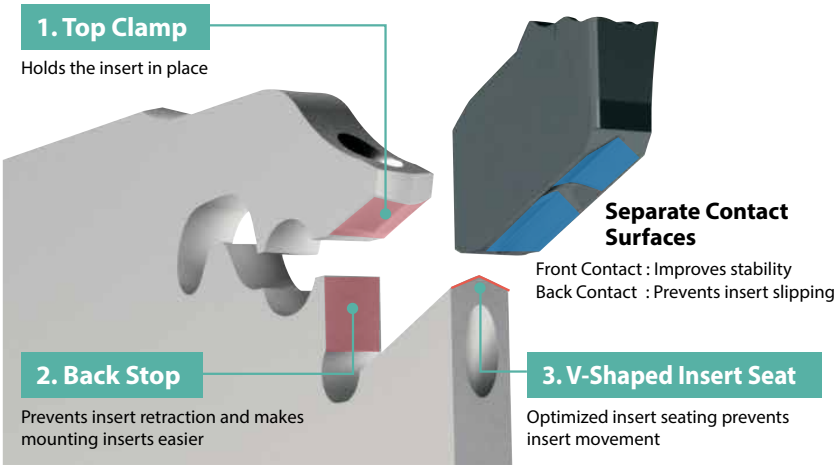


1 Easy Insert Replacement

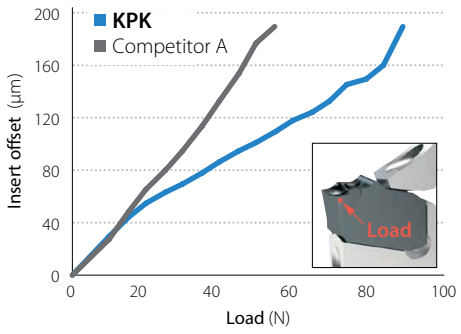


2 Firm Insert Clamp Ensures Added Safety and Security

The firmly secured insert uses three contact surfaces to eliminate sliding or chattering



Insert Deviation Comparison (Internal Evaluation)

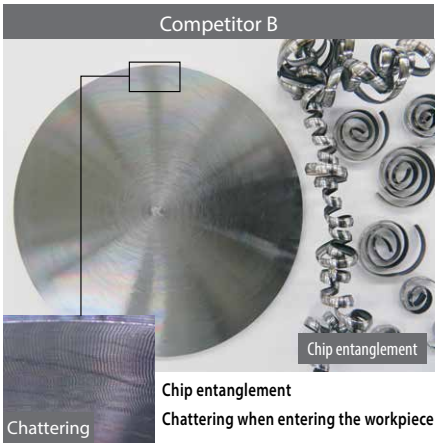


Measured tool : KPKB32-3 PKM30N-025PM

Cutting Performance Comparison (Internal Evaluation)

Cutting Noise and Surface Finish: Good
Stable Machining

Chip Clogging
Scratches on the Finished Surface



Chip entanglement
Chattering when entering the workpiece

Cutting Conditions : n = 320 RPM (constant) , Vc = ~ 330 sfm, f = 0.005 ipr, Wet (External coolant) Workpiece : 4137 (ø 3.937") Cutting Edge Width : 0.118" (3mm), PM Chipbreaker

3 Unique Chipbreaker Designs for Long Tool Life and Stable Machining

Advanced chipbreaker technology inherited from KGD lineup provides excellent chip control

PM Chipbreaker
General Purpose

Insert Grades

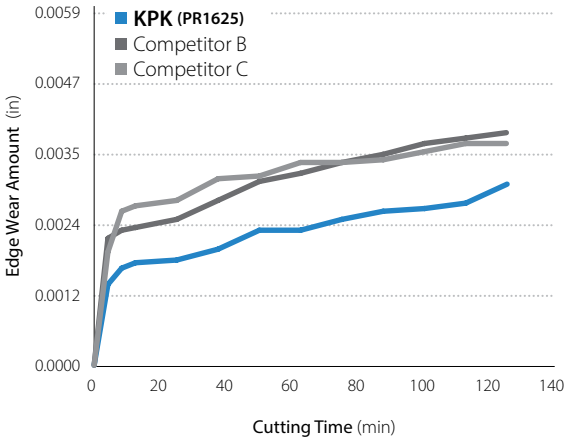
Steel	: **PR1625**
Stainless Steel	: **PR1535**
Cast Iron and Aluminum	: **GW15**

PH Chipbreaker
Tough Edge
High-Feed

Insert Grades

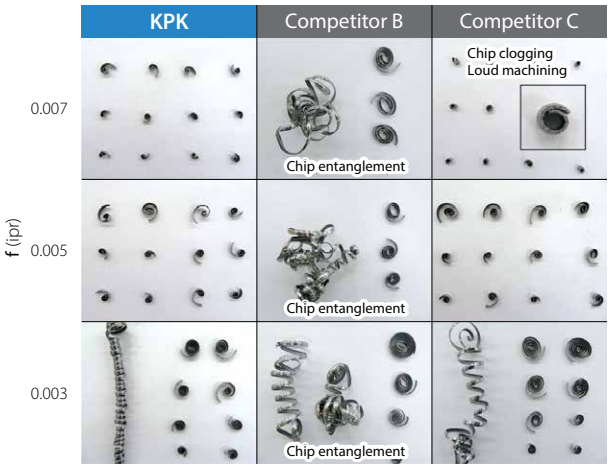
Steel	: **PR1625**
Stainless Steel	: **PR1535**

Wear Resistance Comparison (Internal Evaluation)



Cutting Conditions : n = 955 RPM (constant), Vc = ~ 490 sfm
f = 0.005 ipr (~ ø0.394" : f = 0.002 ipr) Wet (External Coolant)
Workpiece : 4131 (ø1.969") Cutting Width : 0.118" (3mm), PM Chipbreaker

Chip Control Comparison (Internal Evaluation)

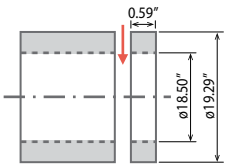


Cutting Conditions : n = RPM (constant) , Vc = ~ 390 sfm , Wet (External Coolant)
Workpiece : 4131 (ø1.969") Cutting Width : 0.118" (3mm), PM Chipbreaker

SOLUTION 1
Tool Life x 1.3
Stable chip curls

Rings
(High Carbon Chromium Steel)

External Coolant



KPK **34 pcs/corner**

Competitor D **25 pcs/corner**

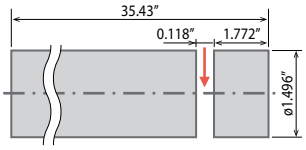
Cutting Conditions : n = 90 RPM (Constant) , Vc = ~ 460 sfm , f = 0.002 ipr,
Wet (External Coolant) KPKB32-3 PKM30N-025PM PR1625

(User Evaluation)

SOLUTION 2
Machining efficiency doubled in stainless steel
Stable machining is possible

Adapter
(316)

External Coolant



KPK

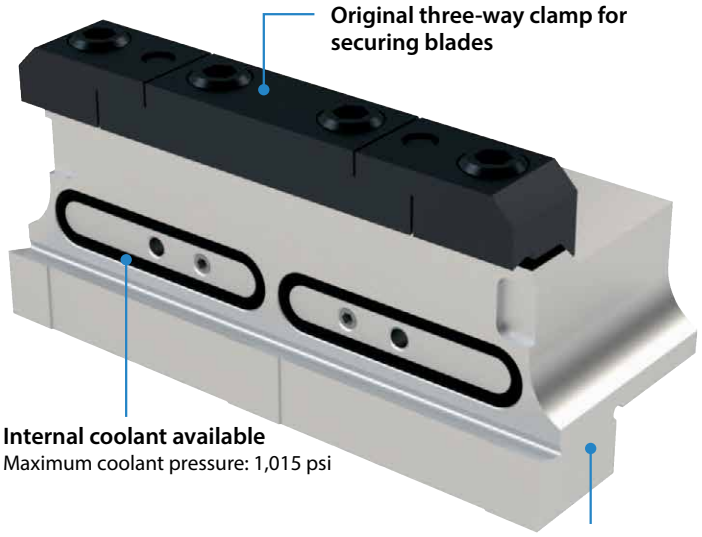
Competitor E

Cutting Conditions : n = 1,450 RPM (Constant) , Vc = ~ 570 sfm , f = 0.002 ipr (Inching: 0.039")
Wet (External Coolant) KPKB32-3 PKM30N-025PM PR1535

(User Evaluation)

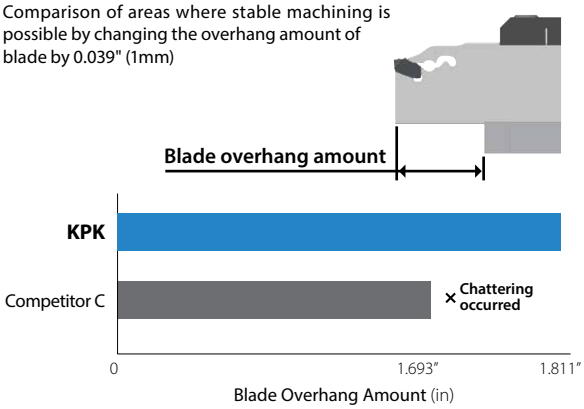
4 Rigid Tool Holder Block Prevents Chattering and Provides Internal Coolant

KPKTB-JCT



Chatter Resistance Comparison (Internal evaluation)

Comparison of areas where stable machining is possible by changing the overhang amount of blade by 0.039" (1mm)

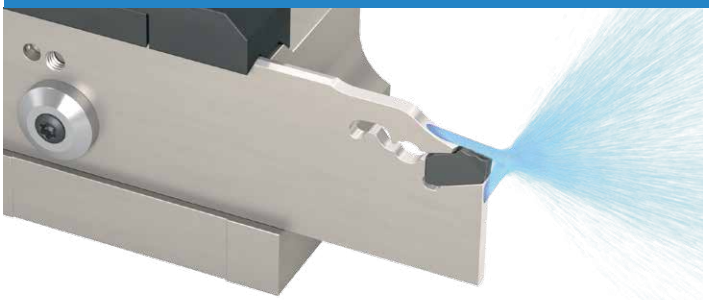


Cutting Conditions : n = 650 RPM (Constant), Vc = ~ 330 sfm, f = 0.005 ipr
Wet (Internal Coolant : Normal Pressure), Workpiece : 4137 (ø1.969")
Cutting Width : 0.118" (3mm), PM Chipbreaker

Note **KTKTB type is compatible with internal coolant with an optional internal connector. (~ 145 psi)**

*Refer to page 10 for the supply method (Type C).

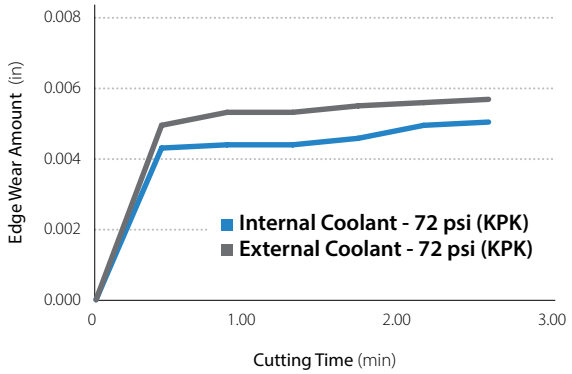
JCT series supports internal coolant for improved tool life under normal pressure



KPKB-JCT maximum overhang length while using internal coolant is as follows:
Size 26 : 1.575" (40mm) **Size 32** : 2.323" (59mm)

Coolant is supplied directly to the rake and the flank face of the cutting edge for increased tool life and improved chip control

Wear Resistance Comparison (Internal Evaluation)

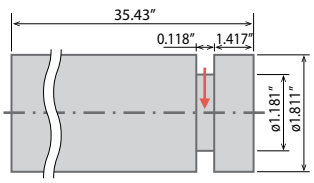


Cutting Conditions : Vc = 100 sfm (Constant), f = 0.004 ipr,
Cutting Depth : 0.394", Wet
Workpiece : Inconel 718 (ø3.937") Cutting Width : 0.118" (3mm), PM Chipbreaker

SOLUTION 3 Doubled tool life
Reduced fracturing

Machine Part
(304)

Internal Coolant



KPK **60 pcs/corner (Stable)**

Competitor F **30 pcs/corner (Unstable)**

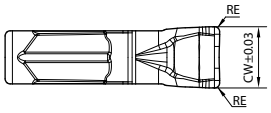
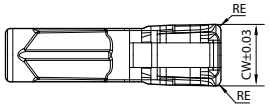
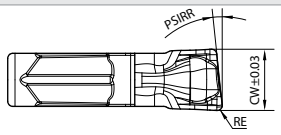
Cutting conditions : Vc = 215 sfm (Constant), f = 0.002 ipr,
Wet (Internal Coolant 508 psi) KPKB32-3JCT PKM30N-025PM PR1535

(User Evaluation)

Chip Control Comparison (Internal Evaluation)

Cutting conditions : n = 780 RPM (Constant), Vc = 390 sfm, f = 0.003 ipr,
Wet Workpiece : 4131 (ø1.969") Cutting Width : 0.118" (3mm), PM Chipbreaker

Applicable Inserts

Shape (Right-hand (R) Shown)			Part Number		Dimensions (in) CW in	CW mm	RE	Angle PSIR/L	MEGACOAT NANO PR1625	MEGACOAT NANO PR1535	Carbide GW15
Without Lead Angle	 General Purpose		PKM	20N-020PM	0.079	2.0	0.008	–	●	●	●
				30N-025PM	0.118	3.0	0.010		●	●	●
				40N-030PM	0.157	4.0	0.012		●	●	●
	 Tough Edge		PKM	20N-020PH	0.079	2.0	0.008	–	●	●	–
				30N-030PH	0.118	3.0	0.012		●	●	–
				40N-030PH	0.157	4.0	0.012		●	●	–
									R L	R L	R L
With Lead Angle			PKM	20°-020PM-6D	0.079	2.0	0.008	6°	● ●	● ●	● ●
				30°-025PM-6D	0.118	3.0	0.010		● ●	● ●	● ●
				40°-030PM-6D	0.157	4.0	0.012		● ●	● ●	● ●

● : Standard Item

Recommended Cutting Conditions ★ 1st Recommendation ☆ 2nd Recommendation

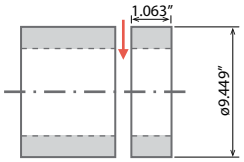
Workpiece	Cutting Speed Vc (sfm) MEGACOAT NANO PR1625	MEGACOAT NANO PR1535	Carbide GW15	Feed f (ipr) PM Cutting Width CW (mm) 2 ~ 4	PH Cutting Width CW (mm) 2	PH Cutting Width CW (mm) 3 ~ 4	Notes
Carbon Steel	★ 260 ~ 720	☆ 260 ~ 720	-	0.003 ~ 0.007	0.004 ~ 0.009	0.006 ~ 0.011	Wet
Alloy Steel	★ 230 ~ 660	☆ 230 ~ 660	-				
Stainless Steel	☆ 200 ~ 490	★ 200 ~ 490	-	0.002 ~ 0.005	0.002 ~ 0.005	0.003 ~ 0.006	
Cast Iron	-	-	★ 160 ~ 330	0.003 ~ 0.007	-	-	
Aluminum Alloy	-	-	★ 660 ~ 1,480	0.003 ~ 0.007	-	-	
Brass	-	-	★ 330 ~ 660	0.003 ~ 0.007	-	-	

Reduce feed to 1/2 ~ 1/3 when nearing the center of the workpiece.

Case Studies

Rings Forging

Vc = 300 sfm
f = 0.007 ipr
Wet (External Coolant)
Overhang Amount : 2.756"
KPKB32-3 PKM30N-025PM PR1535



Machining Efficiency

KPK f = 0.007 ipr

Competitor G f = 0.0035 ipr

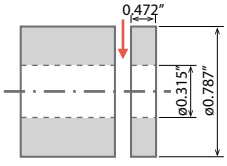
Chip control Surface finish: Good

Machining Efficiency: x 2.0

KPK showed good chip control and finished surface with increased feed rates.
The machining efficiency ratio was doubled. KPK improves insert mounting speeds.
(User Evaluation)

Machine Part SNCM20

n = 1,530 RPM (Constant)
Vc = ~ 330 sfm
f = 0.0035 ipr
Wet (External Coolant)
Overhang Amount : 0.866"
KPKB26 -3 PKM30N-025PM PR1625



Tool life

KPK 1,500 pcs/corner (Stable)

Competitor H 800 pcs/corner (Unstable)

Tool Life: x 1.8

Competitor H was unstable with a sudden fracture. KPK increased tool life by 1.8 times that of competitor. Stable machining with good cutting edge
(User Evaluation)

Blades

KPKB-JCT (Coolant-Through)

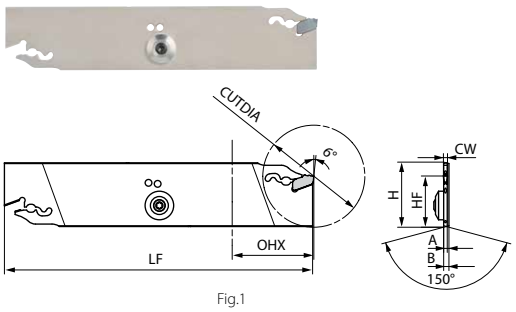


Fig.1

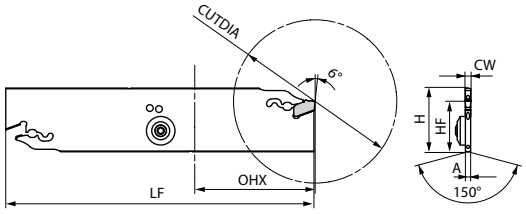


Fig.2

Blade Dimensions (Metric Sizes)

Pressure: 1,015 psi

Part Number	Stock	Cutting Dia.	Dimensions (mm)						Blade Width (mm)	Shape	Parts				Applicable Inserts	Applicable Tool Block
											Insert Wrench	Coolant Plug	Screw	Wrench		
		CUTDIA	OHX*1	H*2	HF	B	LF	A	CW							
KPKB 26-2JCT	●	50	40	26	21.4	2.6	110	1.8	2.0	Fig. 1	LPW-5	CCP-4	SB-4065TR	FT-15	PKM20…	KPKTB○○-26JCT KTKTB○○-26
26-3JCT	●	75				-		2.6	3.0	Fig. 2					PKM30…	
26-4JCT	●	80						3.4	4.0						PKM40…	
KPKB 32-2JCT	●	50	59	32	25.0	2.6	150	1.8	2.0	Fig. 1		Coolant Plug Screw Tightening Torque 3.0 Nm			PKM20…	KPKTB○○-32JCT KTKTB○○-32 KTKTBF○○-32
32-3JCT	●	100				-		2.6	3.0	Fig. 2					PKM30…	
32-4JCT	●	100						3.4	4.0						PKM40…	

See page 9 for insert mounting and removal instructions.

● : Standard Item

When using internal coolant with KTKTB, KTKTBF type tool holder blocks, coolant supply piping (**CCN -5**) sold separately.

*1 OHX: Maximum overhang length while using internal coolant *2 H: Length between virtual vertices

KPKB (Not Coolant-Through)

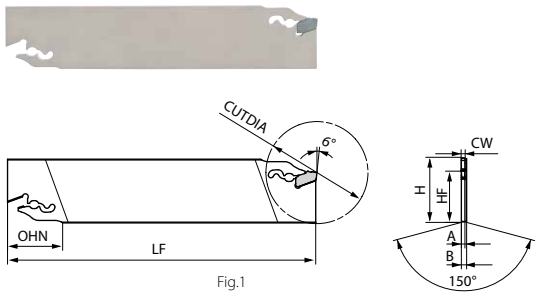


Fig.1

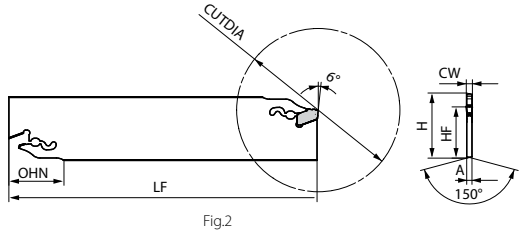


Fig.2

Blade Dimensions (Metric Sizes)

Part Number	Stock	Cutting Dia.	Dimensions (mm)						Blade Width (mm)	Shape	Parts	Applicable Inserts	Applicable Tool Block
											Insert Wrench		
		CUTDIA	OHN	H*2	HF	B	LF	A	CW				
KPKB 26-2	●	50	25	26	21.4	-	110	1.8	2.0	Fig.2	LPW-5	PKM20…	KPKTB○○-26JCT KTKTB○○-26
26-3	●	75						2.6	3.0			PKM30…	
26-4	●	80	24					3.4	4.0			PKM40…	
32-2	●	50	27	32	25.0	2.6	150	1.8	2.0	Fig.1		PKM20…	KPKTB○○-32JCT KTKTB○○-32 KTKTBF○○-32
32-3	●	100				-		2.6	3.0	Fig.2		PKM30…	
32-4	●	100						3.4	4.0			PKM40…	

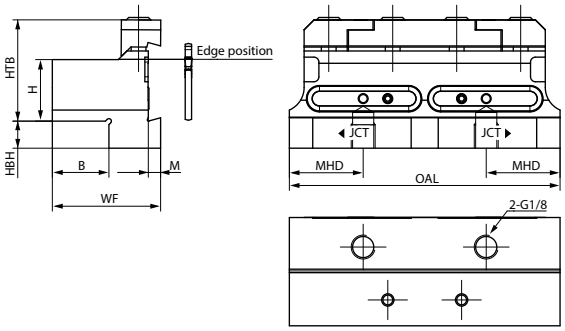
See page 9 for insert mounting and removal instructions.

● : Standard Item

*2 H: Length between virtual vertices

Tool Block

KPKTB-JCT (Coolant-Through)



Tool Block Dimensions (Metric Sizes)

Pressure: 1,015 psi

Part Number		Stock	Dimensions (mm)								Spare Parts						Applicable Blade
											Clamp Set	Screw	Wrench	O-ring	Plug 1	Plug 2	
			H	HTB	HBH	B	WF	M	MHD	OAL	Switchblade type						
KPKTB	20-26JCT	●	20	33	12.4	19	39	4	23.5	86	BCS-2	HH6x16	LW-5	GR-020	HS3x4	HSG1/8X8.0	KPKB26-○JCT KTKB26-○
	20-32JCT	●	20	41	16		40	5	25	100	BCS-3			GR-026	HS4x4		KPKB32-○JCT KTKB32-○
	25-32JCT	●	25		11	23	44		30	110	BCS-4			GR-029			
	32-32JCT	●	32		5	29	50										

Includes only one **HSG1/8X8.0** plug.

● : Standard Item

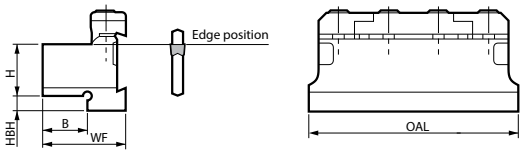
KPKTB-JCT type block is also compatible with conventional KTKB type blades.

See page 11 for coolant piping parts.

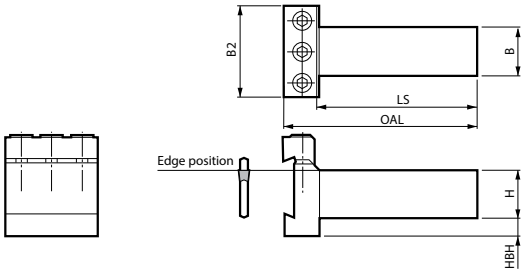
When using internal coolant, the coolant may appear to leak slightly, but this should not affect machining performance. (If the O-ring is damaged, order a new one separately.)

KTKTB / KTKTBF (Not Coolant-Through)

KTKTB



KTKTBF
(Perpendicular Type)



Tool Block Dimensions (Inch & Metric Sizes)

Part Number		Stock	Unit	Dimensions						Spare Parts				Applicable Blade
										Clamp Set		Screw	Wrench	
				H	HBH	B	WF B2	OAL	LS	Switchblade type	Integral type			
KTKTB	19-26	●	inch	0.75	0.39	0.720	1.39	3.39	–	BCS-2	–	HH6x30	LW-5	KPKB26-○ KPKB26-○JCT
	25.4-32	●		1.00	0.30	0.905	1.65	4.33		BCS-4				KPKB32-○ KPKB32-○JCT
KTKTB	16-26	●	mm	16	13	15.5	31.5	86	–	BCS-2	–	HH6x30	LW-5	KPKB26-○ KPKB26-○JCT
	20-26	●		20	9	19	36							
	20-32	●		20	13	19	38	100	–	BCS-3	–	HH6x30	LW-5	KPKB32-○ KPKB32-○JCT
	25-32	●		25	8	23	42	110		BCS-4				
	32-32	●		32	5	29	48							
KTKTBF	25-32	●		25	9.5	25	48	102	84.5	–	BCS-5	HH6x30	LW-5	KPKB32-○ KPKB32-○JCT
	32-32	●		32	2.5	32		117	99.5					

Can be used with internal coolant by utilizing compatible coolant piping (**CCN-5**).

● : Standard Item

How to Mount and Remove Inserts from Blade

1. Insert provided wrench and turn upwards as shown in (Fig. 1)
2. Slide insert into the blade's insert pocket from the front and push in until the back of the insert contacts the blade's back stop surface. (Fig. 2)

Completely eliminate chips from the insert pocket and the wrench insertion area by using compressed air.
Check to make sure the insert is straight and not tilted.
When removing the insert, follow the same procedure as shown in Fig. 2

Fig. 1 Wrench Usage

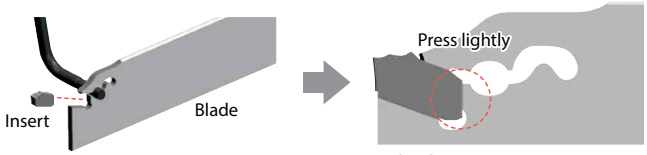
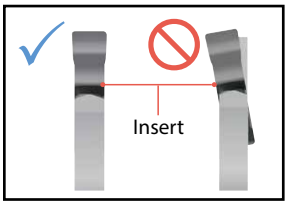
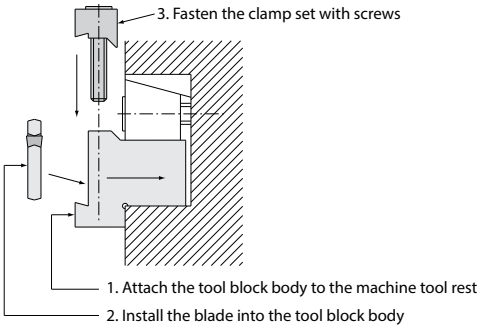


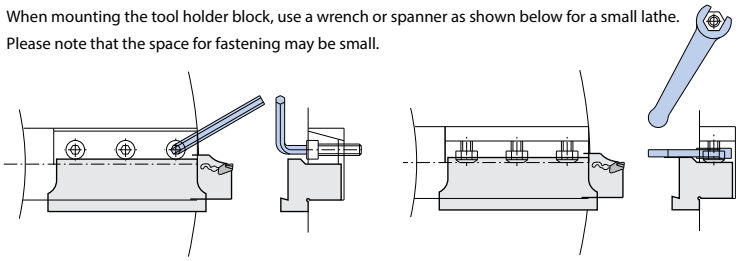
Fig. 2 Mounting Method



Tool Block and Blade Installation Guide

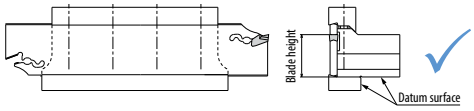


When mounting the tool holder block, use a wrench or spanner as shown below for a small lathe.
Please note that the space for fastening may be small.

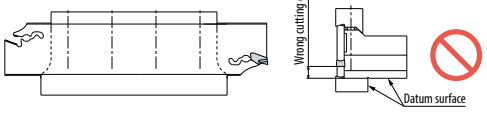


How to Install the Tool Block and Blade

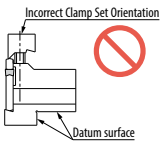
Correct blade installation



Incorrect blade installation



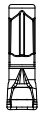
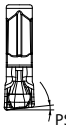
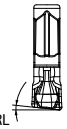
Incorrect Clamp Set Orientation

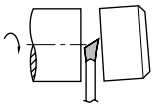
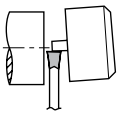
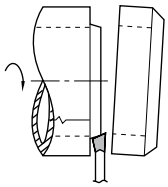
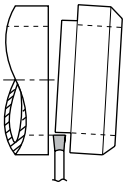


If the clamp set is mounted in the reverse direction, a large gap is created between the tool holder block main body and the clamp set as shown in the left figure. If you continue to use the product, the blade may break off. Reinstall in the correct orientation.

Lead Angle Direction and Usage

1. If there is no restriction on the finished shape, use an insert without lead angle.
2. Insert with lead angle is recommended to prevent remaining boss.
3. If you want to make the remaining boss smaller when machining small or thin parts, use insert with lead angle.

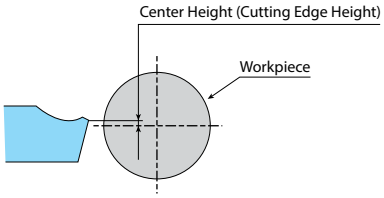
Handed insert with lead angle	N (Neutral)	R (Right-hand)	L (Left-hand)
		 PSIRR	 PSIRL
	· Inserts with lead angle (PSIR $^{R}/_{L}$) reduce burrs in cut-off machining. · The larger the lead angle (PSIR $^{R}/_{L}$), the smaller the cutting force. The feed also needs to be lower.		

	Right-hand (R) Lead Neutral	Neutral		Right-hand (R) Lead Neutral	Neutral
Solid Workpiece			Hollow Workpiece (Pipe)		

Machining Precautions

1. Set cutting edge height 0.004" (0.1mm) above core height.
2. Machining with ample supply of coolant is recommended
3. Machine at constant speeds to gain stable tool life
4. Make the cut-off as close as possible to the chuck
5. To prevent impacts, reduce feed rate by 1/2 ~ 1/3 when nearing the center of the workpiece

Excessive use of the insert may cause chipping or damage to the holder

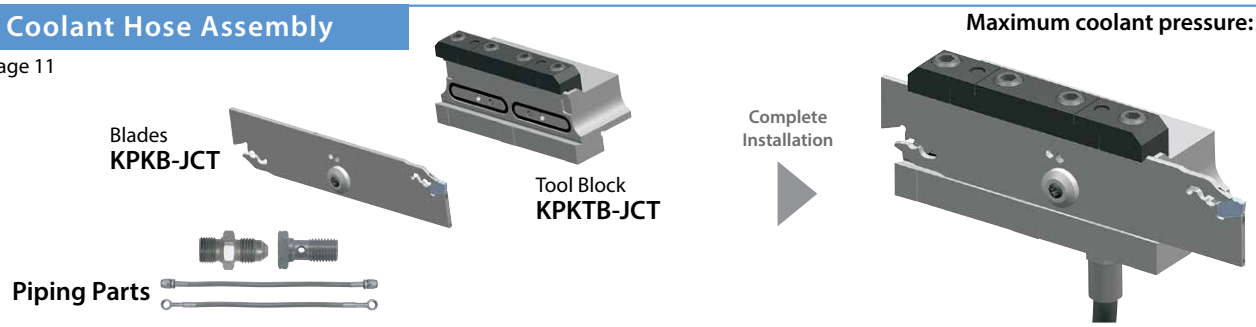


Internal Coolant Connection Methods (Method will be determined by machine specifications and requirements)

A : Coolant Hose Assembly

Maximum coolant pressure: 1,015 psi

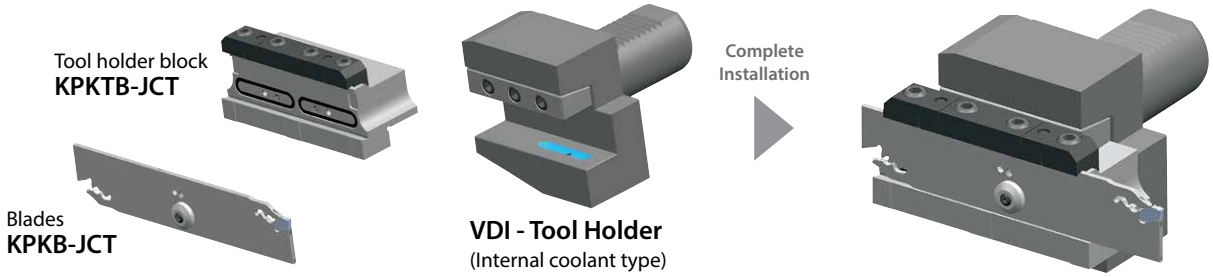
See page 11



B : VDI Holder Assembly

(Internal coolant type)

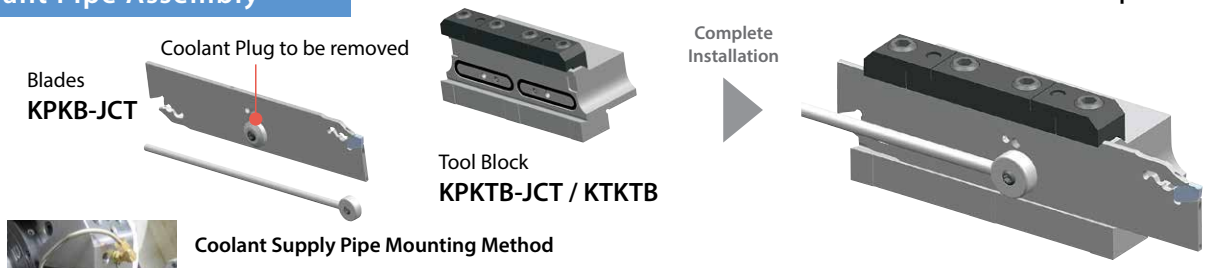
Maximum coolant pressure: 1,015 psi

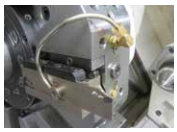


C: Coolant Pipe Assembly

Maximum coolant pressure: 145 psi

See page 11





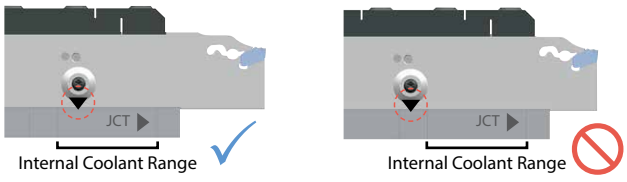
Coolant Supply Pipe Mounting Method

Attach to the blade with the supplied screw
Form pipe to the required shape and connect it to the piping of the machine.

Precautions

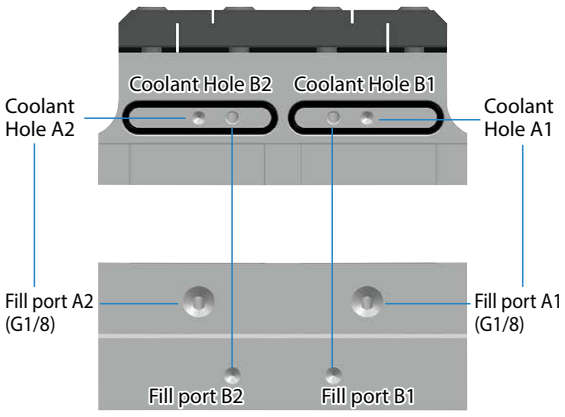
When mounting KPKB-JCT blade

When using internal coolant, keep the arrow (▼) on the blade within the range marked on the tool holder block.



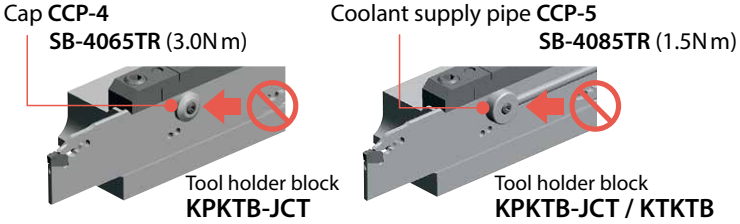
When using a tool block

When using the discharge port B1 (B2), use a sealant for the filler cap (**HSG 1/8 X 8.0**) of the accessory part of the coolant supply port A1 (A2).



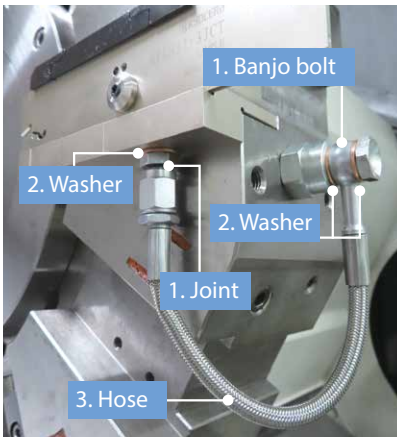
When the cap and coolant supply pipe are mounted

Coolant cannot be supplied correctly if it is mounted in the wrong position.



A : Coolant Hose Assembly

Connection Method and Piping Parts

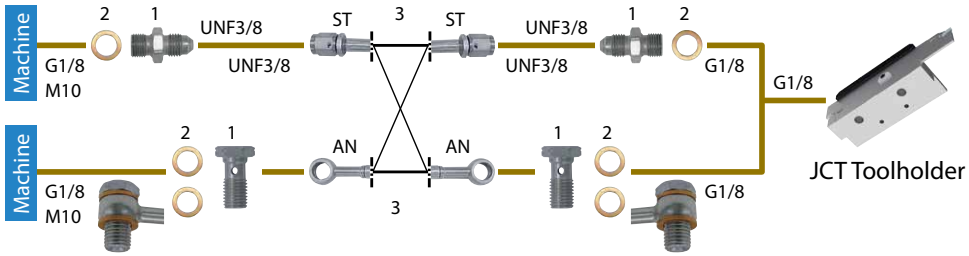


Easy to use with high-pressure hose and joint

Can be used for internal coolant at normal pressure without a high pressure pump unit

Banjo bolts (for angled hoses) are also available.

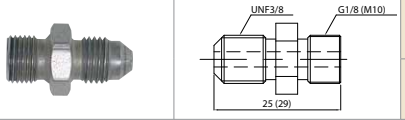
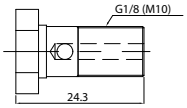
<Piping Installation Guide>



Depending on machine specifications and piping methods, 1.Joint/Banjo bolt x2 2.Washer x2-4 3.Hose x1

1. Joint / Banjo Bolt (Sold Separately)

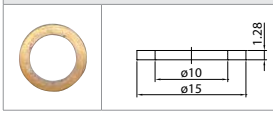
Pressure Resistance: ~ 4,350 psi

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 Angled Hoses)  	BB-G1/8	●	G1/8
	BB-M10X1.5	●	M10X1.5

● : Standard Item

2. Washer (Sold Separately)

Pressure Resistance: ~ 4,350 psi

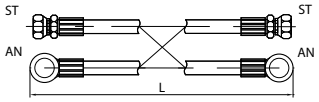
Shape	Part Number	Stock
	WS-10	●

*If you are using a banjo bolt, two washers are needed.

● : Standard Item

3. Hose (Sold Separately)

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/Angled 		HS-ST-AN-200	●	UNF3/8	– (Banjo Bolt)	200
		HS-ST-AN-250	●			250
Angled/Angled 		HS-AN-AN-200	●	– (Banjo Bolt)	– (Banjo Bolt)	200
		HS-AN-AN-250	●			250

● : Standard Item

Precautions

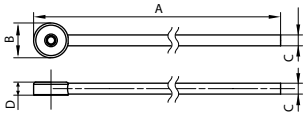
1. Make sure machine door is completely closed before use of these parts.
2. Use appropriate seal for the male thread of the piping parts and make sure the connection is secure. Use plugs to seal off unused coolant holes.
3. Connect and fasten the coolant hose firmly.
4. The use of copper washers may cause leakage but will have no effect on the performance.
5. Commercial piping parts can be used if the thread standards are same. Check the pressure resistance before use.
6. Regularly changing the coolant filter is recommended.

C: Coolant Pipe Assembly

Piping Parts

Coolant Supply Pipe (Sold Separately)

Pressure Resistance: 145 psi

Shape		Part Number	Stock	Dimensions (mm) A	B	C	D	Spare Parts (Screw)
		CCN-5	●	190	16	5	6	SB-4085TR

Use wrench (**FT -15**) supplied with the blade when connecting.

● : Standard Item

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