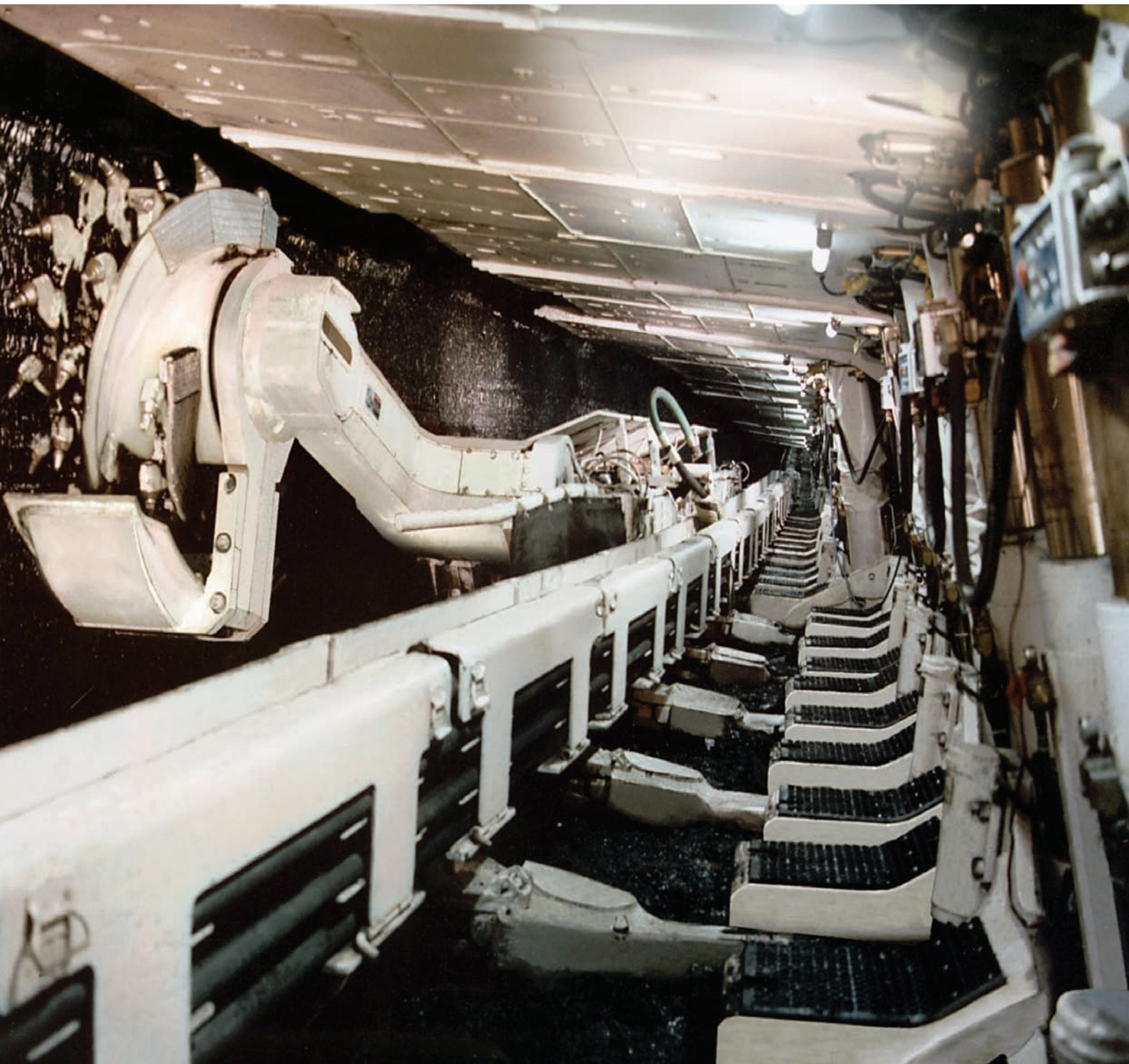


Sealing Systems for the Mining Industry

Technical Data

www.hallite.com



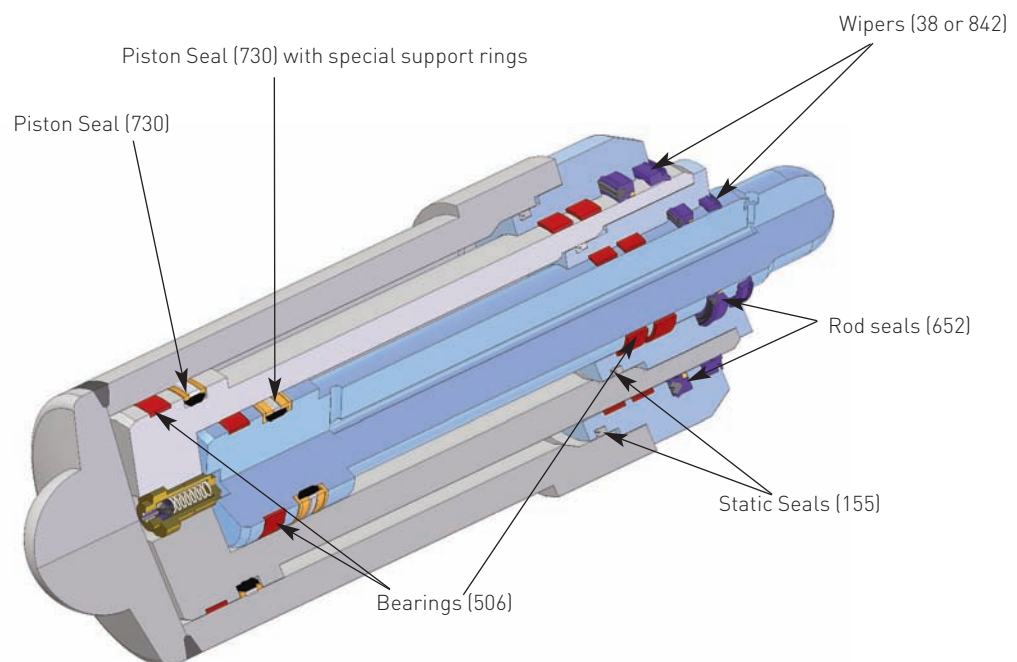
The information contained in this catalogue is based on many years of fluid sealing experience, along with extensive in-house testing and is given in good faith.

No warranty or guarantee is expressed save in our standard terms and conditions of sale (available on request), since the conditions of use are beyond our control.

Hallite Seals is continuously improving its range and reserves the right to withdraw or modify any item shown in this catalogue.

Hallite's commitment to continuous product development means that specifications may sometimes change without notice.

Hallite®, Hythane® are registered trademarks.



Constant Yield Double Telescopic mining roof support leg cylinder, showing position of major seals and bearings.

Hydraulic seals for mining

Operating conditions for HFA fluids

Seal	Hallite Type	Page	Metric	Inch	Profile	bar							°C					m/s								
						0	100	200	300	400	500	600	700	-50	0	+50	+100	+150	+200	0	1	2	3	4	5	
Rod Seal	652	21	•									700				-0	+60°C				0.3					
Double Acting Rod Seal	744	29	•									1200	➡			-0	+60°C				0.3					
Piston Seal	730	25	•									1200	➡			-0	+60°C				0.3					
Wipers	38	5	•													-0	+60°C							4.0		
	842	31	•	•												-0	+60°C							4.0		
Ancillary Items	155	13	•									500				-0	+60°C			STATIC						
	506	15	•	•												-0	+60°C								5.0	

Hallite has over 50 years experience in the design, development and manufacture of hydraulic seals and bearings for the mining industry.

APPLICATIONS INCLUDE:

- Longwall Roof Supports
- Tunnelling Machines
- Cutting Machines
- Roof Bolting Machines
- Excavators
- Scoop Trams
- Shearers
- Shuttle Cars
- Drilling Machines

Hallite's range of materials includes nitrile rubbers and rubber-fabric compounds, thermoplastic elastomers and unique bearing compounds, all proven in mining applications.

Rubber and rubber-fabric seals like Hallite 21, 53 and 58 have been successfully used in water based HFA fluids of the oil emulsion type. The newer HFA fluids of the synthetic and semi-synthetic types that are commonly used by many equipment manufacturers have much poorer boundary lubrication, in general, than the older HFA emulsions. As a result, the Hallite 730 piston seal and Hallite 631 and 652 rod seals are recommended for use in these newer fluids.

Hallite's development and test facilities include:

- Friction and leakage rigs for simulating the operating conditions of ancillary cylinders using water based fluids
- Hydraulic cylinder test rig
- Finite Element Analysis
- Hallite's manufacturing and design systems are approved to ISO 9001

The following pages provide general information for the use of products in mining applications using HFA fluids.

Further information of these and other products are available from your local Hallite sales office.

Housing Design

Hallite Seals' product data sheets give information indicating the allowable extrusion gap a seal can see at pressure during its working life. The extrusion gap can be calculated using the tolerance build ups within the cylinder and any dilation that may occur under pressure.

Maximum extrusion gap = F max (see drawing below).

F max is the maximum extrusion gap for the seal

Minimum metal to metal clearance = F min (see drawing below).

F min for cylinders with minimal side loading should be > 0.1mm (0.004in).

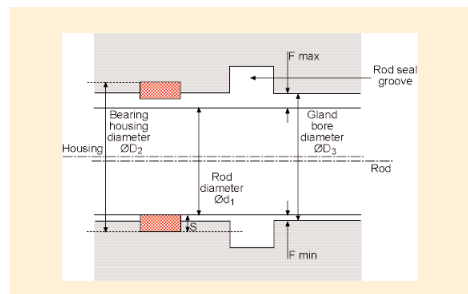
Rods

Maximum extrusion gap

$$F \max = \frac{(\varnothing D_3 \max + \varnothing D_2 \max)}{2} - S \min - \varnothing d_1 \min$$

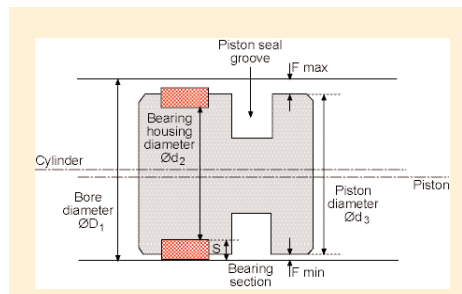
Minimum metal to metal clearance (extrusion gap)

$$F \min = S \min - \frac{(\varnothing D_2 \max - \varnothing D_3 \min)}{2}$$



Rod Bearing

Note: Rod is not concentric with gland, because of clearances.
(shown exaggerated)



Piston Bearing

Note: Piston is not concentric with cylinder bore, because of clearances.
(shown exaggerated)

Pistons

Maximum extrusion gap

$$F \max = \varnothing D_1 \max - S \min - \frac{(\varnothing d_3 \min + \varnothing d_2 \min)}{2} + \text{dilation}$$

Minimum metal to metal clearance (extrusion gap)

$$F \min = S \min - \frac{(\varnothing d_3 \max - \varnothing d_2 \min)}{2}$$

Calculate both F max and F min.

Ensure the F min is greater than 0.1mm (0.004in) and F max is less than the maximum extrusion gap stated on the seal data sheet at the application's working pressure.

For built-in metal bearings, the extrusion gap calculation is simpler.

For F max:

$$\text{Rod} = \varnothing D_3 \max - \varnothing d_1 \min$$

$$\text{Piston} = \varnothing D_1 \max - \varnothing d_3 \min + \text{dilation}$$

F min must be zero

Extrusion is closely linked to pressure and temperature. In general, the best seal performance and life is provided by specifying the smallest possible extrusion gap.

The figures shown for the extrusion gap within the operating conditions of Hallite's product data sheets, relate to the maximum permissible, worst case situation with the gap all on one side.

Technical details

Metric

Inch

Operating conditions

Maximum Speed	4.0 m/sec
Temperature Range	-40°C +120°C

12.0 ft/sec
-40°F +250°F

Surface roughness

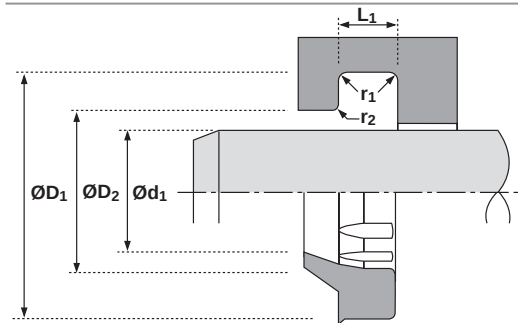
	µmRa	µmRt	µinCLA	µinRMS
Dynamic Sealing Face Ød1	0.1 < > 0.4	4 max	4 < > 16	5 < > 18
Static Sealing Face ØD1 ØD2	1.6 max	10 max	63 max	70 max
Static Housing Faces L1	3.2 max	16 max	125 max	140 max

Radii

Rod Diameter Ød1 mm	≤ 50	≤ 90	≤ 200	> 200
Max Fillet Rad r1 mm	0.4	0.4	0.4	0.8
Max Fillet Rad r2 mm	0.2	0.4	0.6	0.8

Tolerances

Ød1	ØD1	ØD2	L1 mm
f9	H11	H11	+0.2 -0



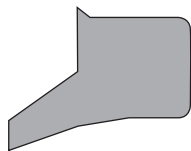
Design

The Hallite 38 wiper has been designed so that the proportions of the wiping lip ensure it maintains contact with the rod surface to remove heavily deposited mud, ice etc. The outside diameter contacts the housing and has a sealing lip to prevent moisture entering the groove. A polyester based material is used to provide a tough abrasion resistant wiper for the difficult conditions usually found in mining or earth moving applications. All the range can be used with a split housing, however, the majority can be installed in a blind housing with care.

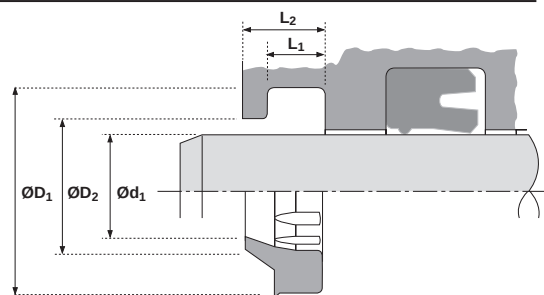
Features

- Outside lip for effective housing seal
- Pressure relief ribs
- Effective scraping lip

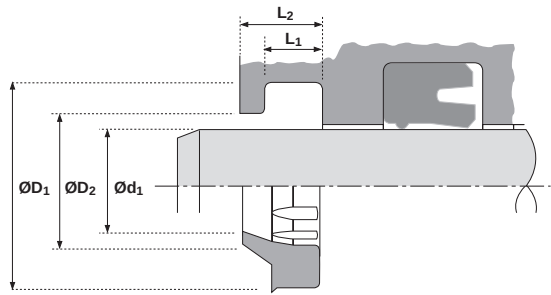
NB: Part numbers suffixed by “±” indicate housing sizes to meet ISO 6195A.



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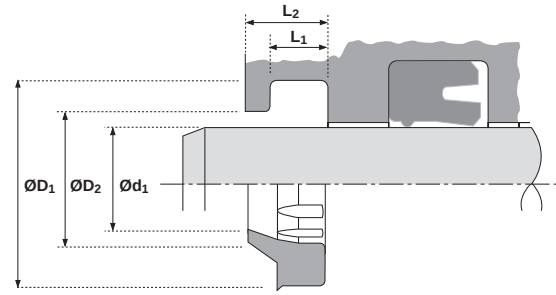
Ød ₁	TOL f9	ØD ₁	TOL H11	ØD ₂	TOL H11	L ₁ +0.2 - 0	L ₂	PART No.
18	-0.016 -0.059	24.0	+0.13 +0.00	21.0	+0.13 +0.00	5.0	7.0	4392000
20	-0.020 -0.072	28.0	+0.13 +0.00	25.5	+0.13 +0.00	5.0	8.0	4321900‡
22	-0.020 -0.072	30.0	+0.13 +0.00	27.5	+0.13 +0.00	5.0	8.0	4322000‡
25	-0.020 -0.072	33.0	+0.16 +0.00	30.5	+0.16 +0.00	5.0	8.0	6617700‡
28	-0.020 -0.072	36.0	+0.16 +0.00	33.5	+0.16 +0.00	5.0	8.0	6617800‡
30	-0.020 -0.072	38.0	+0.16 +0.00	35.5	+0.16 +0.00	5.0	8.0	4419200
30	-0.020 -0.072	41.2	+0.16 +0.00	37	+0.16 +0.00	7.5	10.0	4528900
32	-0.025 -0.087	40.0	+0.16 +0.00	37.5	+0.16 +0.00	5.0	8.0	6617900‡
35	-0.025 -0.087	43.0	+0.16 +0.00	40.5	+0.16 +0.00	5.0	8.0	4724800
36	-0.025 -0.087	44.0	+0.16 +0.00	41.5	+0.16 +0.00	5.0	8.0	6618000‡
40	-0.025 -0.087	48.0	+0.16 +0.00	45.5	+0.16 +0.00	5.0	8.0	6618100‡
40	-0.025 -0.087	50.6	+0.16 +0.00	43.0	+0.16 +0.00	5.3	7.0	4784100
41.28	-0.025 -0.087	49.28	+0.16 +0.00	46.8	+0.16 +0.00	5.0	8.0	4599900
45	-0.025 -0.087	53.0	+0.19 +0.00	50.5	+0.19 +0.00	5.0	8.0	6618200‡
45	-0.025 -0.087	55.6	+0.19 +0.00	48.0	+0.16 +0.00	5.3	7.0	4531201
50	-0.025 -0.087	58.0	+0.19 +0.00	55.5	+0.19 +0.00	5.0	8.0	6618300‡
50	-0.025 -0.087	58.6	+0.19 +0.00	53.0	+0.19 +0.00	5.3	7.0	4300400
50	-0.025 -0.087	60.6	+0.19 +0.00	53.0	+0.19 +0.00	5.3	7.0	4458000
55	-0.030 -0.104	65.6	+0.19 +0.00	58.0	+0.19 +0.00	5.3	7.0	4531401
56	-0.030 -0.104	66.0	+0.19 +0.00	63.0	+0.19 +0.00	6.3	10.0	6618400‡
56	-0.030 -0.104	66.6	+0.19 +0.00	59.0	+0.19 +0.00	5.3	7.0	4458100
60	-0.030 -0.104	70.0	+0.19 +0.00	66.0	+0.19 +0.00	5.3	7.0	4386200
60	-0.030 -0.104	70.0	+0.19 +0.00	67.0	+0.19 +0.00	6.3	10.0	4270200



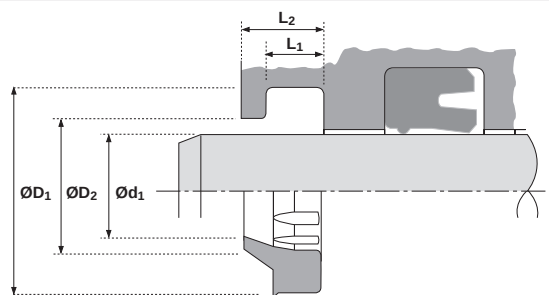
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Ød1	TOL f9	ØD1	TOL H11	ØD2	TOL H11	L1 +0.2 - 0	L2	PART No.
60	-0.030 -0.104	70.6	+0.19 +0.00	63.0	+0.19 +0.00	5.3	7.0	4456400
63	-0.030 -0.104	73.0	+0.19 +0.00	70.0	+0.19 +0.00	6.3	10.0	6618500‡
63	-0.030 -0.104	73.6	+0.19 +0.00	66.0	+0.19 +0.00	5.3	7.0	4283600
65	-0.030 -0.104	75.0	+0.19 +0.00	72.0	+0.19 +0.00	6.3	10.0	4343800
65	-0.030 -0.104	75.6	+0.19 +0.00	68.0	+0.19 +0.00	5.3	7.0	4784200
70	-0.030 -0.104	80.0	+0.19 +0.00	77.0	+0.19 +0.00	6.3	10.0	6618600‡
70	-0.030 -0.104	80.6	+0.22 +0.00	73.0	+0.19 +0.00	5.3	7.0	4454000
70	-0.030 -0.104	82.2	+0.22 +0.00	76.0	+0.19 +0.00	7.2	12.0	4243900
75	-0.030 -0.104	83.6	+0.22 +0.00	78.0	+0.19 +0.00	5.3	7.0	4539500
75	-0.030 -0.104	85.0	+0.22 +0.00	82.0	+0.22 +0.00	6.3	10.0	4532500
75	-0.030 -0.104	87.2	+0.22 +0.00	81.0	+0.22 +0.00	7.2	12.0	4384400
80	-0.030 -0.104	90.0	+0.22 +0.00	87.0	+0.22 +0.00	6.3	10.0	6618700‡
80	-0.030 -0.104	91.0	+0.22 +0.00	85.0	+0.22 +0.00	7.5	11.0	4493200
80	-0.030 -0.104	92.2	+0.22 +0.00	86.0	+0.22 +0.00	7.2	12.0	4242800
82.6	-0.036 -0.123	92.2	+0.22 +0.00	85.7	+0.22 +0.00	5.3	7.1	4415500
85	-0.036 -0.123	93.6	+0.22 +0.00	88.0	+0.22 +0.00	5.3	7.0	4292100
85	-0.036 -0.123	97.2	+0.22 +0.00	91.0	+0.22 +0.00	7.2	12.0	4784300
85	-0.036 -0.123	98.0	+0.22 +0.00	92.0	+0.22 +0.00	7.5	11.5	4332800
88	-0.036 -0.123	100.2	+0.22 +0.00	94.0	+0.22 +0.00	7.2	12.0	4269400
90	-0.036 -0.123	100.0	+0.22 +0.00	97.0	+0.22 +0.00	6.3	10.0	6618800‡
90	-0.036 -0.123	102.2	+0.22 +0.00	96.0	+0.22 +0.00	7.2	12.0	4324500
95	-0.036 -0.123	107.2	+0.22 +0.00	101.0	+0.22 +0.00	7.2	12.0	6667600
100	-0.036 -0.123	110.6	+0.22 +0.00	104.0	+0.22 +0.00	5.3	7.0	4300200

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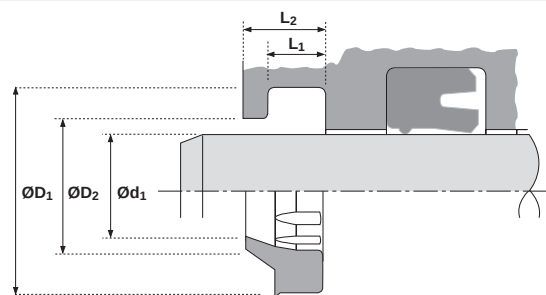


Ød1	TOL f9	ØD1	TOL H11	ØD2	TOL H11	L1 +0.2 - 0	L2	PART No.
100	-0.036 -0.123	112.2	+0.22 +0.00	106.0	+0.22 +0.00	7.2	12.0	4324600
100	-0.036 -0.123	115.0	+0.22 +0.00	110.0	+0.22 +0.00	9.5	14.0	6618900‡
101.6	-0.036 -0.123	116.6	+0.22 +0.00	111.6	+0.22 +0.00	9.5	14.0	6619010
105	-0.036 -0.123	113.0	+0.22 +0.00	110.5	+0.22 +0.00	5.0	8.0	4290300
105	-0.036 -0.123	120.0	+0.22 +0.00	112.0	+0.22 +0.00	7.2	12.0	4539100
110	-0.036 -0.123	122.2	+0.25 +0.00	116.0	+0.22 +0.00	7.2	12.0	4459200
110	-0.036 -0.123	125.0	+0.25 +0.00	120.0	+0.22 +0.00	9.5	14.0	6619000‡
115	-0.036 -0.123	127.2	+0.25 +0.00	121.0	+0.25 +0.00	7.2	12.0	4324800
120	-0.036 -0.123	132.2	+0.25 +0.00	126.0	+0.25 +0.00	7.2	12.0	4454300
120	-0.036 -0.123	135.0	+0.25 +0.00	130.0	+0.25 +0.00	9.5	14.0	4385600
125	-0.043 -0.143	133.0	+0.25 +0.00	130.8	+0.25 +0.00	5.3	7.0	4393000
125	-0.043 -0.143	137.2	+0.25 +0.00	131.0	+0.25 +0.00	7.7	12.0	4233500
125	-0.043 -0.143	140.0	+0.25 +0.00	135.0	+0.25 +0.00	9.5	14.0	6619100‡
125	-0.043 -0.143	140.0	+0.25 +0.00	132.6	+0.25 +0.00	10.2	16.0	4784400
128	-0.043 -0.143	143.0	+0.25 +0.00	138.0	+0.25 +0.00	9.5	14.0	4581800
130	-0.043 -0.143	142.2	+0.25 +0.00	136.0	+0.25 +0.00	7.2	12.0	4304300
130	-0.043 -0.143	145.0	+0.25 +0.00	137.6	+0.25 +0.00	10.2	16.0	4784500
132	-0.043 -0.143	144.2	+0.25 +0.00	138.0	+0.25 +0.00	7.2	12.0	4269500
135	-0.043 -0.143	150.0	+0.25 +0.00	145.0	+0.25 +0.00	9.5	14.0	4278700
140	-0.043 -0.143	148.6	+0.25 +0.00	143.0	+0.25 +0.00	5.3	7.0	4763800
140	-0.043 -0.143	152.2	+0.25 +0.00	146.0	+0.25 +0.00	7.7	12.0	4324900
140	-0.043 -0.143	155.0	+0.25 +0.00	150.0	+0.25 +0.00	9.5	14.0	6619200‡
140	-0.043 -0.143	155.0	+0.25 +0.00	147.6	+0.25 +0.00	10.2	16.0	4784600

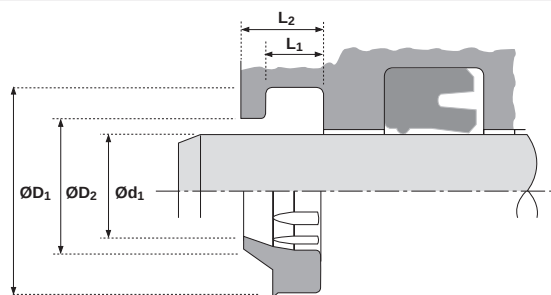


Ød1	TOL f9	ØD1	TOL H11	ØD2	TOL H11	L1 +0.2 - 0	L2	PART No.
145	-0.043 -0.143	153.6	+0.25 +0.00	148.0	+0.25 +0.00	5.3	7.0	4732200
145	-0.043 -0.143	160.0	+0.25 +0.00	155.0	+0.25 +0.00	9.5	14.0	4560600
145	-0.043 -0.143	153.6	+0.25 +0.00	148.0	+0.25 +0.00	5.3	7.0	4732200
145	-0.043 -0.143	160.0	+0.25 +0.00	155.0	+0.25 +0.00	9.5	14.0	4560600
150	-0.043 -0.143	165.0	+0.25 +0.00	158.6	+0.25 +0.00	10.2	12.0	4342500
150	-0.043 -0.143	166.0	+0.25 +0.00	161.0	+0.25 +0.00	8.0	12.0	4336700
155	-0.043 -0.143	163.0	+0.25 +0.00	160.5	+0.25 +0.00	5.0	8.0	4290200
155	-0.043 -0.143	167.2	+0.25 +0.00	161.0	+0.25 +0.00	7.7	12.0	4288200
155	-0.043 -0.143	175.0	+0.25 +0.00	165.0	+0.25 +0.00	10.2	18.0	4226400
160	-0.043 -0.143	172.2	+0.25 +0.00	166.0	+0.25 +0.00	7.7	12.0	4405700
160	-0.043 -0.143	175.0	+0.25 +0.00	170.0	+0.25 +0.00	9.5	14.0	6619300‡
160	-0.043 -0.143	175.0	+0.25 +0.00	167.6	+0.25 +0.00	10.2	16.0	4454100
165	-0.043 -0.143	180.0	+0.25 +0.00	175.0	+0.25 +0.00	9.5	14.0	4537000
170	-0.043 -0.143	180.6	+0.29 +0.00	174.0	+0.25 +0.00	5.3	7.0	4732300
170	-0.043 -0.143	182.2	+0.29 +0.00	176.0	+0.25 +0.00	7.7	12.0	4233600
170	-0.043 -0.143	185.0	+0.29 +0.00	180.0	+0.25 +0.00	9.5	14.0	4745100
177	-0.043 -0.143	192.0	+0.29 +0.00	187.0	+0.29 +0.00	9.5	14.0	4287900
180	-0.043 -0.143	195.0	+0.29 +0.00	190.0	+0.29 +0.00	9.5	14.0	6619400‡
180	-0.043 -0.143	200.0	+0.29 +0.00	190.0	+0.29 +0.00	10.2	18.0	4460900
185	-0.050 -0.165	200.0	+0.29 +0.00	192.6	+0.29 +0.00	10.2	16.0	4777300
185	-0.050 -0.165	205.0	+0.29 +0.00	195.0	+0.29 +0.00	10.2	18.0	4776100
190	-0.050 -0.165	198.6	+0.29 +0.00	193.0	+0.29 +0.00	5.3	7.0	4771100
190	-0.050 -0.165	205.0	+0.29 +0.00	200.0	+0.29 +0.00	9.5	14.0	4753100

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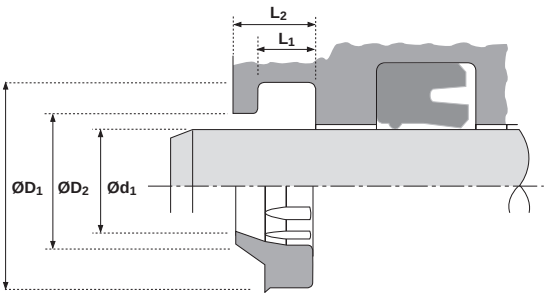


Ød1	TOL f9	ØD1	TOL H11	ØD2	TOL H11	L1 +0.2 - 0	L2	PART No.
190	-0.050 -0.165	210.0	+0.29 +0.00	200.0	+0.29 +0.00	10.2	18.0	4781000
195	-0.050 -0.165	210.0	+0.29 +0.00	202.5	+0.29 +0.00	10.2	16.0	4325100
200	-0.050 -0.165	208.6	+0.29 +0.00	203.0	+0.29 +0.00	5.3	7.0	4391600
200	-0.050 -0.165	215.0	+0.29 +0.00	210.0	+0.29 +0.00	9.5	14.0	6619500‡
200	-0.050 -0.165	220.0	+0.29 +0.00	210.0	+0.29 +0.00	10.2	18.0	4387100
205	-0.050 -0.165	213.6	+0.29 +0.00	210.0	+0.29 +0.00	5.3	7.0	4773800
205	-0.050 -0.165	220.0	+0.29 +0.00	215.0	+0.29 +0.00	9.5	14.0	4560500
210	-0.050 -0.165	225.0	+0.29 +0.00	220.0	+0.29 +0.00	9.5	14.0	4598000
210	-0.050 -0.165	226.0	+0.29 +0.00	221.0	+0.29 +0.00	9.0	12.0	4336600
210	-0.050 -0.165	230.0	+0.29 +0.00	220.0	+0.29 +0.00	10.2	18.0	4325300
212	-0.050 -0.165	232.0	+0.29 +0.00	225.5	+0.29 +0.00	12.5	18.0	4293900
220	-0.050 -0.165	235.0	+0.29 +0.00	227.6	+0.29 +0.00	10.2	16.0	4325400
220	-0.050 -0.165	240.0	+0.29 +0.00	230.0	+0.29 +0.00	10.2	18.0	4799000
220	-0.050 -0.165	240.0	+0.29 +0.00	233.5	+0.29 +0.00	12.5	18.0	6619600‡
225	-0.050 -0.165	240.0	+0.29 +0.00	235.0	+0.29 +0.00	9.5	14.0	4287800
225	-0.050 -0.165	245.0	+0.29 +0.00	235.0	+0.29 +0.00	10.2	18.0	4325500
230	-0.050 -0.165	238.6	+0.29 +0.00	233.0	+0.29 +0.00	5.3	7.0	4514000
230	-0.050 -0.165	245.0	+0.29 +0.00	240.0	+0.29 +0.00	9.5	14.0	4767400
230	-0.050 -0.165	246.0	+0.29 +0.00	240.7	+0.29 +0.00	7.5	12.0	4290700
230	-0.050 -0.165	250.0	+0.29 +0.00	240.0	+0.29 +0.00	10.2	18.0	4325600
235	-0.050 -0.165	255.0	+0.32 +0.00	245.0	+0.29 +0.00	10.2	18.0	4325700
240	-0.050 -0.165	255.0	+0.32 +0.00	250.0	+0.29 +0.00	9.5	14.0	4745200
240	-0.050 -0.165	260.0	+0.32 +0.00	250.0	+0.29 +0.00	10.2	18.0	4520900



Ød1	TOL f9	ØD1	TOL H11	ØD2	TOL H11	L1 +0.2 - 0	L2	PART No.
240	-0.050 -0.165	260.0	+0.32 +0.00	253.5	+0.29 +0.00	12.5	18.0	4787100
245	-0.050 -0.165	265.0	+0.32 +0.00	258.5	+0.32 +0.00	12.5	18.0	4539600
250	-0.050 -0.165	270.0	+0.32 +0.00	260.0	+0.32 +0.00	10.2	18.0	4460100
250	-0.050 -0.165	270.0	+0.32 +0.00	263.5	+0.32 +0.00	12.5	18.0	6619700‡
255	-0.056 -0.186	270.0	+0.32 +0.00	265.0	+0.32 +0.00	9.5	14.0	4578200
260	-0.056 -0.186	275.0	+0.32 +0.00	270.0	+0.32 +0.00	9.5	14.0	4573100
260	-0.056 -0.186	280.0	+0.32 +0.00	270.5	+0.32 +0.00	10.2	18.0	4325900
265	-0.056 -0.186	280.0	+0.32 +0.00	272.6	+0.32 +0.00	10.2	16.0	4762900
265	-0.056 -0.186	285.0	+0.32 +0.00	275.0	+0.32 +0.00	10.2	15.0	4560400
270	-0.056 -0.186	278.6	+0.32 +0.00	273.0	+0.32 +0.00	5.3	7.0	4391700
270	-0.056 -0.186	286.0	+0.32 +0.00	280.7	+0.32 +0.00	7.5	12.0	4786400
275	-0.056 -0.186	295.0	+0.32 +0.00	285.0	+0.32 +0.00	10.2	18.0	4807400
280	-0.056 -0.186	295.0	+0.32 +0.00	290.0	+0.32 +0.00	9.5	14.0	4716100
280	-0.056 -0.186	300.0	+0.32 +0.00	290.0	+0.32 +0.00	10.2	15.0	4763900
285	-0.056 -0.186	300.0	+0.32 +0.00	295.0	+0.32 +0.00	9.5	14.0	4767300
285	-0.056 -0.186	305.0	+0.32 +0.00	298.5	+0.32 +0.00	12.5	18.0	4537100
288	-0.056 -0.186	308.0	+0.32 +0.00	301.5	+0.32 +0.00	10.2	15.0	4265300
290	-0.056 -0.186	310.0	+0.32 +0.00	303.5	+0.32 +0.00	12.5	18.0	4467300
295	-0.056 -0.186	315.0	+0.32 +0.00	308.5	+0.32 +0.00	12.5	18.0	4598100
300	-0.056 -0.186	316.0	+0.36 +0.00	310.7	+0.32 +0.00	7.5	12.0	4290800
300	-0.056 -0.186	320.0	+0.36 +0.00	313.5	+0.32 +0.00	12.5	18.0	4525300
305	-0.056 -0.186	325.0	+0.36 +0.00	318.5	+0.36 +0.00	12.5	18.0	4473200
320	-0.062 -0.202	340.0	+0.36 +0.00	330.0	+0.36 +0.00	10.2	18.0	4454200

38



Ød1	TOL f9	ØD1	TOL H11	ØD2	TOL H11	L1 +0.2 - 0	L2	PART No.
325	-0.062 -0.202	345.0	+0.36 +0.00	335.0	+0.36 +0.00	10.2	18.0	4801100
330	-0.062 -0.202	346.0	+0.36 +0.00	340.7	+0.36 +0.00	7.5	12.0	4587300
335	-0.062 -0.202	355.0	+0.36 +0.00	345.0	+0.36 +0.00	10.2	18.0	4776800
340	-0.062 -0.202	360.0	+0.36 +0.00	350.0	+0.36 +0.00	10.2	18.0	4732500
350	-0.062 -0.202	370.0	+0.36 +0.00	360.0	+0.36 +0.00	10.2	18.0	4717900
355	-0.062 -0.202	375.0	+0.36 +0.00	365.0	+0.36 +0.00	10.2	18.0	4578300
360	-0.062 -0.202	380.0	+0.36 +0.00	370.0	+0.36 +0.00	10.2	18.0	4781200
370	-0.062 -0.202	390.0	+0.36 +0.00	383.5	+0.36 +0.00	12.5	18.0	4579800
370	-0.062 -0.202	390.0	+0.36 +0.00	380.0	+0.36 +0.00	10.2	18.0	4763000
380	-0.062 -0.202	400.0	+0.36 +0.00	393.5	+0.36 +0.00	12.5	18.0	4752100
395	-0.062 -0.202	415.0	+0.40 +0.00	405.0	+0.36 +0.00	10.2	18.0	4807200
400	-0.062 -0.202	420.0	+0.40 +0.00	410.0	+0.40 +0.00	10.2	18.0	4769900
455	-0.068 -0.223	475.0	+0.40 +0.00	465.0	+0.40 +0.00	10.2	18.0	4777900

Technical details

Operating conditions

Temperature Range
Maximum Pressure

Temperature Range
Maximum Pressure

Maximum extrusion gap

Pressure bar
Maximum Gap mm
Pressure p.s.i.

Surface roughness

Static Sealing Face $\varnothing d_1$
Static Sealing Face $\varnothing D_1$
Static Housing Faces L_1

Chamfers & Radii

Groove Section $\leq S$ mm
Min Chamfer C mm
Max Fillet Rad r_1 mm

Tolerances

Metric

HFA Fluids

-0°C + 60°C
500 bar

Mineral Oil

-30°C + 100°C
500 bar

Figures show the maximum permissible gap all on one side using minimum rod $\varnothing$ and maximum clearance $\varnothing$.

400	500	500
0.5	0.4	H8/f7
6000	7500	7500

μmRa	μmRt
1.6	10 max
1.6 max	10 max
3.2 max	16 max

4.0	5.6	6.8
6.0	8.0	10.0
0.2	0.4	0.4

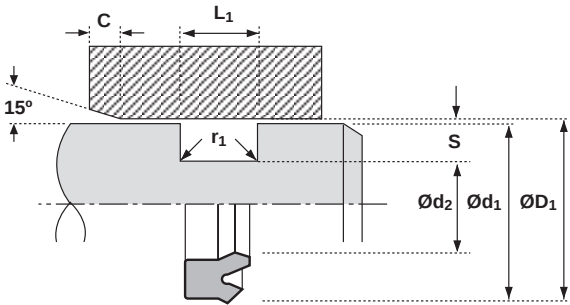
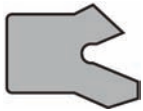
$\varnothing d_1$	$\varnothing d_2 = \varnothing D_1 - 2S$	$\varnothing D_1$	L_1 mm
f7	h9	H8	+0.3-0

Inch

32°F + 140°F
7500 p.s.i.

-22°F + 212°F
7500psi

μinCLA	μinRMS
63 max	70 max
63 max	70 max
125 max	140 max



Design

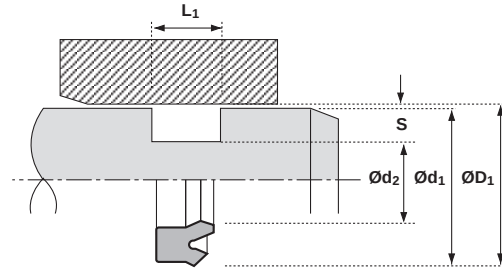
The Hallite 155 U ring is designed as static seal for cylinders. It is used instead of a conventional O ring/back-up ring combination. Through its special design and compound, extrusion gaps up to $F = 0.4\text{mm}$ at 500 bar pressure are allowed.

Every nominal diameter of the Hallite 155 is suitable for diameter ranges of $\varnothing D_1$. (See Table).

Media

This seal was developed for HFA applications, but can also be used with standard mineral oil fluids.

155



ØD ₁ RANGE	L ₁	S	NOMINALS			PART No.
72 - 75	8.2	4.0	72	x	64.0 x 8.2	4543600
90 - 91	8.2	4.0	90	x	82.0 x 8.2	4525900
92 - 100	8.2	4.0	92	x	84.0 x 8.2	4439800
100 - 105	8.2	4.0	100	x	92.0 x 8.2	4796900
105 - 112	8.2	4.0	105	x	97.0 x 8.2	4788200
112 - 120	8.2	4.0	112	x	104.0 x 8.2	4419500
127 - 135	8.2	4.0	127	x	119.0 x 8.2	4414500
137 - 144	8.2	4.0	137	x	129.0 x 8.2	4383000
145 - 153	8.2	4.0	145	x	137.0 x 8.2	4764700
154 - 164	8.2	4.0	154	x	146.0 x 8.2	4414600
165 - 174	8.2	4.0	165	x	157.0 x 8.2	4777400
175 - 184	8.2	4.0	175	x	167.0 x 8.2	4405400
188 - 197	8.2	4.0	188	x	180.0 x 8.2	4405500
198 - 204	8.2	4.0	198	x	190.0 x 8.2	4759800
205 - 212	8.2	4.0	205	x	197.0 x 8.2	4428300
216 - 225	8.2	4.0	216	x	208.0 x 8.2	4396600
230 - 240	11.2	5.6	230	x	218.8 x 11.2	4432500

ØD ₁ RANGE	L ₁	S	NOMINALS			PART No.
242 - 249	11.2	5.6	242	x	230.8 x 11.2	4402600
250 - 260	8.2	4.0	250	x	242.0 x 8.2	4767500
258 - 270	11.2	5.6	258	x	246.8 x 11.2	4405600
274 - 286	11.2	5.6	274	x	262.8 x 11.2	4732600
284 - 290	11.2	5.6	284	x	272.8 x 11.2	4797000
290 - 300	11.2	5.6	290	x	278.8 x 11.2	4414700
300 - 311	11.2	5.6	300	x	288.8 x 11.2	4777600
312 - 322	10.3	5.0	312	x	302.0 x 10.3	4712100
320 - 332	11.2	5.6	320	x	308.8 x 11.2	4387000
340 - 350	11.2	5.6	340	x	328.8 x 11.2	4473300
355 - 365	11.2	5.6	355	x	343.8 x 11.2	4756400
370 - 380	11.2	5.6	370	x	358.8 x 11.2	4774700
385 - 394	15.0	6.8	385	x	371.4 x 15.0	4773200
395 - 405	15.0	6.8	395	x	381.4 x 15.0	4732700
405 - 415	15.0	6.8	405	x	391.4 x 15.0	4578100
420 - 430	15.0	6.8	420	x	406.4 x 15.0	4777500
430 - 440	15.0	6.8	430	x	416.4 x 15.0	4807500

Technical details**Operating Conditions**

Temperature Range

Limiting PV Values Lubricated*

Metric

-40°C +120°C

Speed m/sec

0.1 10.0

1.0 6.0

5.0 0.8

Pressure MN/m²**Inch**

-40°F +250°F

Speed ft/sec

0.3 1500

3.0 900

16.0 120

Pressure p.s.i.

Typical Physical Properties

Specific Gravity

Compression Stress at Failure

Compression Stress at Yield*

Compression Stress at Yield*

Coefficient of Thermal Conductivity

Coefficient of Thermal Expansion

Coefficient of Dynamic Friction on
steel surface (0.2 µm Ra) / (8 µin CLA)

Length Thickness

9 X 10⁻⁵ 13 X 10⁻⁵

per °C per °C

Dry Lubricated

0.50 0.06

Length Thickness

5 X 10⁻⁵ 7.3 X 10⁻⁵

per °F per °F

Dry Lubricated

0.50 0.06

Surface RoughnessDynamic Sealing Face Ød₁, ØD₁Static Sealing Face Ød₂, ØD₂, L₁

µm Ra

0.4

3.2 max

µm Rt

4 max

16 max

µin CLA

16

125 max

µin RMS

18

140 max

Bearing Strip TolerancesL₁

-0.1 to -0.6

S

-0.02 to -0.08

L₁

-0.005 to -0.025

S

-0.001 to -0.003

Width of Bearing Split – WØd₁ / ØD₁

Up to 50

Up to 120

Up to 250

Up to 550

W

3.00 - 1.50

5.00 - 3.50

9.00 - 7.25

17.00 - 15.00

Ød₁ / ØD₁

Up to 2"

Up to 5"

Up to 10"

Up to 22"

W

0.12 - 0.06

0.19 - 0.14

0.35 - 0.29

0.67 - 0.59

Housing Details & Tolerances

Rod

Ød₁ØD₂ = Ød₁ + 2SØD₃ = Ød₁ + GL₁

f9

up to : Ø80 H10

above : Ø80 H9

G min / max

+ 0.2 - 0 mm

Ød₁ØD₂ = Ød₁ + 2SØD₃ = Ød₁ + GL₁

f9

up to : Ø3in H10

above : Ø3in H9

G min / max

+ 0.008 - 0 in

Piston

ØD₁Ød₂ = ØD₁ - 2SØd₃ = ØD₁ - GL₁

H11

f9

G min / max

+ 0.2 - 0 mm

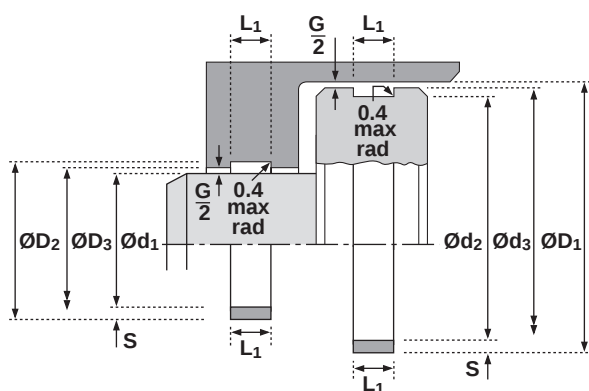
ØD₁Ød₂ = ØD₁ - 2SØd₃ = ØD₁ - GL₁

H11

f9

G min / max

+ 0.008 - 0 in



* Please note that for reciprocating applications, the compressive stress at yield should be used for design calculations. For rotary shafts use the limiting P.V. values. It is suggested that a 2:1 factor of safety is applied.

Design

Hallite 506 bearing strip is available in three forms: cut rings, spiral lengths and flat coils. Hallite 506 provides an extremely effective, hard wearing and easy to use bearing material.

Manufactured to very tight tolerances and providing bearing solutions for reciprocating, oscillating and slow rotary movement applications, Hallite 506 bearing strip is used in many of today's most arduous hydraulic applications around the world. Commonly fitted in reciprocating cylinders as rod and piston bearings, Hallite 506 is capable of withstanding extreme side-loads preventing metal to metal contact. The material's design incorporates micro indentations on the bearing strip's surface to trap fluid and provide built-in lubrication to the bearing. The 506 bearing strip is manufactured by a patented process, using a woven fabric reinforced polyester resin material and is proven to be compatible with a wide range of fluids, including mineral oils, water based fluids and phosphate esters, to produce a rectangular section strip which is available in a wide range of inch and metric sizes including cross sections specified in ISO 10766.

506

506

Hallite 506 bearing strip is available in three forms:

Cut Rings

Ready made bearings, cut to size and to customer specifications, and ready for installation, Hallite 506 bearings have become an industry standard favoured by designers and specifiers alike. Generally produced for the medium to high volume user.

Spiral Lengths

Available in a wide range of preformed diameters, spirals are supplied in continuous lengths to suit a range of inside and outside diameters. Ideal for lower volume users requiring various diameters.

Flat Coils

Packaged in a dispenser for ease of storage and handling, flat coils are supplied in 10 metre lengths suitable for a wide range of diameters and are ideal for those using or supplying one off bearings for small volume requirements.

The ranges shown on the following pages are Hallite's most popular sizes. The section ranges identify section and groove width; from these nearly any diameter of cut ring or spiral length can be manufactured. If you cannot find the size you are looking for, please contact your local Hallite sales office for additional size information.

All standard bearing strip is printed with a size reference and includes distance marking every 100mm on metric size sections and every six inches on inch size sections for guidance only.

When ordering please clearly state whether cut rings, spiral lengths or flat coils are required. For cut rings and spiral lengths please state whether rod or piston application and provide inside ($\varnothing d$) or outside ($\varnothing D$) diameters, groove width (L1) and section (S) dimensions and where spiral lengths are ordered also specify length required. For flat coils please specify groove width (L1) and section (S) dimensions.

Cutting bearing strip to size

1. Select the groove width (L1) and section (S) required.
2. In the case of a rod bearing, position the bearing strip around the rod or in the case of a piston bearing, place it in the piston groove and mark the point of overlap. Determine the correct groove width of bearing split (W) for the $\varnothing d$ or $\varnothing D$ being used, as indicated in the technical details, and make a second mark.
3. Remove the strip and cut at the second marked position to the desired angle using secateurs or other similar cutting tool.

It is recommended that the standard cutting angle is used for the majority of applications.



Cut Rings



Spiral Lengths

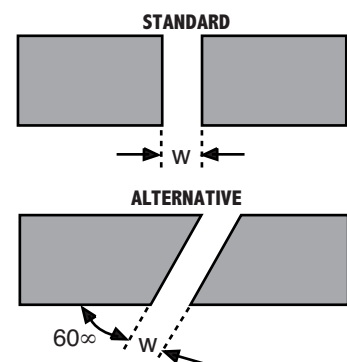


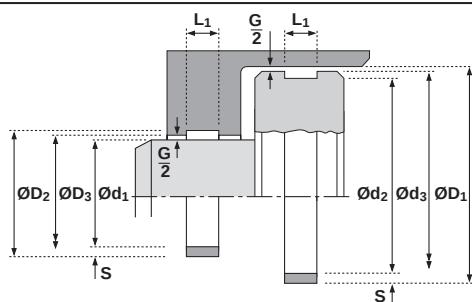
Flat Coils

Features

- High load capability
- Infinite length range
- Virtually zero swell
- Self lubricating
- Low friction
- Cut to length
- Very large range of sizes

Bearing split cutting angle





506

metric – section range

S	L1
1.50	5.6
2.00	9.7
2.00	10.0
2.00	15.0
2.00	20.0
2.00	22.0
2.00	25.0
2.50	5.6 ‡
2.50	6.3
2.50	7.0
2.50	8.0

S	L1
2.50	9.7 ‡
2.50	12.0
2.50	13.0
2.50	15.0 ‡
2.50	16.0
2.52	19.5
2.50	20.0
2.50	25.0 ‡
2.52	30.0
2.50	40.0
3.00	9.7
3.00	12.8

S	L1
3.02	15.0
3.00	20.0
3.00	25.0
3.20	9.7
3.20	19.7
3.50	25.0
4.00	6.1
4.00	9.7
4.00	20.0
4.00	25.0 ‡
4.00	30.0
4.00	40.1

inch – section range

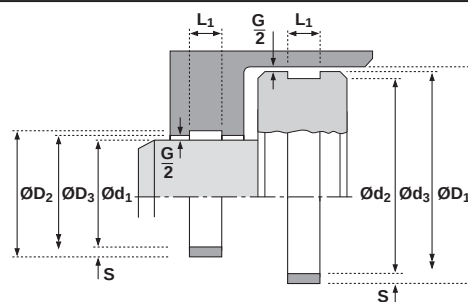
S	L1
0.063	0.375
0.125	0.375
0.125	0.500
0.125	0.625
0.125	0.750
0.125	1.000
0.125	1.500

Within the size range, items suffixed ‡ indicate cross sections to ISO 10766.

metric – spiral lengths

Ø RANGE							PART No.
Ød1	ØD1	S	L1	G MAX	G MIN*		
25 - 41	45 - 90	2.0	10.0	As required by the seal extrusion gap	0.7		8501310
35 - 70	74 - 160	2.0	10.0		0.7		8502610
70 - 155	159 - 310	2.0	10.0		0.7		8502252
35 - 50	54 - 110	2.0	15.0		0.7		8503357
50 - 100	104 - 210	2.0	15.0		0.7		8503175
90 - 180	184 - 370	2.0	15.0		0.7		8503358
25 - 30	35 - 70	2.5	5.6		0.7		8502000‡
25 - 50	55 - 110	2.5	5.6		0.7		8502020‡
50 - 100	105 - 210	2.5	5.6		0.7		8502040‡
25 - 40	45 - 90	2.5	9.7		0.7		8502100‡
35 - 70	75 - 150	2.5	9.7		0.7		8502120‡
70 - 150	155 - 310	2.5	9.7		0.7		8502140‡
40 - 50	55 - 110	2.5	13.0		0.7		8502200
50 - 100	105 - 210	2.5	13.0		0.7		8502220
90 - 180	185 - 370	2.5	13.0		0.8		8502230
40 - 50	55 - 110	2.5	15.0		0.7		8502300‡
50 - 100	105 - 210	2.5	15.0		0.7		8502330‡
90 - 180	185 - 370	2.5	15.0		0.8		8502350‡
50 - 80	85 - 170	2.5	20.0		0.7		8502400
75 - 150	155 - 310	2.5	20.0		0.8		8502410
125 - 250	255 - 510	2.5	20.0		0.8		8502430
60 - 80	85 - 170	2.5	25.0	For applications not using a seal G MAX can be 1.6mm.	0.7		8502500‡
70 - 150	155 - 310	2.5	25.0		0.8		8502520‡
125 - 250	255 - 510	2.5	25.0		0.8		8502530‡
40 - 50	56 - 100	3.0	9.7		0.8		8503369
50 - 100	106 - 210	3.0	9.7		0.8		8503370
100 - 150	156 - 310	3.0	9.7		0.8		8503371

506



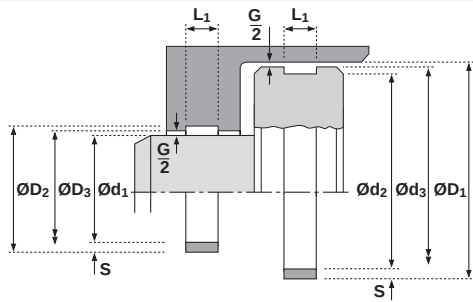
metric – spiral lengths

Ø RANGE							PART No.
Ød1	ØD1	S	L1	G MAX		G MIN*	
50 - 60	66 - 120	3.0	12.8	As required by the seal extrusion gap For applications not using a seal G MAX can be 1.6mm.		0.7	8503037
60 - 104	110 - 220	3.0	12.8			0.8	8503038
90 - 149	155 - 300	3.0	12.8			0.8	8503039
55 - 80	86 - 170	3.0	20.0			0.8	8503124
80 - 150	156 - 310	3.0	20.0			0.8	8502635
140 - 250	256 - 510	3.0	20.0			0.8	8503189
50 - 75	81 - 160	3.02	15.0			0.7	8502734
60 - 80	68 - 170	4.0	6.1			0.8	8503359
80 - 150	158 - 310	4.0	6.1			0.8	8503360
150 - 250	258 - 510	4.0	6.1			0.8	8503361
60 - 80	88 - 170	4.0	9.7			0.8	8503362
80 - 150	158 - 310	4.0	9.7			0.8	8503363
150 - 250	258 - 510	4.0	9.7			0.8	8503364
60 - 80	88 - 170	4.0	20.0			0.8	8503365
80 - 150	158 - 310	4.0	20.0			0.8	8503366
150 - 250	258 - 510	4.0	20.0			0.8	8503191
120 -150	158 - 310	4.0	25.0			0.8	8503367‡
150 - 250	258 - 510	4.0	25.0			0.8	8503192‡
120 -150	158 - 310	4.0	30.0			0.8	8503368
150 - 250	258 - 510	4.0	30.0			0.8	8503193
170 - 200	208 - 410	4.0	40.1			0.8	8503179
200 - 300	308 - 610	4.0	40.1			0.8	8503180

Within the size range, items suffixed ‡ indicate cross sections to ISO 10766.

inch – spiral lengths

Ø RANGE					G MAX	G MIN*	PART No.
Ød ₁	ØD ₁	S	L ₁				
1.000 - 1.375	1.625 - 3.500	0.125	0.375	As required by the seal extrusion gap	0.031	8502098	
1.250 - 1.875	2.125 - 4.250	0.125	0.375		0.031	8502099	
2.000 - 3.500	3.750 - 6.250	0.125	0.375		0.031	8502183	
1.250 - 1.750	2.000 - 4.000	0.125	0.500		0.031	8502089	
1.750 - 3.500	3.750 - 6.250	0.125	0.500		0.031	8502090	
3.500 - 6.000	6.250 - 10.000	0.125	0.500		0.031	8502091	
8.000 - 12.500	12.750 - 25.000	0.125	0.500		0.031	8502720	
2.000 - 3.500	3.750 - 6.250	0.125	0.625	For applications not using a seal G MAX can be 0.080 in.	0.031	8502092	
3.500 - 6.000	6.250 - 10.000	0.125	0.625		0.031	8502093	
2.000 - 3.500	3.750 - 6.250	0.125	0.750		0.031	8502094	
3.500 - 6.000	6.250 - 10.000	0.125	0.750		0.031	8502095	
2.500 - 3.500	3.750 - 6.250	0.125	1.000		0.031	8502096	
3.500 - 6.000	6.250 - 10.000	0.125	1.000		0.031	8502097	
8.000 - 12.500	12.750 - 25.000	0.125	1.000		0.031	8502222	



506

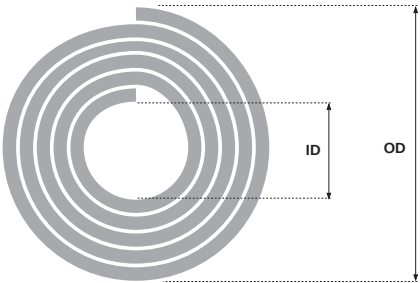
metric - flat coils

Ø RANGE	OD	S	L1	G MAX	G MIN*	PART No.
ID						
140	190	1.5	5.6	As required by the seal extrusion gap For applications not using a seal G MAX can be 1.6mm.	0.7	8581810
140	210	2.0	9.7		0.7	8581910
140	210	2.0	10.0		0.7	8584610
140	210	2.0	20.0		0.7	8582210
140	210	2.0	15.0		0.7	8581210
140	230	2.5	5.6		0.7	8580010‡
140	230	2.5	6.3		0.7	8581310
140	230	2.5	8.0		0.7	8581610
140	230	2.5	9.7		0.7	8580110‡
140	230	2.5	13.0		0.7	8581110
140	230	2.5	15.0		0.7	8580210‡
140	230	2.5	20.0		0.8	8580310
140	230	2.5	25.0		0.8	8580410‡
140	230	2.5	30.0		0.7	8582010
140	240	3.0	9.7		0.7	8581410
140	240	3.0	12.8		0.7	8581010
140	240	3.0	20.0		0.7	8581510
140	240	3.02	15.0		0.7	8581710
5.500	9.750	0.125	0.375	As required by the seal extrusion gap For applications not using a seal G MAX can be 0.080in.	0.031	8580510
5.500	9.750	0.125	0.500		0.031	8580610
5.500	9.750	0.125	0.625		0.031	8580710
5.500	9.750	0.125	0.750		0.031	8580810
5.500	9.750	0.125	1.000		0.031	8580910

Within the size range, items suffixed ‡ indicate cross sections to ISO 10766. ID and OD are indicated as approximate values for guidance only.

* This value can be reduced if required by the seal’s maximum extrusion gap- Refer to Housing Design section.

If necessary coil diameters can be re-sized by curing on a suitable mandrel in an oven for 1 hr at 120°C 250°F and allowing to cool on the mandrel.



Technical details

Operating conditions

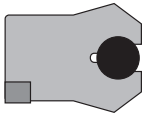
Maximum Speed	0.3m/sec
Temperature Range	0°C + 60°C
Maximum Pressure	700 bar

Metric

HFA Fluids

Inch

1.0 ft/sec
32°F + 140°F
10,000 p.s.i.



Maximum extrusion gap

Pressure bar	160	250	400	500	700
Maximum Gap mm	1.0	0.8	0.6	0.4	0.25
Pressure p.s.i.	2400	3750	6000	7500	10,000

Surface roughness

	µmRa	µmRt	µinCLA	µinRMS
Dynamic Sealing Face Ød1	0.1 < > 0.4	4 max	4 < > 16	5 < > 18
Static Sealing Face ØD1	1.6 max	10 max	63 max	70 max
Static Housing Faces L1	3.2 max	16 max	125 max	140 max

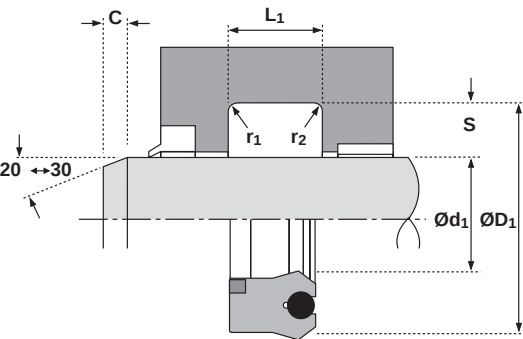
Chamfers & Radii

Groove Section ≤ S mm	4.0	5.0	7.5	10.0	12.5	15.0
Min Chamfer C mm	3.0	3.5	5.0	6.5	7.0	8.0
Max Fillet Rad r1 mm	0.2	0.4	0.8	0.8	1.2	1.6
Max Fillet Rad r2 mm	0.4	0.8	1.2	1.2	1.6	2.4

Tolerances

Ød1	ØD1	L1mm
f9	Js11	+0.25 - 0

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Design

The Hallite 652 is a high pressure rod seal designed specifically for longwall mining applications. The seal design comprises three elements; an O-ring energiser is generally used*, a polyurethane shell and a polyacetal anti-extrusion ring.

The shell is manufactured in Hythane® 181 to provide flexibility for installation and responsiveness to the sealing lip. The rubber energiser ensures complete lip actuation under all pressure conditions and cushions the seal against shock loadings. The anti-extrusion ring enables the seal to withstand side loads and extreme pressure peaks during operation, even with the extrusion gaps which are the result of using remote plastic bearing strips such as Hallite 506.

*In some cases a shaped energiser as T621 is used.

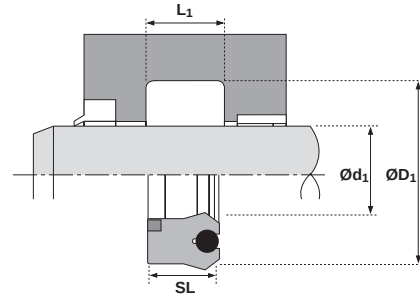
Media

Also suitable for use in mineral oil based hydraulic fluids at temperature between -45°C +110°C/ -50°F + 230°F

Features

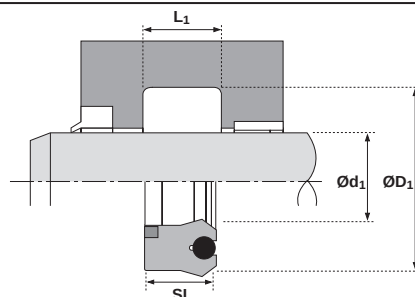
- High pressure/shock load capability
- Polyacetal anti-extrusion ring.
- Responsive sealing

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Ød1	TOL f9	ØD1	TOL Js11	SL	L1 +0.25-0	PART No.
32	-0.025 -0.087	44.0	+0.080 -0.080	8.7	9.6	4344111
40	-0.025 -0.087	52.0	+0.095 -0.095	8.7	9.6	4326311
50	-0.025 -0.087	62.0	+0.095 -0.095	8.7	9.6	4326411
60	-0.030 -0.104	69.8	+0.095 -0.095	11.0	12.5	4534910*
60	-0.030 -0.104	72.0	+0.095 -0.095	8.7	9.6	4344211*
60	-0.030 -0.104	75.0	+0.095 -0.095	11.9	13.0	4451211
63	-0.030 -0.104	75.0	+0.095 -0.095	8.7	9.6	4326511*
70	-0.030 -0.104	82.0	+0.110 -0.110	8.7	9.6	4344311*
75	-0.030 -0.104	95.0	+0.110 -0.110	12.5	14.0	4547810*
80	-0.030 -0.104	95.0	+0.110 -0.110	14.5	16.0	4446511
80	-0.030 -0.104	95.0	+0.110 -0.110	11.8	13.0	4797410
85	-0.036 -0.123	97.0	+0.110 -0.110	8.7	9.6	4344511*
90	-0.036 -0.123	105.0	+0.110 -0.110	14.5	16.0	4428011
100	-0.036 -0.123	115.0	+0.110 -0.110	11.0	12.0	4528010*
100	-0.036 -0.123	115.0	+0.110 -0.110	14.5	16.0	4397611*
105	-0.036 -0.123	120.0	+0.110 -0.110	11.8	13.0	4406711*
105	-0.036 -0.123	120.0	+0.110 -0.110	14.5	16.0	4781810
110	-0.036 -0.123	125.0	+0.125 -0.125	14.5	16.0	4445611
115	-0.036 -0.123	130.0	+0.125 -0.125	14.5	16.0	4455411
120	-0.043 -0.143	135.0	+0.125 -0.125	14.5	16.0	4452011
125	-0.043 -0.143	140.0	+0.125 -0.125	14.5	16.0	4446911
128	-0.043 -0.143	143.0	+0.125 -0.125	14.5	16.0	4581611
130	-0.043 -0.143	145.0	+0.125 -0.125	14.5	16.0	4782410

Ød1	TOL f9	ØD1	TOL Js11	SL	L1 +0.25-0	PART No.
135	-0.043 -0.143	155.0	+0.125 -0.125	13.6	15.0	4475410*
140	-0.043 -0.143	155.0	+0.125 -0.125	14.5	16.0	4753210
150	-0.043 -0.143	165.0	+0.125 -0.125	14.5	16.0	4389111*
160	-0.043 -0.143	175.0	+0.125 -0.125	11.7	12.8	4484010*
160	-0.043 -0.143	175.0	+0.125 -0.125	14.5	16.0	4405011*
160	-0.043 -0.143	177.0	+0.125 -0.125	14.5	16.0	4767610
160	-0.043 -0.143	185.0	+0.145 -0.145	18.8	20.0	4401711*
165	-0.043 -0.143	182.0	+0.145 -0.145	14.5	16.0	4537411
170	-0.043 -0.143	185.0	+0.145 -0.145	14.5	16.0	4745610
177	-0.043 -0.143	192.0	+0.145 -0.145	14.5	16.0	4445711
180	-0.043 -0.143	195.0	+0.145 -0.145	14.5	16.0	4734610
185	-0.050 -0.165	200.0	+0.145 -0.145	14.5	16.0	4777210
185	-0.050 -0.165	210.0	+0.145 -0.145	18.0	20.0	4546611
190	-0.050 -0.165	205.0	+0.145 -0.145	14.5	16.0	4430811
195	-0.050 -0.165	210.0	+0.145 -0.145	14.5	16.0	4459311
195	-0.050 -0.165	215.0	+0.145 -0.145	14.5	16.0	4550511
200	-0.050 -0.165	220.0	+0.145 -0.145	14.5	16.0	4387611*
210	-0.050 -0.165	230.0	+0.145 -0.145	14.5	16.0	4472911
220	-0.050 -0.165	235.0	+0.145 -0.145	14.5	16.0	4759610
220	-0.050 -0.165	240.0	+0.145 -0.145	14.5	16.0	4544510*
225	-0.050 -0.165	240.0	+0.145 -0.145	14.5	16.0	4445811
225	-0.050 -0.165	250.0	+0.145 -0.145	18.0	20.0	4537511
230	-0.050 -0.165	247.0	+0.160 -0.160	14.5	16.0	4767710



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Ød ₁	TOL f9	ØD ₁	TOL Js11	SL	L ₁ +0.25-0	PART No.
230	-0.050 -0.165	249.3	+0.160 -0.160	14.5	16.0	4439411
230	-0.050 -0.165	250.0	+0.160 -0.160	14.5	16.0	4707210
230	-0.050 -0.165	255.0	+0.160 -0.160	22.8	25.0	4555511
235	-0.050 -0.165	255.0	+0.160 -0.160	14.5	16.0	4771410
240	-0.050 -0.165	260.0	+0.160 -0.160	14.5	16.0	4496511
245	-0.050 -0.165	270.0	+0.160 -0.160	18.0	20.0	4546711
250	-0.050 -0.165	270.0	+0.160 -0.160	14.5	16.0	4728810
255	-0.056 -0.186	275.0	+0.160 -0.160	14.5	16.0	4578611
260	-0.056 -0.186	280	+0.160 -0.160	16.4	18.0	4499011
265	-0.056 -0.186	285	+0.160 -0.160	14.5	16.0	4722110
275	-0.056 -0.186	295	+0.160 -0.160	14.5	16.0	4807110
280	-0.056 -0.186	300	+0.160 -0.160	14.5	16.0	4713910
285	-0.056 -0.186	305	+0.160 -0.160	16.4	18.0	4767810
285	-0.056 -0.186	310	+0.160 -0.160	18.0	20.0	4537611
290	-0.056 -0.186	310	+0.160 -0.160	16.4	18.0	4475111
290	-0.056 -0.186	315	+0.160 -0.160	18.0	20.0	4759410
295	-0.056 -0.186	315	+0.160 -0.160	16.4	18.0	4598211
300	-0.056 -0.186	320	+0.180 -0.180	14.5	16.0	4525110*
305	-0.056 -0.186	325	+0.180 -0.180	16.4	18.0	4473011
305	-0.056 -0.186	330	+0.180 -0.180	18.0	20.0	4546811
305	-0.056 -0.186	335	+0.180 -0.180	16.4	18.0	4721910
320	-0.062 -0.202	340	+0.180 -0.180	14.5	16.0	4544410*

Ød ₁	TOL f9	ØD ₁	TOL Js11	SL	L ₁ +0.25-0	PART No.
320	-0.062 -0.202	340	+0.180 -0.180	16.4	18.0	4707310
325	-0.062 -0.202	355	+0.180 -0.180	18.0	20.0	4555711
330	-0.062 -0.202	350	+0.180 -0.180	16.4	18.0	4796710
335	-0.062 -0.202	355	+0.180 -0.180	16.4	18.0	4496611
340	-0.062 -0.202	360	+0.180 -0.180	18.5	20.5	4788100
340	-0.062 -0.202	365	+0.180 -0.180	18.0	20.0	4732810
350	-0.062 -0.202	375	+0.180 -0.180	18.0	20.0	4718010
355	-0.062 -0.202	380	+0.180 -0.180	18.0	20.0	4578411
360	-0.062 -0.202	385	+0.180 -0.180	18.0	20.0	4781110
370	-0.062 -0.202	395	+0.180 -0.180	18.0	20.0	4579710
380	-0.062 -0.202	405	+0.200 -0.200	18.0	20.0	4752010*
390	-0.062 -0.202	415	-0.200 -0.200	18.0	20.0	4730010*
395	-0.062 -0.202	420	-0.200 -0.200	18.0	20.0	4807110
410	-0.062 -0.202	435	-0.200 -0.200	18.0	20.0	4785110*

* Indicates product fitted with shaped energiser

Installation guide for Hallite 730 Piston Seal

PLEASE NOTE!

Before installation of the seals onto the piston check that the piston is free of dirt and sharp edges. Sharp edged tools which could damage the seal during installation must not be used.

INSTALLATION

The rubber energizer must be installed first. It can be pulled over the piston with a circling movement, using a plastic strip for the stretching. The energizer should then be positioned in the centre of the groove, with a clearance either side. The first AE-ring is fitted next. It must be positioned opposite the installation side for the TPE face. This is fitted over the NBR energiser using the plastic installation strip. Please note that the TPE face ring needs to be installed directly against the AE ring. This can easily be achieved by circling movements with the fitting strap. The second AE ring can now be snapped on.

To provide the necessary seal interference, the seal will be considerably larger than the piston diameter. The assembly chamfer on the cylinder tube should be as long and flat as possible. Ensure that all edges are deburred and that the intersection points of the assembly chamfers with the bore are smoothly rounded.

Before the cylinders are assembled, the seal surface should be well greased. The grease also helps the seal to slip into the tube easily. For tubes longer than 800 mm the bore needs to be greased as well.

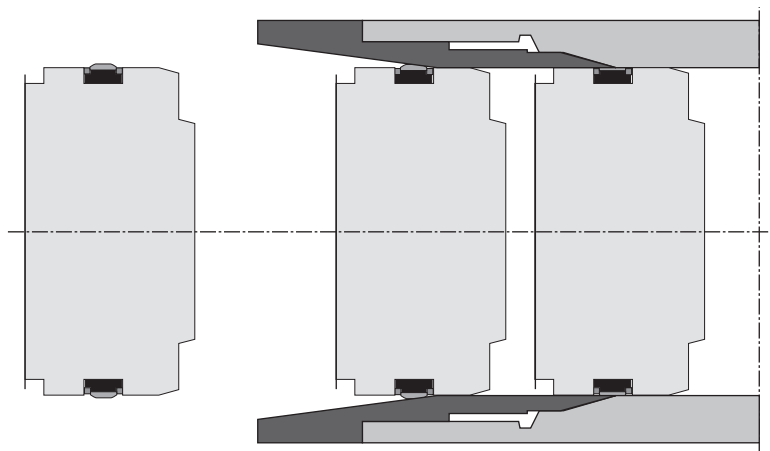
PLEASE NOTE!

The surface between energizer and face-ring must be kept free of grease.

For T730 with nominal groove lengths above 16 mm an installation sleeve is required (this can also be helpful for groove lengths up to 16 mm). This sleeve is needed to extend the assembly chamfer. A slope angle between 7° and 10° is required to prevent the face ring taking up a conical shape that will allow the rear AE-ring to slip under the TPE face ring.

The installation sleeve should be machined from a suitable plastic (such as polyacetal or polyamide). It can be made as a one piece design or as two half shells.

When automatic screwing equipment is used for the installation of the associated gland the maximum surface speed of the seal with respect to the bore must not exceed 0.1 m/s.



Technical details

Operating conditions

Maximum Speed	0.3 m/sec
Temperature Range	-0°C +60°C
Maximum Pressure	700 bar
Static Pressure	1200bar

Inch

1.0 ft/sec
-32°F + 140°F
10,000 p.s.i.
17,400 p.s.i.



Maximum extrusion gap

Pressure bar	160	250	500	700	1200
Maximum Gap mm	1.00	0.80	0.40	0.25	0.10
Pressure p.s.i.	2400	3750	7500	10,000	17,400

Surface roughness

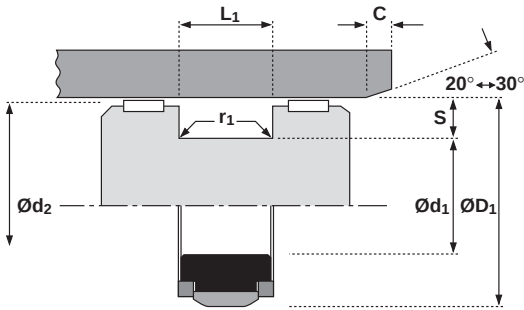
	µmRa	µmRt	µinCLA	µinRMS
Dynamic Sealing Face ØD1	0.1 < > 0.4	4 max	4 < > 16	5 < > 18
Static Sealing Face Ød1 Ød2	1.6 max	10 max	63 max	70 max
Static Housing Faces L1	3.2 max	16 max	125 max	140 max

Chamfers & Radii

Groove Section ≤ S mm	7.5	10.0	12.5
Min Chamfer C mm	4.0	5.0	6.5
Max Fillet Rad r1 mm	0.2	0.4	0.8

Tolerances

ØD1	Ød1	L1mm
H10	h9	+0.2 - 0



Features

- High shock load capability
- High pressure capability
- Proven on both roller-burnished and honed tubing

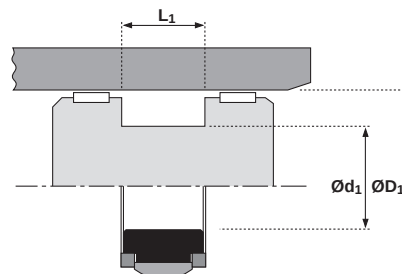
Design

The Hallite 730 is a robust double acting rod seal specifically developed for longwall mining roof support applications. It is constructed with tough wear resistant thermoplastic polyester elastomer (TPE) face, which is loaded by a profiled nitrile energiser. Most designs have rectangular polyacetal anti-extrusion rings. Those with profiled anti-extrusion rings are indicated with an asterisk in the size list. The TPE face material is suitable for both roller-burnished and honed tubing.

The operating conditions given are for HFA (water based) fluids for applications such as longwall mining roof support equipment.

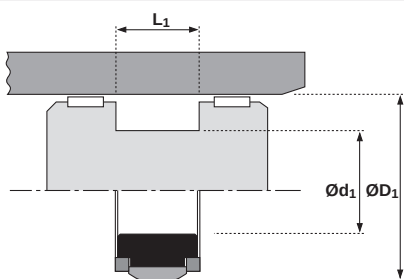
730

730



ØD ₁	TOL H10	Ød ₁	TOL h9	L ₁ +0.2 -0	PART No.
50	+0.10 +0.00	38	+0.00 -0.06	11.5	2335410
60	+0.12 +0.00	44	+0.00 -0.06	20.5	2356710
63	+0.12 +0.00	50	+0.00 -0.06	14.5	2331210
75	+0.12 +0.00	55	+0.00 -0.07	23.0	2346420
80	+0.12 +0.00	66	+0.00 -0.07	17.0	2330310
90	+0.14 +0.00	75	+0.00 -0.07	13.5	2331310
90	+0.14 +0.00	76	+0.00 -0.07	16.0	2364810
100	+0.14 +0.00	82	+0.00 -0.09	22.5	2331410
100	+0.14 +0.00	85	+0.00 -0.09	13.5	2335010
100	+0.14 +0.00	86	+0.00 -0.09	22.5	2359710
105	+0.14 +0.00	80	+0.00 -0.09	22.5	2346710
105	+0.14 +0.00	91	+0.00 -0.09	16.5	2348210
110	+0.14 +0.00	95	+0.00 -0.09	16.0	2331610
110	+0.14 +0.00	95	+0.00 -0.09	18.0	2331640*
115	+0.14 +0.00	90	+0.00 -0.09	21.0	2329110
115	+0.14 +0.00	97	+0.00 -0.09	22.5	2356110
115	+0.14 +0.00	97	+0.00 -0.09	30.0	2328910*
115	+0.14 +0.00	100	+0.00 -0.09	16.0	2329210
120	+0.14 +0.00	105	+0.00 -0.09	16.0	2337410
125	+0.16 +0.00	110	+0.00 -0.09	15.8	2331510
130	+0.16 +0.00	105	+0.00 -0.09	30.0	2356610*

ØD ₁	TOL H10	Ød ₁	TOL h9	L ₁ +0.2 -0	PART No.
135	+0.16 +0.00	110	+0.00 -0.09	30.0	2346610*
135	+0.16 +0.00	118	+0.00 -0.09	20.5	2348110
135	+0.16 +0.00	120	+0.00 -0.09	16.0	2334010
140	+0.16 +0.00	123	+0.00 -0.10	16.0	2357910
140	+0.16 +0.00	125	+0.00 -0.10	16.0	2329410
150	+0.16 +0.00	130	+0.00 -0.10	16.0	2339010
150	+0.16 +0.00	133	+0.00 -0.10	20.0	2360510
150	+0.16 +0.00	135	+0.00 -0.10	16.0	2338210
155	+0.16 +0.00	135	+0.00 -0.10	20.0	2356210*
160	+0.16 +0.00	143	+0.00 -0.10	20.0	2365510
160	+0.16 +0.00	145	+0.00 -0.10	16.0	2331910
165	+0.16 +0.00	145	+0.00 -0.10	20.0	2348910
165	+0.16 +0.00	145	+0.00 -0.10	25.4	2329010*
165	+0.16 +0.00	150	+0.00 -0.10	16.0	2332010
170	+0.16 +0.00	145	+0.00 -0.10	25.0	2345510
170	+0.16 +0.00	150	+0.00 -0.10	16.0	2331110
170	+0.16 +0.00	150	+0.00 -0.10	20.0	2331130*
175	+0.16 +0.00	155	+0.00 -0.10	16.0	2335110
175	+0.16 +0.00	155	+0.00 -0.10	20.0	2335130*
180	+0.16 +0.00	160	+0.00 -0.10	16.0	2328510
180	+0.16 +0.00	160	+0.00 -0.10	18.0	2328520*

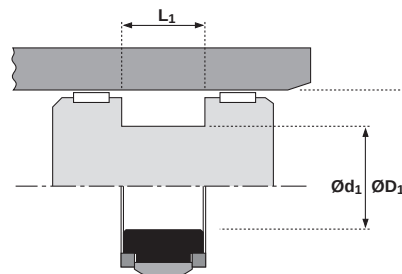


730

ØD ₁	TOL H10	Ød ₁	TOL h9	L ₁ +0.2 -0	PART No.
180	+0.16 +0.00	163	+0.00 -0.10	20.0	2365210
180	+0.16 +0.00	163	+0.00 -0.10	25.0	2365220*
185	+0.19 +0.00	165	+0.00 -0.10	16.0	2328410
185	+0.19 +0.00	165	+0.00 -0.10	20.0	2364010
190	+0.19 +0.00	160	+0.00 -0.10	30.0	2338610*
190	+0.19 +0.00	170	+0.00 -0.10	16.0	2332210
195	+0.19 +0.00	175	+0.00 -0.10	16.0	2334710
200	+0.19 +0.00	175	+0.00 -0.10	28.0	2334320*
200	+0.19 +0.00	180	+0.00 -0.10	16.0	2329310
200	+0.19 +0.00	180	+0.00 -0.10	20.0	2348810
200	+0.19 +0.00	183	+0.00 -0.12	20.0	2365010
200	+0.19 +0.00	183	+0.00 -0.12	25.0	2365020*
210	+0.19 +0.00	190	+0.00 -0.12	16.0	2332410
210	+0.19 +0.00	190	+0.00 -0.12	20.0	2364710
215	+0.19 +0.00	195	+0.00 -0.12	16.0	2332510
215	+0.19 +0.00	195	+0.00 -0.12	20.0	2345110
220	+0.19 +0.00	195	+0.00 -0.12	16.0	2345810
220	+0.19 +0.00	195	+0.00 -0.12	22.0	2333920
220	+0.19 +0.00	195	+0.00 -0.12	25.0	2333910
220	+0.19 +0.00	200	+0.00 -0.12	20.5	2356510
220	+0.19 +0.00	200	+0.00 -0.12	28.5	2356540*

ØD ₁	TOL H10	Ød ₁	TOL h9	L ₁ +0.2 -0	PART No.
224	+0.19 +0.00	204	+0.00 -0.12	20.5	2348510
225	+0.19 +0.00	205	+0.00 -0.12	16.0	2332610
225	+0.19 +0.00	205	+0.00 -0.12	20.0	2346810
225	+0.19 +0.00	205	+0.00 -0.12	25.0	2332620*
230	+0.19 +0.00	205	+0.00 -0.12	25.0	2360720*
230	+0.19 +0.00	205	+0.00 -0.12	30.0	2360730*
230	+0.19 +0.00	210	+0.00 -0.12	16.0	2332710
230	+0.19 +0.00	210	+0.00 -0.12	20.0	2344510
235	+0.19 +0.00	210	+0.00 -0.12	30.0	2338720*
240	+0.19 +0.00	215	+0.00 -0.12	25.0	2333010
240	+0.19 +0.00	215	+0.00 -0.12	33.0	2333030*
240	+0.19 +0.00	220	+0.00 -0.12	25.0	2364310
245	+0.19 +0.00	220	+0.00 -0.12	25.0	2328810
250	+0.19 +0.00	225	+0.00 -0.12	25.0	2348310
250	+0.19 +0.00	225	+0.00 -0.12	33.0	2348330*
255	+0.19 +0.00	230	+0.00 -0.12	25.0	2348320
260	+0.21 +0.00	230	+0.00 -0.12	30.0	2347810
260	+0.21 +0.00	235	+0.00 -0.12	25.0	2347910
260	+0.21 +0.00	235	+0.00 -0.12	30.0	2347920*
260	+0.21 +0.00	235	+0.00 -0.12	35.0	2347930*
270	+0.21 +0.00	245	+0.00 -0.12	24.0	2363210*

730



ØD ₁	TOL H10	Ød ₁	TOL h9	L ₁ +0.2 -0	PART No.
270	+0.21 +0.00	245	+0.00 -0.12	29.0	2363220*
275	+0.21 +0.00	250	+0.00 -0.12	25.0	2362210
280	+0.21 +0.00	255	+0.00 -0.13	25.0	2333510
280	+0.21 +0.00	255	+0.00 -0.13	30.0	2333540*
280	+0.21 +0.00	255	+0.00 -0.13	33.0	2333530*
285	+0.21 +0.00	260	+0.00 -0.13	25.0	2362410
290	+0.21 +0.00	265	+0.00 -0.13	27.0	2364410
290	+0.21 +0.00	265	+0.00 -0.13	37.0	2364440*
300	+0.21 +0.00	275	+0.00 -0.13	25.0	2333610
300	+0.21 +0.00	275	+0.00 -0.13	33.0	2333620*
305	+0.21 +0.00	280	+0.00 -0.13	25.0	2333630
310	+0.21 +0.00	285	+0.00 -0.13	25.0	2333710
310	+0.21 +0.00	285	+0.00 -0.13	33.0	2333720*
320	+0.23 +0.00	290	+0.00 -0.13	30.0	2348010
330	+0.23 +0.00	305	+0.00 -0.13	25.0	2341610*
340	+0.23 +0.00	310	+0.00 -0.13	30.0	2366010
345	+0.23 +0.00	315	+0.00 -0.13	30.0	2363610
350	+0.23 +0.00	320	+0.00 -0.14	30.0	2345410
360	+0.23 +0.00	330	+0.00 -0.14	30.0	2345430
360	+0.23 +0.00	330	+0.00 -0.14	31.5	2365410
360	+0.23 +0.00	330	+0.00 -0.14	35.0	2345440*
360	+0.23 +0.00	330	+0.00 -0.14	41.5	2365420*

ØD ₁	TOL H10	Ød ₁	TOL h9	L ₁ +0.2 -0	PART No.
370	+0.23 +0.00	340	+0.00 -0.14	30.0	2362710
380	+0.23 +0.00	350	+0.00 -0.14	32.0	2362110
390	+0.23 +0.00	360	+0.00 -0.14	32.0	2362120
400	+0.23 +0.00	370	+0.00 -0.14	32.0	2359810
410	+0.23 +0.00	380	+0.00 -0.14	32.0	2359820
420	+0.23 +0.00	390	+0.00 -0.14	32.0	2366410
440	+0.25 +0.00	410	+0.00 -0.16	32.0	2365910

* Indicates Special Support Rings

Technical details

Operating conditions

Maximum Speed	0.3 m/sec
Temperature Range	-0°C +60°C
Maximum Pressure	700 bar
Static Pressure	1200bar

Inch

1.0 ft/sec
-32°F + 140°F
10,000 p.s.i.
17,400 p.s.i



Maximum extrusion gap

Pressure bar	160	250	500	700	1200
Maximum Gap mm	1.00	0.80	0.40	0.25	0.10
Pressure p.s.i.	2400	3750	7500	10,000	17,400

Surface roughness

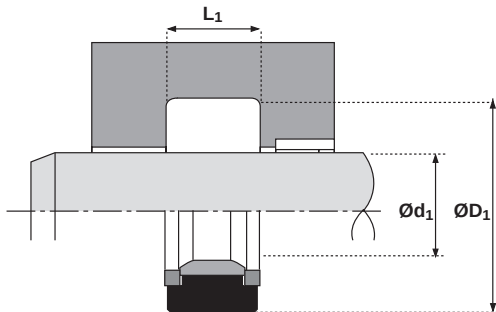
	µmRa	µmRt	µinCLA	µinRMS
Dynamic Sealing Face ØD1	0.1 < > 0.4	4 max	4 < > 16	5 < > 18
Static Sealing Face Ød1 Ød2	1.6 max	10 max	63 max	70 max
Static Housing Faces L1	3.2 max	16 max	125 max	140 max

Chamfers & Radii

Groove Section ≤ S mm	7.5	10.0	12.5
Min Chamfer C mm	4.0	5.0	6.5
Max Fillet Rad r1 mm	0.2	0.4	0.8

Tolerances

Ød1	ØD1	L1mm
f9	Js11	+0.2 - 0



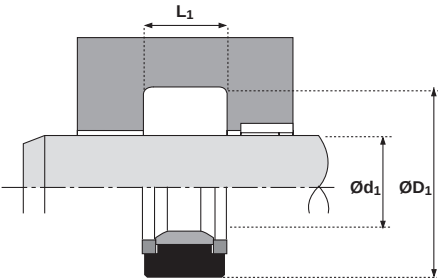
Features

- High shock load capability
- High pressure capability

Design

The Hallite 744 is a robust double acting rod seal specifically developed for longwall mining roof support applications. It is of similar construction to the well established Hallite 730 and comprises a tough wear resistant thermoplastic polyester elastomer (TPE) face, which is loaded by a profiled nitrile energiser. Most designs have rectangular polyacetal anti-extrusion rings. This seal has been developed as a double acting rod seal, which is required for a constant setting mining roof support leg cylinder. The operating conditions given are for HFA (water based) fluids.

744



Ød ₁	TOL f9	ØD ₁	TOL Js11	L ₁ +0.25-0	PART No.
63	-0.030 -0.104	76.0	+0.095 -0.095	14.5	2365110
80	-0.030 -0.104	95.0	+0.110 -0.110	18.0	2360610
110	-0.036 -0.123	125.0	+0.125 -0.125	16.0	2364910

Technical details

Metric

Inch

Operating conditions

Maximum Speed	4.0 m/sec
Temperature Range	-45°C +110°C

12.0 ft/sec
-50°F +230°F

Surface roughness

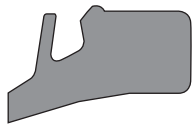
	µmRa	µmRt	µinCLA	µinRMS
Dynamic Sealing Face Ød1	0.1 < > 0.4	4 max	4 < > 16	5 < > 18
Static Sealing Face ØD1 ØD2 h	1.6 max	10 max	63 max	70 max
Static Housing Faces L1	3.2 max	16 max	125 max	140 max

Radii

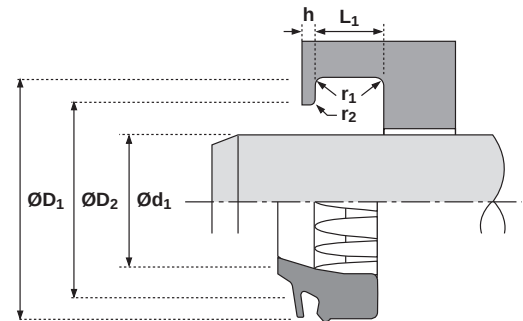
Rod Diameter Ød1	≤ 50	≤ 90	≤ 200	> 200
Max Fillet Rad r1 mm	0.4	0.4	0.4	0.8
Max Fillet Rad r2 mm	0.2	0.4	0.6	0.8
Rod Diameter Ød1	≤ 2.000	≤ 3.500	≤ 7.875	> 7.875
Max Fillet Rad r1 in	0.016	0.016	0.016	0.032
Max Fillet Rad r2 in	0.008	0.016	0.024	0.032

Tolerances

	Ød1	ØD1	ØD2	L1	h
mm	f9	H11	H11	+0.2 -0	+0.10 +0
in	f9	H11	H11	+0.008 -0	+0.004 +0



842



Design

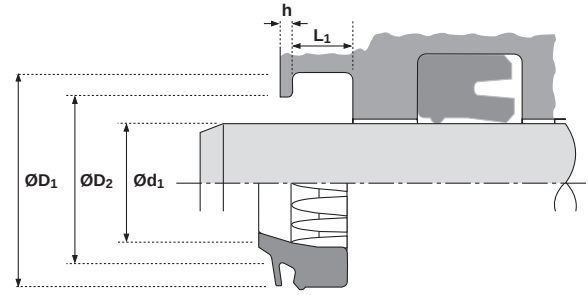
The Hallite 842 rod wiper is designed to prevent the ingress of foreign particles and moisture into the cylinder. The profile has been specially developed for harsh environments, in particular the longwall mining industry.

The special feature is the flap on the wiping lip which covers the gland housing, preventing the water/slurry trap so common with conventional wipers and thus ingress of contamination around the outside of the wiper. The internal ribs on the inside diameter prevent the possibility of pressure trapping between the gland seal and the wiper and ensure correct support and guidance of the wiping lip, even in cases of high eccentricity as can occur between the outer stage gland and the inner cylinder of a roof support leg.

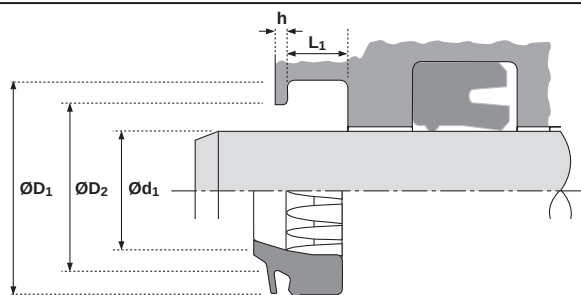
The Hallite 842 is manufactured in Hallite's high performance polyurethane, Hythane® 181. The material has excellent compression set characteristics, excellent wear and abrasive resistance, proven compatibility with HFA (95/5) fluids, as used in longwall mining equipment, and with mineral oil.

NB: Part numbers suffixed by " ± " indicate housing sizes to meet ISO6195A

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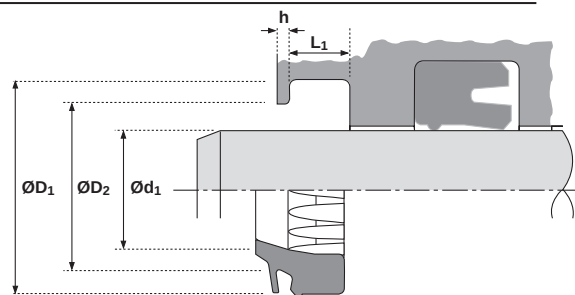
Ød ₁	TOL f9	ØD ₁	TOL H11	ØD ₂	TOL H11	L ₁ +0.2 - 0	L ₂	h +0.1 - 0	PART No.
32	-0.025 -0.087	40.0	+0.16 +0.00	37.5	+0.16 +0.00	5.0	8.0	1.50	4714900‡
35	-0.025 -0.087	45.0	+0.16 +0.00	42.0	+0.16 +0.00	6.3	10.0	1.50	4515300
36	-0.025 -0.087	44.0	+0.16 +0.00	41.5	+0.16 +0.00	5.0	8.0	1.50	4715000‡
38	-0.025 -0.087	46.0	+0.16 +0.00	43.0	+0.16 +0.00	5.3	8.0	1.50	4568700
40	-0.025 -0.087	48.0	+0.16 +0.00	45.5	+0.16 +0.00	5.0	8.0	1.50	4536500‡
45	-0.025 -0.087	53.0	+0.19 +0.00	50.5	+0.19 +0.00	5.0	8.0	1.50	4715100‡
50	-0.025 -0.087	58.0	+0.19 +0.00	55.5	+0.19 +0.00	5.0	8.0	1.50	4533600‡
55	-0.030 -0.104	65.0	+0.19 +0.00	62.0	+0.19 +0.00	6.3	10.0	1.50	4764600
56	-0.030 -0.104	66.0	+0.19 +0.00	63.0	+0.19 +0.00	6.3	10.0	1.50	4715200‡
60	-0.030 -0.104	70.0	+0.19 +0.00	67.0	+0.19 +0.00	6.3	10.0	1.50	4557800
60	-0.030 -0.104	72.0	+0.19 +0.00	67.0	+0.19 +0.00	4.1	10.0	2.50	4739300*
63	-0.030 -0.104	73.0	+0.19 +0.00	70.0	+0.19 +0.00	6.3	10.0	1.50	4536600‡
70	-0.030 -0.104	82.6	+0.22 +0.00	78.4	+0.19 +0.00	8.0	12.0	2.00	4480800
70	-0.030 -0.104	85.0	+0.22 +0.00	78.0	+0.19 +0.00	5.1	12.0	3.00	4739400*
75	-0.030 -0.104	90.0	+0.22 +0.00	83.0	+0.22 +0.00	5.1	12.0	3.00	4744000*
80	-0.030 -0.104	90.0	+0.22 +0.00	87.0	+0.22 +0.00	6.3	10.0	1.50	4715300‡
80	-0.030 -0.104	95.0	+0.22 +0.00	88.0	+0.22 +0.00	5.1	12.0	3.00	4739500*
85	-0.036 -0.123	97.6	+0.22 +0.00	93.4	+0.22 +0.00	8.0	12.0	2.00	4521800
85	-0.036 -0.123	100.0	+0.22 +0.00	93.0	+0.22 +0.00	5.1	10.0	3.00	4744100*
90	-0.036 -0.123	102.2	+0.22 +0.00	96.0	+0.22 +0.00	7.1	12.4	2.80	4727300
90	-0.036 -0.123	102.6	+0.22 +0.00	98.4	+0.22 +0.00	8.0	12.0	2.00	4512500
90	-0.036 -0.123	105.0	+0.22 +0.00	98.0	+0.22 +0.00	5.1	10.0	3.00	4744600*
95	-0.036 -0.123	110.0	+0.22 +0.00	105.0	+0.22 +0.00	9.5	14.0	2.80	4536900



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Ød ₁	TOL f9	ØD ₁	TOL H11	ØD ₂	TOL H11	L ₁ +0.2 - 0	L ₂	h +0.1 - 0	PART No.
100	-0.036 -0.123	112.2	+0.22 +0.00	106.0	+0.22 +0.00	7.1	12.4	2.80	4727400
100	-0.036 -0.123	114.0	+0.22 +0.00	109.9	+0.22 +0.00	8.0	12.0	1.50	4536000
100	-0.036 -0.123	115.0	+0.22 +0.00	108.0	+0.22 +0.00	5.1	12.0	3.00	4584800*
100	-0.036 -0.123	115.0	+0.22 +0.00	108.4	+0.22 +0.00	9.5	14.0	2.00	4589500‡
105	-0.036 -0.123	120.0	+0.22 +0.00	115.0	+0.22 +0.00	9.5	14.0	2.50	4532100
110	-0.036 -0.123	125.0	+0.25 +0.00	118.0	+0.22 +0.00	5.1	12.0	3.00	4739600*
110	-0.036 -0.123	125.0	+0.25 +0.00	120.0	+0.22 +0.00	9.5	14.0	2.00	4715400‡
120	-0.036 -0.123	135.0	+0.25 +0.00	130.0	+0.25 +0.00	9.5	14.0	2.00	4580800
125	-0.043 -0.123	137.2	+0.25 +0.00	131.0	+0.25 +0.00	7.6	10.6	2.80	4727500
125	-0.043 -0.143	140.0	+0.25 +0.00	133.0	+0.25 +0.00	5.1	12.0	3.00	4748300*
125	-0.043 -0.143	140.0	+0.25 +0.00	135.0	+0.25 +0.00	9.5	14.0	2.00	4715500‡
130	-0.043 -0.143	145.0	+0.25 +0.00	140.0	+0.25 +0.00	9.5	14.0	2.25	4491700
140	-0.043 -0.143	152.2	+0.25 +0.00	146.0	+0.25 +0.00	7.6	12.9	2.80	4727600
140	-0.043 -0.143	155.0	+0.25 +0.00	150.0	+0.25 +0.00	9.5	14.0	2.00	4555900‡
145	-0.043 -0.143	160.0	+0.25 +0.00	155.0	+0.25 +0.00	9.5	14.0	2.25	4570200
150	-0.043 -0.143	169.0	+0.25 +0.00	159.0	+0.25 +0.00	6.1	14.0	4.00	4748400*
155	-0.043 -0.143	170.0	+0.25 +0.00	165.0	+0.25 +0.00	9.5	12.0	2.25	4535200
170	-0.043 -0.143	189.0	+0.29 +0.00	179.0	+0.25 +0.00	6.1	14.0	4.00	4749200*
175	-0.043 -0.143	190.0	+0.29 +0.00	185.0	+0.29 +0.00	9.5	14.0	2.25	4552100
180	-0.043 -0.143	195.0	+0.29 +0.00	190.0	+0.29 +0.00	9.5	14.0	2.25	4491300‡
190	-0.050 -0.165	209.0	+0.29 +0.00	199.0	+0.29 +0.00	6.1	14.0	4.00	4749300*
200	-0.050 -0.165	223.0	+0.29 +0.00	211.0	+0.29 +0.00	8.3	20.0	4.80	4748700*
215	-0.050 -0.165	230.0	+0.29 +0.00	225.0	+0.29 +0.00	9.5	14.0	2.00	4705500

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$\varnothing d_1$	TOL f9	$\varnothing D_1$	TOL H11	$\varnothing D_2$	TOL H11	L_1 +0.2 - 0	L_2	h +0.1 - 0	PART No.
230	-0.050 -0.165	250.0	+0.29 +0.00	240.0	+0.29 +0.00	10.2	18.0	3.80	4750500
250	-0.050 -0.165	270.0	+0.32 +0.00	260.0	+0.32 +0.00	10.2	19.0	3.80	4725100
320	-0.062 -0.202	340.0	+0.36 +0.00	330.0	+0.36 +0.00	10.2	18.0	3.80	4750400
350	-0.062 -0.202	370.0	+0.36 +0.00	360.0	+0.36 +0.00	10.2	18.0	3.80	4725200

*These wipers do not have an interference fit between the outside diameter of the wiper and the wiper housing bore $\varnothing D_1$. They float on the retaining lip.

Hallite Seals

Hallite produces high performance hydraulic sealing solutions for the world's fluid power industry. The company enjoys an enviable reputation for high quality and reliability within the mobile hydraulics, mining, off-highway, construction, agriculture, mechanical handling and automation markets.

Hallite products, engineered in a wide variety of advanced materials, are chosen by leading manufacturers for their exceptional performance in the most demanding, safety-critical high specification applications.

Hallite operations are located in Australia, Canada, China, France, Germany, Italy, the UK and the USA. All Hallite locations are committed to providing quality seals in the shortest possible time. Hallite combines carefully chosen and managed stocks in local markets, supported by a fast track moulding capability. Most locations can now boast a CNC machining cell, branded Hallite Service, which can provide immediate delivery for non-standard and breakdown situations.

Additionally a worldwide network of service partners completes the global presence and ensures the full range of Hallite products is readily accessible.

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