KORLOY High Pressure Coolant Holder

# KHP

KORLOY TECH-NEWS



- 300% increased productivity on Inconel machining vs. low pressure coolant system
- Cooling, tool life, and chip control are improved by the high volume coolant multi-directional injection system

KORLOY

TECH-NEWS

High Pressure Coolant Holder for Inconel Machining

# KHP

The HRSA (Inconel, titanium and stainless steel) have high strength and low thermal conductivity used in the space, aircraft, and offshore machining industries, results in structure failures causes chipping on the cutting edge due to heat shock and work hardening and decreases tool life rapidly in machining.

The existing coolant spraying to wide parts is not able to reduce the focused heat on the cutting part in HRSA machining effectively. Therefore, to improve the productivity with high efficient cooling, a solution is needed. That is spraying the high pressure coolant directly on the cutting edge.

A high pressure coolant holder will have the optimal distance between the insert cutting edge and the jet orifice, the ideal place of the streamlined jet orifice of the coolant. KORLOY's new KHP sprays high pressure coolant enhancing chip control and wear resistance.

Our KHP High pressure coolant holder's sliding clamp system provides easy change of inserts and optimal nozzle cooling.

KORLOY KHP High pressure coolant holder provides the best solution meeting the customers' needs with high productivity and highly precise machining, by reducing workpiece damage by limiting fracture of insert, and long chips, for heat removal in HRSA machining.



### High productivity

- Tested up to 300% increased tool life comparing to machining with low pressure coolant system
- Increased cutting speeds and high feeds

### Excellent coolant effect

- Direct spraying coolant on the edge of insert and on the top and bottom sides of insert

### Improved chip control

- Better chip evacuation

### Easy to clamp

- Sliding clamp system

## Code System

| P | C | L | N | R | 25 | 25 | - | M | 12 | - | KHP |
|---|---|---|---|---|---|---|---|---|---|---|---|

**P** — **Clamping method of insert**
P: Lever lock system

**C** — **Insert shape**
C: C type
D: D type
W: W type
V: V type

**L** — **Holder style**
L: 95°
J: 75°

**N** — **Clearance angle of insert**
N: 0°
B: 5°

**R** — **Hand**
R: Right handed

**25** — **Height of shank**
25mm, 32mm

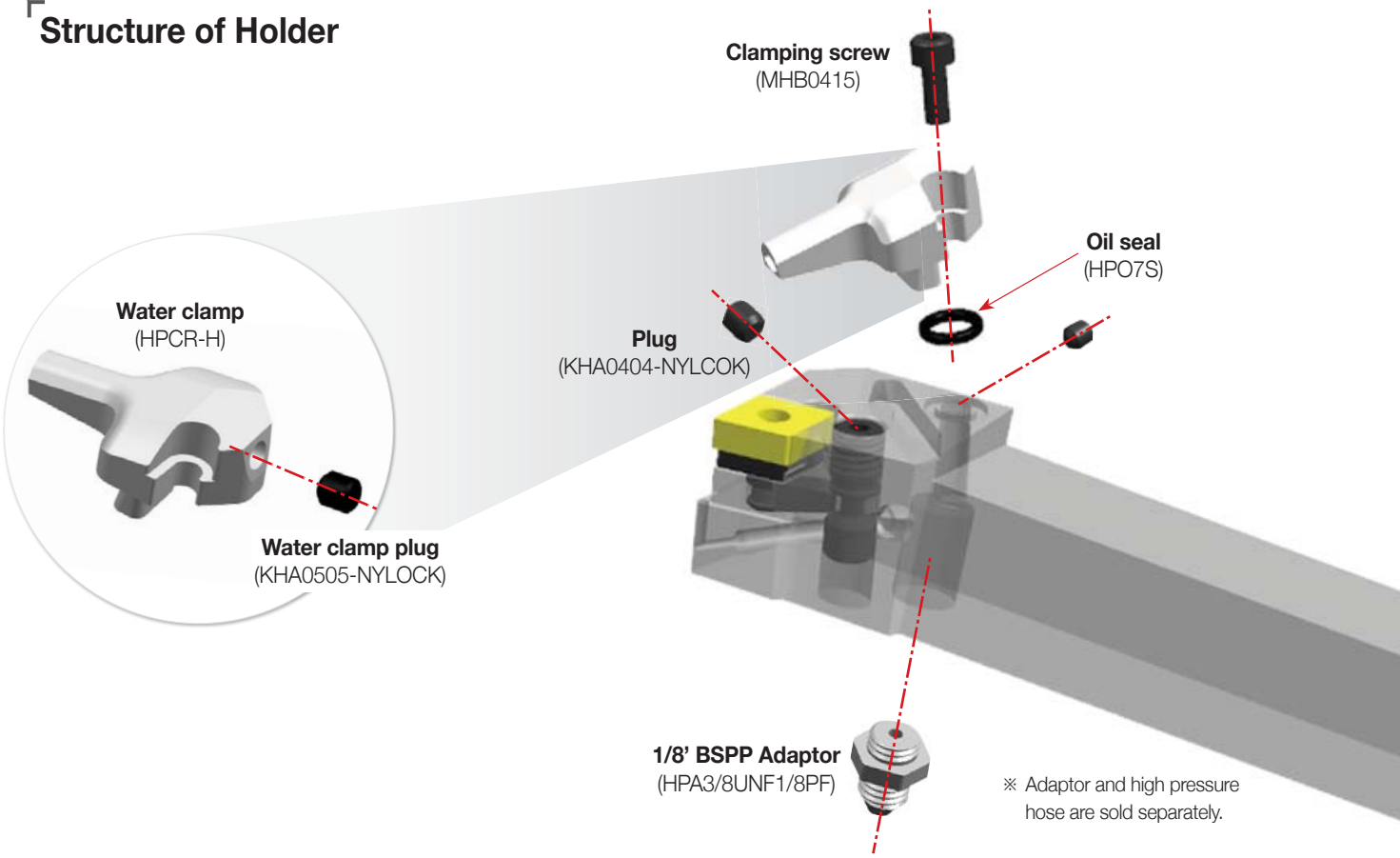
**25** — **Width of shank**
25mm, 32mm

**M** — **Length of holder**
M: 150mm
P: 180mm

**12** — **Length of insert cutting edge**
08, 12, 15, 16

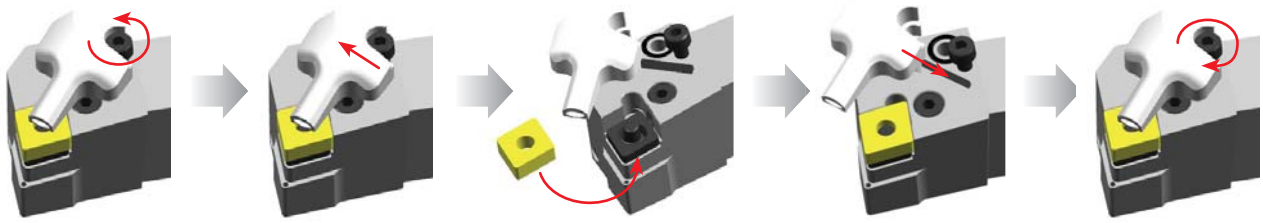
**KHP** — **KORLOY High Pressure coolant**

## Structure of Holder




※ Adaptor and high pressure hose are sold separately.

### 【How to use the water clamp】



Unscrew the clamping screw. → Move the water clamp to the edge of the holder. → Put an insert to the tip seat. → Move the water clamp back to its original position. → Screw the clamping screw.

# Features

- Increased tool life due to the direct spraying coolant of the edge of insert
- Improved chipping resistance and limited notch wear
- High feed machining due to spraying coolant to the part of the nose R intensively
- Better chip control with high pressure in machining

**Water clamp**

- The optimal distance between the insert and the jet orifice and the ideal place of the jet orifice
- Maximized pressure of coolant due to the streamlined jet orifice
- Easy to clamp an insert for sliding clamp system



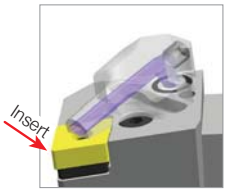
The original position of water clamp



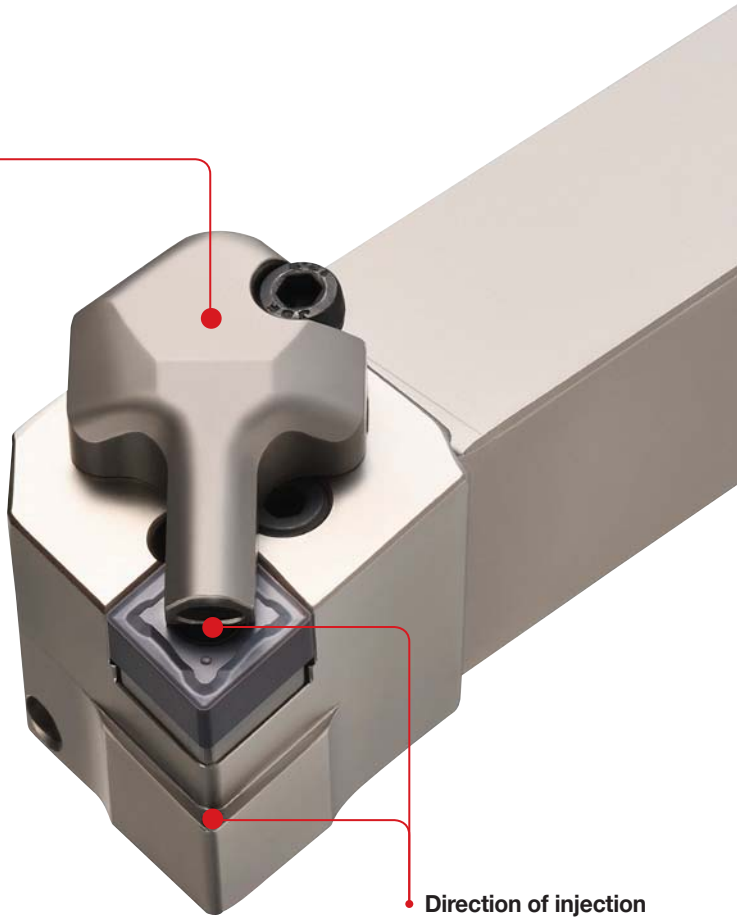

The position of placing insert



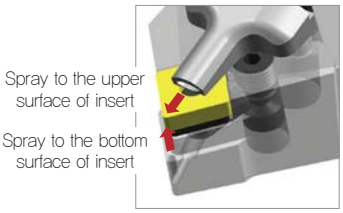
Optimal position and distance of spraying




Oval direct spray



**Direction of injection**




**MAX 300 bar**

| Workpiece | The minimum pressure | The maximum pressure |
|---|---|---|
| P | 50 | 300 |
| M | 70 | |
| K | 60 | |
| N | 50 | |
| S | 70 | |

Improved chip control

## Improved chip control

- **Workpiece** HRSA (Inconel718, HRC42)
- **Cutting conditions** vc (m/min) = 50, fn (mm/rev) = 0.25, ap (mm) = 2, wet (70 bar)
- **Tool** **Insert** CNMG120408-VP4
  **Holder** PCLNR2525-M12-KHP



[10 bar]



[70 bar]

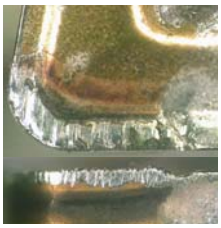
# Performance Evaluation

## Wear resistance

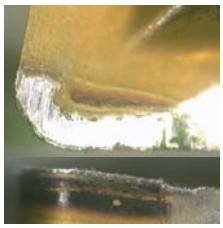
- **Workpiece** HRSA (Inconel718, HRC42)
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**[KORLOY]**



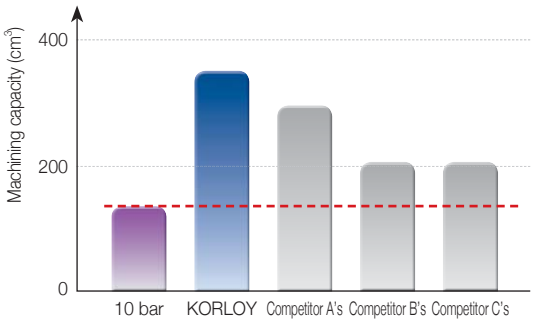
[Competitor A's]



[Competitor B's]



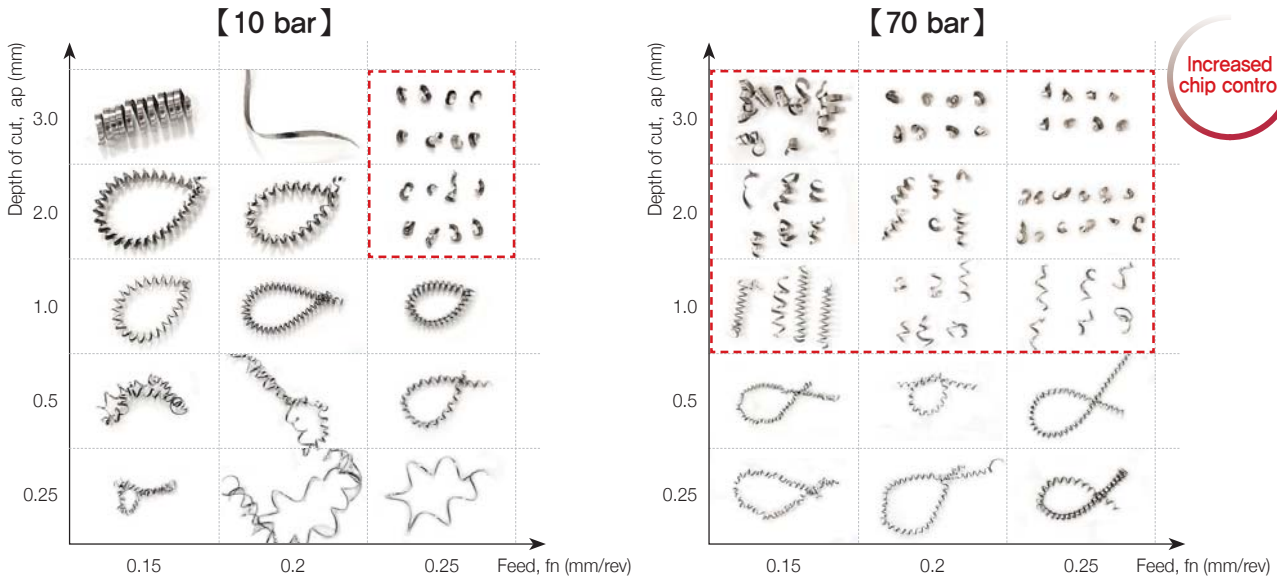
[Competitor C's]




- ▶ Tool life increases up to 60% compared to competitor's in HRSA (Inconel etc.) machining.
- ▶ Decreased notch wear and wear on the nose radius and increased chipping resistance

## Chip control

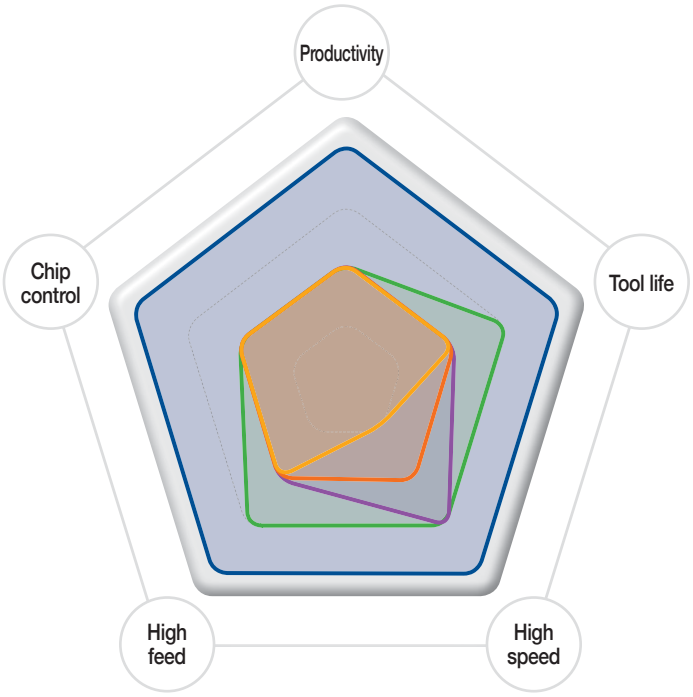
- **Workpiece** HRSA (Inconel718, HRC42)
- **Cutting conditions** vc (m/min) = 50, fn (mm/rev) = 0.25, ap (mm) = 2
- **Tool** **Insert** CNMG120408-VP4 **Holder** PCLNR2525-M12-KHP




- ▶ Preventing early fracture of the tool and workpiece due to long chip
- ▶ Longer tool life and improved chip control with direct spraying coolant to the nose R of the insert instead of spraying on the top and bottom sides of the insert

# Holder Selection Guide

KHP — Lever lock system — Double clamp system — Screw on system — Multi lock system




**KHP** new
- Longer tool life
- Better chip control



**Lever lock system**
- Easy to clamp



**Double clamp system**
- Solid clamping force
- Easy to clamp



**Screw on system**
- For small diameter internal machining



**Multi lock system**
- Solid clamping force



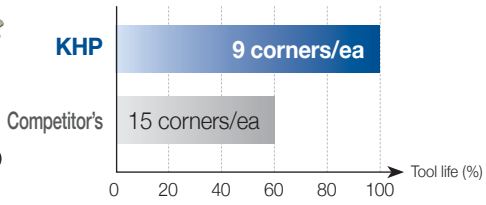
| Tools | Productivity | Tool life | High speed | High feed | Chip control |
|---|---|---|---|---|---|
| KHP new | ★★★★ | ★★★★ | ★★★★ | ★★★★ | ★★★★ |
| Lever lock system | ★★ | ★★ | ★★★ | ★★ | ★★ |
| Double clamp system | ★★ | ★★★ | ★★★ | ★★★ | ★★ |
| Screw on system | ★★ | ★★ | ★ | ★★ | ★★ |
| Multi lock system | ★★ | ★★ | ★★ | ★★ | ★★ |

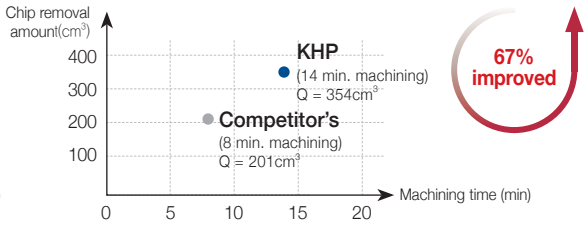
# Application Examples

## Aviation turbine case

- **Workpiece** HRSA (Inconel718, HRC42)
- **Cutting conditions** vc (m/min) = 50~80, fn (mm/rev) = 0.25, ap (mm) = 2, wet (70 bar)
- **Tool** **Insert** CNMG120408-VP4 (PC8115) **Holder** PCLNR2525-M12-KHP





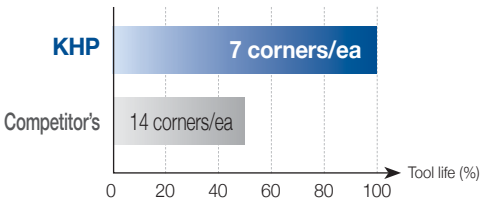



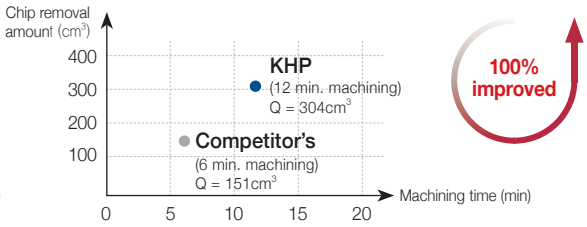

▶ 67% longer tool life per corner

## Aviation turbine disc

- **Workpiece** HRSA (Inconel718, HRC42)
- **Cutting conditions** vc (m/min) = 50~80, fn (mm/rev) = 0.25, ap (mm) = 2, wet (70 bar)
- **Tool** **Insert** CNMG120408-VP4 (PC8115) **Holder** PCLNR2525-M12-KHP





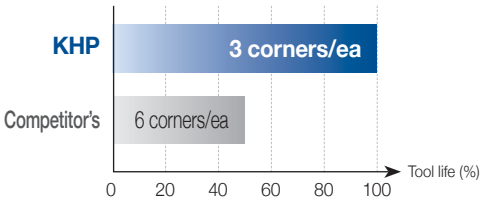



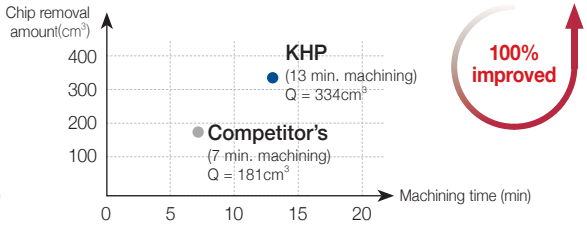

▶ 100% longer tool life per corner

## Aviation turbine spool

- **Workpiece** HRSA (Inconel718, HRC42)
- **Cutting conditions** vc (m/min) = 50~80, fn (mm/rev) = 0.25, ap (mm) = 2, wet (70 bar)
- **Tool** **Insert** CNMG120408-VP4 (PC8115) **Holder** PCLNR2525-M12-KHP



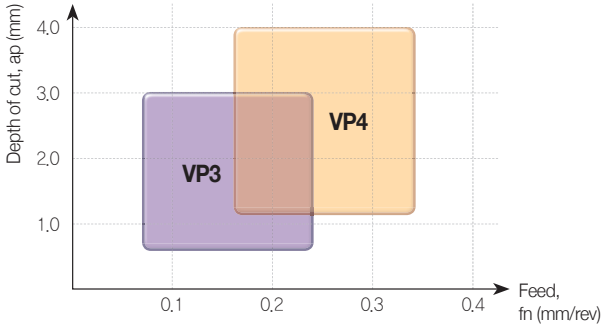


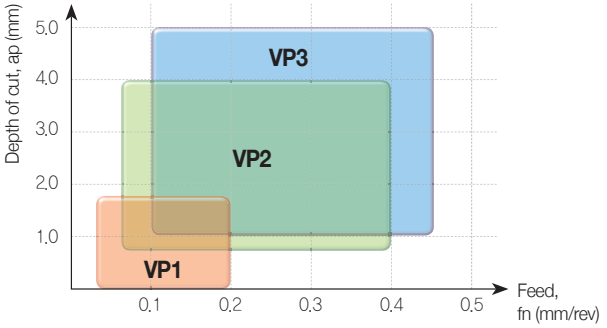

▶ 100% longer tool life per corner

## Application Range

**HRSA (Inconel)**

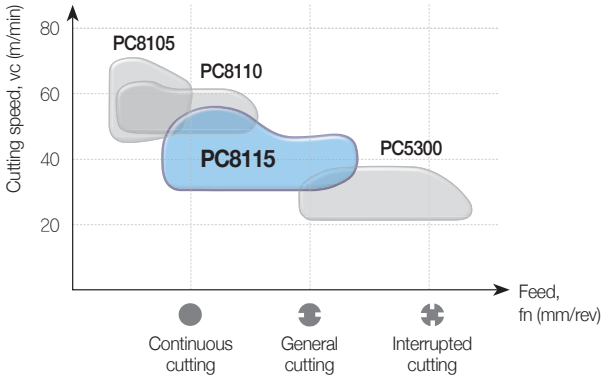



**Titanium alloy**

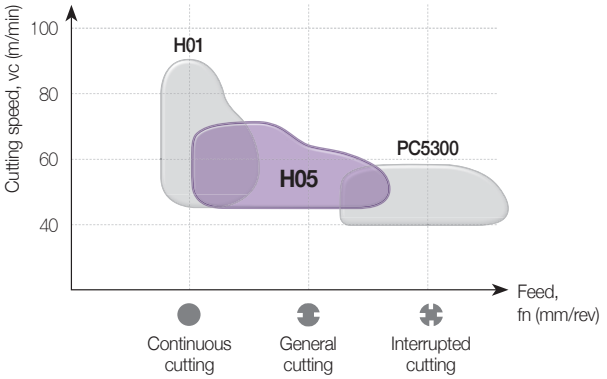



## Grade Line-up

**HRSA (Inconel)**




**Titanium alloy**




### 【Chip Breaker Comparison (HRSA/Titanium alloy)】

| Application | KORLOY | Competitor A's | Competitor B's | Competitor C's | Competitor D's | Competitor E's | Competitor F's | Competitor G's |
|---|---|---|---|---|---|---|---|---|
| Roughing | VP4 | SMR | RS, GJ | TF | MS | ET | MR4 | NRT, NRS |
| Medium cutting | VP3 | SM | MS | VL | MU | EM | MR3 | NMS |
| Medium cutting to finishing | VP2 | NGP | MJ | PP | TK | ML | MF1 | NMT |
| Finishing | VP1 | SF | LS, FJ | SF | MQ | EA | M1 | NFT |

### 【Grade Comparison (HRSA)】

| ISO | KORLOY | Competitor A's | Competitor B's | Competitor C's | Competitor D's | Competitor E's | Competitor F's | Competitor G's |
|---|---|---|---|---|---|---|---|---|
| S05 | PC8105 | S05F | MP9005<br>VP05RT | IC808 | PR1305 | TT5080 | TS2000 | WSM10 |
| S10 | PC8110 | GC1105 | VP10RT | IC907 | PR1310 | | | |
| S15 | PC8115 | GC1115 | MP9015 | - | - | | | |

### 【Grade Comparison (Titanium)】

| ISO | KORLOY | Competitor A's | Competitor B's | Competitor C's | Competitor D's | Competitor E's | Competitor F's | Competitor G's |
|---|---|---|---|---|---|---|---|---|
| S05 | H01 | - | - | - | - | - | - | - |
| S10 | H05 | H13A | MT9015 | IC20 | - | TT5080 | THR | WS10 |
| S15 | PC5300 | GC1125 | RT9015 | IC908 | PR1125<br>PR1325 | TT9030<br>TT9080 | CP500<br>TS2500 | WSM20 |

## How to Clamp the KHP

• Easy to clamp with 3 types of installation system
• The banjo type hose provides wider area for machining than other types.

**Straight to straight (S-S)**



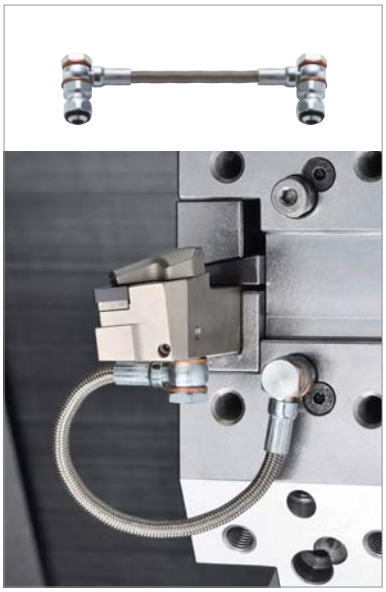
[ Pic.1 ]

**Straight to banjo (S-B)**



[ Pic.2 ]

**Banjo to banjo (B-B)**



[ Pic.3 ]

※ Blank including a fixed oil seal provides easy clamping.
※ Banjo screws provide easy clamping and clamping a holder to the turning machine with various types of blanks.

## Components of KHP

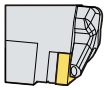
• The components of high pressure coolant are sold separately.
• Various components are available according to different machining sites and uses machining with high pressure coolant.

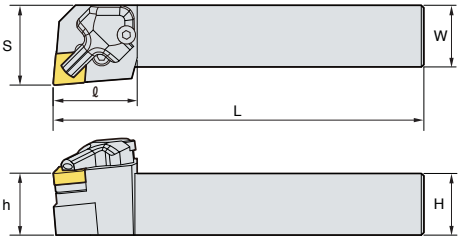
| Designation | Shape | Hose length | High pressure hose | Blank | Adaptor | Banjo screw | Copper washer | Pic No. |
|---|---|---|---|---|---|---|---|---|
| HPH3/8UNF-200-SET | S S | 200 mm | 1 EA | 1 EA | 2 EA | - | - | 1 |
| HPH3/8UNF-250-SET | | 250 mm | | | | | | |
| HPH3/8UNF1/8PF-200-SET | S B | 200 mm | | | 1 EA | 1 EA | 3 EA | 2 |
| HPH3/8UNF1/8PF-250-SET | | 250 mm | | | | | | |
| HPH1/8PF-200-SET | B B | 200 mm | | | - | 2 EA | 5 EA | 3 |
| HPH1/8PF-250-SET | | 250 mm | | | | | | |

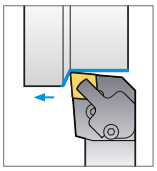
# PCLNR



CN□□





95°

R type insert
(mm)

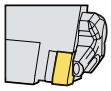
| Designation | | Stock | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim pin | Wrench | Shim pin punch | Clamp | Clamping screw | Oil seal | Plug |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR | 2525-M12-KHP | ● | 25 | 25 | 150 | 32 | 25 | 34 | CN□□1204□□ | LV4N | VHX0820N | SC42N | SP4N | HW20L HW30L | LSPS4 | HPCR-H | MHB0415 | HPO7S | KHA0404-NYLOCK |
| | 3232-P12-KHP | | 32 | 32 | 170 | 40 | 32 | 34 | | | | | | | | | | | |

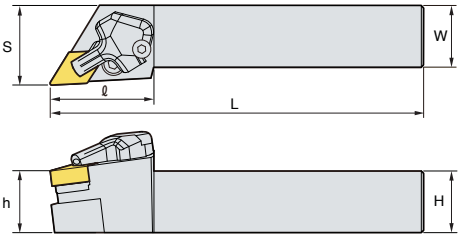
● : Stock items

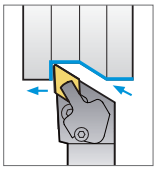
# PDJNR



DN□□





93°

R type insert
(mm)

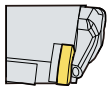
| Designation | | Stock | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim pin | Wrench | Shim pin punch | Clamp | Clamping screw | Oil seal | Plug |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PDJNR | 2525-M11-KHP | | 25 | 25 | 150 | 32.25 | 25 | 42 | DN□□1104□□ | LV3AN | VHX0617N | SD32N | SP3 | HW20L HW25L HW30L | LSPS3 | HPCR-H | MHB0415 | HPO7S | KHA0404-NYLOCK |
| | 2525-M1504-KHP | ● | 25 | 25 | 150 | 32.25 | 25 | 42 | DN□□1504□□ | LV4BN | VHX0821N | SD42N | SP4N | HW20L HW30L | LSPS4 | | | | |
| | 2525-M1506-KHP | ● | 25 | 25 | 150 | 32.25 | 25 | 42 | DN□□1506□□ | | | SD43N | | | | | | | |

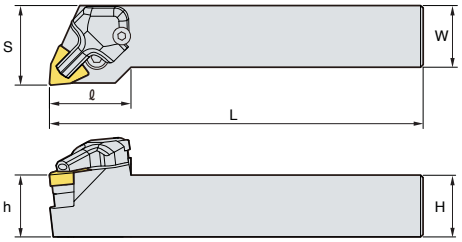
● : Stock items

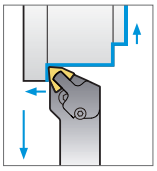
# PWLNR



WN□□





95°

R type insert
(mm)

| Designation | | Stock | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim pin | Wrench | Shim pin punch | Clamp | Clamping screw | Oil seal | Plug |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PWLNR | 2525-M08-KHP | ● | 25 | 25 | 150 | 32.25 | 25 | 33 | WN□□0803□□ | LV4N | VHX0820N | SW42N | SP4N | HW20L HW30L | LSPS4 | HPCR-H | MHB0415 | HPO7S | KHA0404-NYLOCK |
| | 3232-P08-KHP | | 32 | 32 | 170 | 39.25 | 32 | 33 | | | | | | | | | | | |

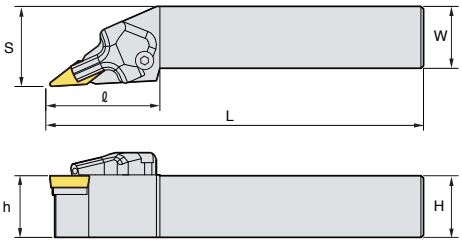
● : Stock items

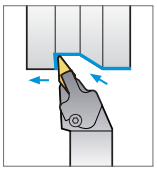
# SVJBR



VB□□





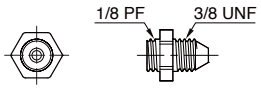
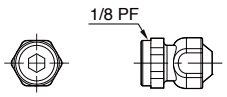
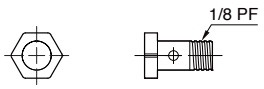
93°

R type insert
(mm)

| Designation | Stock | H | W | L | S | h | ℓ | Insert | Screw | Shim screw | Shim | Wrench | Clamp | Clamping screw | Oil seal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SVJBR 2525-M16-KHP | ● | 25 | 25 | 150 | 32.5 | 25 | 46.5 | VB□□1604□□ | FTGA03512 | SHXN0509F | SV32S | TW15P<br>HW30L<br>HW35L | HPCR-H | MHB0415 | HPO7S |

● : Stock items

## Parts

| Parts | Designation | Shape of parts | |
|---|---|---|---|
| Adaptor | HPA3/8UNF1/8PF |  |   |
| Blank | HPB1/8PF |  |   |
| Banjo screw | HPZ1/8PF |  |   |
| Copper washer | HPW1/8PF |  |  |

## High Pressure Hose

| The shape of the high pressure hose | | Length | Standard S | Standard B |
|---|---|---|---|---|
| Straight to straight (S-S)<br>(HPH3/8UNF) |   | 200 mm<br>250 mm | 3/8 UNF | - |
| Straight to banjo (S-B)<br>(HPH3/8UNF1/8PF) |   | 200 mm<br>250 mm | 3/8 UNF | 1/8 PF |
| Banjo to banjo (B-B)<br>(HPH1/8PF) |   | 200 mm<br>250 mm | - | 1/8 PF |

### Notice

- Use a standard spanner in clamping.
- Be careful of spraying coolant injected by the residual pressure in using high pressure coolant.
- Clamp the parts tightly.
- Clean the turning machine before clamping.
- The O-ring is included in the parts. Don't have to purchase it separately.

# Recommended High Pressure Pump System

• These 2 recommended systems.
• Customers can select a filter, pressure, and discharge according to their cutting conditions

| Brand | Kemtech | |
|---|---|---|
| System | VF-series | BF-series |
| Design |  |  |
| Model no. | VF 70-60 DF | CF 35-25 |
| Filter | Double bag filter | Cyclone filter |
| Pressure (bar) | 70 (Standard pressure) | 35 (Standard pressure) |
| Discharge (ℓ/min) | 60 (Standard discharge) | 25 (Standard discharge) |
| Features | - Suitable for high precision HRSA machining<br>- Variable pressure for the dia. of tool | - Suitable for high precision HRSA machining<br>- Variable pressure for the dia. of tool<br>- Applying a cyclone filter<br>- No filter supplies |
| Automatic pressure control | O | O |
| Options | - Chiller, Inverter multistage control | - Chiller, Inverter multistage control<br>- A tank attached model is applicable. |


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