
Turcon® Glyd Ring®



Double Acting

Rubber Energized Plastic Faced
Seal

Material:

Turcon®, Zurcon® and Elastomer





■ Turcon® Glyd Ring®



Description

Successfully used for decades, the Tucon® Glyd Ring® is a very effective and reliable low frictional seal. It is particularly suitable as a piston seal in both high and low pressure systems.

The double acting Tucon® Glyd Ring® is a combination of a Turcon based slipper seal and an energising O-Ring. It is produced with 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 the Turcon® Glyd Ring® against the sealing face with increased force.

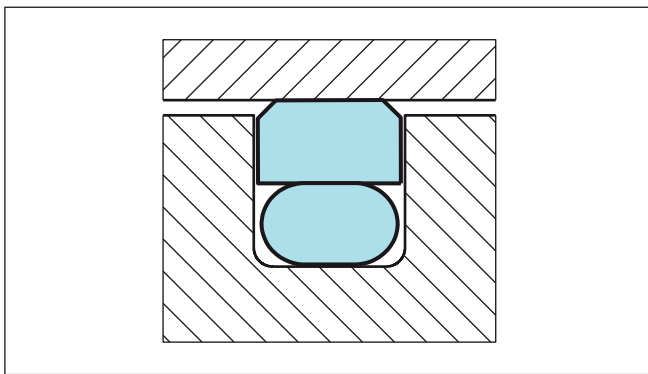


Figure 12 Turcon® Glyd Ring®

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

Notches

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

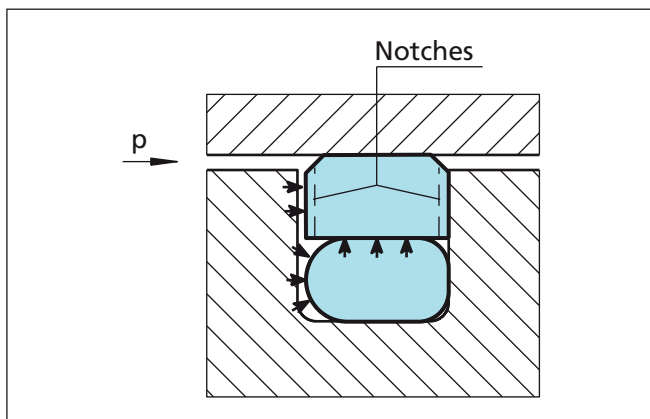


Figure 13 Turcon® Glyd Ring® with notches

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

Advantages

- No stick-slip effect when starting for smooth operation
- Minimum static and dynamic friction coefficient 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
- 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 new environmentally safe hydraulic fluids
- Available for all cylinder diameters up to 2.700 mm.

Application Examples

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

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



Technical Data

Operating conditions:

The Turcon® Glyd Ring® is recommended for reciprocating (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 safe hydraulic fluids (bio-oils), phosphate ester, water and others, depending on the seal and O-Ring material compatibility (see Table X)

Clearance: The maximum permissible radial clearance S_{max} is shown in the Table XI 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 dependent on medium.

*) In the case of unpressurized applications in temperatures below 0°C please contact our application engineers for assistance!

Materials

The following material combinations have proven effective for hydraulic applications:

For light to heavy applications with reciprocating movements in mineral oils and other media with good lubrication:

All round material for hydraulic applications with reciprocating, short stroke or helical movements in mineral oils, flame retardant hydraulic fluids HFC, phosphate ester, bio-oils or fluids having less satisfactory lubricating properties:

Turcon® Glyd Ring®: Turcon® M12

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

Set code: M12N or M12V

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

Turcon® Glyd Ring®: Turcon® T46

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 viable material combinations are listed in Table IX.



Table IX 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 No wear or abrasion of counter surface Mineral fibre and Additives filled Colour: Dark grey	M12	NBR - 70	N	-30 to +100	Steel Steel hardened Steel chrome plated (rod) Steel plated (rod) Cast iron Stainless steel Titanium	50
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
Turcon® T05 For lubricating fluids Also for gas service Very low friction Very good sliding and sealing properties Colour: Turquoise	T05	NBR - 70	N	-30 to +100	Steel hardened Steel chrome plated (rod)	20
		NBR - 70 Low temp.	T	-45 to +80		
		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 Colour: Light to dark brown, which may have variations in shading	T08	NBR - 70	N	-30 to +100	Steel hardened Steel chrome plated (rod) Cast iron	60
		NBR - 70 Low temp.	T	-45 to +80		
		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 Colour: Black	T10	NBR - 70	N	-30 to +100	Steel Steel hardened Steel chrome plated (rod) Stainless steel	40
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
		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 fibre filled Colour: Grey	T29	NBR - 70	N	-30 to +100	Steel Steel hardened Steel chrome plated (rod) Cast iron Stainless steel	30
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
		EPDM- 70	E**	-45 to +145		
Turcon® T40 For lubricating and non-lubricating fluids High frequency and short strokes Water hydraulics Surface texture is not suitable for gas sealing Carbon fibre filled Colour: Grey	T40	NBR - 70	N	-30 to +100	Steel Steel hardened Steel chrome plated (rod) Cast iron Stainless steel Aluminium	25
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
		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. Ø 2300 mm BAM: Tested by "Bundesanstalt Materialprüfung, Germany". Highlighted materials are standard.



Turcon® Glyd Ring®

Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp. * °C	Mating Surface Material	MPa max. Dynamic
Turcon® T46 For lubricated hydraulics in linear motion High compressive strength High extrusion resistance Very good sliding and wear properties BAM tested Bronze filled Colour: Light to dark brown, which may have variations in shading	T46	NBR - 70	N	-30 to +100	Steel hardened Steel chrome plated (rod) Cast iron	50
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
Zurcon® Z51*** 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 Colour: Yellow to light-brown	Z51	NBR - 70	N	-30 to +100	Steel Steel hardened Steel chrome plated (rod) Cast iron Stainless steel Ceramic coating	60
		NBR - 70 Low temp.	T	-45 to +80		
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 media with particles Good chemical resistance Limited temperature capability (-60 to +80 °C) UHMWPE (Ultra High Molecular Weight Polyethylene) Colour: White to off-white	Z80	NBR - 70	N	-30 to (+100)	Steel Steel hardened Steel chrome plated (rod) Stainless steel Aluminium Ceramic coating	35
		NBR - 70 Low temp.	T	-45 to +80		
		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. Ø 2300 mm BAM: Tested by "Bundesanstalt Materialprüfung, Germany". Highlighted materials are standard.

■ Installation Recommendation

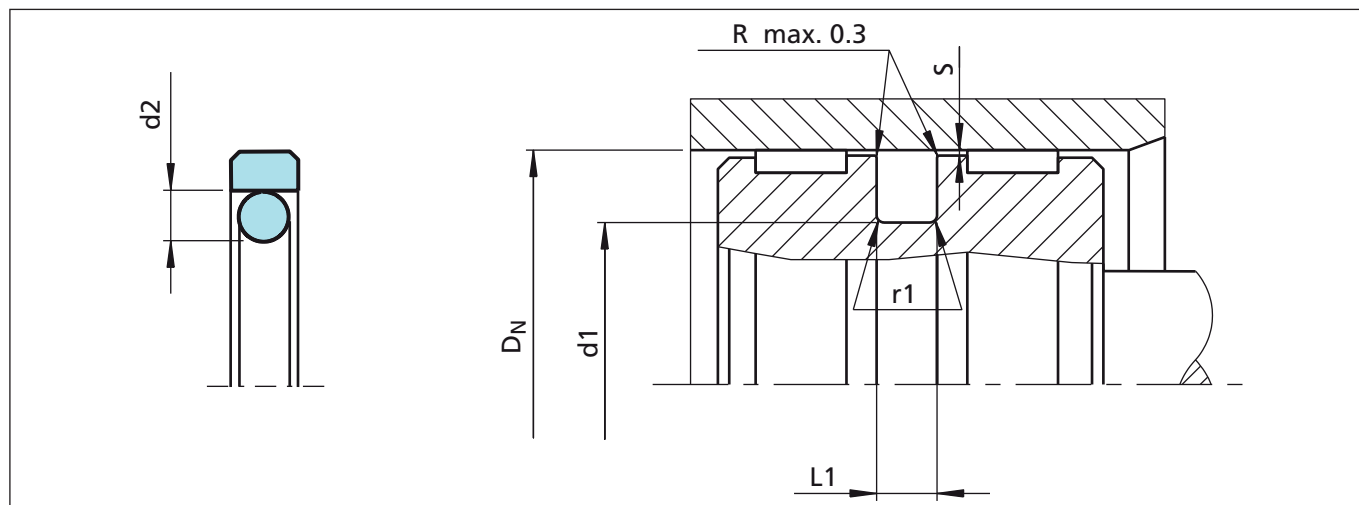


Figure 14 Installation drawing

Table X Installation dimensions

Bore Diameter D _N H9			Groove Diameter	Groove Width	Radius	Radial Clearance S max.*			O-Ring Cross-Section
Series No. PG 44	Series No. PG 46	Series No. PG 42							
Standard Application	Light Application	Heavy Duty Application	d ₁ h9	L ₁ +0.2	r ₁	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	-	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	≥ 1000	330 - 669.9	D _N - 28.0	9.5	2.5	0.70	0.50	0.30	8.40
≥ 1000	≥ 1000	≥ 1000	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 area of the seal or consult TSS for alternative material or profiles. TSS Slydring® / Wear Rings are not applicable at very small radial clearance S . Please consult the Slydring® catalog. O-Rings with 12 mm cross section are delivered as special profiling.



Turcon® Glyd Ring®

Ordering Example

Turcon® Glyd Ring®, complete with O-Ring, standard application, Series PG44 (from Table X).

Bore diameter: $D_N = 80.0 \text{ mm}$

TSS Part No.: PG4400800 (from Table XI)

Select the material from Table IX. The corresponding code numbers are appended to the TSS Part No. Preferred Series (Table XI).

Together they form the TSS Article Number. The TSS Article Number for all intermediate sizes not shown in Preferred Series (Table XI) can be determined following the example opposite.

TSS Article No.	PG44	0	0800	-	M12	N
TSS Series No.						
Type (Standard)						
Bore diameter x 10*						
Quality Index (Standard)						
Material code (Seal ring)						
Material code (O-Ring)						

* For diameters $D_N \geq 1000.0 \text{ mm}$ multiply only by factor 1.

Example: PG44 for diameter $D_N 1200.0 \text{ mm}$.

TSS Article No.: PG44X1200 - M12N.

Table XI Installation dimensions / TSS Part No.

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
$D_N \text{ H9}$	$d_1 \text{ h9}$	$L_1 +0.2$		
8.0	3.1	2.2	PG4400080	2.90 x 1.78
10.0	5.1	2.2	PG4400100	4.80 x 1.8
12.0	7.1	2.2	PG4400120	6.70 x 1.8
14.0	9.1	2.2	PG4400140	8.75 x 1.8
15.0	7.5	3.2	PG4400150	7.59 x 2.62
16.0	11.1	2.2	PG4600160	10.82 x 1.78
16.0	8.5	3.2	PG4400160	7.59 x 2.62
18.0	13.1	2.2	PG4600180	12.42 x 1.78
18.0	10.5	3.2	PG4400180	9.19 x 2.62
19.05	11.55	3.2	PG4400190	10.77 x 2.62
20.0	15.1	2.2	PG4600200	14.00 x 1.78
20.0	12.5	3.2	PG4400200	12.37 x 2.62
21.0	13.5	3.2	PG4400210	12.37 x 2.62
22.0	17.1	2.2	PG4600220	17.17 x 1.78
22.0	14.5	3.2	PG4400220	13.94 x 2.62
24.0	16.5	3.2	PG4400240	15.54 x 2.62
25.0	20.1	2.2	PG4600250	18.77 x 1.78
25.0	17.5	3.2	PG4400250	17.12 x 2.62
25.0	14.0	4.2	PG4200250	13.87 x 3.53
25.4	20.5	2.2	PG4600254	17.12 x 2.62
28.0	20.5	3.2	PG4400280	20.29 x 2.62
30.0	22.5	3.2	PG4400300	21.89 x 2.62
32.0	27.1	2.2	PG4600320	26.70 x 1.78
32.0	24.5	3.2	PG4400320	23.47 x 2.62
32.0	21.0	4.2	PG4200320	20.22 x 3.53
35.0	27.5	3.2	PG4400350	26.64 x 2.62
35.0	24.0	4.2	PG4200350	23.40 x 3.53

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
$D_N \text{ H9}$	$d_1 \text{ h9}$	$L_1 +0.2$		
36.0	28.5	3.2	PG4400360	28.24 x 2.62
38.0	30.5	3.2	PG4400380	29.82 x 2.62
40.0	32.5	3.2	PG4600400	31.42 x 2.62
40.0	29.0	4.2	PG4400400	28.17 x 3.53
42.0	31.0	4.2	PG4400420	29.75 x 3.53
44.45	36.95	3.2	PG4600444	36.17 x 2.62
45.0	34.0	4.2	PG4400450	32.92 x 3.53
48.0	37.0	4.2	PG4400480	36.09 x 3.53
50.0	42.5	3.2	PG4600500	40.94 x 2.62
50.0	39.0	4.2	PG4400500	37.70 x 3.53
50.0	34.5	6.3	PG4200500	32.69 x 5.33
50.8	43.3	3.2	PG4600508	42.52 x 2.62
50.8	39.8	4.2	PG4400508	37.70 x 3.53
52.0	41.0	4.2	PG4400520	40.87 x 3.53
53.0	42.0	4.2	PG4400530	40.87 x 3.53
55.0	44.0	4.2	PG4400550	44.04 x 3.53
57.0	46.0	4.2	PG4400570	44.04 x 3.53
58.0	47.0	4.2	PG4400580	47.22 x 3.53
60.0	49.0	4.2	PG4400600	47.22 x 3.53
62.0	51.0	4.2	PG4400620	50.39 x 3.53
63.0	52.0	4.2	PG4400630	50.39 x 3.53
63.0	47.5	6.3	PG4200630	46.99 x 5.33
65.0	54.0	4.2	PG4400650	53.57 x 3.53
68.0	57.0	4.2	PG4400680	56.74 x 3.53
70.0	59.0	4.2	PG4400700	56.74 x 3.53
70.0	54.5	6.3	PG4200700	53.34 x 5.33
75.0	64.0	4.2	PG4400750	63.09 x 3.53



Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
D _N H9	d ₁ h9	L ₁ +0.2		
75.0	59.5	6.3	PG4200750	56.52 x 5.33
80.0	69.0	4.2	PG4600800	66.27 x 3.53
80.0	64.5	6.3	PG4400800	62.87 x 5.33
80.0	59.0	8.1	PG4200800	58 x 7.0
82.5	67.0	6.3	PG4400825	66.04 x 5.33
85.0	69.5	6.3	PG4400850	69.22 x 5.33
85.0	64.0	8.1	PG4200850	63 x 7.0
90.0	79.0	4.2	PG4600900	78.97 x 3.53
90.0	74.5	6.3	PG4400900	72.39 x 5.33
90.0	69.0	8.1	PG4200900	68 x 7.0
95.0	84.0	4.2	PG4600950	82.14 x 3.53
95.0	79.5	6.3	PG4400950	78.74 x 5.33
95.0	74.0	8.1	PG4200950	73 x 7.0
100.0	89.0	4.2	PG4601000	88.49 x 3.53
100.0	84.5	6.3	PG4401000	81.92 x 5.33
100.0	79.0	8.1	PG4201000	78 x 7.0
101.6	86.1	6.3	PG4401016	85.09 x 5.33
105.0	94.0	4.2	PG4601050	91.67 x 3.53
105.0	89.5	6.3	PG4401050	88.27 x 5.33
108.0	92.5	6.3	PG4401080	91.44 x 5.33
110.0	99.0	4.2	PG4601100	98.02 x 3.53
110.0	94.5	6.3	PG4401100	91.44 x 5.33
110.0	89.0	8.1	PG4201100	88 x 7.0
115.0	99.5	6.3	PG4401150	97.79 x 5.33
120.0	109.0	4.2	PG4601200	107.54 x 3.53
120.0	104.5	6.3	PG4401200	100.97 x 5.33
120.0	99.0	8.1	PG4201200	98 x 7.0
125.0	114.0	4.2	PG4601250	113.89 x 3.53
125.0	109.5	6.3	PG4401250	107.32 x 5.33
125.0	104.0	8.1	PG4201250	103 x 7.0
127.0	111.5	6.3	PG4401270	110.49 x 5.33
130.0	114.5	6.3	PG4401300	113.67 x 5.33
130.0	109.0	8.1	PG4201300	108 x 7.0
132.0	121.0	4.2	PG4601320	120.24 x 3.53
135.0	114.0	8.1	PG4401350	113.67 x 7.0
140.0	124.5	6.3	PG4601400	123.19 x 5.33
140.0	119.0	8.1	PG4401400	116.84 x 7.0
145.0	129.5	6.3	PG4601450	126.37 x 5.33
145.0	124.0	8.1	PG4401450	123.19 x 7.0

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
D _N H9	d ₁ h9	L ₁ +0.2		
150.0	134.5	6.3	PG4601500	132.72 x 5.33
150.0	129.0	8.1	PG4401500	126.37 x 7.0
155.0	134.0	8.1	PG4401550	132.72 x 7.0
160.0	144.5	6.3	PG4601600	142.24 x 5.33
160.0	139.0	8.1	PG4401600	135.89 x 7.0
165.0	144.0	8.1	PG4401650	142.24 x 7.0
170.0	149.0	8.1	PG4401700	145.42 x 7.0
175.0	154.0	8.1	PG4401750	151.77 x 7.0
180.0	164.5	6.3	PG4601800	164.47 x 5.33
180.0	159.0	8.1	PG4401800	158.12 x 7.0
190.0	169.0	8.1	PG4401900	164.47 x 7.0
194.0	178.5	6.3	PG4601940	177.17 x 5.33
200.0	184.5	6.3	PG4602000	183.52 x 5.33
200.0	179.0	8.1	PG4402000	177.17 x 7.0
205.0	184.0	8.1	PG4402050	183.52 x 7.0
210.0	189.0	8.1	PG4402100	183.52 x 7.0
215.0	194.0	8.1	PG4402150	189.87 x 7.0
220.0	199.0	8.1	PG4402200	196.22 x 7.0
230.0	214.5	6.3	PG4602300	208.92 x 5.33
230.0	209.0	8.1	PG4402300	208.90 x 7.0
240.0	219.0	8.1	PG4402400	215.27 x 7.0
250.0	229.0	8.1	PG4402500	227.97 x 7.0
250.0	225.5	8.1	PG4202500	215.27 x 7.0
250.0	234.5	6.3	PG4602500	234.32 x 5.33
254.0	233.0	8.1	PG4402540	227.97 x 7.0
260.0	239.0	8.1	PG4402600	240.67 x 7.0
265.0	244.0	8.1	PG4402650	240.67 x 7.0
268.0	247.0	8.1	PG4402680	240.67 x 7.0
270.0	249.0	8.1	PG4402700	240.67 x 7.0
280.0	259.0	8.1	PG4402800	253.37 x 7.0
290.0	269.0	8.1	PG4402900	266.07 x 7.0
300.0	279.0	8.1	PG4403000	278.77 x 7.0
300.0	275.5	8.1	PG4203000	266.07 x 7.0
304.8	283.8	8.1	PG4403048	278.77 x 7.0
310.0	289.0	8.1	PG4403100	278.77 x 7.0
320.0	299.0	8.1	PG4403200	291.47 x 7.0
320.0	295.5	8.1	PG4203200	291.47 x 7.0
330.0	305.5	8.1	PG4403300	304.17 x 7.0
340.0	315.5	8.1	PG4403400	316.87 x 7.0



Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
$D_N H9$	$d_1 h9$	$L_1 +0.2$		
350.0	325.5	8.1	PG4403500	316.87 x 7.0
360.0	335.5	8.1	PG4403600	329.57 x 7.0
370.0	345.5	8.1	PG4403700	342.27 x 7.0
380.0	355.5	8.1	PG4403800	354.97 x 7.0
400.0	375.5	8.1	PG4404000	367.67 x 7.0
420.0	395.5	8.1	PG4404200	393.07 x 7.0
430.0	405.5	8.1	PG4404300	405.26 x 7.0
440.0	415.5	8.1	PG4404400	405.26 x 7.0
450.0	425.5	8.1	PG4404500	417.96 x 7.0
460.0	435.5	8.1	PG4404600	430.66 x 7.0
480.0	455.5	8.1	PG4404800	456.06 x 7.0
500.0	475.5	8.1	PG4405000	468.76 x 7.0
555.0	530.5	8.1	PG4405550	506.86 x 7.0
600.0	575.5	8.1	PG4406000	557.66 x 7.0
640.0	615.5	8.1	PG4406400	608.08 x 7.0
660.0	635.5	8.1	PG4406600	633.48 x 7.0
700.0	672.0	9.5	PG4407000	670 x 8.4
710.0	682.0	9.5	PG4407100	680 x 8.4
740.0	712.0	9.5	PG4407400	710 x 8.4
780.0	752.0	9.5	PG4407800	750 x 8.4
800.0	772.0	9.5	PG4408000	770 x 8.4
900.0	872.0	9.5	PG4409000	870 x 8.4
1000.0	972.0	9.5	PG46X1000	970 x 8.4
1000.0	962.0	13.8	PG44X1000	960 x 12.0
1050.0	1022.0	9.5	PG46X1050	1020 x 8.4
1065.0	1027.0	13.8	PG44X1065	1025 x 12.0
1070.0	1032.0	13.8	PG44X1070	1030 x 12.0
1200.0	1172.0	9.5	PG46X1200	1170 x 8.4
1200.0	1162.0	13.8	PG44X1200	1160 x 12.0
1225.0	1187.0	13.8	PG44X1225	1185 x 12.0
1500.0	1462.0	13.8	PG44X1500	1460 x 12.0
2000.0	1962.0	13.8	PG44X2000	1960 x 12.0
2700.0	2662.0	13.8	PG44X2700	2660 x 12.0

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 2700 mm dia. including inch sizes can be supplied.

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

Turcon[®] Glyd Ring[®] T



Double Acting

Rubber Energized Plastic Faced Seal

Material:

Turcon[®], Zurcon[®] and Elastomer



■ Turcon® Glyd Ring® T*



Description

Turcon® Glyd Ring® T is a further technical development of the Turcon® Glyd Ring® seal which has been successfully used for decades. It is fully interchangeable with the earlier Glyd Ring® seals in all new applications. Glyd Ring® T meets all the market demands for a function-specific seal solution, observing economic and ecological aspects.

The benefits of the patented seal concept are provided by the innovative functional principle of the trapezoidal profile cross-section.

Both lateral profile flanks are inclined so that the seal profile tapers towards the seal surface. The profile can thus retain the robust and compact form typical of piston seals without losing any of the flexibility required to achieve a pressure-related maximum compression (Figure 15).

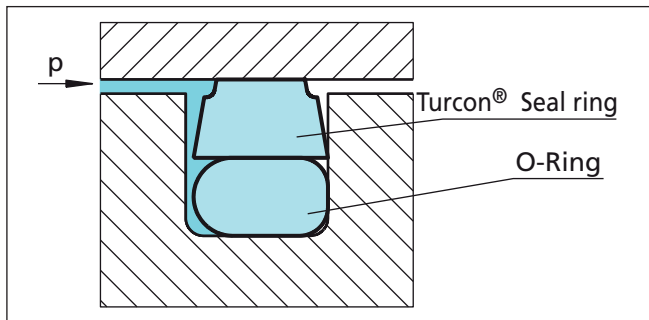


Figure 15 Turcon® Glyd Ring® T

The edge angle created by the special Glyd Ring® T crosssectional form permits an additional degree of freedom and enables a slight tilting movement of the seal. The maximum compression is thus always shifted towards the area of the seal edge directly exposed to the pressure. On the low-pressure edge of the seal, on the other hand, the Glyd Ring® T exhibits only zones with neutral strains without compressive or shearing loads, thus effectively reducing the danger of gap extrusion. The resulting benefits for the user can be seen in the following list.

Advantages

The benefits offered to date by the Glyd Ring® are still retained in full, and are now complemented by a number of further important advantages:

- Very good static leak-tightness
- Increased clearance possible (approx. +50%), depending on the operating conditions
- Due to the larger extrusion gap, safe use even with soiled media
- Low friction, no stick-slip effect

- Simple groove design, one-piece pistons possible
- Installation grooves to ISO 7425/1
- Adaptable to the operating conditions due to a wide range of possible materials (Turcon®, Zurcon®)
- Suitable for new environmentally safe hydraulic fluids
- Available for all cylinder diameters up to 2.700 mm.

Application Examples

The Turcon® Glyd Ring® T is the recommended sealing element for double acting pistons of hydraulic components such as:

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

It is particularly recommended for heavy duty and large diameter applications.

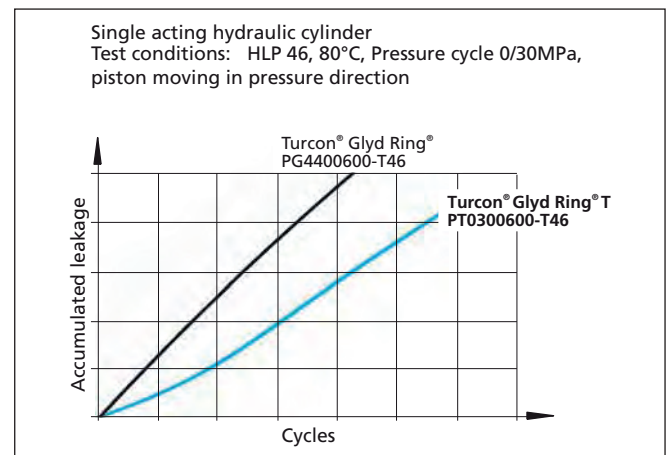


Figure 16 Dynamic leakage Turcon® Glyd Ring® T/ Turcon® Glyd Ring® as single acting piston seal

* Patent No.:
DE 4140833C3
EP 0582593
Japan 2799367
USA 5,433,452



Turcon® Glyd Ring® T

Technical Data

Operating conditions

Pressure:	Up to 60 MPa
Speed:	Up to 15 m/s
Temperature:	-45 °C to +200 °C *) (depending on O-Ring material).
Media:	Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids, environmentally safe hydraulic fluids (bio-oils), phosphate ester, water, air and others, depending on the seal and O-Ring material compatibility (see Table XIII)
Clearance:	The maximum permissible radial clearance s_{max} is shown in Table XIV, 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 dependent on medium.

*) In the case of unpressurized applications in temperatures below 0°C please contact our application engineers for assistance!

Materials

The following material combinations have proven effective for hydraulic applications:

All round material for hydraulic applications with reciprocating or short stroke in mineral oils, flame retardant hydraulic fluids HFC, phosphate ester, bio-oils or fluids having less satisfactory properties.

Turcon® Glyd Ring® T:	Turcon® M12
O-Ring:	NBR, 70 Shore A N FKM, 70 Shore A V
Set code:	M12N or M12V

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

Turcon® Glyd Ring® T:	Turcon® T46
O-Ring:	NBR, 70 Shore A N FKM, 70 Shore A V
Set code:	T46N or T46V

For specific applications, other viable material combinations are listed in Table XIII.

Series

Different cross-section sizes are recommended as a function of the seal diameters.

Table XII, shows the relationship between the series number according to the seal diameter range and the different application class sizes. These application classes are:

Standard application:	General applications in which no exceptional operating conditions exist.
Light application:	Applications with demands for reduced friction or for smaller grooves.
Heavy-duty application:	For exceptional operating loads such as high pressures, pressure peaks, etc.

Table XII Available range

Series No.	Piston Diameter D_N H9
PT00	8.0 - 140.0
PT01	8.0 - 200.0
PT02	16.0 - 380.0
PT03	40.0 - 480.0
PT04	80.0 - 700.0
PT08	133.0 - 999.9
PT05	310.0 - 999.9
PT05X	1000.0 - 1200.0
PT06	750.0 - 999.9
PT06X	1000.0 - 2700.0

For the recommended range see Table XIV.



Table XIII Turcon® and Zurcon® Materials for Glyd Ring® T

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 No wear or abrasion of counter surface Mineral fibre and Additives filled Colour: Dark grey	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	Steel chrome plated (rod) Steel plated (rod) Cast iron Stainless steel Titanium	
Turcon® T40 For lubricating and non-lubricating fluids High frequency and short strokes Water hydraulics Surface texture is not suitable for gas sealing Carbon fibre filled Colour: Grey	T40	NBR - 70	N	-30 to +100	Steel	25
		NBR - 70 Low temp.	T	-45 to +80	Steel hardened	
		FKM - 70	V	-10 to +200	Steel chrome plated (rod) Cast iron	
		EPDM - 70	E**	-45 to +145	Stainless steel Aluminium	
Turcon® T46 For lubricated hydraulics in linear motion High compressive strength High extrusion resistance Very good sliding and wear properties BAM tested Bronze filled Colour: Light to dark brown, which may have variations in shading	T46	NBR - 70	N	-30 to +100	Steel hardened	50
		NBR - 70 Low temp.70	T	-45 to +80	Steel chrome plated (rod) Cast iron	
		FKM - 70	V	-10 to +200		
Zurcon® Z51*** 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 Colour: Yellow to light-brown	Z51	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 media with particles Good chemical resistance Limited temperature capability (-60 to +80 °C) UHMWPE (Ultra High Molecular Weight Polyethylene) Colour: White to off-white	Z80	NBR - 70	N	-30 to (+100)	Steel	35
		NBR - 70 Low temp.	T	-45 to +80	Steel hardened Steel chrome plated (rod) Stainless steel	
		EPDM- 70	E**	-45 to(+145)	Aluminium Ceramic coating	

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

*** max. Ø 2300 mm

BAM: Tested by "Bundesanstalt Materialprüfung, Germany".

** Material not suitable for mineral oils.

Highlighted materials are standard.



■ Installation Recommendation

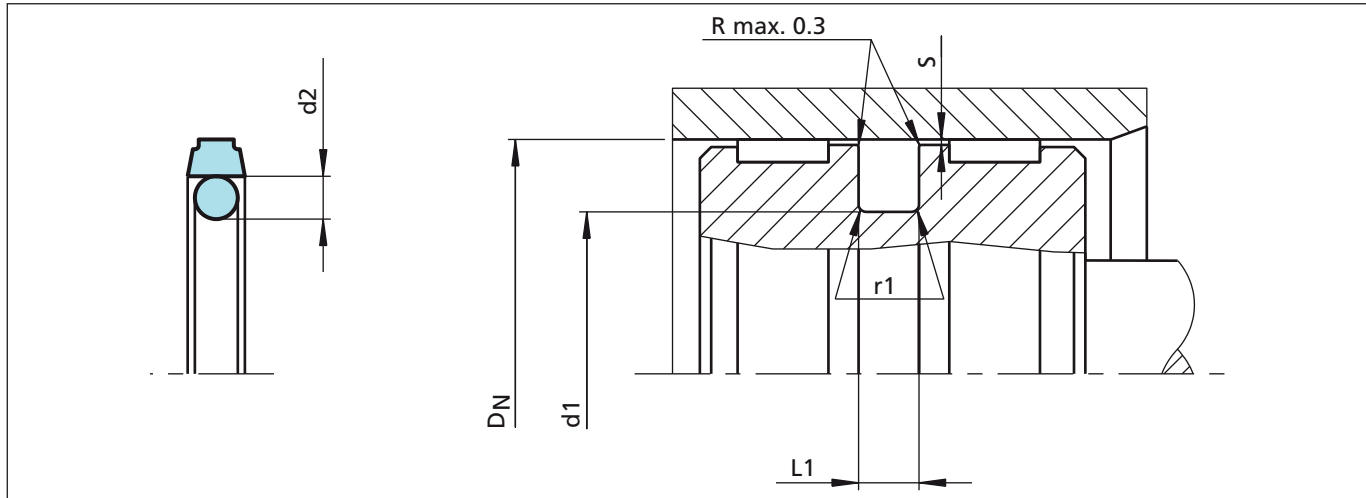


Figure 17 Installation drawing

Table XIV Installation Dimensions – Standard recommendations

Series-No.	Bore Diameter D_N H9			Groove Diameter	Groove Width	Radius	Radial Clearance S max.*			O-Ring Cross-Sec.
	Standard Application	Light Application	Heavy Duty Application	d_1 h9	$L_1 + 0.2$	r_1	10 MPa	20 MPa	40 MPa	d_2
PT00	8 - 14.9	15 - 39.9	--	$D_N - 4.9$	2.2	0.4	0.40	0.30	0.20	1.78
PT01	15 - 39.9	40 - 79.9	--	$D_N - 7.5$	3.2	0.6	0.60	0.50	0.30	2.62
PT02	40 - 79.9	80 - 132.9	15 - 39.9	$D_N - 11.0$	4.2	1.0	0.70	0.50	0.30	3.53
PT03	80 - 132.9	133 - 329.9	40 - 79.9	$D_N - 15.5$	6.3	1.3	0.80	0.60	0.40	5.33
PT04	133 - 329.9	330 - 669.9	80 - 132.9	$D_N - 21.0$	8.1	1.8	0.80	0.60	0.40	7.00
PT08	330 - 669.9	670 - 999.9	133 - 329.9	$D_N - 24.5$	8.1	1.8	0.90	0.70	0.50	7.00
PT05	670 - 999.9	--	310 - 669.9	$D_N - 28.0$	9.5	2.5	1.00	0.80	0.60	8.40
PT05X	--	1000 - 1200	--	$D_N - 28.0$	9.5	2.5	1.00	0.80	0.60	8.40
PT06**	--	--	670 - 999.9	$D_N - 38.0$	13.8	3.0	1.20	0.90	0.70	12.00
PT06X**	1000 - 2700	--	--	$D_N - 38.0$	13.8	3.0	1.20	0.90	0.70	12.00

* At pressures > 40 MPa use diameter tolerance H8/f8 (bore/piston) in area of the seal or consult TSS for alternative material or profiles.
TSS Slydring® / Wear Rings are not applicable at very small radial clearance S. Please consult the Slydring® catalog.

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



Ordering example

Turcon® Glyd Ring® T, complete with O-Ring, standard application, series PT03 (from Table XIV).

Bore diameter: $D_N = 80.0 \text{ mm}$

TSS Part No.: PT0300800 (from Table XV)

Select the material from Table XIII. The corresponding code numbers are appended to the TSS Part No. (from Table XV). Together they form the TSS Article No.

For all intermediate sizes not shown in Table XV, the TSS Article No. can be determined from the example opposite.

TSS Article No.	PT03	0	0800	-	M12	N
TSS Series No.						
Type (Standard)						
Cylinder diameter x 10***						
Quality Index (Standard)						
Material code (Seal ring)						
Material code (O-Ring)						

*** For diameters $\geq 1000.0 \text{ mm}$ multiply only by factor 1.

Example: PT06 for diameter 1200.0 mm.

TSS Article No.: PT06X1200 - M12N.

Table XV Installation dimensions / TSS Part No.

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
$D_N \text{ H9}$	$d1 \text{ h9}$	$L_1 +0.2$		
8.0	3.1	2.2	PT0000080	2.90 x 1.78
10.0	5.1	2.2	PT0000100	4.80 x 1.8
12.0	7.1	2.2	PT0000120	6.70 x 1.8
14.0	9.1	2.2	PT0000140	8.75 x 1.8
15.0	7.5	3.2	PT0100150	7.59 x 2.62
16.0	11.1	2.2	PT0000160	10.82 x 1.78
16.0	8.5	3.2	PT0100160	7.59 x 2.62
18.0	13.1	2.2	PT0000180	12.42 x 1.78
18.0	10.5	3.2	PT0100180	9.19 x 2.62
19.05	11.55	3.2	PT0100190	10.77 x 2.62
20.0	15.1	2.2	PT0000200	14.00 x 1.78
20.0	12.5	3.2	PT0100200	12.37 x 2.62
21.0	13.5	3.2	PT0100210	12.37 x 2.62
22.0	17.1	2.2	PT0000220	17.17 x 1.78
22.0	14.5	3.2	PT0100220	13.94 x 2.62
24.0	16.5	3.2	PT0100240	15.54 x 2.62
25.0	20.1	2.2	PT0000250	18.77 x 1.78
25.0	17.5	3.2	PT0100250	17.12 x 2.62
25.0	14.0	4.2	PT0200250	13.87 x 3.53
25.4	20.5	2.2	PT0000254	17.12 x 2.62
28.0	20.5	3.2	PT0100280	20.29 x 2.62
30.0	22.5	3.2	PT0100300	21.89 x 2.62
32.0	27.1	2.2	PT0000320	26.70 x 1.78
32.0	24.5	3.2	PT0100320	23.47 x 2.62

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
$D_N \text{ H9}$	$d1 \text{ h9}$	$L_1 +0.2$		
32.0	21.0	4.2	PT0200320	20.22 x 3.53
35.0	27.5	3.2	PT0100350	26.64 x 2.62
35.0	24.0	4.2	PT0200350	23.40 x 3.53
36.0	28.5	3.2	PT0100360	28.24 x 2.62
38.0	30.5	3.2	PT0100380	29.82 x 2.62
40.0	32.5	3.2	PT0100400	31.42 x 2.62
40.0	29.0	4.2	PT0200400	28.17 x 3.53
42.0	31.0	4.2	PT0200420	29.75 x 3.53
44.45	36.95	3.2	PT0100444	36.17 x 2.62
45.0	34.0	4.2	PT0200450	32.92 x 3.53
48.0	37.0	4.2	PT0200480	36.09 x 3.53
50.0	42.5	3.2	PT0100500	40.94 x 2.62
50.0	39.0	4.2	PT0200500	37.70 x 3.53
50.0	34.5	6.3	PT0300500	32.69 x 5.33
50.8	43.3	3.2	PT0100508	42.52 x 2.62
50.8	39.8	4.2	PT0200508	37.70 x 3.53
52.0	41.0	4.2	PT0200520	40.87 x 3.53
53.0	42.0	4.2	PT0200530	40.87 x 3.53
55.0	44.0	4.2	PT0200550	44.04 x 3.53
57.0	46.0	4.2	PT0200570	44.04 x 3.53
58.0	47.0	4.2	PT0200580	47.22 x 3.53
60.0	49.0	4.2	PT0200600	47.22 x 3.53
62.0	51.0	4.2	PT0200620	50.39 x 3.53
63.0	52.0	4.2	PT0200630	50.39 x 3.53



Turcon® Glyd Ring® T

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
D _N H9	d1 h9	L ₁ +0.2		
63.0	47.5	6.3	PT0300630	46.99 x 5.33
65.0	54.0	4.2	PT0200650	53.57 x 3.53
68.0	57.0	4.2	PT0200680	56.74 x 3.53
70.0	59.0	4.2	PT0200700	56.74 x 3.53
70.0	54.5	6.3	PT0300700	53.34 x 5.33
75.0	64.0	4.2	PT0200750	63.09 x 3.53
75.0	59.5	6.3	PT0300750	56.52 x 3.53
80.0	69.0	4.2	PT0200800	66.27 x 3.53
80.0	64.5	6.3	PT0300800	62.87 x 5.33
80.0	59.0	8.1	PT0400800	58 x 7.0
82.5	67.0	6.3	PT0300825	66.04 x 5.33
85.0	69.5	6.3	PT0300850	69.22 x 5.33
85.0	64.0	8.1	PT0400850	63 x 7.0
90.0	79.0	4.2	PT0200900	78.97 x 3.53
90.0	74.5	6.3	PT0300900	72.39 x 5.33
90.0	69.0	8.1	PT0400900	68 x 7.0
95.0	84.0	4.2	PT0200950	82.14 x 3.53
95.0	79.5	6.3	PT0300950	78.74 x 5.33
95.0	74.0	8.1	PT0400950	73 x 7.0
100.0	89.0	4.2	PT0201000	88.49 x 3.53
100.0	84.5	6.3	PT0301000	81.92 x 5.33
100.0	79.0	8.1	PT0401000	78 x 7.0
101.6	86.1	6.3	PT0301016	85.09 x 5.33
105.0	94.0	4.2	PT0201050	91.67 x 3.53
105.0	89.5	6.3	PT0301050	88.27 x 5.33
108.0	92.5	6.3	PT0301080	91.44 x 5.33
110.0	99.0	4.2	PT0201100	98.02 x 3.53
110.0	94.5	6.3	PT0301100	91.44 x 5.33
110.0	89.0	8.1	PT0401100	88 x 7.0
115.0	99.5	6.3	PT0301150	97.79 x 5.33
120.0	109.0	4.2	PT0201200	107.54 x 3.53
120.0	104.5	6.3	PT0301200	100.97 x 5.33
120.0	99.0	8.1	PT0401200	98 x 7.0
125.0	114.0	4.2	PT0201250	113.89 x 3.53
125.0	109.5	6.3	PT0301250	107.32 x 5.33
125.0	104.0	8.1	PT0401250	103 x 7.0

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
D _N H9	d1 h9	L ₁ +0.2		
127.0	111.5	6.3	PT0301270	110.49 x 5.33
130.0	114.5	6.3	PT0301300	113.67 x 5.33
130.0	109.0	8.1	PT0401300	108 x 7.0
132.0	121.0	4.2	PT0201320	120.24 x 3.53
135.0	114.0	8.1	PT0401350	113.67 x 7.0
140.0	124.5	6.3	PT0301400	123.19 x 5.33
140.0	119.0	8.1	PT0401400	116.84 x 7.0
145.0	129.5	6.3	PT0301450	126.37 x 5.33
145.0	124.0	8.1	PT0401450	123.19 x 7.0
150.0	134.5	6.3	PT0301500	132.72 x 5.33
150.0	129.0	8.1	PT0401500	126.37 x 7.0
155.0	134.0	8.1	PT0401550	132.72 x 7.0
160.0	144.5	6.3	PT0301600	142.24 x 5.33
160.0	139.0	8.1	PT0401600	135.89 x 7.0
165.0	144.0	8.1	PT0401650	142.24 x 7.0
170.0	149.0	8.1	PT0401700	145.42 x 7.0
175.0	154.0	8.1	PT0401750	151.77 x 7.0
180.0	164.5	6.3	PT0301800	164.47 x 5.33
180.0	159.0	8.1	PT0401800	158.12 x 7.0
190.0	169.0	8.1	PT0401900	164.47 x 7.0
194.0	178.5	6.3	PT0301940	177.17 x 5.33
200.0	184.5	6.3	PT0302000	183.52 x 5.33
200.0	179.0	8.1	PT0402000	177.17 x 7.0
205.0	184.0	8.1	PT0402050	183.52 x 7.0
210.0	189.0	8.1	PT0402100	183.52 x 7.0
215.0	194.0	8.1	PT0402150	189.87 x 7.0
220.0	199.0	8.1	PT0402200	196.22 x 7.0
230.0	214.5	6.3	PT0302300	208.92 x 5.33
230.0	209.0	8.1	PT0402300	208.92 x 7.0
240.0	219.0	8.1	PT0402400	215.27 x 7.0
250.0	229.0	8.1	PT0402500	227.97 x 7.0
250.0	225.5	8.1	PT0802500	215.27 x 7.0
250.0	134.5	6.3	PT0302500	234.32 x 5.33
254.0	233.0	8.1	PT0402540	227.97 x 7.0
260.0	239.0	8.1	PT0402600	240.67 x 7.0
265.0	244.0	8.1	PT0402650	240.67 x 7.0



Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
D _N H9	d1 h9	L ₁ +0.2		
268.0	247.0	8.1	PT0402680	240.67 x 7.0
270.0	249.0	8.1	PT0402700	240.67 x 7.0
280.0	259.0	8.1	PT0402800	253.37 x 7.0
290.0	269.0	8.1	PT0402900	266.07 x 7.0
300.0	279.0	8.1	PT0403000	278.77 x 7.0
300.0	275.5	8.1	PT0803000	266.07 x 7.0
304.8	283.8	8.1	PT0403048	278.77 x 7.0
310.0	289.0	8.1	PT0403100	278.77 x 7.0
320.0	299.0	8.1	PT0403200	291.47 x 7.0
320.0	295.5	8.1	PT0803200	291.47 x 7.0
330.0	305.5	8.1	PT0803300	304.17 x 7.0
340.0	315.5	8.1	PT0803400	316.87 x 7.0
350.0	325.5	8.1	PT0803500	316.87 x 7.0
360.0	335.5	8.1	PT0803600	329.57 x 7.0
370.0	345.5	8.1	PT0803700	342.27 x 7.0
380.0	355.5	8.1	PT0803800	354.97 x 7.0
400.0	375.5	8.1	PT0804000	367.67 x 7.0
420.0	395.5	8.1	PT0804200	393.07 x 7.0
430.0	405.5	8.1	PT0804300	405.26 x 7.0
440.0	415.5	8.1	PT0804400	405.26 x 7.0
450.0	425.5	8.1	PT0804500	417.96 x 7.0
460.0	435.5	8.1	PT0804600	430.66 x 7.0
480.0	455.5	8.1	PT0804800	456.06 x 7.0
500.0	475.5	8.1	PT0805000	468.76 x 7.0
555.0	530.5	8.1	PT0805550	506.86 x 7.0
600.0	575.5	8.1	PT0806000	557.66 x 7.0
640.0	615.5	8.1	PT0806400	608.08 x 7.0
660.0	635.5	8.1	PT0806600	633.48 x 7.0
700.0	672.0	9.5	PT0507000	670 x 8.4
710.0	682.0	9.5	PT0507100	680 x 8.4
740.0	712.0	9.5	PT0507400	710 x 8.4
780.0	752.0	9.5	PT0507800	750 x 8.4
800.0	772.0	9.5	PT0508000	770 x 8.4
900.0	872.0	9.5	PT0509000	870 x 8.4
1000.0	972.0	9.5	PT05X1000	970 x 8.4
1000.0	962.0	13.8	PT06X1000	960 x 12.0

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
D _N H9	d1 h9	L ₁ +0.2		
1050.0	1022.0	9.5	PT05X1050	1020 x 8.4
1065.0	1027.0	13.8	PT06X1065	1025 x 12.0
1070.0	1032.0	13.8	PT06X1070	1030 x 12.0
1200.0	1172.0	9.5	PT05X1200	1170 x 8.4
1200.0	1162.0	13.8	PT06X1200	1160 x 12.0
1225.0	1187.0	13.8	PT06X1225	1185 x 12.0
1500.0	1462.0	13.8	PT06X1500	1460 x 12.0
2000.0	1962.0	13.8	PT06X2000	1960 x 12.0
2700.0	2662.0	13.8	PT06X2700	2660 x 12.0

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 2700 mm dia. including inch sizes can be supplied.

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