Drastically shortened time and reduced costs!
Hydro-Clamp Type Valve Finisher

**HVF Series**

**Greatly Reduced Costs**
The head and holder combination dramatically reduces the work required for tool replacement.

Integrated Type (Conventional)  
Assembly Type (Separated Head)

Suitable for small-quantity, large-variety production (Heads can be prepared for each vehicle model).  
Price: Assembly type < Integrated type

**Successful Tool Standardization**
Reduced amounts of spare tools make management easier.

**Improved Accuracy**
An optimal coolant supply to the cutting edge improves accuracy while also extending tool life.
Drastically Shortened Time

The reamer and head can be clamped simultaneously with one-touch operation (While maintaining high rigidity).

Simple control reduces the required setup time.

Important!
Be sure to mount the reamer and head before clamping. If connection is performed while either of them is not mounted, the joining surface of the clamp may be deformed and breakage may occur.

This is the strength of the hydro chuck!
Simultaneous clamp connection of the inner and outer diameters while maintaining high rigidity allows high accuracy, making reamer run-out adjustment virtually unnecessary.

Reamer run-out of 5μm or less is ensured.
(When the master reamer and master head are mounted.)
## Tool Holder

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Stock LPR</th>
<th>Coolant Hole (Hole)</th>
<th>WT (kg)</th>
<th>Installation</th>
<th>Balance Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVF06-HSK63A110A3</td>
<td>● 80</td>
<td>Fig.1 (3 Hole)</td>
<td>1.5</td>
<td>HSK63A (With Coolant Pipe)</td>
<td>G2.5 (5000min⁻¹)</td>
</tr>
<tr>
<td>HVF06-HSK63A110A4</td>
<td>● 80</td>
<td>Fig.2 (4 Hole)</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HVF06-HSK63A180A3</td>
<td>● 150</td>
<td>Fig.1 (3 Hole)</td>
<td>2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HVF06-HSK63A180A4</td>
<td>● 150</td>
<td>Fig.2 (4 Hole)</td>
<td>2.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* A variety of other tool holders, such as BT shanks with their distinctive double face contact, can be mounted as well.

## Spare Parts (Reamer Adjustment Screws)

<table>
<thead>
<tr>
<th>Geometry</th>
<th>Order Number</th>
<th>Stock</th>
<th>MPCA</th>
<th>MPCB</th>
<th>MPCC</th>
<th>MPCD</th>
<th>MPCE</th>
<th>MPCF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HSC05016HW</td>
<td>● 5.8</td>
<td>M5×0.8</td>
<td>14</td>
<td>2</td>
<td>2</td>
<td>2.5</td>
<td></td>
</tr>
</tbody>
</table>

Reamer adjustment screws can be operated using a wrench from both the reamer insertion hole side and the mounting side.
The reamer adjustment screw is an accessory (1 piece), which can also be additionally purchased as a stand-alone item.
A hexagon socket set screw (M4) is included with the tool holder. It should be used as a stopper when discharging coolant with the use of an external oil supply.

● : Inventory maintained in Japan.
Produced-to-Order Products  Please inquire with our Sales Department regarding production.

For Valve Guide Hole Reaming
Compatible Reamer Range : \( \leq \varnothing 6 \) (Guide Hole Diameter)

RT9005
Optimization and strengthening of the hard phase (WC) particle diameter and bonded phase (Co) have improved the wear resistance and fracture resistance, for the creation of a unique cemented carbide.

EF05
An ultra-high hardness, ultra micro-particle cemented carbide that contains specialized components. Just as with RT9005, its wear resistance and fracture resistance have been improved.

Coating (TiN)
The hard coating with smooth surface properties can maintain an excellent finished surface over extended periods of time.

For Seat Surface Machining
Compatible Head Range : \( \varnothing 20 \leq \) Head Diameter < \( \varnothing 35 \) (Seat Hole : 45°-Surface Gauge Diameter)
Tool Bits : 3 types

MB4020
High edge toughness has been achieved with a newly-developed special binder. The even sharper cutting edge shape can suppress the creation of burrs and ensure high accuracy. CBN, which is included with a high chemical content, has outstanding welding resistance so that a constant dimensional accuracy can be maintained.

The seat surface is composed of 3 faces at different angles (Cutting with 3 types of edges).

Relationship between number of head cutting edge grooves and tool holders
* HVF06-HSK63A110A : Suitable for cases with no processing beyond the angle plate
* HVF06-HSK63A180A : Suitable for cases with processing beyond the angle plate

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Coolant Hole (Hole)</th>
<th>Number of Cutting Edge Grooves on Head</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>HVF06-HSK63A110A3</td>
<td>3</td>
<td>○</td>
</tr>
<tr>
<td>HVF06-HSK63A180A3</td>
<td>3</td>
<td>○</td>
</tr>
<tr>
<td>HVF06-HSK63A110A4</td>
<td>4</td>
<td>○</td>
</tr>
<tr>
<td>HVF06-HSK63A180A4</td>
<td>4</td>
<td>○</td>
</tr>
</tbody>
</table>

○ = Suitable  × = Unsuitable

* Hexagon socket set screws (M4) are included as separately-packaged accessories.

Important Install screws in any unused coolant holes.
Hydro-Clamp Type Valve Finisher

Recommended Cutting Conditions

Valve Guide Hole Reaming

<table>
<thead>
<tr>
<th>Work Material</th>
<th>Reamer Material</th>
<th>Grade</th>
<th>Hardness (HRA)</th>
<th>Cutting Speed (m/min)</th>
<th>Feed per Tooth (mm/t.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel-based Sintered Alloy</td>
<td>RT9005</td>
<td>92.2</td>
<td>2.0</td>
<td>40 – 60</td>
<td>0.03 – 0.05</td>
</tr>
<tr>
<td>Cast Iron</td>
<td>EF05</td>
<td>94.0</td>
<td>2.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Seat Surface Machining

<table>
<thead>
<tr>
<th>Work Material</th>
<th>Priority</th>
<th>CBN Material for Bits</th>
<th>Cutting Speed (vc) (m/min)</th>
<th>Feed per Tooth (fz) (mm/t.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sintered Alloy</td>
<td>1</td>
<td>MB4020</td>
<td>60 – 120</td>
<td>0.05 – 0.10</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>MB825</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>MB835</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Select materials in accordance with seat material characteristics.

Setup Reference Diagram

(When Tool Holder : HVF06-HSK63A110A3 is suitable)

Rough Processing

Finish Processing
## Application Example (Finishing)

<table>
<thead>
<tr>
<th>Application Example</th>
<th>Example 1</th>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reamer Material</td>
<td>RT9005</td>
<td>RT9005+TiAIN Coating</td>
</tr>
<tr>
<td>Tool Bit Material</td>
<td>MB4020</td>
<td>MB835</td>
</tr>
</tbody>
</table>

### Workpiece

![Workpiece Image]

<table>
<thead>
<tr>
<th>Cutting Conditions</th>
<th>Revolution (min⁻¹)</th>
<th>Cutting Speed (m/min)</th>
<th>Feed per Tooth (mm/t)</th>
<th>Table Feed (mm/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Guide Holes</strong></td>
<td>2200</td>
<td>35</td>
<td>0.03</td>
<td>360</td>
</tr>
<tr>
<td><strong>Seat Surface</strong></td>
<td>1500</td>
<td>110</td>
<td>0.06</td>
<td>180</td>
</tr>
</tbody>
</table>

### Cutting Mode

- Wet Cutting (Internal Coolant 6Mpa)
- Wet Cutting (Internal Coolant 3Mpa)

### Machine Used

- Horizontal Machining Center

### Result

- Eliminating the necessity for reamer adjustment has dramatically improved the machine utilization rate, with all of the specified requirement values for machining accuracy being fulfilled.
- Setup can be performed in a short time even by inexperienced workers. The small seat diameter maintains outstanding accuracy and finished surfaces over extended time periods.
  - Guide hole roundness : 0.001 mm or less
  - Seat surface run-out : 0.02 mm or less
  - Finished surface roughness : Ra 0.1 μm or less
Procedure

**STEP 1**
Mount the head on the tool holder.

**STEP 2**
Attach the reamer.

**STEP 3**
Tightening and removing screws follow opposite procedures from the usual.

During use, line up the markings on the head and tool holder to secure them in place. When mounting and removing them, turn them to the side marked “FREE”.

For Your Safety
- Don’t handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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(Tools specifications subject to change without notice.)