**TECHNICAL DETAILS**

The Hallite PFR is a chamfered, double-acting piston seal that performs well in both high- and low-pressure systems. The PFR has chamfers on the primary sealing face paired with either a square or an o-ring elastomer energizer. Typically, the square energizer is preferred for heavy-duty applications, as it provides superior interference and stability in the groove. High-performance Armorlene® materials, like HLX, provide outstanding wear and extrusion-resistance properties as well as large range of temperature and media compatibility.

Hallite's PFR seal is well-suited for a variety of hydraulic and pneumatic reciprocating applications. Hallite recommends proper guidance (see Hallite Bearings section) be used with this seal in heavy-duty applications. The PFR seal is available in a variety of Hallite's high-performance Armorlene® materials to suit a wide range of demanding applications.

This seal is designed to fit the ANSI B93.32-1973 and NFPA T3.19.18 housing size.

**FEATURES**

- Precision machined bronze/PTFE cap ring
- High-strength compression-molded material
- Chamfered corners for easier installation
- Low friction, no stick-slip issues
- Wide range of materials available

**Part Number Structure**

PFRER01250NHLX

- **PFR** PROFILE DESIGNATION
- **E** UNIT OF MEASUREMENT
  - M = Metric
  - E = Inch
- **R** APPLICATION
  - Refer to Installation Recommendations and use designator for desired application
- **01250** BORE DIAMETER
  - Metric = mm X 10
  - Inch = inches X 1000
- **R** ENERGIZER MATERIAL
  - Refer to Energizer Table for desired energizer material
- **HLX** PTFE MATERIAL
  - Refer to Material Table for desired PTFE (face) material
- **___** SPECIAL FEATURE
  - Blank = Std profile
  - N = Notches
### OPERATING CONDITIONS

<table>
<thead>
<tr>
<th></th>
<th>metric</th>
<th>inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Speed</td>
<td>Up to 4.0m/sec</td>
<td>Up to 13.0ft/sec</td>
</tr>
<tr>
<td>Temperature Range*</td>
<td>-45 to 200°C</td>
<td>-49 to 392°F</td>
</tr>
<tr>
<td>Maximum Dynamic Pressure</td>
<td>350 bar</td>
<td>5000 psi</td>
</tr>
</tbody>
</table>

*Dependent upon energizer used (NBR, FKM, etc.).

#### NOTE
Data given are maximum values and can apply depending on specific application. Maximum ratings of temperature, pressure, or operating speeds are dependent on fluid medium, surface, gap value, and other variables such as dynamic or static service. Maximum values are not intended for use together at the same time, e.g. max temperature and max pressure. Please contact your Hallite technical representative for application support.

### SURFACE FINISH RECOMMENDATIONS

<table>
<thead>
<tr>
<th>SURFACE ROUGHNESS</th>
<th>pMRA</th>
<th>pMRZ</th>
<th>pMRT</th>
<th>pINRA</th>
<th>pINRZ</th>
<th>pINRT</th>
<th>RMR*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic Sealing Face ØD₁</td>
<td>0.05 - 0.2</td>
<td>1.3 max</td>
<td>2 max</td>
<td>2 - 8</td>
<td>52 max</td>
<td>78 max</td>
<td>60% - 90%</td>
</tr>
<tr>
<td>Static Sealing Face Ød₁</td>
<td>1.6 max</td>
<td>7 max</td>
<td>10 max</td>
<td>63 max</td>
<td>276 max</td>
<td>394 max</td>
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<tr>
<td>Static Housing Faces L₁</td>
<td>3.2 max</td>
<td>10 max</td>
<td>16 max</td>
<td>125 max</td>
<td>394 max</td>
<td>630 max</td>
<td></td>
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</tbody>
</table>

*RMR is measured at a depth of 25% of the Rz value based upon a reference level (zero line) at 5% material/bearing area.

### ENERGIZER TABLE

<table>
<thead>
<tr>
<th>ENERGIZER MATERIAL (SHORE A)</th>
<th>ENERGIZER TYPE</th>
<th>ENERGIZER DESIGNATION</th>
<th>ENERGIZER OPERATING TEMPERATURE°C</th>
<th>ENERGIZER OPERATING TEMPERATURE°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBR - 70A</td>
<td>Square</td>
<td>R</td>
<td>-30 to 100°C</td>
<td>-22 to 212°F</td>
</tr>
<tr>
<td>No Energizer*</td>
<td>None</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Seal ratings are based upon capabilities of its matched material components. Hallite cannot rate seal performance when the seal is mixed with other manufacturers’ energizers/components.
## MATERIALS

### MATERIAL FEATURES AND APPLICATIONS

<table>
<thead>
<tr>
<th>MATERIAL FEATURES AND APPLICATIONS</th>
<th>FILLER</th>
<th>MATERIAL DESIGNATOR</th>
<th>COLOR</th>
<th>TEMPERATURE RANGE°C</th>
<th>TEMPERATURE RANGE°F</th>
<th>MAXIMUM DYNAMIC PRESSURE - BAR</th>
<th>MAXIMUM DYNAMIC PRESSURE - PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ARMORLENE® HLX</strong></td>
<td>Special Bronze Compound</td>
<td>Hlx</td>
<td>Gold</td>
<td>-73 to 288°C</td>
<td>-100 to 550°F</td>
<td>350 bar</td>
<td>5000 psi</td>
</tr>
<tr>
<td>• Standard material for hydraulic applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• High compressive strength</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Excellent extrusion resistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Extended wear resistance</td>
<td></td>
<td></td>
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<tr>
<td><strong>ARMORLENE® 702</strong></td>
<td>Glass Molybdenum Disulfide</td>
<td>702</td>
<td>Gray</td>
<td>-73 to 260°C</td>
<td>-100 to 500°F</td>
<td>300 bar</td>
<td>4350 psi</td>
</tr>
<tr>
<td>• Excellent in lubricating and non-lubricating hydraulic fluids</td>
<td></td>
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<td></td>
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<tr>
<td>• Good low-friction properties</td>
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</tr>
<tr>
<td>• Excellent extrusion resistance</td>
<td></td>
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<tr>
<td>• Good chemical resistance</td>
<td></td>
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</tr>
<tr>
<td><strong>ARMORLENE® 706</strong></td>
<td>15% Glass</td>
<td>706</td>
<td>Off-White</td>
<td>-73 to 260°C</td>
<td>-100 to 500°F</td>
<td>300 bar</td>
<td>4350 psi</td>
</tr>
<tr>
<td>• Excellent in lubricating and non-lubricating hydraulic fluids</td>
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<tr>
<td>• Excellent extrusion resistance</td>
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<tr>
<td>• Good chemical resistance</td>
<td></td>
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<td></td>
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<tr>
<td>• Good dieelectrical properties</td>
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<tr>
<td><strong>ARMORLENE® 701</strong></td>
<td>25% Glass</td>
<td>701</td>
<td>Off-White</td>
<td>-73 to 260°C</td>
<td>-100 to 500°F</td>
<td>350 bar</td>
<td>5000 psi</td>
</tr>
<tr>
<td>• Excellent in lubricating and non-lubricating hydraulic fluids</td>
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<tr>
<td>• Excellent extrusion resistance</td>
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</table>

For other material options consult the Master Materials Index at the front of the catalog. If you do not find the material that you require please contact your local Hallite sales office.

## INSTALLATION RECOMMENDATIONS

### BORE DIAMETER ØD₁, H9

<table>
<thead>
<tr>
<th>Diameter Range</th>
<th>ØD₁ h9</th>
<th>L₁ + 0.008</th>
<th>r₁</th>
<th>C</th>
<th>S</th>
<th>Up to 1000 psi</th>
<th>Up to 3000 psi</th>
<th>Up to 5000 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Duty Application - R</td>
<td>ØD₁ h9</td>
<td>L₁ + 0.008</td>
<td>r₁</td>
<td>C</td>
<td>S</td>
<td>Up to 1000 psi</td>
<td>Up to 3000 psi</td>
<td>Up to 5000 psi</td>
</tr>
<tr>
<td>1.000 – 2.999</td>
<td>D₁ - 0.308</td>
<td>0.129</td>
<td>0.016</td>
<td>0.125</td>
<td>0.154</td>
<td>0.026</td>
<td>0.010</td>
<td>0.006</td>
</tr>
<tr>
<td>3.000 – 5.000</td>
<td>D₁ - 0.555</td>
<td>0.284</td>
<td>0.024</td>
<td>0.260</td>
<td>0.278</td>
<td>0.040</td>
<td>0.030</td>
<td>0.007</td>
</tr>
<tr>
<td>5.001 – 8.999</td>
<td>D₁ - 0.762</td>
<td>0.379</td>
<td>0.032</td>
<td>0.325</td>
<td>0.381</td>
<td>0.050</td>
<td>0.033</td>
<td>0.008</td>
</tr>
<tr>
<td>9.000 – 15.000</td>
<td>D₁ - 0.878</td>
<td>0.379</td>
<td>0.032</td>
<td>0.325</td>
<td>0.439</td>
<td>0.064</td>
<td>0.044</td>
<td>0.009</td>
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</table>

*Radial Clearance G max. = maximum permissible gap all on one side using max. tube diameter and min. clearance diameter.*
### Part Number Range (Inch)*

<table>
<thead>
<tr>
<th>ØD₁</th>
<th>Ød₁</th>
<th>L₁</th>
<th>Part Number</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>Tol. H9</td>
<td>Tol. H9</td>
<td>Tol. +0.008</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.000</td>
<td>0.692</td>
<td>0.129</td>
<td>PFRER01000RHLX</td>
</tr>
<tr>
<td>1.250</td>
<td>0.942</td>
<td>0.129</td>
<td>PFRER01250RHLX</td>
</tr>
<tr>
<td>1.500</td>
<td>1.192</td>
<td>0.129</td>
<td>PFRER01500RHLX</td>
</tr>
<tr>
<td>1.750</td>
<td>1.442</td>
<td>0.129</td>
<td>PFRER01750RHLX</td>
</tr>
<tr>
<td>2.000</td>
<td>1.692</td>
<td>0.129</td>
<td>PFRER02000RHLX</td>
</tr>
<tr>
<td>2.250</td>
<td>1.942</td>
<td>0.129</td>
<td>PFRER02250RHLX</td>
</tr>
<tr>
<td>2.500</td>
<td>2.192</td>
<td>0.129</td>
<td>PFRER02500RHLX</td>
</tr>
<tr>
<td>2.750</td>
<td>2.442</td>
<td>0.129</td>
<td>PFRER02750RHLX</td>
</tr>
<tr>
<td>3.000</td>
<td>2.445</td>
<td>0.284</td>
<td>PFRER03000RHLX</td>
</tr>
<tr>
<td>3.250</td>
<td>2.695</td>
<td>0.284</td>
<td>PFRER03250RHLX</td>
</tr>
<tr>
<td>3.500</td>
<td>2.945</td>
<td>0.284</td>
<td>PFRER03500RHLX</td>
</tr>
<tr>
<td>3.750</td>
<td>3.195</td>
<td>0.284</td>
<td>PFRER03750RHLX</td>
</tr>
<tr>
<td>4.000</td>
<td>3.445</td>
<td>0.284</td>
<td>PFRER04000RHLX</td>
</tr>
<tr>
<td>4.125</td>
<td>3.570</td>
<td>0.284</td>
<td>PFRER04125RHLX</td>
</tr>
<tr>
<td>4.250</td>
<td>3.695</td>
<td>0.284</td>
<td>PFRER04250RHLX</td>
</tr>
<tr>
<td>4.500</td>
<td>3.945</td>
<td>0.284</td>
<td>PFRER04500RHLX</td>
</tr>
<tr>
<td>4.750</td>
<td>4.195</td>
<td>0.284</td>
<td>PFRER04750RHLX</td>
</tr>
<tr>
<td>5.000</td>
<td>4.445</td>
<td>0.284</td>
<td>PFRER05000RHLX</td>
</tr>
<tr>
<td>5.250</td>
<td>4.488</td>
<td>0.379</td>
<td>PFRER05250RHLX</td>
</tr>
</tbody>
</table>

### Applications with Maximum Radial Clearance

Applications with maximum radial clearance that are using nylon, phenolic, or PTFE bearings must ensure proper clearance in accordance with the bearing recommendations to avoid metal-to-metal contact. Please refer to Hallite Type 87, Type 506, and Type 533 Specification Sheets for this information.

*Please contact Hallite for custom sizes, material selection, or seal design.*