

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 Turcon® Glyd Ring®. It is fully interchangeable with earlier Glyd Ring® seals in all new applications.

The main benefits of the patented seal are provided by the innovative functional principle of the trapezoidal profile cross section. The sides of 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 see Figure 106.

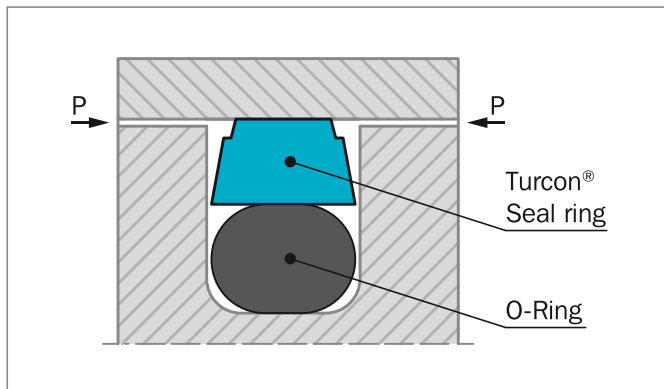


Figure 106: Turcon® Glyd Ring® T

The edge angle of Glyd Ring® T 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 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 are as follows:

ADVANTAGES

- Very good static sealing performance
- Increased clearance possible (approximately +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 as well as Stepseal® standard groove dimensions

- Adaptable to the operating conditions due to a wide range of materials (Turcon®, Zurcon®)
- Suitable for environmentally friendly hydraulic fluids
- Available for all cylinder diameters up to 2,700 mm.

APPLICATION EXAMPLES

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

- Injection molding 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.

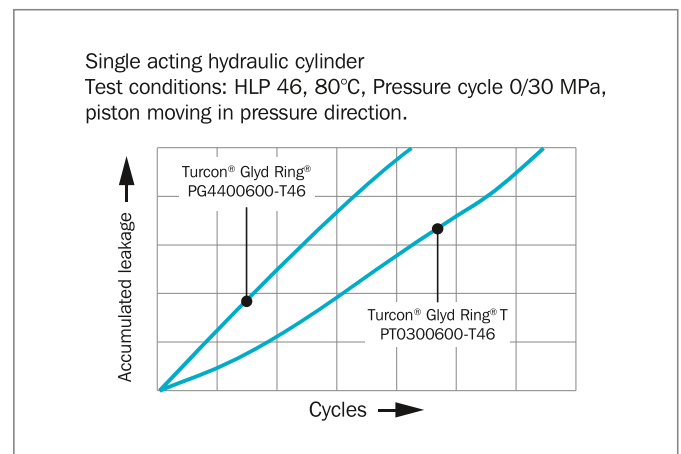


Figure 107: Dynamic leakage Turcon® Glyd Ring® T / Turcon® Glyd Ring® as single-acting piston seal

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



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 friendly hydraulic fluids (bio-oils), phosphate ester, water, air and others, depending on the seal and O-Ring material compatibility see Table 89.
Clearance:	The maximum permissible radial clearance S_{max} is shown in Table 90, 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!

SERIES

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

Table 90, shows the relationship between the series number according to the seal diameter range and the different application class sizes:

Standard application:	General applications without exceptional operating conditions.
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 88: 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	1,000.0 - 1,200.0
PT06	670.0 - 999.9
PT06X	1,000.0 - 2,700.0

For the recommended Standard Application range see Table 90.

INSTALLATION INSTRUCTIONS

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

Closed groove installation applies same dimensions as for Turcon® Glyd Ring® in Table 81 page 249.

RECOMMENDED MATERIALS

The following material combinations have proven effective for hydraulic applications:

Turcon® Glyd Ring® T in Turcon® M12

All round material for light to heavy hydraulic applications with linear or helical movements in mineral oils, flame retardant hydraulic fluids HFC, 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® T in Turcon® T46

For medium to heavy applications with linear movements in mineral oils and other media 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 89.

**Table 89: 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 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	40
		NBR 70 Low temp.	T	-45 to +80	Steel hardened Cast iron	
		FKM 70	V	-10 to +200	Stainless steel Titanium	
Turcon® T40 For lubricating and non-lubricating fluids 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	
		FKM 70	V	-10 to +200	Stainless steel Aluminum	
		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	50
		NBR 70 Low temp.	T	-45 to +80	Cast iron	
		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	

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
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) 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

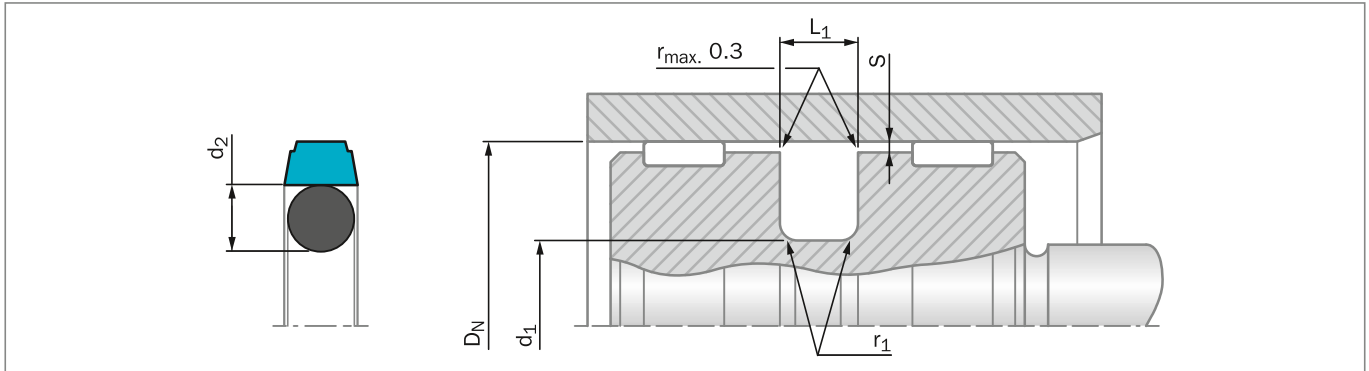


Figure 108: Installation Drawing

Table 90: Installation Dimensions – Standard Recommendations

Series No.	Bore Diameter D_N H9			Groove Diameter d_1 h9	Groove Width $L_1 + 0.2$	Radius r_1 max	Radial Clearance S_{max}^*			O-Ring Cross Section d_2
	Standard Application	Light Application	Heavy Duty Application				10 MPa	20 MPa	40 MPa	
PT00	8 - 15.9	16 - 39.9	-	$D_N - 4.9$	2.2	0.4	0.40	0.30	0.20	1.78
PT01	16 - 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	16 - 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	-	1,000 - 1,200	-	$D_N - 28.0$	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**	1,000 - 2,700	-	-	$D_N - 38.0$	13.8	3.0	1.20	0.90	0.70	12.00

* At pressures > 40 MPa use diameter tolerance H8/f8 (bore/piston) in 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

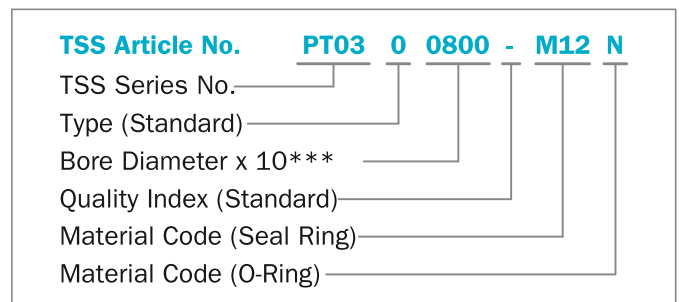
Turcon® Glyd Ring® T complete with O-Ring, standard application:

Series: PT03 from Table 90

Bore diameter: $D_N = 80.0$ mm

TSS Part No.: PT0300800 from Table 91

Select the material from Table 89. 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: PT06 for diameter $D_N = 1,200.0$ mm
 TSS Article No.: PT06X1200 - M12N



Table 91: Installation Dimensions / TSS Part No.

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions	Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
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	PT0000080	2.57 x 1.78	50.8	39.8	4.2	PT0200508	37.69 x 3.53
10.0	5.1	2.2	PT0000100	4.47 x 1.78	52.0	41.0	4.2	PT0200520	40.87 x 3.53
12.0	7.1	2.2	PT0000120	6.70 x 1.80	53.0	42.0	4.2	PT0200530	40.87 x 3.53
14.0	9.1	2.2	PT0000140	8.75 x 1.80	55.0	44.0	4.2	PT0200550	44.04 x 3.53
15.0	7.5	3.2	PT0100150	6.98 x 2.62	57.0	46.0	4.2	PT0200570	44.04 x 3.53
15.8	10.9	2.2	PT0000158	10.60 x 1.80	58.0	47.0	4.2	PT0200580	47.22 x 3.53
16.0	11.1	2.2	PT0000160	10.60 x 1.80	60.0	49.0	4.2	PT0200600	47.22 x 3.53
16.0	8.5	3.2	PT0100160	7.59 x 2.62	62.0	51.0	4.2	PT0200620	50.39 x 3.53
18.0	13.1	2.2	PT0000180	12.42 x 1.78	63.0	52.0	4.2	PT0200630	50.39 x 3.53
18.0	10.5	3.2	PT0100180	9.19 x 2.62	63.0	47.5	6.3	PT0300630	46.99 x 5.33
19.05	11.5	3.2	PT0100190	10.77 x 2.62	65.0	54.0	4.2	PT0200650	53.57 x 3.53
20.0	15.1	2.2	PT0000200	14.00 x 1.78	68.0	57.0	4.2	PT0200680	56.74 x 3.53
20.0	12.5	3.2	PT0100200	12.37 x 2.62	70.0	59.0	4.2	PT0200700	56.74 x 3.53
21.0	13.5	3.2	PT0100210	12.37 x 2.62	70.0	54.5	6.3	PT0300700	53.34 x 5.33
22.0	17.1	2.2	PT0000220	17.17 x 1.78	75.0	64.0	4.2	PT0200750	63.09 x 3.53
22.0	14.5	3.2	PT0100220	13.94 x 2.62	75.0	59.5	6.3	PT0300750	56.52 x 5.33
24.0	16.5	3.2	PT0100240	15.54 x 2.62	80.0	69.0	4.2	PT0200800	66.27 x 3.53
25.0	20.1	2.2	PT0000250	19.00 x 1.80	80.0	64.5	6.3	PT0300800	62.87 x 5.33
25.0	17.5	3.2	PT0100250	17.12 x 2.62	80.0	59.0	8.1	PT0400800	58.00 x 7.00
25.0	14.0	4.2	PT0200250	13.87 x 3.53	82.5	67.0	6.3	PT0300825	66.04 x 5.33
25.4	20.5	2.2	PT0000254	20.35 x 1.78	85.0	69.5	6.3	PT0300850	69.22 x 5.33
28.0	20.5	3.2	PT0100280	20.29 x 2.62	85.0	64.0	8.1	PT0400850	63.00 x 7.00
30.0	22.5	3.2	PT0100300	21.89 x 2.62	90.0	79.0	4.2	PT0200900	78.97 x 3.53
32.0	27.1	2.2	PT0000320	26.70 x 1.78	90.0	74.5	6.3	PT0300900	72.39 x 5.33
32.0	24.5	3.2	PT0100320	23.47 x 2.62	90.0	69.0	8.1	PT0400900	68.00 x 7.00
32.0	21.0	4.2	PT0200320	20.22 x 3.53	95.0	84.0	4.2	PT0200950	82.14 x 3.53
35.0	27.5	3.2	PT0100350	26.64 x 2.62	95.0	79.5	6.3	PT0300950	78.74 x 5.33
35.0	24.0	4.2	PT0200350	23.40 x 3.53	95.0	74.0	8.1	PT0400950	73.00 x 7.00
36.0	28.5	3.2	PT0100360	28.24 x 2.62	100.0	89.0	4.2	PT0201000	88.49 x 3.53
38.0	30.5	3.2	PT0100380	29.82 x 2.62	100.0	84.5	6.3	PT0301000	81.92 x 5.33
40.0	32.5	3.2	PT0100400	31.42 x 2.62	100.0	79.0	8.1	PT0401000	78.00 x 7.00
40.0	29.0	4.2	PT0200400	28.17 x 3.53	101.6	86.1	6.3	PT0301016	85.09 x 5.33
42.0	31.0	4.2	PT0200420	29.75 x 3.53	105.0	94.0	4.2	PT0201050	91.67 x 3.53
44.45	36.95	3.2	PT0100444	36.17 x 2.62	105.0	89.5	6.3	PT0301050	88.27 x 5.33
45.0	34.0	4.2	PT0200450	32.92 x 3.53	108.0	92.5	6.3	PT0301080	91.44 x 5.33
48.0	37.0	4.2	PT0200480	36.09 x 3.53	110.0	99.0	4.2	PT0201100	98.02 x 3.53
50.0	42.5	3.2	PT0100500	40.94 x 2.62	110.0	94.5	6.3	PT0301100	91.44 x 5.33
50.0	39.0	4.2	PT0200500	37.69 x 3.53	110.0	89.0	8.1	PT0401100	88.00 x 7.00
50.0	34.5	6.3	PT0300500	32.69 x 5.33	115.0	99.5	6.3	PT0301150	97.79 x 5.33
50.8	43.3	3.2	PT0100508	42.52 x 2.62	120.0	109.0	4.2	PT0201200	107.54 x 3.53



Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions	Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
D_N H9	d_1 h9	L_1 +0.2			D_N H9	d_1 h9	L_1 +0.2		
120.0	104.5	6.3	PT0301200	100.97 x 5.33	265.0	244.0	8.1	PT0402650	240.67 x 7.00
120.0	99.0	8.1	PT0401200	98.00 x 7.00	268.0	247.0	8.1	PT0402680	240.67 x 7.00
125.0	114.0	4.2	PT0201250	113.89 x 3.53	270.0	249.0	8.1	PT0402700	240.67 x 7.00
125.0	109.5	6.3	PT0301250	107.32 x 5.33	280.0	259.0	8.1	PT0402800	253.37 x 7.00
125.0	104.0	8.1	PT0401250	103.00 x 7.00	290.0	269.0	8.1	PT0402900	266.07 x 7.00
127.0	111.5	6.3	PT0301270	110.49 x 5.33	300.0	279.0	8.1	PT0403000	278.77 x 7.00
130.0	114.5	6.3	PT0301300	113.67 x 5.33	300.0	275.5	8.1	PT0803000	266.07 x 7.00
130.0	109.0	8.1	PT0401300	108.00 x 7.00	304.8	283.8	8.1	PT0403048	278.77 x 7.00
132.0	121.0	4.2	PT0201320	120.24 x 3.53	310.0	289.0	8.1	PT0403100	278.77 x 7.00
135.0	114.0	8.1	PT0401350	113.67 x 7.00	320.0	299.0	8.1	PT0403200	291.47 x 7.00
140.0	124.5	6.3	PT0301400	123.19 x 5.33	320.0	295.5	8.1	PT0803200	291.47 x 7.00
140.0	119.0	8.1	PT0401400	116.84 x 7.00	330.0	305.5	8.1	PT0803300	304.17 x 7.00
145.0	129.5	6.3	PT0301450	126.37 x 5.33	340.0	315.5	8.1	PT0803400	316.87 x 7.00
145.0	124.0	8.1	PT0401450	123.19 x 7.00	350.0	325.5	8.1	PT0803500	316.87 x 7.00
150.0	134.5	6.3	PT0301500	132.72 x 5.33	360.0	335.5	8.1	PT0803600	329.57 x 7.00
150.0	129.0	8.1	PT0401500	126.37 x 7.00	370.0	345.5	8.1	PT0803700	342.27 x 7.00
155.0	134.0	8.1	PT0401550	132.72 x 7.00	380.0	355.5	8.1	PT0803800	354.97 x 7.00
160.0	144.5	6.3	PT0301600	142.24 x 5.33	400.0	375.5	8.1	PT0804000	367.67 x 7.00
160.0	139.0	8.1	PT0401600	135.89 x 7.00	420.0	395.5	8.1	PT0804200	393.07 x 7.00
165.0	144.0	8.1	PT0401650	142.24 x 7.00	430.0	405.5	8.1	PT0804300	405.26 x 7.00
170.0	149.0	8.1	PT0401700	145.42 x 7.00	440.0	415.5	8.1	PT0804400	405.26 x 7.00
175.0	154.0	8.1	PT0401750	151.77 x 7.00	450.0	425.5	8.1	PT0804500	417.96 x 7.00
180.0	164.5	6.3	PT0301800	164.47 x 5.33	460.0	435.5	8.1	PT0804600	430.66 x 7.00
180.0	159.0	8.1	PT0401800	158.12 x 7.00	480.0	455.5	8.1	PT0804800	456.06 x 7.00
190.0	169.0	8.1	PT0401900	164.47 x 7.00	500.0	475.5	8.1	PT0805000	468.76 x 7.00
194.0	178.5	6.3	PT0301940	177.17 x 5.33	555.0	530.5	8.1	PT0805550	532.26 x 7.00
200.0	184.5	6.3	PT0302000	183.52 x 5.33	600.0	575.5	8.1	PT0806000	557.66 x 7.00
200.0	179.0	8.1	PT0402000	177.17 x 7.00	640.0	615.5	8.1	PT0806400	608.08 x 7.00
205.0	184.0	8.1	PT0402050	183.52 x 7.00	660.0	635.5	8.1	PT0806600	633.48 x 7.00
210.0	189.0	8.1	PT0402100	183.52 x 7.00	700.0	672.0	9.5	PT0507000	670.00 x 8.40
215.0	194.0	8.1	PT0402150	189.87 x 7.00	710.0	682.0	9.5	PT0507100	680.00 x 8.40
220.0	199.0	8.1	PT0402200	196.22 x 7.00	740.0	712.0	9.5	PT0507400	710.00 x 8.40
230.0	214.5	6.3	PT0302300	208.92 x 5.33	780.0	752.0	9.5	PT0507800	750.00 x 8.40
230.0	209.0	8.1	PT0402300	202.57 x 7.00	800.0	772.0	9.5	PT0508000	770.00 x 8.40
240.0	219.0	8.1	PT0402400	215.27 x 7.00	900.0	872.0	9.5	PT0509000	870.00 x 8.40
250.0	234.5	6.3	PT0302500	234.32 x 5.33	1,000.0	972.0	9.5	PT05X1000	970.00 x 8.40
250.0	229.0	8.1	PT0402500	227.97 x 7.00	1,000.0	962.0	13.8	PT06X1000	960.00 x 12.00
250.0	225.5	8.1	PT0802500	215.27 x 7.00	1,050.0	1,022.0	9.5	PT05X1050	1,020.00 x 8.40
254.0	233.0	8.1	PT0402540	227.97 x 7.00	1,065.0	1,027.0	13.8	PT06X1065	1,025.00 x 12.00
260.0	239.0	8.1	PT0402600	240.67 x 7.00	1,070.0	1,032.0	13.8	PT06X1070	1,030.00 x 12.00



Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Dimensions
D_N H9	d_1 h9	L_1 +0.2		
1,200.0	1,172.0	9.5	PT05X1200	1,170.00 x 8.40
1,200.0	1,162.0	13.8	PT06X1200	1,160.00 x 12.00
1,225.0	1,187.0	13.8	PT06X1225	1,185.00 x 12.00
1,500.0	1,462.0	13.8	PT06X1500	1,460.00 x 12.00
2,000.0	1,962.0	13.8	PT06X2000	1,960.00 x 12.00
2,700.0	2,662.0	13.8	PT06X2700	2,660.00 x 12.00

All dimensions in **bold** type are suitable for installation in grooves to ISO 7425-1, bore diameter in accordance with ISO 3320.

Other dimensions and all intermediate sizes up to 2,700 mm diameter including inch sizes can be supplied.

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