

High-Performance Cut-Off Solutions

# KPK Series

**NEW****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)**

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.

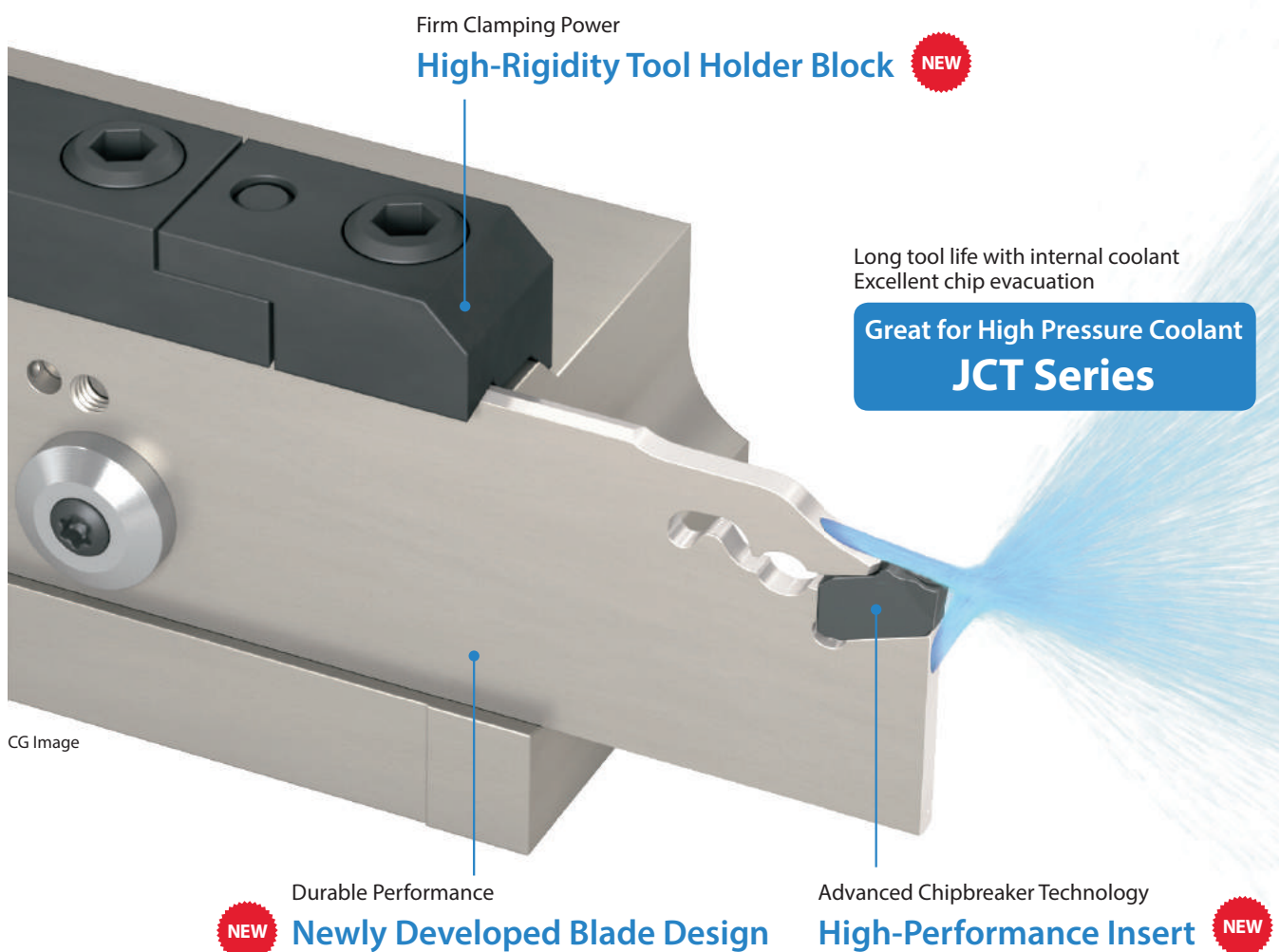
Cut-off is often used on bottlenecks of a workpiece or during the final process, requiring a trouble-free machining environment.

### Challenges

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

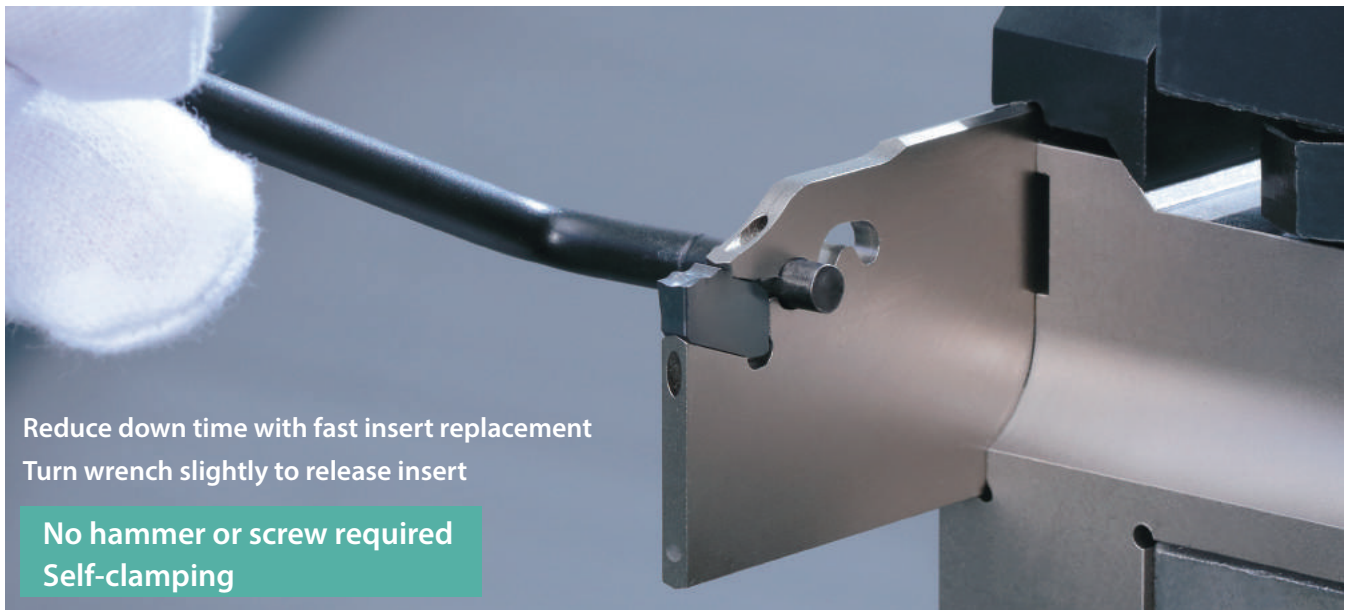
### SOLUTION

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



# 1

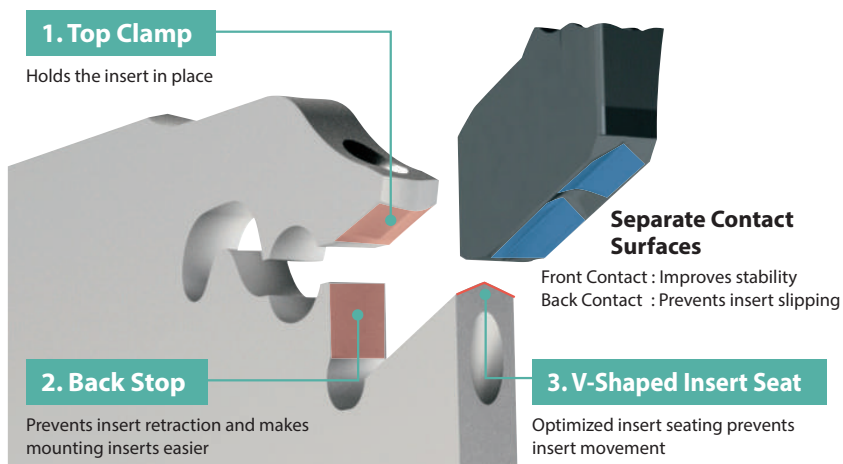
## Easy Insert Replacement



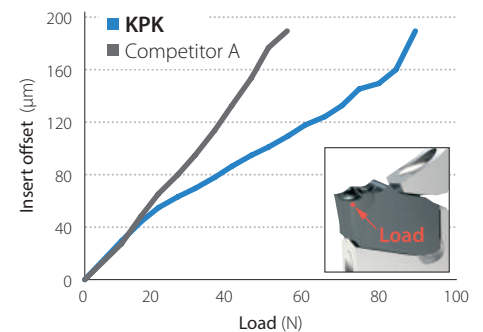
# 2

## Firm Insert Clamp Ensures Added Safety and Security

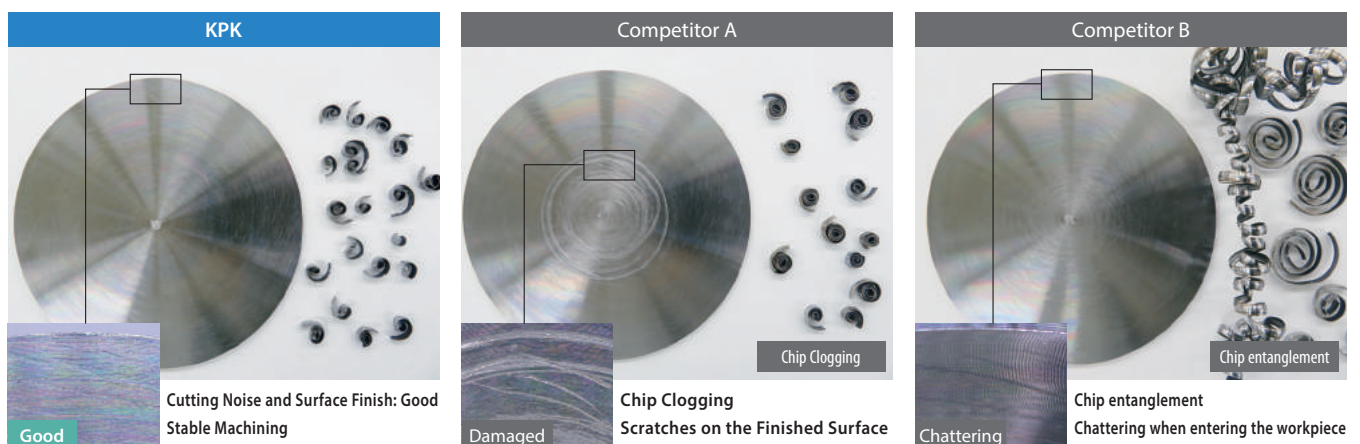
The firmly secured insert uses three contact surfaces to eliminate sliding or chattering



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

## Unique Chipbreaker for Long Tool Life and Stable Machining

Advanced chipbreaker technology inherited from KGD lineup provides excellent chip control



### General use PM Chipbreaker

#### Insert grade

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

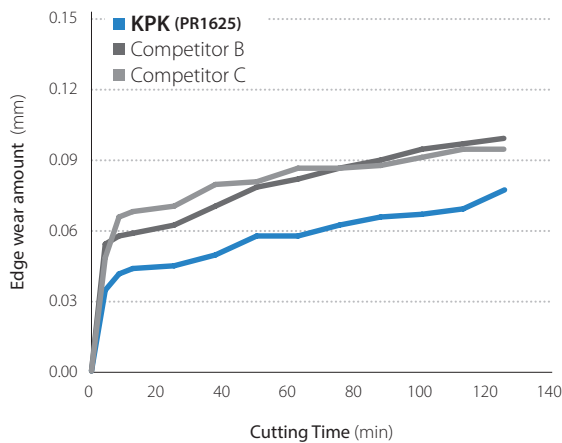


### For Tough edge and High-feed machining PH Chipbreaker

#### Insert grade

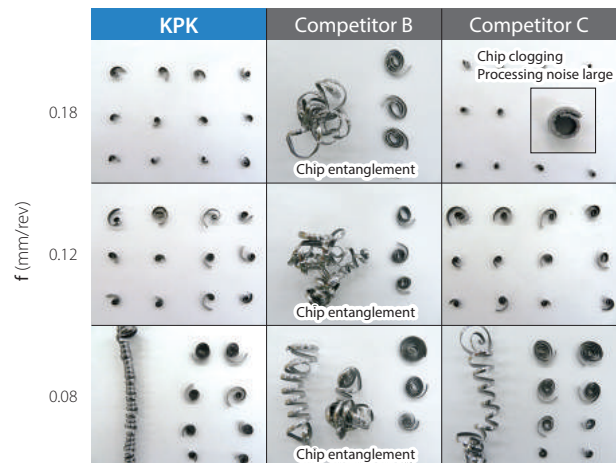
For Steel : PR1625  
For Stainless steel : PR1535

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)

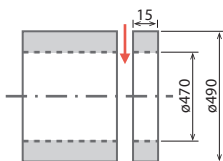


Cutting Conditions :  $n = 780 \text{ min}^{-1}$  (constant),  $V_c \sim 120 \text{ m/min}$ , Wet (External Coolant)  
Workpiece : SCM 415 ( $\phi 50$ ) Blade width : 3 mm (PM Chipbreaker)

### SOLUTION 1 Tool Life x 1.3 Stable chip curl

Rings  
(SUJ2)

External Coolant



KPK

34 pcs/corner



Competitor D

25 pcs/corner



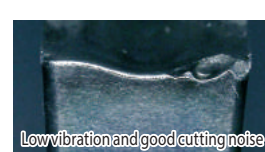
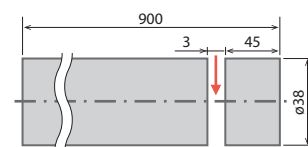
Cutting Conditions :  $n = 90 \text{ min}^{-1}$  (Constant),  $V_c \sim 140 \text{ m/min}$ ,  $f = 0.06 \text{ mm/rev}$ ,  
Wet (External Coolant) KPKB32-3 PKM30N-025PM PR1625

(User evaluation)

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

Adaptor  
(SUS316)

External Coolant



KPK

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



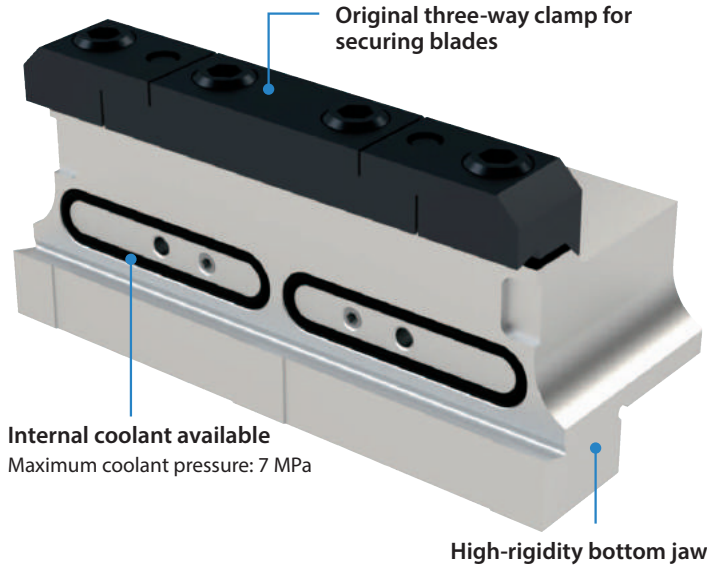
Competitor E

(User evaluation)

# 4

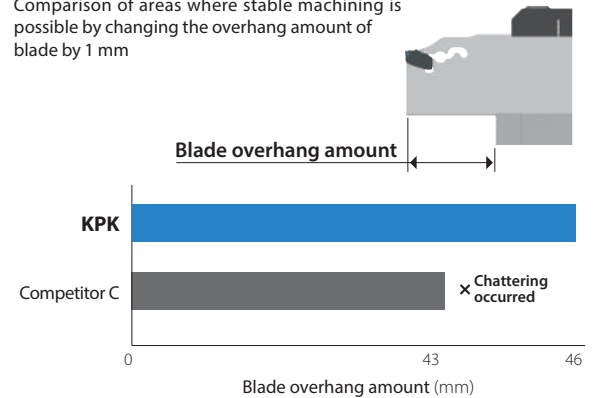
## Rigid Tool Holder Block Prevents Chattering and Provides Internal Coolant

### 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



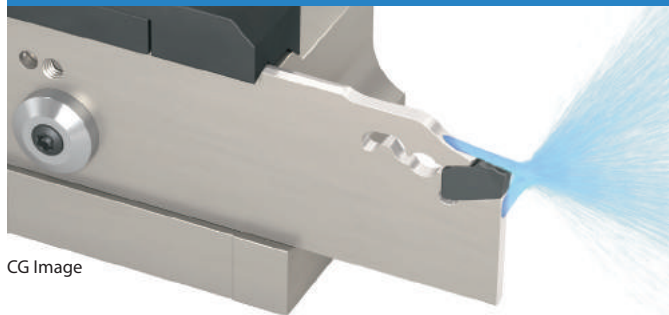
Cutting Conditions :  $n = 650 \text{ min}^{-1}$  (Constant),  $V_c = \sim 100 \text{ m/min}$ ,  $f = 0.12 \text{ mm/rev}$   
Wet (Internal Coolant : Normal pressure) Workpiece : SCM 435 ( $\phi 50$ ), Blade width : 3 mm (PM Chipbreaker)

### Note

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

\*Refer to page 9 for the supply method (Type C).

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

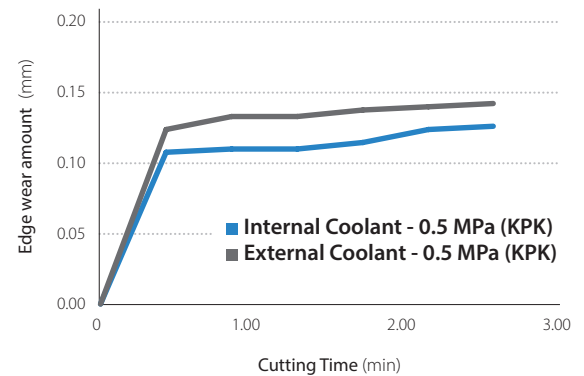


CG Image

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)

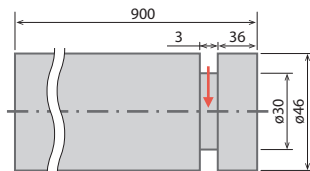


Cutting Conditions :  $V_c = 30 \text{ m/min}$  (Constant),  $f = 0.1 \text{ mm/rev}$ ,  
Machining depth : 10 mm, Wet  
Workpiece : Inconel 718 ( $\phi 100$ ) Blade width : 3 mm (PM Chipbreaker)

### 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) KPKB32-3JCT PKM30N-025PM PR1535


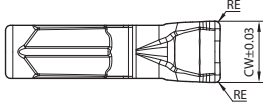

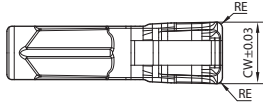

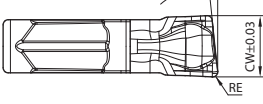
(User evaluation)

#### 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)

## Applicable Inserts

Shape Right-hand (R) Shown			Description	Dimensions (mm)		Angle	MEGACOAT NANO		Carbide
				CW	RE	PSIR <sup>R</sup> / <sub>L</sub>	PR1625	PR1535	GW15
Without lead angle	 General use		PKM 20N-020PM	2.0	0.20	-	●	●	●
			30N-025PM	3.0	0.25		●	●	●
			40N-030PM	4.0	0.30		●	●	●
	 Tough Edge		PKM 20N-020PH	2.0	0.20	-	●	●	-
			30N-030PH	3.0	0.30		●	●	-
			40N-030PH	4.0	0.30		●	●	-
With lead angle			PKM 20 <sup>R</sup> / <sub>L</sub> -020PM-6D	2.0	0.20	6 °	●	●	●
			30 <sup>R</sup> / <sub>L</sub> -025PM-6D	3.0	0.25		●	●	●
			40 <sup>R</sup> / <sub>L</sub> -030PM-6D	4.0	0.30		●	●	●

● : Standard Stock

## Recommended Cutting Conditions Table ★1st recommendation ☆2nd recommendation

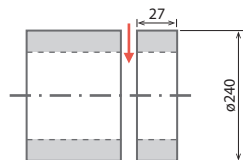
Workpiece	Cutting speed Vc (m/min)			Feed f (mm/rev)			Remarks
				PM	PH		
	MEGACOAT NANO		Carbide	Blade width CW (mm)	Blade width CW (mm)		
	PR1625	PR1535	GW15	2 ~ 4	2	3 ~ 4	
Carbon Steel (SxxC, etc.)	★ 80 – 220	☆ 80 – 220	—	0.08 – 0.18	0.10 – 0.22	0.15 – 0.28	Wet
Alloy Steel (SCM etc.)	★ 70 – 200	☆ 70 – 200	—				
Stainless steel (SUS 304, etc.)	☆ 60 – 150	★ 60 – 150	—	0.06 – 0.12	0.05 – 0.12	0.08 – 0.15	
Cast Iron (FC, FCD, etc.)	—	—	★ 50 – 100	0.08 – 0.18	—	—	
Aluminum alloy	—	—	★ 200 – 450	0.08 – 0.18	—	—	
Brass	—	—	★ 100 – 200	0.08 – 0.18	—	—	

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 amount : 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

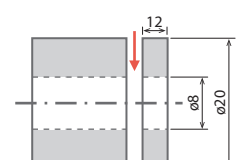
f = 0.09 mm/rev

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<sup>-1</sup> (Constant)  
Vc = ~ 100 m/min  
f = 0.09 mm/rev  
Wet (External coolant)  
Extrusion : 22 mm  
KPKB26-3 PKM30N-025PM PR1625



Tool life

KPK

1,500 pcs/corner (Stable)

Tool life

x 1.8

Competitor H

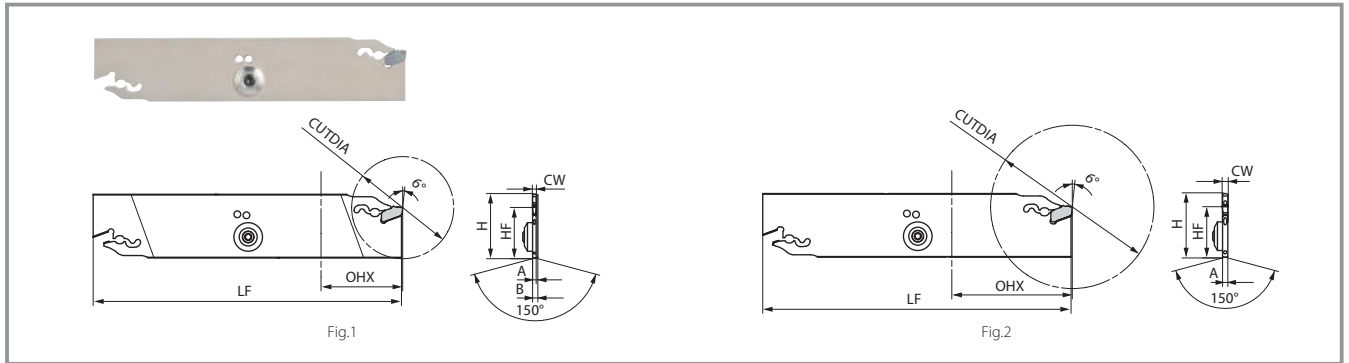
800 pcs/corner (Unstable)

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

(User evaluation)





## Blades

### KPKB - JCT With Coolant holes



### Blade dimension

Pressure: 7 MPa

Description		Stock	Cutting Dia.	Dimensions (mm)						Blade width (mm)	Shape	Parts				Applicable Inserts	Applicable Tool Holder Block				
				CUTDIA	OHX <sup>*1</sup>	H <sup>*2</sup>	HF	B	LF			A	CW	Insert Wrench	Coolant Plug			Screw	Wrench		
																					
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				
	26-3JCT	●	75				-		2.6	3.0						PKM30...	KTKTB○○-26				
	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 N · m				PKM20...	KPKTB○○-32JCT
	32-3JCT	●	100				-		2.6	3.0										PKM30...	KTKTB○○-32
	32-4JCT	●	100				-		3.4	4.0										PKM40...	KTKTBF○○-32

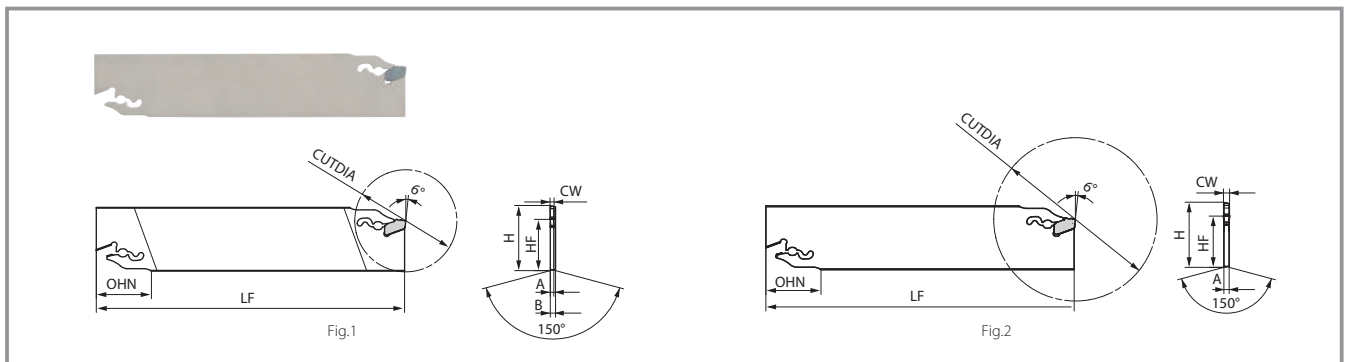
See page 8 for insert mounting and removal instructions.

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

●: Standard Stock

### KPKB Without coolant hole



### Blade dimension

Description		Stock	Cutting Dia.	Dimensions (mm)						Blade width (mm)	Shape	Parts		Applicable Inserts	Applicable Tool Holder Block
				Detachable wrench											
				CUTDIA	OHN	H <sup>*2</sup>	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 KTCTB○○-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	-	150	1.8	2.0	Fig.1		PKM20...	KPKTB○○-32JCT KTCTB○○-32 KTCTBF○○-32	
	32-3	●	100						2.6	3.0			PKM30...		
	32-4	●	100						3.4	4.0			PKM40...		

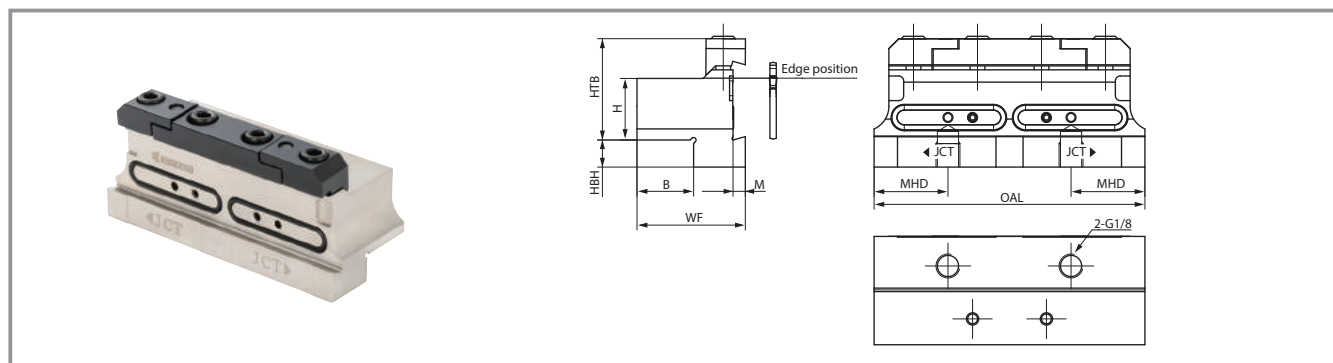
See page 8 for insert mounting and removal instructions.

\*2 H: Length between virtual vertices

●: Standard Stock







## Tool holder block

### KPKTB-JCT Coolant with holes



### Tool holder block dimensions

Pressure: 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.

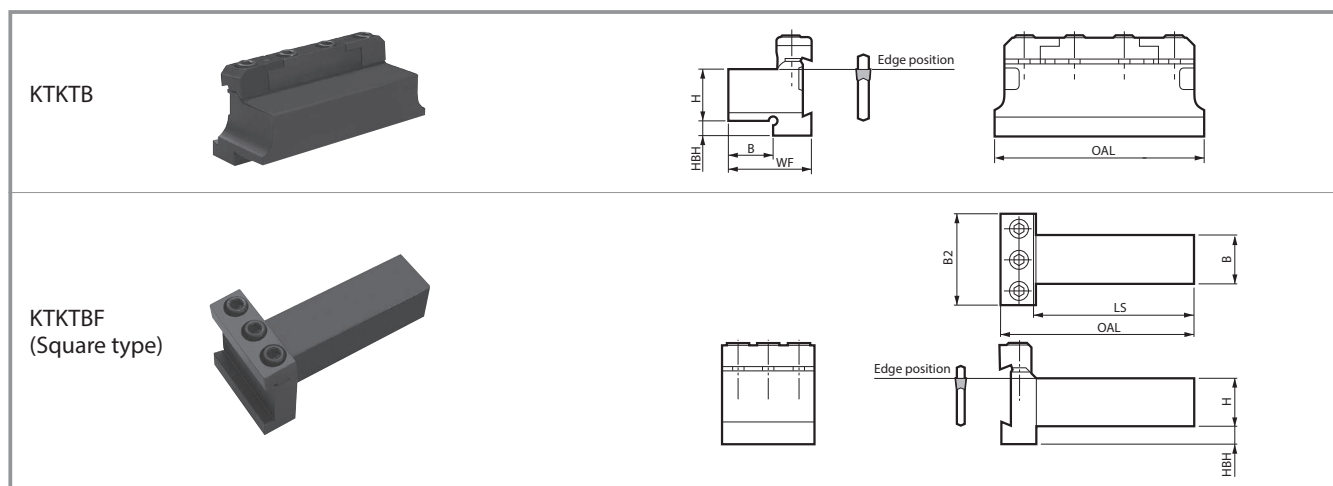
KPKTB-JCT type block is also compatible with conventional KTKB type blades.

See page 10 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/KTKTBF Without coolant holes



### Tool holder block dimensions

Description		Stock	Dimensions (mm)						Parts				Applicable blade
									Clamp set		Screw	wrench	
			H	HBH	B	WF B2	OAL	LS					
KTKTB	16-26	●	16	13	15.5	31.5	86	–	BCS-2	–	HH6x30	LW-5	KPKB26-○ KPKB26-○JCT
	20-26	●	20	9	19	36			BCS-3	–	HH6x30	LW-5	KPKB32-○ KPKB32-○JCT
	20-32	●	20	13	19	38	100	BCS-4					
	25-32	●	25	8	23	42	110						
	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



## How to mount and remove the insert

1. Insert provide 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.

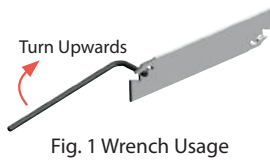


Fig. 1 Wrench Usage

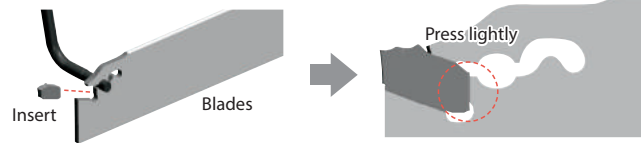
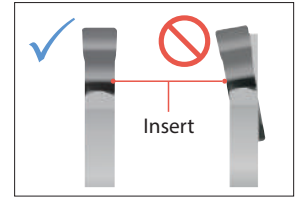
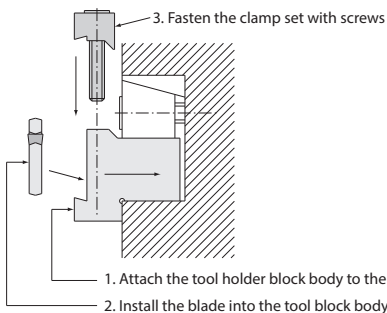


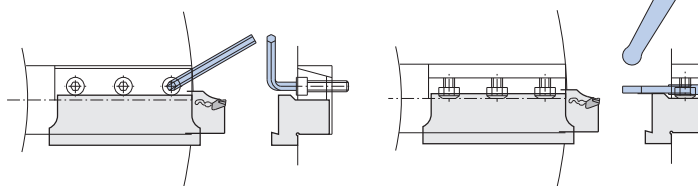
Fig. 2 Mounting Method



## Installation Guide

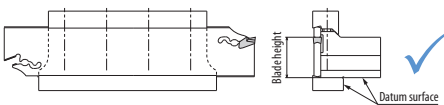


When mounting the tool holder block, use a wrench or spanner as shown below for a small lathe. Please note that the space for fastening may be small.

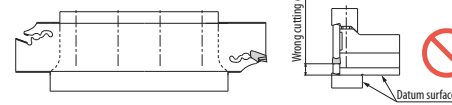


### How to install the tool holder block and blade

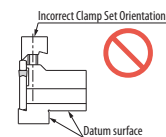
#### Correct blade installation



#### 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

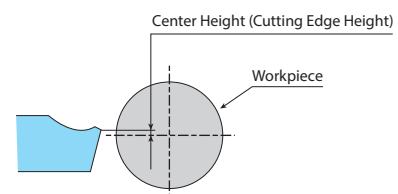
1. If there is no restriction on the finished shape, use an insert without lead angle.
2. Insert with lead angle is recommended to prevent remaining boss.
3. If you want to make the remaining boss smaller when machining small or thin parts, use insert with lead angle.

	N (Neutral)	R (Right hand)	L (Left hand)
Handed insert with lead angle			
	<ul style="list-style-type: none"> <li>· Inserts with lead angle (PSIR <sup>R/L</sup>) reduce burrs at cut-off machining.</li> <li>· The larger the lead angle (PSIR <sup>R/L</sup>), the smaller the cutting force. The feed also needs to be smaller.</li> </ul>		

	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

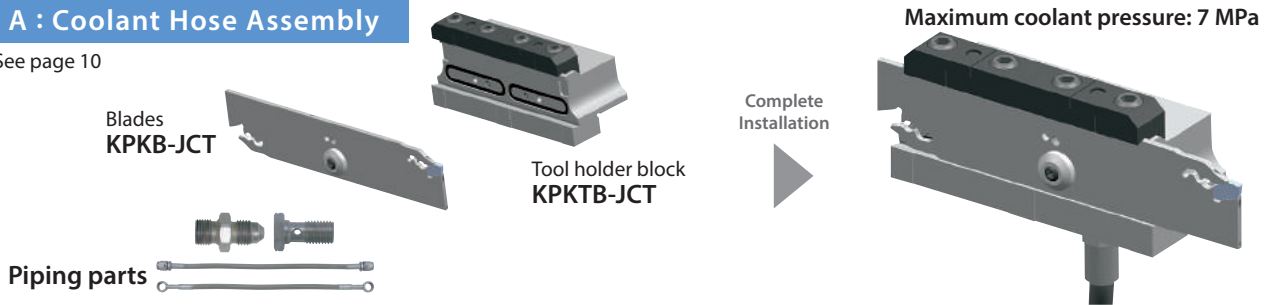


## Internal coolant supply method

Supplies according to machine specifications and requirements

### A : Coolant Hose Assembly

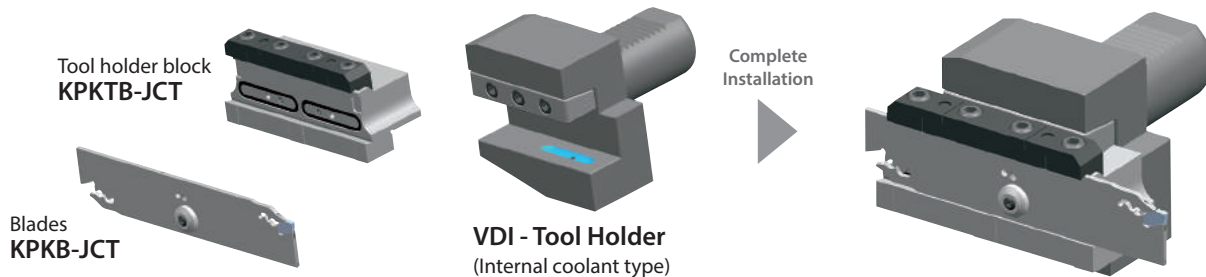
See page 10



### B : VDI Holder Assembly

(Internal coolant type)

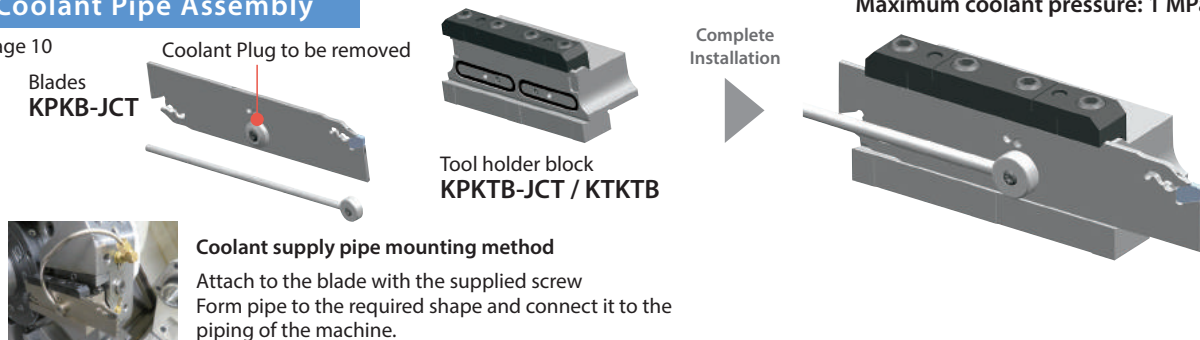
Maximum coolant pressure: 7 MPa



### C: Coolant Pipe Assembly

See page 10

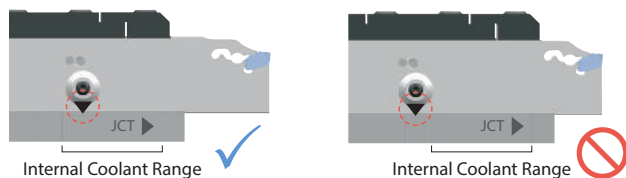
Maximum coolant pressure: 1 MPa



## Precautions

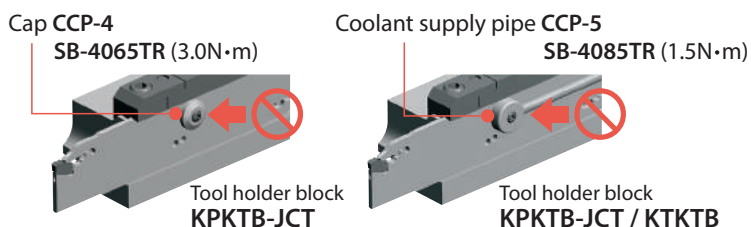
### When mounting KPKB-JCT blade

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



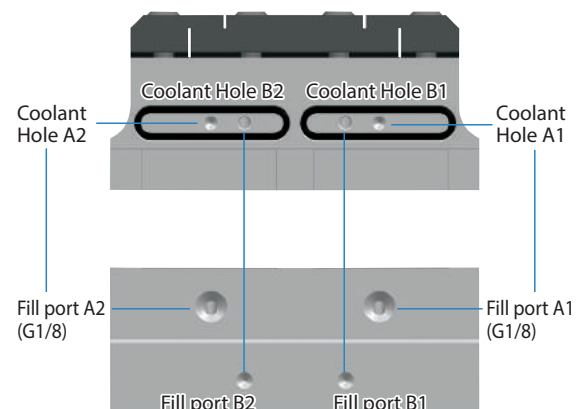
### When the cap and coolant supply pipe are mounted

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



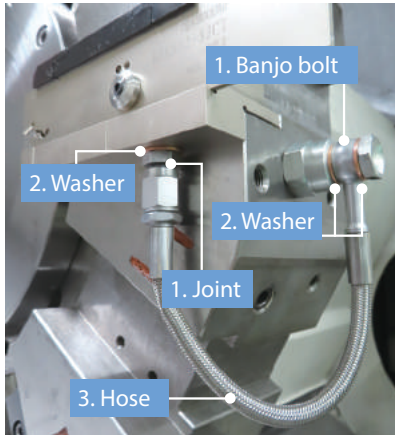
### When using a tool holder block

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



## A : Coolant Hose Assembly

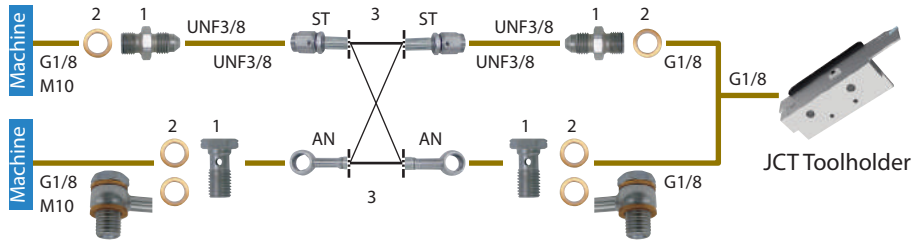
### Connection method and piping parts



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) L
	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	●	(Banjo bolt)	200
	HS-AN-AN-250	●		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)
			A	B	C	D	
	CCN-5	●	190	16	5	6	SB-4085TR

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

● : Standard Stock

