

EXF

WIPER/EXCLUDER

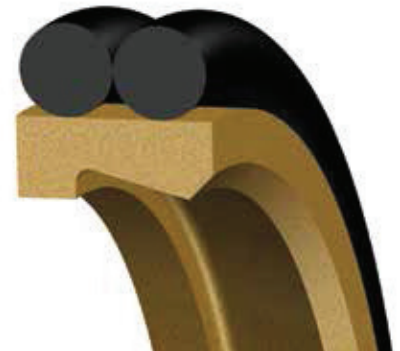
Double-Acting

TECHNICAL DETAILS

The Hallite EXF is a double-acting, twin o-ring energized, rod wiper designed to include two different unique wiping geometries. The two lips combine to scrape debris from the rod and contain residual oil on rod extension, as well as allowing oil to pump back into the cylinder. The o-ring energizers provide the force necessary to maintain the engagement of the wiping lips against the sliding surface and allow the wiper to adjust for deflection.

Typically made from exclusive Hallite Armorlene® materials, this seal is capable of high speed applications and eliminates any potential for stick-slip. High-performance Armorlene® materials, like HLX, provide outstanding wear and scraping capability as well as large range of temperature and media compatibility.

The Halite EXF works well paired with rod seals that support the requisite dynamic pressure pump-back, like the Hallite R16 rod seal. When paired, they produce a sealing system capable of handling higher speeds, a large range of fluid compatibilities, and temperature range of service. For other rod seal arrangements with EXF, it is necessary to make sure the rod seal will provide proper pressure pump-back, or alternatively vent the system. The Hallite wipers/excluder series EXF is built to service moderate to slightly heavy-duty applications. It has the advantages of improved sealing function due to its twin energizer arrangement. Though it is easier to install in the groove, care must be taken to ensure it is not installed backwards and to ensure the proper fit of three individual components.



FEATURES

- Low friction and elimination of stick-slip
- Excellent in high-speed applications
- More stable design for application with excessive side-to-side movement on rod
- Balanced design keeps contamination out of cylinder while also minimizing oil film on rod

Part Number Structure

EXFMR00400NHLX _

EXF	M	R	00400	N	HLX	_
PROFILE DESIGNATION	UNIT OF MEASUREMENT M = Metric E = Inch	APPLICATION Refer to <i>Installation Recommendations</i> and use designator for desired application	ROD 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



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

*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 and ØD₂	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	-	-

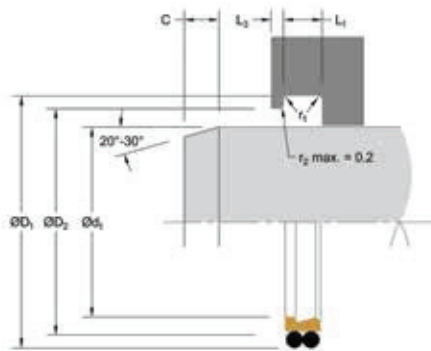
*Seal ratings are based upon capabilities of its matched material components. Hallite cannot rate seal performance when the seal is mixed with other manufacturers' energizers/components.

MATERIALS

MATERIAL FEATURES AND APPLICATIONS	FILLER	MATERIAL DESIGNATOR	COLOR	TEMPERATURE RANGE °C	TEMPERATURE RANGE °F
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
ARMORLENE® HCF <ul style="list-style-type: none"> • 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
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
ARMORLENE® 711 <ul style="list-style-type: none"> • 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
ARMORLENE® 700 <ul style="list-style-type: none"> • 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
748 - UHMWPE <ul style="list-style-type: none"> • Excellent impact resistance • Good dielectrical properties • Excellent abrasion resistance • Low coefficient of friction 	Standard	748	Translucent	-184 to 82°C	-300 to 180°F
HU5 - POLYURETHANE, 55D <ul style="list-style-type: none"> • Positive position load holding • Excellent extrusion resistance • Excellent wear resistance • Available up to 2540mm (100 inches) diameter 	Standard	HU5	Yellow	-20 to 115°C	-4 to 240°F
HU9 - POLYURETHANE, 95A <ul style="list-style-type: none"> • Positive position load holding • Excellent extrusion resistance • Excellent wear resistance • Available up to 2540mm (100 inches) diameter 	Standard	HU9	Red	-20 to 115°C	-4 to 240°F

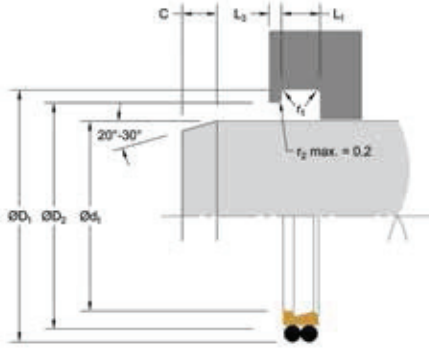
For other material options consult the Master Materials Index at the front of the catalog. If you do not find the material that you require, please contact your local Hallite sales office.





INSTALLATION RECOMMENDATIONS

metric		GROOVE DIAMETER	GROOVE WIDTH	BORE DIAMETER	STEP WIDTH	RADIUS	CHAMFER	O-RING CROSS SECTION
ROD DIAMETER Ød ₁ f8/h9								
DIAMETER RANGE		D ₁ H9	L ₁ + 0.2	D ₂ H11	L ₃ min	r ₁	C	O-Ring
Standard Duty Application - R	Light Duty Application - L							
19.0 - 39.9	40.0 - 69.9	d ₁ + 7.6	4.2	d ₁ + 1.0	3.0	0.4	3.0	1.78
40.0 - 69.9	70.0 - 139.9	d ₁ + 8.8	6.3	d ₁ + 1.5	3.0	1.0	4.0	2.62
70.0 - 139.9	140.0 - 399.9	d ₁ + 12.2	8.1	d ₁ + 2.0	4.0	1.2	6.0	3.53
140.0 - 399.9	400.0 - 649.9	d ₁ + 16.0	11.5	d ₁ + 2.0	5.0	2.0	8.0	5.33
400.0 - 649.9	650.0 - 999.9	d ₁ + 24.0	15.5	d ₁ + 2.5	8.0	2.5	8.0	6.99
650.0 - 999.9	≥ 1000.0	d ₁ + 27.3	18.0	d ₁ + 2.5	10.0	2.5	11.0	8.40



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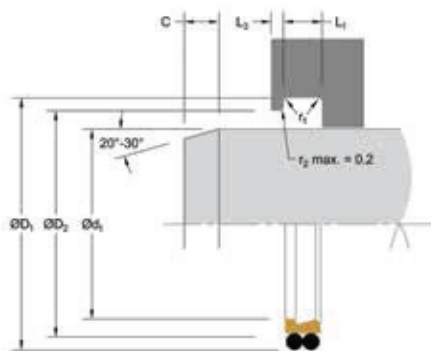
PART NUMBER RANGE (METRIC)*

metric					PART NUMBER
ØD ₁	ØD ₁	L ₁	ØD ₂	STEP WIDTH	
Tol. f8/h9	Tol. H9	Tol. +0.2	Tol. H11	L ₃ Min	
20.0	27.6	4.2	21.0	3.0	EXFMR00200****
25.0	32.6	4.2	26.0	3.0	EXFMR00250****
28.0	35.6	4.2	29.0	3.0	EXFMR00280****
30.0	37.6	4.2	31.0	3.0	EXFMR00300****
32.0	39.6	4.2	33.0	3.0	EXFMR00320****
35.0	42.6	4.2	36.0	3.0	EXFMR00350****
36.0	43.6	4.2	37.0	3.0	EXFMR00360****
40.0	48.8	6.3	41.5	3.0	EXFMR00400****+
42.0	50.8	6.3	43.5	3.0	EXFMR00420****
45.0	53.8	6.3	46.5	3.0	EXFMR00450****+
50.0	58.8	6.3	51.5	3.0	EXFMR00500****
55.0	63.8	6.3	56.5	3.0	EXFMR00550****
56.0	64.8	6.3	57.5	3.0	EXFMR00560****
60.0	68.8	6.3	61.5	3.0	EXFMR00600****
63.0	71.8	6.3	64.5	3.0	EXFMR00630****+
65.0	73.8	6.3	66.5	3.0	EXFMR00650****
70.0	82.2	8.1	72.0	4.0	EXFMR00700****+
75.0	87.2	8.1	77.0	4.0	EXFMR00750****
80.0	92.2	8.1	82.0	4.0	EXFMR00800****+
85.0	97.2	8.1	87.0	4.0	EXFMR00850****
90.0	102.2	8.1	92.0	4.0	EXFMR00900****+
100.0	112.2	8.1	102.0	4.0	EXFMR01000****
105.0	117.2	8.1	107.0	4.0	EXFMR01050****
110.0	122.2	8.1	112.0	4.0	EXFMR01100****+
115.0	127.2	8.1	117.0	4.0	EXFMR01150****
120.0	132.2	8.1	122.0	4.0	EXFMR01200****
125.0	137.2	8.1	127.0	4.0	EXFMR01250****+
130.0	142.2	8.1	132.0	4.0	EXFMR01300****

metric					PART NUMBER
Ød ₁	ØD ₁	L ₁	ØD ₂	STEP WIDTH	
Tol. f8/h9	Tol. H9	Tol. +0.2	Tol. H11	L ₃ Min	
135.0	147.2	8.1	137.0	4.0	EXFMR01350****
140.0	156.0	11.5	142.0	5.0	EXFMR01400****
145.0	161.0	11.5	147.0	5.0	EXFMR01450****
150.0	166.0	11.5	152.0	5.0	EXFMR01500****
155.0	171.0	11.5	157.0	5.0	EXFMR01550****
160.0	176.0	11.5	162.0	5.0	EXFMR01600****+
165.0	181.0	11.5	167.0	5.0	EXFMR01650****
170.0	186.0	11.5	172.0	5.0	EXFMR01700****
175.0	191.0	11.5	177.0	5.0	EXFMR01750****
180.0	196.0	11.5	182.0	5.0	EXFMR01800****
190.0	206.0	11.5	192.0	5.0	EXFMR01900****
200.0	216.0	11.5	202.0	5.0	EXFMR02000****+
210.0	226.0	11.5	212.0	5.0	EXFMR02100****
220.0	236.0	11.5	222.0	5.0	EXFMR02200****
230.0	246.0	11.5	232.0	5.0	EXFMR02300****
240.0	256.0	11.5	242.0	5.0	EXFMR02400****
245.0	261.0	11.5	247.0	5.0	EXFMR02450****
250.0	266.0	11.5	252.0	5.0	EXFMR02500****+
260.0	276.0	11.5	262.0	5.0	EXFMR02600****
265.0	281.0	11.5	267.0	5.0	EXFMR02650****
280.0	296.0	11.5	282.0	5.0	EXFMR02800****+
290.0	306.0	11.5	292.0	5.0	EXFMR02900****
300.0	316.0	11.5	302.0	5.0	EXFMR03000****
310.0	326.0	11.5	312.0	5.0	EXFMR03100****
320.0	336.0	11.5	322.0	5.0	EXFMR03200****+
330.0	346.0	11.5	332.0	5.0	EXFMR03300****
340.0	356.0	11.5	342.0	5.0	EXFMR03400****
350.0	366.0	11.5	352.0	5.0	EXFMR03500****

*Fits ISO 6195 Type D Grooves





PART NUMBER RANGE (METRIC)*

metric					PART NUMBER
$\varnothing D_1$	$\varnothing D_1$	L_1	$\varnothing D_2$	STEP WIDTH	
Tol. f8/h9	Tol. H9	Tol. +0.2	Tol. H11	L_3 Min	
355.0	371.0	11.5	357.0	5.0	EXFMR03550****
360.0	376.0	11.5	362.0	5.0	EXFMR03600****+
365.0	381.0	11.5	367.0	5.0	EXFMR03650****
370.0	386.0	11.5	372.0	5.0	EXFMR03700****
375.0	391.0	11.5	377.0	5.0	EXFMR03750****
380.0	396.0	11.5	382.0	5.0	EXFMR03800****
390.0	406.0	11.5	392.0	5.0	EXFMR03900****
400.0	416.0	11.5	402.0	5.0	EXFML04000****
400.0	424.0	15.5	402.5	8.0	EXFMR04000****
410.0	434.0	15.5	412.5	8.0	EXFMR04100****
420.0	444.0	15.5	422.5	8.0	EXFMR04200****
430.0	454.0	15.5	432.5	8.0	EXFMR04300****
440.0	464.0	15.5	442.5	8.0	EXFMR04400****
445.0	469.0	15.5	447.5	8.0	EXFMR04450****
450.0	474.0	15.5	452.5	8.0	EXFMR04500****
460.0	484.0	15.5	462.5	8.0	EXFMR04600****
465.0	489.0	15.5	467.5	8.0	EXFMR04650****
470.0	494.0	15.5	472.5	8.0	EXFMR04700****
475.0	499.0	15.5	477.5	8.0	EXFMR04750****

metric					PART NUMBER
$\varnothing d_1$	$\varnothing D_1$	L_1	$\varnothing D_2$	STEP WIDTH	
Tol. f8/h9	Tol. H9	Tol. +0.2	Tol. H11	L_3 Min	
495.0	519.0	15.5	497.5	8.0	EXFMR04950****
510.0	534.0	15.5	512.5	8.0	EXFMR05100****
520.0	544.0	15.5	522.5	8.0	EXFMR05200****
525.0	549.0	15.5	527.5	8.0	EXFMR05250****
530.0	554.0	15.5	532.5	8.0	EXFMR05300****
540.0	564.0	15.5	542.5	8.0	EXFMR05400****
570.0	594.0	15.5	572.5	8.0	EXFMR05700****
585.0	609.0	15.5	587.5	8.0	EXFMR05850****
590.0	614.0	15.5	592.5	8.0	EXFMR05900****
600.0	624.0	15.5	602.5	8.0	EXFMR06000****
620.0	644.0	15.5	622.5	8.0	EXFMR06200****
635.0	659.0	15.5	637.5	8.0	EXFMR06350****
675.0	702.3	18.0	677.5	10.0	EXFMR06750****
690.0	717.3	18.0	692.5	10.0	EXFMR06900****
745.0	772.3	18.0	747.5	10.0	EXFMR07450****
800.0	827.3	18.0	802.5	10.0	EXFMR08000****
815.0	842.3	18.0	817.5	10.0	EXFMR08150****
900.0	927.3	18.0	902.5	10.0	EXFMR09000****
910.0	937.3	18.0	912.5	10.0	EXFMR09100****

+Fits ISO 6195 Type D Grooves *Please contact Hallite for custom sizes, material selection, or seal design.