

## Design

The Hallite 659 is an asymmetric piston seal designed to offer effective bore sealing in a wide variety of applications.

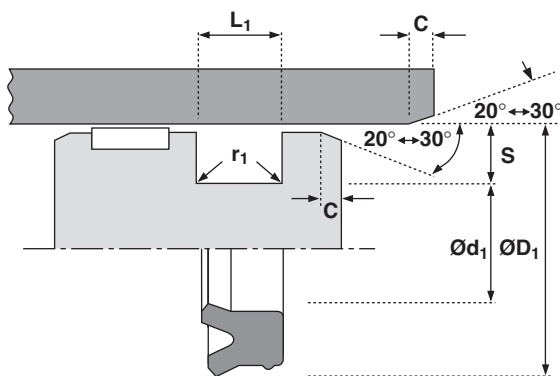
The outer dynamic lip is shorter and more robust to provide improved sealing and compression set characteristics over conventional U rings. The seal also features a secondary lip that provides a pocket for lubrication as well as the benefits listed below.

For use in single acting applications only, the seal is manufactured in Hallite's high performance polyurethane Hythane® 181. The Hallite 659 provides the following benefits:

**Note:** Variations of this seal are available in other sizes, please contact your local Hallite sales office for additional information and technical details.

### Features

- Flexible for easy installation
- Excellent wear resistance
- High resistance to extrusion
- Wide temperature range
- Twin lip design for:
  - improved sealing
  - lower friction
  - increased seal stability
  - primary lip protection



### Technical details

#### Operating conditions

Maximum Speed	1.0 m/sec
Temperature Range	-45°C +110°C
Maximum Pressure	400 bar

#### Inch

Maximum Speed	3.0 ft/sec
Temperature Range	-50°F +230°F
Maximum Pressure	6000 p.s.i.

#### Maximum extrusion gap

	160	250	400
Pressure bar	160	250	400
Maximum Gap mm	0.6	0.5	0.4
Pressure p.s.i.	2400	3750	6000
Maximum Gap in	0.024	0.020	0.016

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	µmRt	µinCLA	µinRMS
Dynamic Sealing Face ØD <sub>1</sub>	0.1 > 0.4	4 max	4 > 16	5 > 18
Static Sealing Face Ød <sub>1</sub>	1.6 max	10 max	63 max	70 max
Static Housing Faces L <sub>1</sub>	3.2 max	16 max	125 max	140 max

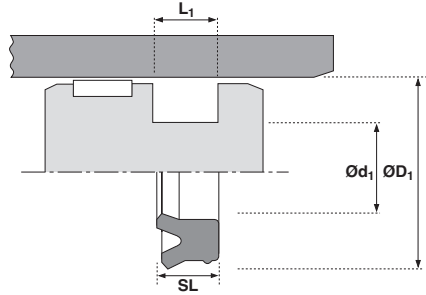
#### Chamfers & Radii

	4.0	5.0	7.5	10.0
Groove Section ≤ S mm	4.0	5.0	7.5	10.0
Min Chamfer C mm	3.0	3.5	5.0	6.5
Max Fillet Rad r <sub>1</sub> mm	0.2	0.4	0.8	0.8
Groove Section ≤ S in	0.125	0.187	0.250	0.500
Min Chamfer C in	0.093	0.093	0.125	0.217
Max Fillet Rad r <sub>1</sub> in	0.008	0.008	0.016	0.032

#### Tolerances

	ØD <sub>1</sub>	Ød <sub>1</sub>	L <sub>1</sub>
mm	H9	js11	+0.25 -0
in	+0.004 -0	0 -0.002	+0.010 -0





**metric**

ØD <sub>1</sub>	TOL H9	Ød <sub>1</sub>	TOL js11	SL	L <sub>1</sub> +0.25 -0	PART No.
75.0	+0.08 +0.00	65.0	+0.10 -0.10	7.30	8.00	4775500
90.0	+0.09 +0.00	75.0	+0.11 -0.11	11.50	12.50	4775500
90.0	+0.09 +0.00	80.0	+0.11 -0.11	8.00	9.00	4834000
100.0	+0.09 +0.00	80.0	+0.11 -0.11	14.50	16.00	4580300

ØD <sub>1</sub>	TOL H9	Ød <sub>1</sub>	TOL js11	SL	L <sub>1</sub> +0.25 -0	PART No.
100.0	+0.09 +0.00	85.0	+0.11 -0.11	11.50	12.50	4775600
110.0	+0.09 +0.00	90.0	+0.11 -0.11	14.50	16.00	4580400
110.0	+0.09 +0.00	95.0	+0.11 -0.11	11.50	12.50	4775700
130.0	+0.09 +0.00	115.0	+0.11 -0.11	11.50	12.50	4813000

**inch**

ØD <sub>1</sub>	TOL	Ød <sub>1</sub>	TOL	SL	L <sub>1</sub> +0.010 -0	PART No.
1.250	+0.004 -0.000	1.000	+0.000 -0.002	0.171	0.187	4416600
1.500	+0.004 -0.000	1.250	+0.000 -0.002	0.187	0.207	4372400
1.750	+0.004 -0.000	1.250	+0.000 -0.002	0.375	0.413	4528600
2.000	+0.004 -0.000	1.630	+0.000 -0.002	0.250	0.281	4563300 Δ
2.375	+0.004 -0.000	1.750	+0.000 -0.002	0.437	0.481	4528500
2.500	+0.004 -0.000	2.130	+0.000 -0.002	0.250	0.281	4563400 Δ
3.000	+0.004 -0.000	2.250	+0.000 -0.002	0.500	0.550	4528400
3.000	+0.004 -0.000	2.630	+0.000 -0.002	0.250	0.281	4563500 Δ

ØD <sub>1</sub>	TOL	Ød <sub>1</sub>	TOL	SL	L <sub>1</sub> +0.010 -0	PART No.
3.500	+0.004 -0.000	3.130	+0.000 -0.002	0.250	0.281	4563600 Δ
3.625	+0.004 -0.000	2.875	+0.000 -0.002	0.562	0.619	4528300
4.000	+0.004 -0.000	3.630	+0.000 -0.002	0.250	0.281	4563700 Δ
4.250	+0.004 -0.000	3.500	+0.000 -0.002	0.562	0.619	4528200
5.000	+0.004 -0.000	4.000	+0.000 -0.002	0.731	0.804	4528100
6.000	+0.004 -0.000	5.000	+0.000 -0.002	0.731	0.804	4530200
7.000	+0.004 -0.000	6.000	+0.000 -0.002	0.731	0.804	4529700

Δ Denotes parts designed to fit inch standard O ring grooves.

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