HONING

Honing is a material removal operation yielding excellent dimensional accuracy in terms of linearity and roundness for cylinders and tubes in assembled parts. It can be performed after cutting and grinding the part and before or after heat treatment.

Honing process is characterized by the simultaneous rotation and linear stroke of the honing head producing a typical cross-hatch pattern on the surface. This controlled roughness provides lodges for the lubricant during operation.

Honing is generally performed on tubes and cylinders used in the lifting, engine, and robotic industries. Examples of applications are hydraulic arms for cranes and hoists, plastic extrusion cylinders, hydraulic jacks and lifting platforms (with hydraulic or oil pistons). This operation is also performed on spherical valves, controlling the flow of gas, oil or water with a simple opening/closing system in pipelines.

Abrasive grains are aluminum oxide in grit size 60-80 for roughing, and down to 800 for finishing.
Superfinishing is a high precision process to improve the final geometry and surface finish of the part, and to remove defects generated during grinding operations. Microfinishing is characterized by an oscillation of the stone, and the pressure of the abrasive on the rotating workpiece.

Superfinishing are operations most frequently performed with mineral oil to improve the final roughness and avoid loading of the abrasive which might generate scratches and defects on the part.

Depending on the initial and targeted average roughness (Ra) different sequences of abrasives are used. For example, with an initial Ra of 0.30 μm, two operations are performed: the roughing process with an aluminum oxide stone grit size 500 to remove 5-6 μm, and the finishing operation with silicon carbide grit size 1000-1200 to remove 2-3 μm. If a final Ra under 0.10 μm is required, a third stone in silicon carbide with finer grit size (1500-1800) can be used for a stock removal lower than 2 μm.
## MARKING SYSTEM

### ABRASIVE
- SA/CSA: White aluminium oxide
- NC: Black silicon carbide
- PA: Pink aluminium oxide
- VC/31C: Green silicon carbide
- MVC: Mix of green SiC and aluminium oxide
- 30AS: Special aluminium oxide
- 55GA: Sintered aluminium oxide type A
- 55GG: Sintered aluminium oxide type G

### GRIT SIZE
- From A (soft) to R (hard)

### HARDNESS
- From 0 (open) to 25 (closed)

### STRUCTURE
- Vitrified

### BOND
- TREATMENT
  - S5: Sulfur impregnation
  - W: Wax impregnation
  - F11: Paraffin impregnation

### SHAPE 54
- Extension AH for square profile
- Extension BH for rectangular profile

### DIMENSIONS (mm)
- Thickness x Width x Length with $T < W < L$

### Conversion of the abrasive grit size in microns

### FINAL TREATMENTS (S5 – W – F11)

Sticks and stones can be impregnated with sulfur, wax or paraffin. The sulfur treatment (S5) improves the cutting ability of the abrasive and improves the final surface roughness. Due to health and environment regulations and industry standards, new treatments based on wax and paraffin (W and F11) are now available.
**SPHERICAL BALL VALVE HONING**

MARKET: Hydraulic, oil and gas  
MATERIAL: Mild steel, stainless steel

**DEEP HORIZONTAL HONING**

<table>
<thead>
<tr>
<th>ROUGH GRINDING</th>
<th>FINISHING</th>
<th>KEY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA120 M8 V55</td>
<td>SA 800 H8 V S5</td>
<td></td>
</tr>
<tr>
<td>5S GG 120 N10V E3A S5</td>
<td>SA 320 M2 V F11</td>
<td></td>
</tr>
</tbody>
</table>

MARKET: Hydraulic, oil and gas  
MATERIAL: Mild steel  
CHARACTERISTICS:  
External diameter: 60 - 100mm  
Length: 6000 - 10000 mm

**CYLINDER HONING (VERTICAL)**

<table>
<thead>
<tr>
<th>ROUGH GRINDING</th>
<th>FINISHING</th>
<th>KEY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA120 M8 V55</td>
<td>SA 800 H8 V S5</td>
<td></td>
</tr>
<tr>
<td>5S GG 120 N12 V55</td>
<td>SA 320 M2 V F11</td>
<td></td>
</tr>
</tbody>
</table>

MARKET: Hydraulic, oil and gas  
MATERIAL: Mild steel  
CHARACTERISTICS:  
External diameter: 100 - 350mm  
Length: 100 - 3500mm

**SPECIFICATION**

ROUGH GRINDING | FINISHING       | KEY: |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PA 120 F0 V S5</td>
<td>SA 320 I18 V S5</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>SA 320 M2 V F11</td>
<td></td>
</tr>
</tbody>
</table>
ENGINE BLOCK HONING

SPECIFICATION

ROUGH GRINDING | SEMI-FINISHING | FINISHING
SOGG 100 MB VEA S5 | SOGG 240 MB VEA S5 | MNC 400 LS V

MATERIAL: Cast iron
MARKET: Automotive

KEY:
- Abrasive
- Feeding wheel
- Workpiece
- Directional movement of abrasive and workpiece

SHAFT SUPERFINISHING

SPECIFICATION

FINISHING
MVC 600 HB VCA S5
MVC 800 JB VCA S5

MARKET: Automotive
MATERIAL: Case hardened steel

CAMSHAFT SUPERFINISHING

SPECIFICATION

FINISHING
VGC 1000 P25 VAMX

KEY:
- Abrasive
- Workpiece
- Directional movement of abrasive and workpiece
SUPERFINISHING INNER / OUTER RING

**MARKET:** Bearing

**MATERIAL:** Steel 100Cr6

### SPECIFICATION FOR SINGLE STATION

<table>
<thead>
<tr>
<th>SMALL SIZE RING DIAMETER 20mm - 50mm</th>
<th>MEDIUM SIZE RING DIAMETER 50mm - 100mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>BETTER SA1000 D5/K10 V S5</td>
<td>SA 600-800 D/L VS5</td>
</tr>
<tr>
<td>BEST 30AS 800-1000 L3 V6448 F11</td>
<td>30AS 800-1000 M3 V6448 F11</td>
</tr>
</tbody>
</table>

### SPECIFICATION FOR DOUBLE OR MULTIPLE STATION

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>SMALL SIZE RING DIAMETER 20mm - 50mm</th>
<th>MEDIUM SIZE RING DIAMETER 50mm - 100mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roughing</td>
<td>SA 800 G/J VS5</td>
<td>SA 500-600 G/H V SS</td>
</tr>
<tr>
<td>Finishing</td>
<td>MVC15008 H/J VEAM55</td>
<td>MVC 800-1200 G/J VEAS5</td>
</tr>
<tr>
<td>Polishing</td>
<td>MVC18008 G5 VCAM SS/W</td>
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</tr>
</tbody>
</table>
**ROLLS AND ROLLERS SUPERFINISHING**

![Rollers and Roller Thrufeed Diagram]

**MARKET:** Bearing  
**MATERIAL:** Steel 100Cr6

### CYLINDRICAL & TAPERED ROLLERS

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>SMALL SIZE DIAMETER 3mm - 10mm</th>
<th>LARGE SIZE DIAMETER 11mm - 20mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roughing</td>
<td>30AS 600-500 F8 V6448P15AF11</td>
<td>30AS 400 H6 V6448P15AF11</td>
</tr>
<tr>
<td></td>
<td>SA 600-500 F/G V S5 or W</td>
<td>SA 320 F/I V S5 or W</td>
</tr>
<tr>
<td>Semi-finishing</td>
<td>MVC 1000-800 H/L VM14 S5 or W</td>
<td>mvc 3000-800 F/G V S5 or W</td>
</tr>
<tr>
<td>Finishing</td>
<td>MVC 1200 H/L VEO SMS5 or W</td>
<td>MVC 1000-800 D5 V S5 or W</td>
</tr>
<tr>
<td>Polishing</td>
<td>31C500 JB860</td>
<td></td>
</tr>
</tbody>
</table>

### WATER PUMP BEARING SUPERFINISHING

**MARKET:** Bearing  
**MATERIAL:** Steel 100Cr6

#### SPECIFICATION

**WATER PUMP BEARING**

| MVC 800 M8 VEA S5 | 30AS 1000 L/M 3 V6448 F11 | BEST ******* |

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