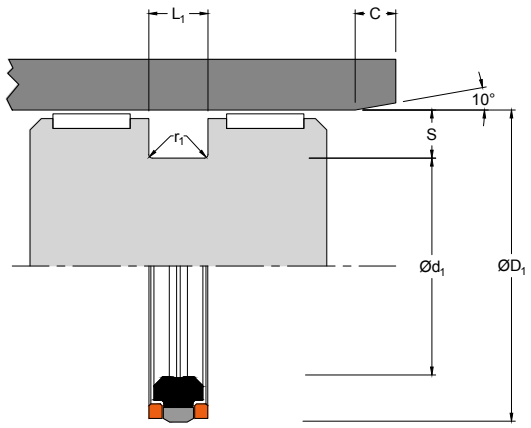


730

PISTON SEAL

Double-Acting
Four Part Assembly with AE Rings
for Heavy-Duty Applications

DESIGN

The Hallite 730 double-acting piston seal in a four part assembly is designed for use in heavy-duty applications where position holding ability is important, such as longwall mining roof support applications using water-based fluids and large diameter crane cylinders using standard hydraulic oils.

The Hallite 730 is comprised of a tough, wear resistant thermoplastic polyester elastomer (TPE) face seal pre-loaded by a profiled nitrile rubber energiser. The Hallite 730 design also contains a pair of rectangular polyacetal anti-extrusion rings.

The standard TPE face material is suitable for both roller-burnished and honed tubing. While rarely used in alternate material, the face material can be provided in a number of material options including lubricated polyester and PTFE.

For your reference, we have included an installation guide for the Hallite 730 double-acting piston seal which you can find after the part number range pages of this data sheet.

FEATURES

- Excellent position holding characteristics under load
- Extremely well proven in longwall mining applications
- Extremely well proven in HFA water-based fluids
- High pressure and shock load capability
- Proven on both roller-burnished and honed tubing

MATERIALS

As standard, this product comes in the following materials. Contact your local Hallite technical team if you would like to find out if this profile can be made in a custom material to suit your application. For further material details, please refer to the Hallite Material Table.

MATERIAL OPTIONS	Name	Face Type	Face Colour
Standard	TPE 111-Nitrile 1411-POM 0011	TPE	Grey

TECHNICAL DETAILS

OPERATING CONDITIONS	METRIC	INCH
Maximum Speed	0.3 m/sec	1.0 ft/sec
Temperature Range Hydraulic Oils	-40°C +110°C	-40°F +230°F
Temperature Range Water-Based Fluids	-0°C +60°C	32°F +140°F
Maximum Pressure	700 bar	10000 psi

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.

MAXIMUM EXTRUSION GAP				
Pressure bar	160	250	500	700
Maximum Gap mm	1.00	0.80	0.40	0.25
Pressure psi	1.00	0.80	0.40	0.25
Maximum Gap in	0.040	0.032	0.016	0.010

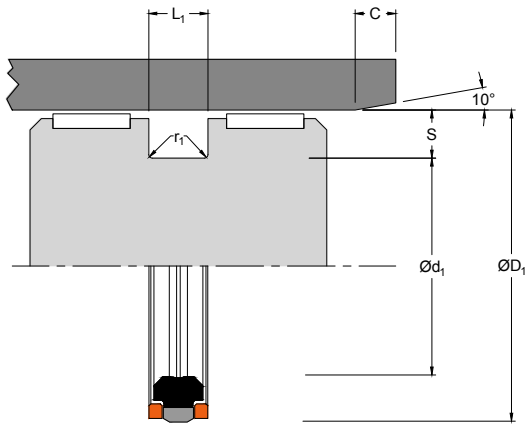
NOTE

Figures show the maximum permissible gap all on one side using minimum rod Ø and maximum clearance Ø. Refer to Housing Design section.

SURFACE ROUGHNESS	µmRa	µmRz	µmRt	µinRa	µinRz	µinRt
Dynamic Sealing Face $ØD_1$	0.1 - 0.4	1.6 max	4 max	4 - 16	63 max	157 max
Static Sealing Face $Ød_1$	1.6 max	6.3 max	10 max	63 max	250 max	394 max
Static Housing Faces L_1	3.2 max	10 max	16 max	125 max	394 max	630 max

CHAMFERS & RADII				
Groove Section ≤ S mm	7.50	10.00	12.50	15.00
Min Chamfer C mm	8.00	10.00	13.00	15.00
Max Fillet Rad r_1 mm	0.20	0.40	0.80	0.80

TOLERANCES	$ØD_1$	$Ød_1$	L_1
mm	H10	h9	+0.20 -0



730

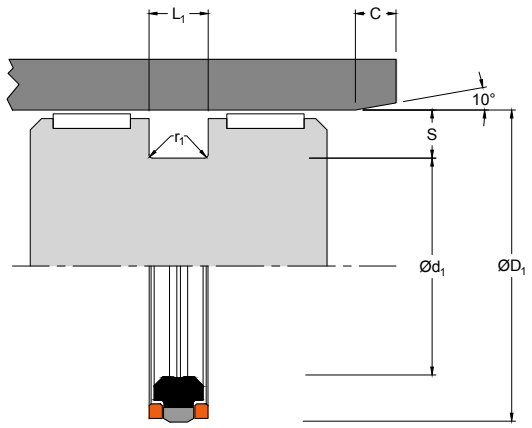
PISTON SEAL

Double-Acting
Four Part Assembly with AE Rings
for Heavy-Duty Applications

PART NUMBER RANGE

METRIC					
$ØD_1$	TOL H10	$Ød_1$	TOL h9	L_1 +0.20-0	PART No.
40.00	+0.10 0.00	28.00	0.00 -0.05	11.50	2390810
50.00	+0.10 0.00	38.00	0.00 -0.06	11.50	2335410
60.00	+0.12 0.00	44.00	0.00 -0.06	13.00	2390710
60.00	+0.12 0.00	44.00	0.00 -0.06	20.50	2356710
63.00	+0.12 0.00	50.00	0.00 -0.06	14.50	2331210
75.00	+0.12 0.00	55.00	0.00 -0.07	23.00	2346420
80.00	+0.12 0.00	66.00	0.00 -0.07	17.00	2330310
90.00	+0.14 0.00	75.00	0.00 -0.07	13.50	2331310
90.00	+0.14 0.00	76.00	0.00 -0.07	16.00	2364810
100.00	+0.14 0.00	82.00	0.00 -0.09	22.50	2331410
100.00	+0.14 0.00	85.00	0.00 -0.09	12.50	2342910*
100.00	+0.14 0.00	85.00	0.00 -0.09	13.50	2335010
100.00	+0.14 0.00	86.00	0.00 -0.09	22.50	2359710
105.00	+0.14 0.00	80.00	0.00 -0.07	22.50	2346710
105.00	+0.14 0.00	91.00	0.00 -0.09	16.50	2348210
110.00	+0.14 0.00	95.00	0.00 -0.09	12.50	2343010*
110.00	+0.14 0.00	95.00	0.00 -0.09	16.00	2331610

NOTE Part numbers suffixed by "*" indicate use of Hallite 754 face ring.



PART NUMBER RANGE

METRIC					
$ØD_1$	TOL H10	$Ød_1$	TOL h9	L_1 +0.20-0	PART No.
115.00	+0.14 0.00	90.00	0.00 -0.09	21.00	2329110
115.00	+0.14 0.00	97.00	0.00 -0.09	22.50	2356110
115.00	+0.14 0.00	100.00	0.00 -0.09	16.00	2329210
120.00	+0.14 0.00	105.00	0.00 -0.09	16.00	2337410
125.00	+0.16 0.00	110.00	0.00 -0.09	15.80	2331510
130.00	+0.16 0.00	113.00	0.00 -0.09	12.50	2339110*
130.00	+0.16 0.00	113.00	0.00 -0.09	20.50	2369010
135.00	+0.16 0.00	118.00	0.00 -0.09	20.50	2348110
135.00	+0.16 0.00	120.00	0.00 -0.09	16.00	2334010
140.00	+0.16 0.00	123.00	0.00 -0.10	16.00	2357910
140.00	+0.16 0.00	125.00	0.00 -0.10	16.00	2329410
150.00	+0.16 0.00	130.00	0.00 -0.10	16.00	2339010
150.00	+0.16 0.00	133.00	0.00 -0.10	20.00	2360510
150.00	+0.16 0.00	135.00	0.00 -0.10	16.00	2338210
160.00	+0.16 0.00	143.00	0.00 -0.10	20.00	2365510
160.00	+0.16 0.00	145.00	0.00 -0.10	16.00	2331910
165.00	+0.16 0.00	145.00	0.00 -0.10	20.00	2348910

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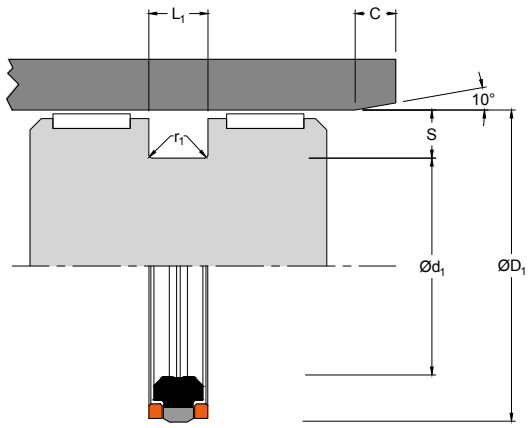

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PISTON SEAL

Double-Acting
Four Part Assembly with AE Rings
for Heavy-Duty Applications

PART NUMBER RANGE

METRIC					
$ØD_1$	TOL H10	$Ød_1$	TOL h9	L_1 +0.20-0	PART No.
165.00	+0.16 0.00	150.00	0.00 -0.10	16.00	2332010
170.00	+0.16 0.00	145.00	0.00 -0.10	25.00	2345510
170.00	+0.16 0.00	150.00	0.00 -0.10	16.00	2331110
175.00	+0.16 0.00	155.00	0.00 -0.10	16.00	2335110
180.00	+0.16 0.00	160.00	0.00 -0.10	16.00	2328510
180.00	+0.16 0.00	163.00	0.00 -0.10	20.00	2365210
185.00	+0.19 0.00	165.00	0.00 -0.10	16.00	2328410
185.00	+0.19 0.00	165.00	0.00 -0.10	20.00	2364010
190.00	+0.19 0.00	170.00	0.00 -0.10	16.00	2332210
195.00	+0.19 0.00	175.00	0.00 -0.10	16.00	2334710
200.00	+0.19 0.00	180.00	0.00 -0.10	16.00	2329310
200.00	+0.19 0.00	180.00	0.00 -0.10	20.00	2348810
200.00	+0.19 0.00	183.00	0.00 -0.12	20.00	2365010
210.00	+0.19 0.00	190.00	0.00 -0.12	16.00	2332410
210.00	+0.19 0.00	190.00	0.00 -0.12	20.00	2364710
215.00	+0.19 0.00	195.00	0.00 -0.12	16.00	2332510
215.00	+0.19 0.00	195.00	0.00 -0.12	20.00	2345110

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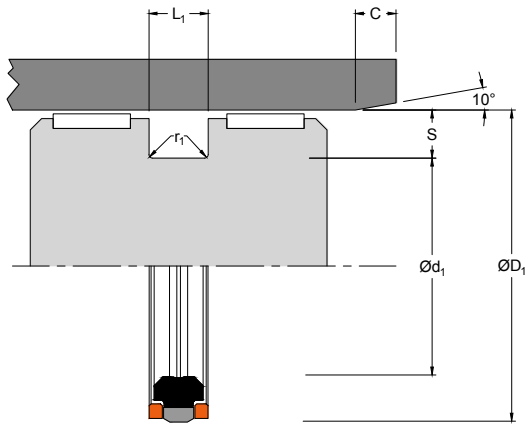

PART NUMBER RANGE

METRIC					
$ØD_1$	TOL H10	$Ød_1$	TOL h9	L_1 +0.20-0	PART No.
220.00	+0.19 0.00	195.00	0.00 -0.12	16.00	2345810
220.00	+0.19 0.00	195.00	0.00 -0.12	22.00	2333920
220.00	+0.19 0.00	195.00	0.00 -0.12	25.00	2333910
220.00	+0.19 0.00	200.00	0.00 -0.12	20.50	2356510
224.00	+0.19 0.00	204.00	0.00 -0.12	20.50	2348510
225.00	+0.19 0.00	205.00	0.00 -0.12	16.00	2332610
225.00	+0.19 0.00	205.00	0.00 -0.12	20.00	2346810
230.00	+0.19 0.00	210.00	0.00 -0.12	16.00	2332710
230.00	+0.19 0.00	210.00	0.00 -0.12	20.00	2344510
240.00	+0.19 0.00	215.00	0.00 -0.12	25.00	2333010
240.00	+0.19 0.00	220.00	0.00 -0.12	25.00	2364310
245.00	+0.19 0.00	220.00	0.00 -0.12	25.00	2328810
250.00	+0.19 0.00	225.00	0.00 -0.12	25.00	2348310
255.00	+0.21 0.00	230.00	0.00 -0.12	25.00	2348320
260.00	+0.21 0.00	230.00	0.00 -0.12	30.00	2347810
260.00	+0.21 0.00	235.00	0.00 -0.12	25.00	2347910
275.00	+0.21 0.00	250.00	0.00 -0.12	25.00	2362210

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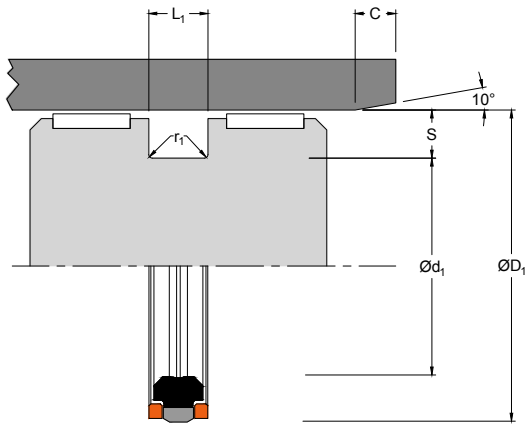

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PISTON SEAL

Double-Acting
Four Part Assembly with AE Rings
for Heavy-Duty Applications

PART NUMBER RANGE

METRIC					
$ØD_1$	TOL H10	$Ød_1$	TOL h9	L_1 +0.20-0	PART No.
280.00	+0.21 0.00	255.00	0.00 -0.13	25.00	2333510
285.00	+0.21 0.00	260.00	0.00 -0.13	25.00	2362410
290.00	+0.21 0.00	265.00	0.00 -0.13	27.00	2364410
300.00	+0.21 0.00	275.00	0.00 -0.13	25.00	2333610
305.00	+0.21 0.00	280.00	0.00 -0.13	25.00	2333630
310.00	+0.21 0.00	285.00	0.00 -0.13	25.00	2333710
320.00	+0.23 0.00	290.00	0.00 -0.13	30.00	2348010
340.00	+0.23 0.00	310.00	0.00 -0.13	30.00	2366010
340.00	+0.23 0.00	310.00	0.00 -0.13	32.00	2390910
345.00	+0.23 0.00	315.00	0.00 -0.13	30.00	2363610
350.00	+0.23 0.00	320.00	0.00 -0.14	30.00	2345410
360.00	+0.23 0.00	330.00	0.00 -0.14	30.00	2345430
360.00	+0.23 0.00	330.00	0.00 -0.14	31.50	2365410
370.00	+0.23 0.00	340.00	0.00 -0.14	30.00	2362710
380.00	+0.23 0.00	350.00	0.00 -0.14	32.00	2362110
390.00	+0.23 0.00	360.00	0.00 -0.14	32.00	2362120
400.00	+0.23 0.00	370.00	0.00 -0.14	32.00	2359810

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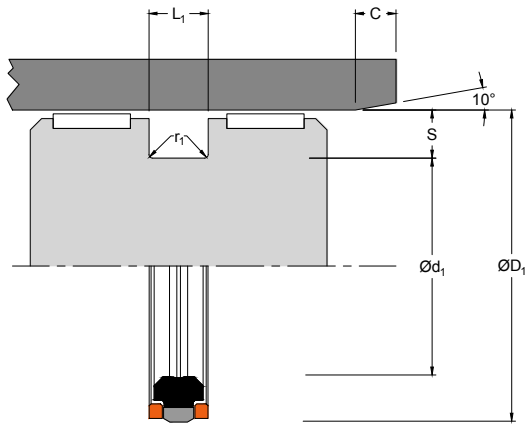

PART NUMBER RANGE

METRIC					
$ØD_1$	TOL H10	$Ød_1$	TOL h9	L_1 +0.20-0	PART No.
410.00	+0.25 0.00	380.00	0.00 -0.14	32.00	2359820
420.00	+0.25 0.00	390.00	0.00 -0.14	32.00	2366410
440.00	+0.25 0.00	410.00	0.00 -0.16	32.00	2365910
450.00	+0.25 0.00	410.00	0.00 -0.16	32.00	2390510
480.00	+0.25 0.00	440.00	0.00 -0.16	32.00	2391010
500.00	+0.25 0.00	470.00	0.00 -0.16	32.00	2369410

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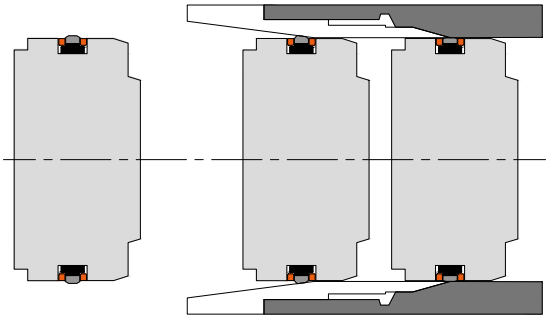

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PISTON SEAL

Double-Acting
Four Part Assembly with AE Rings
for Heavy-Duty Applications

INSTALLATION INSTRUCTIONS FOR HALLITE 730

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 energiser must be installed first. It can be pulled over the piston with a circling movement using a flexible plastic installation strip to stretch the energiser.

The energiser should then be positioned in the centre of the groove with a clearance on either side.

The first AE-ring is fitted next. It must be positioned opposite the installation side for the TPE face. The face is fitted over the NBR energiser using a flexible plastic installation strip. Please note that the TPE face ring needs to be installed directly against the AE ring. This can be easily achieved by circling movements with a circling movement using a flexible plastic installation strip.

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 as flat as possible. Ensure that all edges are deburred and the intersection points of the assembly chamfers with the bore are smoothly rounded. A maximum slope angle of 10° is recommended.

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.

FURTHER POINTS

Keep the surface between energiser and face ring free of grease.

For Hallite 730 with nominal groove lengths above 16 mm, an installation sleeve is required. An installation sleeve may 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 deforming into conical shape, which would 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.