

# GP2

## PISTON SEAL

Double-Acting

### TECHNICAL DETAILS

The Hallite GP2 is a double-acting piston seal utilizing Hallite's proprietary high-performance Armorlene® HLX PTFE paired with twin premium o-ring energizers and an x-ring for optimum performance and durability. The Armorlene® PTFE seal ring and the x-ring together provides the dynamic sealing function, while the o-ring energizers provide the static sealing.

Hallite's GP2 seals are especially effective in applications where two different types of media need to be separated such as in piston accumulators, intensifiers, and position-holding applications. This makes this seal a good choice for applications in stabilizers, accumulators, manlifts, industrial machinery, and hydraulic suspension. The GP2 is well-suited for larger-diameter heavy-duty systems.



### FEATURES

- Excellent sealing in applications that require separation of two different fluids
- Low breakout friction and elimination of stick-slip action
- Higher pressure rating than original GPS
- Uses an x-ring and 2 energizers to maximize sealing response at all pressure ranges to ensure best performance

### Part Number Structure

GP2MR00550NHLX \_

<b>GP2</b>	<b>M</b>	<b>R</b>	<b>00550</b>	<b>N</b>	<b>HLX</b>	<b>—</b>
<b>PROFILE DESIGNATION</b>	<b>UNIT OF MEASUREMENT</b> M = Metric E = Inch	<b>APPLICATION</b> Refer to <i>Installation Recommendations</i> and use designator for desired application	<b>BORE DIAMETER</b> Metric = mm X 10 Inch = inches X 1000	<b>ENERGIZER MATERIAL</b> Refer to <i>Energizer Table</i> for desired energizer material	<b>PTFE MATERIAL</b> Refer to <i>Material Table</i> for desired PTFE (face) material	<b>SPECIAL FEATURE</b> Blank = Std profile N = Notches



## OPERATING CONDITIONS

	metric	inch
<b>Maximum Speed</b>	Up to 3.0m/sec	Up to 10.0ft/sec
<b>Temperature Range*</b>	-45 to 200°C	-49 to 392°F
<b>Maximum Dynamic Pressure**</b>	600 bar	8700 psi

\*Dependent upon energizer used (NBR, FKM, etc.). \*\*For pressures above 300 bar (4350 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	
<b>Dynamic Sealing Face ØD<sub>1</sub></b>	0.05 - 0.2	1.3 max	2 max	2 - 8	52 max	78 max	60% - 90%
<b>Static Sealing Face Ød<sub>1</sub></b>	1.6 max	7 max	10 max	63 max	276 max	394 max	
<b>Static Housing Faces L<sub>1</sub></b>	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 AND X-RING TABLE

ENERGIZER AND X-RING MATERIAL (SHORE A)	ENERGIZER TYPE	ENERGIZER DESIGNATION	ENERGIZER OPERATING TEMPERATURE°C	ENERGIZER OPERATING TEMPERATURE°F
<b>NBR - 70A</b>	O-Ring/X-Ring	N	-30 to 100°C	-22 to 212°F
<b>NBR - 70A Low temp.</b>	O-Ring/X-Ring	L	-45 to 80°C	-49 to 176°F
<b>FKM - 75A</b>	O-Ring/X-Ring	F	-10 to 200°C	14 to 392°F
<b>EPDM - 70A</b>	O-Ring/X-Ring	E	-45 to 145°C	-49 to 293°F
<b>HNBR - 70A</b>	O-Ring/X-Ring	H	-25 to 150°C	-13 to 302°F
<b>NBR - 90A</b>	O-Ring/X-Ring	Q	-30 to 100°C	-22 to 212°F
<b>HNBR - 90A</b>	O-Ring/X-Ring	U	-25 to 150°C	-13 to 302°F
<b>No O-Ring Energizers or X-Ring*</b>	-	X	-	-

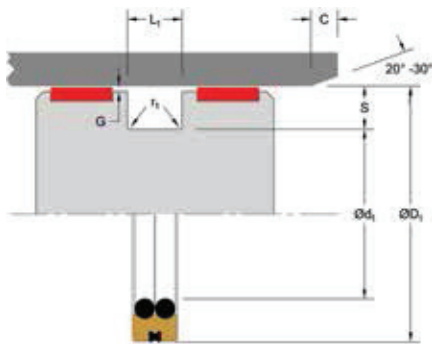
\*Seal ratings are based upon capabilities of its matched material components. Hallite cannot rate seal performance when the seal is mixed with other manufacturers' energizers/components.

## MATERIALS

MATERIAL FEATURES AND APPLICATIONS	FILLER	MATERIAL DESIGNATOR	COLOR	TEMPERATURE RANGE°C	TEMPERATURE RANGE°F	MAXIMUM DYNAMIC PRESSURE - BAR	MAXIMUM DYNAMIC PRESSURE - PSI
<b>ARMORLENE® HLX</b> <ul style="list-style-type: none"> <li>• Standard material for hydraulic applications</li> <li>• High compressive strength</li> <li>• Excellent extrusion resistance</li> <li>• Extended wear resistance</li> </ul>	Special Bronze Compound	HLX	Gold	-73 to 288°C	-100 to 550°F	500 bar	7250 psi
<b>ARMORLENE® HLA</b> <ul style="list-style-type: none"> <li>• Excellent in all hydraulic fluids</li> <li>• Excellent wear resistance</li> <li>• Excellent low-friction properties</li> <li>• Good extrusion resistance</li> </ul>	Special Mineral Compound	HLA	Gray	-73 to 260°C	-100 to 500°F	500 bar	7250 psi
<b>ARMORLENE® HCF</b> <ul style="list-style-type: none"> <li>• Excellent in lubricating and non-lubricating hydraulic fluids (includes water) w/o zinc content</li> <li>• Not recommended for gas sealing applications</li> <li>• Not recommended for electrical conductive fluids</li> </ul>	Carbon Fiber Filled	HCF	Gray/Black	-73 to 260°C	-100 to 500°F	250 bar	3625 psi
<b>ARMORLENE® 700</b> <ul style="list-style-type: none"> <li>• Excellent in all hydraulic fluids</li> <li>• Recommended for use with soft mating surfaces</li> <li>• Low friction and no stick-slip</li> </ul>	Unfilled	700	White	-184 to 204°C	-300 to 400°F	200 bar	2900 psi
<b>ARMORLENE® 713</b> <ul style="list-style-type: none"> <li>• High compressive strength</li> <li>• Excellent extrusion resistance</li> <li>• Excellent wear properties</li> </ul>	60% Bronze Content	713	Bronze	-73 to 288°C	-100 to 550°F	600 bar	8700 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 <sub>1</sub> H9		GROOVE DIAMETER	GROOVE WIDTH	RADIUS	CHAMFER	GROOVE SECTION	RADIAL CLEARANCE G max*			O-RING CROSS SECTION	X-RING CROSS SECTION
DIAMETER RANGE		Ød <sub>1</sub> h9	L <sub>1</sub> + 0.2	r <sub>1</sub>	C	S	Up to 100 bar	Up to 200 bar	Up to 300 bar	O-Ring	X-Ring
Standard Duty Application - R	Heavy Duty Application - H										
40.0 - 79.9	25.0 - 39.9	D <sub>1</sub> - 10.0	6.3	0.6	2.5	5.00	0.30	0.20	0.15	2.62	1.78
80.0 - 132.9	50.0 - 79.9	D <sub>1</sub> - 13.0	8.3	1.0	5	6.50	0.40	0.30	0.15	3.53	2.62
133.0 - 462.9	100.0 - 132.9	D <sub>1</sub> - 18.0	12.3	1.3	7.5	9.00	0.40	0.30	0.20	5.33	3.53
463.0 - 700.0	425.0 - 462.9	D <sub>1</sub> - 31.0	16.3	1.8	10	15.50	0.50	0.40	0.30	6.99	5.33

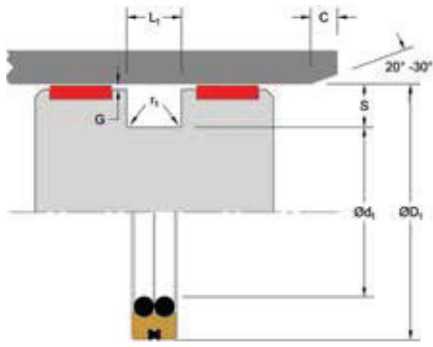
At pressure >300 bar use diameter tolerance H8/f7.

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

inch											
BORE DIAMETER ØD <sub>1</sub> H9		GROOVE DIAMETER	GROOVE WIDTH	RADIUS	CHAMFER	GROOVE SECTION	RADIAL CLEARANCE G max*		O-RING CROSS SECTION	X-RING CROSS SECTION	
DIAMETER RANGE		Ød <sub>1</sub> h9	L <sub>1</sub> + 0.2	r <sub>1</sub>	C	S	Up to 1500 psi	Up to 4350 psi	O-Ring	X-Ring	
Standard Duty Application - R	Heavy Duty Application - H										
1.500 - 2.999	-	D <sub>1</sub> - 0.394	0.248	0.005	2.500	5.000	0.012	0.009	0.103	0.070	
3.000 - 4.999	1.500 - 2.999	D <sub>1</sub> - 0.512	0.326	0.010	5.000	6.500	0.013	0.010	0.139	0.103	
5.000 - 11.999	3.000 - 4.999	D <sub>1</sub> - 0.709	0.484	0.015	7.500	9.000	0.014	0.011	0.210	0.139	
12.000 - 26.999	5.000 - 11.999	D <sub>1</sub> - 1.220	0.642	0.015	10.000	15.500	0.016	0.013	0.275	0.210	

At pressure >4350 psi use diameter tolerance H8/f7.

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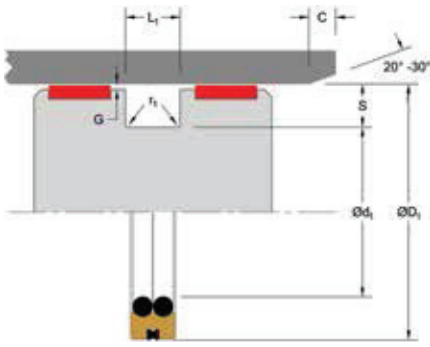
## PART NUMBER RANGE (METRIC)\*

metric			PART NUMBER
ØD <sub>1</sub>	Ød <sub>1</sub>	L <sub>1</sub>	
Tol. H9	Tol. H9	Tol. +0.2	
40.0	30.0	6.3	GP2MR00400****
42.0	32.0	6.3	GP2MR00420****
45.0	35.0	6.3	GP2MR00450****
48.0	38.0	6.3	GP2MR00480****
50.0	40.0	6.3	GP2MR00500****
52.0	42.0	6.3	GP2MR00520****
55.0	45.0	6.3	GP2MR00550****
60.0	50.0	6.3	GP2MR00600****
63.0	53.0	6.3	GP2MR00630****
65.0	55.0	6.3	GP2MR00650****
70.0	60.0	6.3	GP2MR00700****
75.0	65.0	6.3	GP2MR00750****
80.0	67.0	8.3	GP2MR00800****
85.0	72.0	8.3	GP2MR00850****
90.0	77.0	8.3	GP2MR00900****
95.0	82.0	8.3	GP2MR00950****
100.0	87.0	8.3	GP2MR01000****
105.0	92.0	8.3	GP2MR01050****
110.0	97.0	8.3	GP2MR01100****
115.0	102.0	8.3	GP2MR01150****
120.0	107.0	8.3	GP2MR01200****
125.0	112.0	8.3	GP2MR01250****
130.0	117.0	8.3	GP2MR01300****
135.0	117.0	12.3	GP2MR01350****
140.0	122.0	12.3	GP2MR01400****
150.0	132.0	12.3	GP2MR01500****
160.0	142.0	12.3	GP2MR01600****
170.0	152.0	12.3	GP2MR01700****

metric			PART NUMBER
ØD <sub>1</sub>	Ød <sub>1</sub>	L <sub>1</sub>	
Tol. H9	Tol. H9	Tol. +0.2	
180.0	162.0	12.3	GP2MR01800****
190.0	172.0	12.3	GP2MR01900****
200.0	182.0	12.3	GP2MR02000****
210.0	192.0	12.3	GP2MR02100****
220.0	202.0	12.3	GP2MR02200****
230.0	212.0	12.3	GP2MR02300****
240.0	222.0	12.3	GP2MR02400****
250.0	232.0	12.3	GP2MR02500****
280.0	262.0	12.3	GP2MR02800****
300.0	282.0	12.3	GP2MR03000****
320.0	302.0	12.3	GP2MR03200****
350.0	332.0	12.3	GP2MR03500****
400.0	382.0	12.3	GP2MR04000****
420.0	402.0	12.3	GP2MR04200****
450.0	432.0	12.3	GP2MR04500****
480.0	449.0	16.3	GP2MR04800****
500.0	469.0	16.3	GP2MR05000****
600.0	569.0	16.3	GP2MR06000****
700.0	669.0	16.3	GP2MR07000****

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

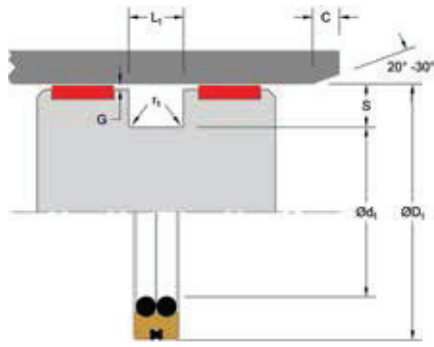




**PART NUMBER RANGE (INCH)\***

inches			PART NUMBER
ØD <sub>1</sub>	Ød <sub>1</sub>	L <sub>1</sub>	
Tol. H9	Tol. H9	Tol. +0.008	
1.500	1.106	0.248	GP2ER01500****
1.562	1.168	0.248	GP2ER01562****
1.625	1.231	0.248	GP2ER01625****
1.687	1.293	0.248	GP2ER01687****
1.750	1.356	0.248	GP2ER01750****
1.812	1.418	0.248	GP2ER01812****
1.875	1.481	0.248	GP2ER01875****
1.937	1.543	0.248	GP2ER01937****
2.000	1.606	0.248	GP2ER02000****
2.125	1.731	0.248	GP2ER02125****
2.250	1.856	0.248	GP2ER02250****
2.375	1.981	0.248	GP2ER02375****
2.500	2.106	0.248	GP2ER02500****
2.625	2.231	0.248	GP2ER02625****
2.750	2.356	0.248	GP2ER02750****
2.875	2.481	0.248	GP2ER02875****
3.000	2.488	0.326	GP2ER03000****
3.125	2.613	0.326	GP2ER03125****
3.250	2.738	0.326	GP2ER03250****
3.375	2.863	0.326	GP2ER03375****
3.500	2.988	0.326	GP2ER03500****
3.625	3.113	0.326	GP2ER03625****
3.750	3.238	0.326	GP2ER03750****
3.875	3.363	0.326	GP2ER03875****
4.000	3.488	0.326	GP2ER04000****
4.125	3.613	0.326	GP2ER04125****
4.250	3.738	0.326	GP2ER04250****
4.375	3.863	0.326	GP2ER04375****

inches			PART NUMBER
ØD <sub>1</sub>	Ød <sub>1</sub>	L <sub>1</sub>	
Tol. H9	Tol. H9	Tol. +0.008	
4.500	3.988	0.326	GP2ER04500****
4.625	4.113	0.326	GP2ER04625****
4.750	4.238	0.326	GP2ER04750****
4.875	4.363	0.326	GP2ER04875****
5.000	4.291	0.484	GP2ER05000****
5.125	4.416	0.484	GP2ER05125****
5.250	4.541	0.484	GP2ER05250****
5.375	4.666	0.484	GP2ER05375****
5.500	4.791	0.484	GP2ER05500****
5.625	4.916	0.484	GP2ER05625****
5.750	5.041	0.484	GP2ER05750****
5.875	5.166	0.484	GP2ER05875****
6.000	5.291	0.484	GP2ER06000****
6.250	5.541	0.484	GP2ER06250****
6.500	5.791	0.484	GP2ER06500****
6.750	6.041	0.484	GP2ER06750****
7.000	6.291	0.484	GP2ER07000****
7.250	6.541	0.484	GP2ER07250****
7.500	6.791	0.484	GP2ER07500****
7.750	7.041	0.484	GP2ER07750****
8.000	7.291	0.484	GP2ER08000****
8.250	7.541	0.484	GP2ER08250****
8.500	7.791	0.484	GP2ER08500****
8.750	8.041	0.484	GP2ER08750****
9.000	8.291	0.484	GP2ER09000****
9.250	8.541	0.484	GP2ER09250****
9.500	8.791	0.484	GP2ER09500****
9.750	9.041	0.484	GP2ER09750****



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### PART NUMBER RANGE (INCH)\*

inches			PART NUMBER
$\varnothing D_1$	$\varnothing d_1$	$L_1$	
Tol. H9	Tol. H9	Tol. +0.008	
10.000	9.291	0.484	GP2ER10000****
10.500	9.791	0.484	GP2ER10500****
11.000	10.291	0.484	GP2ER11000****
11.500	10.791	0.484	GP2ER11500****
12.000	10.78	0.642	GP2ER12000****
12.500	11.28	0.642	GP2ER12500****
13.000	11.78	0.642	GP2ER13000****
13.500	12.28	0.642	GP2ER13500****
14.000	12.78	0.642	GP2ER14000****
14.500	13.28	0.642	GP2ER14500****
15.000	13.78	0.642	GP2ER15000****

inches			PART NUMBER
$\varnothing D_1$	$\varnothing d_1$	$L_1$	
Tol. H9	Tol. H9	Tol. +0.008	
15.500	14.28	0.642	GP2ER15500****
16.000	14.78	0.642	GP2ER16000****
16.500	15.28	0.642	GP2ER16500****
17.000	15.78	0.642	GP2ER17000****
17.500	16.28	0.642	GP2ER17500****
18.000	16.78	0.642	GP2ER18000****
18.500	17.28	0.642	GP2ER18500****
19.000	17.78	0.642	GP2ER19000****
19.500	18.28	0.642	GP2ER19500****
20.000	18.78	0.642	GP2ER20000****

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

