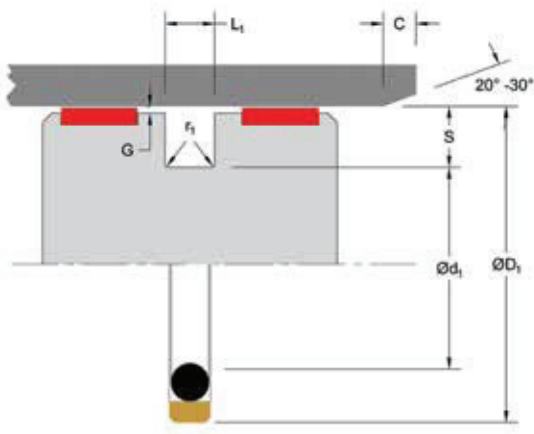




P54

PISTON SEAL

Double-Acting

TECHNICAL DETAILS

The Hallite P54 is a double-acting, o-ring energized, low-friction piston seal that performs well in both high- and low-pressure systems. High-performance Armorlene® materials, like HLX, provide outstanding wear and extrusion-resistance properties as well as large range of temperature and media compatibility. The P54 has a proven design pedigree as a high-performance seal used in demanding applications. The standard P54 seal face includes pressure notches, which makes the seal very responsive to changes in pressure or direction of travel. Used successfully for years in performance-critical applications in construction equipment, machine tools, material handling, agricultural equipment, and other industries, the Hallite P54 is a workhorse compact, double-acting, piston-sealing solution. Its design fits a variety of housing sizes, including ISO 7425-1 grooves, and is offered in a wide range of metric and inch options. Hallite recommends proper guidance be used with this seal in heavy-duty applications (see Hallite Bearings section).

This seal is available in a variety of Hallite's high-performance Armorlene® and Hythane® materials to suit a wide range of demanding applications.



FEATURES

- No stick-slip
- Low breakout and running friction
- Excellent in high-speed applications
- Compact piston design
- Seal ring component can be machined to any size
- Pressure notches to optimize seal response at all pressures

Part Number Structure

P54MR00900NHLX _

P54	M	R	00900	N	HLX	—
PROFILE DESIGNATION	UNIT OF MEASUREMENT M = Metric E = Inch	APPLICATION Refer to <i>Installation Recommendations</i> and use designator for desired application	BORE DIAMETER Metric = mm X 10 Inch = inches X 1000	ENERGIZER MATERIAL Refer to <i>Energizer Table</i> for desired energizer material	PTFE MATERIAL Refer to <i>Material Table</i> for desired PTFE (face) material	SPECIAL FEATURE Blank = Std profile (with notches) X = No Notches <i>Notches not offered with groove widths (L1) of 2.2mm (0.087in) or 3.2mm (0.126in)</i>



OPERATING CONDITIONS

	metric	inch
Maximum Speed	Up to 15m/sec	Up to 50.0ft/sec
Temperature Range*	-45 to 200°C	-49 to 392°F
Maximum Dynamic Pressure**	600 bar	8700 psi

*Dependent upon energizer used (NBR, FKM, etc.). **For pressures above 400 bar (5800 psi), 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

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	O-Ring	N	-30 to 100°C	-22 to 212°F
NBR - 70A Low temp.	O-Ring	L	-45 to 80°C	-49 to 176°F
FKM - 75A	O-Ring	F	-10 to 200°C	14 to 392°F
EPDM - 70A	O-Ring	E	-45 to 145°C	-49 to 293°F
HNBR - 70A	O-Ring	H	-25 to 150°C	-13 to 302°F
NBR - 90A	O-Ring	Q	-30 to 100°C	-22 to 212°F
HNBR - 90A	O-Ring	U	-25 to 150°C	-13 to 302°F
No Energizer*	None	X	-	-

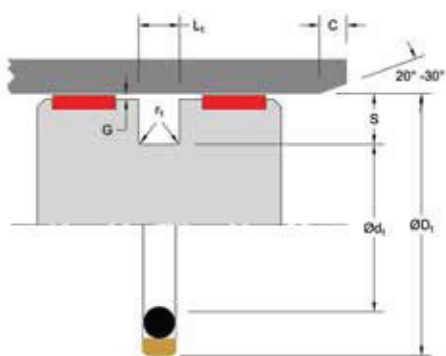
*Seal ratings are based upon capabilities of its matched material components. Hallite cannot rate seal performance when the seal is mixed with other manufacturers' energizers/components.

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
ARMORLENE® 706 - 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® 700 - Excellent in all hydraulic fluids - Recommended for use with soft mating surfaces - Low friction and no stick-slip	Unfilled	700	White	-184 to 204°C	-300 to 400°F	200 bar	2900 psi
ARMORLENE® HCF - Excellent in lubricating and non-lubricating hydraulic fluids (includes water) w/o zinc content - Not recommended for gas sealing applications - Not recommended for electrical conductive fluids	Carbon Fiber Filled	HCF	Gray/Black	-73 to 260°C	-100 to 500°F	250 bar	3600 psi
ARMORLENE® HCV - Recommended for lubricating and non-lubricating fluids - Excellent for high-frequency and short-stroke applications - Not recommended for gas sealing applications - Not recommended for electrical conductive fluids	High Carbon Fiber Filled	HCV	Gray/Black	-73 to 260°C	-100 to 500°F	300 bar	4350 psi
ARMORLENE® 711 - Excellent in all lubricating fluids and pneumatic applications - High chemical resistance - Excellent extrusion resistance - Excellent wear properties	25% Carbon/Graphite	711	Black	-73 to 288°C	-100 to 550°F	400 bar	5800 psi
ARMORLENE® 713 - High compressive strength - Excellent extrusion resistance - Excellent wear properties	60% Bronze Content	713	Bronze	-73 to 288°C	-100 to 550°F	600 bar	8700 psi
HU9 - POLYURETHANE, 95A - Positive position load holding - Excellent extrusion resistance - Excellent wear resistance	Standard	HU9	Red	-20 to 115°C	-4 to 240°F	500 bar	7250 psi
HU5 - POLYURETHANE, 55D - Positive position load holding - Excellent extrusion resistance - Excellent wear resistance	Standard	HU5	Yellow	-20 to 115°C	-4 to 240°F	500 bar	7250 psi
HYTHANE® 9270111 - POLYESTER, 55D - Positive position load holding - Hydrolysis stabilized - Strong chemical resistance - Excellent extrusion resistance - Excellent wear properties	Hydrolysis Stabilized	111	Gray	-40 to 120°C	-40 to 250°F	500 bar	7250 psi
HYTHANE® 9270261 - POLYESTER, 55D - Positive position load holding - Internal lubrication provides extended wear in high-speed applications - Excellent extrusion resistance - Excellent wear resistance	Internally Lubricated	261	Off-White	-40 to 120°C	-40 to 250°F	500 bar	7250 psi
HE5 - POLYESTER, 55D - Positive position load holding - Excellent extrusion resistance - Excellent wear resistance	Standard	HE5	Gray/Black	-20 to 115°C	-40 to 240°F	500 bar	7250 psi
748 - UHMWPE - Excellent impact resistance - Good dielectrical properties - Excellent abrasion resistance - Low coefficient of friction	Standard	748	Translucent	-184 to 82°C	-300 to 180°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.





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.

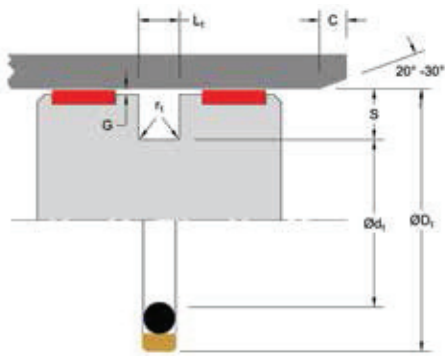
INSTALLATION RECOMMENDATIONS

metric

BORE DIAMETER ØD ₁ H9			GROOVE DIAMETER	GROOVE WIDTH	RADIUS	CHAMFER	GROOVE SECTION	RADIAL CLEARANCE G max*			O-RING CROSS SECTION
DIAMETER RANGE			Ød ₁ h9	L ₁ + 0.2	r ₁	C	S	Up to 100 bar	Up to 200 bar	Up to 400 bar	O-Ring
Standard Duty Application - R	Light Duty Application - L	Heavy Duty Application - H									
8.0 - 14.9	15.0 - 39.9	-	D ₁ - 4.9	2.2	0.4	2.0	2.45	0.30	0.20	0.15	1.78
15.0 - 39.9	40.0 - 79.9	-	D ₁ - 7.5	3.2	0.6	3.0	3.75	0.40	0.25	0.15	2.62
40.0 - 79.9	80.0 - 132.9	15.0 - 39.9	D ₁ - 11.0	4.2	1.0	4.0	5.50	0.40	0.25	0.20	3.53
80.0 - 132.9	133.0 - 329.9	40.0 - 79.9	D ₁ - 15.5	6.3	1.3	6.0	7.75	0.50	0.30	0.20	5.33
133.0 - 329.9	330.0 - 669.9	80.0 - 132.9	D ₁ - 21.0	8.1	1.8	8.0	10.50	0.60	0.35	0.25	6.99
330.0 - 669.9	670.0 - 999.9	133.0 - 329.9	D ₁ - 24.5	8.1	1.8	8.0	12.25	0.60	0.35	0.25	6.99
670.0 - 999.9	≥ 1000.0	330.0 - 669.9	D ₁ - 28.0	9.5	2.5	9.0	14.00	0.70	0.50	0.30	8.40
≥ 1000.0	-	670.0 - 999.9	D ₁ - 38.0	13.8	3.0	10.0	19.00	1.00	0.70	0.60	12.00

At pressure >400 bar use diameter tolerance H8/f7.

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



P54

PISTON SEAL

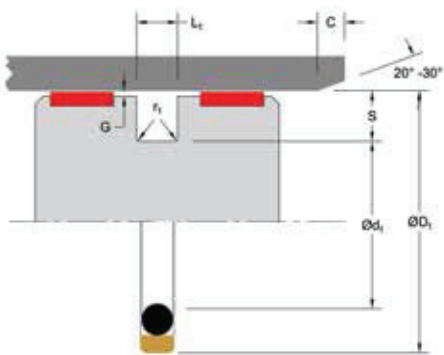
Double-Acting

PART NUMBER RANGE (METRIC)*

metric			PART NUMBER
ØD ₁	Ød ₁	L ₁	
Tol. H9	Tol. H9	Tol. +0.2	
8.0	3.1	2.2	P54MR00080****
10.0	5.1	2.2	P54MR00100****
12.0	7.1	2.2	P54MR00120****
14.0	9.1	2.2	P54MR00140****
15.0	7.5	3.2	P54MR00150****
16.0	11.1	2.2	P54ML00160****
16.0	8.5	3.2	P54MR00160****
18.0	13.1	2.2	P54ML00180****
18.0	10.5	3.2	P54MR00180****
20.0	15.1	2.2	P54ML00200****
20.0	12.5	3.2	P54MR00200****
21.0	13.5	3.2	P54MR00210****
22.0	17.1	2.2	P54ML00220****
22.0	14.5	3.2	P54MR00220****
24.0	16.5	3.2	P54MR00240****
24.0	19.1	2.2	P54ML00240****
25.0	20.1	2.2	P54ML00250****
25.0	17.5	3.2	P54MR00250****
25.0	14.0	4.2	P54MH00250****
28.0	20.5	3.2	P54MR00280****
30.0	22.5	3.2	P54MR00300****
32.0	27.1	2.2	P54ML00320****
32.0	24.5	3.2	P54MR00320****
32.0	21.0	4.2	P54MH00320****
35.0	27.5	3.2	P54MR00350****
35.0	24.0	4.2	P54MH00350****
36.0	28.5	3.2	P54MR00360****
38.0	30.5	3.2	P54MR00380****

metric			PART NUMBER
ØD ₁	Ød ₁	L ₁	
Tol. H9	Tol. H9	Tol. +0.2	
40.0	32.5	3.2	P54ML00400****
40.0	29.0	4.2	P54MR00400****
42.0	31.0	4.2	P54MR00420****
45.0	34.0	4.2	P54MR00450****
48.0	37.0	4.2	P54MR00480****
50.0	42.5	3.2	P54ML00500****
50.0	39.0	4.2	P54MR00500****
50.0	34.5	6.3	P54MH00500****
50.8	43.3	3.2	P54ML00508****
50.8	39.8	4.2	P54MR00508****
52.0	41.0	4.2	P54MR00520****
53.0	42.0	4.2	P54MR00530****
55.0	44.0	4.2	P54MR00550****
57.0	46.0	4.2	P54MR00570****
58.0	47.0	4.2	P54MR00580****
60.0	49.0	4.2	P54MR00600****
62.0	51.0	4.2	P54MR00620****
63.0	52.0	4.2	P54MR00630****
63.0	47.5	6.3	P54MH00630****
65.0	54.0	4.2	P54MR00650****
68.0	57.0	4.2	P54MR00680****
70.0	59.0	4.2	P54MR00700****
70.0	54.5	6.3	P54MH00700****
75.0	64.0	4.2	P54MR00750****
75.0	59.5	6.3	P54MH00750****
80.0	69.0	4.2	P54ML00800****
80.0	64.5	6.3	P54MR00800****
80.0	59.0	8.1	P54MH00800****

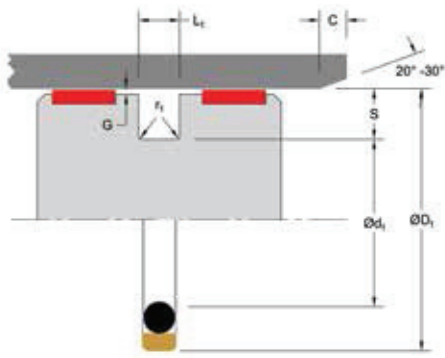




PART NUMBER RANGE (METRIC)*

metric			PART NUMBER
ØD ₁	Ød ₁	L ₁	
Tol. H9	Tol. H9	Tol. +0.2	
82.5	67.0	6.3	P54MR00825****
85.0	69.5	6.3	P54MR00850****
85.0	64.0	8.1	P54MH00850****
90.0	79.0	4.2	P54ML00900****
90.0	74.5	6.3	P54MR00900****
90.0	69.0	8.1	P54MH00900****
95.0	84.0	4.2	P54ML00950****
95.0	79.5	6.3	P54MR00950****
95.0	74.0	8.1	P54MH00950****
100.0	89.0	4.2	P54ML01000****
100.0	84.5	6.3	P54MR01000****
100.0	79.0	8.1	P54MH01000****
101.6	86.1	6.3	P54MR01016****
105.0	94.0	4.2	P54ML01050****
105.0	89.5	6.3	P54MR01050****
108.0	92.5	6.3	P54MR01080****
110.0	99.0	4.2	P54ML01100****
110.0	94.5	6.3	P54MR01100****
110.0	89.0	8.1	P54MH01100****
115.0	99.5	6.3	P54MR01150****
120.0	109.0	4.2	P54ML01200****
120.0	104.5	6.3	P54MR01200****
120.0	99.0	8.1	P54MH01200****
125.0	114.0	4.2	P54ML01250****
125.0	109.5	6.3	P54MR01250****
125.0	104.0	8.1	P54MH01250****
127.0	111.5	6.3	P54MR01270****
130.0	114.5	6.3	P54MR01300****

metric			PART NUMBER
ØD ₁	Ød ₁	L ₁	
Tol. H9	Tol. H9	Tol. +0.2	
130.0	109.0	8.1	P54MH01300****
132.0	121.0	4.2	P54ML01320****
135.0	114.0	8.1	P54MR01350****
140.0	124.5	6.3	P54ML01400****
140.0	119.0	8.1	P54MR01400****
145.0	129.5	6.3	P54ML01450****
145.0	124.0	8.1	P54MR01450****
150.0	134.5	6.3	P54ML01500****
150.0	129.0	8.1	P54MR01500****
155.0	134.0	8.1	P54MR01550****
160.0	144.5	6.3	P54ML01600****
160.0	139.0	8.1	P54MR01600****
165.0	144.0	8.1	P54MR01650****
170.0	149.0	8.1	P54MR01700****
175.0	154.0	8.1	P54MR01750****
180.0	164.5	6.3	P54ML01800****
180.0	159.0	8.1	P54MR01800****
185.0	164.0	8.1	P54MR01850****
190.0	169.0	8.1	P54MR01900****
194.0	178.5	6.3	P54ML01940****
200.0	184.5	6.3	P54ML02000****
200.0	179.0	8.1	P54MR02000****
205.0	184.0	8.1	P54MR02050****
210.0	189.0	8.1	P54MR02100****
215.0	194.0	8.1	P54MR02150****
220.0	199.0	8.1	P54MR02200****
225.0	204.0	8.1	P54MR02250****
230.0	214.5	6.3	P54ML02300****



P54

PISTON SEAL

Double-Acting

PART NUMBER RANGE (METRIC)*

metric			PART NUMBER
ØD ₁	Ød ₁	L ₁	
Tol. H9	Tol. H9	Tol. +0.2	
230.0	209.0	8.1	P54MR02300****
240.0	219.0	8.1	P54MR02400****
250.0	229.0	8.1	P54MR02500****
250.0	225.5	8.1	P54MH02500****
250.0	234.5	6.3	P54ML02500****
254.0	233.0	8.1	P54MR02540****
260.0	239.0	8.1	P54MR02600****
265.0	244.0	8.1	P54MR02650****
268.0	247.0	8.1	P54MR02680****
270.0	249.0	8.1	P54MR02700****
280.0	259.0	8.1	P54MR02800****
290.0	269.0	8.1	P54MR02900****
300.0	279.0	8.1	P54MR03000****
300.0	275.5	8.1	P54MH03000****
304.8	283.8	8.1	P54MR03048****
310.0	289.0	8.1	P54MR03100****
320.0	299.0	8.1	P54MR03200****
320.0	295.5	8.1	P54MH03200****
330.0	305.5	8.1	P54MR03300****
340.0	315.5	8.1	P54MR03400****
350.0	325.5	8.1	P54MR03500****
360.0	335.5	8.1	P54MR03600****
370.0	345.5	8.1	P54MR03700****
380.0	355.5	8.1	P54MR03800****
390.0	365.5	8.1	P54MR03900****
400.0	375.5	8.1	P54MR04000****
420.0	395.5	8.1	P54MR04200****
430.0	405.5	8.1	P54MR04300****

metric			PART NUMBER
ØD ₁	Ød ₁	L ₁	
Tol. H9	Tol. H9	Tol. +0.2	
440.0	415.5	8.1	P54MR04400****
450.0	425.5	8.1	P54MR04500****
460.0	435.5	8.1	P54MR04600****
480.0	455.5	8.1	P54MR04800****
500.0	475.5	8.1	P54MR05000****
555.0	530.5	8.1	P54MR05550****
600.0	575.5	8.1	P54MR06000****
640.0	615.5	8.1	P54MR06400****
660.0	635.5	8.1	P54MR06600****
700.0	672.0	9.5	P54MR07000****
710.0	682.0	9.5	P54MR07100****
740.0	712.0	9.5	P54MR07400****
780.0	752.0	9.5	P54MR07800****
800.0	772.0	9.5	P54MR08000****
900.0	872.0	9.5	P54MR09000****
1000.0	972.0	9.5	P54ML10000****
1000.0	962.0	13.8	P54MR10000****
1050.0	1022.0	9.5	P54ML10500****
1065.0	1027.0	13.8	P54MR10650****
1070.0	1032.0	13.8	P54MR10700****
1200.0	1172.0	9.5	P54ML12000****
1200.0	1162.0	13.8	P54MR12000****
1225.0	1187.0	13.8	P54MR12250****

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

