Cylix Actuation
Technical Guide
The Cylix Actuators are bolted to the manifold and must be protected from overheating to ensure long seal life. During system start-up, operation and shut-down the cooling water supply to the actuators must continue flowing to ensure the seals are thermally separated from the hot manifold and excessive heat does not cause premature failure of the components.

**Cooling Water Medium**
1. Water quality and PH levels must be maintained to ensure it is clean and free of particulates and biological growth
2. Cooling water temperature must not exceed 80°C
3. Cooling water pressure should not exceed 8 bar
4. Cooling water flow rate should be a minimum of 2 l/min. per unit
5. A maximum of 2 Cylix actuators may be connected in series for cooling

**Actuator Start-up Procedure**
1. Turn on all water chillers/cooling and ensure temperatures are below 80°C
2. Turn on water cooling connections to actuators and check cooling flow is operating correctly
3. Continue with normal hot runner mould start-up procedure

**Actuator Shut-down Procedure**
Use normal hot runner mould shut-down procedures, ensuring all water cooling continues flowing to the actuators until the hot runner is below 150°C.
Key Features
- Conical or Cylindrical shut off
- From Ø2.0mm to Ø5.0mm pin
- Air actuated
Cylix Actuation Overall Dimensions

Note: Pins are supplied in standard length and must be cut to required length before installation.

Pins can be supplied by Mastip finished ready to use

→ Refer to page PVB40-8 Pin Calculations section to calculate required final pin lengths

<table>
<thead>
<tr>
<th>Description</th>
<th>Nozzle</th>
<th>Tip</th>
<th>Supplied Pin Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVB40-P1 Headed Pin</td>
<td>MX13 / BX13</td>
<td>OV</td>
<td>Ø2.0</td>
</tr>
<tr>
<td>PVB40-P1 Headed Pin</td>
<td>MX16 / BX16 / TX16</td>
<td>OV / TV</td>
<td>Ø2.5</td>
</tr>
<tr>
<td>PVB40-P1 Headed Pin</td>
<td>MX19 / BX19 / TX19</td>
<td>OV / TV</td>
<td>Ø3.0</td>
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<tr>
<td>PVB40-P1 Headed Pin</td>
<td>BX27 / TX27</td>
<td>OV / TV</td>
<td>Ø5.0</td>
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</tbody>
</table>
Plate Details - 90° Bend Exit

Figure 7

Figure 8

Break sharp edge

Clearance required for connectors
To calculate final pin length, use the following equation:

- For PVB40-P1 - D2.0:
  \[ \text{Pin Length} = (Y=28.75) + 10.0 + X + L4 + L + 0.1 \]
- For PVB40-P1 - D2.5:
  \[ \text{Pin Length} = (Y=29.00) + 10.0 + X + L4 + L + 0.1 \]
### Conical and Cylindrical Valve Gate Recommendations

<table>
<thead>
<tr>
<th></th>
<th>Conical Valve Gate</th>
<th>Cylindrical Valve Gate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gate Quality</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Pin Cooling</td>
<td>***</td>
<td>*</td>
</tr>
<tr>
<td>Filled Materials</td>
<td>*</td>
<td>***</td>
</tr>
<tr>
<td>Material with Small Moulding Window</td>
<td>*</td>
<td>***</td>
</tr>
<tr>
<td>Ease of Pin Setup</td>
<td>*</td>
<td>***</td>
</tr>
<tr>
<td>Ease of Gate Manufacture</td>
<td>***</td>
<td>**</td>
</tr>
<tr>
<td>Gate Life</td>
<td>***</td>
<td>*</td>
</tr>
</tbody>
</table>

#### VG1 - Conical Valve Gate

<table>
<thead>
<tr>
<th>D</th>
<th>d1</th>
<th>d2</th>
<th>AF</th>
<th>CP</th>
<th>AT</th>
<th>qT</th>
<th>HT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>1.3</td>
<td>1.25</td>
<td>1.80</td>
<td>8</td>
<td>1.30</td>
<td>0.8</td>
<td>1.0</td>
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<tr>
<td>2.5</td>
<td>1.8</td>
<td>1.75</td>
<td>2.30</td>
<td>8</td>
<td>1.80</td>
<td>1.0</td>
<td>2.0</td>
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<tr>
<td>3.0</td>
<td>2.2</td>
<td>2.15</td>
<td>2.75</td>
<td>8</td>
<td>2.20</td>
<td>1.2</td>
<td>2.5</td>
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<tr>
<td>5.0</td>
<td>3.5</td>
<td>3.45</td>
<td>4.65</td>
<td>10</td>
<td>3.50</td>
<td>2.0</td>
<td>3.0</td>
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</table>

The pin will form a 0.1mm deep dimple on the part. Pin and gate to be lapped to ensure clean shutoff. Recommended for amorphous polymers.

#### VG2 - Cylindrical Valve Gate

<table>
<thead>
<tr>
<th>D</th>
<th>AP</th>
<th>BP</th>
<th>CP</th>
<th>DP</th>
<th>AF</th>
<th>GP</th>
<th>qP</th>
<th>HP</th>
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</thead>
<tbody>
<tr>
<td>2.0</td>
<td>1.292</td>
<td>2.0</td>
<td>8</td>
<td>1.892</td>
<td>1.70</td>
<td>1.305</td>
<td>0.5</td>
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<tr>
<td>2.5</td>
<td>1.792</td>
<td>2.0</td>
<td>8</td>
<td>2.392</td>
<td>2.20</td>
<td>1.805</td>
<td>0.7</td>
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<tr>
<td>3.0</td>
<td>2.192</td>
<td>2.0</td>
<td>8</td>
<td>2.892</td>
<td>2.65</td>
<td>2.205</td>
<td>0.8</td>
<td>2.5</td>
</tr>
<tr>
<td>5.0</td>
<td>3.492</td>
<td>2.5</td>
<td>10</td>
<td>4.892</td>
<td>4.55</td>
<td>3.505</td>
<td>1.3</td>
<td>3.0</td>
</tr>
</tbody>
</table>

The pin will form a 0.1mm deep dimple on the part. Recommended for semi-crystalline and filled polymers.
Installation and Pin Adjustment Guide

PRE-INSTALLATION
1. Verify the actuator pockets and hose channels are machined in the back plate as shown in figure 7.
2. Ensure there are no sharp edges or burrs.
3. Cut pins to length and profile end to conical or cylindrical (refer nozzle approval drawing).
4. Pin and seal are a matched set and must remain paired.

VALVE CYLINDER ASSEMBLY

Apply heat resistant nickel based anti-seize grease to the thread of the Valve Pin Seal 16 and screw into the manifold and tighten to 20Nm. Ensure pins slide smoothly through the pin seal after tightening.

Mount the Base 15 onto the manifold and secure in place with the Base Mounting Screws 14 and tighten to 14Nm.
Mount the Cylinder 12 to the Base 15, orientate the Cylinder 12 so the connections are facing the correct direction. Secure in place with Cylinder Retaining Screws 11 and tighten to 16Nm. Ensure the Flange Plug 13 is tightly sealed in place in the cooling circuit.

Fit the Piston Seals 7a & 7b, Bearing Strip 9 and Rod Seal 10 to the Piston 8. Apply high temperature silicon grease to the cylinder bore, Piston Seals 7a & 7b, Bearing Strip 9 and Rod Seal 10.

Fit the Piston 8 to the Cylinder 12.
Insert the Valve Pin Adjustment Packers 5b, 5c & 5d onto the Valve Pin 6. Ensure the correct packer thickness is in the correct position. (Recommend starting with the thinnest packer above the pin head, then adjust to suit if necessary). Fit the Valve Pin 6 to the Piston 8.

Fit the remaining Valve Pin Adjustment Spacer 5a, above the Valve Pin 6 head.
Fit the Pin Locking Screw 4 to the Piston 8 and tighten to 40Nm.
VALVE CYLINDER ASSEMBLY CONT...

**SIX**

- Fit the Lid Seal 3 to the Blanking Plate 2.
- Fit the Blanking Plate 2 to the Cylinder 12.
- Secure with Blanking Plate Retaining Screws 1 and tighten to 4.5Nm.

**SEVEN**

- Install all pneumatic and cooling fittings and hoses to the Cylinder 12 (G1/8 threads) and mould connections, and ensure all connections are correct.
PIN HEIGHT ADJUSTMENT

ONE

Remove **Blanking Plate Retaining Screws** 1 and **Blanking Plate** 2

TWO

Remove the **Pin Locking Screw** 4
Remove the **Valve Pin Adjustment Packer** 5a
Remove the **Valve Pin** 6
Remove the remaining **Valve Pin Adjustment Packers** 5b, 5c & 5d
PIN HEIGHT ADJUSTMENT...

***THREE***

Minor Adjustment

Swap Valve Pin Adjustment Packers 5a, 5b, 5c & 5d to achieve small pin adjustments.

(different packer = different height)

***FOUR***

Major Adjustment

Move one or more Valve Pin Adjustment Packers 5a, 5b, 5c & 5d from below the pin head to above the pin head to achieve large pin adjustment

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PVG40-16
Assemble Valve Pin 6 (ensure pins are matched to seals), Valve Pin Adjustment Packers 5a, 5b, 5c & 5d and the Pin Locking Screw 4 and tighten to 40Nm.

Fit the Blanking Plate 2 to the Cylinder 12, secure with Blanking Plate Retaining Screws 1 and tighten to 4.5Nm.
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