

High-Performance Cut-Off Solutions

KPK Series



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)

**Toolholder (Blade Type, Shank Type) and Insert
Lineup Expansion**



High-Performance Cut-Off Solutions

KPK Series

Easy Insert Replacement Reduces Downtime

High Performance, Long Tool Life and Stable Machining with Strong Clamping Mechanism

CUT-OFF SOLUTION

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

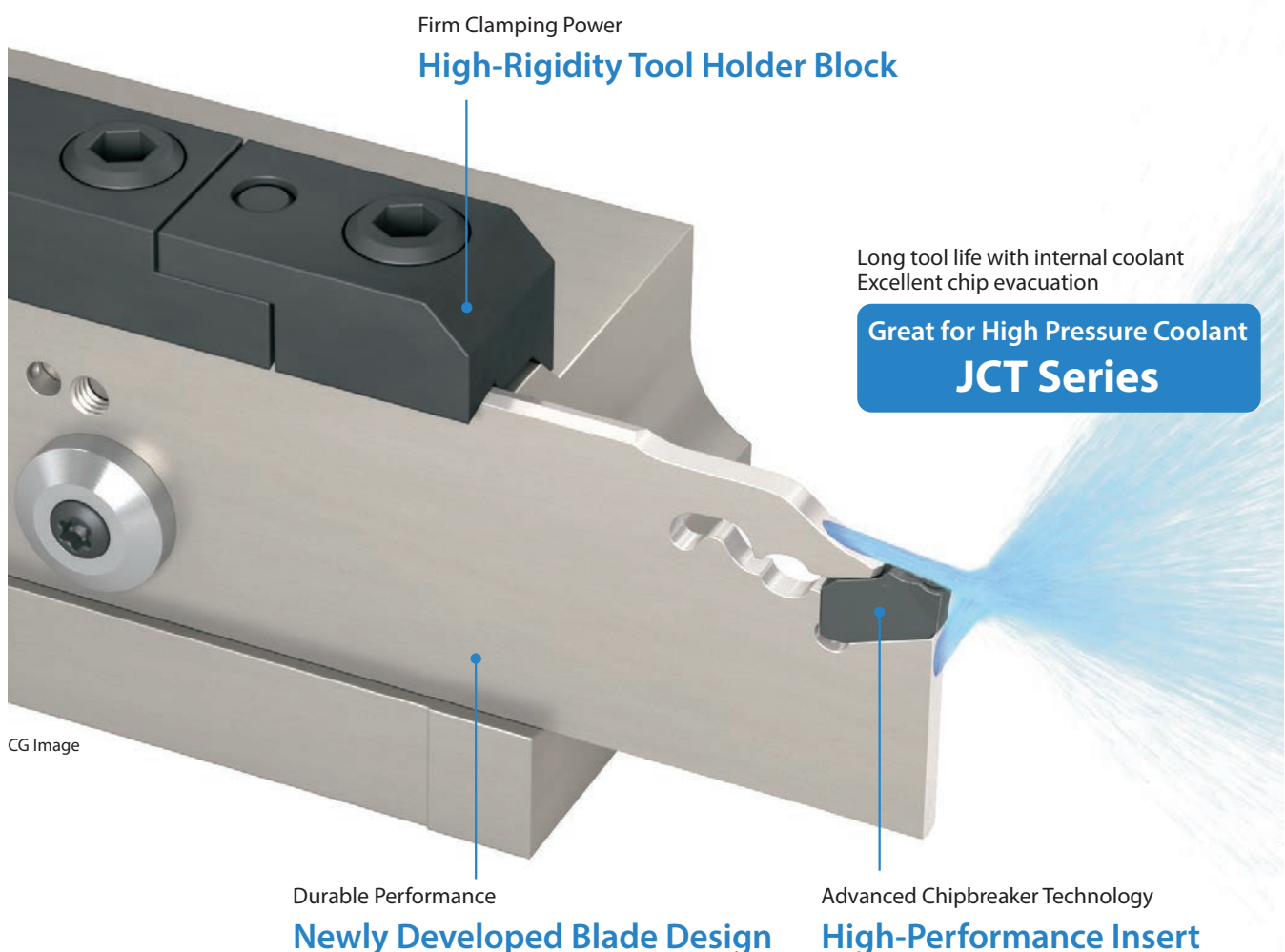
Cut-off is often used on bottlenecks of a workpiece or during the final process, requiring a trouble-free machining environment.

Challenges

The shape of the workpiece can be difficult to secure, thus creating rigidity and chattering issues.

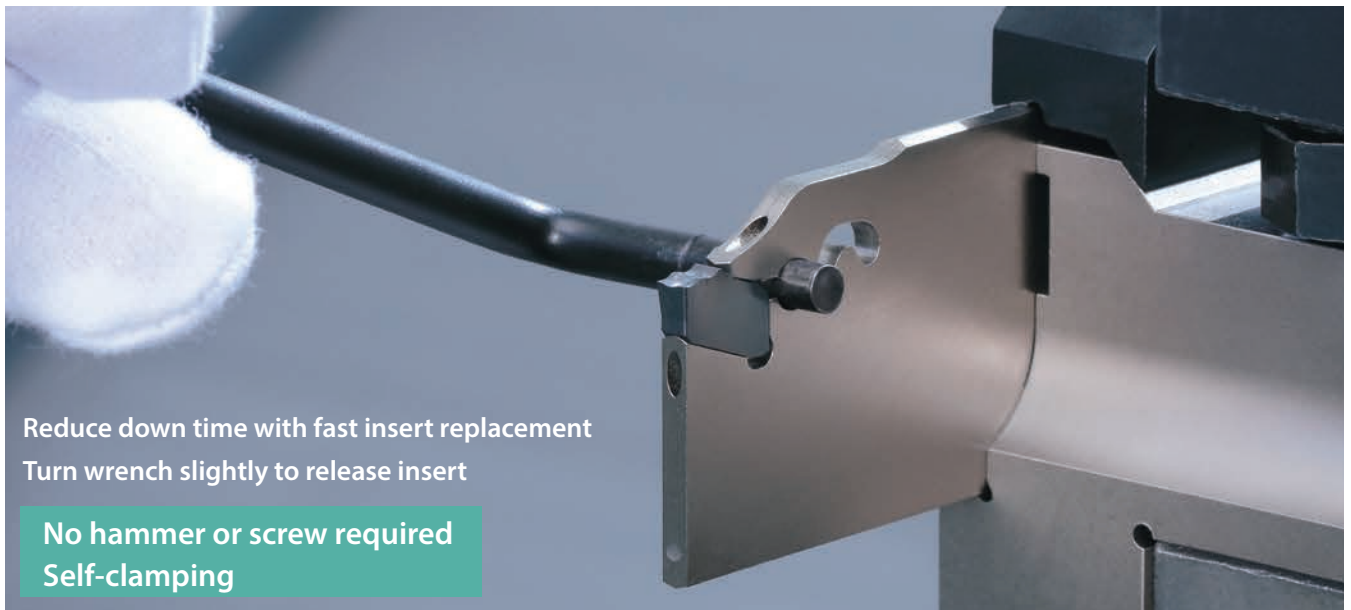
SOLUTION

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



1

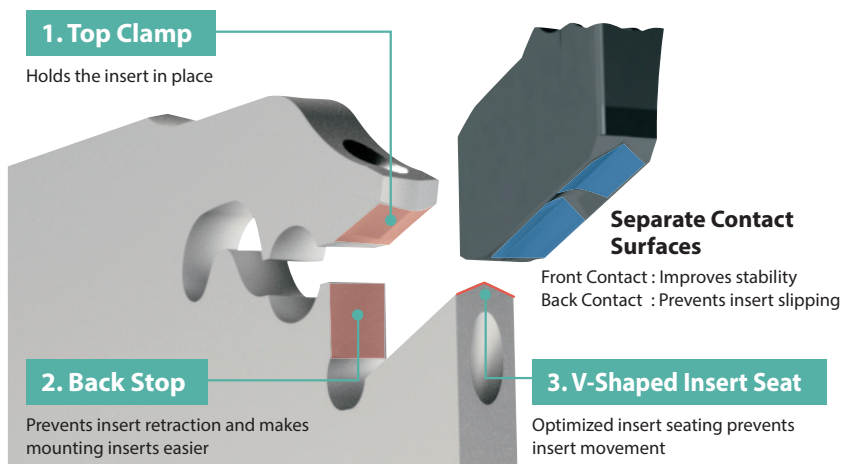
Easy Insert Replacement



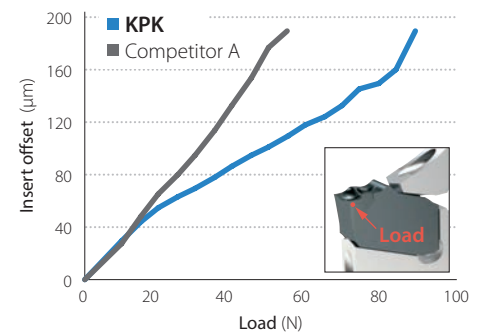
2

Firm Insert Clamp Ensures Added Safety and Security

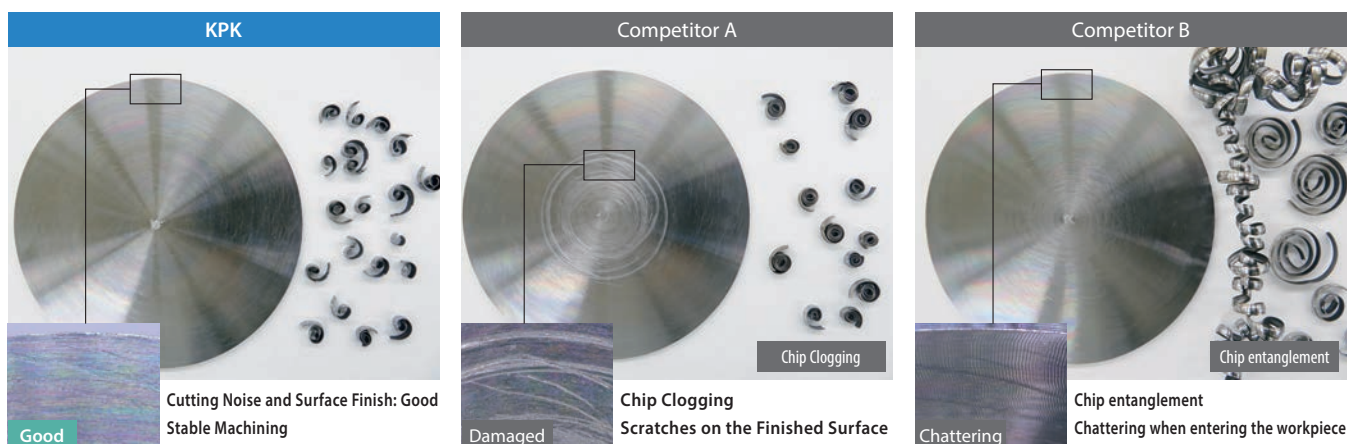
The firmly secured insert uses three contact surfaces to eliminate sliding or chattering



Insert Deviation Comparison (Internal evaluation)



Cutting Performance Comparison (Internal evaluation)



Cutting Conditions : $n = 320 \text{ min}^{-1}$ (constant), $V_c = \sim 100 \text{ m/min}$, $f = 0.12 \text{ mm/rev}$, Wet (External coolant) Workpiece : SCM 435 ($\phi 100$) Edge width : 3 mm (PM Chipbreaker)

3

Advanced chipbreaker technology inherited from KGD lineup provides excellent chip control

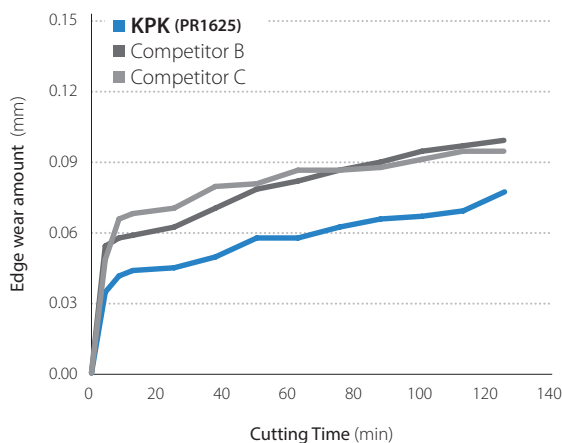


For Steel : **PR1625**
For Stainless steel : **PR1535**
For Cast Iron and Aluminum : **GW15**



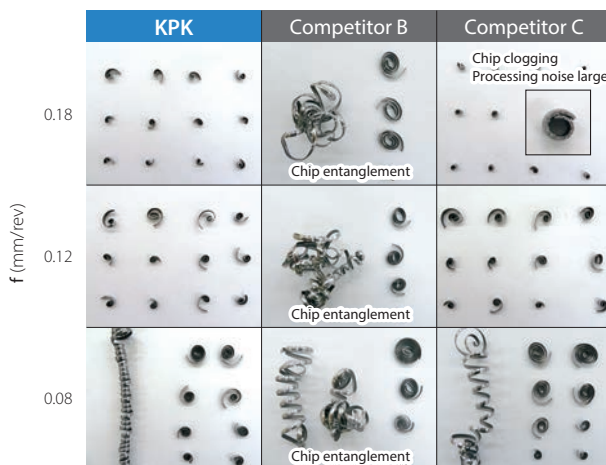
For Steel : PR1625
For Stainless steel : PR1535

Wear Resistance Comparison (Internal Evaluation)



Cutting Conditions : $n = 955 \text{ min}^{-1}$ (constant), $V_c = \sim 150 \text{ m/min}$
 $f = 0.12 \text{ mm/rev}$ ($\sim \phi 10 : f = 0.05 \text{ mm/rev}$) Wet (External Coolant)
 Workpiece : SCM 415 ($\phi 50$) Edge width : 3 mm (PM Chipbreaker)

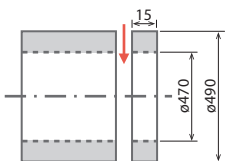
Chip Control Comparison (Internal evaluation)



Cutting Conditions : $n = 780 \text{ min}^{-1}$ (constant), $V_c = \sim 120 \text{ m/min}$, Wet (External Coolant)
Workpiece : SCM 415 ($\phi 50$) Blade width : 3 mm (PM Chipbreaker)

SOLUTION 1 Tool Life x 1.3
Stable chip curl

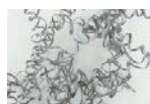
External Coolant



34 pcs/corner



25 pcs/corner

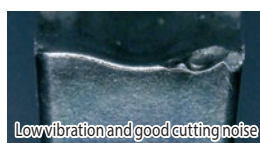
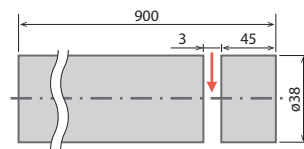


Cutting Conditions : $n = 90 \text{ min}^{-1}$ (Constant), $V_c = \sim 140 \text{ m/min}$, $f = 0.06 \text{ mm/rev}$,
Wet (External Coolant) KPKB32-3 PKM30N-025PM PR1625

(User evaluation)

SOLUTION 2 Machining efficiency double in Stainless steel
Achievement of stable machining

External Coolant



KPK



Competitor E

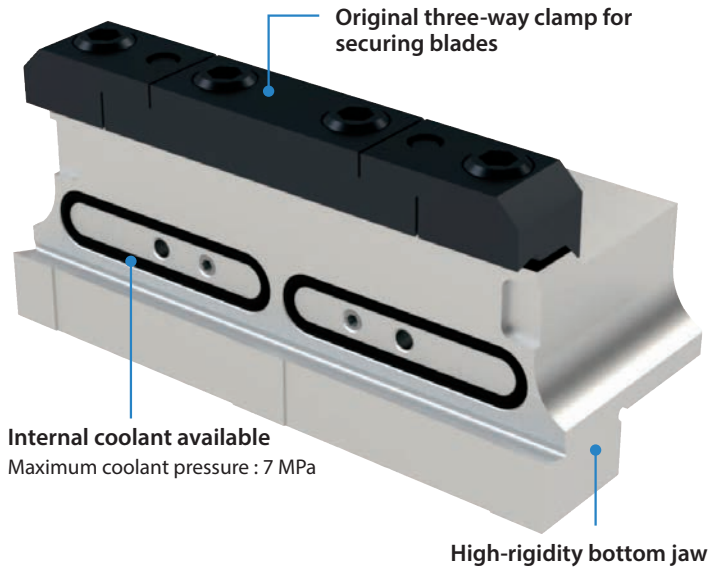
Cutting Conditions : $n = 1,450 \text{ min}^{-1}$ (Constant), $V_c = \sim 173 \text{ m/min}$, $f = 0.05 \text{ mm/rev}$ (Inching: 1 mm)
Wet (External coolant) KPKB32-3 PKM30N-025PM PR1535

(User evaluation)

4

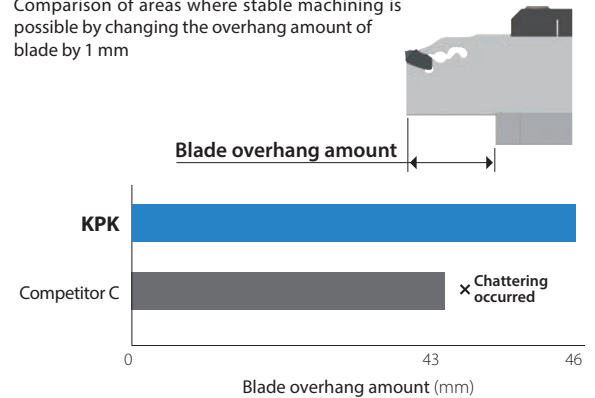
Rigid Tool Holder Block Prevents Chattering and Provides Internal Coolant

KPKTB-JCT



Chatter Resistance Comparison (Internal evaluation)

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



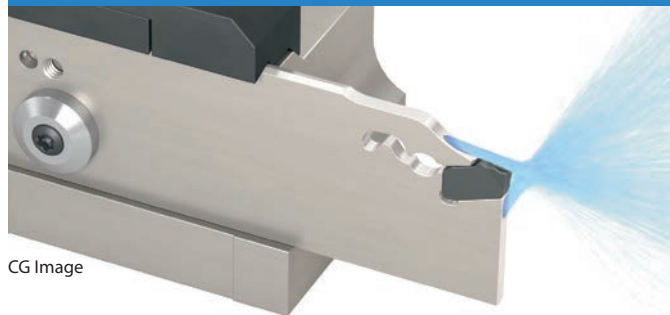
Cutting Conditions : $n = 650 \text{ min}^{-1}$ (Constant), $V_c = \sim 100 \text{ m/min}$, $f = 0.12 \text{ mm/rev}$
Wet (Internal Coolant : Normal pressure) Workpiece : SCM 435 ($\phi 50$), Blade width : 3 mm (PM Chipbreaker)

Note

KTKTB type is compatible with internal coolant with an optional internal connector. (~ 1 MPa)

*Refer to page 11 for the supply method (Type C).

JCT series supports internal coolant. Improved tool life under normal pressure

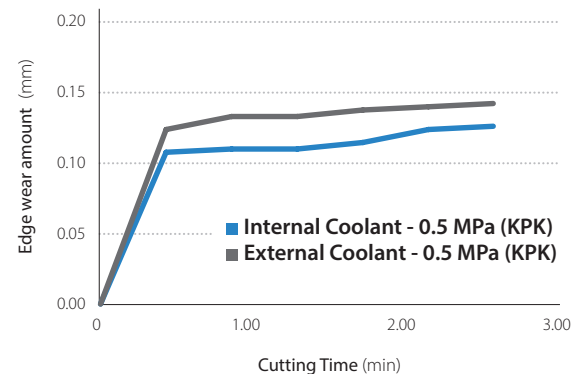


CG Image

KPKB-JCT maximum overhang length while using internal coolant is as follows :
Size 26 : 40 mm Size 32 : 59 mm

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)

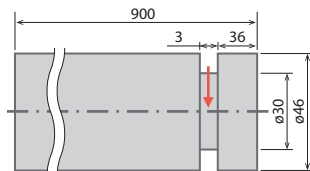


Cutting Conditions : $V_c = 30 \text{ m/min}$ (Constant), $f = 0.1 \text{ mm/rev}$,
Machining depth : 10 mm, Wet
Workpiece : Inconel 718 ($\phi 100$) Blade width : 3 mm (PM Chipbreaker)

SOLUTION 3 Double tool life Reduce fracturing

Machine part
(SUS304)

Internal Coolant



KPK

60 pcs/corner (Stable)

Competitor F

30 pcs/corner (Unstable)

Cutting conditions : $V_c = 65 \text{ m/min}$ (Constant), $f = 0.06 \text{ mm/rev}$,
Wet (Internal coolant 3.5MPa) KPKB32-JCT PKM30N-025PM PR1535

(User evaluation)

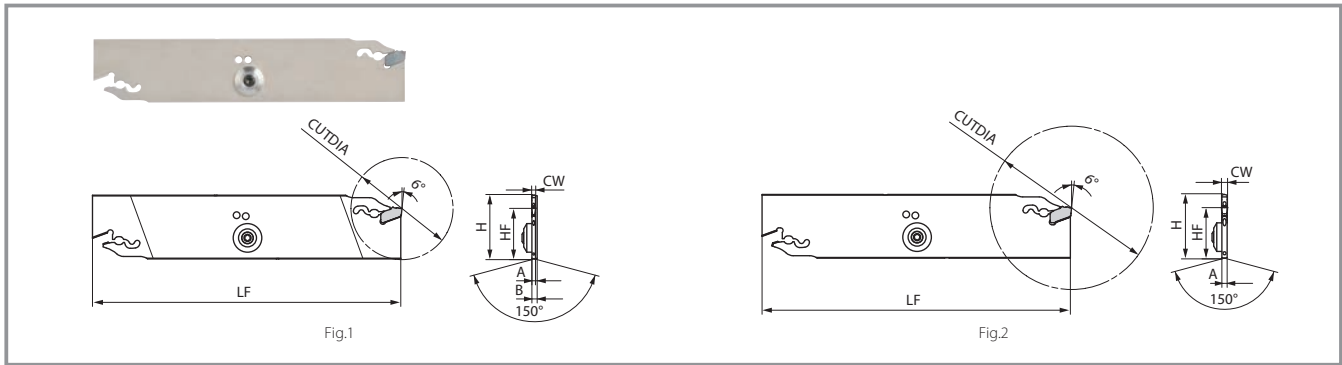
Chip Control Comparison (Internal evaluation)



Cutting conditions : $n = 780 \text{ min}^{-1}$ (Constant), $V_c = 120 \text{ m/min}$, $f = 0.08 \text{ mm/rev}$,
Wet Workpiece : SCM 415 ($\phi 50$) Blade width : 3 mm (PM Chipbreaker)

Blades

KPKB-JCT With coolant holes



Blade dimensions

Pressure Resistance : ~7 MPa

Description	Stock	Cutting Dia.	Dimensions (mm)					Edge Width (mm)	Drawing	Parts				Applicable Inserts	Applicable Tool Holder Block				
			CUTDIA	*H	HF	B	LF			A	CW	Insert Wrench	Coolant Plug			Screw	Wrench		
																			
NEW KPKB 26-1JCT	●	35	26	21.4	2.6	110	1.4	1.6	Fig. 1	LPW-5	CCP-4	SB-4065TR	FT-15	PKM16...	KPKTB○○-26JCT KTKTB○○-26				
26-2JCT	●	50					1.8	2.0 2.4						PKM20... PKM24...					
26-3JCT	●	75					2.6	3.0	Fig. 2					PKM30...					
26-4JCT	●	80			3.4		4.0	PKM40...											
NEW 26-5JCT	●	80			4.2		4.8 5.0	PKM48... PKM50...											
NEW KPKB 32-1JCT	●	35	32	25.0	2.6	150	1.4	1.6	Fig. 1					Coolant Plug Screw Tightening Torque 3.0 N · m				PKM16...	KPKTB○○-32JCT KTKTB○○-32 KTKTBFO○○-32
32-2JCT	●	50					1.8	2.0 2.4										PKM20... PKM24...	
32-3JCT	●	100					2.6	3.0	Fig. 2					PKM30...					
32-4JCT	●	100			3.4		4.0	PKM40...											
NEW 32-5JCT	●	120			4.2		4.8 5.0	PKM48... PKM50...											
NEW 32-6JCT	●	120			5.4		6.0	PKM60...											

See page 14 for how to attach insert.

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

*H : Length between virtual vertices

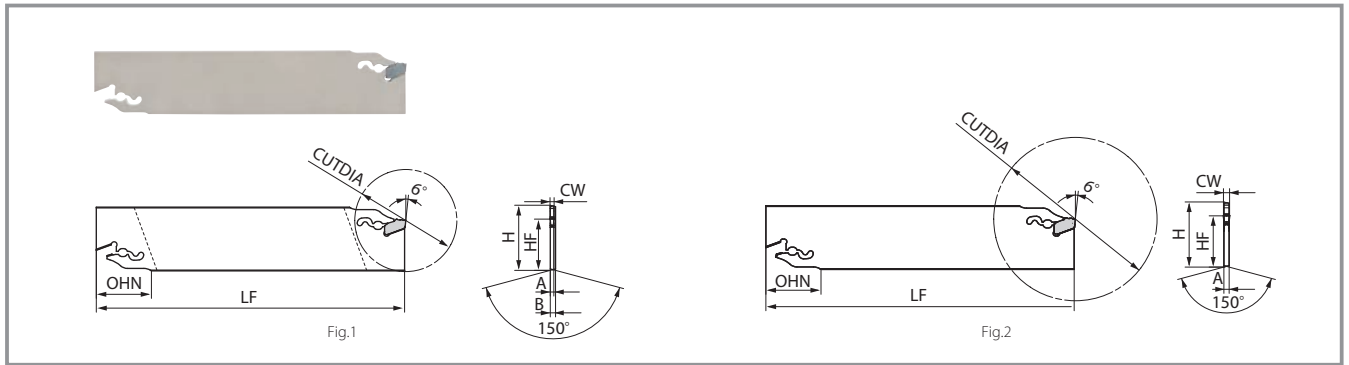
● : Standard Stock

Minimum /maximum overhang length while using internal coolant

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Blades

KPKB Without coolant hole



Blade dimensions

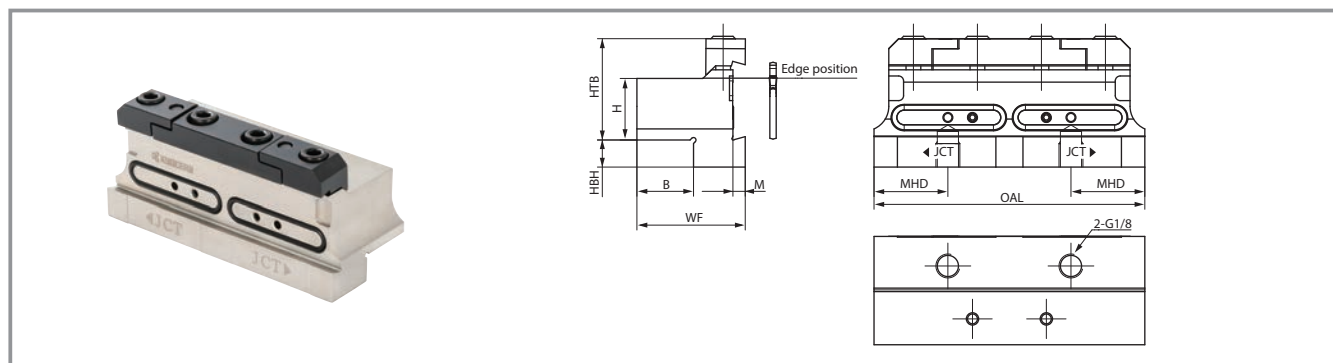
Description	Stock	Cutting Dia.	Dimensions (mm)						Edge Width (mm)	Drawing	Parts	Applicable Inserts	Applicable Tool Holder Block	
			CUTDIA	*H	HF	B	LF	A			CW			Insert Wrench
														
NEW KPKB 19-1	●	32	19	15.7	2.6	86	1.4	1.6	Fig.1	LPW-5	PKM16...	KTKTB○○-19		
NEW 19-2	●	40			-		1.8	2.0 2.4	Fig.2		PKM20... PKM24...			
NEW KPKB 26-1	●	35	26	21.4	2.6	110	1.4	1.6	Fig.1		PKM16...	KPKTB○○-26JCT KTKTB○○-26		
26-2	●	50					1.8	2.0 2.4	Fig.2		PKM20... PKM24...			
26-3	●	75					2.6	3.0			PKM30...			
26-4	●	80					3.4	4.0			PKM40...			
NEW 26-5	●	80					4.2	4.8 5.0			PKM48... PKM50...			
NEW KPKB 32-1	●	35	32	25.0	2.6	150	1.4	1.6	Fig.1		PKM16...	KPKTB○○-32JCT KTKTB○○-32 KTKTBF○○-32		
32-2	●	50							1.8		2.0 2.4		Fig.2	
32-3	●	100			2.6				3.0		PKM30...			
32-4	●	100			3.4				4.0		PKM40...			
NEW 32-5	●	120					4.2	4.8 5.0	PKM48... PKM50...					
NEW 32-6	●	120					5.4	6.0	PKM60...					

See page 14 for how to attach insert.
*H : Length between virtual vertices

● : Standard Stock

Tool holder block

KPKTB-JCT With coolant holes



Tool holder block dimensions

Pressure Resistance : ~7 MPa

Description	Stock	Dimensions (mm)									Parts						Applicable blade
		H	HTB	HBH	B	WF	M	MHD	OAL	Clamp set	Screw	Wrench	O-ring	Plug 1	Plug 2		
																	
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		16		40		25	100	BCS-3			GR-026	HS4x4			
25-32JCT	●	25	41	11	23	44	5	30	110	BCS-4			GR-029				
32-32JCT	●	32		5	29	50											

Includes only one HSG1/8X8.0 plug.

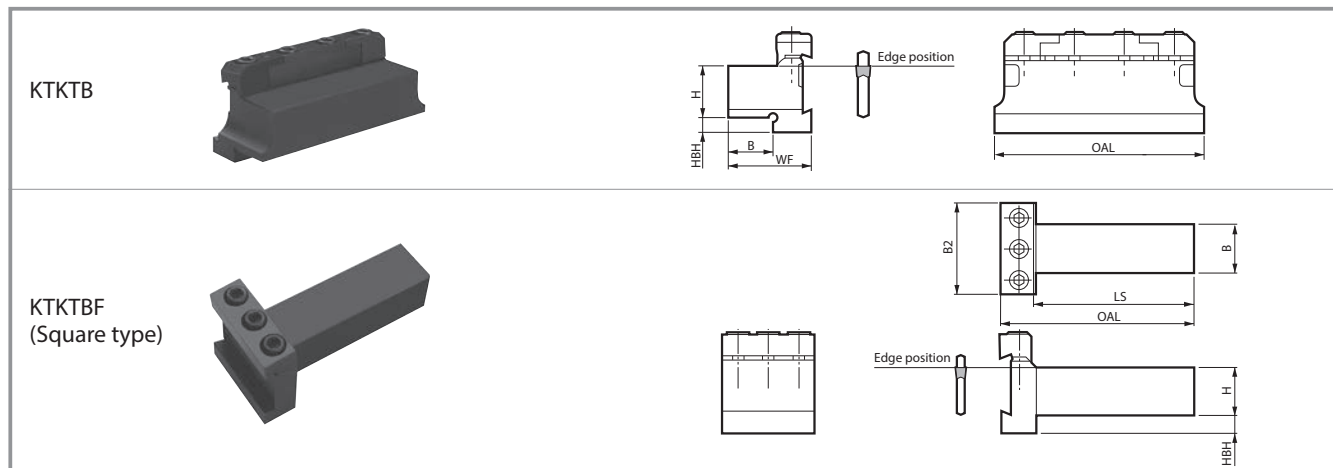
KPKTB-JCT type block is also compatible with conventional KTKB type blades.

See page 13 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 separately.)

● : Standard Stock

KTKTB / KTKTB F Without coolant hole



Tool holder block dimensions

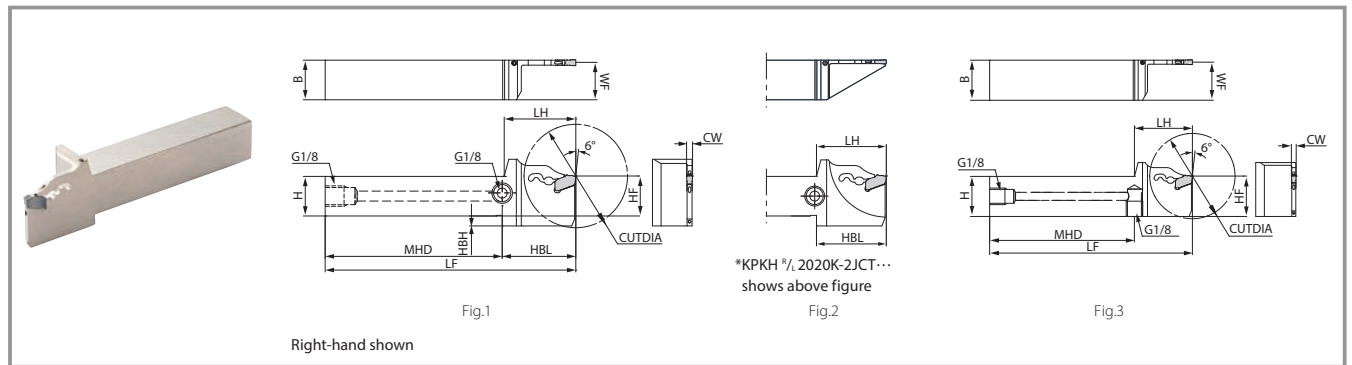
Description		Stock	Dimensions (mm)						Parts				Applicable blade
									Clamp set		Screw	Wrench	
			H	HBH	B	WF B2	OAL	LS					
KTKTB	16-19	●	16	4	15.5	29.5	76	—	—	BCS-1	HH5X25	LW-4	KPKB19-○
	20-19	●	20		19	34	86	—	BCS-2	—	HH6X30	LW-5	KPKB26-○ KPKB26-○JCT
	16-26	●	16	13	15.5	31.5	100	BCS-3	—	HH6X30	LW-5	KPKB32-○ KPKB32-○JCT	
	20-26	●	20	9	19	36							BCS-4
	20-32	●	20	13	19	38		110					
	25-32	●	25	8	23	42							
	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 Stock

Toolholder

KPKH - JCT With coolant holes



Toolholder Dimensions

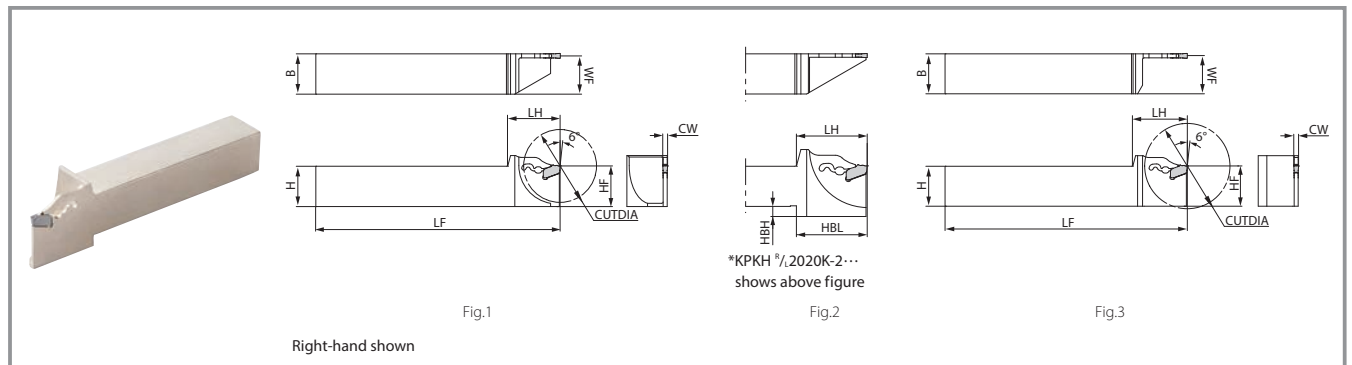
Pressure Resistance : ~15 MPa

Description		Stock		Cutting Dia.	Dimensions (mm)									Edge Width (mm)	Drawing	Parts		Applicable Inserts	
		R	L		CUTDIA	H	HF	HBH	B	LF	LH	WF	HBL			MHD	CW		Insert Wrench
																			
KPKH ^R / _L	2020K-2JCT	●	●	38	20	20	5	20	125	35.1	19.15	35.1	89	2 2.4	Fig.2	LPW-5	HSG1/8X8.0	PKM20...	
	2020K-3JCT	●	●	52						36	18.75	37	88	3.0				Fig.1	PKM24...
	2525K-3JCT	●	●	53	25	25	-	25		42.5	23.75	-	89					Fig.3	PKM30...
	2020K-4JCT	●	●	62	20	20	5	20		42.5	18.35	42	83	4.0				Fig.1	PKM40...
	2525K-4JCT	●	●	68	25	25	-	25			23.35	-	82					Fig.3	

See page 14 for how to attach insert.
See page 13 for coolant piping parts.

● : Standard Stock

KPKH Without coolant hole



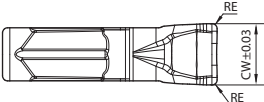
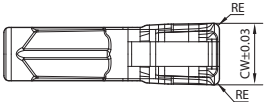
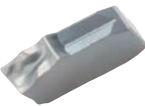
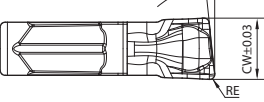
Toolholder Dimensions

Description	Stock		Cutting Dia.	Dimensions (mm)									Edge Width (mm)	Drawing	Parts	Applicable Inserts
	R	L		CUTDIA	H	HF	HBH	B	LF	LH	WF	HBL			CW	
																
KPKH ^{R/L} 2020K-2	●	●	38	20	20	5	20	125	33.1	19.15	33.1	2.0 2.4	Fig.2	LPW-5	PKM20... PKM24...	
	●	●	52			-			34	18.75	3.0	Fig.3	PKM30...			
	●	●	53	25	25	25	150	40.5	23.75	4.0	PKM40...					
	●	●	62	20	20	20	125	40.5	18.35	4.0	PKM48... PKM50...					
	●	●	68	25	25	25	150	45.9	22.95	4.8 5.0	Fig.1		PKM30...			
	●	●	79									25	25		25	150
KPKH ^{R/L} 2020K-3D35	●	●	35	20	20	-	20	125	32.5	18.75	-	3.0	Fig.1	LPW-5	PKM30...	
	●	●	45	25	25		25	150	32.5	23.75		3.0			PKM30...	
	●	●	45	20	20		20	125	35	18.35		4.0			PKM40...	
	●	●	45	25	25		25	150	35	23.35		4.0			PKM40...	

See page 14 for how to attach insert.

● : Standard Stock

Applicable Inserts

Shape Right-hand Shown			Description	Dimensions (mm)		Angle	MEGACOAT NANO		Carbide		
				CW	RE	PSIR ^R / _L	PR1625	PR1535	GW15		
Without lead angle			 PKM	16N-015PM	1.6	0.15	-				
				20N-020PM	2.0	0.20					
				 24N-020PM	2.4	0.20					
				30N-025PM	3.0	0.25					
				40N-030PM	4.0	0.30					
				 48N-030PM	4.8	0.30					
				 50N-030PM	5.0	0.30					
				 60N-035PM	6.0	0.35					
			PKM	20N-020PH	2.0	0.20	-				
				30N-030PH	3.0	0.30					
				40N-030PH	4.0	0.30					
				 50N-030PH	5.0	0.30					
				 60N-040PH	6.0	0.40					
With lead angle			 PKM	16 ^R / _L -015PM-6D	1.6	0.15	6°				
				20 ^R / _L -020PM-6D	2.0	0.20					
				 24 ^R / _L -020PM-6D	2.4	0.20					
				30 ^R / _L -025PM-6D	3.0	0.25					
				40 ^R / _L -030PM-6D	4.0	0.30					
				 50 ^R / _L -030PM-6D	5.0	0.30					

● : Standard Stock

Recommended Cutting Conditions ★1st recommendation ☆2nd recommendation

PM Chipbreaker

Workpiece	Cutting speed Vc (m/min)			Feed f (mm/rev)			Remarks
	MEGACOAT NANO		Carbide	Edge Width CW (mm)			
	PR1625	PR1535	GW15	1.6	2 ~ 4	4.8 ~ 6	
Carbon Steel (SxxC, etc.)	80  220	80  220	—	0.03 – 0.12	0.08 – 0.18	0.10 – 0.22	Wet
Alloy Steel (SCM etc.)	70  200	70  200	—				
Stainless steel (SUS304, etc.)	60  150	60  150	—	0.03 – 0.08	0.06 – 0.12	0.08 – 0.15	
Cast Iron (FC, FCD, etc.)	—	—	50  100	0.03 – 0.08	0.08 – 0.18	0.10 – 0.22	
Aluminum alloy	—	—	200  450	0.03 – 0.08	0.08 – 0.18	0.10 – 0.22	
Brass	—	—	100  200				

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

PH Chipbreaker

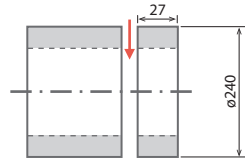
Workpiece	Cutting speed Vc (m/min)			Feed f (mm/rev)			Remarks
	MEGACOAT NANO		Carbide	Edge Width CW (mm)			
	PR1625	PR1535		2	3 ~ 4	5 ~ 6	
Carbon Steel (SxxC, etc.)	80 – 220★	80 – 220☆	—	0.10 – 0.22	0.15 – 0.28	0.15 – 0.35	Wet
Alloy Steel (SCM etc.)	70 – 200★	70 – 200☆	—				
Stainless steel (SUS304, etc.)	60 – 150☆	60 – 150★	—	0.05 – 0.12	0.08 – 0.15	0.08 – 0.18	
Cast Iron (FC, FCD, etc.)	—	—	—	—	—	—	
Aluminum alloy	—	—	—	—	—	—	
Brass	—	—	—				

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

Case Studies

Rings Forging

Vc = 90 m/min
f = 0.18 mm/rev
Wet (External coolant)
Overhang length : 70 mm
KPKB32-3 PKM30N-025PM PR1535



Machining Efficiency

KPK

f = 0.18 mm/rev



Chip control
Surface finish

Good

Machining Efficiency

x 2.0

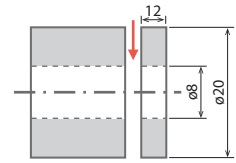
Competitor G

f = 0.09 mm/rev

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 min⁻¹ (Constant)
Vc = ~ 100 m/min
f = 0.09 mm/rev
Wet (External coolant)
Overhang length : 22 mm
KPKB26 -3 PKM30N-025PM PR1625



Tool life

KPK

1,500 pcs/corner (Stable)

Tool life

x 1.8

Competitor H

800 pcs/corner (Unstable)

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

HELLO

Stable Cut-off for Your Work



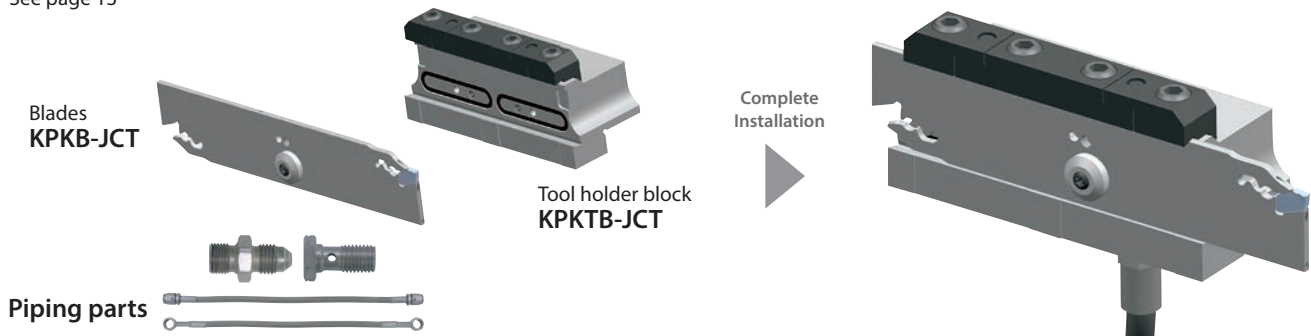
Internal coolant supply method (Blade type)

Supplies according to machine specifications and requirements

A : Coolant Hose Assembly

Maximum coolant pressure : 7 MPa

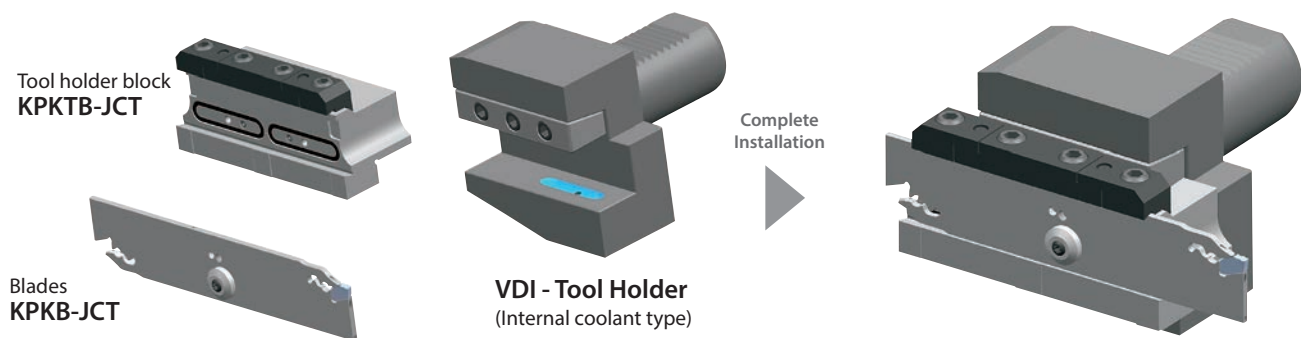
See page 13



B : VDI Holder Assembly

(Internal coolant type)

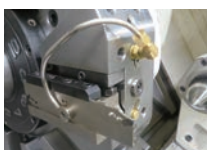
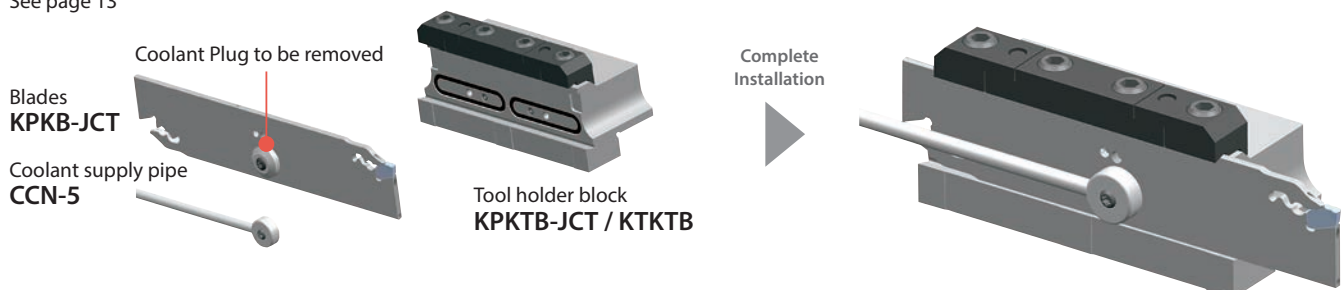
Maximum coolant pressure : 7 MPa



C : Coolant Pipe Assembly

Maximum coolant pressure : 1 MPa

See page 13



Coolant supply pipe mounting method

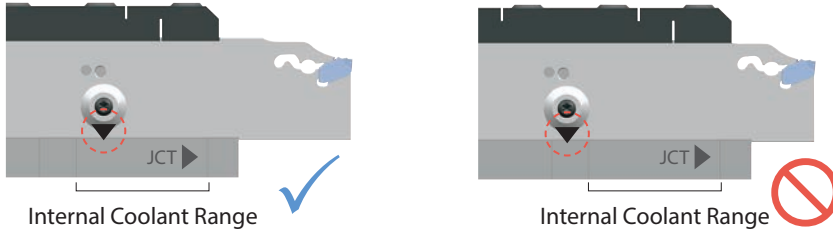
Attach to the blade with the supplied screw

Form pipe to the required shape and connect it to the piping of the machine.

Precautions

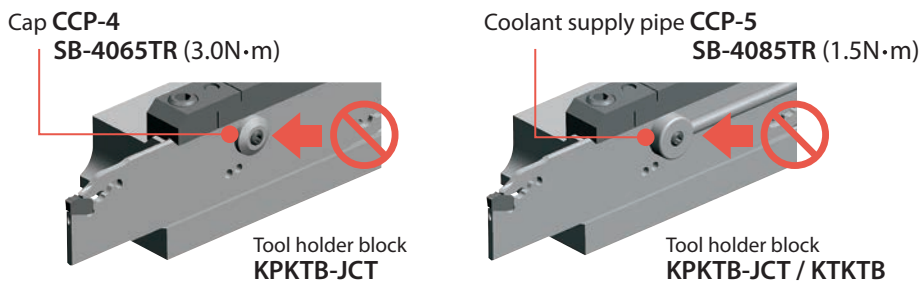
When mounting KPKB-JCT blade

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



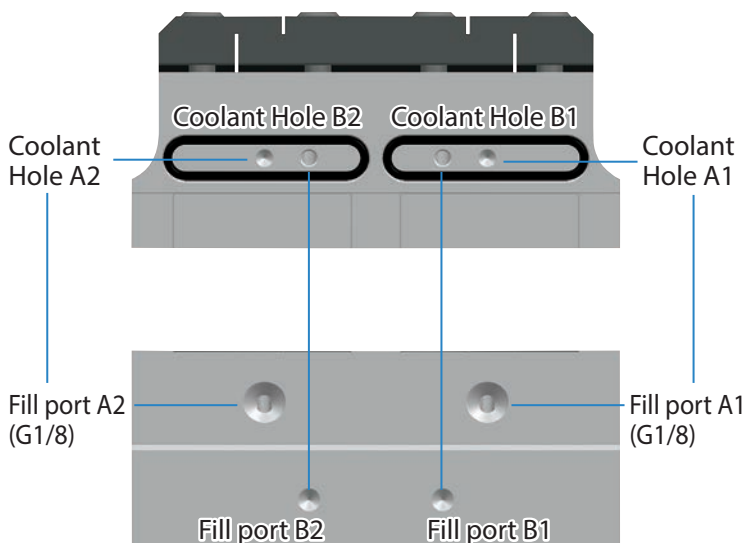
When the cap and coolant supply pipe are mounted

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



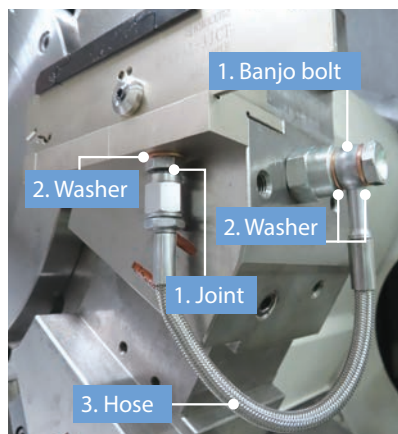
When using a tool holder block

When using the discharge port B1 (B2), use a sealant for the filler cap (HSG 1/8 X 8.0) provided as an accessory and attach it to the coolant supply port A1 (A2).



A : Coolant Hose Assembly

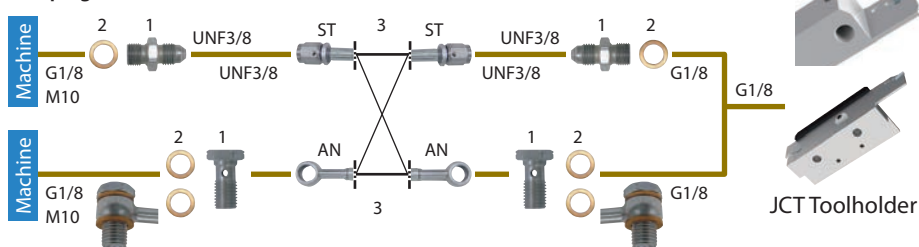
Connection method and piping parts



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

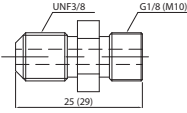
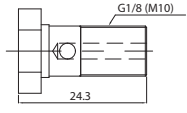
<Piping Installation Guide>



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 : ~ 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
	BB-G1/8	●	G1/8
	BB-M10X1.5	●	M10X1.5

● : Standard Stock

2.Washer (Sold separately)

Pressure Resistance : ~ 30 MPa

Shape	Description	Stock
	WS-10	●

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

● : Standard Stock

3.Hose (Sold separately)

Pressure Resistance : ~ 30 MPa

Shape	Description	Stock	Thread standard	Dimensions (mm)
	HS-ST-ST-200	●	UNF3/8	200
	HS-ST-ST-250	●		250
	HS-ST-AN-200	●	UNF3/8	200
	HS-ST-AN-250	●		250
	HS-AN-AN-200	●	—	200
	HS-AN-AN-250	●	(Banjo bolt)	250

● : Standard Stock

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)

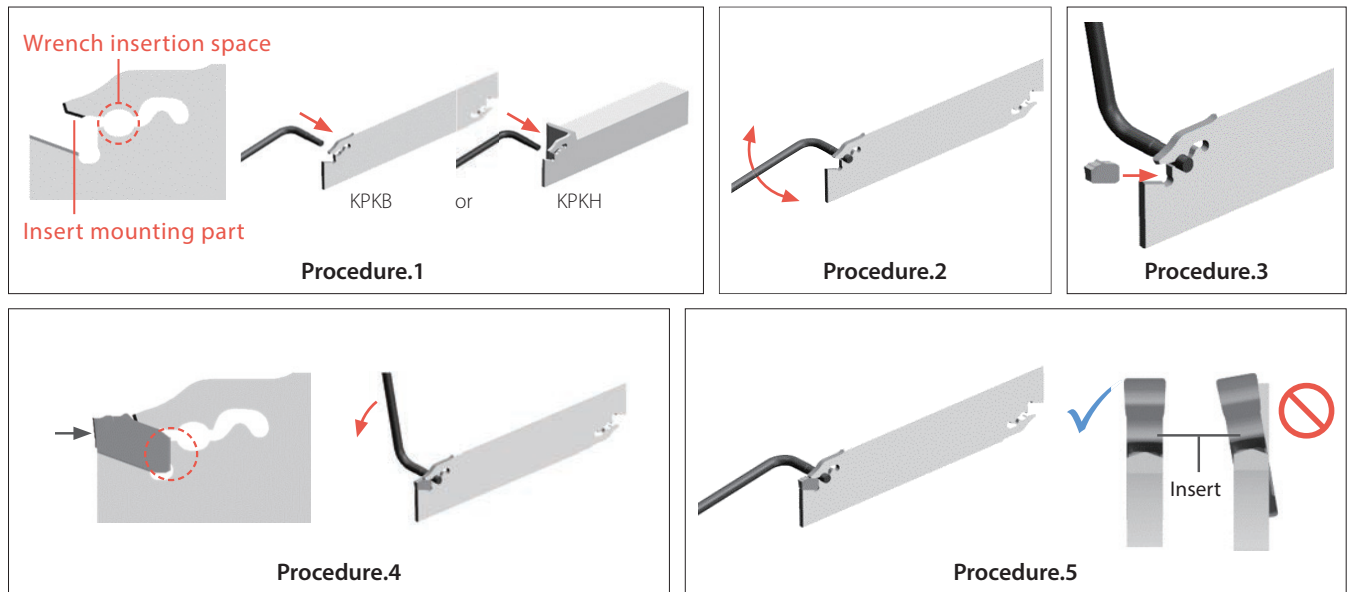
Pressure Resistance : ~ 1 MPa

Shape	Description	Stock	Dimension	Parts (Screw)
	CCN-5	●	A: 190, B: 16, C: 5, D: 6	SB-4085TR

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

● : Standard Stock

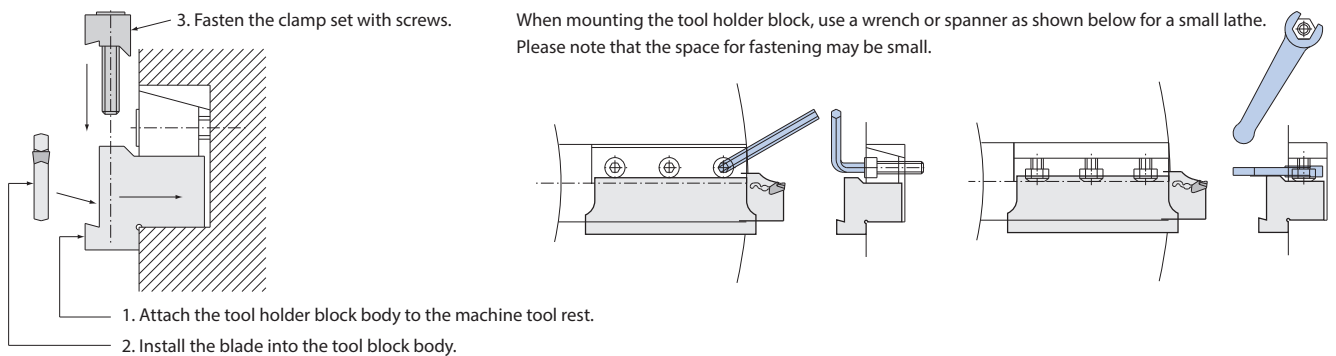
How to attach insert



Procedure

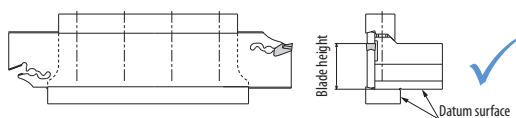
1. Use compressed air or other measures to remove chips from the insert mounting part and wrench insertion space and put in the wrench.
2. Turn the wrench.
3. Put in the insert into insert mounting part. (When removing the insert, follow the same procedure and remove it at step 3.)
4. Please clamp it while gently pressing it makes contact with the back end of blade's surface.
5. Make sure that the insert is set straight.

Installation Guide

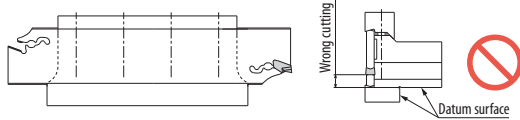


How to install the tool holder block and blade

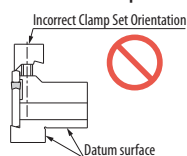
Correct blade installation



Incorrect blade installation



Incorrect Clamp Set Orientation

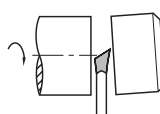
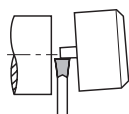
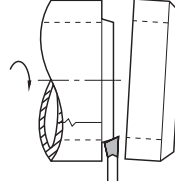
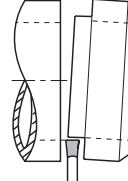


If the clamp set is mounted in the reverse direction, a large gap is created between the tool holder block main body and the clamp set as shown in the left figure. If you continue to use the product, the blade may break off. Reinstall in the correct orientation.

Lead Angle Direction and Usage

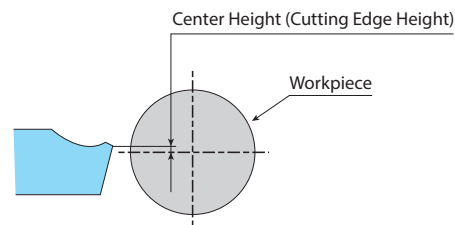
1. If there is no restriction on the finished shape, use an insert without lead angle.
2. Insert with lead angle is recommended to prevent remaining boss.
3. If you want to make the remaining boss smaller when machining small or thin parts, use insert with lead angle.

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

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

Machining Precautions

1. Set cutting edge height 0.1mm 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.



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