

PFR

PISTON SEAL

Double-Acting

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 Armormlene® 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 Armormlene® materials to suit a wide range of demanding applications.

This seal is designed to fit the ANSI B93.32-1973 and NFPAT3.19.18 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	E	R	01250	R	HLX	—
PROFILE DESIGNATION	UNIT OF MEASUREMENT M = Metric E = Inch	APPLICATION Refer to Installation Recommendations and use designator for desired application	BORE DIAMETER Metric = mm X 10 Inch = inches X 1000	ENERGIZER MATERIAL Refer to Energizer Table for desired energizer material	PTFE MATERIAL Refer to Material Table for desired PTFE (face) material	SPECIAL FEATURE Blank = Std profile N Notches



OPERATING CONDITIONS

	metric	inch
Maximum Speed	Up to 4.0m/sec	Up to 13.0ft/sec
Temperature Range*	-45 to 200°C	-49 to 392°F
Maximum Dynamic Pressure	350 bar	5000 psi

*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

SURFACE ROUGHNESS	metric			inch			RMR*
	μMRA	μMRZ	μMRT	μINRA	μINRZ	μINRT	
Dynamic Sealing Face ØD₁	0.05 - 0.2	1.3 max	2 max	2 - 8	52 max	78 max	60% - 90%
Static Sealing Face Ød₁	1.6 max	7 max	10 max	63 max	276 max	394 max	
Static Housing Faces L₁	3.2 max	10 max	16 max	125 max	394 max	630 max	

*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

ENERGIZER MATERIAL (SHORE A)	ENERGIZER TYPE	ENERGIZER DESIGNATION	ENERGIZER OPERATING TEMPERATURE°C	ENERGIZER OPERATING TEMPERATURE°F
NBR - 70A	Square	R	-30 to 100°C	-22 to 212°F
No Energizer*	None	X	-	-

*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	FILLER	MATERIAL DESIGNATOR	COLOR	TEMPERATURE RANGE°C	TEMPERATURE RANGE°F	MAXIMUM DYNAMIC PRESSURE - BAR	MAXIMUM DYNAMIC PRESSURE - PSI
ARMORLENE® HLX <ul style="list-style-type: none"> • Standard material for hydraulic applications • High compressive strength • Excellent extrusion resistance • Extended wear resistance 	Special Bronze Compound	HLX	Gold	-73 to 288°C	-100 to 550°F	350 bar	5000 psi
ARMORLENE® 702 <ul style="list-style-type: none"> • Excellent in lubricating and non-lubricating hydraulic fluids • Good low-friction properties • Excellent extrusion resistance • Good chemical resistance 	Glass Molybdenum Disulfide	702	Gray	-73 to 260°C	-100 to 500°F	300 bar	4350 psi
ARMORLENE® 706 <ul style="list-style-type: none"> • Excellent in lubricating and non-lubricating hydraulic fluids • Excellent extrusion resistance • Good chemical resistance • Good dielectrical properties 	15% Glass	706	Off-White	-73 to 260°C	-100 to 500°F	300 bar	4350 psi
ARMORLENE® 701 <ul style="list-style-type: none"> • Excellent in lubricating and non-lubricating hydraulic fluids • Excellent extrusion resistance • Good chemical resistance • Good dielectrical properties 	25% Glass	701	Off-White	-73 to 260°C	-100 to 500°F	350 bar	5000 psi

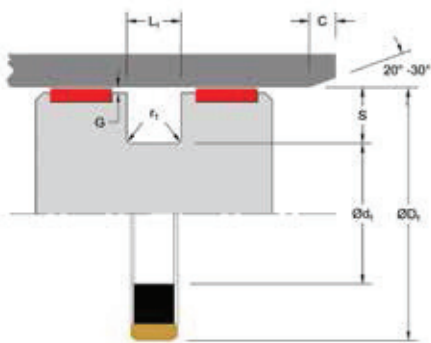
For other material options consult the Master Materials Index at the front of the catalog. If you do not find the material that you require please contact your local Hallite sales office.

INSTALLATION RECOMMENDATIONS

inch								
BORE DIAMETER ØD ₁ H9	GROOVE DIAMETER	GROOVE WIDTH	RADIUS	CHAMFER	GROOVE SECTION	RADIAL CLEARANCE G max*		
	Ød ₁ h9	L ₁ + 0.008	r ₁	C	S	Up to 1000 psi	Up to 3000 psi	Up to 5000 psi
1.000 – 2.999	D ₁ - 0.308	0.129	0.016	0.125	0.154	0.026	0.010	0.006
3.000 – 5.000	D ₁ - 0.555	0.284	0.024	0.260	0.278	0.040	0.030	0.007
5.001 – 8.999	D ₁ - 0.762	0.379	0.032	0.325	0.381	0.050	0.033	0.008
9.000 – 15.000	D ₁ - 0.878	0.379	0.032	0.325	0.439	0.064	0.044	0.009

*Radial Clearance G max. = maximum permissible gap all on one side using max. tube diameter and min. clearance diameter.





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.

PART NUMBER RANGE (INCH)*

inch			PART NUMBER
ØD ₁	Ød ₁	L ₁	
Tol. H9	Tol. H9	Tol. +0.008	
1.000	0.692	0.129	PFRER01000RHLX
1.250	0.942	0.129	PFRER01250RHLX
1.500	1.192	0.129	PFRER01500RHLX
1.750	1.442	0.129	PFRER01750RHLX
2.000	1.692	0.129	PFRER02000RHLX
2.250	1.942	0.129	PFRER02250RHLX
2.500	2.192	0.129	PFRER02500RHLX
2.750	2.442	0.129	PFRER02750RHLX
3.000	2.445	0.284	PFRER03000RHLX
3.250	2.695	0.284	PFRER03250RHLX
3.500	2.945	0.284	PFRER03500RHLX
3.750	3.195	0.284	PFRER03750RHLX
4.000	3.445	0.284	PFRER04000RHLX
4.125	3.570	0.284	PFRER04125RHLX
4.250	3.695	0.284	PFRER04250RHLX
4.500	3.945	0.284	PFRER04500RHLX
4.750	4.195	0.284	PFRER04750RHLX
5.000	4.445	0.284	PFRER05000RHLX
5.250	4.488	0.379	PFRER05250RHLX

inch			PART NUMBER
ØD ₁	Ød ₁	L ₁	
Tol. H9	Tol. H9	Tol. +0.008	
5.500	4.738	0.379	PFRER05500RHLX
5.750	4.988	0.379	PFRER05750RHLX
6.000	5.238	0.379	PFRER06000RHLX
6.250	5.488	0.379	PFRER06250RHLX
6.500	5.738	0.379	PFRER06500RHLX
7.000	6.238	0.379	PFRER07000RHLX
7.250	6.488	0.379	PFRER07250RHLX
7.500	6.738	0.379	PFRER07500RHLX
7.750	6.988	0.379	PFRER07750RHLX
8.000	7.238	0.379	PFRER08000RHLX
8.250	7.488	0.379	PFRER08250RHLX
8.500	7.738	0.379	PFRER08500RHLX
9.000	8.122	0.379	PFRER09000RHLX
9.500	8.622	0.379	PFRER09500RHLX
10.000	9.122	0.379	PFRER10000RHLX
11.000	10.122	0.379	PFRER11000RHLX
12.000	11.122	0.379	PFRER12000RHLX
13.000	12.122	0.379	PFRER13000RHLX
14.000	13.122	0.379	PFRER14000RHLX

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