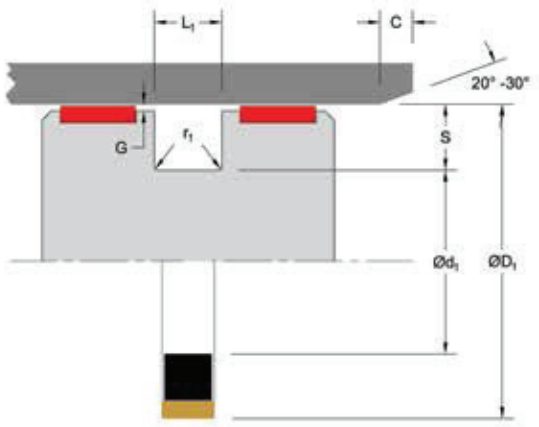


PCA

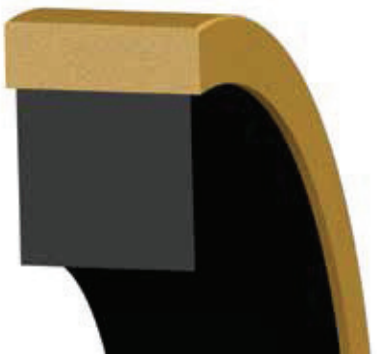
PISTON SEAL

Double-Acting

TECHNICAL DETAILS

The Hallite PCA is a double-acting piston seal that performs well in both high- and low-pressure systems. The PCA has a square edge design on the primary sealing face paired with a square elastomer energizer. The square ring provides more stable pressure loading to the PTFE face ring, therefore it provides exceptional sealability throughout the pressure ranges. High-performance Armorlene® materials, like HLX, provide outstanding wear and extrusion-resistance properties as well as large range of temperature and media compatibility.

The Hallite PCA seal is well-suited for a variety of hydraulic and pneumatic reciprocating applications. The compact housing allows designers to use a narrow-width piston, but it is recommended that proper guidance be used with this seal, especially in heavy-duty applications (see Hallite Bearings section). The PCA seal is available in a variety of Hallite's high-performance Armorlene® materials to suit a wide range of demanding applications.



F E A T U R E S

- Low breakout friction and elimination of stick-slip action
- Compact design to save metal spacing
- High service temperature, long wear, and high extrusion resistance
- Compact design allows for smaller grooves in hardware

Part Number Structure

PCAMR00400RHLX _

PCA	M	R	00400	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 15.0m/sec	Up to 50.0ft/sec
Temperature Range*	-45 to 200°C	-49 to 392°F
Maximum Dynamic Pressure**	400 bar	5800 psi

**Dependent upon energizer used (NBR, FKM, etc.). **For pressures above 400 bar, contact Hallite Engineering.*

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

	metric			inch			RMR*
SURFACE ROUGHNESS	**µMRA**	**µMRZ**	**µMRT**	**µINRA**	**µINRZ**	**µINRT**	
Dynamic Sealing Face $ØD_1$	0.05 - 0.2	1.3 max	2 max	2 - 8	52 max	78 max	60% - 90%
Static Sealing Face $Ød_1$	1.6 max	7 max	10 max	63 max	276 max	394 max	
Static Housing Faces L_1	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

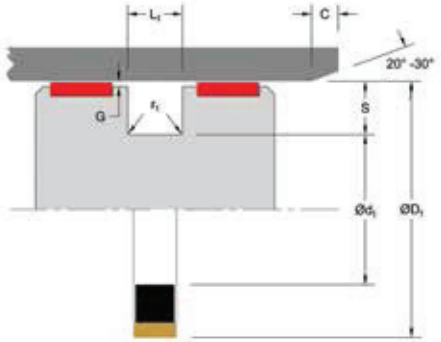
ENERGIZER MATERIAL (SHORE A)	ENERGIZER TYPE	ENERGIZER DESIGNATION	ENERGIZER OPERATING TEMPERATURE°C	ENERGIZER OPERATING TEMPERATURE°F
NBR - 70A	Square	R	-30 to 100°C	-22 to 212°F
No Energizer*	None	X	-	-

**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 • 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	500 bar	7250 psi
ARMORLENE® HLA • Excellent in all hydraulic fluids • Excellent wear resistance • Excellent low-friction properties • Good extrusion resistance	Special Mineral Compound	HLA	Gray	-73 to 260°C	-100 to 500°F	500 bar	7250 psi
ARMORLENE® 702 • 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

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.



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.

INSTALLATION RECOMMENDATIONS

metric

BORE DIAMETER ØD$_1$ H9	GROOVE DIAMETER	GROOVE WIDTH	RADIUS	CHAMFER	GROOVE SECTION	RADIAL CLEARANCE G max*			
DIAMETER RANGE Standard Duty Application - R	Ød$_1$ h9	L$_1$ + 0.2	r$_1$	C	S	Up to 100 bar	Up to 160 bar	Up to 250 bar	Up to 400 bar
20.0 - 60.0	D$_1$ - 10.0	4.5	0.3	4.0	5.00	0.30	0.25	0.22	0.13
61.0 - 107.0	D$_1$ - 15.0	7.5	0.5	6.5	7.50	0.30	0.25	0.22	0.13
108.0 - 160.0	D$_1$ - 16.0	7.5	0.5	6.5	8.00	0.30	0.25	0.22	0.13
161.0 - 250.0	D$_1$ - 22.0	11.0	0.5	6.5	11.00	0.30	0.25	0.22	0.13
251.0 - 400.0	D$_1$ - 24.0	12.0	0.5	10.0	12.00	0.30	0.25	0.22	0.13
401.0 - 900.0	D$_1$ - 30.0	15.0	0.8	15.0	15.00	0.30	0.25	0.22	0.13
> 900.0	D$_1$ - 40.0	20.0	0.8	20.0	20.00	0.30	0.25	0.22	0.13

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

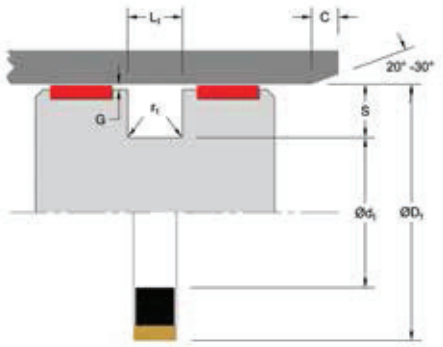
PART NUMBER RANGE (METRIC)*

metric

ØD$_1$ Tol. H9	Ød$_1$ Tol. H9	L$_1$ Tol. +0.2	PART NUMBER
40.0	30.0	4.5	PCAMR00400****
45.0	35.0	4.5	PCAMR00450****
50.0	40.0	4.5	PCAMR00500****
55.0	45.0	4.5	PCAMR00550****
56.0	46.0	4.5	PCAMR00560****
60.0	50.0	4.5	PCAMR00600****
63.0	48.0	7.5	PCAMR00630****
65.0	50.0	7.5	PCAMR00650****

metric

ØD$_1$ Tol. H9	Ød$_1$ Tol. H9	L$_1$ Tol. +0.2	PART NUMBER
69.0	54.0	7.5	PCAMR00690****
70.0	55.0	7.5	PCAMR00700****
71.0	56.0	7.5	PCAMR00710****
75.0	60.0	7.5	PCAMR00750****
80.0	65.0	7.5	PCAMR00800****
85.0	70.0	7.5	PCAMR00850****
90.0	75.0	7.5	PCAMR00900****
95.0	80.0	7.5	PCAMR00950****



PCA

PISTON SEAL

Double-Acting

PART NUMBER RANGE (METRIC)*

metric			
$ØD_1$	$Ød_1$	L_1	PART NUMBER
Tol. H9	Tol. H9	Tol. +0.2	
100.0	85.0	7.5	PCAMR01000****
105.0	90.0	7.5	PCAMR01050****
108.0	92.0	7.5	PCAMR01080****
110.0	94.0	7.5	PCAMR01100****
112.0	96.0	7.5	PCAMR01120****
120.0	104.0	7.5	PCAMR01200****
125.0	109.0	7.5	PCAMR01250****
130.0	114.0	7.5	PCAMR01300****
135.0	119.0	7.5	PCAMR01350****
140.0	124.0	7.5	PCAMR01400****
145.0	129.0	7.5	PCAMR01450****
150.0	134.0	7.5	PCAMR01500****
155.0	139.0	7.5	PCAMR01550****
160.0	144.0	7.5	PCAMR01600****
170.0	148.0	11.0	PCAMR01700****
180.0	158.0	11.0	PCAMR01800****
190.0	168.0	11.0	PCAMR01900****
200.0	178.0	11.0	PCAMR02000****
204.0	182.0	11.0	PCAMR02040****
210.0	188.0	11.0	PCAMR02100****
215.0	193.0	11.0	PCAMR02150****
220.0	198.0	11.0	PCAMR02200****
224.0	202.0	11.0	PCAMR02240****
225.0	203.0	11.0	PCAMR02250****
230.0	208.0	11.0	PCAMR02300****
240.0	218.0	11.0	PCAMR02400****
250.0	228.0	11.0	PCAMR02500****
260.0	236.0	12.0	PCAMR02600****

metric			
$ØD_1$	$Ød_1$	L_1	PART NUMBER
Tol. H9	Tol. H9	Tol. +0.2	
270.0	246.0	12.0	PCAMR02700****
280.0	256.0	12.0	PCAMR02800****
290.0	266.0	12.0	PCAMR02900****
300.0	276.0	12.0	PCAMR03000****
310.0	286.0	12.0	PCAMR03100****
320.0	296.0	12.0	PCAMR03200****
360.0	336.0	12.0	PCAMR03600****
400.0	376.0	12.0	PCAMR04000****
485.0	455.0	15.0	PCAMR04850****
500.0	470.0	15.0	PCAMR05000****
600.0	570.0	15.0	PCAMR06000****
650.0	620.0	15.0	PCAMR06500****
720.0	690.0	15.0	PCAMR07200****
900.0	870.0	15.0	PCAMR09000****
930.0	890.0	20.0	PCAMR09300****
1000.0	960.0	20.0	PCAMR10000****
1060.0	1020.0	20.0	PCAMR10600****
1120.0	1080.0	20.0	PCAMR11200****
1150.0	1110.0	20.0	PCAMR11500****
1210.0	1170.0	20.0	PCAMR12100****
1250.0	1210.0	20.0	PCAMR12500****

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