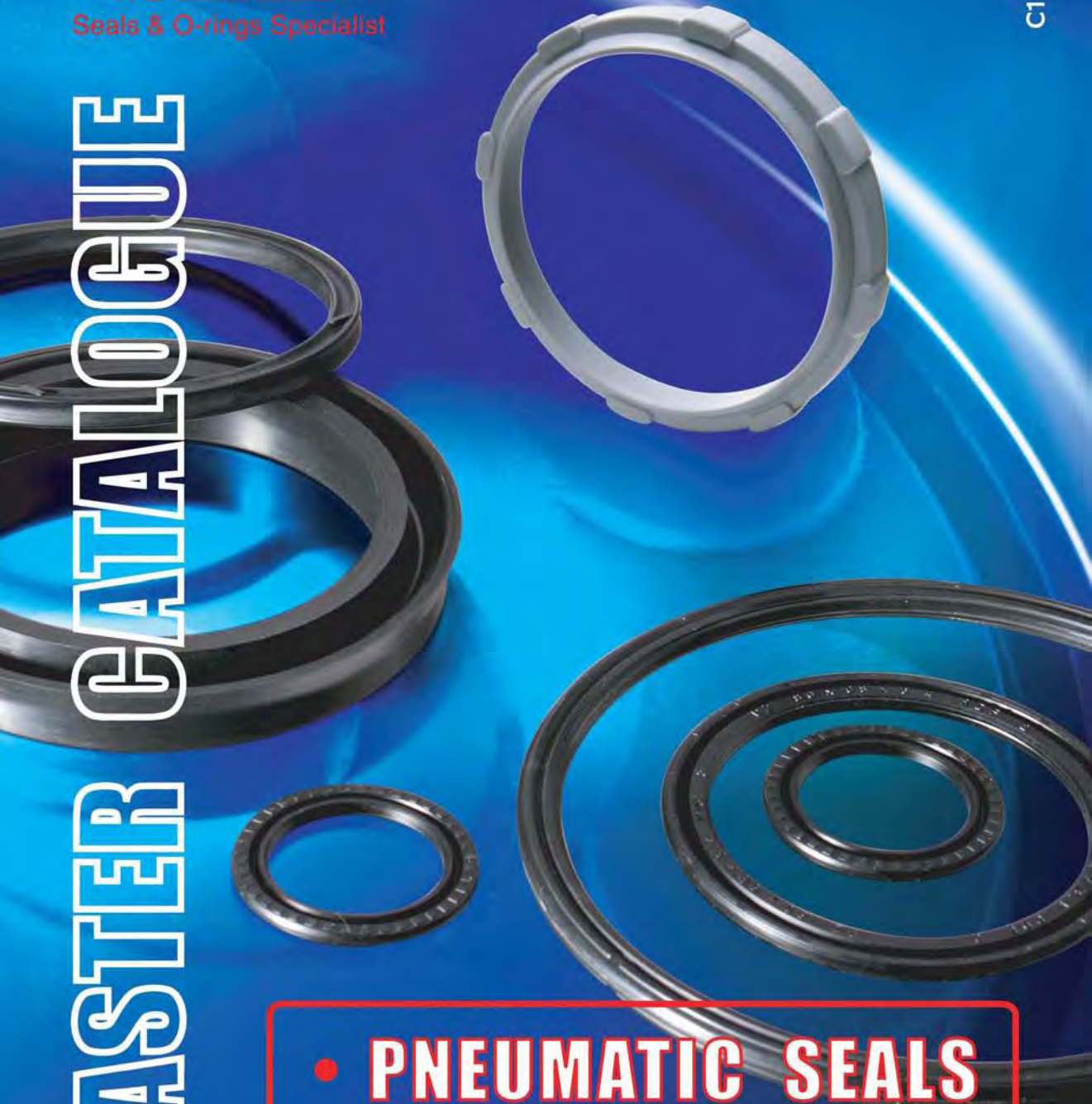




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MASTER CATALOGUE



• **PNEUMATIC SEALS**



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Pneumatic Seals

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Introduction

กว่า 23 ปี ที่ผ่านมา สเปคซีลยึดถือปฏิบัติหลักการกำกับดูแลกิจการที่ดีและจรรยาบรรณธุรกิจ โดยมีคุณธรรม จริยธรรม หลักการทำงานเป็นทีมและความเป็นมืออาชีพ สเปคซีลได้ลงทุนในธุรกิจอย่างต่อเนื่อง มุ่งมั่นสร้างมูลค่าเพิ่มและเติบโตอย่างยั่งยืนโดยมีมาตรฐานการดำเนินงานที่เป็นเลิศ ควบคู่ไปกับการรับผิดชอบต่อสังคมและบุคลากรในองค์กร ทำให้สเปคซีลบรรลุเป้าหมายเป็นที่เชื่อถือและยอมรับของทุกๆ ฝ่าย

สเปคซีลเชื่อว่าแคตตาล็อกซีลที่ดีมีความสำคัญและเอื้อประโยชน์ต่อวิศวกรผู้ใช้งานรวมถึงฝ่ายจัดซื้อ จึงได้บรรจุผลิตร่วมปรับปรุงเพิ่มเติมสินค้าใหม่ๆ ลงในแคตตาล็อกซีลนิวเมติกเล่มนี้ที่มีความสมบูรณ์แบบมากที่สุดในประเทศไทยเพื่อเป็นการง่ายต่อท่านทั้งหลายในการอ้างอิงเมื่อสั่งซื้อสินค้าจากสเปคซีล

ไม่ว่าท่านจะใช้ซีลชนิดใดหรืออยู่ในอุตสาหกรรมการผลิตใดก็ตาม ท่านก็สามารถมั่นใจได้ถึงคุณภาพและการบริการที่เป็นหนึ่งเดียวเพราะสเปคซีลจะอยู่เคียงข้างและมีส่วนร่วมในความสำเร็จขององค์กรของท่านพร้อมช่วยให้เกิดงานที่มีประสิทธิภาพยิ่งขึ้นไป

หากท่านมีข้อสงสัยหรือต้องการสอบถามข้อมูลเพิ่มเติมเกี่ยวกับซีลและโอริง สำนักงานขายของสเปคซีลทั้ง 4 สำนักงานพร้อมที่จะช่วยแก้ปัญหาให้ท่าน.....ด้วยความปรารถนาดี
สเปคซีล... ผู้เชี่ยวชาญด้านซีลและโอริง

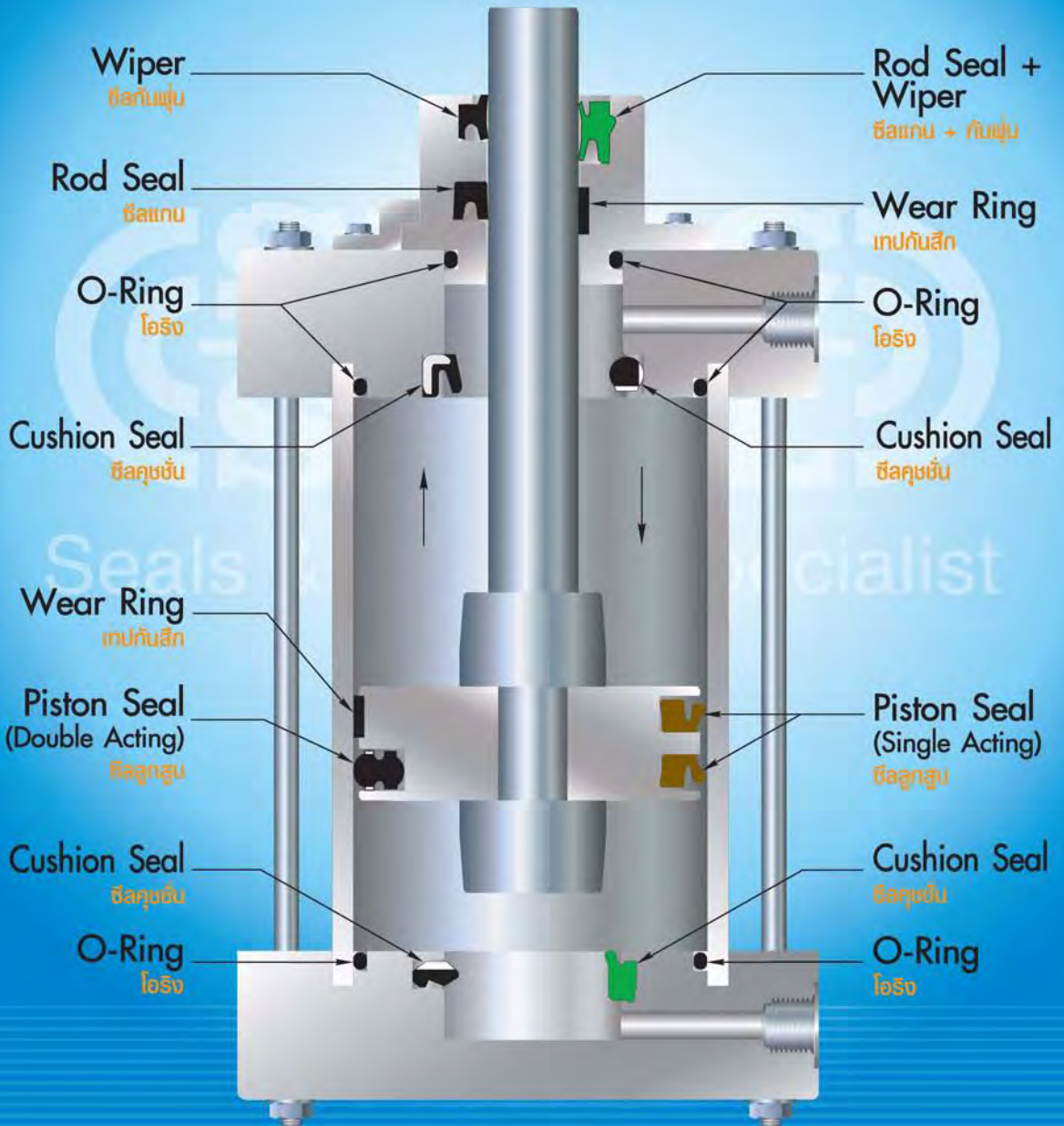
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A Pneumatic cylinder design showing
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Pneumatic Seals

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Housing & installation data

Specified tolerances
Metric

Nominal sizes mm.		Shafts (outside diameter) units 0.001 mm.									Bores (inside diameters) units 0.001 mm.				
over	to	f8	f9	h8	h9	h10	h11	JS10	JS11	H8	H9	H10	H11	JS11	
1.6	3	-6 -20	-6 -31	0 -14	0 -25	0 -40	0 -60	+20 -20	+30 -30	+14 0	+25 0	+40 0	+60 0	+30 -30	
3	6	-10 -28	-10 -40	0 -18	0 -30	0 -48	0 -75	+24 -24	+37.5 -37.5	+18 0	+30 0	+48 0	+75 0	+37.5 -37.5	
6	10	-13 -35	-13 -49	0 -22	0 -36	0 -58	0 -90	+29 -29	+45 -45	+22 0	+36 0	+58 0	+90 0	+45 -45	
10	18	-16 -43	-16 -59	0 -27	0 -43	0 -70	0 -110	+35 -35	+55 -55	+27 0	+43 0	+70 0	+110 0	+55 -55	
18	30	-20 -53	-20 -72	0 -33	0 -52	0 -84	0 -130	+42 -42	+65 -65	+33 0	+52 0	+84 0	+130 0	+65 -65	
30	50	-25 -64	-25 -87	0 -39	0 -62	0 -100	0 -160	+50 -50	+80 -80	+39 0	+62 0	+100 0	+160 0	+80 -80	
50	80	-30 -76	-30 -104	0 -46	0 -74	0 -120	0 -190	+60 -60	+95 -95	+46 0	+74 0	+120 0	+190 0	+95 -95	
80	120	-36 -90	-36 -123	0 -54	0 -87	0 -140	0 -220	+70 -70	+110 -110	+54 0	+87 0	+140 0	+220 0	+110 -110	
120	180	-43 -106	-43 -143	0 -63	0 -100	0 -160	0 -250	+80 -80	+125 -125	+63 0	+100 0	+160 0	+250 0	+125 -125	
180	250	-50 -122	-50 -165	0 -72	0 -115	0 -185	0 -290	+92 -92	+145 -145	+72 0	+115 0	+185 0	+290 0	+145 -145	
250	315	-56 -137	-56 -186	0 -81	0 -130	0 -210	0 -320	+105 -105	+160 -160	+81 0	+130 0	+210 0	+320 0	+160 -160	
315	400	-62 -151	-62 -212	0 -89	0 -140	0 -230	0 -360	+115 -115	+180 -180	+89 0	+140 0	+230 0	+360 0	+180 -180	
400	500	-68 -165	-68 -223	0 -97	0 -155	0 -250	0 -400	+125 -125	+200 -200	+97 0	+155 0	+250 0	+400 0	+200 -200	
500	630	-76 -186	-76 -251	0 -110	0 -175	0 -280	0 -440	+140 -140	+220 -220	+110 0	+175 0	+280 0	+440 0	+220 -220	
630	800	-80 -205	-80 -280	0 -125	0 -200	0 -320	0 -500	+160 -160	+250 -250	+125 0	+200 0	+320 0	+500 0	+250 -250	

Inch

Nominal sizes in.		Shafts (outside diameter) units 0.001 in.									Bores (inside diameters) units 0.001 in.				
over	to	f8	f9	h8	h9	h10	h11	JS10	JS11	H8	H9	H10	H11	JS11	
0.04	0.12	-0.3 -0.9	-0.3 -1.2	0 -0.6	0 -1.0	0 -1.6	0 -2.5	+0.8 -0.8	+1.3 -1.3	+0.6 0	+1.0 0	+1.6 0	+2.5 0	+1.3 -1.3	
0.12	0.24	-0.4 -1.1	-0.4 -1.6	0 -0.7	0 -1.2	0 -1.8	0 -3.0	+0.9 -0.9	+1.5 -1.5	+0.7 0	+1.2 0	+1.8 0	+3.0 0	+1.5 -1.5	
0.24	0.40	-0.5 -1.4	-0.5 -1.9	0 -0.9	0 -1.4	0 -2.2	0 -3.5	+1.1 -1.1	+1.8 -1.8	+0.9 0	+1.4 0	+2.2 0	+3.5 0	+1.8 -1.8	
0.40	0.71	-0.6 -1.6	-0.6 -2.3	0 -1.0	0 -1.6	0 -2.8	0 -4.0	+1.4 -1.4	+2.0 -2.0	+1.0 0	+1.6 0	+2.8 0	+4.0 0	+2.0 -2.0	
0.71	1.19	-0.8 -2.0	-0.8 -2.8	0 -1.2	0 -2.0	0 -3.5	0 -5.0	+1.8 -1.8	+2.5 -2.5	+1.2 0	+2.0 0	+3.5 0	+5.0 0	+2.5 -2.5	
1.19	1.97	-1.0 -2.6	-1.0 -3.4	0 -1.6	0 -2.5	0 -4.0	0 -6.0	+2.0 -2.0	+3.0 -3.0	+1.6 0	+2.5 0	+4.0 0	+6.0 0	+3.0 -3.0	
1.97	3.15	-1.2 -3.0	-1.2 -4.1	0 -1.8	0 -3.0	0 -4.5	0 -7.0	+2.3 -2.3	+3.5 -3.5	+1.8 0	+3.0 0	+4.5 0	+7.0 0	+3.5 -3.5	
3.15	4.73	-1.4 -3.6	-1.4 -4.8	0 -2.2	0 -3.5	0 -5.0	0 -9.0	+2.5 -2.5	+4.5 -4.5	+2.2 0	+3.5 0	+5.0 0	+9.0 0	+4.5 -4.5	
4.73	7.09	-1.6 -4.1	-1.6 -5.6	0 -2.5	0 -4.0	0 -6.0	0 -10.0	+3.0 -3.0	+5.0 -5.0	+2.5 0	+4.0 0	+6.0 0	+10.0 0	+5.0 -5.0	
7.09	9.85	-2.0 -4.8	-2.0 -6.5	0 -2.8	0 -4.5	0 -7.0	0 -12.0	+3.5 -3.5	+6.0 -6.0	+2.8 0	+4.5 0	+7.0 0	+12.0 0	+6.0 -6.0	
9.85	12.41	-2.2 -5.2	-2.2 -7.3	0 -3.0	0 -5.0	0 -8.0	0 -12.0	+4.0 -4.0	+6.0 -6.0	+3.0 0	+5.0 0	+8.0 0	+12.0 0	+6.0 -6.0	
12.41	15.785	-2.5 -6.0	-2.5 -8.3	0 -3.5	0 -6.0	0 -9.0	0 -14.0	+4.5 -4.5	+7.0 -7.0	+3.5 0	+6.0 0	+9.0 0	+14.0 0	+7.0 -7.0	
15.75	19.69	-2.8 -6.5	-2.8 -8.8	0 -4.0	0 -6.0	0 -10.0	0 -16.0	+5.0 -5.0	+8.0 -8.0	+4.0 0	+6.0 0	+10.0 0	+16.0 0	+8.0 -8.0	
19.69	24.80	-3.0 -7.0	-3.0 -9.9	0 -4.3	0 -6.9	0 -11.0	0 -17.3	+5.5 -5.5	+8.7 -8.7	+4.3 0	+6.9 0	+11.0 0	+17.3 0	+8.7 -8.7	
24.80	31.49	-3.1 -8.1	-3.1 -11.0	0 -4.9	0 -7.9	0 -12.6	0 -19.7	+6.3 -6.3	+9.8 -9.8	+4.9 0	+7.9 0	+12.6 0	+19.7 0	+9.8 -9.8	













Tolerances extracted from BS 1916 & BS 4500 (ISO 286) with kind permission of British Standards Institution

Conversion Chart

Fractions	Decimals	Millimeters	Millimeters	Decimals	Fractions
$\frac{1}{64}$	.0156	.3969	13.0969	.5156	$\frac{33}{64}$
$\frac{1}{32}$	.0313	.7938	13.4938	.5313	$\frac{17}{32}$
$\frac{3}{64}$	.0469	1.1906	13.8906	.5469	$\frac{35}{64}$
$\frac{1}{16}$	.0625	1.5875	14.2875	.5625	$\frac{9}{16}$
$\frac{5}{64}$	.0781	1.9844	14.6844	.5781	$\frac{37}{64}$
$\frac{3}{32}$	.0938	2.3813	15.0813	.5938	$\frac{19}{32}$
$\frac{7}{64}$	.1094	2.7781	15.4781	.6094	$\frac{39}{64}$
$\frac{1}{8}$	.125	3.1750	15.8750	.625	$\frac{41}{64}$
$\frac{9}{64}$	.1406	3.5719	16.2719	.6406	$\frac{21}{32}$
$\frac{5}{32}$	.1563	3.9688	16.6688	.6563	$\frac{43}{64}$
$\frac{11}{64}$	.1719	4.3656	17.0656	.6719	$\frac{11}{16}$
$\frac{3}{16}$	.1875	4.7625	17.4625	.6875	$\frac{45}{64}$
$\frac{13}{64}$	.2031	5.1594	17.8594	.7031	$\frac{23}{32}$
$\frac{7}{32}$	.2188	5.5563	18.2563	.7188	$\frac{47}{64}$
$\frac{15}{64}$	.2344	5.9531	18.6531	.7344	$\frac{3}{4}$
$\frac{1}{4}$	.250	6.3500	19.0500	.750	$\frac{49}{64}$
$\frac{17}{64}$	.2656	6.7469	19.4469	.7656	$\frac{25}{32}$
$\frac{9}{32}$	.2813	7.1438	19.8438	.7813	$\frac{51}{64}$
$\frac{19}{64}$	.2969	7.5406	20.2406	.7969	$\frac{13}{16}$
$\frac{5}{16}$	.3125	7.9375	20.6375	.8125	$\frac{53}{64}$
$\frac{21}{64}$	.3281	8.3344	21.0344	.8281	$\frac{27}{32}$
$\frac{11}{32}$	.3438	8.7313	21.4313	.8438	$\frac{55}{64}$
$\frac{23}{64}$	.3594	9.1281	21.8281	.8594	$\frac{7}{8}$
$\frac{3}{8}$	.375	9.5250	22.2250	.875	$\frac{57}{64}$
$\frac{25}{64}$	.3906	9.9219	22.6219	.8906	$\frac{29}{32}$
$\frac{13}{32}$	.4063	10.3188	23.0188	.9063	$\frac{59}{64}$
$\frac{27}{64}$	.4219	10.7156	23.4156	.9219	$\frac{15}{16}$
$\frac{7}{16}$	.4375	11.1125	23.8125	.9375	$\frac{61}{64}$
$\frac{29}{64}$	.4531	11.5094	24.2094	.9531	$\frac{31}{32}$
$\frac{15}{32}$	.4688	11.9063	24.6063	.9688	$\frac{63}{64}$
$\frac{31}{64}$	.4844	12.3031	25.0031	.9844	$\frac{1}{2}$
$\frac{1}{2}$	.500	12.7000	25.4000	1.000	

Piston Seals Profiles

Piston Seals

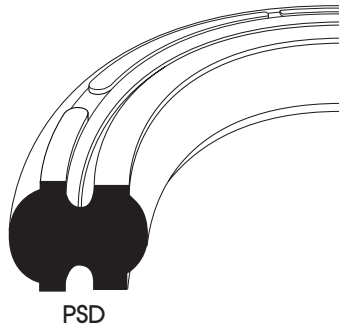
Design	Ref.	Material	Pressure (BAR)	Temp. (°C)	Speed (m/s)	Dim mm. inch	Page
	PSD	NBR	10	-20 +80	1	•	10
	DK	NBR-Metal	16	-30 +80	1	•	12
	DP	NBR	12	-30 +100	1	•	14
	TD	NBR-Metal	40	-30 +105	0.25	•	16
	Z5	NBR	16	-30 +80	1	•	18
	PZ	NBR	12	-20 +80	1	•	20
	PKK	NBR	16	-40 +80	1	•	22
	DXP	NBR	10	-40 +90	1	•	24
	Z8	SFR	16	-20 +80	1	•	26
	E4	NBR	16	-30 +80	1	•	30
	PGY	NBR	10	-25 +80	1	•	34
	EVDE	NBR	80	-30 +110	0.25	•	36



Piston Seals

PSD

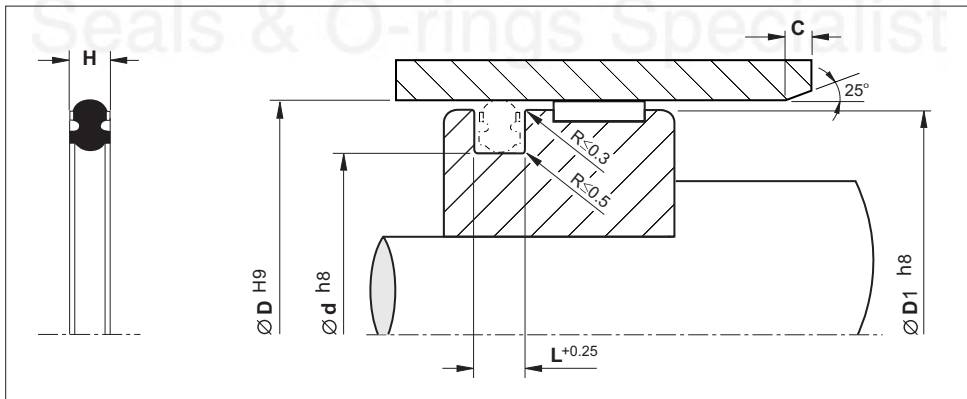
(Metric Size)



Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
NBR	10	-20 +80	1

- Compact packings used exclusively of double acting piston.
- Excellent frictional resistance.
- Anti-twisting and distortion.
- Long service life.

Installation Recommendation



Surface roughness	Ra	Rmax
-------------------	----	------

Sliding surface	≤ 0.3 µm	≤ 2.5 µm
Surface of housing	≤ 1.6 µm	≤ 6.3 µm
Sides of housing	≤ 3.0 µm	≤ 15 µm

Piston - PSD

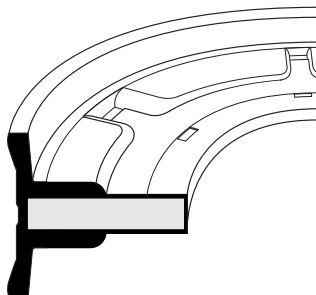
(Metric Size)

Bore Dia.	Groove Dia.	Groove Width	Seal Height	Piston Dia.	Chamfer Length	Reference (For order processing)
D	d	L	H	D1	C	
10.0	5.4	1.8	1.6	9.7	1.0	PSD-010
12.0	7.4	1.8	1.6	11.7	1.0	PSD-012
15.0	10.4	1.8	1.6	14.7	1.0	PSD-015
16.0	11.4	1.8	1.6	15.7	1.0	PSD-016
20.0	14.0	2.4	2.24	19.5	1.5	PSD-020
25.0	17.0	3.2	3.0	24.5	2.0	PSD-025
30.0	22.0	3.2	3.0	29.5	2.0	PSD-030
32.0	24.0	3.2	3.0	31.5	2.0	PSD-032
38.0	30.0	3.2	3.0	37.5	2.0	PSD-038
40.0	32.0	3.2	3.0	39.5	2.0	PSD-040
44.0	36.0	3.2	3.0	43.5	2.0	PSD-044
50.0	40.0	4.0	3.8	49.5	2.5	PSD-050
56.0	46.0	4.0	3.8	55.5	2.5	PSD-056
60.0	50.0	4.0	3.8	59.5	2.5	PSD-060
63.0	53.0	4.0	3.8	62.4	2.5	PSD-063
70.0	55.0	6.0	5.6	69.4	3.0	PSD-070
75.0	60.0	6.0	5.6	74.4	3.0	PSD-075
80.0	65.0	6.0	5.6	79.4	3.0	PSD-080
85.0	70.0	6.0	5.6	84.4	3.0	PSD-085
90.0	75.0	6.0	5.6	89.4	3.0	PSD-090
95.0	80.0	6.0	5.6	94.4	3.0	PSD-095
100.0	85.0	6.0	5.6	99.4	3.0	PSD-100
110.0	95.0	6.0	5.6	109.3	3.0	PSD-110
120.0	105.0	6.0	5.6	119.3	3.5	PSD-120
125.0	110.0	6.0	5.6	124.3	3.5	PSD-125
140.0	125.0	6.0	5.6	139.3	3.5	PSD-140
150.0	135.0	6.0	5.6	149.3	3.5	PSD-150
160.0	140.0	8.0	7.6	159.3	5.0	PSD-160
175.0	155.0	8.0	7.6	174.3	5.0	PSD-175
180.0	160.0	8.0	7.6	179.3	5.0	PSD-180
200.0	180.0	8.0	7.6	199.0	5.0	PSD-200
250.0	230.0	8.0	7.6	249.0	5.0	PSD-250
300.0	280.0	8.0	7.6	299.0	5.0	PSD-300

Piston Seals

DK

(Metric Size)

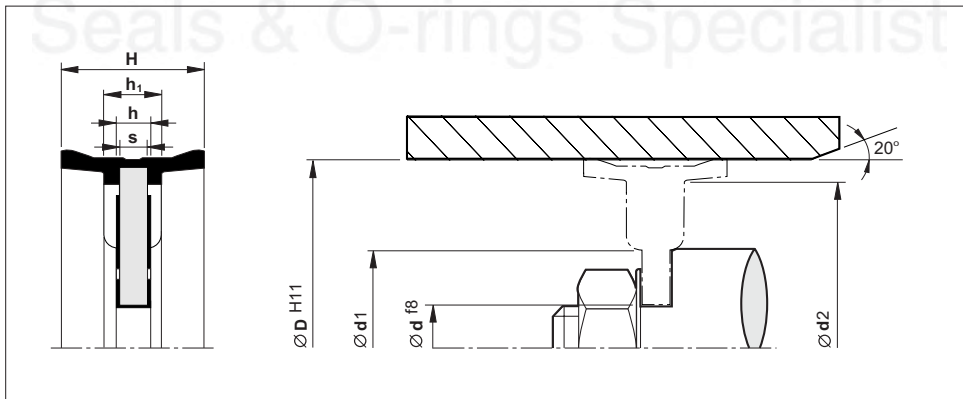


DK

Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR-Metal	16	-30 +80	1

- Simple attachment to the piston without additional sealing element.
- No corrosion due to complete polymer covering.
- Low friction and smooth running.
- Can be used in oil-free air

Installation Recommendation



Surface roughness	Ra	Rmax
-------------------	----	------

Sliding surface	≤ 0.3 µm	≤ 2.5 µm
Surface of housing	≤ 1.6 µm	≤ 6.3 µm
Sides of housing	≤ 3.0 µm	≤ 15 µm

Piston - DK

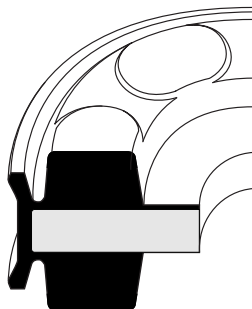
(Metric Size)

Bore Dia.	Dimensions							Reference (For order processing)
	D	d	H	S	h1	d1	h		d2
16.0	4.0	12.0	3.0	6.0	9.0	3.6	12.0	DK 1630 N
16.0	5.0	12.0	3.0	6.0	9.0	3.6	12.0	DK 1631 N
20.0	5.0	12.0	3.0	6.0	10.0	3.6	16.0	DK 2030 N
20.0	6.0	12.0	3.0	6.0	10.0	3.6	16.0	DK 2031 N
25.0	6.0	12.0	3.0	6.0	13.5	3.6	21.0	DK 2506 N
25.0	8.0	12.0	3.0	6.0	16.0	3.6	21.0	DK 2509 N
25.0	8.0	12.0	3.0	4.0	16.0	3.6	21.0	DK 2508 N
32.0	5.0	18.0	3.0	6.0	16.0	3.6	26.5	DK 3205 N
32.0	6.0	15.0	3.0	6.0	16.0	3.6	26.5	DK 3206 N
32.0	8.0	15.0	3.0	6.0	16.0	3.6	26.5	DK 3207 N
32.0	8.0	15.0	3.0	6.5	16.0	4.0	26.5	DK 3210 N
35.0	8.0	15.0	3.0	6.0	16.0	3.6	29.5	DK 3508 N
40.0	8.0	18.0	4.0	7.0	22.0	4.6	34.0	DK 4007 N
40.0	8.0	20.0	4.0	6.5	22.0	4.6	34.0	DK 4008 N
40.0	10.0	18.0	4.0	7.0	22.0	4.6	34.0	DK 4009 N
50.0	8.0	20.0	4.0	6.5	25.0	4.6	43.0	DK 5008 N
50.0	10.0	18.0	4.0	7.8	25.0	4.6	43.0	DK 5010 N
50.0	16.0	20.5	4.0	7.0	25.0	4.6	43.0	DK 5016 N
50.8	11.12	18.0	4.0	7.8	25.8	5.4	44.0	DK 5028 N
60.0	12.0	21.0	4.0	6.5	37.0	4.6	52.0	DK 6012 N
60.0	18.0	21.0	4.0	6.5	37.0	4.6	52.0	DK 6018 N
60.0	22.0	21.0	4.0	6.5	37.0	4.6	52.0	DK 6022 N
63.0	12.0	22.0	5.0	8.0	40.0	5.6	55.0	DK 6312 N
63.0	16.0	21.5	4.0	7.0	40.0	4.6	55.0	DK 6316 N
63.5	11.12	22.0	5.0	8.0	40.5	7.0	56.0	DK 6323 N
70.0	12.0	22.0	5.0	8.0	44.0	5.6	62.0	DK 7012 N
70.0	33.0	22.0	5.0	8.0	44.0	5.6	62.0	DK 7033 N
80.0	12.0	22.5	5.0	8.0	55.0	5.6	70.0	DK 8013 N
80.0	16.0	22.5	5.0	8.0	55.0	5.6	70.0	DK 8016 N
80.0	20.0	22.5	5.0	8.0	55.0	5.6	70.0	DK 8020 N
82.55	19.05	22.5	5.0	8.0	57.5	6.4	74.0	DK 8040 N
100.0	12.0	25.0	6.0	10.0	72.0	6.6	90.0	DK A012 N
100.0	16.0	25.0	6.0	10.0	72.0	6.6	90.0	DK A016 N
100.0	20.0	26.0	6.0	10.0	72.0	6.6	90.0	DK A019 N
101.6	19.05	25.0	6.0	10.0	73.6	7.4	92.0	DK A030 N
125.0	20.0	26.0	5.0	9.5	90.0	5.6	114.0	DK C520 N
125.0	20.0	28.0	7.0	12.0	90.0	8.2	114.0	DK C522 N
130.0	20.0	29.0	8.0	13.0	98.0	8.6	123.0	DK D020 N
140.0	22.0	29.0	6.0	10.5	108.0	6.6	125.0	DK E022 N
150.0	20.0	29.0	10.0	13.0	100.0	10.6	143.0	DK F020 N
160.0	27.0	29.0	6.0	10.5	110.0	6.6	145.0	DK G027 N
160.0	30.0	29.0	6.0	10.5	110.0	6.6	145.0	DK G030 N
200.0	27.0	35.0	10.0	14.5	150.0	10.6	180.0	DK L027 N
200.0	30.0	35.0	10.0	13.0	150.0	10.6	180.0	DK L030 N

Piston Seals

DP

(Metric Size)

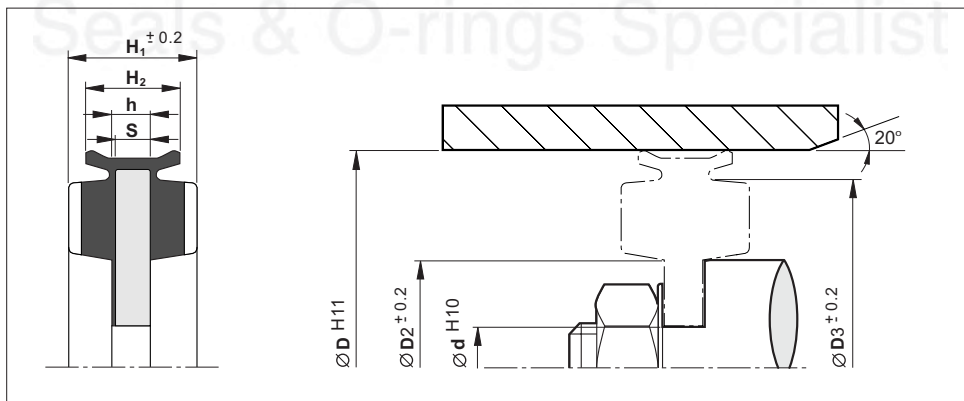


DP

Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	12	-30 +80	1

- Simple fixing at the piston rod without additional sealing requirements.
- Immediate response (full pressure load).
- Self cushioning.
- Low friction and smooth running.

Installation Recommendation



Surface roughness	Ra	Rmax
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Sliding surface	≤ 0.3 µm	≤ 2.5 µm
Surface of housing	≤ 1.6 µm	≤ 6.3 µm
Sides of housing	≤ 3.0 µm	≤ 15 µm

Piston - DP

(Metric Size)

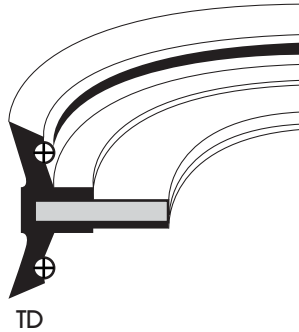
Bore Dia.	Dimensions							Reference (For order processing)
	D	d	H1	H2	S	h	D2		D3
6.0	2.0	3.8	3.0	1.25	1.45	3.2	5.0	DP 0602 N
8.0	3.0	5.0	4.0	1.5	1.8	4.2	6.3	DP 0803 N
10.0	3.0	5.0	4.0	1.5	1.8	5.2	8.0	DP 1003 N
12.0	4.5	6.0	4.0	2.0	2.3	6.9	9.4	DP 1203 N
12.0	4.5	6.0	5.0	2.0	2.3	6.9	10.2	DP 1204 N
16.0	4.5	6.5	4.5	2.0	2.3	6.9	13.2	DP 1603 N
16.0	4.5	6.5	5.5	2.0	2.4	6.9	13.9	DP 1604 N
20.0	6.0	7.5	5.5	2.5	2.8	9.4	17.0	DP 2005 N
20.0	6.0	7.5	6.3	2.5	2.9	8.8	17.3	DP 2006 N
25.0	7.0	8.8	7.0	3.0	3.5	10.8	21.2	DP 2506 N
25.0	7.0	8.8	7.6	3.0	3.5	10.8	22.0	DP 2507 N
32.0	8.0	11.0	8.0	3.0	3.5	12.5	27.0	DP 3208 N
40.0	8.0	11.8	8.8	4.0	4.5	17.0	34.9	DP 4008 N
50.0	10.0	14.0	10.0	4.0	4.5	26.0	43.9	DP 5010 N
63.0	12.0	14.0	10.0	4.0	4.5	26.0	56.6	DP 6312 N
80.0	16.0	16.0	12.0	5.0	5.5	30.0	72.0	DP 8016 N
100.0	20.0	18.0	14.0	6.0	6.5	35.0	91.0	DP A020 N

Seals & O-rings Specialist

Piston Seals

TD

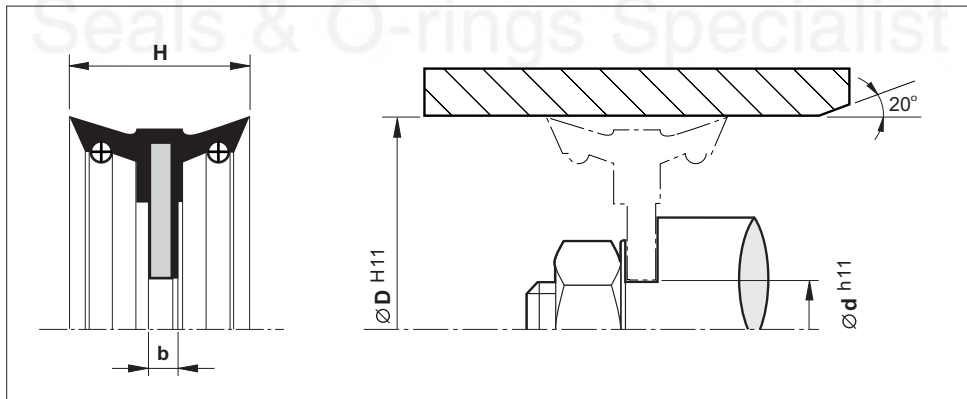
(Metric Size)



Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR-Metal	40	-30 +105	0.25

- Simple fixing at the piston.
- Low friction and smooth running.
- Can be used in lubricated air as well as in oil free air.

Installation Recommendation



Surface roughness	Ra	Rmax
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Sliding surface	$\leq 0.3 \mu\text{m}$	$\leq 2.5 \mu\text{m}$
Surface of housing	$\leq 1.6 \mu\text{m}$	$\leq 6.3 \mu\text{m}$
Sides of housing	$\leq 3.0 \mu\text{m}$	$\leq 15 \mu\text{m}$

Piston - TD

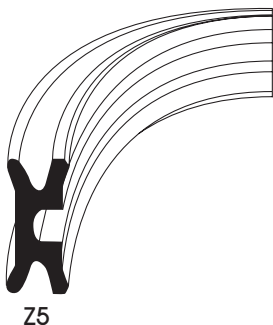
(Metric Size)

Bore Dia.	Dimensions			Reference (For order processing)
	D	d	H		b
25.0	8.0	22.0	3.5	TD 025-008.0-022
26.0	8.0	22.0	3.5	TD 026-008.0-022
30.0	8.0	22.0	3.5	TD 030-008.0-022
32.0	8.0	25.0	3.5	TD 032-008.0-025
35.0	8.0	26.0	3.5	TD 035-008.0-026
38.0	8.0	25.0	3.5	TD 038-008.0-025
40.0	10.0	25.0	3.5	TD 040-010.0-025
45.0	10.0	25.0	4.5	TD 045-010.0-025
50.0	10.0	25.0	4.5	TD 050-010.0-025
55.0	10.0	25.0	4.5	TD 055-010.0-025
60.0	12.0	26.0	4.5	TD 060-012.0-026
63.0	12.0	25.0	4.5	TD 063-012.0-025
65.0	12.0	25.0	4.5	TD 065-012.0-025
70.0	12.0	30.0	5.9	TD 070-012.0-030
75.0	12.0	30.0	5.9	TD 075-012.0-030
80.0	12.0	30.0	5.9	TD 080-012.0-030
85.0	12.0	35.0	7.1	TD 085-012.0-035
90.0	12.0	35.0	7.1	TD 090-012.0-035
100.0	12.0	35.0	7.1	TD 100-012.0-035
110.0	12.0	40.0	7.0	TD 110-012.0-040
120.0	20.0	40.0	9.0	TD 120-012.0-040
125.0	20.0	40.0	9.0	TD 125-020.0-040
130.0	20.0	40.0	9.0	TD 130-020.0-040
140.0	20.0	40.0	11.0	TD 140-020.0-040
145.0	20.0	40.0	11.0	TD 145-020.0-040
150.0	20.0	40.0	11.0	TD 150-020.0-040
160.0	20.0	40.0	11.0	TD 160-020.0-040
175.0	20.0	40.0	11.0	TD 175-020.0-040
180.0	20.0	40.0	11.0	TD 180-020.0-040
200.0	20.0	40.0	11.0	TD 200-020.0-040
230.0	30.0	40.0	13.0	TD 230-030.0-040
250.0	30.0	40.0	13.0	TD 250-030.0-040
300.0	60.0	40.0	13.0	TD 300-060.0-040

Piston Seals

Z5

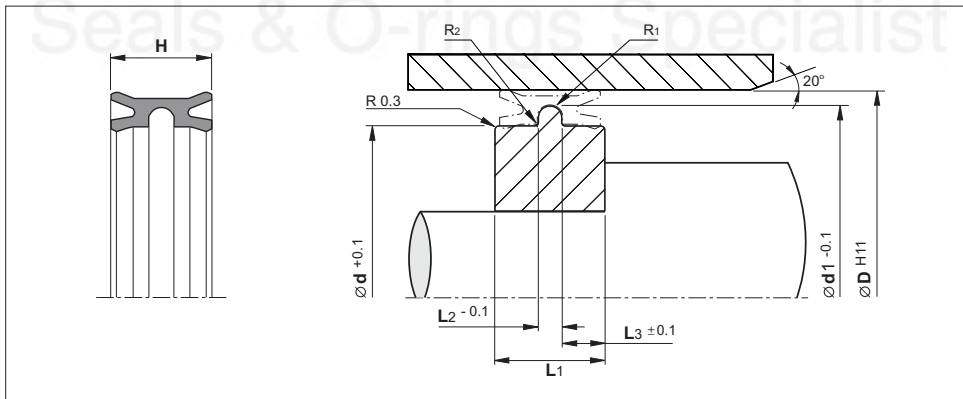
(Metric Size)



Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	16	-30 +80	1

- No metallic contact between piston and cylinder.
- Smooth running due to optimized sealing lip.
- For use in dry and oil free air.
- Easy assembly on one piece piston.

Installation Recommendation



Surface roughness	Ra	Rmax
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Sliding surface	≤ 0.3 μm	≤ 2.5 μm
Surface of housing	≤ 1.6 μm	≤ 6.3 μm
Sides of housing	≤ 3.0 μm	≤ 15 μm

Piston - Z5

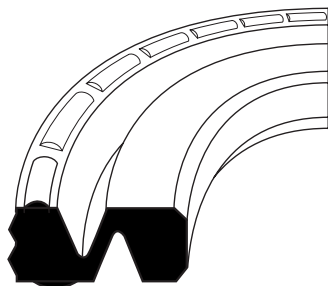
(Metric Size)

Bore Dia.	Groove Dimensions					Seal Height.	Radius		Reference (For order processing)
	D	d	d1	L1	L2		L3	H		R1	R2
16.0	10.0	13.5	12.0	3.0	4.5	10.5	0.9	0.2	Z5 1610 N
18.0	12.0	15.5	12.0	3.0	4.5	10.5	0.9	0.2	Z5 1812 N
20.0	14.0	17.5	12.0	3.0	4.5	10.5	0.9	0.2	Z5 2014 N
25.0	18.0	22.5	13.0	3.0	5.0	12.0	0.9	0.2	Z5 2518 N
28.0	22.0	25.5	12.0	3.0	4.5	10.5	0.9	0.2	Z5 2822 N
30.0	23.0	27.5	13.0	3.0	5.0	12.0	1.3	0.2	Z5 3023 N
32.0	25.0	29.5	13.0	3.0	5.0	12.0	1.3	0.2	Z5 3225 N
35.0	28.0	32.5	13.0	3.0	5.0	12.0	1.3	0.2	Z5 3528 N
40.0	33.0	37.5	13.0	3.0	5.0	12.0	1.3	0.2	Z5 4033 N
45.0	38.0	42.5	13.0	3.0	5.0	12.0	1.3	0.2	Z5 4538 N
50.0	43.0	47.5	13.0	3.0	5.0	12.0	1.3	0.2	Z5 5043 N
54.0	46.0	51.5	15.0	4.0	5.5	13.0	1.3	0.2	Z5 5446 N
63.0	53.0	60.0	19.0	5.0	7.0	17.0	1.6	0.3	Z5 6353 N
63.0	56.0	60.5	13.0	3.0	5.0	12.0	1.3	0.3	Z5 6356 N
70.0	62.0	67.5	15.0	4.0	5.5	13.0	1.6	0.3	Z5 7007 N
76.0	66.0	73.0	20.0	6.0	7.0	18.0	1.6	0.3	Z5 7666 N
80.0	70.0	77.0	20.0	6.0	7.0	18.0	1.6	0.3	Z5 8070 N
80.0	72.0	77.4	15.0	4.0	5.5	13.0	1.6	0.3	Z5 8067 N
100.0	88.0	96.5	23.0	8.0	7.5	21.0	1.6	0.4	Z5 A088 N
100.0	90.0	97.0	18.0	4.0	7.0	16.0	1.6	0.3	Z5 A089 N
125.0	113.0	122.0	17.0	5.0	6.0	15.0	1.6	0.4	Z5 C511 N
125.0	113.0	121.5	23.0	8.0	7.5	21.0	1.6	0.4	Z5 C513 N
130.0	120.0	127.0	19.0	5.0	7.0	17.0	1.6	0.3	Z5 D017 N
140.0	128.0	136.5	23.0	8.0	7.5	21.0	1.6	0.4	Z5 E028 N
150.0	140.0	147.0	19.0	5.0	7.0	17.0	1.6	0.3	Z5 F014 N
160.0	145.0	155.5	29.0	10.0	9.5	26.0	1.6	0.4	Z5 G045 N
200.0	185.0	195.5	29.0	10.0	9.5	26.0	1.6	0.4	Z5 L085 N

Piston Seals

PZ

(Metric Size)

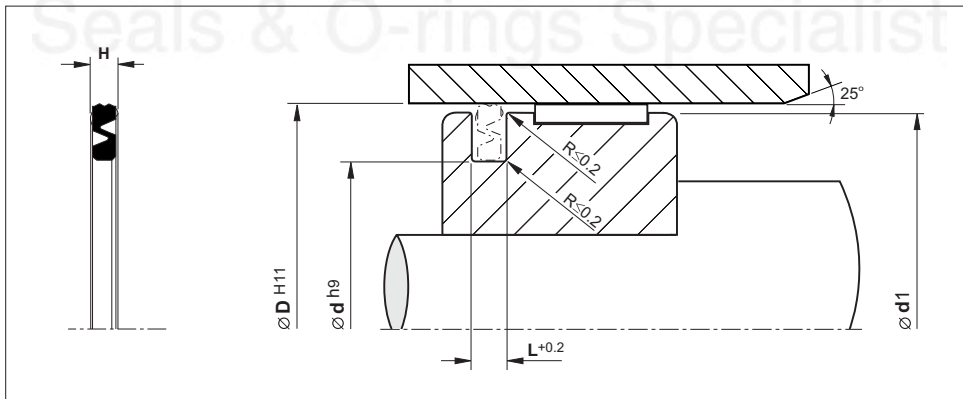


PZ

Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	12	-20 +80	1

- Good sealing performance in small installation grooves.
- Low static and dynamic friction.
- Use in dry air and oil-free air.
- Easily assembly in simple grooves.

Installation Recommendation



Surface roughness	Ra	Rmax
Sliding surface	$\leq 0.3 \mu\text{m}$	$\leq 2.5 \mu\text{m}$
Surface of housing	$\leq 1.6 \mu\text{m}$	$\leq 6.3 \mu\text{m}$
Sides of housing	$\leq 3.0 \mu\text{m}$	$\leq 15 \mu\text{m}$

Piston - PZ

(Metric Size)

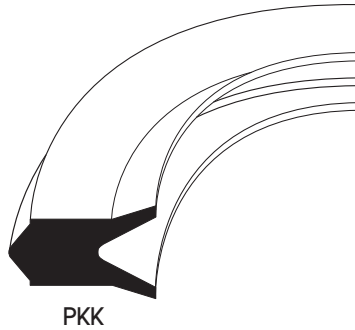
Bore Dia.	Groove Dia.	Groove Width	Seal Height	Piston Dia.	Reference (For order processing)
D	d	L	H	d1	
10.0	6.5	1.8	1.4	9.6	PZ 1006 N
12.0	7.0	2.5	2.0	11.6	PZ 1207 N
14.0	8.0	2.5	2.1	13.6	PZ 1408 N
16.0	9.0	2.5	2.1	15.6	PZ 1605 N
20.0	13.0	2.5	2.1	19.6	PZ 2013 N
25.0	18.0	2.5	2.1	24.6	PZ 2518 N
28.0	19.0	3.0	2.5	27.6	PZ 2819 N
30.0	21.0	3.0	2.5/1	29.6	PZ 3021 N
32.0	23.0	3.0	2.5	31.6	PZ 3210 N
35.0	26.0	3.0	2.5	34.5	PZ 3520 N
40.0	31.0	3.0	2.5	39.5	PZ 4031 N
45.0	36.0	3.0	2.5	44.5	PZ 4520 N
50.0	41.0	3.0	2.5	49.5	PZ 5010 N
63.0	51.0	4.0	3.4	62.5	PZ 6051 N
80.0	68.0	4.0	3.4	79.5	PZ 8010 N
100.0	88.0	4.0	3.4	99.4	PZ A008 N
125.0	110.0	5.0	4.4	124.4	PZ C050 N

Seals & O-rings Specialist

Piston Seals

PKK

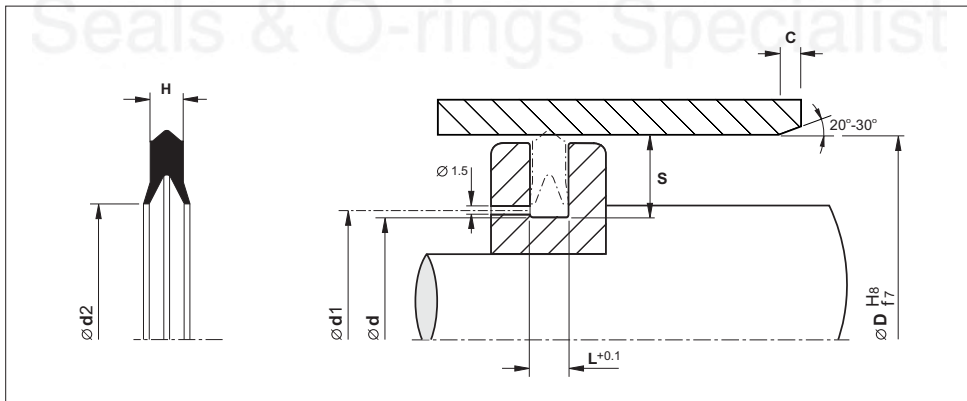
(Metric Size)



Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	16	-40 +80	1

- Piston seal for pneumatic systems
- Pressure admission on one side or both sides.
- Low friction.
- Long service life.

Installation Recommendation



Surface roughness	Ra	Rmax	Chamfers	
			S	C
Sliding surface	≤ 0.3 μm	≤ 2.5 μm	4.0	2.0
Surface of housing	≤ 1.6 μm	≤ 6.3 μm	5.0	2.5
Sides of housing	≤ 3.0 μm	≤ 15 μm	7.5	4.0
			10.0	5.0
			12.5	6.5
			15.0	7.5
			20.0	10.0

Piston - PKK

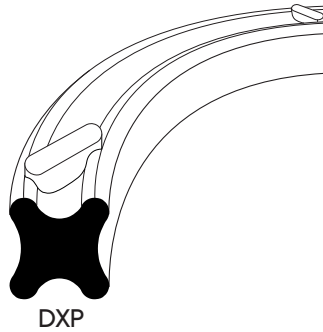
(Metric Size)

Bore Dia.	Dimensions		Groove Width	Seal Height	Seal Dia.	Reference	Reference (For order processing)
	D	d						d1	L	H	d2
12	5.2	6.8	1.7	1.5	7.2	2-9826	PKK-012
15	5.2	6.8	2.3	2.0	7.4	2-9963	PKK-015
18	7.5	9.2	2.3	2.0	10.4	2-11072	PKK-018
20	9.5	11.2	2.3	2.0	12.4	2-11871	PKK-020
30	19.5	21.2	2.3	2.0	22.4	2-9571	PKK-030
30	21.0	22.7	1.7	1.5	24.2	2-9573	PKK-030A
32	21.5	23.2	2.3	2.0	24.4	2-11518	PKK-032
35	21.5	23.2	3.0	2.5	25.0	2-11718	PKK-035
40	26.5	28.2	3.0	2.5	30.0	2-9475	PKK-040
45	31.5	33.2	3.0	2.5	35.0	2-9466	PKK-045
50	36.5	38.2	3.0	2.5	39.0	2-11184	PKK-050
60	42.5	44.2	3.5	3.0	46.0	2-9572	PKK-060
63	45.5	47.5	3.5	3.0	49.0	2-11235	PKK-063
70	54.5	56.2	3.5	3.0	58.0	2-9701	PKK-070
80	60.0	61.7	4.1	3.5	63.4	2-11313	PKK-080
82	62.0	63.7	4.1	3.5	65.4	2-9846	PKK-082
100	80.0	81.7	4.6	4.0	83.4	2-11519	PKK-100
102	82.0	83.7	4.6	4.0	85.4	2-9931	PKK-102
118	95.0	96.7	5.1	4.5	99.0	2-11010	PKK-118
125	100.0	101.7	5.1	4.5	104.4	2-9476	PKK-125
127	102.0	103.7	5.1	4.5	106.4	2-9806	PKK-127
150	122.5	124.0	6.2	5.5	126.4	2-9932	PKK-150
160	132.0	134.0	6.2	5.5	135.6	2-9995	PKK-160
175	148.0	150.0	6.7	6.0	151.0	2-11335	PKK-175
180	152.0	154.0	6.7	6.0	156.0	2-9799	PKK-180
222	186.0	188.0	8.8	8.0	190.0	2-11044	PKK-222
255	219.0	221.0	8.8	8.0	223.0	2-11045	PKK-255

Piston Seals

DXP

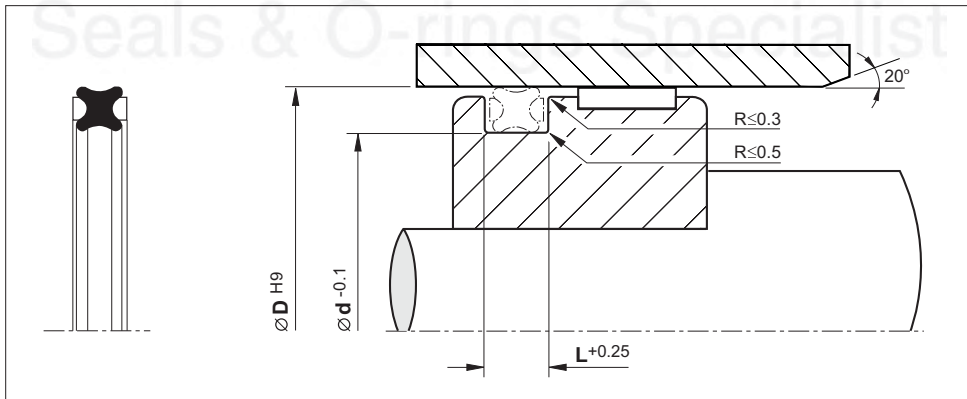
(Metric Size)



Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
NBR	10	-40 +90	1

- Good sealing performance.
- Anti-twisting or rolling.
- High wear resistance.
- Easy installation.

Installation Recommendation



Surface roughness	Ra	Rmax
Sliding surface	$\leq 0.3 \mu\text{m}$	$\leq 2.5 \mu\text{m}$
Surface of housing	$\leq 1.6 \mu\text{m}$	$\leq 6.3 \mu\text{m}$
Sides of housing	$\leq 3.0 \mu\text{m}$	$\leq 15 \mu\text{m}$

Piston - DXP

(Metric Size)

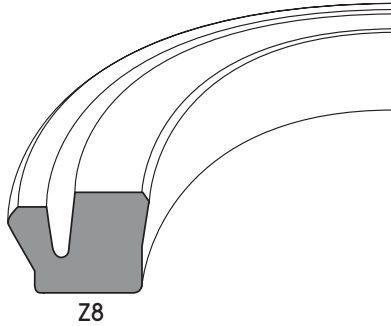
Bore Dia.	Groove Dia.	Groove Width	Reference (For order processing)
D	d	L	
20.0	14.0	5.0	DXP-020
25.0	19.0	5.0	DXP-025
30.0	24.0	5.0	DXP-030
32.0	26.0	5.0	DXP-032
40.0	32.0	5.0	DXP-040
50.0	42.0	5.0	DXP-050
63.0	53.0	7.0	DXP-063
80.0	70.0	7.0	DXP-080
100.0	90.0	7.0	DXP-100
125.0	110.0	10.0	DXP-125
150.0	135.0	10.0	DXP-150
160.0	145.0	10.0	DXP-160
180.0	165.0	10.0	DXP-180
200.0	185.0	10.0	DXP-200
250.0	235.0	10.0	DXP-250
300.0	285.0	10.0	DXP-300
320.0	305.0	10.0	DXP-320

Seals & O-rings Specialist

Piston Seals

Z8

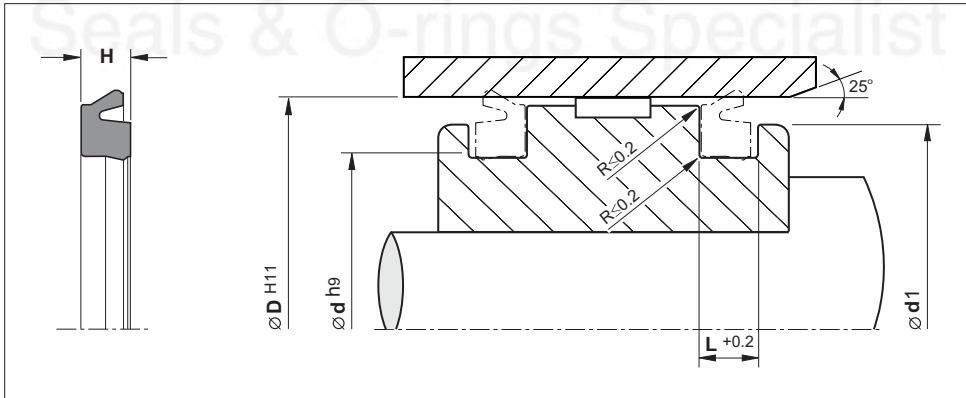
(Metric Size)



Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
SFR	16	-20 +80	1

- Good sealing performance.
- Low static and dynamic friction.
- Suitable for plastic pistons.
- Easy assembly in the seal grooves

Installation Recommendation



Surface roughness	Ra	Rmax
Sliding surface	≤ 0.3 μm	≤ 2.5 μm
Surface of housing	≤ 1.6 μm	≤ 6.3 μm
Sides of housing	≤ 3.0 μm	≤ 15 μm

Piston - Z8

(Metric Size)

Bore Dia.	Groove Dia.	Seal Hight	Groove Width	Fitting Dia.	Prefix No.	Reference (For order processing)
D	d	H	L	d1		
4.0	1.5	1.5	2.0	3.6	0415	UC 001.5-004-01.5 Z8
5.0	2.5	1.5	2.0	4.6	0504	UC 002.5-005-01.5 Z8
6.0	3.0	2.0	2.5	5.6	0630	UC 003-006-02 Z8
7.5	4.9	2.0	2.5	7.1	0750	UC 004.9-007.5-02 Z8
7.8	5.0	2.0	2.5	7.4	0785	UC 005-007.8-02 Z8
8.0	4.0	2.55	3.0	7.6	0804	UC 004-008-02.55 Z8
8.0	4.8	2.3	2.7	7.6	0806	UC 004.8-008-02.3 Z8
8.0	4.8	2.55	3.0	7.6	0807	UC 004.8-008-02.55 Z8
8.0	5.45	2.3	2.8	7.6	0810	UC 005.45-008-02.3 Z8
9.0	5.0	2.55	3.0	8.6	0905	UC 005-009-02.55 Z8
10.0	3.0	3.5	4.0	9.6	1003	UC 003-010-03.5 Z8
10.0	6.0	2.55	3.0	9.6	1006	UC 006-010-2.55 Z8
10.0	6.45	2.55	3.0	9.6	1007	UC 006.45-010-02.55 Z8
11.0	6.0	2.55	3.0	10.6	1106	UC 006-011-02.55 Z8
12.0	7.0	2.55	3.0	11.6	1207	UC 007-012-02.55 Z8
12.6	7.5	2.55	3.0	12.2	1260	UC 007.5-012.6-02.55 Z8
13.0	8.0	2.55	3.0	12.6	1030	UC 008-013-02.55 Z8
14.0	8.0	2.55	3.0	13.6	1421	UC 008-014-02.55 Z8
15.0	9.0	2.55	3.0	14.6	1509	UC 009-015-02.55 Z8
16.0	10.0	2.55	3.0	15.6	1610	UC 010-016-02.55 Z8
16.0	11.0	2.55	3.0	15.6	1611	UC 011-016-02.55 Z8
18.0	12.0	2.55	3.0	17.6	1812	UC 012-018-02.55 Z8
20.0	14.0	2.55	3.0	19.6	2014	UC 014-020-02.55 Z8
21.0	15.0	2.55	3.0	20.4	2115	UC 015-021-02.55 Z8
22.0	16.0	2.55	3.0	21.4	2216	UC 016-022-02.55 Z8
24.0	18.0	3.25	3.5	23.4	2418	UC 018-024-03.25 Z8
25.0	19.0	3.25	3.5	24.4	2519	UC 019-025-03.25 Z8
25.0	19.0	4.0	4.5	24.4	2520	UC 019-025-04 Z8
28.0	22.0	3.25	3.5	27.4	2822	UC 022-028-03.25 Z8
30.0	21.0	2.75	3.2	29.4	3021	UC 021-030-02.75 Z8
30.0	22.0	3.25	3.5	29.4	3022	UC 022-030-03.25 Z8
30.0	22.5	4.8	5.2	29.4	3023	UC 022.5-030-04.8 Z8
32.0	24.0	3.25	3.5	31.4	3224	UC 024-032-03.25 Z8
35.0	27.0	3.25	3.5	34.4	3527	UC 027-035-03.25 Z8
36.0	28.0	3.25	3.5	35.4	3628	UC 028-036-03.25 Z8
37.0	29.0	3.25	3.5	36.4	3729	UC 029-037-03.25 Z8
38.0	30.0	3.25	3.5	37.4	3818	UC 030-038-03.25 Z8
40.0	32.0	3.25	3.5	39.4	4032	UC 032-040-03.25 Z8
42.0	34.0	3.25	3.5	41.4	4234	UC 034-042-03.25 Z8
45.0	37.0	3.25	3.5	44.4	4522	UC 037-045-03.25 Z8

(Metric Size)

Bore Dia.	Groove Dia.	Seal Hight	Groove Width	Fitting Dia.	Prefix No.	Reference (For order processing)
D	d	H	L	d1		
50.0	42.0	3.25	3.5	49.4	5042	UC 042-050-03.25 Z8
52.0	42.0	4.25	4.5	51.4	5205	UC 042-052-04.25 Z8
57.0	50.5	3.25	3.5	56.4	5705	UC 050.5-057-03.25 Z8
58.0	48.0	4.25	4.5	57.4	5816	UC 048-058-04.25 Z8
63.0	53.0	4.25	4.5	62.4	6353	UC 053-063-04.25 Z8
80.0	70.0	4.25	4.5	79.4	8070	UC 070-080-04.25 Z8
90.0	80.0	4.25	4.5	89.4	9080	UC 080-090-04.25 Z8
100.0	90.0	4.25	4.5	99.4	A090	UC 090-100-04.25 Z8
125.0	105.0	8.25	8.5	123.8	C505	UC 105-125-08.25 Z8
150.0	130.0	8.25	8.5	148.8	F113	UC 130-150-08.25 Z8
160.0	140.0	8.25	8.5	158.8	G014	UC 140-160-08.25 Z8
200.0	180.0	8.25	8.5	198.8	L018	UC 180-200-08.25 Z8

SPEC SEAL
Seals & O-rings Specialist

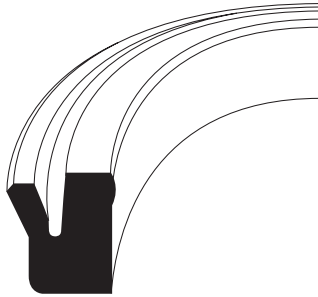


Seals & O-rings Specialist

Piston Seals

E4

(Metric Size)

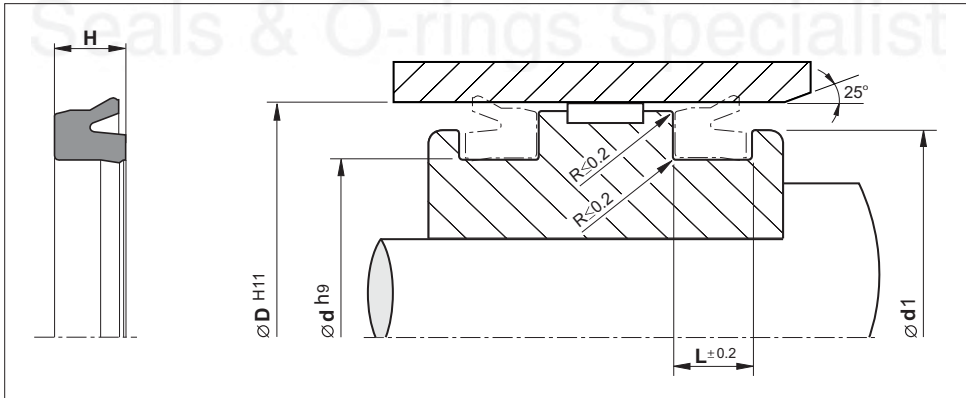


E4

Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	16	-30 +80	1

- Tight fit into the groove ensures reliable operation.
- Suitable for cylinders with cushioning.
- Long service life.
- Easy snap assembly in grooves.

Installation Recommendation



Surface roughness	Ra	Rmax
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Sliding surface	≤ 0.3 µm	≤ 2.5 µm
Surface of housing	≤ 1.6 µm	≤ 6.3 µm
Sides of housing	≤ 3.0 µm	≤ 15 µm

Piston - E4



(Metric Size)

Bore Dia.	Groove Dia.	Seal Hight	Groove Width	Fitting Dia.	Prefix No.	Reference (For order processing)
D	d	H	L	d1		
10.0	5.0	3.0	3.5	9.0	1050	UC 005-010-03 E4
12.0	6.0	4.0	4.5	11.0	1206	UC 006-012-04 E4
12.0	7.0	4.0	4.5	11.0	1207	UC 007-012-04 E4
14.0	8.0	4.0	4.5	13.0	1408	UC 008-014-04 E4
16.0	8.0	5.5	6.0	15.0	1608	UC 008-016-05.5 E4
16.0	9.0	5.0	5.5	15.0	1609	UC 009-016-05 E4
16.0	10.0	4.0	4.5	15.0	1610	UC 010-016-04 E4
20.0	12.0	5.5	6.0	19.0	2012	UC 012-020-05.5 E4
20.0	14.0	4.0	4.5	19.0	2014	UC 014-020-04 E4
20.5	14.0	4.0	4.5	19.5	2016	UC 014-020.5-04 E4
22.0	16.0	5.0	5.5	21.0	2216	UC 016-022-05 E4
24.0	16.0	5.5	6.0	23.0	2416	UC 016-024-05.5 E4
25.0	15.5	5.8	6.3	24.0	2515	UC 015.5-025-05.8 E4
25.0	17.0	4.5	5.0	24.0	2516	UC 017-025-04.5 E4
25.0	17.0	5.5	6.0	24.0	2517	UC 017-025-05.5 E4
28.0	18.0	7.0	7.5	26.5	2818	UC 018-028-07 E4
32.0	20.0	6.5	7.0	30.0	3220	UC 020-032-06.5 E4
32.0	22.0	7.0	7.5	30.5	3222	UC 022-032-07 E4
32.0	24.0	5.5	6.0	31.0	3224	UC 024-032-05.5 E4
34.0	24.0	7.0	7.5	32.5	3424	UC 024-034-07 E4
36.0	26.0	7.0	7.5	34.5	3666	UC 026-036-07 E4
40.0	30.0	7.0	7.5	38.5	4030	UC 030-040-07 E4
42.0	30.0	6.0	6.5	40.0	4203	UC 030-042-06 E4
45.0	33.0	9.0	10.0	43.0	4533	UC 033-045-09 E4
45.0	37.0	7.0	7.5	44.0	4537	UC 037-045-07 E4
50.0	40.0	7.0	7.5	48.5	5040	UC 040-050-07 E4
60.0	50.0	7.0	7.5	58.5	6022	UC 050-060-07 E4
63.0	53.0	7.0	7.5	61.5	6353	UC 053-063-07 E4
65.0	55.0	7.0	7.5	63.5	6510	UC 055-065-07 E4
70.0	58.0	7.0	7.5	68.0	7058	UC 058-070-07 E4
75.0	65.0	7.5	8.0	73.5	7065	UC 065-075-07.5 E4
80.0	68.0	8.5	9.5	78.0	8068	UC 068-080-08.5 E4
84.0	72.0	8.5	9.5	82.0	8072	UC 072-084-08.5 E4
100.0	88.0	8.5	9.5	98.0	A088	UC 088-100-08.5 E4
105.0	93.0	8.5	9.5	103.0	A501	UC 093-105-08.5 E4
110.0	98.0	8.5	9.5	108.0	B002	UC 098-110-08.5 E4
115.0	103.0	8.5	9.5	113.0	B515	UC 103-115-08.5 E4
120.0	105.0	10.0	11.0	117.5	C005	UC 105-120-10 E4
125.0	110.0	10.0	11.0	122.5	C010	UC 110-125-10 E4
130.0	115.0	10.0	11.0	127.5	D015	UC 115-130-10 E4

Piston - E4

(Metric Size)

Bore Dia.	Groove Dia.	Seal Hight	Groove Width	Fitting Dia.	Prefix No.	Reference (For order processing)
D	d	H	L	d1		
140.0	125.0	10.0	11.0	137.5	E040	UC 125-140-10 E4
150.0	135.0	10.0	11.0	147.5	F004	UC 135-150-10 E4
160.0	140.0	14.0	15.0	155.0	G014	UC 140-160-14 E4
160.0	145.0	10.0	11.0	157.5	G022	UC 145-160-10 E4
180.0	160.0	14.0	15.0	175.0	J014	UC 160-180-14 E4
200.0	180.0	14.0	15.0	195.0	L018	UC 180-200-14 E4
220.0	199.0	15.0	16.0	215.0	M005	UC 199-220-15 E4
250.0	225.0	18.0	19.0	242.5	N525	UC 225-250-18 E4
250.0	226.0	16.0	17.0	242.5	N502	UC 226-250-16 E4
250.0	230.0	14.0	15.0	245.0	N503	UC 230-250-14 E4
260.0	240.0	14.0	15.0	255.0	O040	UC 240-260-14 E4
280.0	260.0	14.0	15.0	275.0	P060	UC 260-280-14 E4
320.0	295.0	14.0	15.0	312.5	Q205	UC 295-320-14 E4
320.0	295.0	17.0	18.0	312.5	Q206	UC 295-320-17 E4
470.0	440.0	21.0	22.0	460.0	R720	UC 440-470-21 E4

SPEC SEAL
Seals & O-rings Specialist

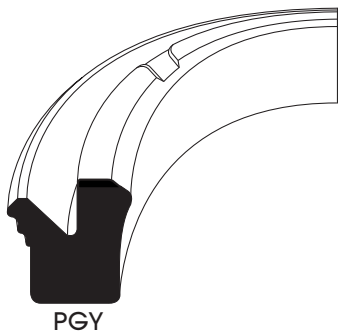


Seals & O-rings Specialist

Piston Seals

PGY

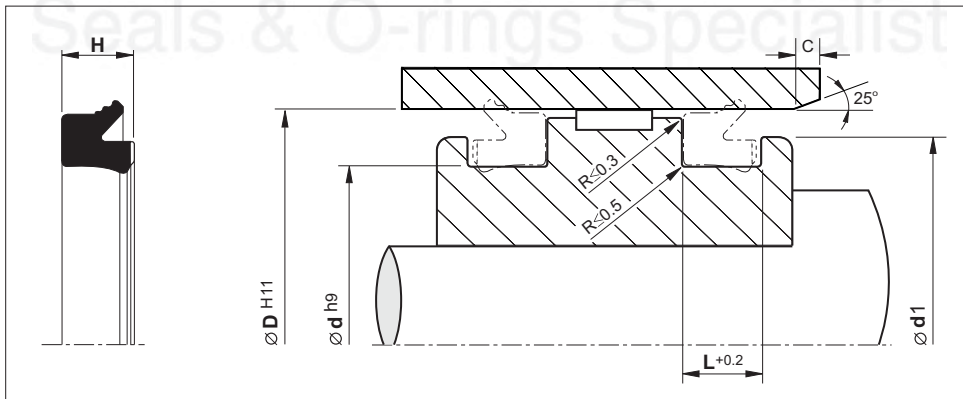
(Metric Size)



Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
NBR	10	-25 +80	1

- Exclusively designed for piston.
- Non lubrication required.
- High wear resistance.
- Low friction.

Installation Recommendation



Surface roughness	Ra	Rmax	Chamfers	
Sliding surface	$\leq 0.3 \mu\text{m}$	$\leq 2.5 \mu\text{m}$	$\varnothing D$	C
Surface of housing	$\leq 1.6 \mu\text{m}$	$\leq 6.3 \mu\text{m}$	< 100	3.0
Sides of housing	$\leq 3.0 \mu\text{m}$	$\leq 15 \mu\text{m}$	100-180	4.0
			180-300	5.0

Piston - PGY



(Metric Size)

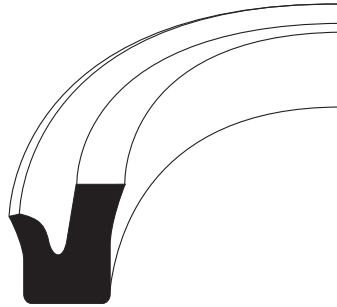
Bore Dia.	Groove Dia.	Seal Hight	Groove Width	Fitting Dia.	Reference (For order processing)
D	d	H	L	d1	
20.0	12.0	5.2	5.7	17.0	PGY-020
25.0	17.0	5.2	5.7	23.0	PGY-025
28.0	20.0	5.2	5.7	26.0	PGY-028
30.0	22.4	5.2	5.7	29.0	PGY-030
32.0	24.0	5.2	5.7	31.0	PGY-032
40.0	30.0	6.5	7.0	39.0	PGY-040
50.0	40.0	6.5	7.0	49.0	PGY-050
63.0	53.0	6.5	7.0	62.0	PGY-063
80.0	70.0	6.5	7.0	79.0	PGY-080
100.0	85.0	9.5	10.0	98.5	PGY-100
120.0	105.0	9.5	10.0	118.5	PGY-120
125.0	110.0	9.5	10.0	123.5	PGY-125
140.0	125.0	9.5	10.0	138.5	PGY-140
150.0	135.0	9.5	10.0	148.5	PGY-150
160.0	145.0	9.5	10.0	158.5	PGY-160
180.0	165.0	9.5	10.0	178.5	PGY-180
200.0	180.0	12.0	13.0	198.0	PGY-200
250.0	230.0	12.0	13.0	248.0	PGY-250
300.0	280.0	14.0	15.0	298.0	PGY-300

Seals & O-rings Specialist

Piston Seals

EVDE

(Imperial Size)

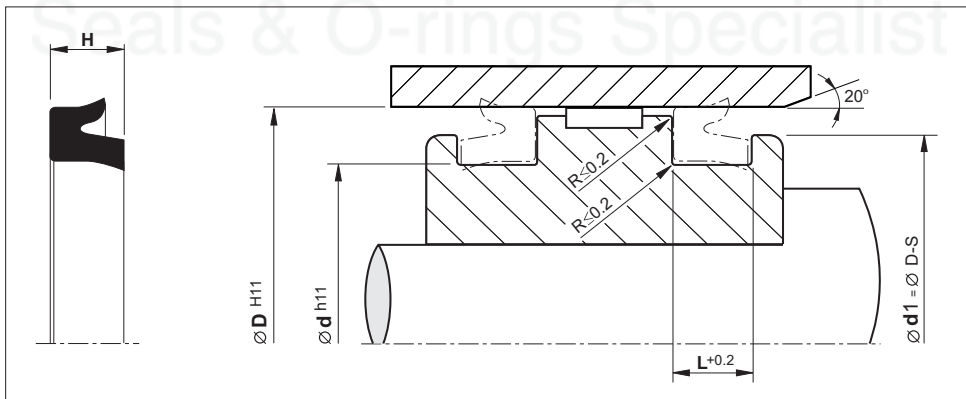


EVDE

Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	80	-30 +110	0.25

- Large size range for piston.
- Tight fit into piston grooves.
- Low friction.
- Long service life.

Installation Recommendation



Surface roughness	Ra	Rmax
Sliding surface	$\leq 0.3 \mu\text{m}$	$\leq 2.5 \mu\text{m}$
Surface of housing	$\leq 1.6 \mu\text{m}$	$\leq 6.3 \mu\text{m}$
Sides of housing	$\leq 3.0 \mu\text{m}$	$\leq 15 \mu\text{m}$

Piston - EVDE



(Imperial Size)

Bore Dia.	Groove Dia.	Seal Hight	Groove Width	Reference (For order processing)
D	d	H	L	
9.50	3.17	3.96	5.50	UC 003.17-009.5-03.96 EVDE
11.10	4.76	3.96	5.50	UC 004.76-011.1-03.96 EVDE
13.00	6.70	4.76	6.30	UC 006.7-013-04.76 EVDE
14.00	7.70	4.76	6.30	UC 007.7-014-04.76 EVDE
16.00	8.10	5.55	7.00	UC 008.1-016-05.55 EVDE
17.50	12.60	3.17	5.00	UC 012.6-017.5-03.17 EVDE
19.00	12.70	3.17	5.00	UC 012.7-019-03.17 EVDE
19.05	9.52	6.35	7.14	UC 009.52-019.05-06.35 EVDE
20.62	11.10	6.35	7.14	UC 011.10-020.62-06.35 EVDE
21.00	14.70	6.35	8.00	UC 014.7-021-06.35 EVDE
22.00	12.50	6.35	8.00	UC 012.5-022-06.35 EVDE
24.00	14.50	6.35	8.00	UC 014.5-024-06.35 EVDE
26.00	16.50	6.35	8.00	UC 016.5-026-06.35 EVDE
27.00	17.50	6.35	8.00	UC 017.5-027-06.35 EVDE
28.57	15.87	7.92	9.52	UC 015.87-028.57-07.92 EVDE
29.00	19.05	6.35	8.00	UC 019.05-029-06.35 EVDE
30.00	20.50	6.35	8.00	UC 020.5-030-06.35 EVDE
30.15	17.45	7.92	9.52	UC 017.45-030.15-07.92 EVDE
31.75	19.05	7.92	9.52	UC 019.05-031.75-07.92 EVDE
32.00	19.30	6.35	8.00	UC 019.3-032-06.35 EVDE
33.32	20.62	7.92	9.52	UC 020.62-033.32-07.92 EVDE
34.00	15.00	9.52	11.00	UC 015-034-09.52 EVDE
34.92	22.22	7.92	9.52	UC 022.22-034.92-07.92 EVDE
35.00	22.30	6.35	8.00	UC 022.3-035-06.35 EVDE
36.50	23.80	7.92	9.52	UC 023.8-036.5-7.92 EVDE
37.00	26.00	6.35	8.00	UC 026-037-06.35 EVDE
38.00	30.00	6.35	8.00	UC 030-038-06.35 EVDE
38.10	25.40	7.92	9.52	UC 025.4-038.1-07.92 EVDE
40.00	27.30	6.35	8.00	UC 027.3-040-06.35 EVDE
41.27	25.40	9.52	11.10	UC 025.4-041.27-09.52 EVDE
42.00	30.90	6.35	8.00	UC 030.9-042-06.35 EVDE
43.00	30.30	9.52	11.00	UC 030.30-043-09.52 EVDE
44.45	28.57	9.52	11.10	UC 028.57-044.45-09.52 EVDE
45.00	35.50	7.00	8.50	UC 035.5-045-07 EVDE
46.00	28.20	10.20	12.00	UC 028.2-046-10.2 EVDE
47.62	31.75	9.52	11.10	UC 031.75-047.62-09.52 EVDE
48.00	32.10	7.93	9.50	UC 032.1-048-07.93 EVDE
49.00	35.00	9.52	11.00	UC 035-049-09.52 EVDE
50.80	34.92	9.52	11.10	UC 034.92-050.8-09.52 EVDE
51.00	41.50	7.14	9.00	UC 041.5-051-07.14 EVDE
53.97	38.10	9.52	11.10	UC 038.1-053.97-09.52 EVDE
54.00	41.30	9.52	11.00	UC 041.3-054-09.52 EVDE

(Imperial Size)

Bore Dia.	Groove Dia.	Seal Hight	Groove Width	Reference (For order processing)
D	d	H	L	
57.00	44.30	6.35	8.00	UC 044.3-057-06.35 EVDE
57.15	41.27	9.52	11.10	UC 041.27-057.15-09.52 EVDE
60.32	44.45	9.52	11.10	UC 044.45-060.32-09.52 EVDE
61.00	48.30	6.35	8.00	UC 048.3-061-06.35 EVDE
63.50	47.62	9.52	11.10	UC 047.62-063.5-09.52 EVDE
64.00	46.30	8.85	10.50	UC 046.3-064-08.85 EVDE
66.67	50.80	9.52	11.10	UC 050.8-066.67-09.52 EVDE
67.00	51.10	8.85	10.50	UC 051.1-067-08.85 EVDE
69.85	50.80	12.70	14.30	UC 050.8-069.85-12.7 EVDE
70.00	54.10	7.93	9.50	UC 054.1-070-07.93 EVDE
73.00	63.50	5.55	7.00	UC 063.5-073-05.55 EVDE
73.02	53.97	12.70	14.30	UC 053.97-073.02-12.7 EVDE
76.00	57.90	8.73	10.50	UC 057.9-076-08.73 EVDE
76.20	57.15	12.70	14.30	UC 057.15-076.2-12.7 EVDE
79.37	60.32	12.70	14.30	UC 060.32-079.37-12.7 EVDE
80.00	67.30	6.35	8.00	UC 067.3-080-06.35 EVDE
82.55	63.50	12.70	14.30	UC 063.5-082.55-12.7 EVDE
83.00	71.90	7.50	8.50	UC 071.9-083-07.5 EVDE
86.00	73.30	9.52	11.00	UC 073.3-086-09.52 EVDE
88.90	69.85	12.70	14.30	UC 069.85-088.9-12.7 EVDE
89.00	76.30	6.35	8.00	UC 076.3-089-06.35 EVDE
92.00	76.10	9.52	11.00	UC 076.1-092-09.52 EVDE
95.00	76.70	7.40	9.00	UC 076.7-095-07.4 EVDE
95.50	76.20	12.70	14.30	UC 076.2-95.5-12.7 EVDE
99.00	86.30	9.52	11.00	UC 086.3-099-09.52 EVDE
101.60	82.55	12.70	14.30	UC 082.55-101.6-12.7 EVDE
102.00	89.30	9.52	11.00	UC 089.3-102-09.52 EVDE
105.00	89.10	7.93	9.50	UC 089.1-105-07.93 EVDE
107.95	88.90	12.70	14.30	UC 088.9-107.95-12.7 EVDE
108.00	95.30	7.93	9.50	UC 095.3-108-07.93 EVDE
111.00	94.70	7.93	9.50	UC 094.7-111-07.93 EVDE
115.00	89.60	15.90	19.00	UC 089.6-115-15.9 EVDE
118.00	105.30	9.52	11.00	UC 105.3-118-09.52 EVDE
120.65	95.25	15.87	17.45	UC 095.25-120.65-15.87 EVDE
121.00	108.30	9.52	11.00	UC 108.3-121-09.52 EVDE
124.00	111.30	9.52	11.00	UC 111.3-124-09.52 EVDE
127.00	101.60	15.87	17.45	UC 101.6-127-15.87 EVDE
127.00	108.00	9.52	11.00	UC 108-127-09.52 EVDE
130.00	117.30	9.52	11.00	UC 117.3-130-09.52 EVDE
133.35	107.95	15.87	17.45	UC 107.95-133.35-15.87 EVDE
134.00	121.30	9.52	11.00	UC 121.3-134-09.52 EVDE




Piston - EVDE

(Imperial Size)

Bore Dia.	Groove Dia.	Seal Hight	Groove Width	Reference (For order processing)
D	d	H	L	
137.00	124.30	9.52	11.00	UC 124.3-137-09.52 EVDE
139.70	114.30	15.87	17.45	UC 114.3-139.7-15.87 EVDE
140.00	127.30	9.52	11.00	UC 127.3-140-09.52 EVDE
143.00	130.30	9.52	11.00	UC 130.3-143-09.52 EVDE
146.00	120.60	15.90	19.00	UC 120.6-146-15.9 EVDE
149.00	136.30	9.52	11.00	UC 136.3-149-09.52 EVDE
153.00	127.60	15.90	19.00	UC 127.6-153-15.9 EVDE
159.00	133.60	15.90	19.00	UC 133.6-159-15.9 EVDE
165.00	139.60	15.90	19.00	UC 139.6-165-15.9 EVDE
171.45	146.05	15.87	17.45	UC 146.05-171.45-15.87 EVDE
172.00	153.00	11.10	12.50	UC 153-172-11.1 EVDE
178.00	152.60	15.90	19.00	UC 152.6-178-15.9 EVDE
184.00	165.00	11.11	12.50	UC 165-184-11.11 EVDE
184.15	152.40	19.05	20.62	UC 152.4-184.15-19.05 EVDE
191.00	159.30	19.00	22.00	UC 159.3-191-19 EVDE
197.00	165.30	19.00	22.00	UC 165.3-197-19 EVDE
204.00	172.30	19.00	22.00	UC 172.3-204-19 EVDE
210.00	178.30	19.00	22.00	UC 178.3-210-19 EVDE
216.00	184.30	19.00	22.00	UC 184.3-216-19 EVDE
222.25	190.50	19.05	20.62	UC 190.5-222.25-19.05 EVDE
223.00	201.30	12.70	14.50	UC 201.3-223-12.7 EVDE
228.60	196.85	19.05	20.62	UC 196.85-228.6-19.05 EVDE
229.00	210.00	12.70	14.50	UC 210-229-12.7 EVDE
235.00	203.30	19.00	22.00	UC 203.3-235-19 EVDE
242.00	210.30	19.00	22.00	UC 210.3-242-19 EVDE
248.00	216.30	19.00	22.00	UC 216.3-248-19 EVDE
254.00	222.25	19.05	20.62	UC 222.25-254-19.05 EVDE
254.00	235.00	12.70	14.50	UC 235-254-12.7 EVDE
261.00	229.30	19.00	22.00	UC 229.3-261-19 EVDE
266.70	234.95	19.05	20.62	UC 234.95-266.7-19.05 EVDE
267.00	248.00	12.70	14.50	UC 248-267-12.7 EVDE
274.00	242.30	19.00	22.00	UC 242.3-274-19 EVDE
280.00	248.30	19.00	22.00	UC 248.3-280-19 EVDE
286.00	254.30	19.00	22.00	UC 254.3-286-19 EVDE
292.00	260.30	19.00	22.00	UC 260.3-292-19 EVDE
299.00	267.30	19.00	22.00	UC 267.3-299-19 EVDE
304.80	273.05	19.05	20.62	UC 273.05-304.8-19.05 EVDE
305.00	279.60	12.70	14.00	UC 279.6-305-12.7 EVDE
330.00	311.00	12.70	14.50	UC 311-330-12.7 EVDE
343.00	323.00	12.70	14.50	UC 323-343-12.7 EVDE
356.00	335.50	12.70	14.50	UC 335.5-356-12.7 EVDE

Rod Seals Profiles

Rod Seals

Design	Ref.	Material	Pressure (BAR)	Temp. (°C)	Speed (m/s)	Dim mm. inch	Page
	PNY	NBR	10	-20 +80	1	•	44
	EVDI	NBR	120	-30 +100	0.25	•	46
	PKS	NBR	16	-40 +80	1	•	50



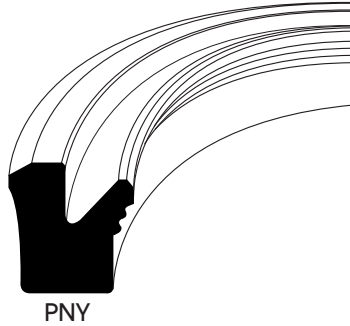
**CSPEC
SEAL**

Seals & O-rings Specialist

Rod Seals

PNY

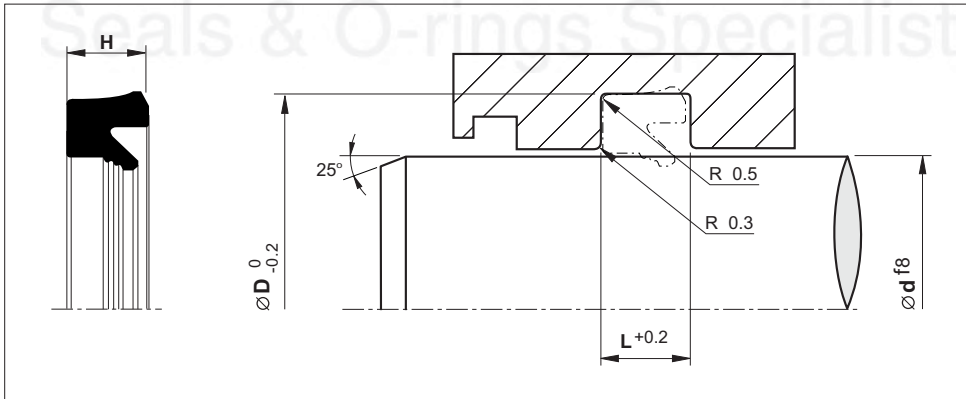
(Metric Size)



Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	10	-25 +80	1

- Non lubrication required.
- Exclusively for rod.
- High wear resistance.
- Low friction.

Installation Recommendation



Surface roughness	Ra	Rt
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Sliding surface	≤ 0.3 μm	≤ 4 μm
Surface of housing	≤ 1.8 μm	≤ 10 μm
Sides of housing	≤ 3.0 μm	≤ 16 μm

Rod Seals - PNY



(Metric Size)

Rod Dia.	Groove Dia.	Seal Hight	Groove Width	Reference (For order processing)
d	D	H	G	
16.0	24.0	5.2	5.7	PNY-016
18.0	26.0	5.2	5.7	PNY-018
20.0	28.0	5.2	5.7	PNY-020
22.0	30.0	5.2	5.7	PNY-022
22.4	30.0	5.2	5.7	PNY-022.4
25.0	33.0	5.2	5.7	PNY-025
28.0	36.0	5.2	5.7	PNY-028
30.0	40.0	6.5	7.0	PNY-030
32.0	42.0	6.5	7.0	PNY-032
35.0	45.0	6.5	7.0	PNY-035
35.5	45.5	6.5	7.0	PNY-035.5
36.0	46.0	6.5	7.0	PNY-036
40.0	50.0	6.5	7.0	PNY-040
45.0	55.0	6.5	7.0	PNY-045
50.0	60.0	6.5	7.0	PNY-050
55.0	65.0	6.5	7.0	PNY-055
60.0	70.0	6.5	7.0	PNY-060
63.0	73.0	6.5	7.0	PNY-063
70.0	80.0	6.5	7.0	PNY-070

Seals & O-rings Specialist

Rod Seals

EVDI

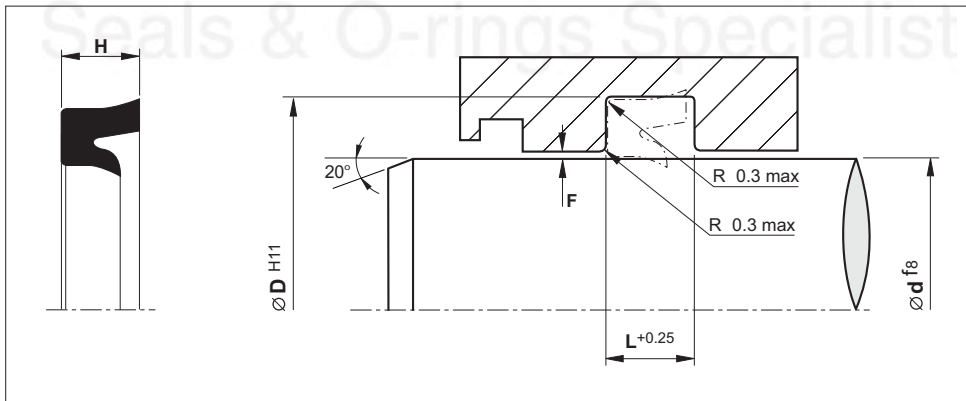
(Imperial Size)



Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	120	-30 +100	0.25

- Extremely low friction.
- Easy installation.
- Exclusively for rod.
- Long service life.

Installation Recommendation



Surface roughness	Ra	Rt	CLEARANCE	
			Pressure : Bar	F max
Sliding surface	≤ 0.3 µm	≤ 4 µm	25	1.0
Surface of housing	≤ 1.8 µm	≤ 10 µm	50	0.8
Sides of housing	≤ 3.0 µm	≤ 16 µm	100	0.6

Rod Seals - EVDI



(Imperial Size)

Rod Dia.	Groove Dia.	Seal Hight	Groove Width	Reference (For order processing)
d	D	H	L	
3.17	8.75	3.96	5.5	UC 003.17-008.75-03.96 EVDI
4.76	11.11	3.96	5.5	UC 004.76-011.11-03.96 EVDI
6.35	12.70	3.96	5.5	UC 006.35-012.7-03.96 EVDI
7.93	14.28	3.96	5.5	UC 007.93-014.28-03.96 EVDI
9.52	16.50	3.96	5.5	UC 009.52-016.5-03.96 EVDI
11.11	19.05	3.96	5.5	UC 011.11-019.05-03.96 EVDI
12.70	21.00	5.10	7.0	UC 012.7-021-05.1 EVDI
14.28	20.63	4.76	6.0	UC 014.28-020.63-04.76 EVDI
15.87	22.22	4.76	6.0	UC 015.87-022.22-04.76 EVDI
17.46	23.81	4.60	6.0	UC 017.46-023.81-04.6 EVDI
19.08	25.40	4.76	6.0	UC 019.08-025.4-04.76 EVDI
20.63	28.58	4.76	6.0	UC 020.63-028.58-04.76 EVDI
22.22	31.75	4.76	6.0	UC 022.22-031.75-04.76 EVDI
23.81	36.51	6.35	8.0	UC 023.81-036.51-06.35 EVDI
25.40	38.10	6.35	8.0	UC 025.4-038.1-06.35 EVDI
26.99	36.51	6.35	8.0	UC 026.99-036.51-06.35 EVDI
28.58	41.28	7.93	9.5	UC 028.58-041.28-07.93 EVDI
30.16	38.10	6.35	8.0	UC 030.16-038.1-06.35 EVDI
31.75	44.45	6.35	8.0	UC 031.75-044.45-06.35 EVDI
33.34	40.63	4.60	6.0	UC 033.34-040.63-04.6 EVDI
34.93	50.80	7.93	9.5	UC 034.93-050.8-07.93 EVDI
36.51	50.80	7.93	9.5	UC 036.51-050.8-07.93 EVDI
38.10	50.80	9.52	11.0	UC 038.1-050.8-09.52 EVDI
39.69	55.96	9.52	11.0	UC 039.69-055.96-09.52 EVDI
41.28	50.80	5.55	7.0	UC 041.28-050.8-05.55 EVDI
42.86	53.98	9.52	11.0	UC 042.86-053.98-09.52 EVDI
44.45	57.15	7.93	9.5	UC 044.45-057.15-07.93 EVDI
46.04	60.33	9.52	11.0	UC 046.04-060.33-09.52 EVDI
47.63	63.50	9.52	11.0	UC 047.63-063.5-09.52 EVDI
49.21	66.68	9.52	11.0	UC 049.21-066.68-09.52 EVDI
50.80	73.03	11.11	12.5	UC 050.80-073.03-11.11 EVDI
53.98	69.85	9.52	11.0	UC 053.98-069.85-09.52 EVDI
57.15	69.85	7.93	9.5	UC 057.15-069.85-07.93 EVDI
60.33	76.20	7.93	9.5	UC 060.33-076.2-07.93 EVDI
63.50	76.20	7.93	9.5	UC 063.5-076.2-07.93 EVDI
66.68	79.38	9.52	11.0	UC 066.68-079.38-09.52 EVDI
69.85	90.90	9.52	11.0	UC 069.85-090.9-09.52 EVDI
73.03	82.55	9.52	11.0	UC 073.03-082.55-09.52 EVDI
76.20	88.90	9.52	11.0	UC 076.2-088.9-09.52 EVDI
79.38	98.43	9.52	11.0	UC 079.38-098.43-09.52 EVDI

(Imperial Size)

Rod Dia.	Groove Dia.	Seal Hight	Groove Width	Reference (For order processing)
d	D	H	L	
82.55	95.25	7.93	9.5	UC 082.55-095.25-07.93 EVDI
85.73	98.43	9.52	11.0	UC 085.73-098.43-09.52 EVDI
88.90	101.60	9.52	11.0	UC 088.9-101.6-09.52 EVDI
92.08	106.40	7.93	9.5	UC 092.08-106.4-07.93 EVDI
95.25	111.10	9.52	11.0	UC 095.25-111.1-09.52 EVDI
98.43	107.95	9.52	11.0	UC 098.43-107.95-09.52 EVDI
101.60	111.10	5.75	7.0	UC 101.6-111.1-05.75 EVDI
107.95	127.00	9.52	11.0	UC 107.95-127-09.52 EVDI
114.30	146.05	12.70	14.0	UC 114.3-146.05-12.7 EVDI
120.65	136.50	7.14	8.5	UC 120.65-136.5-07.14 EVDI
127.00	146.05	12.70	14.0	UC 127-146.05-12.7 EVDI
133.35	152.40	12.70	14.0	UC 133.35-152.4-12.7 EVDI
139.70	157.52	7.14	8.5	UC 139.7-157.52-07.14 EVDI
146.05	165.10	12.70	14.0	UC 146.05-165.1-12.7 EVDI
152.40	171.45	9.52	11.0	UC 152.4-171.45-09.52 EVDI
158.80	177.80	12.70	14.0	UC 158.8-177.8-12.7 EVDI
165.10	184.15	12.70	14.0	UC 165.1-184.15-12.7 EVDI
171.45	190.50	12.70	14.0	UC 171.45-190.5-12.7 EVDI
177.80	190.50	7.14	8.5	UC 177.8-190.5-07.14 EVDI
184.15	203.20	9.52	11.0	UC 184.15-203.2-09.52 EVDI
190.50	209.55	12.70	14.0	UC 190.5-209.55-12.7 EVDI
196.90	215.90	12.70	14.0	UC 196.9-215.9-12.7 EVDI
203.20	222.30	12.70	14.0	UC 203.2-222.3-12.7 EVDI
209.55	228.60	12.70	14.0	UC 209.55-228.6-12.7 EVDI
215.90	235.00	12.70	14.0	UC 215.9-235-12.7 EVDI
222.30	241.30	9.52	11.0	UC 222.3-241.3-09.52 EVDI
228.60	247.70	12.70	14.0	UC 228.6-247.7-12.7 EVDI

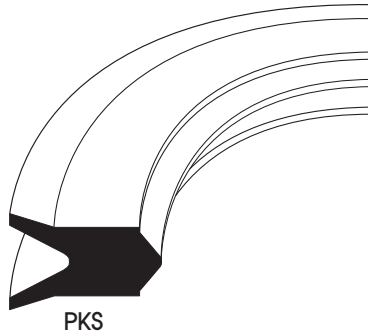


Seals & O-rings Specialist

Rod Seals

PKS

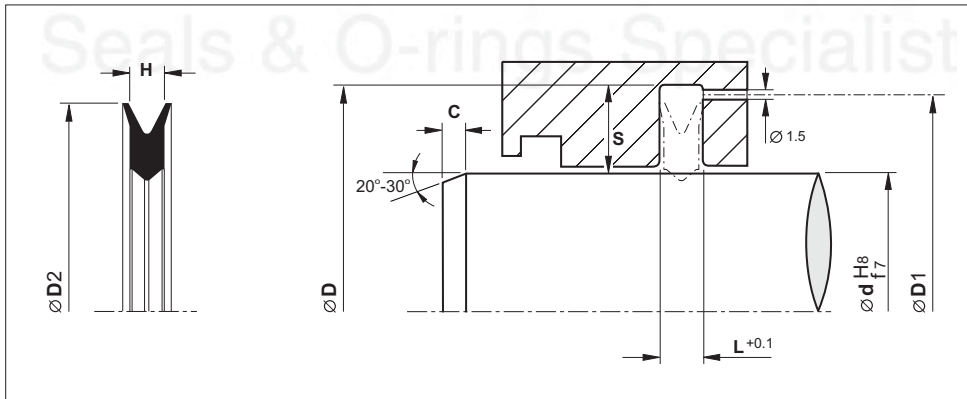
(Metric Size)



Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	16	-40 +80	1

- Rod seal for pneumatic systems.
- Low friction
- Easy installation.
- Long service life.

Installation Recommendation



Surface roughness	Ra	Rt	Chamfers	
Sliding surface	≤ 0.3 µm	≤ 4 µm	S	C
Surface of housing	≤ 1.8 µm	≤ 10 µm	4.0	2.0
Sides of housing	≤ 3.0 µm	≤ 16 µm	5.0	2.5
			7.5	4.0
			10.0	5.0
			12.5	6.5
			15.0	7.5
			20.0	10.0

Rod Seals - PKS





(Metric Size)

Rod Dia. d	Dimensions		Groove Width L	Seal Height H	Seal Dia. D2	Reference	Reference (For order processing)
	D	D1					
16	24	22.3	1.8	1.5	21.4	2-9478	PKS-016
16	27	25.4	2.3	2.0	25.0	2-9472	PKS-016A
20	30	28.4	2.3	2.0	27.6	2-9479	PKS-020
30	41	39.5	2.3	2.0	39.0	2-11762	PKS-030
36	48	46.4	3.0	2.5	46.0	2-11763	PKS-036
45	59	57.4	3.0	2.5	57.0	2-11764	PKS-045
60	77	75.4	3.5	3.0	74.0	2-11240	PKS-060
90	110	108.4	4.1	3.5	106.6	2-11241	PKS-090



Piston & Rod Seals Profiles

Piston & Rod Seals

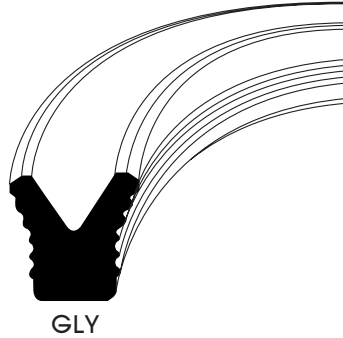
Design	Ref.	Material	Pressure (BAR)	Temp. (°C)	Speed (m/s)	Dim mm. inch	Page
	GLY	NBR	10	-25 +70	1	•	54
	MYA	NBR	8	-25 +70	0.4	•	58
	EVUM	NBR	120	-30 +110	0.25	•	60
	8400	NBR	50	-20 +80	1	•	64



Piston & Rod Seals

GLY

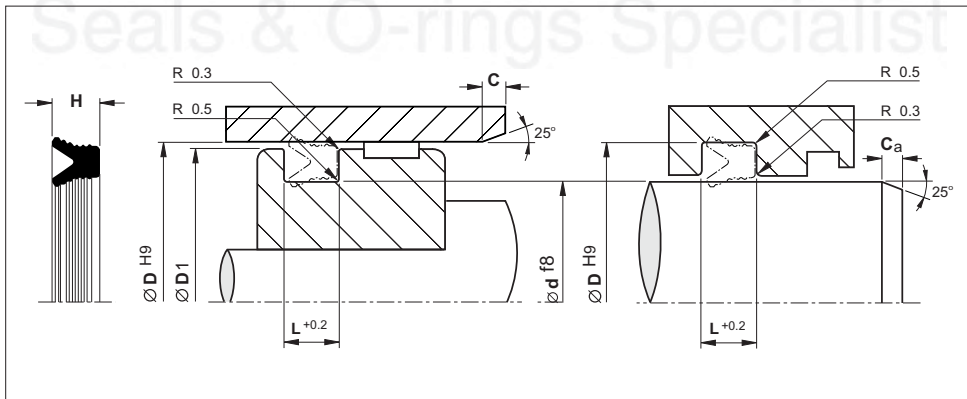
(Metric Size)



Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
NBR	10	-25 +70	1

- Applicable for both pistons and rods.
- Exclusively for non lubrication cylinders.
- Easy to installed.
- Economical solution

Installation Recommendation



Surface roughness

Ra

Rt

Sliding surface

≤ 0.3 μm

≤ 4 μm

Surface of housing

≤ 1.8 μm

≤ 10 μm

Sides of housing

≤ 3.0 μm

≤ 16 μm

Piston & Rod Seals - GLY



(Metric Size)

Rod/ Groove Dia.	Bore/ Groove Dia.	Seal Height	Groove Width	Dimensions			Reference (For order processing)
				d	D	H		L	D1	C	Ca
10.0	18.0	5.0	5.7	17.1	3.0	1.5	GLY-010
12.0	20.0	5.0	5.7	19.1	3.0	1.5	GLY-012
14.0	22.0	5.0	5.7	21.1	3.0	1.5	GLY-014
16.0	24.0	5.0	5.7	23.1	3.0	1.5	GLY-016
17.0	25.0	5.0	5.7	24.1	3.0	1.5	GLY-017
18.0	26.0	5.0	5.7	25.1	3.0	1.5	GLY-018
20.0	28.0	5.0	5.7	27.1	3.0	1.5	GLY-020
22.4	30.0	5.0	5.7	29.1	3.0	1.5	GLY-022.4
25.0	33.0	5.0	5.7	32.1	3.0	1.5	GLY-025
27.0	35.0	5.0	5.7	34.1	3.0	1.5	GLY-027
28.0	36.0	5.0	5.7	35.1	3.0	1.5	GLY-028
30.0	40.0	6.0	7.0	39.0	3.0	3.0	GLY-030
31.5	41.5	6.0	7.0	40.5	3.0	3.0	GLY-031.5
32.0	42.0	6.0	7.0	41.0	3.0	3.0	GLY-032
35.0	45.0	6.0	7.0	44.0	3.0	3.0	GLY-035
35.5	45.5	6.0	7.0	44.5	3.0	3.0	GLY-035.5
36.0	46.0	6.0	7.0	45.0	3.0	3.0	GLY-036
40.0	50.0	6.0	7.0	49.0	3.0	3.0	GLY-040
45.0	55.0	6.0	7.0	54.0	3.0	3.0	GLY-045
50.0	60.0	6.0	7.0	59.0	3.0	3.0	GLY-050
53.0	63.0	6.0	7.0	62.0	3.0	3.0	GLY-053
55.0	65.0	6.0	7.0	64.0	3.0	3.0	GLY-055
60.0	70.0	6.0	7.0	69.0	3.0	3.0	GLY-060
63.0	73.0	6.0	7.0	72.0	3.0	3.0	GLY-063
65.0	75.0	6.0	7.0	74.0	3.0	3.0	GLY-065
70.0	80.0	6.0	7.0	79.0	3.0	3.0	GLY-070
75.0	85.0	6.0	7.0	84.0	3.0	3.0	GLY-075
80.0	90.0	6.0	7.0	89.0	3.0	3.0	GLY-080
85.0	100.0	9.0	10.0	98.5	4.0	4.0	GLY-085
95.0	110.0	9.0	10.0	108.5	4.0	4.0	GLY-095
100.0	115.0	9.0	10.0	113.5	4.0	4.0	GLY-100
105.0	120.0	9.0	10.0	118.5	4.0	4.0	GLY-105
110.0	125.0	9.0	10.0	123.5	4.0	4.0	GLY-110
115.0	130.0	9.0	10.0	128.5	4.0	4.0	GLY-115
125.0	140.0	9.0	10.0	138.5	4.0	4.0	GLY-125
135.0	150.0	9.0	10.0	148.5	4.0	4.0	GLY-135
145.0	160.0	9.0	10.0	158.5	4.0	4.0	GLY-145
160.0	175.0	9.0	10.0	173.5	4.0	4.0	GLY-160
165.0	180.0	9.0	10.0	178.5	4.0	4.0	GLY-165
175.0	190.0	9.0	10.0	188.5	4.0	4.0	GLY-175

(Metric Size)

Rod/ Groove Dia.	Bore/ Groove Dia.	Seal Hight	Groove Width	Dimensions			Reference (For order processing)
				d	D	H		L	D1	C	Ca
180.0	200.0	12.0	13.0	198.0	5.0	5.0	GLY-180
185.0	205.0	12.0	13.0	203.0	5.0	5.0	GLY-185
200.0	220.0	12.0	13.0	218.0	5.0	5.0	GLY-200
215.0	235.0	12.0	13.0	233.0	5.0	5.0	GLY-215
230.0	250.0	12.0	13.0	248.0	5.0	5.0	GLY-230
240.0	260.0	12.0	13.0	258.0	5.0	5.0	GLY-240

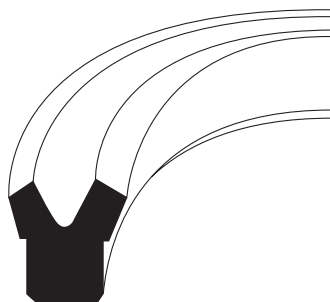


Seals & O-rings Specialist

Piston & Rod Seals

MYA

(Metric Size)

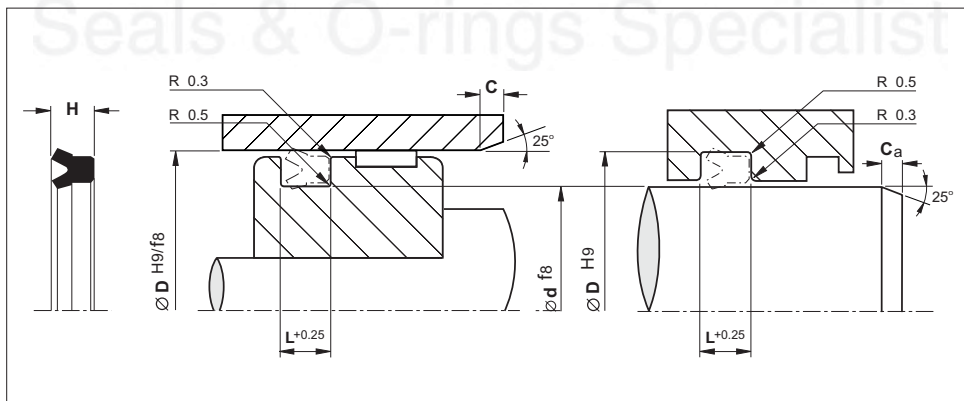


MYA

Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
NBR	8	-25 +70	0.4

- Small cross section.
- Applicable for solinoid valves.
- Compatible with the groove of O-Ring of JIS B2401-P-series.
- Low price.

Installation Recommendation



Surface roughness

Ra

Rt

Sliding surface

≤ 0.3 μm

≤ 4 μm

Surface of housing

≤ 1.8 μm

≤ 10 μm

Sides of housing

≤ 3.0 μm

≤ 16 μm

Piston & Rod Seals - MYA



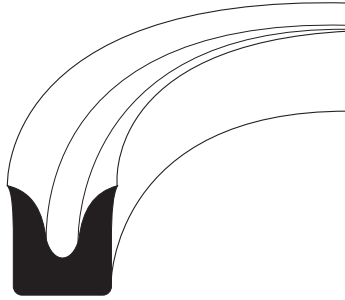
(Metric Size)

Rod/ Groove Dia.	Bore/ Groove Dia.	Seal Hight	Groove Width	Dimensions		Reference (For order processing)
				C	Ca	
3.0	6.0	2.1	2.5	2.0	1.5	MYA-003
4.0	7.0	2.1	2.5	2.0	1.5	MYA-004
5.0	8.0	2.1	2.5	2.0	1.5	MYA-005
6.0	9.0	2.1	2.5	2.0	1.5	MYA-006
7.0	10.0	2.1	2.5	2.0	1.5	MYA-007
8.0	11.0	2.1	2.5	2.0	1.5	MYA-008
9.0	12.0	2.1	2.5	2.0	1.5	MYA-009
10.0	13.0	2.1	2.5	2.0	1.5	MYA-010
10.0	14.0	2.8	3.2	2.5	2.0	MYA-010A
11.0	15.0	2.8	3.2	2.5	2.0	MYA-011
11.2	15.2	2.8	3.2	2.5	2.0	MYA-011.2
12.0	16.0	2.8	3.2	2.5	2.0	MYA-012
12.5	16.5	2.8	3.2	2.5	2.0	MYA-012.5
14.0	18.0	2.8	3.2	2.5	2.0	MYA-014
15.0	19.0	2.8	3.2	2.5	2.0	MYA-015
16.0	20.0	2.8	3.2	2.5	2.0	MYA-016
18.0	22.0	2.8	3.2	2.5	2.0	MYA-018
20.0	24.0	2.8	3.2	2.5	2.0	MYA-020
21.0	25.0	2.8	3.2	2.5	2.0	MYA-021
22.0	26.0	2.8	3.2	2.5	2.0	MYA-022
24.0	30.0	4.2	4.7	3.0	3.0	MYA-024
34.0	40.0	4.2	4.7	3.0	3.0	MYA-034

Piston & Rod Seals

EVUM

(Metric Size)

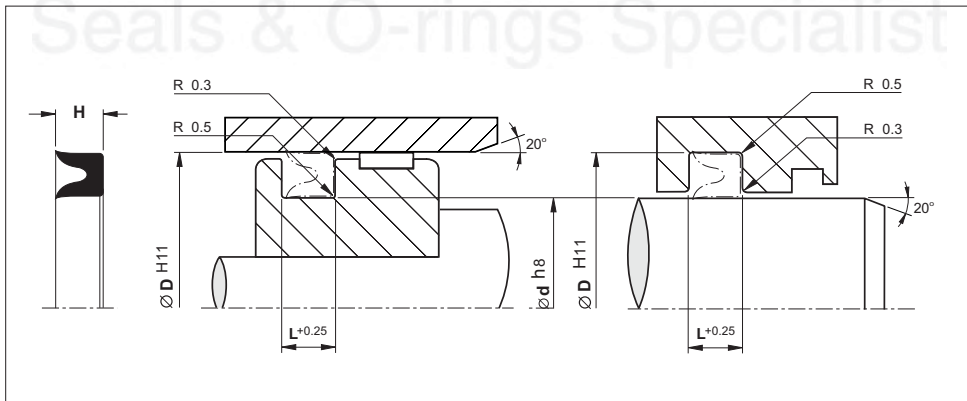


EVUM

Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	120	-30 +110	0.25

- Good for low pressure.
- Simple groove design.
- Excellent wear resistance.

Installation Recommendation



Surface roughness

Ra

Rt

Sliding surface

≤ 0.3 µm

≤ 4 µm

Surface of housing

≤ 1.8 µm

≤ 10 µm

Sides of housing

≤ 3.0 µm

≤ 16 µm

Piston & Rod Seals - EVUM



(Metric Size)

Rod/ Groove Dia.	Bore/ Groove Dia.	Seal Height	Groove Width	Reference (For order processing)
d	D	H	L	
5.0	12.0	5.0	6.5	UC 005-012-05 EVUM
6.0	17.0	6.0	7.5	UC 006-017-06 EVUM
6.0	18.0	8.0	9.5	UC 006-018-08 EVUM
6.0	20.0	8.0	9.5	UC 006-020-08 EVUM
8.0	15.0	6.0	7.5	UC 008-015-06 EVUM
8.0	16.0	6.0	7.5	UC 008-016-06 EVUM
8.0	25.0	6.0	7.5	UC 008-025-06 EVUM
10.0	20.0	8.0	9.5	UC 010-020-08 EVUM
10.0	22.0	6.0	7.5	UC 010-022-06 EVUM
10.0	25.0	10.0	11.5	UC 010-025-10 EVUM
10.0	26.0	8.0	9.5	UC 010-026-08 EVUM
10.0	30.0	10.0	11.5	UC 010-030-10 EVUM
12.0	24.0	6.0	7.5	UC 012-024-06 EVUM
12.0	28.0	10.0	11.5	UC 012-028-10 EVUM
12.0	35.0	12.0	13.5	UC 012-035-12 EVUM
13.0	30.0	10.0	11.5	UC 013-030-10 EVUM
14.0	28.0	10.0	11.5	UC 014-028-10 EVUM
14.0	32.0	10.0	11.5	UC 014-032-10 EVUM
15.0	30.0	8.0	9.5	UC 015-030-08 EVUM
15.0	30.0	10.0	11.5	UC 015-030-10 EVUM
15.0	35.0	10.0	11.5	UC 015-035-10 EVUM
16.0	32.0	8.0	9.5	UC 016-032-08 EVUM
16.0	36.0	10.0	11.5	UC 016-036-10 EVUM
17.0	38.0	10.0	11.5	UC 017-038-10 EVUM
18.0	30.0	10.0	11.5	UC 018-030-10 EVUM
18.0	34.0	8.0	9.5	UC 018-034-08 EVUM
18.0	38.0	10.0	11.5	UC 018-038-10 EVUM
18.0	40.0	10.0	11.5	UC 018-040-10 EVUM
20.0	35.0	10.0	11.5	UC 020-035-10 EVUM
20.0	36.0	8.0	9.5	UC 020-036-08 EVUM
20.0	40.0	10.0	11.5	UC 020-040-10 EVUM
20.0	43.0	12.0	13.5	UC 020-043-12 EVUM
22.0	34.0	10.0	11.5	UC 022-034-10 EVUM
22.0	38.0	10.0	11.5	UC 022-038-10 EVUM
22.0	42.0	10.0	11.5	UC 022-042-10 EVUM
25.0	42.0	8.0	9.5	UC 025-042-08 EVUM
25.0	40.0	10.0	11.5	UC 025-040-10 EVUM
25.0	45.0	10.0	11.5	UC 025-045-10 EVUM
25.0	50.0	12.0	13.5	UC 025-050-12 EVUM
26.0	46.0	10.0	11.5	UC 026-046-10 EVUM

(Metric Size)

Rod/ Groove Dia.	Bore/ Groove Dia.	Seal Height	Groove Width	Reference (For order processing)
d	D	H	L	
28.0	48.0	10.0	11.5	UC 028-048-10 EVUM
30.0	45.0	10.0	11.5	UC 030-045-10 EVUM
30.0	50.0	10.0	11.5	UC 030-050-10 EVUM
30.0	60.0	15.0	16.5	UC 030-060-15 EVUM
32.0	45.0	10.0	11.5	UC 032-045-10 EVUM
32.0	52.0	10.0	11.5	UC 032-052-10 EVUM
35.0	50.0	10.0	11.5	UC 035-050-10 EVUM
35.0	55.0	10.0	11.5	UC 035-055-10 EVUM
35.0	60.0	12.0	13.5	UC 035-060-12 EVUM
38.0	58.0	10.0	11.5	UC 038-058-10 EVUM
40.0	56.0	10.0	11.5	UC 040-056-10 EVUM
40.0	60.0	10.0	11.5	UC 040-060-10 EVUM
40.0	65.0	12.0	13.5	UC 040-065-12 EVUM
45.0	65.0	10.0	11.5	UC 045-065-10 EVUM
46.0	70.0	12.0	13.5	UC 046-070-12 EVUM
48.0	68.0	10.0	11.5	UC 048-068-10 EVUM
50.0	70.0	10.0	11.5	UC 050-070-10 EVUM
55.0	75.0	10.0	11.5	UC 055-075-10 EVUM
55.0	80.0	12.0	13.5	UC 055-080-12 EVUM
55.0	85.0	15.0	16.5	UC 055-085-15 EVUM
60.0	80.0	10.0	11.5	UC 060-080-10 EVUM
60.0	90.0	15.0	16.5	UC 060-090-15 EVUM
65.0	85.0	10.0	11.5	UC 065-085-10 EVUM
65.0	90.0	12.0	13.5	UC 065-090-12 EVUM
65.0	95.0	12.0	13.5	UC 065-095-12 EVUM
70.0	90.0	10.0	11.5	UC 070-090-10 EVUM
75.0	95.0	10.0	11.5	UC 075-095-10 EVUM
75.0	100.0	15.0	16.5	UC 075-100-15 EVUM
75.0	105.0	15.0	16.5	UC 075-105-15 EVUM
80.0	100.0	10.0	11.5	UC 080-100-10 EVUM
80.0	105.0	12.0	13.5	UC 080-105-12 EVUM
80.0	110.0	15.0	16.5	UC 080-110-15 EVUM
85.0	105.0	10.0	11.5	UC 085-105-10 EVUM
85.0	110.0	12.0	13.5	UC 085-110-12 EVUM
85.0	115.0	15.0	16.5	UC 085-115-15 EVUM
90.0	110.0	10.0	11.5	UC 090-110-10 EVUM
90.0	120.0	15.0	16.5	UC 090-120-15 EVUM
95.0	115.0	10.0	11.5	UC 095-115-10 EVUM
95.0	125.0	15.0	16.5	UC 095-125-15 EVUM
100.0	120.0	10.0	11.5	UC 100-120-10 EVUM

Piston & Rod Seals - EVUM



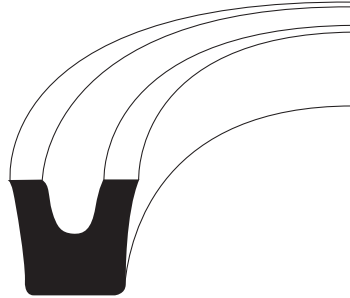
(Metric Size)

Rod/ Groove Dia.	Bore/ Groove Dia.	Seal Height	Groove Width	Reference (For order processing)
d	D	H	L	
100.0	125.0	12.0	13.5	UC 100-125-12 EVUM
100.0	130.0	15.0	16.5	UC 100-130-15 EVUM
110.0	135.0	12.0	13.5	UC 110-135-12 EVUM
110.0	140.0	15.0	16.5	UC 110-140-15 EVUM
115.0	145.0	12.0	13.5	UC 115-145-12 EVUM
120.0	140.0	10.0	11.5	UC 120-140-10 EVUM
120.0	150.0	15.0	16.5	UC 120-150-15 EVUM
125.0	155.0	15.0	16.5	UC 125-155-15 EVUM
125.0	150.0	18.0	19.5	UC 125-150-18 EVUM
130.0	160.0	15.0	16.5	UC 130-160-15 EVUM
135.0	160.0	18.0	19.5	UC 135-160-18 EVUM
140.0	170.0	15.0	16.5	UC 140-170-15 EVUM
140.0	165.0	18.0	19.5	UC 140-165-18 EVUM
145.0	175.0	15.0	16.5	UC 145-175-15 EVUM
150.0	180.0	15.0	16.5	UC 150-180-15 EVUM
160.0	190.0	15.0	16.5	UC 160-190-15 EVUM
160.0	200.0	20.0	21.5	UC 160-200-20 EVUM
170.0	200.0	15.0	16.5	UC 170-200-15 EVUM
170.0	210.0	20.0	21.5	UC 170-210-20 EVUM
180.0	210.0	22.0	23.5	UC 180-210-22 EVUM
180.0	220.0	22.0	21.5	UC 180-220-22 EVUM
190.0	220.0	15.0	16.5	UC 190-220-15 EVUM
195.0	225.0	15.0	16.5	UC 195-225-15 EVUM
200.0	230.0	15.0	16.5	UC 200-230-15 EVUM
200.0	240.0	20.0	21.5	UC 200-240-20 EVUM
210.0	250.0	20.0	21.5	UC 210-250-20 EVUM
220.0	260.0	20.0	21.5	UC 220-260-20 EVUM
230.0	270.0	20.0	21.5	UC 230-270-20 EVUM
240.0	280.0	20.0	21.5	UC 240-280-20 EVUM
250.0	290.0	20.0	21.5	UC 250-290-20 EVUM
260.0	300.0	20.0	21.5	UC 260-300-20 EVUM
280.0	320.0	20.0	21.5	UC 280-320-20 EVUM
300.0	340.0	20.0	21.5	UC 300-340-20 EVUM
310.0	350.0	20.0	21.5	UC 310-350-20 EVUM
320.0	360.0	20.0	21.5	UC 320-360-20 EVUM
320.0	350.0	22.0	23.5	UC 320-350-22 EVUM
340.0	380.0	20.0	21.5	UC 340-380-20 EVUM
350.0	400.0	25.0	26.5	UC 350-400-25 EVUM
400.0	450.0	25.0	26.5	UC 400-450-25 EVUM
450.0	500.0	25.0	26.5	UC 450-500-25 EVUM

Piston & Rod Seals

8400

(Inch Size)

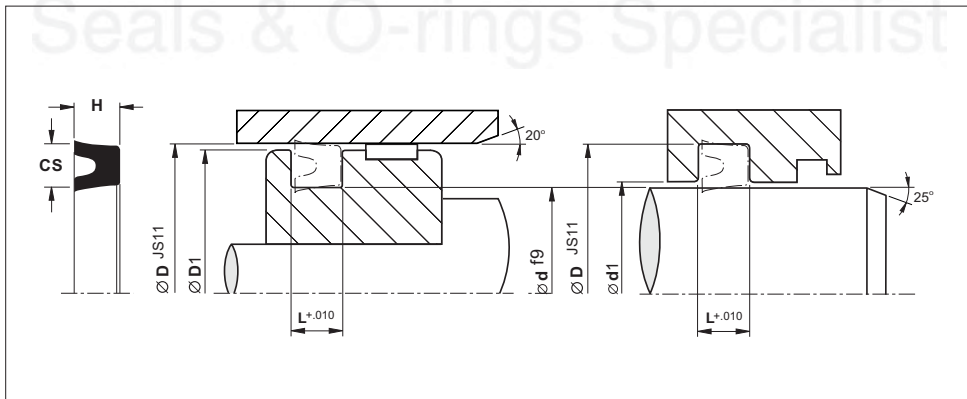


8400

Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
NBR	50	-20 +80	1

- Easy installation in simple grooves.
- Low friction.
- Used for both pistons and rods.
- Extended service life.

Installation Recommendation



Surface roughness

µin CLA

Sliding surface	4 to 16
Surface of housing	63 max
Sides of housing	125 max

Piston & Rod Seals - 8400



(Inch Size)

Nominal Seal Dimensions			Rod/ Groove Dia.	Bore/ Groove Dia.	Throat Dia.	Piston Dia.	Groove Width w/o Back up	Groove Width with Back up	Reference
ID.	OD.	CS/H	d	D	d1	D1			
1/4	1/2	1/8	.250	.500	.251	.498	.156	.219	840400250
5/16	1/2	3/32	.312	.500	.313	.498	.125	.188	840300312
5/16	9/16	1/8	.312	.562	.313	.560	.156	.219	840400312
3/8	5/8	1/8	.375	.625	.376	.623	.156	.219	840400375
1/2	3/4	1/8	.500	.750	.501	.748	.156	.219	840400500
5/8	7/8	1/8	.625	.875	.626	.873	.156	.219	840400625
3/4	1	1/8	.750	1.000	.751	.998	.156	.219	840400750
13/16	1-1/16	1/8	.812	1.062	.813	1.060	.156	.219	840400812
7/8	1-1/8	1/8	.875	1.125	.876	1.123	.156	.219	840400875
15/16	1-3/16	1/8	.938	1.188	.939	1.186	.156	.219	840400937
15/16	1-1/4	5/32	.938	1.250	.939	1.248	.188	.250	840500937
1	1-1/4	1/8	1.000	1.250	1.001	1.248	.156	.219	840401000
1	1-5/16	5/32	1.000	1.312	1.001	1.310	.188	.250	840501000
1	1-1/2	1/4	1.000	1.500	1.001	1.498	.281	.344	840801000
1-1/16	1-3/8	5/32	1.062	1.375	1.063	1.373	.188	.250	840501062
1-1/8	1-3/8	1/8	1.125	1.375	1.126	1.373	.156	.219	840401125
1-3/16	1-1/2	5/32	1.188	1.500	1.189	1.498	.188	.250	840501187
1-1/4	1-9/16	5/32	1.250	1.562	1.251	1.560	.188	.250	840501250
1-5/16	1-5/8	5/32	1.312	1.625	1.313	1.623	.188	.250	840501312
1-3/8	1-11/16	5/32	1.375	1.688	1.376	1.686	.188	.250	840501375
1-3/8	1-3/4	3/16	1.375	1.750	1.376	1.748	.219	.281	840601375
1-1/2	1-13/16	5/32	1.500	1.812	1.501	1.810	.188	.250	840501500
1-1/2	1-7/8	3/16	1.500	1.875	1.501	1.873	.219	.281	840601500
1-5/8	2	3/16	1.625	2.000	1.626	1.998	.219	.281	840601625
1-3/4	2-1/8	3/16	1.750	2.125	1.751	2.123	.219	.281	840601750
1-7/8	2-1/4	3/16	1.875	2.250	1.876	2.248	.219	.281	840601875
1-15/16	2-3/8	7/32	1.938	2.375	1.939	2.373	.250	.312	840701937
2	2-3/8	3/16	2.000	2.375	2.001	2.373	.219	.281	840602000
2-1/8	2-1/2	3/16	2.125	2.500	2.126	2.498	.219	.281	840602125
2-1/4	2-5/8	3/16	2.250	2.625	2.251	2.623	.219	.281	840602250
2-1/4	3	3/8	2.250	3.000	2.251	2.998	.406	.469	841202250
2-3/8	2-3/4	3/16	2.375	2.750	2.376	2.748	.219	.281	840602375
2-1/2	2-7/8	3/16	2.500	2.875	2.501	2.873	.219	.281	840602500
2-1/2	2-15/16	7/32	2.500	2.938	2.501	2.936	.250	.312	840702500
2-9/16	3	7/32	2.562	3.000	2.563	2.998	.250	.312	840702562
2-3/4	3-1/8	3/16	2.750	3.125	2.751	3.123	.219	.281	840602750
2-3/4	3-3/16	7/32	2.750	3.188	2.751	3.186	.250	.312	840702750
2-13/16	3-1/4	7/32	2.812	3.250	2.813	3.248	.250	.312	840702812
3	3-3/8	3/16	3.000	3.375	3.001	3.373	.219	.281	840603000
3	3-7/16	7/32	3.000	3.437	3.001	3.435	.250	.312	840703000

Piston & Rod Seals - 8400

(Inch Size)







Nominal Seal Dimensions			Rod/ Groove Dia.	Bore/ Groove Dia.	Throat Dia.	Piston Dia.	Groove Width w/o Back up	Groove Width with Back up	Reference
ID.	OD.	CS/H	d	D	d1	D1			
3-1/16	3-1/2	7/32	3.062	3.500	3.063	3.498	.250	.312	840703062
3-1/2	4	1/4	3.500	4.000	3.501	3.998	.281	.344	840803500
3-3/4	4-1/4	1/4	3.750	4.250	3.751	4.248	.281	.344	840803750
4	4-1/2	1/4	4.000	4.500	4.001	4.498	.281	.344	840804000
4-1/4	4-3/4	1/4	4.250	4.750	4.251	4.748	.281	.344	840804250
4-7/16	5	9/32	4.437	5.000	4.438	4.997	.312	.375	840904437
4-1/2	5	1/4	4.500	5.000	4.501	4.997	.281	.344	840804500
4-3/4	5-1/4	1/4	4.750	5.250	4.751	5.247	.281	.344	840804750
5	5-9/16	9/32	5.000	5.562	5.001	5.559	.312	.375	840905000
5-1/8	5-3/4	5/16	5.125	5.750	5.126	5.747	.344	.406	841005125
5-3/8	6	5/16	5.375	6.000	5.376	5.997	.344	.406	841005375
5-7/16	6	9/32	5.438	6.000	5.439	5.997	.312	.375	840905437
5-1/2	6-1/8	5/16	5.500	6.125	5.501	6.122	.344	.406	841005500
5-15/16	6-1/2	9/32	5.938	6.500	5.939	6.497	.312	.375	840905937
6	6-5/8	5/16	6.000	6.625	6.001	6.622	.344	.406	841006000
6-3/8	7	5/16	6.375	7.000	6.376	6.997	.344	.406	841006375
6-31/32	7-19/32	5/16	6.969	7.594	6.970	7.591	.344	.406	841006969
7-3/8	8	5/16	7.375	8.000	7.376	7.997	.344	.406	841007375
9-5/16	10	11/32	9.312	10.000	9.314	9.997	.375	.438	841109312
11-1/4	12	3/8	11.250	12.000	11.252	11.997	.406	.469	841211250
13	14	1/2	13.000	14.000	13.002	13.997	.531	.594	841613000
13-3/16	14	13/32	13.188	14.000	13.190	13.997	.438	.500	841313187



Seals & O-rings Specialist

Rod Seals & Wipers Profiles

Rod Seals + Wipers

Design	Ref.	Material	Pressure (BAR)	Temp. (°C)	Speed (m/s)	Dim mm. inch	Page
	PDU	NBR	10	-20 +80	1	•	68
	EU	PU	16	-35 +80	1	•	70
	E8	SFR-Polyester	16	-20 +80	1	•	72
	E9	FPM-Metal	16	-10 +150	1	•	74
	NIPSL	NBR-Metal	12	-30 +100	1	•	76
	EP	PU-Metal	16	-35 +80	1	•	78



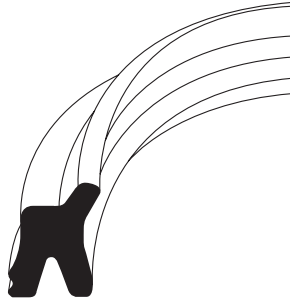
**CSPEC
SEAL**

Seals & O-rings Specialist

Rod Seals + Wiper

PDU

(Metric Size)

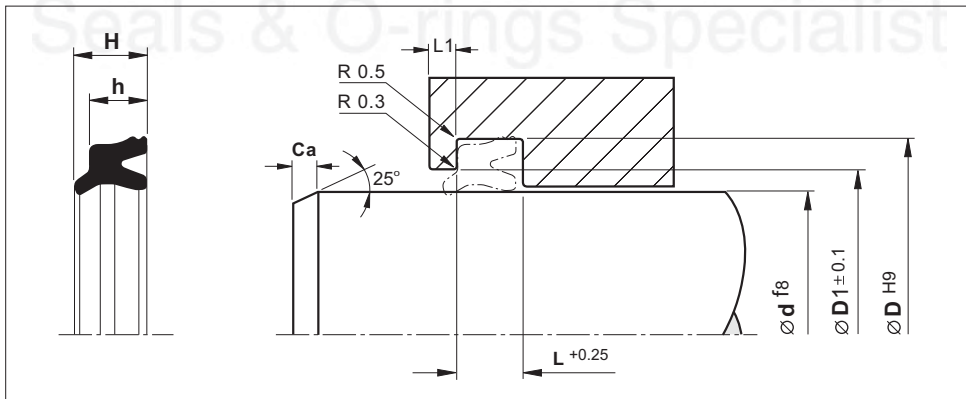


PDU

Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
NBR	10	-20 +80	1

- Function as both seal and wiper.
- Simple and economical to manufacture.
- Easy to installed.
- Long service life.

Installation Recommendation



Surface roughness

Ra

Rt

Sliding surface

≤ 0.3 µm

≤ 4 µm

Surface of housing

≤ 1.8 µm

≤ 10 µm

Sides of housing

≤ 3.0 µm

≤ 16 µm

Rod Seals & Wiper - PDU

(Metric Size)

Rod Dia.	Groove Dia.	Seal Height	Seal Step Height	Groove Width	Bore Dia.	Part Width	Chamfer Length	Reference (For order processing)
d	D	H	h	L	D1	L1	Ca	
6.0	10.0	4.4	3.0	3.5	7.6	2.0	1.5	PDU-006Z
8.0	12.0	4.9	3.5	4.0	9.6	2.0	1.5	PDU-008Z
10.0	14.0	4.9	3.5	4.0	11.6	2.0	1.5	PDU-010Z
12.0	16.0	4.9	3.5	4.0	13.6	2.0	1.5	PDU-012Z
14.0	18.0	4.9	3.5	4.0	15.6	2.0	1.5	PDU-014Z
16.0	24.0	7.5	5.5	6.0	19.4	2.0	2.0	PDU-016Z
20.0	28.0	7.5	5.5	6.0	23.4	2.0	2.0	PDU-020Z
25.0	33.0	7.5	5.5	6.0	28.4	2.0	2.0	PDU-025Z
30.0	40.0	8.5	6.5	7.0	34.0	2.0	2.5	PDU-030Z
32.0	42.0	8.5	6.5	7.0	36.0	2.0	2.5	PDU-032Z
35.0	45.0	8.5	6.5	7.0	39.0	2.0	2.5	PDU-035Z
36.0	46.0	8.5	6.5	7.0	40.0	2.0	2.5	PDU-036Z
40.0	50.0	8.5	6.5	7.0	44.0	2.0	2.5	PDU-040Z
45.0	55.0	8.5	6.5	7.0	49.0	2.0	2.5	PDU-045Z

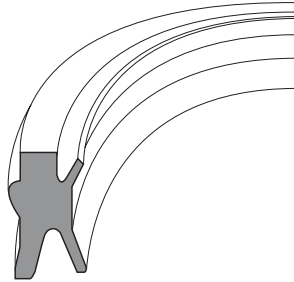


 Seals & O-rings Specialist

Rod Seals + Wiper

EU

(Metric Size)

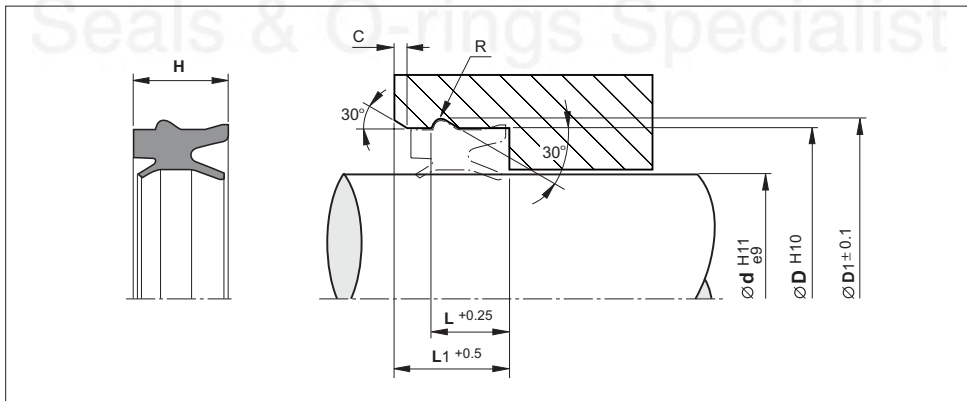


EU

Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
PU	16	-35 +80	1

- No danger of corrosion as the combined retainer/wiper.
- No dust corners thanks to the special design in the vicinity of the wiper.
- Low friction values.
- Can be used even with dry and oil free.

Installation Recommendation



Surface roughness

Ra

Rt

Sliding surface

$\leq 0.3 \mu\text{m}$

$\leq 4 \mu\text{m}$

Surface of housing

$\leq 1.8 \mu\text{m}$

$\leq 10 \mu\text{m}$

Sides of housing

$\leq 3.0 \mu\text{m}$

$\leq 16 \mu\text{m}$

Rod Seals & Wiper - EU

(Metric Size)

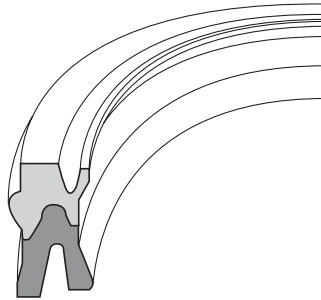
Rod Dia.	Groove Dia.	Seal Height	Dimensions					Reference (For order processing)
			D1	L	L1	R	C	
10.0	18.0	10.7	20.0	8.8	13.0	1.1	1.5	EU1018 P
12.0	19.0	10.0	21.0	7.7	12.0	1.0	1.5	EU1219 P
12.0	20.0	10.7	22.0	8.8	13.0	1.1	1.5	EU1205 P
12.0	22.0	10.7	24.0	8.8	13.0	1.1	1.5	EU1222 P
14.0	24.0	10.7	26.0	8.8	13.0	1.1	1.5	EU1424 P
16.0	26.0	10.7	28.0	8.8	13.0	1.1	1.5	EU1626 P
18.0	26.0	10.7	28.0	8.8	13.0	1.1	1.5	EU1826 P
18.0	28.0	10.7	30.0	8.8	13.0	1.1	1.5	EU1828 P
20.0	30.0	10.7	32.0	8.8	13.0	1.1	1.5	EU2029 P
22.0	32.0	11.2	34.5	9.4	14.0	1.4	2.0	EU2205 P
25.0	35.0	11.2	37.5	9.4	14.0	1.4	2.0	EU2535 P
30.0	40.0	11.2	42.5	9.4	14.0	1.4	2.0	EU3040 P
32.0	42.0	11.2	44.5	9.4	14.0	1.4	2.0	EU3242 P
40.0	50.0	11.2	52.5	9.4	14.0	1.4	2.0	EU4050 P
45.0	55.0	12.2	58.2	10.4	15.0	1.8	2.0	EU4555 P
50.0	60.0	12.2	63.2	10.4	15.0	1.8	2.0	EU5060 P
63.0	75.0	13.0	78.2	11.4	16.0	1.8	2.0	EU6375 P

Seals & O-rings Specialist

Rod Seals + Wiper

E8

(Metric Size)

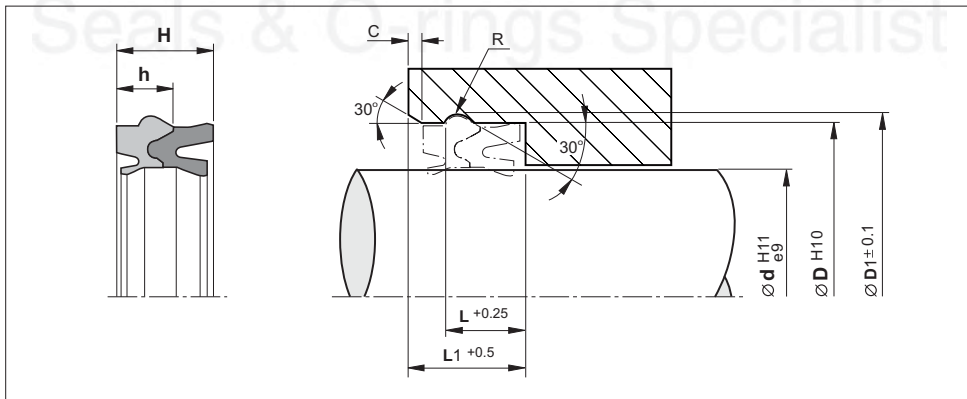


E8

Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
SFR-Polyester	16	-20 +80	1

- No danger of corrosion as the combined retainer/wiper.
- No dust corners thanks to the special design in the vicinity of the wiper.
- Favorable friction value and long service life.

Installation Recommendation



Surface roughness

Ra

Rt

Sliding surface

≤ 0.3 µm

≤ 4 µm

Surface of housing

≤ 1.8 µm

≤ 10 µm

Sides of housing

≤ 3.0 µm

≤ 16 µm

Rod Seals & Wiper - E8

(Metric Size)

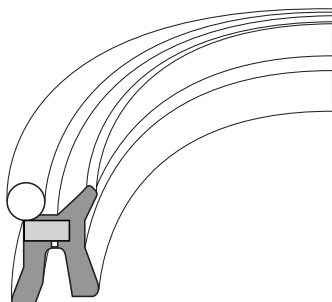
Rod Dia.	Groove Dia.	Seal Height		Dimensions					Reference (For order processing)
		H	h	D1	L	L1	R	C	
12.0	19.0	10.0	5.90	21.0	8.0	12.3	1.1	1.5	E80009 00606
12.0	20.0	10.3	5.50	22.0	8.8	13.0	1.1	1.5	E80011 00606
12.0	22.0	11.0	5.50	24.0	8.8	13.0	1.1	1.5	E80012 00606
14.0	24.0	11.0	5.50	26.0	8.8	13.0	1.1	1.5	E80014 00606
16.0	26.0	11.0	5.50	28.0	8.8	13.0	1.1	1.5	E80016 00606
18.0	26.0	11.0	5.50	28.0	8.8	13.0	1.1	1.5	E80036 00606
18.0	28.0	11.0	5.50	30.0	8.8	13.0	1.1	1.5	E80018 00606
20.0	30.0	11.0	5.50	32.0	8.8	13.0	1.1	1.5	E80020 00606
22.0	32.0	11.5	6.45	34.5	9.4	14.0	1.4	2.0	E80022 00606
25.0	35.0	11.5	6.45	37.5	9.4	14.0	1.4	2.0	E80025 00606
28.0	38.0	11.5	6.45	40.5	9.4	14.0	1.4	2.0	E80028 00606
30.0	40.0	11.5	6.45	42.5	9.4	14.0	1.4	2.0	E80030 00606
32.0	42.0	11.5	6.45	44.5	9.4	14.0	1.4	2.0	E80032 00606
35.0	45.0	11.5	6.45	47.5	9.4	14.0	1.4	2.0	E80035 00606
40.0	50.0	11.5	6.45	52.5	9.4	14.0	1.4	2.0	E80040 00606
45.0	55.0	12.5	7.45	58.2	10.4	15.0	1.8	2.0	E80045 00606
50.0	60.0	12.5	7.45	63.2	10.4	15.0	1.8	2.0	E80050 00606
63.0	75.0	13.0	7.45	78.2	11.4	16.0	1.8	2.0	E80063 00606

Seals & O-rings Specialist

Rod Seals + Wiper

E9

(Metric Size)

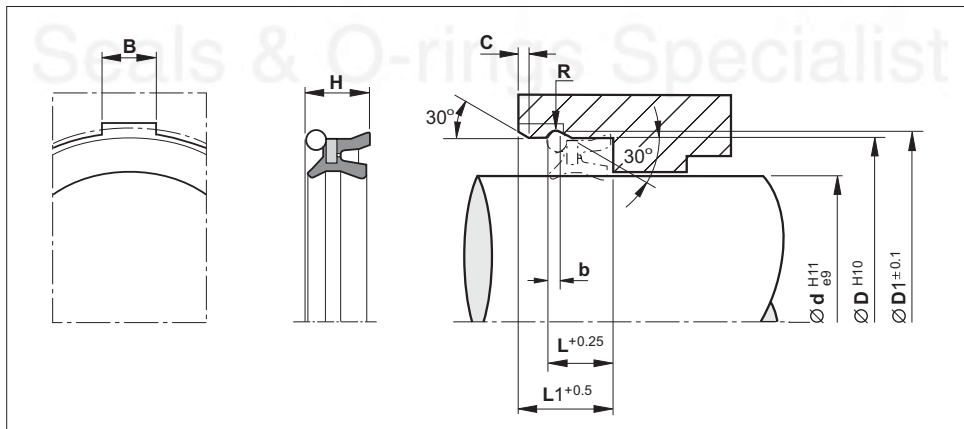


E9

Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
FPM-Metal	16	-10 +150	1

- Designed for high temperature application.
- Fitted into the housing by means of a circlip.
- Can be used even with dry and oil free.

Installation Recommendation



Surface roughness

Ra

Rt

Sliding surface

≤ 0.3 μm

≤ 4 μm

Surface of housing

≤ 1.8 μm

≤ 10 μm

Sides of housing

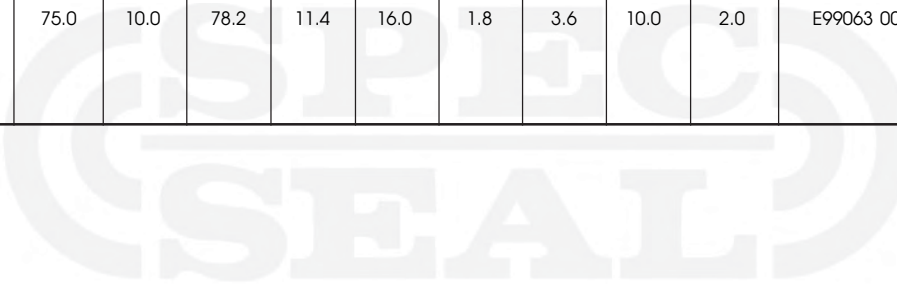
≤ 3.0 μm

≤ 16 μm

Rod Seals & Wiper - E9

(Metric Size)

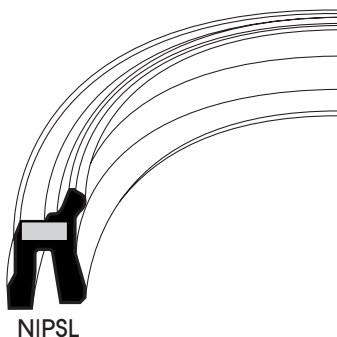
Rod Dia.	Groove Dia.	Seal Height	Dimensions							Reference (For order processing)
			d	D	H	D1	L	L1	R		b	B	C
12.0	20.0	8.5	22.0	8.8	13.0	1.1	2.2	4.0	1.5	E99011 00606
12.0	22.0	8.5	24.0	8.8	13.0	1.1	2.2	4.0	1.5	E99012 00606
16.0	26.0	8.5	28.0	8.8	13.0	1.1	2.2	5.0	1.5	E99016 00606
18.0	26.0	8.5	28.0	8.8	13.0	1.1	2.2	5.0	1.5	E99017 00606
18.0	28.0	8.5	30.0	8.8	13.0	1.1	2.2	5.0	1.5	E99018 00606
20.0	30.0	8.5	32.0	8.8	13.0	1.1	2.2	5.0	1.5	E99020 00606
22.0	32.0	8.5	34.5	9.4	14.0	1.4	2.8	7.5	2.0	E99022 00606
25.0	35.0	8.5	37.5	9.4	14.0	1.4	2.8	7.5	2.0	E99025 00606
32.0	42.0	8.5	44.5	9.4	14.0	1.4	2.8	7.5	2.0	E99032 00606
40.0	50.0	8.5	52.5	9.4	14.0	1.4	2.8	7.5	2.0	E99040 00606
50.0	60.0	8.5	63.2	10.4	15.0	1.8	3.6	10.0	2.0	E99050 00606
63.0	75.0	10.0	78.2	11.4	16.0	1.8	3.6	10.0	2.0	E99063 00606


 Seals & O-rings Specialist

Rod Seals + Wiper

NIPSL

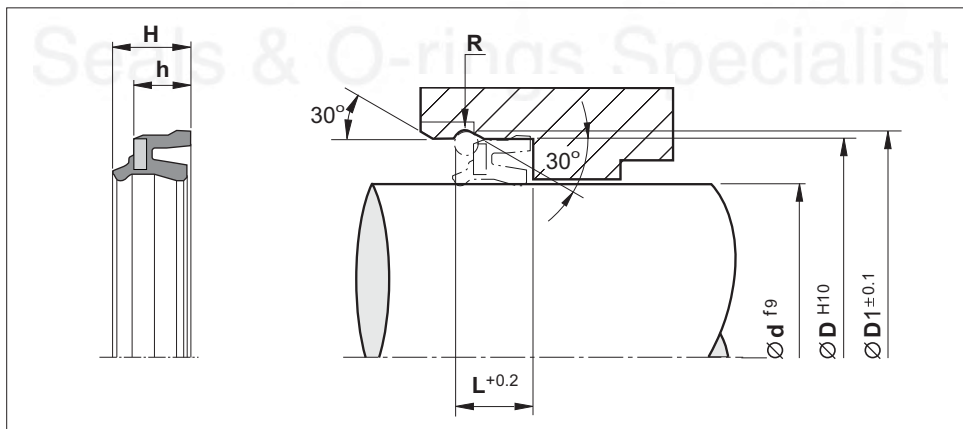
(Metric Size)



Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
NBR-Metal	12	-30 +100	1

- Simple designed as the combined seal and wiper.
- Fitted into the housing by means of a circlip.
- Can be used even with dry and oil free.

Installation Recommendation



Surface roughness

Sliding surface
Surface of housing
Sides of housing

Ra

≤ 0.3 µm
≤ 1.8 µm
≤ 3.0 µm

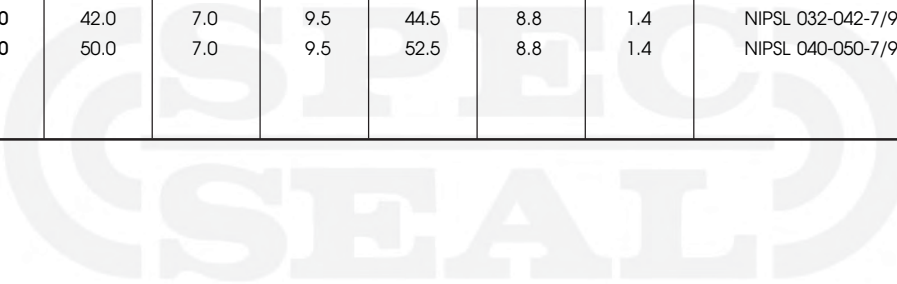
Rt

≤ 4 µm
≤ 10 µm
≤ 16 µm

Rod Seals & Wiper - NIPSL

(Metric Size)

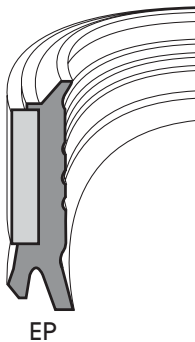
Rod Dia.	Groove Dia.	Seal Height		Dimensions			Reference (For order processing)
				D1	L	R	
8.0	16.0	7.0	9.5	18.0	8.5	1.1	NIPSL 008-016-7/9.5
10.0	20.0	7.0	9.5	22.0	8.5	1.1	NIPSL 010-020-7/9.5
12.0	20.0	6.0	8.5	22.0	7.5	1.1	NIPSL 012-020-6/8.5
12.0	22.0	7.0	9.5	24.0	8.5	1.1	NIPSL 012-022-7/9.5
14.0	24.0	7.0	9.5	26.0	8.5	1.1	NIPSL 014-024-7/9.5
16.0	26.0	7.0	9.5	28.0	8.5	1.1	NIPSL 016-026-7/9.5
18.0	28.0	7.0	9.5	30.0	8.5	1.1	NIPSL 018-028-7/9.5
20.0	30.0	7.0	9.5	32.0	8.5	1.1	NIPSL 020-030-7/9.5
22.0	32.0	7.0	9.5	34.5	8.8	1.4	NIPSL 022-032-7/9.5
25.0	35.0	7.0	9.5	37.5	8.8	1.4	NIPSL 025-035-7/9.5
30.0	40.0	7.0	9.5	42.5	8.8	1.4	NIPSL 030-040-7/9.5
32.0	42.0	7.0	9.5	44.5	8.8	1.4	NIPSL 032-042-7/9.5
40.0	50.0	7.0	9.5	52.5	8.8	1.4	NIPSL 040-050-7/9.5


 Seals & O-rings Specialist

Rod Seals + Wiper

EP

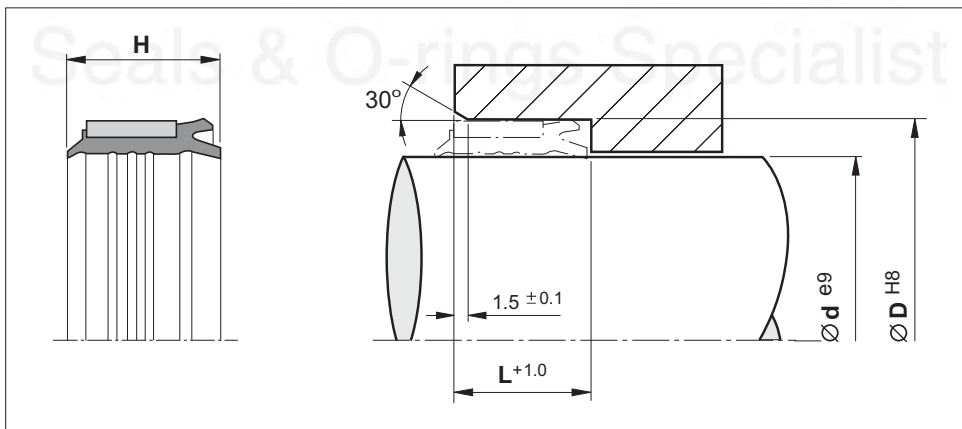
(Metric Size)



Material	Pressure (Bar)	Temp. (°c)	Speed (m/s)
PU-Metal	16	-35 +80	1

- Economical to manufacture.
- Easy installation.
- Low friction coefficients.
- Long working life.

Installation Recommendation



Surface roughness

Ra

Rt

Sliding surface

≤ 0.3 μm

≤ 4 μm

Surface of housing

≤ 1.8 μm

≤ 10 μm

Sides of housing

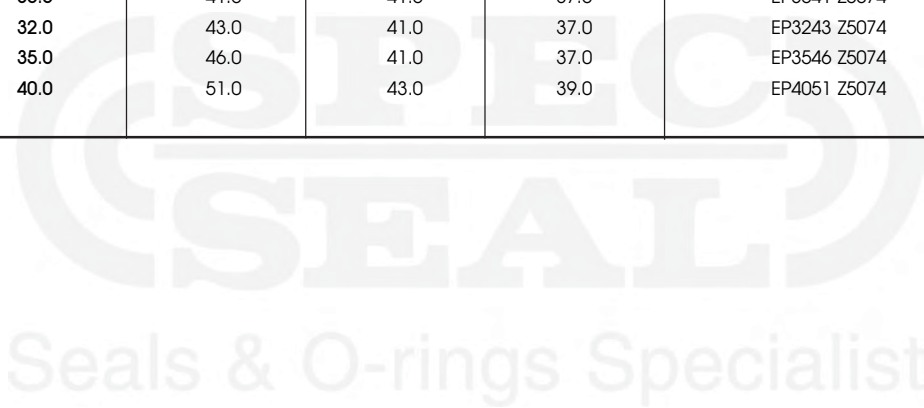
≤ 3.0 μm

≤ 16 μm

Rod Seals & Wiper - EP




(Metric Size)

Rod Dia.	Groove Dia.	Seal Height	Groove Width	Reference (For order processing)
d	D	H	L	
8.0	15.0	17.5	15.0	EP0815 Z5074
10.0	17.0	20.5	18.0	EP1017 Z5074
11.0	19.0	20.0	17.0	EP1119 Z5074
12.0	19.0	22.5	19.5	EP1219 Z5074
14.0	21.0	23.5	20.5	EP1421 Z5074
16.0	25.0	25.5	21.5	EP1625 Z5074
18.0	27.0	28.5	23.5	EP1827 Z5074
20.0	29.0	30.5	26.5	EP2029 Z5074
22.0	31.0	30.5	26.5	EP2231 Z5074
25.0	35.0	35.5	31.5	EP2535 Z5074
30.0	41.0	41.0	37.0	EP3041 Z5074
32.0	43.0	41.0	37.0	EP3243 Z5074
35.0	46.0	41.0	37.0	EP3546 Z5074
40.0	51.0	43.0	39.0	EP4051 Z5074



Wipers Profiles

Wipers

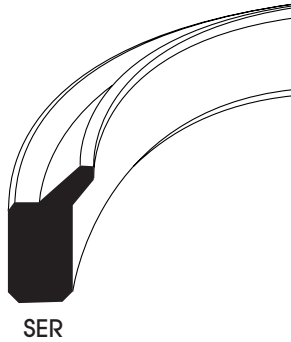
Design	Ref.	Material	Temp. (°C)	Speed (m/s)	Dim mm. inch	Page
	SER	NBR	-25 +100	0.5	•	82
	SFR	NBR	-30 +100	1	•	86
	8600	NBR	-20 +80	1	•	88



Wiper

SER

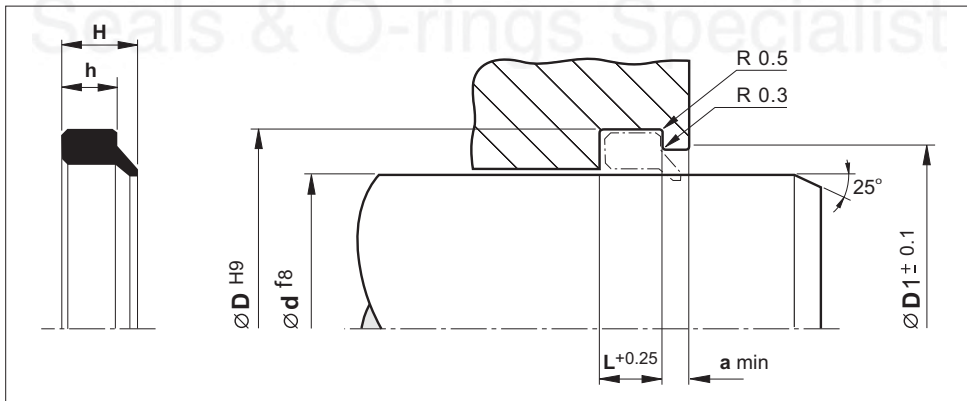
(Metric Size)



Material	Temp. (°C)	Speed (m/s)
NBR	-25 +100	0.5

- Small cross section type.
- High wear resistance.
- For small diameter cylinder placed indoor.
- Economical solution.

Installation Recommendation



Surface roughness	Ra	Rt
-------------------	----	----

Sliding surface	$\leq 0.3 \mu\text{m}$	$\leq 4 \mu\text{m}$
Surface of housing	$\leq 1.8 \mu\text{m}$	$\leq 10 \mu\text{m}$
Sides of housing	$\leq 3.0 \mu\text{m}$	$\leq 16 \mu\text{m}$

Wiper - SER

(Metric Size)

Rod Dia.	Groove Dia.	Seal Height	Seal Step Height	Groove Width	Bore Dia.	Step Width	Reference (For order processing)
d	D	H	h	L	D1	a	
3.0	6.0	2.75	2.0	2.5	4.5	1.5	SER-003
4.0	7.0	2.75	2.0	2.5	5.5	1.5	SER-004
5.0	8.0	2.75	2.0	2.5	6.5	1.5	SER-005
6.0	9.0	2.75	2.0	2.5	7.5	1.5	SER-006
7.0	10.0	2.75	2.0	2.5	8.5	1.5	SER-007
8.0	11.0	2.75	2.0	2.5	9.5	1.5	SER-008
9.0	12.0	2.75	2.0	2.5	10.5	1.5	SER-009
10.0	13.0	2.75	2.0	2.5	11.5	1.5	SER-010
10.0	14.0	3.9	2.9	3.2	12.0	1.5	SER-010A
11.2	15.2	3.9	2.9	3.2	13.2	1.5	SER-011.2
12.0	16.0	3.9	2.9	3.2	14.0	1.5	SER-012
12.5	16.5	3.9	2.9	3.2	14.5	1.5	SER-012.5
14.0	18.0	3.9	2.9	3.2	16.0	1.5	SER-014
15.0	19.0	3.9	2.9	3.2	17.0	1.5	SER-015
16.0	20.0	3.9	2.9	3.2	18.0	1.5	SER-016
18.0	22.0	3.9	2.9	3.2	20.0	1.5	SER-018
20.0	24.0	3.9	2.9	3.2	22.0	1.5	SER-020
22.0	26.0	3.9	2.9	3.2	24.0	1.5	SER-022
22.0	28.0	5.8	4.3	4.7	25.0	2.0	SER-022A
22.4	28.4	5.8	4.3	4.7	25.4	2.0	SER-022.4
24.0	30.0	5.8	4.3	4.7	27.0	2.0	SER-024
25.0	31.0	5.8	4.3	4.7	28.0	2.0	SER-025
26.0	32.0	5.8	4.3	4.7	29.0	2.0	SER-026
28.0	34.0	5.8	4.3	4.7	31.0	2.0	SER-028
30.0	36.0	5.8	4.3	4.7	33.0	2.0	SER-030
31.0	37.0	5.8	4.3	4.7	34.0	2.0	SER-031
31.5	37.5	5.8	4.3	4.7	34.5	2.0	SER-031.5
32.0	38.0	5.8	4.3	4.7	35.0	2.0	SER-032
34.0	40.0	5.8	4.3	4.7	37.0	2.0	SER-034
35.0	41.0	5.8	4.3	4.7	38.0	2.0	SER-035
35.5	41.5	5.8	4.3	4.7	38.5	2.0	SER-035.5
36.0	42.0	5.8	4.3	4.7	39.0	2.0	SER-036
38.0	44.0	5.8	4.3	4.7	41.0	2.0	SER-038
40.0	46.0	5.8	4.3	4.7	43.0	2.0	SER-040
41.0	47.0	5.8	4.3	4.7	44.0	2.0	SER-041
42.0	48.0	5.8	4.3	4.7	45.0	2.0	SER-042
44.0	50.0	5.8	4.3	4.7	47.0	2.0	SER-044
45.0	51.0	5.8	4.3	4.7	48.0	2.0	SER-045
46.0	52.0	5.8	4.3	4.7	49.0	2.0	SER-046
48.0	54.0	5.8	4.3	4.7	51.0	2.0	SER-048

Wiper - SER

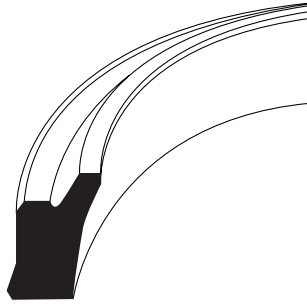
(Metric Size)

Rod Dia.	Groove Dia.	Seal Height	Seal Step Height	Groove Width	Bore Dia.	Step Width	Reference (For order processing)
d	D	H	h	L	D1	a	
48.0	58.0	9.4	6.9	7.5	53.0	3.0	SER-048A
50.0	56.0	5.8	4.3	4.7	53.0	2.0	SER-050
50.0	60.0	9.4	6.9	7.5	55.0	3.0	SER-050A
52.0	62.0	9.4	6.9	7.5	57.0	3.0	SER-052
53.0	63.0	9.4	6.9	7.5	58.0	3.0	SER-053
55.0	65.0	9.4	6.9	7.5	60.0	3.0	SER-055
56.0	66.0	9.4	6.9	7.5	61.0	3.0	SER-056
58.0	68.0	9.4	6.9	7.5	63.0	3.0	SER-058
60.0	70.0	9.4	6.9	7.5	65.0	3.0	SER-060
62.0	72.0	9.4	6.9	7.5	67.0	3.0	SER-062
63.0	73.0	9.4	6.9	7.5	68.0	3.0	SER-063
65.0	75.0	9.4	6.9	7.5	70.0	3.0	SER-065
67.0	77.0	9.4	6.9	7.5	72.0	3.0	SER-067
70.0	80.0	9.4	6.9	7.5	75.0	3.0	SER-070
71.0	81.0	9.4	6.9	7.5	76.0	3.0	SER-071
75.0	85.0	9.4	6.9	7.5	80.0	3.0	SER-075
80.0	90.0	9.4	6.9	7.5	85.0	3.0	SER-080
85.0	95.0	9.4	6.9	7.5	90.0	3.0	SER-085
90.0	100.0	9.4	6.9	7.5	95.0	3.0	SER-090
95.0	105.0	9.4	6.9	7.5	100.0	3.0	SER-095
100.0	110.0	9.4	6.9	7.5	105.0	3.0	SER-100

Wiper

SFR

(Metric Size)

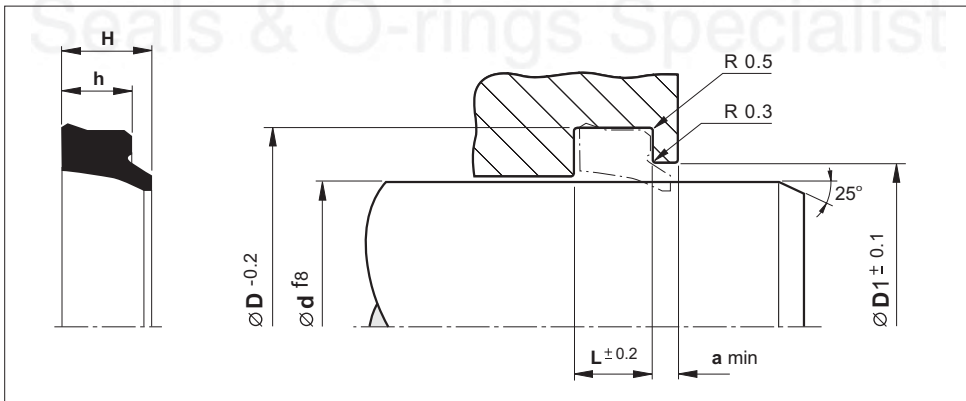


SFR

Material	Temp. (°C)	Speed (m/s)
NBR	-30 +100	1

- Low friction.
- High wear resistance.
- Easy installation.
- Used for pneumatic indoor cylinders

Installation Recommendation



Surface roughness	Ra	Rt
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Sliding surface	$\leq 0.3 \mu\text{m}$	$\leq 4 \mu\text{m}$
Surface of housing	$\leq 1.8 \mu\text{m}$	$\leq 10 \mu\text{m}$
Sides of housing	$\leq 3.0 \mu\text{m}$	$\leq 16 \mu\text{m}$

Wiper - SFR

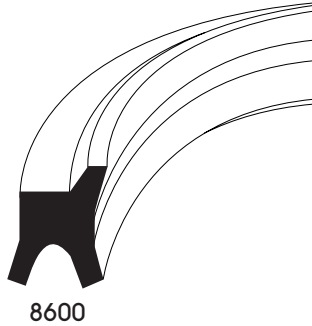
(Metric Size)

Rod Dia.	Groove Dia.	Seal Height	Seal Step Height	Groove Width	Bore Dia.	Step Width	Reference (For order processing)
d	D	H	h	L	D1	a	
16.0	24.0	6.0	4.5	5.0	20.3	2.0	SFR-016
18.0	26.0	6.0	4.5	5.0	22.3	2.0	SFR-018
20.0	28.0	6.0	4.5	5.0	24.3	2.0	SFR-020
22.0	30.0	6.0	4.5	5.0	26.3	2.0	SFR-022
22.4	30.4	6.0	4.5	5.0	26.7	2.0	SFR-022.4
25.0	33.0	6.0	4.5	5.0	29.3	2.0	SFR-025
28.0	36.0	6.0	4.5	5.0	32.3	2.0	SFR-028
30.0	38.0	6.5	5.0	6.0	34.0	2.0	SFR-030
31.5	39.5	6.5	5.0	6.0	35.5	2.0	SFR-031.5
32.0	40.0	6.5	5.0	6.0	36.0	2.0	SFR-032
35.0	43.0	6.5	5.0	6.0	39.0	2.0	SFR-035
35.5	43.5	6.5	5.0	6.0	39.5	2.0	SFR-035.5
36.0	44.0	6.5	5.0	6.0	40.0	2.0	SFR-036
40.0	48.0	6.5	5.0	6.0	44.0	2.0	SFR-040
45.0	53.0	6.5	5.0	6.0	49.0	2.0	SFR-045
50.0	58.0	6.5	5.0	6.0	54.0	2.0	SFR-050
55.0	63.0	6.5	5.0	6.0	59.0	2.0	SFR-055
60.0	68.0	6.5	5.0	6.0	64.0	2.0	SFR-060
63.0	71.0	6.5	5.0	6.0	67.0	2.0	SFR-063
70.0	80.0	8.0	6.0	7.0	75.0	3.0	SFR-070
75.0	85.0	8.0	6.0	7.0	80.0	3.0	SFR-075
80.0	90.0	8.0	6.0	7.0	85.0	3.0	SFR-080

Wiper

8600

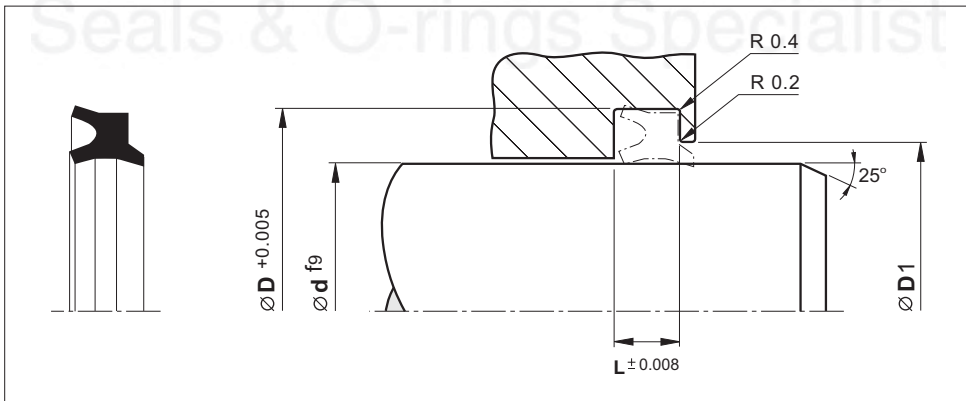
(Inch Size)



Material	Temp. (°C)	Speed (m/s)
NBR	-20 +80	1

- Easy installation in simple groove.
- High wear resistance.
- Low friction.
- Extended service life.

Installation Recommendation



Surface roughness	Ra	Rt
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Sliding surface	$\leq 0.3 \mu\text{m}$	$\leq 4 \mu\text{m}$
Surface of housing	$\leq 1.8 \mu\text{m}$	$\leq 10 \mu\text{m}$
Sides of housing	$\leq 3.0 \mu\text{m}$	$\leq 16 \mu\text{m}$





Wiper - 8600

(Inch Size)

Rod Dia.	Bore Dia.	Groove Dia.	Groove Width	Reference (For order processing)
d	D	L	D1	
.375	.677	.203	.495	860000375
.500	.802	.203	.620	860000500
.625	.927	.203	.745	860000625
.688	.990	.203	.808	860000688
.750	1.052	.203	.870	860000750
.875	1.240	.218	1.010	860000875
1.000	1.365	.218	1.135	860001000
1.250	1.615	.218	1.385	860001250
1.375	1.740	.218	1.510	860001375
1.500	1.865	.218	1.635	860001500
1.750	2.115	.218	1.885	860001750
1.875	2.240	.218	2.010	860001875
2.000	2.365	.218	2.135	860002000
2.125	2.490	.218	2.260	860002125
2.188	2.683	.281	2.323	860002188
2.250	2.745	.281	2.385	860002250
2.500	2.995	.281	2.635	860002500
2.688	3.183	.281	2.823	860002688
2.938	3.433	.281	3.073	860002938
3.000	3.495	.281	3.135	860003000
3.250	3.745	.281	3.385	860003250
3.438	3.933	.281	3.573	860003438
3.500	3.995	.281	3.635	860003500
3.688	4.183	.281	3.823	860003688
4.000	4.495	.281	4.135	860004000
4.250	4.745	.281	4.385	860004250
4.438	4.933	.281	4.573	860004438
4.500	4.995	.281	4.635	860004500
5.000	5.495	.281	5.135	860005000
5.188	5.683	.281	5.323	860005188
5.500	5.995	.281	5.635	860005500
6.000	6.495	.281	6.135	860006000
6.750	7.245	.281	6.885	860006750
7.000	7.495	.281	7.135	860007000
7.750	8.245	.281	7.885	860007750
9.750	10.245	.281	9.885	860009750

Cushion Seals Profiles

Cushion Seals

Design	Ref.	Material	Pressure (BAR)	Temp. (°C)	Speed (m/s)	Dim mm. inch	Page
	PP	PU	16	-35 +80	1	•	92
	PP	NBR	16	-20 +80	1	•	92
	PCS	NBR-Metal	10	-5 +80	0.5	•	94
	YCS	NBR	10	-30 +80	1	•	96



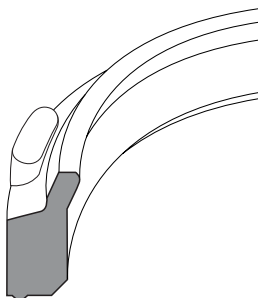
**CSPEC
SEAL**

Seals & O-rings Specialist

Cushion Seals

PP

(Metric Size)

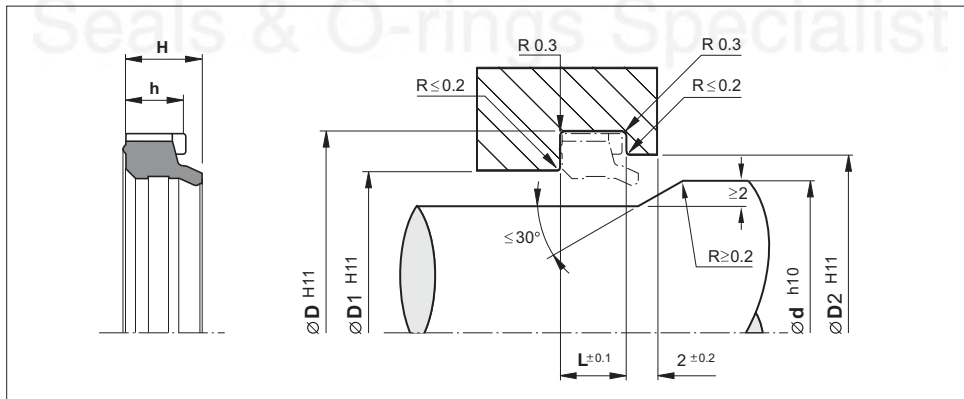


PP

Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
PU	16	-35 +80	1
NBR	16	-20 +80	1

- As the seal functions as a check valve, no separate valve is necessary.
- High cushioning consistency due to automatic centering.
- Increased reliability due to two independent sealing systems.
- Easy manual snap assembly.

Installation Recommendation



Surface roughness

Ra

Rt

Sliding surface

$\leq 0.3 \mu\text{m}$

$\leq 4 \mu\text{m}$

Surface of housing

$\leq 1.8 \mu\text{m}$

$\leq 10 \mu\text{m}$

Sides of housing

$\leq 3.0 \mu\text{m}$

$\leq 16 \mu\text{m}$

Cushion Seals - PP

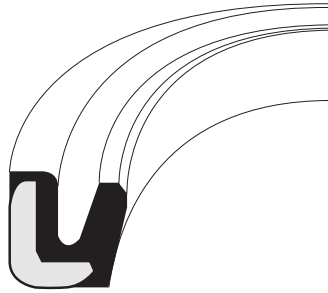
(Metric Size)

Cushion Dia.	Groove Dimensions				Seal Step Height	Seal Height	Reference (For order processing)	Reference (For order processing)
	d	D	D1	D2	L	h			H
4.5	8.0	5.0	6.5	3.1	2.6	3.5	PP0408 N	
5.0	9.0	5.5	7.0	3.7	3.2	4.1	PP0509 N	
6.0	10.0	6.5	8.0	3.7	3.2	4.1	PP0610 N	
7.8	11.6	8.5	10.0	3.3	2.8	3.5		PP0711 P
8.0	11.6	8.5	10.0	3.3	2.8	3.5	PP0811 N	PP0811 P
9.5	15.0	10.0	12.0	4.5	3.7	4.6	PP0915 N	PP0915 P
10.0	18.0	10.5	13.0	7.0	6.3	7.8	PP1018 N	
10.0	18.0	10.5	15.0	7.0	6.3	7.8		PP1018 P
12.0	18.0	13.0	15.5	4.8	4.1	5.0	PP1218 N	PP1218 P
12.0	20.0	13.0	17.0	7.0	6.3	7.8	PP1220 N	
14.0	22.0	15.0	19.0	7.0	6.3	7.8	PP1422 N	PP1422 P
16.0	22.0	17.0	19.5	5.2	4.5	5.5	PP1622 N	PP1622 P
16.0	24.0	17.0	21.0	7.0	6.3	7.8	PP1624 N	PP1624 P
18.0	26.0	19.0	23.0	7.0	6.3	7.8	PP1826 N	PP1826 P
20.0	28.0	21.0	24.0	7.0	6.3	7.8	PP2028 N	PP2028 P
22.0	30.0	23.0	26.0	7.0	6.3	7.8	PP2230 N	PP2230 P
25.0	33.0	26.0	29.0	7.0	6.3	7.8	PP2533 N	PP2533 P
28.0	36.0	29.0	32.0	7.0	6.3	7.8	PP2836 N	PP2836 P
30.0	40.0	31.5	35.0	7.0	6.2	7.8	PP3040 N	
30.0	40.0	31.5	35.0	7.0	6.3	7.8		PP3040 P
32.0	42.0	33.5	37.0	7.0	6.2	7.8	PP3242 N	PP3242 P
36.0	46.0	37.5	41.0	7.0	6.2	7.8	PP3646 N	PP3646 P
40.0	50.0	41.5	45.0	7.0	6.2	7.8	PP4050 N	PP4050 P
50.0	60.0	51.5	55.0	7.0	6.2	7.8	PP5060 N	PP5060 P
50.0	67.0	53.0	58.0	12.5	11.0	11.0	PP5067 N	
57.0	74.0	60.0	65.0	12.5	11.0	11.0	PP5774 N	PP5774 P
70.0	87.0	73.0	78.0	12.5	11.0	11.0	PP7087 N	
78.0	95.0	81.0	86.0	12.5	11.0	11.0	PP7895 N	PP7895 P

Cushion Seals

PCS

(Metric Size)

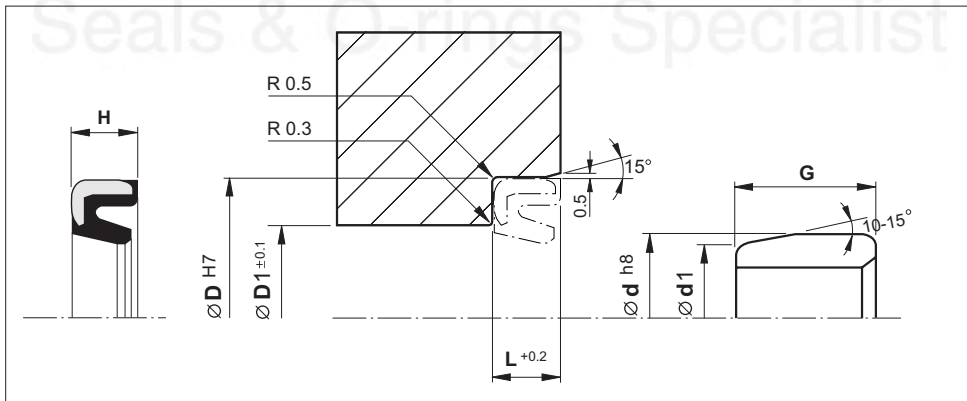


PCS

Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR-Metal	10	-5 +80	0.5

- Absorb shock at the end of a cylinder.
- Prevent damage and impact noise.
- Press-fit assembly.

Installation Recommendation



Surface roughness	Ra	Rt
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Sliding surface	≤ 0.3 µm	≤ 4 µm
Surface of housing	≤ 1.8 µm	≤ 10 µm
Sides of housing	≤ 3.0 µm	≤ 16 µm

Cushion Seals - PCS



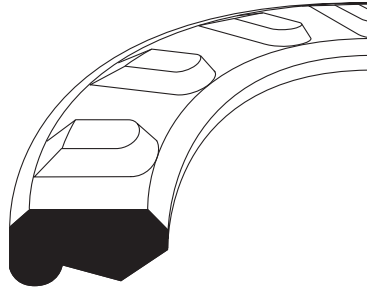
(Metric Size)

Cushion Dia.	Groove Dia.	Seal Height	Groove Width	Dimensions			Reference (For order processing)
				d1	dI	G	
10.0	18.0	4.7	5.0	12.5	8.0	15-20	PCS-010
11.2	19.2	4.7	5.0	13.7	9.2	15-20	PCS-011.2
14.0	22.0	4.7	5.0	16.5	12.0	15-20	PCS-014
15.0	23.0	4.7	5.0	17.5	13.0	15-20	PCS-015
16.0	24.0	4.7	5.0	18.5	14.0	15-20	PCS-016
18.0	26.0	4.7	5.0	20.5	16.0	15-20	PCS-018
20.0	28.0	4.7	5.0	22.5	18.0	15-20	PCS-020
22.0	30.0	4.7	5.0	24.5	20.0	15-20	PCS-022
22.4	30.4	4.7	5.0	24.9	20.4	15-20	PCS-022.4
24.0	32.0	4.7	5.0	26.5	22.0	15-20	PCS-024
25.0	33.0	4.7	5.0	27.5	23.0	15-30	PCS-025
28.0	36.0	4.7	5.0	30.5	26.0	15-30	PCS-028
30.0	40.0	5.6	6.0	33.0	28.0	20-30	PCS-030
31.5	41.5	5.6	6.0	34.5	29.5	20-30	PCS-031.5
35.0	45.0	5.6	6.0	38.0	33.0	20-30	PCS-035
35.5	45.5	5.6	6.0	38.5	33.5	20-30	PCS-035.5
38.0	48.0	5.6	6.0	41.0	36.0	20-30	PCS-038
40.0	50.0	5.6	6.0	43.0	38.0	20-40	PCS-040
45.0	55.0	5.6	6.0	48.0	43.0	20-40	PCS-045
50.0	62.0	6.6	7.0	53.0	48.0	25-40	PCS-050
55.0	67.0	6.6	7.0	58.0	53.0	25-40	PCS-055
56.0	68.0	6.6	7.0	59.0	54.0	25-40	PCS-056
60.0	72.0	6.6	7.0	63.0	58.0	25-40	PCS-060
65.0	77.0	6.6	7.0	68.0	63.0	25-40	PCS-065
75.0	87.0	6.6	7.0	78.0	73.0		PCS-075
85.0	97.0	6.6	7.0	88.0	83.0		PCS-085
120.0	132.0	6.6	7.0	123.0	118.0		PCS-120
130.0	142.0	6.6	7.0	133.0	128.0		PCS-130

Cushion Seals

YCS

(Metric Size)

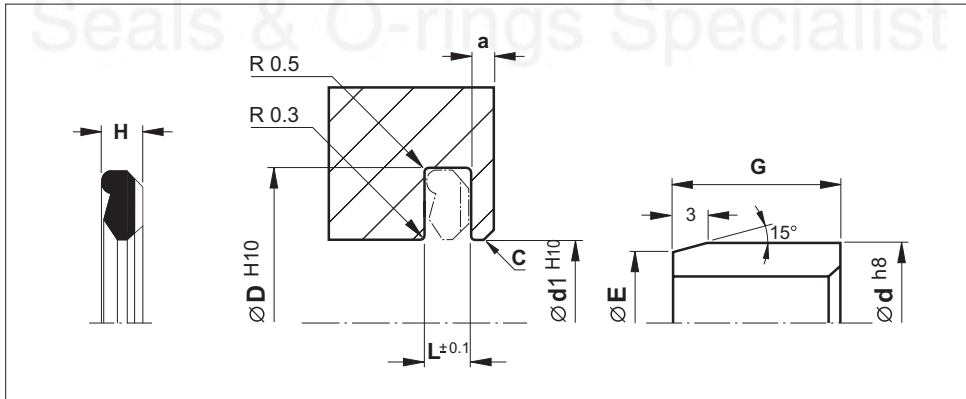


YCS

Material	Pressure (Bar)	Temp. (°C)	Speed (m/s)
NBR	10	-30 +80	1

- Low friction.
- High wear resistance.
- Simple snap assembly.

Installation Recommendation



Surface roughness	Ra	Rt
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Sliding surface	≤ 0.3 μm	≤ 4 μm
Surface of housing	≤ 1.8 μm	≤ 10 μm
Sides of housing	≤ 3.0 μm	≤ 16 μm

Cushion Seals - YCS

(Metric Size)

Cushion Dia.	Groove Dia.	Seal Height	Bore Dia.	Groove Width	Step Width	Chamfer	Cushion Dimensions			Reference (For order processing)
							d	G	E	
22.0	32.0	3.2	23.0	4.0	2.0	1.0	22.0	24.0	20.4	YCS-022
24.0	35.0	3.5	25.0	4.5	2.0	1.0	24.0	26.0	22.4	YCS-024
28.0	40.0	4.0	29.0	5.0	2.5	1.5	28.0	28.0	26.4	YCS-028
35.0	49.0	4.7	36.2	5.7	3.0	2.0	35.0	30.0	33.4	YCS-035
45.0	60.0	5.0	46.2	6.0	3.0	2.0	45.0	32.0	43.4	YCS-045
55.0	71.0	5.5	56.5	6.5	3.0	2.0	55.0	34.0	53.4	YCS-055



คำถามเกี่ยวกับซีลนิวเมติกที่ถูกลามประจำ Frequently Asked Questions (FAQ)

ในการเลือกซื้อซีลแต่ละครั้งท่านอาจจะมีคำถามหรือข้อสงสัยเกี่ยวกับซีลซึ่งยังหาคำตอบไม่ได้ ทำให้ท่านไม่สามารถเลือกซีลให้ได้ตรงตามวัตถุประสงค์ของการทำงาน จึงเป็นสาเหตุอย่างหนึ่งที่ทำให้ซีลที่ท่านใช้งานอยู่นั้นไม่ได้ประสิทธิภาพเต็มที่ หรือมีอายุการใช้งานของซีลสั้นกว่าที่ควรจะเป็น ทางบริษัท สเปคซีล จำกัด จึงได้รวบรวมข้อมูล คำถามเกี่ยวกับซีลนิวเมติกที่ทางบริษัทฯ ถูกลามเป็นประจำ แล้วตอบอยู่ในส่วน Q & A นี้ เพื่อเป็นแนวทางเบื้องต้นในการเลือกซื้อซีลของท่านในครั้งต่อไป

ทางบริษัทฯ หวังเป็นอย่างยิ่งว่าท่านจะได้รับประโยชน์จากข้อมูลคำตอบเหล่านี้ไม่มากนักน้อย และหากท่านต้องการข้อมูลเพิ่มเติม หรือมีข้อสงสัยเกี่ยวกับการใช้งานของซีลนิวเมติก ซีลไฮดรอลิค และโอรัง ท่านสามารถสอบถามได้โดยส่งคำถาม และโปรดระบุรายละเอียดที่จะสามารถติดต่อท่านได้โดยตรง อย่างชัดเจน ส่งมาทางแฟกซ์ หมายเลข 02-8810550 ท่านจะได้รับข้อมูลคำตอบในไม่ช้า.....

Q & A

- Q** : ซีลที่ดีควรมีอายุการใช้งานนานเท่าใด ?
- A** : อายุการใช้งานของซีล มีปัจจัยแวดล้อมมากมาย เช่น ชั่วโมงการใช้งานต่อวัน หากเครื่องจักรทำงานตลอด 24 ชั่วโมง ก็จะทำให้อายุของซีลสั้นลง ทั้งนี้อายุการใช้งานของซีลแต่ละตัว จะขึ้นอยู่กับจำนวนครั้งในการใช้งาน (Cycle Time) ความร้อน และความสะอาดของลมในระบบ ทั้งหมดนี้จะเป็นตัวแปรที่ทำให้มีผลกับอายุการใช้งานของซีล จึงไม่มีตัวเลขตายตัวที่จะบ่งบอกถึงอายุการใช้งานของซีลได้
- Q** : ควรเก็บรักษาซีลอย่างไร ให้มีคุณภาพดีก่อนการประกอบใช้งาน ?
- A** : ควรเก็บซีลไว้ในที่แห้ง สะอาดปราศจากฝุ่นละออง มีอุณหภูมิ ประมาณ 20 องศาเซลเซียส ไม่ควรให้ถูกแสงโดยตรง เท่านี้ก็จะสามารถรักษาคุณภาพของซีลก่อนการใช้งานได้ยาวนาน
- Q** : จำเป็นจะต้องมีซิลคัชชันในกระบอกนิวเมติกหรือไม่ เพื่อประโยชน์อะไร ?
- A** : ซีลคัชชัน (Cushion) มีไว้เพื่อชะลอหรือหยุดลูกสูบที่เคลื่อนที่อย่างรวดเร็วไม่ให้เกิดการกระแทกอย่างรุนแรงกับฝากระบอกซึ่งจะทำให้เกิดความเสียหายตามมาได้ ดังนั้นจึงจำเป็นต้องมีซิลคัชชันไว้ในกระบอกนิวเมติกเพื่อความนุ่มนวลในการทำงานของกระบอกนิวเมติก

- Q :** วัสดุของซีลที่ใช้ในระบบอกนิวเมติกควรจะเป็นวัสดุที่ทำจากยางหรือโพลียูรีเทน ?
- A :** ในระยะหลังนี้เราจะสามารถพบเห็นซีลของระบบอกนิวเมติกที่ทำมาจากวัสดุโพลียูรีเทนเป็นจำนวนมาก ทั้งนี้ หากสังเกตให้ดีจะพบว่าความแข็งแรงของวัสดุโพลียูรีเทนที่ใช้ผลิตซีลนิวเมติกจะมีความแข็งแรงน้อยกว่าวัสดุโพลียูรีเทนที่ใช้ผลิตซีลไฮดรอลิก ซึ่งโดยทั่วไปความแข็งแรงของทั้งโพลียูรีเทนและยางที่ใช้ผลิตซีลนิวเมติกจะมีความแข็งแรงอยู่ที่ประมาณ 70-75 shore A เหตุผลหลักของการนิยมใช้วัสดุโพลียูรีเทนในการผลิตซีลนิวเมติกมากขึ้นเพราะ วัสดุโพลียูรีเทนมีความทนทานต่อการสึกหรอ (Wear Resistant) มากกว่ายางนั่นเอง ซึ่งหากใช้ยางในการผลิตซีลนิวเมติกก็ควรจะเป็นยางที่ผสมสารหล่อลื่นในตัว (Self Lubrication) เพื่อช่วยลดแรงเสียดทาน (Friction)
- Q :** ทำไมในระบบอกนิวเมติกบางระบบก็ไม่มีซีลแกน มีแต่ซีลกันฝุ่นประกอบอยู่ที่ปลายกระบอกลมาเพียงวงเดียว ?
- A :** เป็นการเข้าใจผิดว่าซีลที่ประกอบอยู่ปลายกระบอกลนิวเมติกเป็นซีลกันฝุ่นเพียงอย่างเดียว ที่จริงแล้วซีลที่มี ลักษณะเหมือนซีลกันฝุ่นที่อยู่ปลายกระบอกลนิวเมติก จะมีส่วนของ Lip ด้านในสามารถทำหน้าที่ในการกัน Pressure ได้ด้วย ซึ่งเป็นซีลที่ทำหน้าที่ทั้งเป็นซีลกัน Pressure และเป็นทั้งซีลกันฝุ่นด้วยในตัวเดียวกัน
- Q :** ในระบบอกนิวเมติกควรจะใช้ Wearing วัสดุอะไร ?
- A :** ในระบบนิวเมติกโดยทั่วไปจะไม่มีระบบหล่อลื่นที่สมบูรณ์ จึงจำเป็นต้องเลือกใช้วัสดุที่ทนต่อการเสียดสีได้ดีและมีการหล่อลื่นได้ด้วยตัวเอง (Self Lubrication) ดังนั้นซีลทุกตัว รวมถึงตัวประกอบที่จะนำมาใช้ในระบบอกนิวเมติกจึงควรเลือกใช้วัสดุที่มีสารหล่อลื่นผสมอยู่ในวัสดุที่ใช้ผลิต เช่น PTFE ผสม Carbon หรือ PE จะช่วยยืดอายุของซีลและตัวประกอบให้ยาวนานขึ้นอีกมาก
- Q :** เราสามารถใช้ซีลไฮดรอลิกแทนซีลนิวเมติกได้หรือไม่ ?
- A :** ซีลนิวเมติกและซีลไฮดรอลิก ดูจากภายนอกอาจมีลักษณะเหมือนกัน แต่ที่จริงแล้ววัสดุที่ใช้ผลิตจะแตกต่างกันโดยเฉพาะความแข็งแรงของวัสดุที่ใช้ผลิตจะมีความแข็งแรงที่ต่างกัน ซีลนิวเมติกจะมีความแข็งแรงน้อยกว่าซีลไฮดรอลิก และจะผสมสารหล่อลื่นในวัสดุที่ใช้ในการผลิตซีลนิวเมติกด้วย หากเรานำซีลไฮดรอลิกมาใช้ในงานนิวเมติก จะทำให้ซีลเกิดการสึกหรอเร็ว และไม่ทนทานเท่าที่ควรจะเป็น

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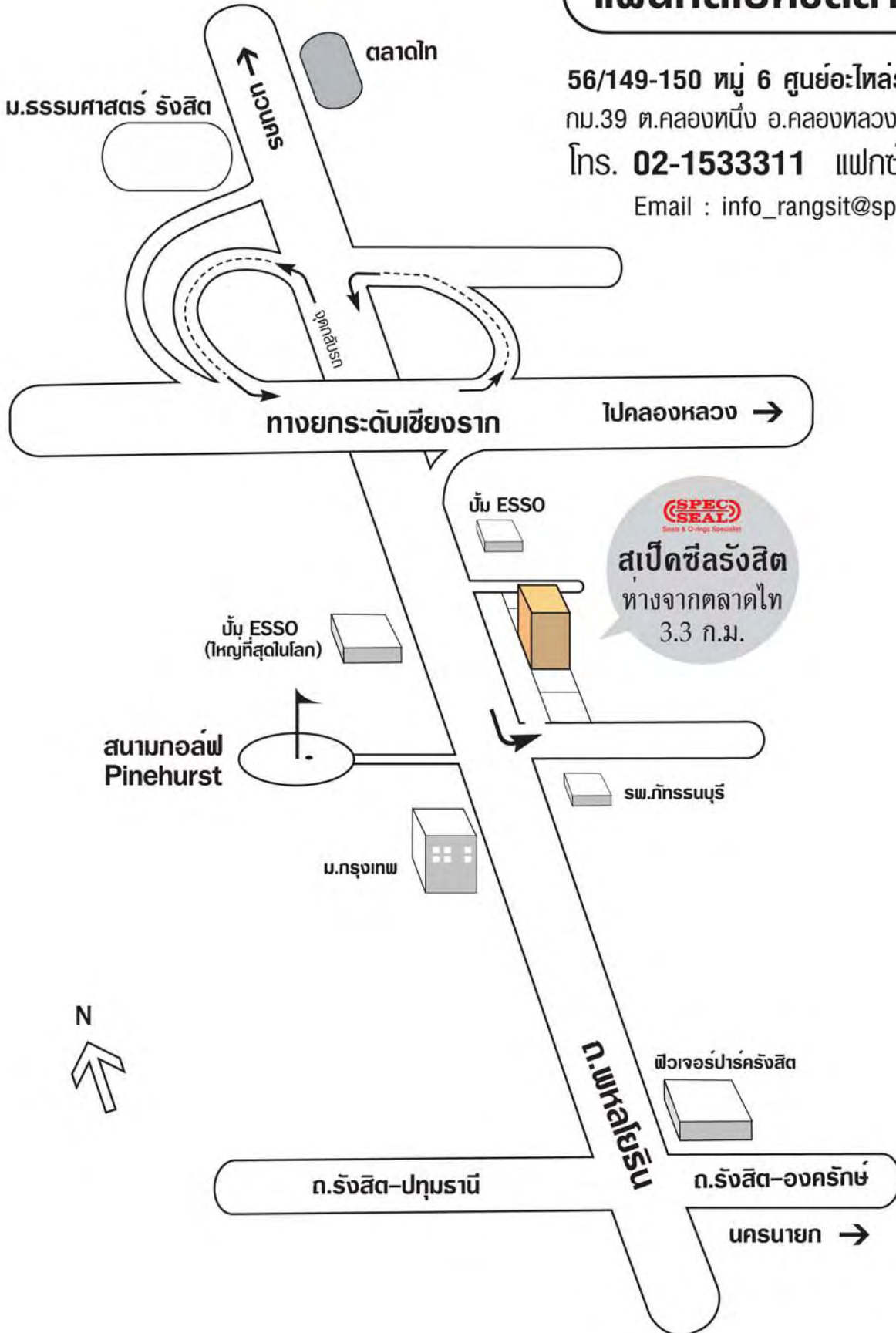
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