

Turcon® Glyd Ring®



Double-acting

Rubber-energized plastic-faced seal

Material:

Turcon®, Zurcon® and Elastomer





Turcon® Glyd Ring®



Description

Turcon® Glyd Ring® is a very effective and reliable low friction seal. It is particularly suitable as a piston seal in both high and low pressure systems.

The double-acting Glyd Ring® is a combination of a Turcon® based slipper seal and an energizing O-Ring. It has an interference fit which together with the squeeze of the O-Ring ensures a good sealing effect even at low pressure. At higher system pressures, the O-Ring is energised by the fluid, pushing Glyd Ring® against the sealing face with increased force.

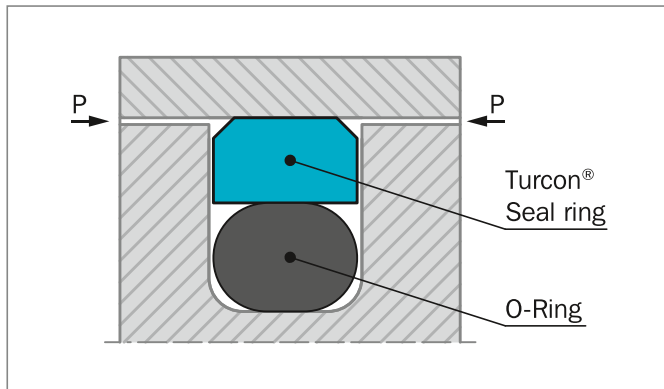


Figure 103: Turcon® Glyd Ring®

The geometry of Glyd Ring® ensures good static sealing and allows the lubricating hydrodynamic fluid film to be built under the seal in linear applications.

ADVANTAGES

- No stick-slip effect when starting for smooth operation
- Minimum static and dynamic friction for a minimum energy loss and operating temperature
- Suitable for non lubricating fluids depending on seal material for optimum design flexibility
- High wear resistance ensures long service life
- Installation grooves acc. to ISO 7425-1 as well as Stepseal® standard groove dimensions
- No adhesive effect to the mating surface during long period of inactivity or storage
- Suitable for most hydraulic fluids in relation with most modern hardware materials and surface finish depending on material selected.
- Suitable for environmentally friendly hydraulic fluids
- Available for all cylinder diameters up to 2,700 mm.

APPLICATION EXAMPLES

Over several decades Glyd Ring® has been successfully implemented in a large variety of applications as double acting Piston seals in hydraulic components such as:

- Injection molding machines
- Machine tools
- Presses
- Excavators
- Forklifts & handling machinery
- Agriculture equipment
- Valves for hydraulic & pneumatic circuits
- Servo equipment
- Pressure intensifiers
- Jacks

OPERATING CONDITIONS

Glyd Ring® is recommended for linear (with a length of stroke at least twice the groove width) and helical movements.

Pressure:	Up to 60 MPa
Speed:	Up to 15 m/s
Frequency:	Up to 5 Hz.
Temperature:	-45 °C to +200 °C* depending on O-Ring material
Media:	Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids, environmentally friendly hydraulic fluids (bio-oils), phosphate ester, water and others, depending on the seal and O-Ring material compatibility see Table 85
Clearance:	The maximum permissible radial clearance S_{max} is shown in the Table 86 as a function of the operating pressure and functional diameter.

IMPORTANT NOTE

The above data are maximum values and cannot be used at the same time, e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also depends on media.

* In the case of unpressurized applications in temperatures below 0 °C please contact your local Customer Solution Center for more information!



NOTCHES

To assure that a rapid energising of the seal takes place at sudden changes of pressure and direction of motion, radial notches are made on both sides of the seal.

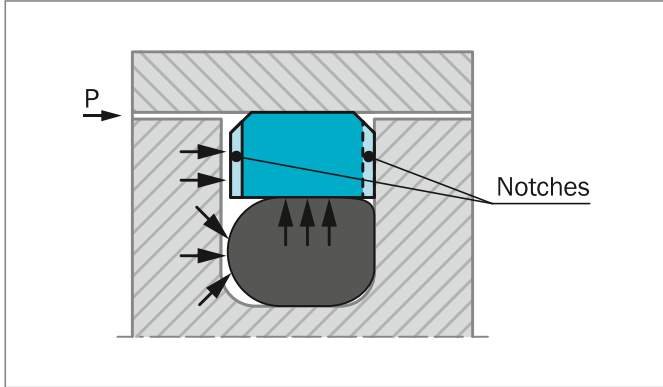


Figure 104: Turcon® Glyd Ring® with notches

Notches are standard on the following series and diameters
 PG 42 for bore dia. > 30 mm
 PG 44 for bore dia. > 20 mm
 PG 46 for bore dia. > 40 mm

INSTALLATION INSTRUCTIONS

Glyd Ring® is installed according to information on page 247 to 249.

Closed groove installation according to dimensions in Table 81 page 249.

RECOMMENDED MATERIALS

The following material combinations have proven effective for hydraulic applications:

Turcon® Glyd Ring® in Turcon® M12

All round material for light to heavy hydraulic applications with linear or helical movements in mineral oils, flame retardant hydraulic fluids, phosphate ester, bio-oils or fluids having low lubricating properties:

O-Ring:	NBR 70 Shore A	N
	FKM 70 Shore A	V

Set code: M12N or M12V

Turcon® Glyd Ring® in Turcon® T46

For medium to heavy applications with linear movements in mineral oils and other medium with good lubrication:

O-Ring:	NBR 70 Shore A	N
	FKM 70 Shore A	V

Set code: T46N or T46V

For specific applications, all Turcon® materials are available. Other material combinations are listed in Table 85.

**Table 85: Turcon® and Zurcon® Materials for Glyd Ring®**

Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp.* °C	Mating Surface Material	MPa max. Dynamic
Turcon® M12 First material choice for seals in linear motion Overall improved properties For new constructions and updating For all commonly applied hydraulic fluids including fluids with low lubrication performance Lowest friction and best sliding properties Lowest wear on seals Improved absorption of abrasive contaminants Low wear or abrasion of counter surface BAM tested Mineral fiber and Additives filled Color: Dark gray	M12	NBR 70	N	-30 to +100	Steel	50
		NBR 70 Low temp.	T	-45 to +80	Steel hardened	
		FKM 70	V	-10 to +200	Cast iron Stainless steel Titanium	
Turcon® T05 For lubricating fluids Also for gas service Very low friction Very good sliding and sealing properties Color: Turquoise	T05	NBR 70	N	-30 to +100	Steel	20
		NBR 70 Low temp.	T	-45 to +80	Steel hardened	
		FKM 70	V	-10 to +200		
Turcon® T08 For lubricating fluids and linear motion Very high compressive strength and extrusion resistance Hard counter surfaces is recommended Bronze filled Color: Light to dark brown, which may have variations in shading	T08	NBR 70	N	-30 to +100	Steel hardened	60
		NBR 70 Low temp.	T	-45 to +80	Cast iron	
		FKM 70	V	-10 to +200		
Turcon® T10 For hydraulic and pneumatic For lubricating and non-lubricating fluids High extrusion resistance Good chemical resistance Not for electrically conducting fluids BAM tested Carbon, graphite filled Color: Black	T10	NBR 70	N	-30 to +100	Steel	40
		NBR 70 Low temp.	T	-45 to +80	Steel hardened	
		FKM 70	V	-10 to +200	Stainless steel	
		EPDM 70	E**	-45 to +145		
Turcon® T29 For lubricating and non-lubricating fluids Good extrusion resistance Surface texture is not suitable for gas sealing Not for electrically conducting fluids Carbon fiber filled Color: Gray	T29	NBR 70	N	-30 to +100	Steel	30
		NBR 70 Low temp.	T	-45 to +80	Steel hardened	
		FKM 70	V	-10 to +200	Cast iron	
		EPDM 70	E**	-45 to +145	Stainless steel	

Table continues on next page



Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp.* °C	Mating Surface Material	MPa max. Dynamic
Turcon® T40 For lubricating and non-lubricating fluids High frequency and short strokes Water hydraulics Surface texture is not suitable for gas sealing Carbon fiber filled Color: Gray	T40	NBR 70	N	-30 to +100	Steel	25
		NBR 70 Low temp.	T	-45 to +80	Steel hardened Cast iron Stainless steel Aluminum	
		FKM 70	V	-10 to +200		
		EPDM 70	E**	-45 to +145		
Turcon® T46 For lubricated hydraulics in linear motion High compressive strength High extrusion resistance Very good sliding and wear properties BAM tested Bronze filled Color: Light to dark brown, which may have variations in shading	T46	NBR 70	N	-30 to +100	Steel hardened Cast iron	50
		NBR 70 Low temp.	T	-45 to +80		
		FKM 70	V	-10 to +200		
Zurcon® Z53*** For mineral oil based fluids Very high abrasion and extrusion resistance For counter surface with rougher surface finish Limited chemical resistance Max. working temperature 110 °C Cast polyurethane Color: Yellow to light-brown	Z53	NBR 70	N	-30 to +100	Steel	60
		NBR 70 Low temp.	T	-45 to +80	Steel hardened Steel chrome plated (rod) Cast iron Stainless steel Ceramic coating	
Zurcon® Z80 For lubricating and non-lubricating fluids Water based fluids, air and gases Dry air pneumatics High abrasion and extrusion resistance For service in abrasive conditions and medium with particles Good chemical resistance Limited temperature capability (-60 to +80 °C) UHMWPE (Ultra High Molecular Weight Polyethylene) Color: White to off-white	Z80	NBR 70	N	-30 to +100	Steel	35
		NBR 70 Low temp.	T	-45 to +80	Steel hardened Stainless steel Aluminum Ceramic coating	
		EPDM 70	E**	-45 to +145		

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil (except EPDM).

** Material not suitable for mineral oils.

*** Max. diameter 2,300 mm.

BAM: Tested by "Bundesanstalt Materialprüfung, Germany".

Highlighted materials are recommended.



Installation Recommendation

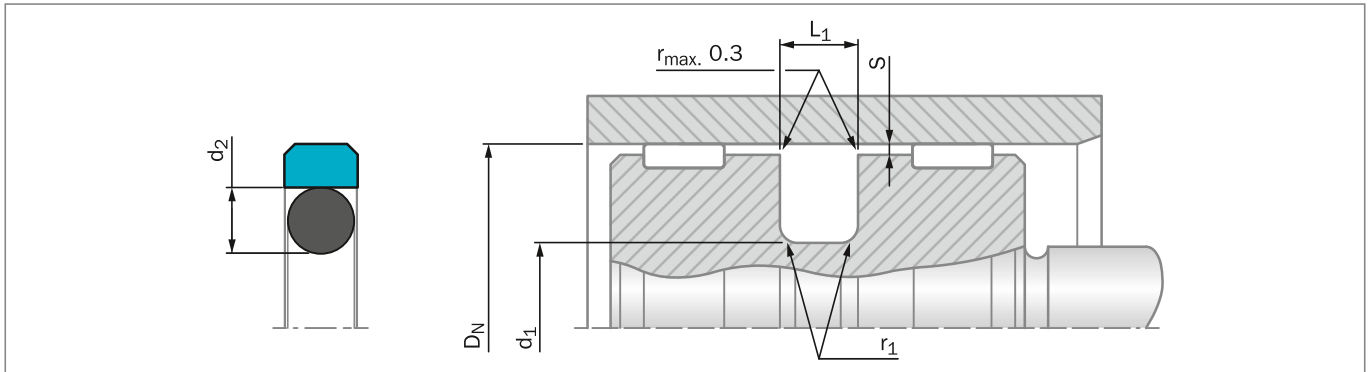


Figure 105: Installation Drawing

Table 86: Installation Dimensions – Standard Recommendations

Bore Diameter D_N H9			Groove Diameter	Groove Width	Radius	Radial Clearance S_{max}^*			O-Ring Cross Section
Series No. PG 44 Standard Application	Series No. PG 46 Light Application	Series No. PG 42 Heavy Duty Application	d_1 h9	L_1 +0.2	r_1 max	10 MPa	20 MPa	40 MPa	d_2
8 - 14.9	15 - 39.9	-	$D_N - 4.9$	2.2	0.4	0.30	0.20	0.15	1.78
15 - 39.9	40 - 79.9	8 - 14.9	$D_N - 7.5$	3.2	0.6	0.40	0.25	0.15	2.62
40 - 79.9	80 - 132.9	15 - 39.9	$D_N - 11.0$	4.2	1.0	0.40	0.25	0.20	3.53
80 - 132.9	133 - 329.9	40 - 79.9	$D_N - 15.5$	6.3	1.3	0.50	0.30	0.20	5.33
133 - 329.9	330 - 669.9	80 - 132.9	$D_N - 21.0$	8.1	1.8	0.60	0.35	0.25	7.00
330 - 669.9	670 - 999.9	133 - 329.9	$D_N - 24.5$	8.1	1.8	0.60	0.35	0.25	7.00
670 - 999.9	1,000 - 1,200	330 - 669.9	$D_N - 28.0$	9.5	2.5	0.70	0.50	0.30	8.40
1,000 - 2,700**	-	670 - 999.9	$D_N - 38.0$	13.8	3.0	1.00	0.70	0.60	12.00

* At pressures > 40 MPa use diameter tolerance H8/f8 (bore/piston) in the area of the seal or consult your local Customer Solution Center for alternative material or profiles.

Slydring® / Wear Rings are not applicable at very small radial clearances please consult the Slydring® section in this catalog.

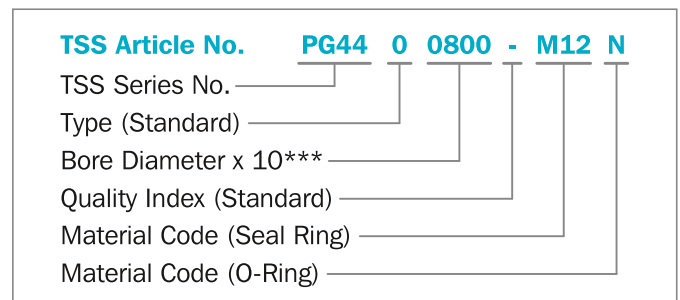
** O-Rings with 12 mm cross section are delivered as special profile ring.

ORDERING EXAMPLE

Turcon® Glyd Ring® complete with O-Ring, standard application:

Series:	PG44 from Table 86
Bore Diameter:	$D_N = 80.0$ mm
TSS Part No.:	PG4400800 from Table 87

Select the material from Table 85. The corresponding code numbers are appended to the TSS Part No. Together these form the TSS Article Number. The TSS Article Number for all intermediate sizes can be determined by following the example:



*** For diameters $D_N \geq 1,000.0$ mm multiply only by factor 1.
 Example: PG44 for diameter $D_N = 1,200.0$ mm
 TSS Article No.: PG44**X1200** - M12N



Table 87: Installation Dimensions / TSS Part No.

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Size	Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Size
D _N H9	d ₁ h9	L ₁ +0.2			D _N H9	d ₁ h9	L ₁ +0.2		
8.0	3.1	2.2	PG4400080	2.57 x 1.78	50.0	34.5	6.3	PG4200500	32.69 x 5.33
10.0	5.1	2.2	PG4400100	4.80 x 1.80	50.8	43.3	3.2	PG4600508	42.52 x 2.62
12.0	7.1	2.2	PG4400120	6.70 x 1.80	50.8	39.8	4.2	PG4400508	37.69 x 3.53
14.0	9.1	2.2	PG4400140	8.75 x 1.80	52.0	41.0	4.2	PG4400520	40.87 x 3.53
15.0	7.5	3.2	PG4400150	7.00 x 2.62	53.0	42.0	4.2	PG4400530	40.87 x 3.53
16.0	11.1	2.2	PG4600160	10.60 x 1.80	55.0	44.0	4.2	PG4400550	44.04 x 3.53
16.0	8.5	3.2	PG4400160	7.59 x 2.62	57.0	46.0	4.2	PG4400570	44.04 x 3.53
18.0	13.1	2.2	PG4600180	12.42 x 1.78	58.0	47.0	4.2	PG4400580	47.22 x 3.53
18.0	10.5	3.2	PG4400180	9.19 x 2.62	60.0	49.0	4.2	PG4400600	47.22 x 3.53
19.05	11.5	3.2	PG4400190	10.77 x 2.62	62.0	51.0	4.2	PG4400620	50.39 x 3.53
20.0	15.1	2.2	PG4600200	14.00 x 1.78	63.0	52.0	4.2	PG4400630	50.39 x 3.53
20.0	12.5	3.2	PG4400200	12.37 x 2.62	63.0	47.5	6.3	PG4200630	46.99 x 5.33
21.0	13.5	3.2	PG4400210	12.37 x 2.62	65.0	54.0	4.2	PG4400650	53.57 x 3.53
22.0	17.1	2.2	PG4600220	17.17 x 1.78	68.0	57.0	4.2	PG4400680	56.74 x 3.53
22.0	14.5	3.2	PG4400220	13.94 x 2.62	70.0	62.5	3.2	PG4600700	61.60 x 2.62
24.0	16.5	3.2	PG4400240	15.54 x 2.62	70.0	59.0	4.2	PG4400700	56.74 x 3.53
25.0	20.1	2.2	PG4600250	19.00 x 1.80	70.0	54.5	6.3	PG4200700	53.34 x 5.33
25.0	17.5	3.2	PG4400250	17.12 x 2.62	75.0	64.0	4.2	PG4400750	63.09 x 3.53
25.0	14.0	4.2	PG4200250	13.87 x 3.53	75.0	59.5	6.3	PG4200750	56.52 x 5.33
25.4	20.5	2.2	PG4600254	20.35 x 1.78	80.0	69.0	4.2	PG4600800	66.27 x 3.53
28.0	20.5	3.2	PG4400280	20.29 x 2.62	80.0	64.5	6.3	PG4400800	62.87 x 5.33
30.0	25.1	2.2	PG4600300	25.12 x 1.78	80.0	59.0	8.1	PG4200800	58.00 x 7.00
30.0	22.5	3.2	PG4400300	21.89 x 2.62	82.5	67.0	6.3	PG4400825	66.04 x 5.33
32.0	27.1	2.2	PG4600320	26.70 x 1.78	85.0	69.5	6.3	PG4400850	69.22 x 5.33
32.0	24.5	3.2	PG4400320	23.47 x 2.62	85.0	64.0	8.1	PG4200850	63.00 x 7.00
32.0	21.0	4.2	PG4200320	20.22 x 3.53	90.0	79.0	4.2	PG4600900	78.97 x 3.53
34.0	29.1	2.2	PG4600340	28.30 x 1.78	90.0	74.5	6.3	PG4400900	72.39 x 5.33
35.0	27.5	3.2	PG4400350	26.64 x 2.62	90.0	69.0	8.1	PG4200900	68.00 x 7.00
35.0	24.0	4.2	PG4200350	23.40 x 3.53	95.0	84.0	4.2	PG4600950	82.14 x 3.53
36.0	28.5	3.2	PG4400360	28.24 x 2.62	95.0	79.5	6.3	PG4400950	78.74 x 5.33
38.0	33.1	2.2	PG4600380	33.05 x 1.78	95.0	74.0	8.1	PG4200950	73.00 x 7.00
38.0	30.5	3.2	PG4400380	29.82 x 2.62	100.0	89.0	4.2	PG4601000	88.49 x 3.53
40.0	32.5	3.2	PG4600400	31.42 x 2.62	100.0	84.5	6.3	PG4401000	81.92 x 5.33
40.0	29.0	4.2	PG4400400	28.17 x 3.53	100.0	79.0	8.1	PG4201000	78.00 x 7.00
42.0	31.0	4.2	PG4400420	29.75 x 3.53	101.6	86.1	6.3	PG4401016	85.09 x 5.33
44.45	36.9	3.2	PG4600444	36.17 x 2.62	105.0	94.0	4.2	PG4601050	91.67 x 3.53
45.0	34.0	4.2	PG4400450	32.92 x 3.53	105.0	89.5	6.3	PG4401050	88.27 x 5.33
48.0	37.0	4.2	PG4400480	36.09 x 3.53	108.0	92.5	6.3	PG4401080	91.44 x 5.33
50.0	42.5	3.2	PG4600500	40.94 x 2.62	110.0	99.0	4.2	PG4601100	98.02 x 3.53
50.0	39.0	4.2	PG4400500	37.69 x 3.53	110.0	94.5	6.3	PG4401100	91.44 x 5.33



Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Size	Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Size
D _N H9	d ₁ h9	L ₁ +0.2			D _N H9	d ₁ h9	L ₁ +0.2		
110.0	89.0	8.1	PG4201100	88.00 x 7.00	250.0	225.5	8.1	PG4202500	227.97 x 7.00
115.0	99.5	6.3	PG4401150	97.79 x 5.33	254.0	233.0	8.1	PG4402540	227.97 x 7.00
120.0	109.0	4.2	PG4601200	107.54 x 3.53	260.0	239.0	8.1	PG4402600	240.67 x 7.00
120.0	104.5	6.3	PG4401200	100.97 x 5.33	265.0	244.0	8.1	PG4402650	240.67 x 7.00
120.0	99.0	8.1	PG4201200	98.00 x 7.00	268.0	247.0	8.1	PG4402680	240.67 x 7.00
125.0	114.0	4.2	PG4601250	113.89 x 3.53	270.0	249.0	8.1	PG4402700	240.67 x 7.00
125.0	109.5	6.3	PG4401250	107.32 x 5.33	280.0	259.0	8.1	PG4402800	253.37 x 7.00
125.0	104.0	8.1	PG4201250	103.00 x 7.00	290.0	269.0	8.1	PG4402900	266.07 x 7.00
127.0	111.5	6.3	PG4401270	110.49 x 5.33	300.0	279.0	8.1	PG4403000	278.77 x 7.00
130.0	114.5	6.3	PG4401300	113.67 x 5.33	300.0	275.5	8.1	PG4203000	266.07 x 7.00
130.0	105.5	8.1	PG4201300	104.00 x 7.00	304.8	283.8	8.1	PG4403048	278.77 x 7.00
132.0	121.0	4.2	PG4601320	120.24 x 3.53	310.0	289.0	8.1	PG4403100	278.77 x 7.00
135.0	114.0	8.1	PG4401350	113.67 x 7.00	320.0	299.0	8.1	PG4403200	291.47 x 7.00
140.0	124.5	6.3	PG4601400	123.19 x 5.33	320.0	295.5	8.1	PG4203200	291.47 x 7.00
140.0	119.0	8.1	PG4401400	116.84 x 7.00	330.0	305.5	8.1	PG4403300	304.17 x 7.00
145.0	129.5	6.3	PG4601450	126.37 x 5.33	340.0	315.5	8.1	PG4403400	316.87 x 7.00
145.0	124.0	8.1	PG4401450	123.19 x 7.00	350.0	325.5	8.1	PG4403500	316.87 x 7.00
150.0	134.5	6.3	PG4601500	132.72 x 5.33	360.0	335.5	8.1	PG4403600	329.57 x 7.00
150.0	129.0	8.1	PG4401500	126.37 x 7.00	370.0	345.5	8.1	PG4403700	342.27 x 7.00
155.0	134.0	8.1	PG4401550	132.72 x 7.00	380.0	355.5	8.1	PG4403800	354.97 x 7.00
160.0	144.5	6.3	PG4601600	142.24 x 5.33	400.0	375.5	8.1	PG4404000	367.67 x 7.00
160.0	139.0	8.1	PG4401600	135.89 x 7.00	420.0	395.5	8.1	PG4404200	393.07 x 7.00
165.0	144.0	8.1	PG4401650	142.24 x 7.00	430.0	405.5	8.1	PG4404300	405.26 x 7.00
170.0	149.0	8.1	PG4401700	145.42 x 7.00	440.0	415.5	8.1	PG4404400	405.26 x 7.00
175.0	154.0	8.1	PG4401750	151.77 x 7.00	450.0	425.5	8.1	PG4404500	417.96 x 7.00
180.0	164.5	6.3	PG4601800	164.47 x 5.33	460.0	435.5	8.1	PG4404600	430.66 x 7.00
180.0	159.0	8.1	PG4401800	158.12 x 7.00	480.0	455.5	8.1	PG4404800	456.06 x 7.00
190.0	169.0	8.1	PG4401900	164.47 x 7.00	500.0	475.5	8.1	PG4405000	468.76 x 7.00
194.0	178.5	6.3	PG4601940	177.17 x 5.33	555.0	530.5	8.1	PG4405550	532.26 x 7.00
200.0	184.5	6.3	PG4602000	183.52 x 5.33	600.0	575.5	8.1	PG4406000	557.66 x 7.00
200.0	179.0	8.1	PG4402000	177.17 x 7.00	640.0	615.5	8.1	PG4406400	608.08 x 7.00
205.0	184.0	8.1	PG4402050	183.52 x 7.00	660.0	635.5	8.1	PG4406600	633.48 x 7.00
210.0	189.0	8.1	PG4402100	183.52 x 7.00	700.0	672.0	9.5	PG4407000	670.00 x 8.40
215.0	194.0	8.1	PG4402150	189.87 x 7.00	710.0	682.0	9.5	PG4407100	680.00 x 8.40
220.0	199.0	8.1	PG4402200	196.22 x 7.00	740.0	712.0	9.5	PG4407400	710.00 x 8.40
230.0	214.5	6.3	PG4602300	208.92 x 5.33	780.0	752.0	9.5	PG4407800	750.00 x 8.40
230.0	209.0	8.1	PG4402300	202.57 x 7.00	800.0	772.0	9.5	PG4408000	770.00 x 8.40
240.0	219.0	8.1	PG4402400	215.27 x 7.00	900.0	872.0	9.5	PG4409000	870.00 x 8.40
250.0	234.5	6.3	PG4602500	234.32 x 5.33	1,000.0	972.0	9.5	PG46X1000	970.00 x 8.40
250.0	229.0	8.1	PG4402500	227.97 x 7.00	1,000.0	962.0	13.8	PG44X1000	960.00 x 12.00



Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Size
D_N H9	d₁ h9	L₁ +0.2		
1,050.0	1,022.0	9.5	PG46X1050	1,020.00 x 8.40
1,065.0	1,027.0	13.8	PG44X1065	1,025.00 x 12.00
1,070.0	1,032.0	13.8	PG44X1070	1,030.00 x 12.00
1,200.0	1,172.0	9.5	PG46X1200	1,170.00 x 8.40
1,200.0	1,162.0	13.8	PG44X1200	1,160.00 x 12.00
1,225.0	1,187.0	13.8	PG44X1225	1,185.00 x 12.00
1,500.0	1,462.0	13.8	PG44X1500	1,460.00 x 12.00
2,000.0	1,962.0	13.8	PG44X2000	1,960.00 x 12.00
2,700.0	2,662.0	13.8	PG44X2700	2,660.00 x 12.00

All dimensions in **bold** type are suitable for installation in grooves to ISO 7425-1, bore dia. in accordance with ISO 3320. Other dimensions and all intermediate sizes up to 2,700 mm dia. including inch sizes can be supplied.

All O-Rings with 12 mm cross section are delivered as special profile ring.