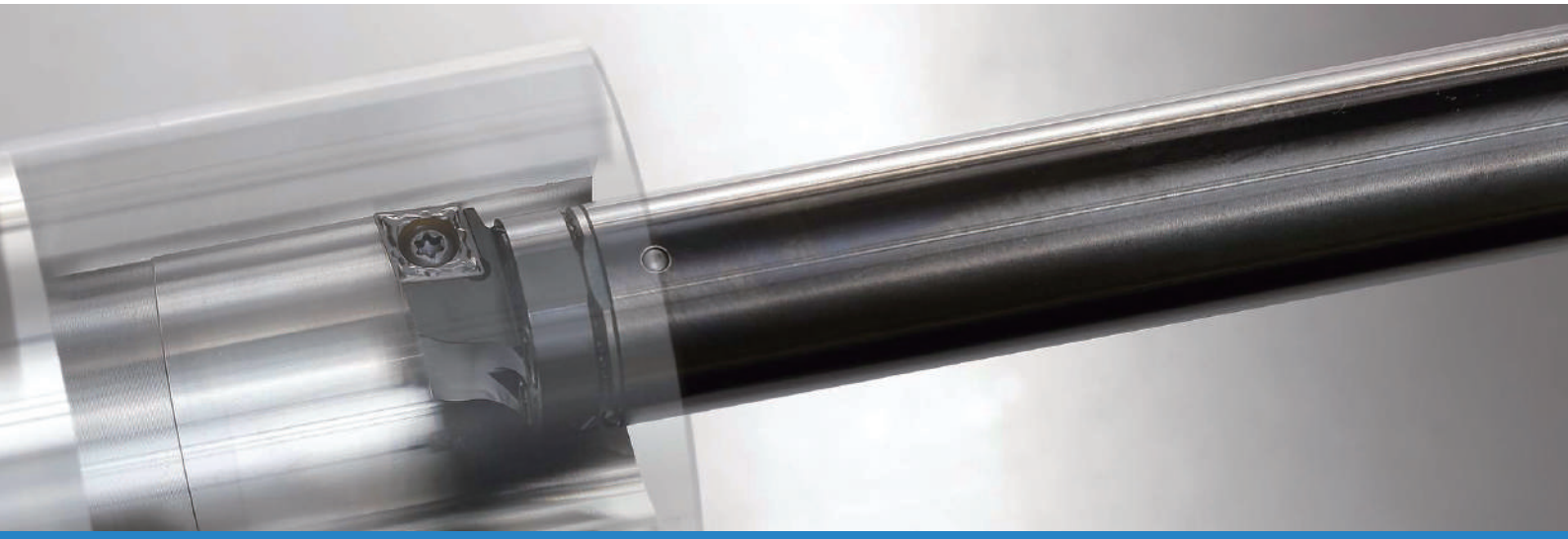
Interchangeable head boring bars with anti-vibration dampener system

KAV Series NEW



"Max L/D = 10" Solves deep-boring challenges with superior chatter resistance

Unique anti-vibration mechanism provides superior anti-chatter performance
Shank diameters from 16mm to 32mm (Max L/D = 7, 10)

Variety of internal machining processes possible with interchangeable heads
Strong hold with serrated joint structure

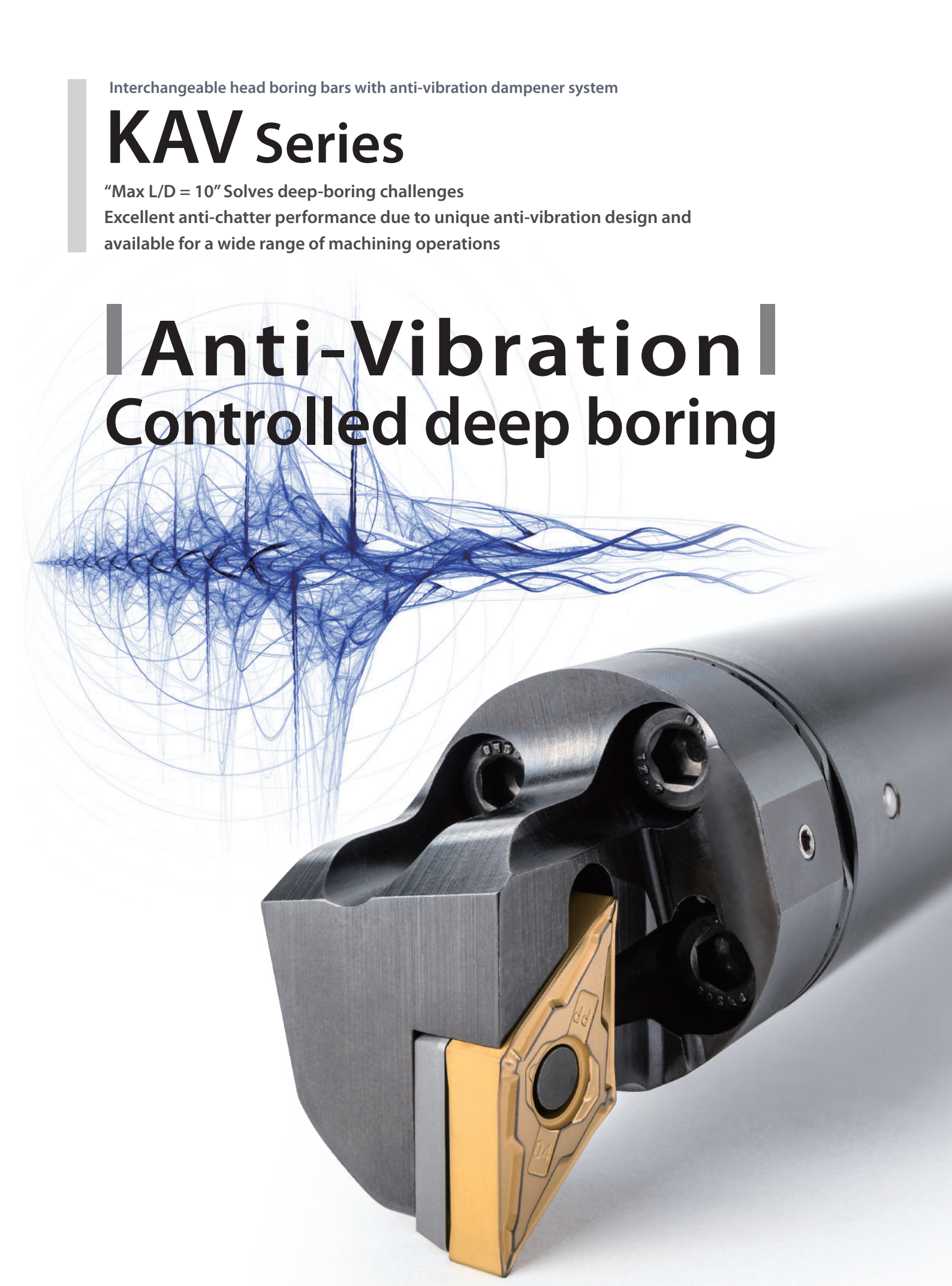
Easy cutting edge adjustment with E-Sleeve design
Easy machining setup

Interchangeable head boring bars with anti-vibration dampener system

KAV Series

"Max L/D = 10" Solves deep-boring challenges
Excellent anti-chatter performance due to unique anti-vibration design and available for a wide range of machining operations

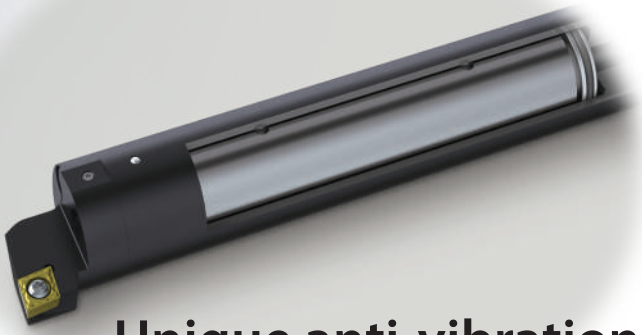
Anti-Vibration
Controlled deep boring



Shank Lineup

Shank diameters, from 16mm to 32mm with L/D = 7 and 10, are available
Carbide reinforced style also available

Shank diameter	Available overhang length range	Type
ø16 ø20		Steel Carbide reinforcement
ø25 ø32		Steel Steel



Unique anti-vibration mechanism

Built-in proprietary damper technology dampens vibration
Superior anti-chatter performance over carbide

Interchangeable head type

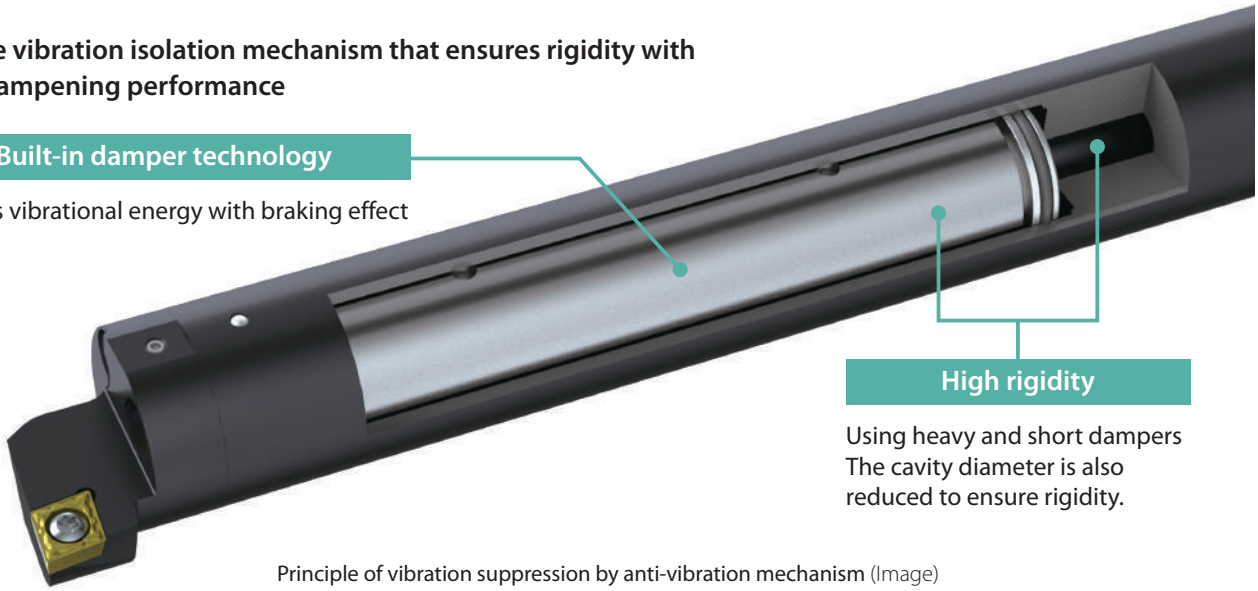
Interchangeable heads for a variety of machining applications
Strong fastening with serrated joint structure

1 Unique anti-vibration mechanism provides superior chatter resistance

Unique vibration isolation mechanism that ensures rigidity with high dampening performance

Built-in damper technology

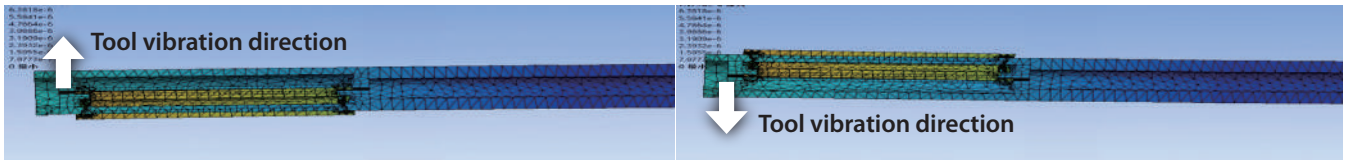
Absorbs vibrational energy with braking effect



High rigidity

Using heavy and short dampers
The cavity diameter is also reduced to ensure rigidity.

Principle of vibration suppression by anti-vibration mechanism (Image)



The damper vibrates late against the shank. Effective for vibration damping

Video

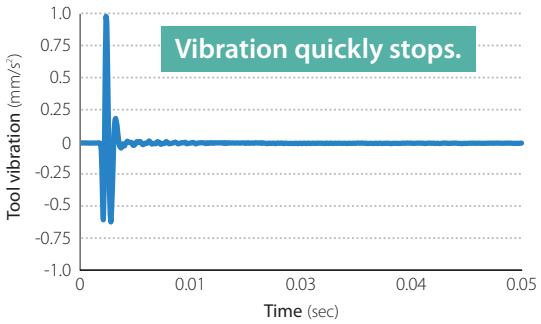
Available up to L/D = 10. Excellent anti-vibration performance over conventional carbide shanks

Hammering test (Internal evaluation)

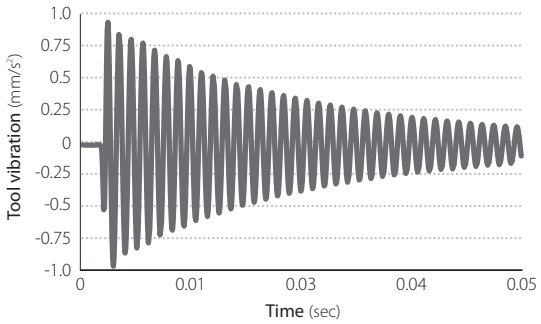
Hammer impacts to the head of the tool
(ø20, Overhang length 10D)

Vibration measurement direction

KAV (built-in anti-vibration mechanism)

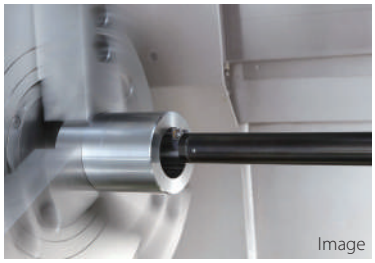


Conventional carbide shank



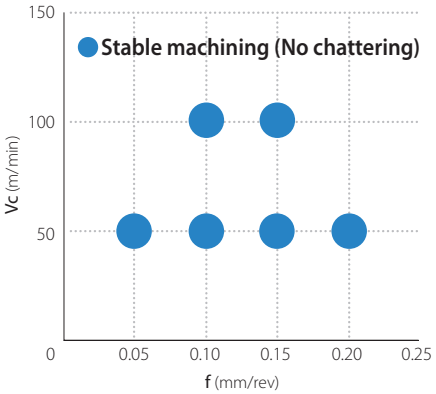
10D Shank Anti-vibration performance (Internal evaluation)

KAV maintains stable machining

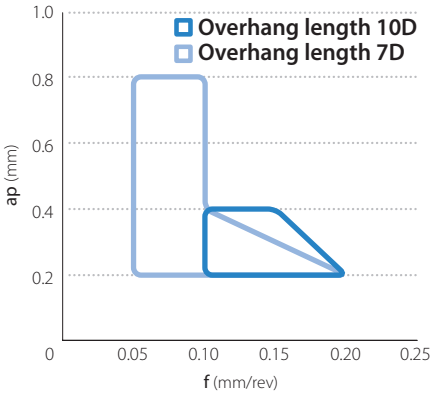


KAV-G20-10D / KAVH20-SCLCR09
CCMT09T304PP
Overhang length: 140 mm (7D) / 200 mm (10D)
Workpiece: SCM435

Stable machining area map
(Overhang length 10D, ap = 0.4 mm)



Stable machining area map
(Cutting speed Vc = 100 m/min)

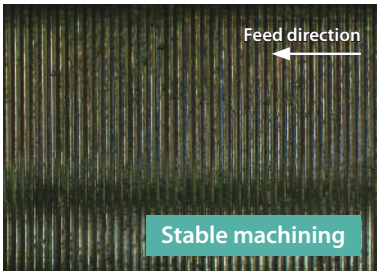


Unique anti-vibration mechanism provides superior anti-chatter performance against competitors

Anti-vibration performance comparison (Internal evaluation)

Competitors produced chattering. KAV maintains stable machining.

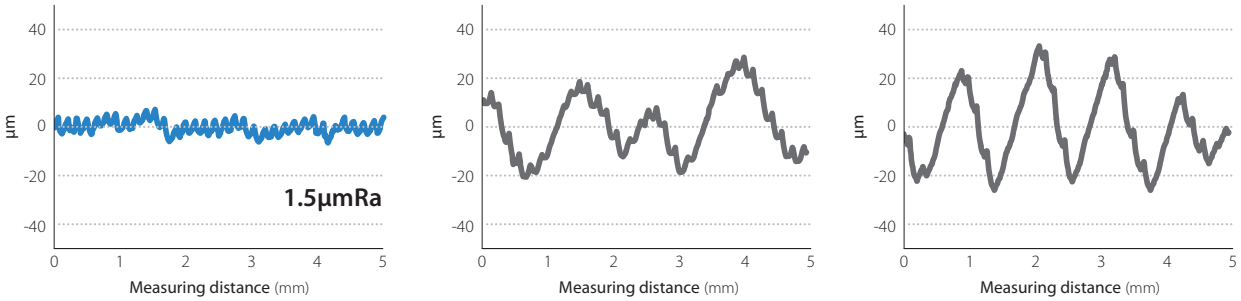
KAV



Competitor A (anti-vibration type)

Competitor B (anti-vibration type)

Surface roughness



Cutting Conditions: Vc = 150 m/min, ap = 0.4 mm, f = 0.15 mm/rev Workpiece: SCM435 Overhang length 320 mm

Case Studies

❶ Mechanical parts (Worm gears) S45C

Shank: KAV-G16-10D
Head: KAVH16-SDUCR07
Insert: DCGT070202EL-U (PV720)

Vc = 50 m/min
ap = 0.05 mm
f = 0.2 mm/rev Wet

Overhang length: ø16-160mm (10D)

Stable machining

(User evaluation)

❷ Mechanical parts (Worm gears) SCM435

Shank: KAV-D32-10D
Head: KAVH32-PDUNR11
Insert: DNMG110404HQ (CA515)

Vc = 180 m/min
ap = 0.15 mm
f = 0.2 mm/rev Wet

Overhang length: ø32-200mm (6.2D)

Stable machining

(User evaluation)

❸ Auto parts (Differential case) FCD700

Shank: KAV-G20-10D
Head: KAVH20-STLPR11
Insert: TPGB110308 (PV7005)

Vc = 140 m/min
ap = 0.2 mm
f = 0.12 mm/rev Wet

Overhang length: ø20-160mm (8D)

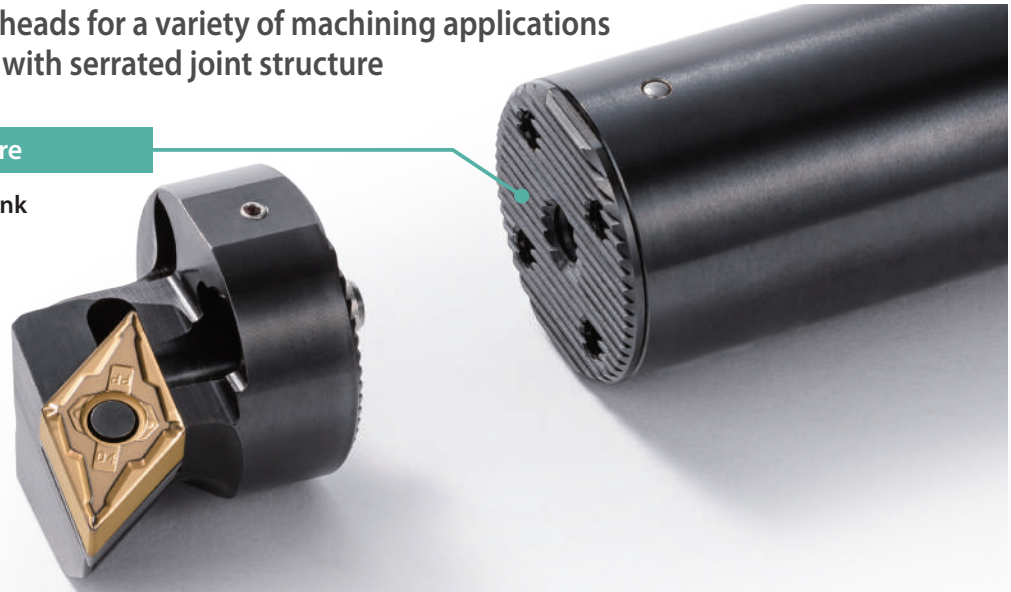
Stable machining

(User evaluation)

2 Interchangeable heads for a variety of machining applications
Strong fastening with serrated joint structure

Serrated structure

Securely fastens head and shank



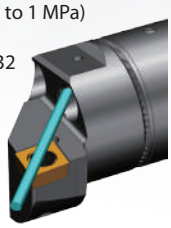
Internal coolant recommended

Internal coolant recommended to prevent damage to anti-vibration mechanism

When using our plumbing parts:
Supports pressures up to 7 MPa
(some items are only recommended up to 1 MPa)

ø16 ~ ø25

ø32



Coolant pipe connections: See page 11

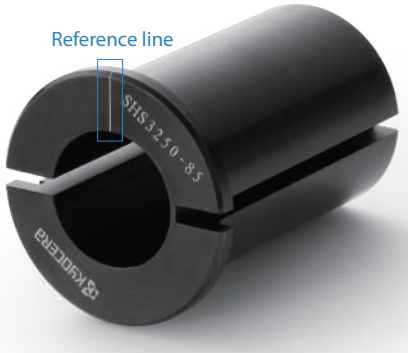
Head Lineup

Shank diameter	Positive Type (Screw Clamp)				Negative Type (Lever Lock)		
	SCLC	SDUC	STLP	SVUB	PCLN	PDUN	PTFN
ø16	●	●	●				
ø20	●	●	●	●			
ø25	●	●	●	●			
ø32	●	●	●	●	●	●	●

3 Easy cutting edge adjustment with E-Sleeve
Smooth machining setup

E-Sleeve (Sold separately)

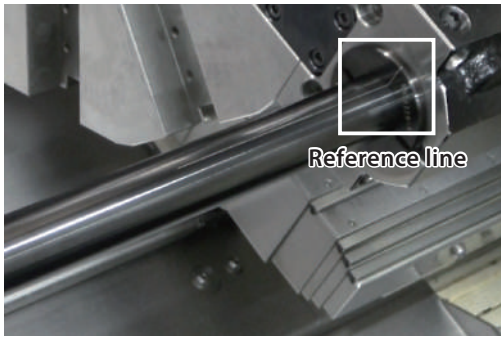
Separated structure with printed reference lines
Easy adjustment reduces setup time



Adjusting the cutting edge position

Exclusive Sleeve (E-Sleeve)

Adjusting the cutting edge position with a reference line

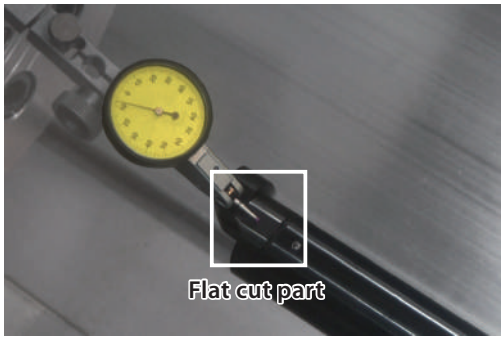


Instruction video

Adjusting the cutting edge position is easy by simply aligning the reference line between the shank and the sleeve.

Conventional Sleeve

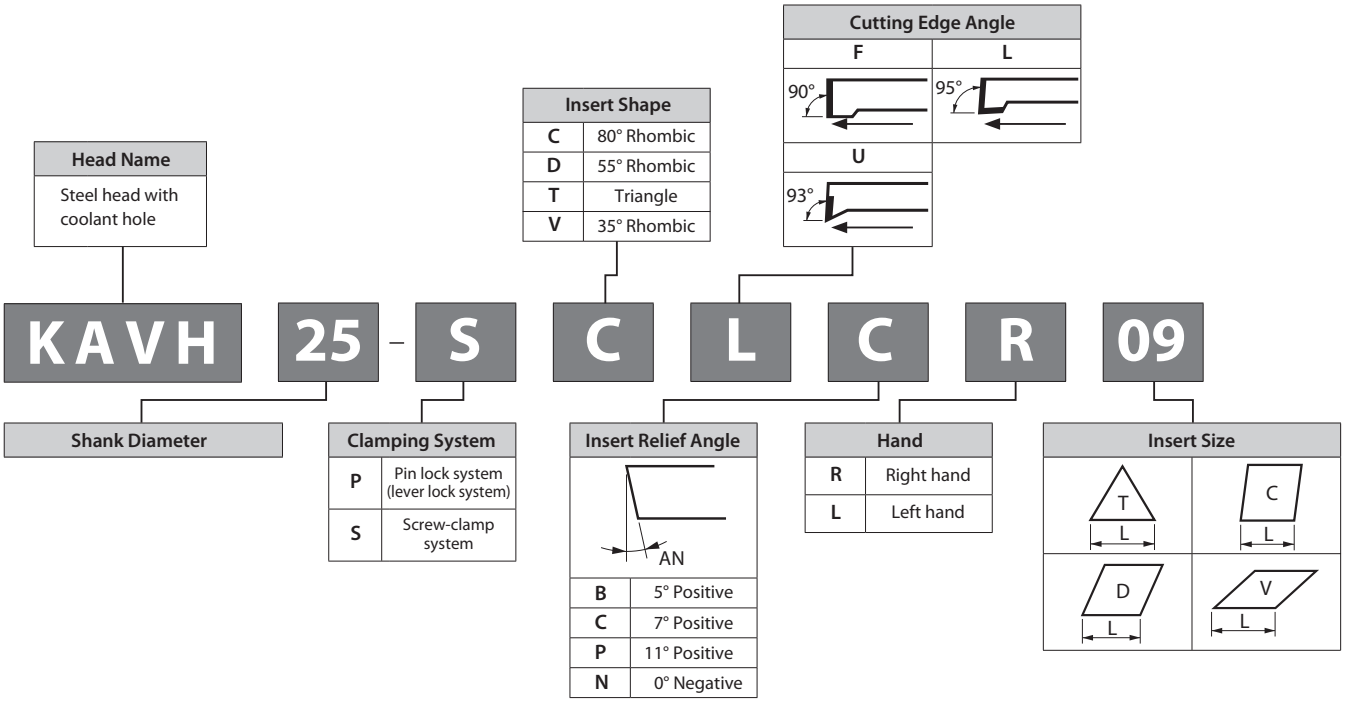
Adjusting the cutting edge position with the flat cut part of the head



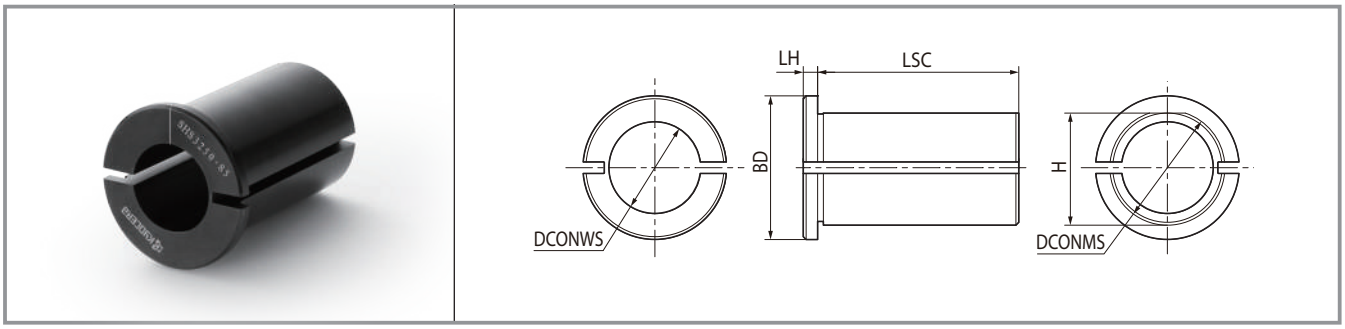
Instruction video

Adjust the flat cut part of the head by moving the tool while applying a dial gauge, etc.

Replaceable boring bar head identification system



Sleeve for KAV (E-Sleeve)



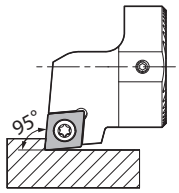
Sleeve dimensions

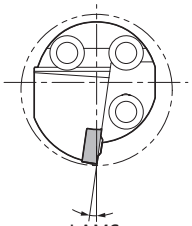
Description		Stock	Dimensions (mm)						Applicable Shank
			DCONMS	DCONWS	BD	LSC	LH	H	
SHS	1640-75	●	40	16	50	70	5	39	KAV-D16-7D/10D KAV-G16-10D
	2040-75	●		20					KAV-D20-7D/10D KAV-G20-10D
	2540-75	●		25					KAV-D25-7D/10D
	3240-75	●		32					KAV-D32-7D/10D
SHS	2550-85	●	50	25	60	80	5	48.5	KAV-D25-7D/10D
	3250-85	●		32					KAV-D32-7D/10D

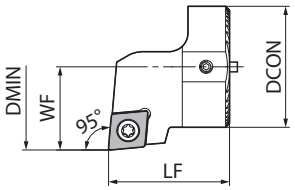
Choose the sleeve DCONWS together with the shank DCONMS.

●: Standard Stock

KAVH-SCLC (Internal/Internal Facing, Screw Clamp)







GAMO = 0°

Right hand shown

Right-hand insert for Left-hand toolholder, and Left-hand insert for Right-hand toolholder

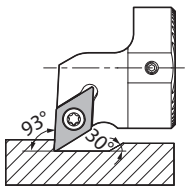
Toolholder dimensions

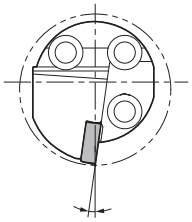
Description	Stock		Dimensions (mm)				LAMS (°)	Std. Corner R (RE)	Spare Parts		Applicable Shank	Applicable Insert
	R	L	DMIN	DCON	LF	WF			Clamp Screw	Wrench		
KAVH 16-SCLC R/L06	●	●	20	16	20	11	-7	0.4	SB-2545TR	FT-8	KAV-D16/G16...	CC□T0602... CC□W0602...
KAVH 20-SCLC R/L09	●	●	25	20	20	13	-8	0.4	SB-4065TR	FT-15	KAV-D20/G20...	CC□T09T3... CC□W09T3...
25-SCLC R/L09	●	●	32	25		17					KAV-D25...	
32-SCLC R/L09	●	●	40	32	32	22					KAV-D32...	

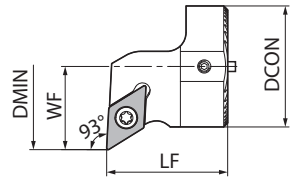
When using the P chipbreaker, use Right-hand insert for Right-hand toolholder and Left-hand insert for Left-hand toolholder.

●: Standard Stock

KAVH-SDUC (Copying, Screw Clamp)







GAMO = 0°

Right hand shown

Right-hand insert for Left-hand toolholder, and Left-hand insert for Right-hand toolholder

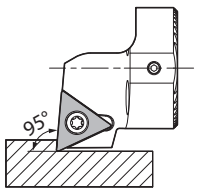
Toolholder dimensions

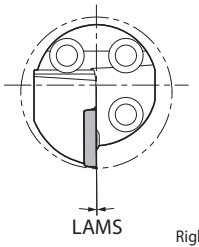
Description	Stock		Dimensions (mm)				LAMS (°)	Std. Corner R (RE)	Spare Parts		Applicable Shank	Applicable Insert
	R	L	DMIN	DCON	LF	WF			Clamp Screw	Wrench		
KAVH 16-SDUC R/L07	●	●	20	16	20	11	-7	0.4	SB-2545TR	FT-8	KAV-D16/G16...	DC□T0702... DC□W0702... DC□X0702...
KAVH 20-SDUC R/L11	●	●	25	20	20	13	-9	0.4	SB-4065TR	FT-15	KAV-D20/G20...	DC□T11T3... DC□W11T3... DC□X11T3...
25-SDUC R/L11	●	●	32	25		17	-8				KAV-D25...	
32-SDUC R/L11	●	●	40	32	32	22	-8				KAV-D32...	

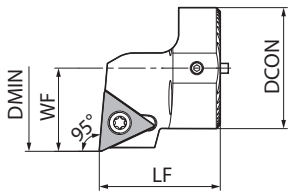
When using a WP chipbreaker, you need to correct the cutting edge position or the machining program.

●: Standard Stock

KAVH-STLP (Internal/Internal Facing, Screw Clamp)



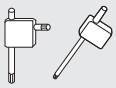




GAMO = 5°

Right hand shown
Right-hand insert for Left-hand toolholder, and Left-hand insert for Right-hand toolholder

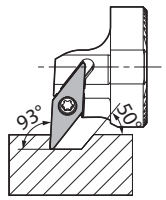
Toolholder dimensions

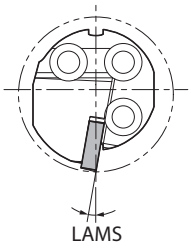
Description	Stock		Dimensions (mm)				LAMS (°)	Std. Corner R (RE)	Spare Parts		Applicable Shank	Applicable Insert
	R	L	DMIN	DCON	LF	WF			Clamp Screw	Wrench		
												
KAVH 16-STLP R/L 11	●	●	20	16	20	11	-3.5	0.4	SB-3060TR	FT-10	KAV-D16/G16...	TP□T1103... TP□H1103... TP□B1103... TP□X1103...
KAVH 20-STLP R/L 11	●	●	25	20		13	-2		SB-3080TR		KAV-D20/G20...	
KAVH 25-STLP R/L 11	●	●	32	25		17	0				KAV-D25...	
KAVH 32-STLP R/L 16	●	●	40	32	32	22	0	0.4	SB-4065TR	FT-15	KAV-D32...	TP□T1603... TP□H1603... TP□B1603...

When using a WP chipbreaker insert, you need to correct the cutting edge position or the machining program.
When using the P chipbreaker, use Right-hand insert for Right-hand toolholder and Left-hand insert for Left-hand toolholder.

●: Standard Stock

KAVH-SVUB (Copying, Screw Clamp)





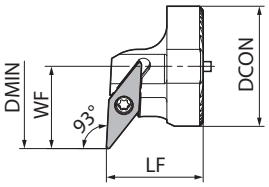
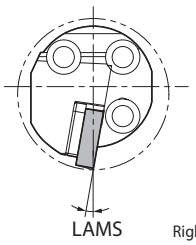


Fig.1



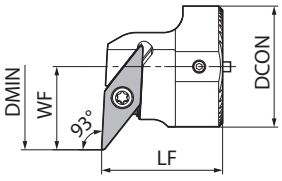


Fig.2

GAMO = 0°

Right hand shown
Right-hand insert for Left-hand toolholder, and Left-hand insert for Right-hand toolholder

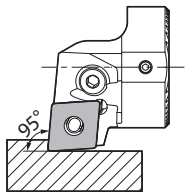
Toolholder dimensions

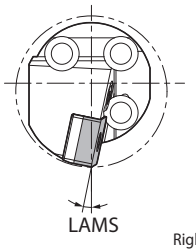
Description	Stock		Dimensions (mm)				LAMS (°)	Std. Corner R (RE)	Spare Parts					Shape	Applicable Shank	Applicable Insert
	R	L	DMIN	DCON	LF	WF			Clamp Screw	Wrench	Sheet	Shim Screw	Wrench (for shim screws)			
																
KAVH 20-SVUB R/L 11	●	●	25	20	20	13	-10	0.4	SB-2570TR	FT-8	-	-	-	Fig.1	KAV-D20/G20...	VB□T1103... VB□W1103...
KAVH 25-SVUB R/L 11	●	●	32	25		17									KAV-D25...	
KAVH 32-SVUB R/L 16	●	●	40	32	32	22	-10	0.4	SB-40125TRN	FT-15	SVN-32N *(SVN-32S)	SS-4N	LW-4	Fig.2	KAV-D32...	VB□T1604... VB□W1604... VB□T1604...

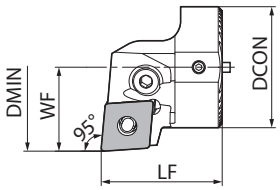
When using a corner R (RE) = 0.2 or 0.4 mm insert, we recommend using a sheet marked with * (sold separately).

●: Standard Stock

KAVH-PCLN (Internal/Internal Facing, Lever Lock)







GAMO = -6°

Right hand shown
Right-hand insert for Left-hand toolholder, and Left-hand insert for Right-hand toolholder

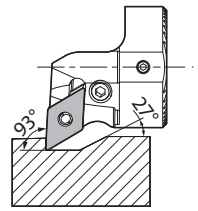
Toolholder dimensions

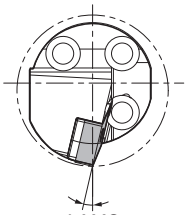
Description	Stock		Dimensions (mm)				LAMS (°)	Std. Corner R (RE)	Spare Parts						Applicable Shank	Applicable Insert
	R	L	DMIN	DCON	LF	WF			Lever	Lock Screw	Sheet	Shim Pin	Punch	Wrench		
KAVH 32-PCLN R/L 12	●	●	40	32	32	22.2	-11.5	0.8	LL-2N	LS-2N	LC-42N R/L	LSP-2	PC-2	LW-3	KAV-D32...	CN□A1204... CN□G1204... CN□M1204...

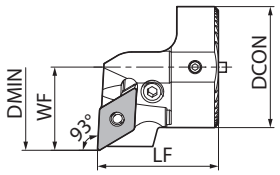
Sheet: LC-42NR for Right-hand toolholder, LC-42NL for Left-hand toolholder

●: Standard Stock

KAVH-PDUN (Copying, Lever Lock)







GAMO = -6°

Right hand shown
Right-hand insert for Left-hand toolholder, and Left-hand insert for Right-hand toolholder

Toolholder dimensions

Description	Stock		Dimensions (mm)				LAMS (°)	Std. Corner R (RE)	Spare Parts						Applicable Shank	Applicable Insert
	R	L	DMIN	DCON	LF	WF			Lever	Lock Screw	Sheet	Shim Pin	Punch	Wrench		
KAVH 32-PDUN R/L 11	●	●	40	32	32	22	-13	0.4	LL-1DN	LS-1SN	LD-32N	LSP-1	PC-1	FH-2.5	KAV-D32...	DN□G1104...

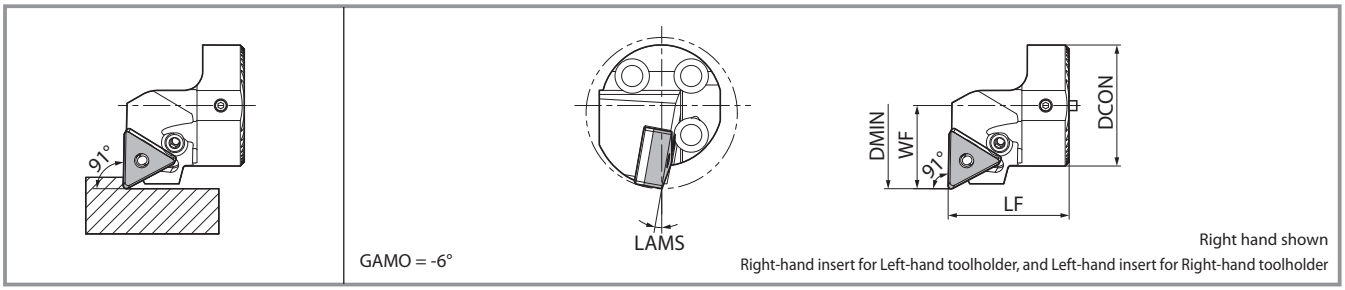
●: Standard Stock

Description	Stock		Dimensions (mm)				LAMS (°)	Std. Corner R (RE)	Spare Parts					Applicable Shank	Applicable Insert
	R	L	DMIN	DCON	LF	WF			Wrench	Locking Pin	Sheet	Clamp Screw	Wrench (for clamp screws)		
KAVH 32-PDUN R/L 15	●	●	40	32	32	22	-12.5	0.8	LW-3	PP-4	PD-42	SB-2050TR	FT-6	KAV-D32...	DN□A1504... DN□G1504... DN□M1504... DN□X1504...

When using a WF chipbreaker insert, you need to correct the cutting edge position or machining program.
When using inserts with corner-R (RE) greater than 1.6mm, additional modifications to the sheet are necessary to prevent workpiece and sheet from interfering with each other.

●: Standard Stock

KAVH-PTFN (Internal, Lever Lock)



GAMO = -6°

Right hand shown

Right-hand insert for Left-hand toolholder, and Left-hand insert for Right-hand toolholder

Toolholder dimensions

Description	Stock		Dimensions (mm)				LAMS (°)	Std. Corner R (RE)	Spare Parts						Applicable Shank	Applicable Insert
	R	L	DMIN	DCON	LF	WF			Lever	Lock Screw	Sheet	Shim Pin	Punch	Wrench		
KAVH 32-PTFN R/L 16	●	●	40	32	32	22	-10	0.8	LL-1N	LS-1N	LT-32N ✻(LT-32N-20)	LSP-1	PC-1	FH-2.5	KAV-D32...	TN□A1604... TN□G1604... TN□M1604... TN□X1604...

✻ When using inserts with a corner-R (RE) greater than 1.6mm, purchase a sheet marked with ✻ (sold separately) to prevent workpiece and sheet from interfering with each other. ●: Standard Stock

Shank

Standard shank

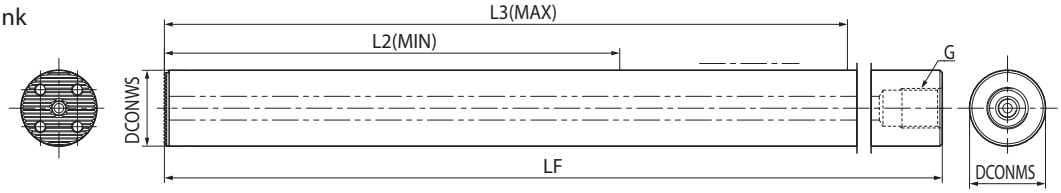


Fig.1

Carbide reinforced shank

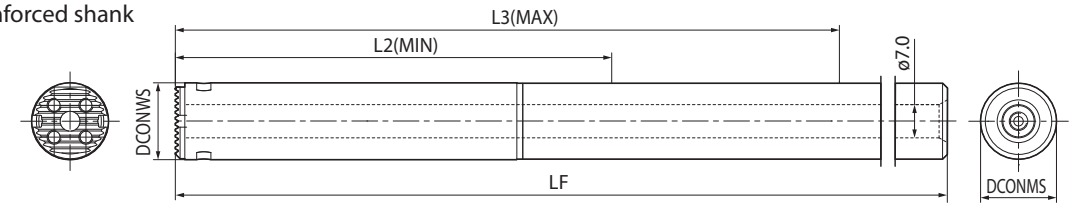


Fig.2

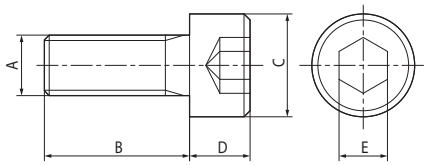
Toolholder dimensions

Description			Stock	Dimensions (mm)						Spare Parts			Shape
				DCONWS	DCONMS	LF	L2(MIN) Minimum Overhang length	L3(MAX) Maximum Overhang length	G	Head fastening bolts (3)	Wrench	O-ring	
Standard shank	KAV-	D16-7D	●	16	16	157.5	44	92	G1/8	HH3X10S	LW-2.5	-	Fig.1
		D20-7D	●	20	20	201.5	60	120	G1/4	HH3.5X10S			
		D25-7D	●	25	25	256.5	80	155		HH4X12S	LW-3		
		D25-10D	●			331.5	155	230					
		D32-7D	●	32	32	321.5	96	192	G3/8	HH5X12	LW-4	GR-006-2	
		D32-10D	●			417.5	192	288					
Carbide reinforced shank	KAV-	G16-10D	●	16.2	16	205.5	92	140	-	HH3X10S	LW-2.5	-	Fig.2
		G20-10D	●	20.2	20	261.5	120	180		HH3.5X10S			

When cutting the back end, consider the length of the shank grip in addition to the amount of overhang length: See page 14.

●: Standard Stock

Head fastening bolt

Shape	Description	Stock	Dimensions (mm)				
			A	B	C	D	E
	HH3X10S	●	M3X0.5	10	5	3	2.5
	HH3.5X10S	●	M3.5X0.6	10	5.5	3	2.5
	HH4X12S	●	M4X0.7	12	7	4	3
	HH5X12	●	M5X0.8	12	8.5	5	4

●: Standard Stock

Recommended tightening torque

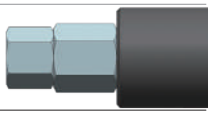
Shank diameter	Tightening torque
ø16	2.2 [N·m]
ø20	2.2 [N·m]
ø25	3.0 [N·m]
ø32	5.0 [N·m]

Internal coolant: Piping connections

1 Screw standard for shank back end (pipe connection)

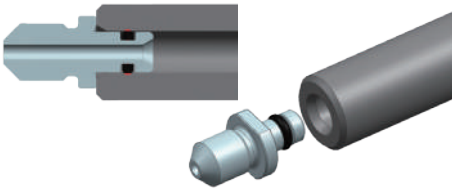
- The thread standard depends on the description. Please refer to the dimension chart "G" on page 10 when using commercially available piping parts.
- When using our piping components, they must be converted to **"UNF3/8" or "G1/8."**
  Check the table below and select the required joint parts (sold separately).

● Steel shank (Pressure ~ 7MPa)

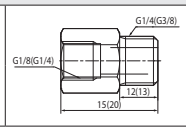
Type	Thread Standards and Conversion Joints
ø16-7D	**G1/8** 
ø20-7D ø25-7D/10D	**G1/8 ⇐ G1/4** J-ST-G1/4-G1/8 
ø32-7D/10D	**G1/8 ⇐ G1/4 ⇐ G3/8** J-ST-G3/8-G1/4 J-ST-G1/4-G1/8 

If a leak occurs, use a commercially available washer.

● Carbide reinforced shank (Pressure ~ 1MPa)

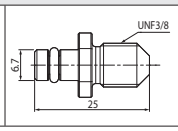
Type	Thread Standards and Conversion Joints
ø16-10D ø20-10D	 **UNF3/8 ⇐ ø7 Straight Hole** *The shank side is not threaded.

Joint

Shape		Description	Stock	Thread Standard
		J-ST-G1/4-G1/8	●	G1/4 ⇔ G1/8
		J-ST-G3/8-G1/4	●	G3/8 ⇔ G1/4

●: Standard Stock

Resin joint (with O-ring)

Shape		Description	Stock	Thread Standard
		PR07-ST-UNF3/8	●	UNF3/8

You can order only the included O-ring (**GR-004-2**).

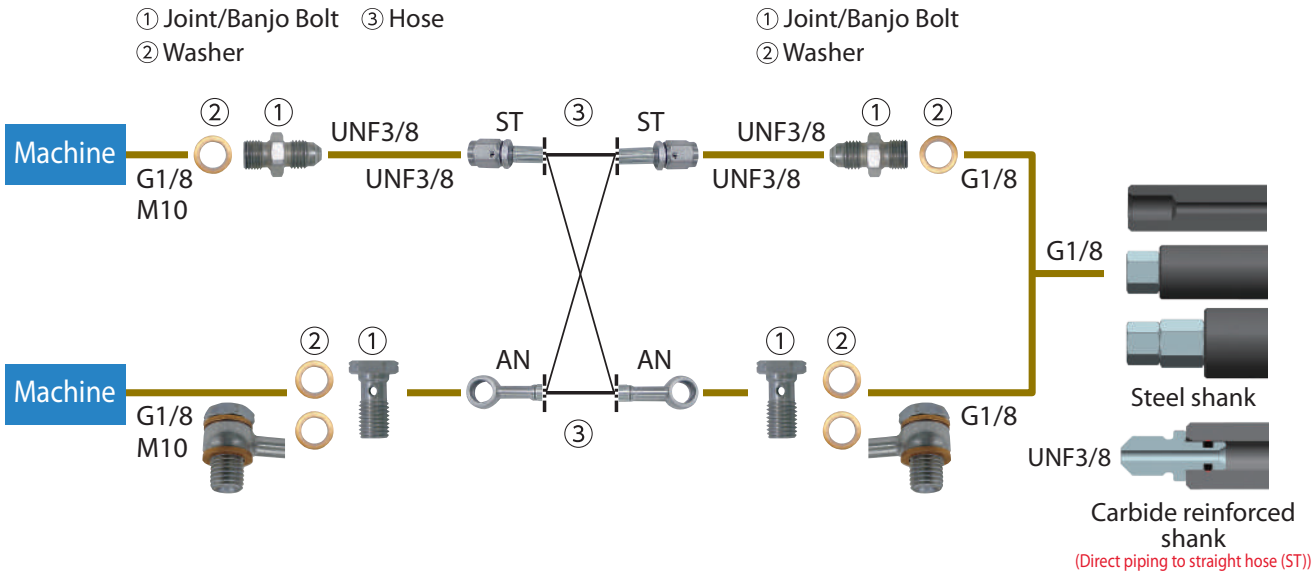
●: Standard Stock

② How to connect when using our plumbing parts

Easy to use with high pressure capable hoses and joints

- Can be used as internal coolant at normal pressure without a high-pressure pump unit
- Banjo bolts for angle hoses available. Supports a wide variety of machines

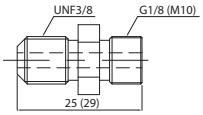
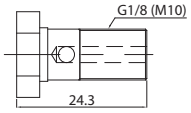
<Piping Installation Guide>



Optional piping parts available (Sold separately)
Choose from parts below to match your machine specifications and piping method.
① Joint or banjo bolt × 2, ② 2 ~ 4 washers, ③ 1 hose

① Joint/Banjo Bolt

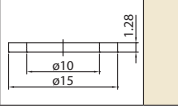
Pressure: ~ 30 MPa

Shape		Description	Stock	Thread Standard Thread connection to the machine
		J-G1/8-UNF3/8	●	G1/8
		J-M10X1.5-UNF3/8	●	M10X1.5
Banjo bolt available for angled hose connection 		BB-G1/8	●	G1/8
		BB-M10X1.5	●	M10X1.5

●: Standard Stock

② Washer

Pressure: ~ 30 MPa

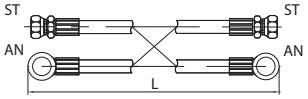
Shape		Description	Stock
		WS-10	●

*Two washers are required when using banjo bolts

●: Standard Stock

③ Hose

Pressure: ~ 30 MPa

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

●: Standard Stock

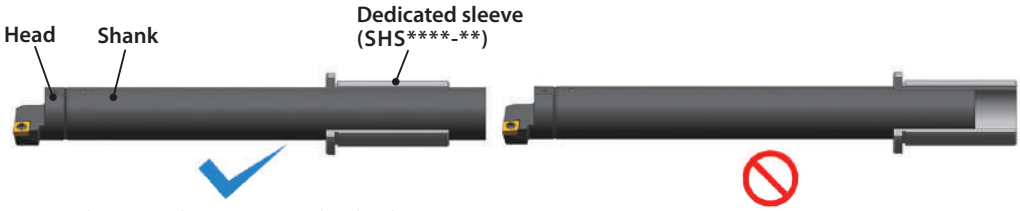
Precautions

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.

Precautions

About the Dedicated E-Sleeve

The shank does not have a flat cut. In order to ensure vibration-proof performance, we recommend using a special sleeve (SHS ****-**) that is sold separately.

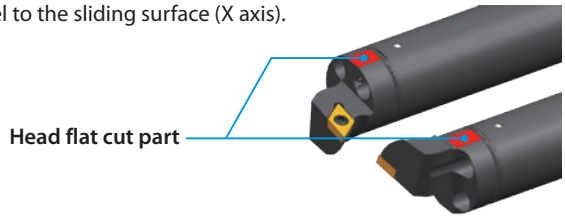


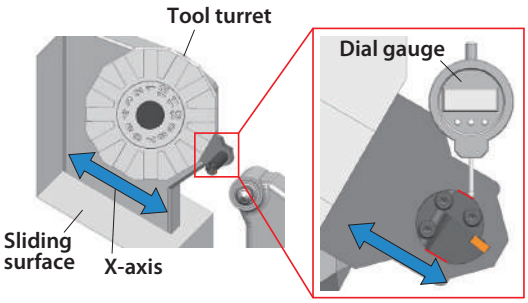
Use the entire sleeve to grasp the shank area.

How to adjust cutting edge position

When using a head flat cut part

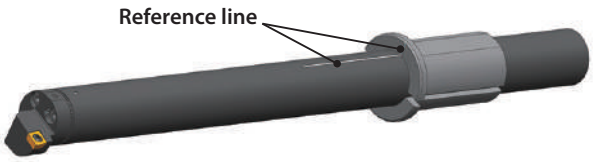
After attaching the tool to the machine, move the tool turret against the flat cut part of the head with a dial gauge, etc., and make sure that it is parallel to the sliding surface (X axis).

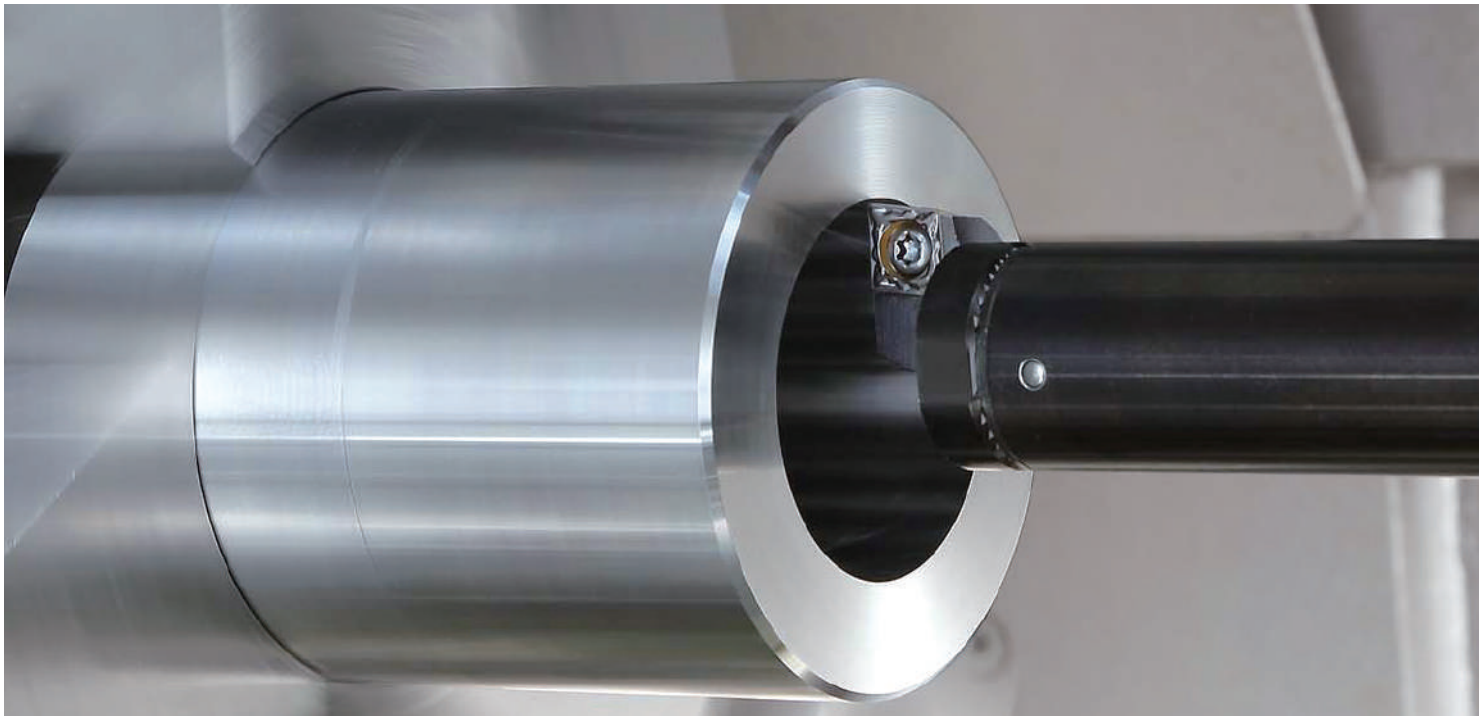




When using the reference lines of the shank/dedicated sleeve (E-Sleeve)

Align the reference lines printed on the shank and the dedicated sleeve (SHS ****-**).
It is possible to more easily adjust the cutting edge position than using the head flat cut part.





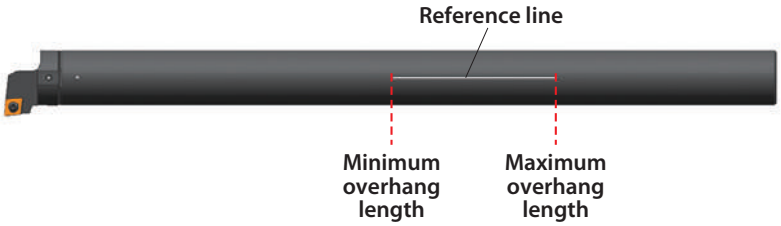
Recommendations for internal coolant

Under high temperatures, the anti-vibration mechanism may deteriorate or be damaged.
Please use with internal coolant.
The coolant pressure resistance of the shank is 7 MPa. However, when using coolant parts (PR07-ST-UNF 3/8) for internal coolant in the carbide reinforced shank (KAV-G ***), the coolant pressure is 1 MPa. Please be careful.

Available overhang length range

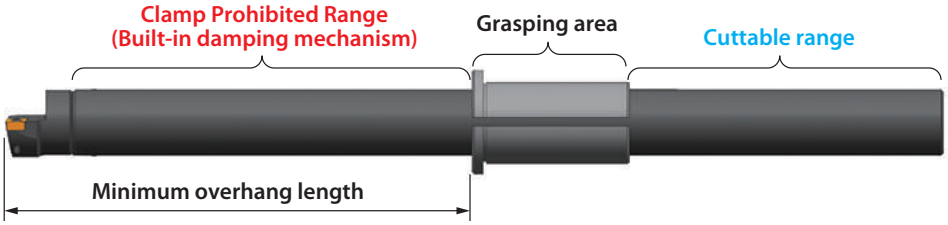
Available overhang length is set for this tool
To adjust the overhang length, please use the reference line printed on the shank.

Available overhang length range		
Description	Minimum overhang length	Maximum overhang length
KAV-***-10D	Shank diameter × 7	Shank diameter × 10
KAV-***-7D	Shank diameter × 4	Shank diameter × 7

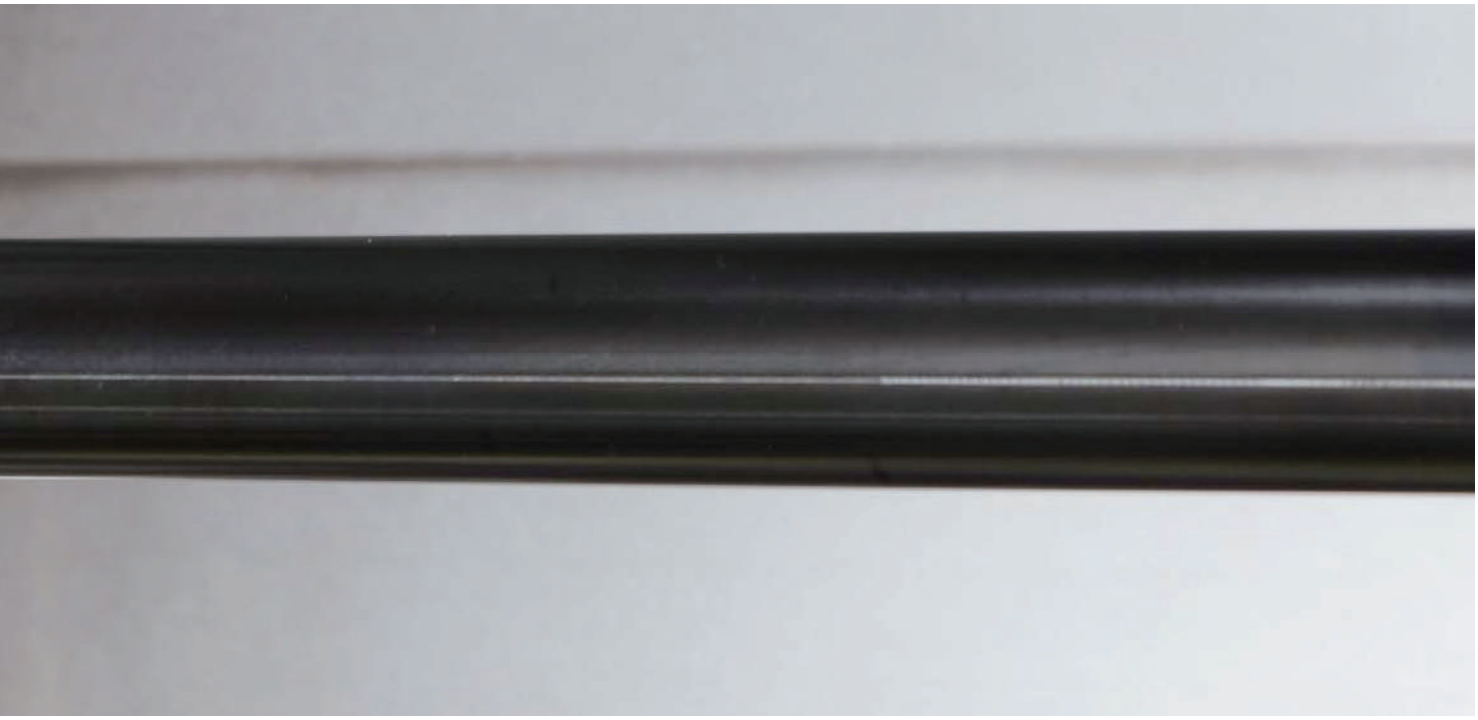


Shank cut

If the shank needs to be cut or modified, do so within the cutting range and do not clamp the built-in damping mechanism.



- Use the appropriate inserts and parts. Use of damaged parts may result in tool breakage and injury.
- Do not touch the cutting edge of the insert directly with your bare hands. There is a risk of injury.
- Make sure that there are no foreign materials such as chips in the insert seating area, serrated area, or shank grip area before mounting.
- Do not use the product under chattering conditions. This can lead to damage of the built-in damping mechanism.
- If tool falls or hits the part while machining, do not use it. The impact can cause tool damage and lead to large chattering.
- Avoid high humidity and store at room temperature (about 20°C).



Anti-Vibration
Max L/D = 10

Interchangeable head boring bars with anti-vibration dampener system

KAV Series

CP486 CAT/25T2304MSN