

# 780

## PISTON SEAL

*Double-Acting  
Five Part Assembly*

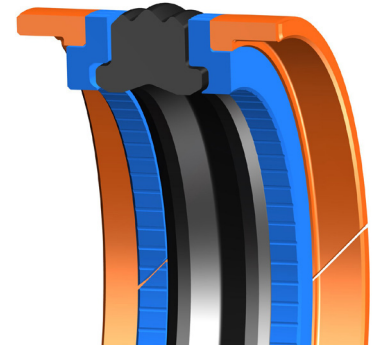
### DESIGN

The Hallite 780 double-acting piston seal in a robust five part assembly is designed specifically for one piece pistons in a wide range of medium duty applications. The seal is also suitable for two piece pistons.

The Hallite 780 is comprised of a nitrile rubber sealing element, two split support rings, and two split L-shaped bearings located either side of the seal. The well-proven nitrile rubber sealing element is designed to be extremely wear resistant with multi-lips for efficient dynamic sealing with minimal low pressure friction and, when pressurized, will be protected from extrusion damage by the extending lips of the support rings.

The support ring is manufactured from a tough, flexible, wear resistant thermoplastic polyester elastomer (TPE) and scarf cut for assembly.

Both the L-shaped bearings and support rings are grooved to ensure that the fluid pressure properly energises the sealing element and to prevent the possibility of any pressure trapping within the seal assembly.



### FEATURES

- Excellent position holding characteristics under load
- Excellent on a variety of tube surface finishes
- Extremely well proven in a variety of applications using hydraulic oil
- Extremely wear resistant
- Low friction

### 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	Colour
Standard	Nitrile 1411-Polyester-POM	Black-Blue-Orange

## TECHNICAL DETAILS

OPERATING CONDITIONS	METRIC	INCH
Maximum Speed	0.5 m/sec	1.5 ft/sec
Temperature Range	-30°C +100°C	-22°F +212°F
Maximum Pressure	400 bar	6000 psi

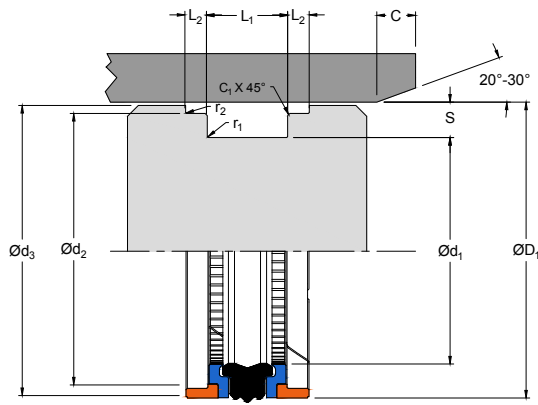
### NOTE

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.

SURFACE ROUGHNESS	$\mu\text{mRa}$	$\mu\text{mRz}$	$\mu\text{mRt}$	$\mu\text{inRa}$	$\mu\text{inRz}$	$\mu\text{inRt}$
Dynamic Sealing Face $\text{ØD}_1$	0.1 - 0.4	1.6 max	4 max	4 - 16	63 max	157 max
Static Sealing Face $\text{Ød}_1$	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

RADII						
Groove Section $\leq S$ mm	5.00	7.50	8.00	10.00	12.50	15.00
Min Chamfer $C$ mm	2.40	4.00	5.00	5.00	6.50	7.50
Max Chamfer $C_1$ mm	0.40	0.40	0.40	0.80	0.80	0.80
Max Fillet Rad $r_1$ mm	0.40	0.40	0.40	0.40	0.80	0.80
Max Fillet Rad $r_2$ mm	0.40	0.40	0.40	0.40	0.80	0.80
Groove Section $\leq S$ in	0.312	0.375	0.500			
Min Chamfer $C$ in	0.156	0.187	0.217			
Max Chamfer $C_1$ in	0.016	0.032	0.032			
Max Fillet Rad $r_1$ in	0.016	0.016	0.032			
Max Fillet Rad $r_2$ in	0.016	0.016	0.032			

TOLERANCES	$\text{ØD}_1$	$\text{Ød}_1$	$\text{Ød}_2$	$\text{Ød}_3$	$L_1$	$L_2$
mm	H9	h9	h9	h11	+0.20 -0	+0.10 -0
in	H9	h9	h9	h11	+0.016 +0.005	+0.004 -0



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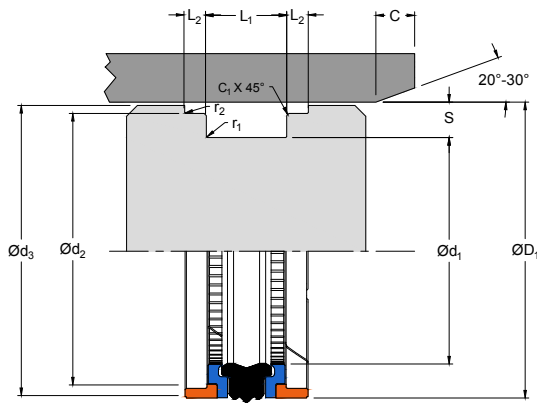
## PISTON SEAL

Double-Acting  
Five Part Assembly

### PART NUMBER RANGE

METRIC										
ØD <sub>1</sub>	TOL H9	Ød <sub>1</sub>	TOL h9	Ød <sub>2</sub>	TOL h9	Ød <sub>3</sub>	TOL h11	L <sub>1</sub> +0.20-0	L <sub>2</sub> +0.10-0	PART No.
20.00	+0.05 0.00	11.00	0.00 -0.04	17.00	0.00 -0.04	19.00	0.00 -0.13	13.50	2.10	5006710
25.00	+0.05 0.00	15.00	0.00 -0.04	21.00	0.00 -0.05	24.00	0.00 -0.13	12.00	4.00	5003710
25.00	+0.05 0.00	15.00	0.00 -0.04	22.00	0.00 -0.05	24.00	0.00 -0.13	12.50	4.00	5003730
25.00	+0.05 0.00	16.00	0.00 -0.04	22.00	0.00 -0.05	24.00	0.00 -0.13	13.50	2.10	5003810
30.00	+0.05 0.00	17.00	0.00 -0.04	27.00	0.00 -0.05	29.00	0.00 -0.13	15.40	6.35	5006410
30.00	+0.05 0.00	21.00	0.00 -0.05	27.00	0.00 -0.05	29.00	0.00 -0.13	13.50	2.10	5003910
32.00	+0.06 0.00	22.00	0.00 -0.05	28.00	0.00 -0.05	31.00	0.00 -0.16	15.50	2.60	5001420
32.00	+0.06 0.00	22.00	0.00 -0.05	28.50	0.00 -0.05	30.50	0.00 -0.16	16.40	6.35	5001410
32.00	+0.06 0.00	24.00	0.00 -0.05	28.00	0.00 -0.05	31.40	0.00 -0.16	15.50	3.20	5009210
35.00	+0.06 0.00	25.00	0.00 -0.05	31.00	0.00 -0.06	34.00	0.00 -0.16	15.50	2.60	5001520
35.00	+0.06 0.00	25.00	0.00 -0.05	31.40	0.00 -0.06	33.50	0.00 -0.16	16.40	6.35	5001510
40.00	+0.06 0.00	24.00	0.00 -0.05	35.40	0.00 -0.06	38.50	0.00 -0.16	18.40	6.35	5001310
40.00	+0.06 0.00	26.00	0.00 -0.05	36.00	0.00 -0.06	39.00	0.00 -0.16	15.50	2.60	5008010
40.00	+0.06 0.00	30.00	0.00 -0.05	35.40	0.00 -0.06	38.50	0.00 -0.16	16.40	6.35	5004010
40.00	+0.06 0.00	30.00	0.00 -0.05	36.00	0.00 -0.06	38.00	0.00 -0.16	12.50	4.00	5005820
40.00	+0.06 0.00	30.00	0.00 -0.05	36.50	0.00 -0.06	39.00	0.00 -0.16	10.00	5.00	5008610
40.00	+0.06 0.00	30.00	0.00 -0.05	37.00	0.00 -0.06	39.00	0.00 -0.16	12.50	4.00	5005810

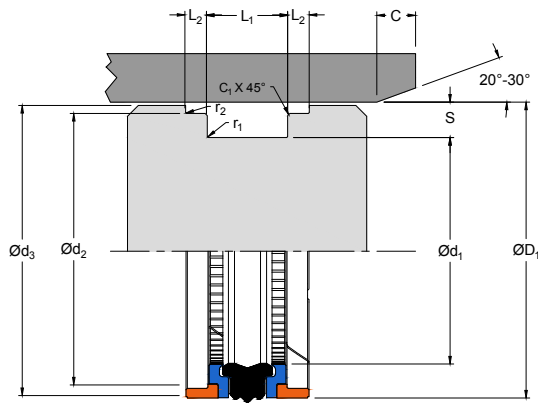
**NOTE** Part numbers suffixed by "±" indicate housing sizes to meet ISO 6547.



## PART NUMBER RANGE

METRIC										
$\text{Ø}D_1$	TOL H9	$\text{Ø}d_1$	TOL h9	$\text{Ø}d_2$	TOL h9	$\text{Ø}d_3$	TOL h11	$L_1$ +0.20-0	$L_2$ +0.10-0	PART No.
40.00	+0.06 0.00	32.00	0.00 -0.06	36.00	0.00 -0.06	39.40	0.00 -0.16	15.50	3.20	5008110
45.00	+0.06 0.00	29.00	0.00 -0.05	40.40	0.00 -0.06	43.50	0.00 -0.16	18.40	6.35	5000710
45.00	+0.06 0.00	31.00	0.00 -0.06	41.00	0.00 -0.06	44.00	0.00 -0.16	15.50	2.60	5004110
45.00	+0.06 0.00	35.00	0.00 -0.06	40.40	0.00 -0.06	43.50	0.00 -0.16	16.40	6.35	5001610
50.00	+0.06 0.00	34.00	0.00 -0.06	45.40	0.00 -0.06	48.50	0.00 -0.16	18.40	6.35	5000810
50.00	+0.06 0.00	34.00	0.00 -0.06	46.00	0.00 -0.06	49.00	0.00 -0.16	20.50	3.10	5000820
50.00	+0.06 0.00	38.00	0.00 -0.06	46.00	0.00 -0.06	49.40	0.00 -0.16	20.50	4.20	5004810
50.00	+0.06 0.00	40.00	0.00 -0.06	47.00	0.00 -0.06	49.00	0.00 -0.16	12.50	4.00	5005910±
55.00	+0.07 0.00	39.00	0.00 -0.06	50.36	0.00 -0.07	53.50	0.00 -0.19	18.40	6.35	5000910
55.00	+0.07 0.00	39.00	0.00 -0.06	51.00	0.00 -0.07	54.00	0.00 -0.19	20.50	3.10	5000920
55.00	+0.07 0.00	45.00	0.00 -0.06	52.00	0.00 -0.07	54.00	0.00 -0.19	12.50	4.00	5009110
60.00	+0.07 0.00	44.00	0.00 -0.06	55.40	0.00 -0.07	58.50	0.00 -0.19	18.40	6.35	5001010
60.00	+0.07 0.00	44.00	0.00 -0.06	56.00	0.00 -0.07	59.00	0.00 -0.19	20.50	3.10	5001020
60.00	+0.07 0.00	48.00	0.00 -0.06	56.00	0.00 -0.07	59.40	0.00 -0.19	20.50	4.20	5004910
63.00	+0.07 0.00	47.00	0.00 -0.06	58.40	0.00 -0.07	61.50	0.00 -0.19	18.40	6.35	5001110
63.00	+0.07 0.00	47.00	0.00 -0.06	58.40	0.00 -0.07	61.50	0.00 -0.19	19.40	6.35	5001120
63.00	+0.07 0.00	47.00	0.00 -0.06	59.00	0.00 -0.07	62.00	0.00 -0.19	20.50	3.10	5001130

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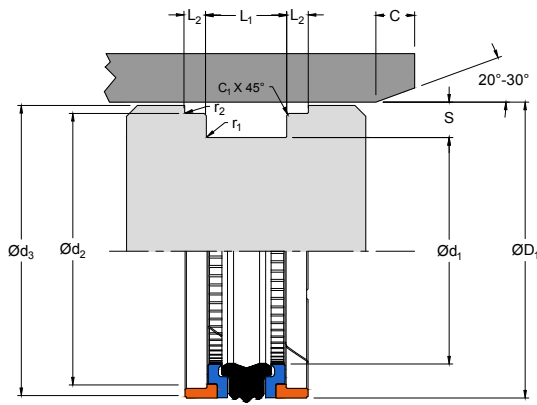
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METRIC										
ØD <sub>1</sub>	TOL H9	Ød <sub>1</sub>	TOL h9	Ød <sub>2</sub>	TOL h9	Ød <sub>3</sub>	TOL h11	L <sub>1</sub> +0.20-0	L <sub>2</sub> +0.10-0	PART No.
63.00	+0.07 0.00	51.00	0.00 -0.07	59.00	0.00 -0.07	62.40	0.00 -0.19	20.50	4.20	5005010
63.00	+0.07 0.00	53.00	0.00 -0.07	60.00	0.00 -0.07	62.00	0.00 -0.19	12.50	4.00	5006010±
65.00	+0.07 0.00	49.00	0.00 -0.06	61.00	0.00 -0.07	64.00	0.00 -0.19	20.50	3.10	5005510
65.00	+0.07 0.00	50.00	0.00 -0.06	60.40	0.00 -0.07	63.50	0.00 -0.19	18.40	6.35	5001210
65.00	+0.07 0.00	53.00	0.00 -0.07	61.00	0.00 -0.07	64.40	0.00 -0.19	20.50	4.20	5010710
70.00	+0.07 0.00	50.00	0.00 -0.06	64.20	0.00 -0.07	68.30	0.00 -0.19	22.40	6.35	5000210
70.00	+0.07 0.00	54.00	0.00 -0.07	66.00	0.00 -0.07	69.00	0.00 -0.19	20.50	3.10	5004210
70.00	+0.07 0.00	58.00	0.00 -0.07	66.00	0.00 -0.07	69.40	0.00 -0.19	20.50	4.20	5005110
75.00	+0.07 0.00	55.00	0.00 -0.07	69.20	0.00 -0.07	73.30	0.00 -0.19	22.40	6.35	5000310
75.00	+0.07 0.00	59.00	0.00 -0.07	71.00	0.00 -0.07	74.00	0.00 -0.19	20.50	3.10	5004310
75.00	+0.07 0.00	63.00	0.00 -0.07	71.00	0.00 -0.07	74.40	0.00 -0.19	20.50	4.20	5010810
80.00	+0.07 0.00	60.00	0.00 -0.07	74.15	0.00 -0.07	78.30	0.00 -0.19	22.40	6.35	5000110
80.00	+0.07 0.00	60.00	0.00 -0.07	75.00	0.00 -0.07	78.00	0.00 -0.19	25.00	6.30	5000120
80.00	+0.07 0.00	62.00	0.00 -0.07	76.00	0.00 -0.07	79.00	0.00 -0.19	22.50	3.60	5004410
80.00	+0.07 0.00	65.00	0.00 -0.07	76.00	0.00 -0.07	78.50	0.00 -0.19	20.00	5.00	5008710±
80.00	+0.07 0.00	66.00	0.00 -0.07	76.00	0.00 -0.07	79.40	0.00 -0.19	22.50	5.20	5005210
85.00	+0.09 0.00	65.00	0.00 -0.07	79.15	0.00 -0.07	83.30	0.00 -0.22	22.40	6.35	5000410

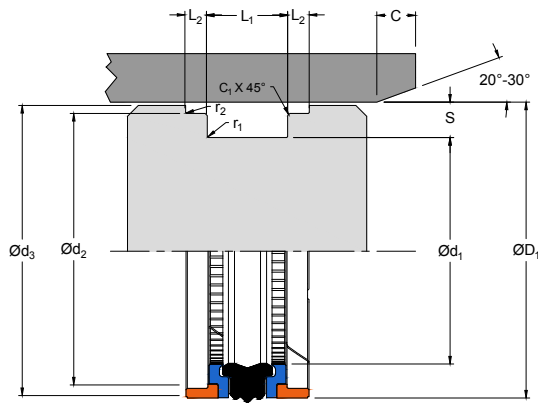
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METRIC										
ØD <sub>1</sub>	TOL H9	Ød <sub>1</sub>	TOL h9	Ød <sub>2</sub>	TOL h9	Ød <sub>3</sub>	TOL h11	L <sub>1</sub> +0.20-0	L <sub>2</sub> +0.10-0	PART No.
90.00	+0.09 0.00	70.00	0.00 -0.07	84.15	0.00 -0.09	88.30	0.00 -0.22	22.40	6.35	5000510
90.00	+0.09 0.00	72.00	0.00 -0.07	86.00	0.00 -0.09	89.00	0.00 -0.22	22.50	3.60	5007910
90.00	+0.09 0.00	76.00	0.00 -0.07	86.00	0.00 -0.09	89.40	0.00 -0.22	22.50	5.20	5005310
95.00	+0.09 0.00	75.00	0.00 -0.07	89.15	0.00 -0.09	93.30	0.00 -0.22	22.40	6.35	5000610
100.00	+0.09 0.00	75.00	0.00 -0.07	93.15	0.00 -0.09	98.00	0.00 -0.22	22.40	6.35	5001710
100.00	+0.09 0.00	80.00	0.00 -0.07	95.00	0.00 -0.09	98.00	0.00 -0.22	25.00	6.30	5004710‡
100.00	+0.09 0.00	82.00	0.00 -0.09	96.00	0.00 -0.09	99.00	0.00 -0.22	22.50	3.60	5004510
100.00	+0.09 0.00	85.00	0.00 -0.09	96.00	0.00 -0.09	98.50	0.00 -0.22	20.00	5.00	5006110‡
100.00	+0.09 0.00	86.00	0.00 -0.09	96.00	0.00 -0.09	99.40	0.00 -0.22	22.50	5.20	5005410
105.00	+0.09 0.00	80.00	0.00 -0.07	98.10	0.00 -0.09	103.00	0.00 -0.22	22.40	6.35	5001810
110.00	+0.09 0.00	85.00	0.00 -0.09	103.10	0.00 -0.09	108.00	0.00 -0.22	22.40	6.35	5001910
110.00	+0.09 0.00	92.00	0.00 -0.09	106.00	0.00 -0.09	109.00	0.00 -0.22	22.50	3.60	5007810
115.00	+0.09 0.00	90.00	0.00 -0.09	108.10	0.00 -0.09	113.00	0.00 -0.22	22.40	6.35	5002010
120.00	+0.09 0.00	95.00	0.00 -0.09	113.10	0.00 -0.09	118.00	0.00 -0.22	22.40	6.35	5002110
120.00	+0.09 0.00	106.00	0.00 -0.09	116.00	0.00 -0.09	119.40	0.00 -0.22	22.50	5.20	5008810
125.00	+0.10 0.00	100.00	0.00 -0.09	118.10	0.00 -0.09	123.00	0.00 -0.25	25.40	6.35	5002310
125.00	+0.10 0.00	103.00	0.00 -0.09	121.00	0.00 -0.10	124.00	0.00 -0.25	26.50	5.10	5007710

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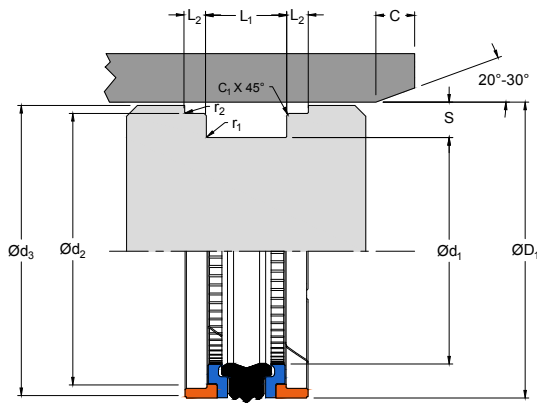
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ØD <sub>1</sub>	TOL H9	Ød <sub>1</sub>	TOL h9	Ød <sub>2</sub>	TOL h9	Ød <sub>3</sub>	TOL h11	L <sub>1</sub> +0.20-0	L <sub>2</sub> +0.10-0	PART No.
125.00	+0.10 0.00	105.00	0.00 -0.09	120.00	0.00 -0.09	123.00	0.00 -0.25	25.00	6.30	5006210±
130.00	+0.10 0.00	105.00	0.00 -0.09	122.60	0.00 -0.10	128.00	0.00 -0.25	25.40	9.50	5002410
130.00	+0.10 0.00	105.00	0.00 -0.09	123.10	0.00 -0.10	128.00	0.00 -0.25	25.40	6.35	5002420
135.00	+0.10 0.00	110.00	0.00 -0.09	127.60	0.00 -0.10	133.00	0.00 -0.25	25.40	9.50	5002510
140.00	+0.10 0.00	115.00	0.00 -0.09	132.60	0.00 -0.10	138.00	0.00 -0.25	25.40	9.50	5002210
140.00	+0.10 0.00	115.00	0.00 -0.09	133.00	0.00 -0.10	138.00	0.00 -0.25	25.40	6.35	5002220
145.00	+0.10 0.00	120.00	0.00 -0.09	137.60	0.00 -0.10	143.00	0.00 -0.25	25.40	9.50	5002610
150.00	+0.10 0.00	125.00	0.00 -0.10	142.60	0.00 -0.10	148.00	0.00 -0.25	25.40	9.50	5002710
150.00	+0.10 0.00	125.00	0.00 -0.10	143.00	0.00 -0.10	148.00	0.00 -0.25	25.40	6.35	5002720
155.00	+0.10 0.00	130.00	0.00 -0.10	147.60	0.00 -0.10	153.00	0.00 -0.25	25.40	9.50	5002810
160.00	+0.10 0.00	130.00	0.00 -0.10	152.60	0.00 -0.10	158.00	0.00 -0.25	25.40	9.50	5004610
160.00	+0.10 0.00	130.00	0.00 -0.10	153.00	0.00 -0.10	158.00	0.00 -0.25	25.40	6.35	5004620
160.00	+0.10 0.00	135.00	0.00 -0.10	152.60	0.00 -0.10	158.00	0.00 -0.25	25.40	9.50	5005610
160.00	+0.10 0.00	143.00	0.00 -0.10	156.00	0.00 -0.10	159.40	0.00 -0.25	26.50	7.20	5008910
165.00	+0.10 0.00	140.00	0.00 -0.10	157.60	0.00 -0.10	163.00	0.00 -0.25	25.40	9.50	5002910
170.00	+0.10 0.00	145.00	0.00 -0.10	161.70	0.00 -0.10	168.00	0.00 -0.25	25.40	12.70	5003010
175.00	+0.10 0.00	150.00	0.00 -0.10	166.70	0.00 -0.10	173.00	0.00 -0.25	25.40	12.70	5003110

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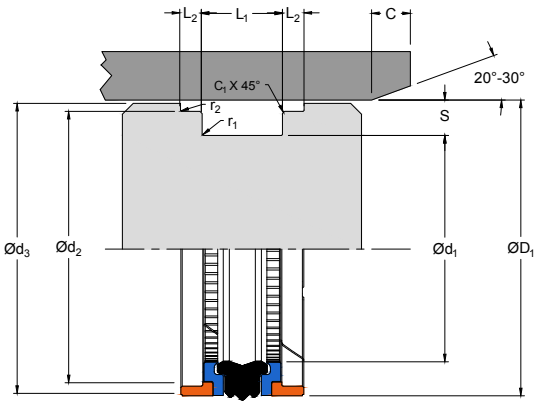
## PART NUMBER RANGE

### METRIC

$\text{Ø}D_1$	TOL H9	$\text{Ø}d_1$	TOL h9	$\text{Ø}d_2$	TOL h9	$\text{Ø}d_3$	TOL h11	$L_1$ +0.20-0	$L_2$ +0.10-0	PART No.
180.00	+0.10 0.00	150.00	0.00 -0.10	172.95	0.00 -0.10	178.00	0.00 -0.25	35.40	6.35	5006310
180.00	+0.10 0.00	155.00	0.00 -0.10	171.70	0.00 -0.10	178.00	0.00 -0.25	25.40	12.70	5003210
185.00	+0.12 0.00	160.00	0.00 -0.10	176.70	0.00 -0.10	183.00	0.00 -0.29	25.40	12.70	5003310
190.00	+0.12 0.00	165.00	0.00 -0.10	181.70	0.00 -0.12	188.00	0.00 -0.29	25.40	12.70	5003410
195.00	+0.12 0.00	170.00	0.00 -0.10	186.70	0.00 -0.12	193.00	0.00 -0.29	25.40	12.70	5003510
200.00	+0.12 0.00	175.00	0.00 -0.10	191.60	0.00 -0.12	198.00	0.00 -0.29	25.40	12.70	5003610
210.00	+0.12 0.00	185.00	0.00 -0.12	201.60	0.00 -0.12	208.00	0.00 -0.29	25.40	12.70	5008210
220.00	+0.12 0.00	195.00	0.00 -0.12	211.60	0.00 -0.12	218.00	0.00 -0.29	25.40	12.70	5008310
230.00	+0.12 0.00	205.00	0.00 -0.12	221.60	0.00 -0.12	227.00	0.00 -0.29	25.40	12.70	5006510
240.00	+0.12 0.00	215.00	0.00 -0.12	231.60	0.00 -0.12	238.00	0.00 -0.29	25.40	12.70	5008410
250.00	+0.12 0.00	225.00	0.00 -0.12	241.60	0.00 -0.12	247.00	0.00 -0.29	25.40	12.70	5006610

### NOTE

Part numbers suffixed by “±” indicate housing sizes to meet ISO 6547.



# 780

## PISTON SEAL

Double-Acting  
Five Part Assembly

### PART NUMBER RANGE

INCH										
ØD <sub>1</sub>	TOL H9	Ød <sub>1</sub>	TOL h9	Ød <sub>2</sub>	TOL h9	Ød <sub>3</sub>	TOL h11	L <sub>1</sub> +0.016 +0.005	L <sub>2</sub> +0.004-0	PART No.
1.750	+0.003 0.000	1.380	0.000 -0.003	1.640	0.000 -0.003	1.720	0.000 -0.006	0.490	0.240	5008510
2.000	+0.003 0.000	1.375	0.000 -0.003	1.820	0.000 -0.003	1.950	0.000 -0.006	0.750	0.250	5010910
2.000	+0.003 0.000	1.625	0.000 -0.003	1.888	0.000 -0.003	1.970	0.000 -0.006	0.490	0.240	5010010
2.250	+0.003 0.000	1.625	0.000 -0.003	2.070	0.000 -0.003	2.200	0.000 -0.007	0.750	0.250	5011010
2.375	+0.003 0.000	1.750	0.000 -0.003	2.196	0.000 -0.003	2.325	0.000 -0.007	0.760	0.250	5001030
2.500	+0.003 0.000	1.875	0.000 -0.003	2.320	0.000 -0.003	2.450	0.000 -0.007	0.750	0.250	5011110
2.500	+0.003 0.000	2.000	0.000 -0.003	2.320	0.000 -0.003	2.470	0.000 -0.007	0.650	0.240	5010110
3.000	+0.003 0.000	2.250	0.000 -0.003	2.773	0.000 -0.003	2.940	0.000 -0.007	0.937	0.250	5011210
3.000	+0.003 0.000	2.375	0.000 -0.003	2.772	0.000 -0.003	2.970	0.000 -0.007	0.778	0.240	5010210
3.500	+0.004 0.000	2.750	0.000 -0.003	3.273	0.000 -0.004	3.440	0.000 -0.009	0.937	0.250	5011310
3.500	+0.004 0.000	2.852	0.000 -0.003	3.272	0.000 -0.004	3.470	0.000 -0.009	0.778	0.290	5010310
4.000	+0.004 0.000	3.250	0.000 -0.004	3.772	0.000 -0.004	3.940	0.000 -0.009	0.937	0.250	5011410
4.000	+0.004 0.000	3.376	0.000 -0.004	3.772	0.000 -0.004	3.970	0.000 -0.009	0.778	0.240	5010410
4.500	+0.004 0.000	3.500	0.000 -0.004	4.231	0.000 -0.004	4.428	0.000 -0.009	1.250	0.250	5011510
4.500	+0.004 0.000	3.876	0.000 -0.004	4.272	0.000 -0.004	4.470	0.000 -0.009	0.778	0.240	5010510
5.000	+0.004 0.000	4.000	0.000 -0.004	4.711	0.000 -0.004	4.910	0.000 -0.010	1.250	0.375	5011610
5.000	+0.004 0.000	4.252	0.000 -0.004	4.772	0.000 -0.004	4.970	0.000 -0.010	0.958	0.240	5010610
6.000	+0.004 0.000	5.000	0.000 -0.004	5.711	0.000 -0.004	5.910	0.000 -0.010	1.250	0.375	5011710

PART NUMBERS ON THIS PAGE ARE LISTED IN THE STANDARD MATERIAL OPTION. FOR MATERIAL VARIATIONS OR FOR CUSTOM SIZES, MATERIALS, OR SEAL DESIGNS, PLEASE CONTACT YOUR LOCAL HALLITE REPRESENTATIVE.