Design
The Hallite 454 double acting piston seal provides the designer with a compact, low friction seal for light to medium duty hydraulic cylinders.

It comprises a bronze filled PTFE ring, which is pre-loaded by an O ring to be effective for the operating pressure range recommended. As the pressure rises the O ring deforms and compresses the PTFE ring against the tube wall increasing the sealing force and the effectiveness of the seal. As only the PTFE ring is in contact with the sliding surface, friction is very low and stick slip movement is eliminated.

The housing width allows the designer to use a narrow width piston, but it is recommended an adequate bearing is mounted either side of the seal as shown.

A number of material options can be provided to extend operating conditions. Please ensure that the correct part number is specified for the material option as indicated.

The Hallite 454 seal is not recommended for applications where it is necessary for the pressurised cylinder to maintain the load in a set position.

---

**Features**
- Low stick/slip
- Low cost
- High strength precision machined PTFE cap ring
- Compact piston design
- Wide range of materials available

**Materials**

<table>
<thead>
<tr>
<th>Face Material - O Ring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard material</td>
</tr>
<tr>
<td>Bronze/PTFE – NBR</td>
</tr>
<tr>
<td>Material options:</td>
</tr>
<tr>
<td>15% Glass/PTFE – NBR</td>
</tr>
<tr>
<td>15% Glass/PTFE – FKM</td>
</tr>
<tr>
<td>Bronze/PTFE – FKM</td>
</tr>
</tbody>
</table>

**Technical details**

**Operating conditions**
- Maximum Speed: 4.0 m/sec, 12.0 ft/sec
- Temperature Range: -30°C +100°C, -22°F +212°F
- Maximum Pressure: 350 bar, 5,000 p.s.i.
- Maximum extrusion gap:
  - Pressure: 1500, 2400, 3750, 5250 p.s.i.
  - Maximum Gap: 0.024, 0.020, 0.018, 0.014

**Surface roughness**
- Dynamic Sealing Face ØD₁
  - µmRa: 0.1 < > 0.4
  - µmRt: 4 max
  - µinCLA: 4 < > 16
  - µinRMS: 5 < > 18
- Static Sealing Face Ød₁
  - 1.6 max
  - 10 max
  - 63 max
  - 70 max
- Static Housing Faces L₁
  - 3.2 max
  - 16 max
  - 125 max
  - 140 max

**Chamfers & Radii**
- Groove Section ≤ S in
  - 0.147, 0.216, 0.305, 0.413, 0.483
- Min Chamfer C in
  - 0.093, 0.125, 0.156, 0.187, 0.305
- Max Fillet Rad r₁ in
  - 0.016, 0.016, 0.032, 0.032, 0.032

**Tolerances**
- ØD₁, Ød₁, L₁, H9, f8, -0.008 -0
### Table 1: Piston Seals - Inch

<table>
<thead>
<tr>
<th>ØD₁</th>
<th>TOL H9</th>
<th>Ød₁</th>
<th>TOL f8</th>
<th>L₁ + 0.008 -0</th>
<th>PART No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.000</td>
<td>+0.0030</td>
<td>1.576</td>
<td>-0.0012</td>
<td>0.165</td>
<td>72305_ _</td>
</tr>
<tr>
<td>2.500</td>
<td>+0.0030</td>
<td>2.076</td>
<td>-0.0012</td>
<td>0.165</td>
<td>72310_ _</td>
</tr>
<tr>
<td>2.750</td>
<td>+0.0030</td>
<td>2.326</td>
<td>-0.0012</td>
<td>0.165</td>
<td>72315_ _</td>
</tr>
<tr>
<td>3.000</td>
<td>+0.0030</td>
<td>2.576</td>
<td>-0.0012</td>
<td>0.165</td>
<td>72320_ _</td>
</tr>
<tr>
<td>3.250</td>
<td>+0.0035</td>
<td>2.634</td>
<td>-0.0014</td>
<td>0.246</td>
<td>72325_ _</td>
</tr>
<tr>
<td>3.500</td>
<td>+0.0035</td>
<td>2.884</td>
<td>-0.0014</td>
<td>0.246</td>
<td>72330_ _</td>
</tr>
<tr>
<td>4.000</td>
<td>+0.0035</td>
<td>3.384</td>
<td>-0.0014</td>
<td>0.246</td>
<td>72335_ _</td>
</tr>
<tr>
<td>4.250</td>
<td>+0.0035</td>
<td>3.634</td>
<td>-0.0014</td>
<td>0.246</td>
<td>72340_ _</td>
</tr>
<tr>
<td>4.500</td>
<td>+0.0035</td>
<td>3.884</td>
<td>-0.0014</td>
<td>0.246</td>
<td>72345_ _</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ØD₁</th>
<th>TOL H9</th>
<th>Ød₁</th>
<th>TOL f8</th>
<th>L₁ + 0.008 -0</th>
<th>PART No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.000</td>
<td>+0.0040</td>
<td>4.384</td>
<td>-0.0016</td>
<td>0.246</td>
<td>72350_ _</td>
</tr>
<tr>
<td>5.500</td>
<td>+0.0040</td>
<td>4.670</td>
<td>-0.0016</td>
<td>0.319</td>
<td>72355_ _</td>
</tr>
<tr>
<td>6.000</td>
<td>+0.0040</td>
<td>5.170</td>
<td>-0.0016</td>
<td>0.319</td>
<td>72360_ _</td>
</tr>
<tr>
<td>6.500</td>
<td>+0.0040</td>
<td>5.670</td>
<td>-0.0016</td>
<td>0.319</td>
<td>72365_ _</td>
</tr>
<tr>
<td>7.000</td>
<td>+0.0040</td>
<td>6.170</td>
<td>-0.0016</td>
<td>0.319</td>
<td>72370_ _</td>
</tr>
<tr>
<td>7.500</td>
<td>+0.0045</td>
<td>6.670</td>
<td>-0.0016</td>
<td>0.319</td>
<td>72375_ _</td>
</tr>
<tr>
<td>8.000</td>
<td>+0.0045</td>
<td>7.170</td>
<td>-0.0020</td>
<td>0.319</td>
<td>72380_ _</td>
</tr>
<tr>
<td>9.500</td>
<td>+0.0045</td>
<td>8.670</td>
<td>-0.0020</td>
<td>0.319</td>
<td>72385_ _</td>
</tr>
<tr>
<td>10.000</td>
<td>+0.0050</td>
<td>9.170</td>
<td>-0.0020</td>
<td>0.319</td>
<td>72390_ _</td>
</tr>
</tbody>
</table>

**Diagram:**

[Diagram of piston seals]

---

**Seal & Design**

**Able Division**

5533 Steeles Avenue West Unit 11
Toronto, Ontario M9L 1S7
Ph: (416) 741-0750
Gasket@AbleSealAndDesign.com

---

**Seal & Design**

**Corporate Headquarters**

4015 Casillo Parkway
Clarence, NY 14031
Ph: (716) 759-2222
Info@SealAndDesign.com
www.SealAndDesign.com

---

**Seal & Design**

**Higbee Division**

6741 Thompson Rd N
Syracuse, NY 13221
Ph: (315) 432-8021
Sales@Higbee-Inc.com

---

**Hallite **

Fenner Advanced Sealing Technologies