

Zurcon[®] Roto Glyd Ring[®] S



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■ Zurcon® Roto Glyd Ring® S¹⁾

■ General Description

Zurcon® Roto Glyd Ring® S is used to seal rotary transmission lead-throughs journals, swivels and with rotary or oscillating movement. The seal is double-acting and can be exposed to pressure from one, or both, sides.

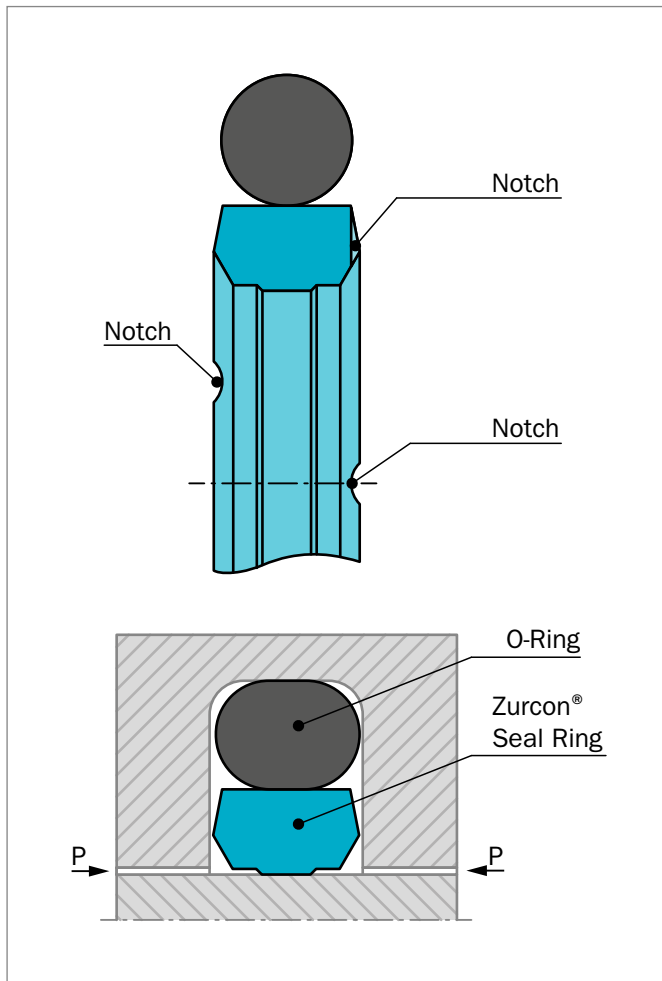


Figure 140: Zurcon® Roto Glyd Ring® S

It consists of a seal ring of Zurcon® material and is activated by an O-Ring as an elastic energizing element.

The contact surface profile of the seal ring is specially designed for use with high pressures and at low sliding speeds.

1) Patent: W003027545A1

METHOD OF OPERATION

Reduced contact surfaces under all operating conditions significantly improve friction and wear characteristics. When exposed to low pressure, only the central section of the seal comes into contact with the mating surface.

As the system pressure increases, the seal ring is tilted slightly generating the hydrostatic pressure balance in the sealing gap. Tilting the ring under pressure optimizes the lubrication between the seal and the mating surface.

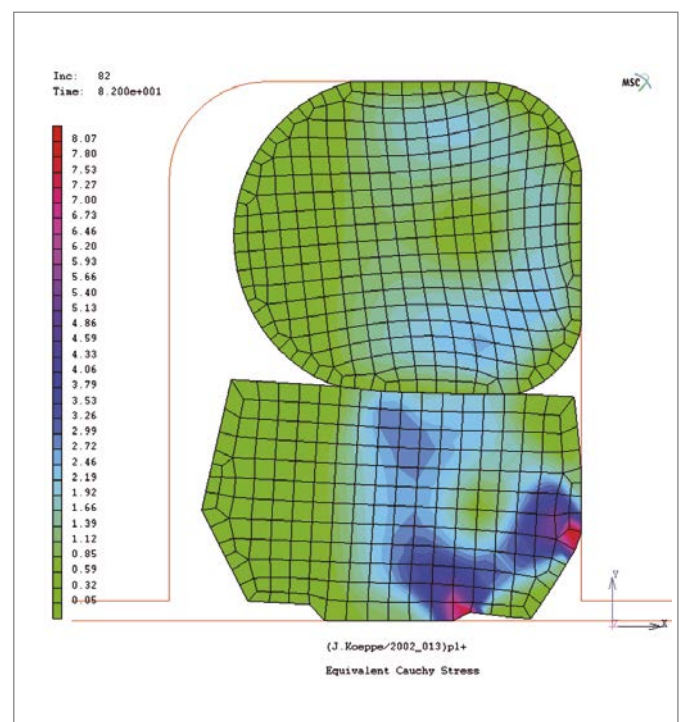


Figure 141: Zurcon® Roto Glyd Ring® S - Finite Element Analysis (FEA)

The profile is supported by a second edge which restricts contact with the shaft or bore, thereby significantly reducing friction and wear. The O-Ring material can be adapted to suit operating conditions. The angle on both sides of Zurcon® Seal Ring prevents extrusion into the system gap.

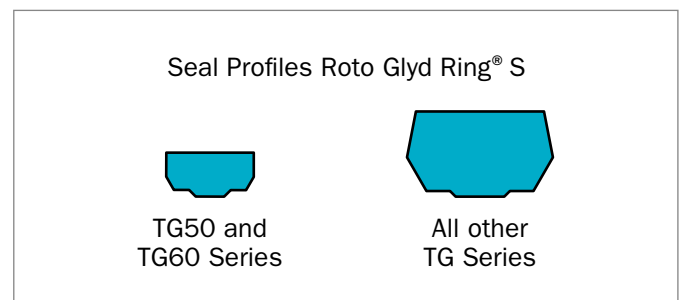


Figure 142: Cross-section profiles depending on Series No.

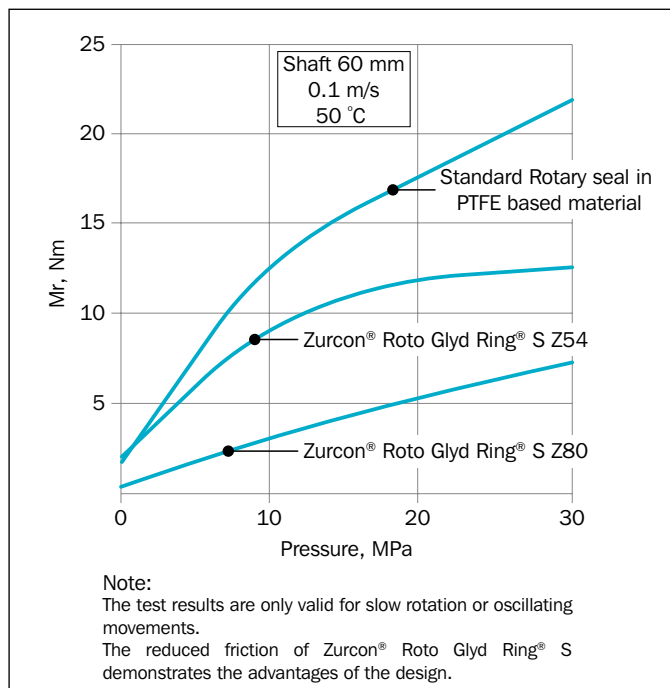


Figure 143: Friction of seals after endurance test

NOTCH

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

FEATURES AND BENEFITS

- Available for shaft and bore sealing applications
- Low to high pressure
- Low friction
- Stick-slip-free starting, no sticking in operation
- High abrasion resistance and dimensional stability
- Simple groove design, small groove dimensions
- Available in Z53 and Z54 materials for all shaft sizes up to 2,200 mm diameter and for all bore sizes up to 2,300 mm
- Available in Z80 material for all shaft sizes up to 2,600 mm diameter and for all bore sizes up to 2,700 mm.

APPLICATION EXAMPLES

- Shafts, axles and rotary transmission lead-throughs
- Rotary indexing tables
- Rotary connections with swivel movement, e.g. damping units

OPERATING CONDITIONS

Pressure:	Up to 40 MPa
PV:	Up to 6.5 MPa x m/s
Temperatures:	-30 °C to +100 °C
Media:	Mineral oil-based hydraulic fluids, flame-retardant hydraulic fluids, environmentally friendly hydraulic fluids (bio-oils) and others, depending on seal and elastomer material. For sealing e.g. coolants, water or air use Z80.

NOTE

For continuous operation at temperatures over +60 °C, pressure and speed must be limited.

Table 92: Material

Material	Pressure P MPa	P x V MPa x m/s	Temperature °C
Zurcon® Z53*	40	6.5	-30/+100
Zurcon® Z54	25	6.5	-30/+100
Zurcon® Z80	30	6.5	-30/+80

*Zurcon® Z53 only for P > 30 MPa

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 value gap.

INSTALLATION INSTRUCTIONS

Zurcon® Roto Glyd Ring® S is installed according to information on page 315.

Closed groove installation according to dimensions in Table 94 on page 275.



RECOMMENDED MATERIALS

The following material combinations have proven effective for applications with slow turning movements:

Zurcon® Roto Glyd Ring® S in Zurcon® Z80

All-round material:

O-Ring: NBR 70 Shore A N
 FKM 70 Shore A V
 (according to media)

Set code: Z80N or Z80V

Zurcon® Roto Glyd Ring® S in Zurcon® Z54

Material for high sealing effect:

O-Ring: NBR 70 Shore A N

Set code: Z54N

For specific applications, other material combinations are available.


Table 93: Zurcon® Roto Glyd Ring® S

Material, Applications, Properties	Code	O-Ring Material Shore A	Code	Service Temp. * °C	Mating Surface Material	MPa max. Dynamic
Zurcon® Z53** For lubricating hydraulic fluids Very high abrasion and extrusion resistance Good sealing performance Well suited to abrasive mating surfaces For swiveling and intermittent low-velocity rotary service only Limited chemical resistance Maximum service temperature: +110 °C Cast polyurethane Color: Yellow to light brown	Z53	NBR 70	N	-30 to +100	Hardened steel	40
		NBR 70 Low temp.	T	-45 to +80	Chrome-plated steel (shaft) Ceramic coatings Stainless steel	
Zurcon® Z54** For lubricating hydraulic fluids Very high abrasion resistance Good sealing performance Well suited to abrasive mating surfaces. For swiveling and intermittent low-velocity rotary service only Maximum service temperature: +110 °C Cast polyurethane Color: Turquoise	Z54	NBR 70	N	-30 to +100	Steel	25
		NBR 70 Low temp.	T	-45 to +80	Hardened steel Chrome-plated steel (shaft) Ceramic coating Stainless steel	
Zurcon® Z80 For lubricating and non-lubricating fluids and gases High abrasion and extrusion resistance Well suited to abrasive mating surfaces and fluids For swiveling and intermittent low-velocity rotary service only Good chemical resistance Ultra-high molecular weight polyethylene Color: White to off-white	Z80	NBR 70	N	-30 to +80	Steel	30
		NBR 70 Low temp.	T	-45 to +80	Hardened steel Ceramic coatings HVOF Tungsten carbide	

* Service temperatures are only valid when using hydraulic mineral oil. Note that frictional heat may cause increased temperatures at the seal.

** Maximum diameter 2,200 mm

Note:

Rotary seals exert high loads on mating surfaces and mild steels are best suited for slow or swiveling service.

As a basic principle, the hardness of the mating surface should increase with the peripheral speed, and a hardness of 60 HRC is recommended for velocities above 1 m/s. Due to the mechanical stresses imposed, a hardness depth of 0.5 mm or more is recommended to limit dimensional changes to the mating surface.



■ Installation Recommendation for Shaft

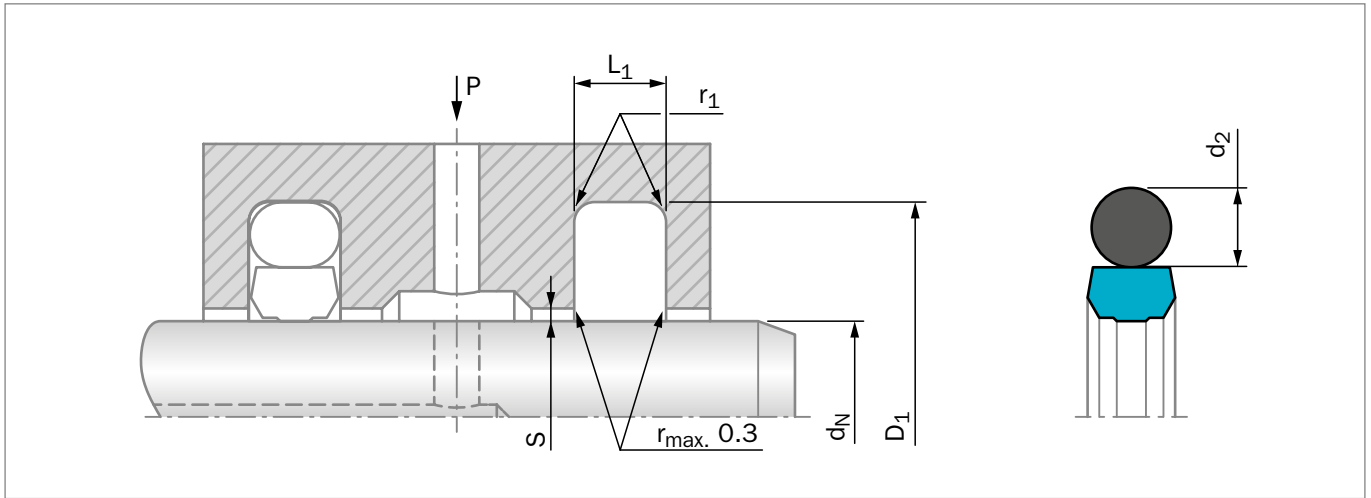


Figure 144: Installation Drawing

Table 94: Installation Dimensions – Standard Recommendations

Series Number	Shaft Diameter d_N f8/h9		Groove Diameter*	Groove Width	Radius	Radial Clearance S_{max} *		O-Ring Cross-Section-Ø
	Standard Range	Available Range	D_1 H9	$L_1 +0.2$	r_1	10 MPa	30 MPa	d_2
TG50	12 - 18.9	10 - 18.9	$d_N + 4.9$	2.20	0.40	0.20	0.10	1.78
TG51	19 - 37.9	12 - 59.9	$d_N + 7.5$	3.20	0.60	0.25	0.15	2.62
TG52	38 - 132.9	19 - 199.9	$d_N + 11.0$	4.20	1.00	0.30	0.20	3.53
TG53	133 - 255.9	38 - 329.9	$d_N + 15.5$	6.30	1.30	0.35	0.25	5.33
TG54	256 - 649.9	120 - 655.0	$d_N + 21.0$	8.10	1.80	0.40	0.25	7.00
TG55	650 - 999.9	650 - 999.9	$d_N + 28.0$	9.50	2.50	0.50	0.30	8.40
TG55X**	1,000 - 2,600	-	$d_N + 28.0$	9.50	2.50	0.50	0.30	8.40

* For max. temperature = +60 °C at the seal.

** Z53 and Z54 max. Ø 2,200 mm.

ORDERING EXAMPLE

Zurcon® Roto Glyd Ring® S, complete with O-Ring, standard application:

Series:	TG52 from Table 94
Shaft diameter:	$d_N = 80.0$ mm
TSS Part No.:	TG5200800 from Table 95

Select the material from Table 93. The corresponding code numbers are appended to the TSS Part No. Together they form the TSS Article No. The TSS Article No. for all intermediate sizes not shown in Table 95 can be determined following the example opposite.

TSS Article No.	TG52 0 0800 - Z54 N
Series No.	_____
Type (Standard)	_____
Shaft Diameter x 10***	_____
Quality Index (Standard)	_____
Material Code (Seal Ring)	_____
Material Code (O-Ring)	_____

*** For diameters $\geq 1,000.0$ mm multiply only by factor 1.

Example: TG55X for diameter 1,200.0 mm
TSS Article No.: TG55X**1200** - Z54N


Table 95: Standard Installation Dimensions / TSS Part Number

Shaft Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Sizes	Shaft Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Sizes
d_N f8/h9	D_1 H9	L_1 +0.2			d_N f8/h9	D_1 H9	L_1 +0.2		
10.0	14.9	2.2	TG5000100	12.42 x 1.80	150.0	165.5	6.3	TG5301500	158.12 x 5.33
12.0	16.9	2.2	TG5000120	14.00 x 1.78	160.0	175.5	6.3	TG5301600	170.82 x 5.33
14.0	18.9	2.2	TG5000140	15.60 x 1.78	170.0	185.5	6.3	TG5301700	177.17 x 5.33
15.0	19.9	2.2	TG5000150	17.17 x 1.78	180.0	195.5	6.3	TG5301800	189.87 x 5.33
16.0	20.9	2.2	TG5000160	18.77 x 1.78	190.0	205.5	6.3	TG5301900	202.57 x 5.33
18.0	22.9	2.2	TG5000180	20.35 x 1.78	200.0	215.5	6.3	TG5302000	208.92 x 5.33
20.0	27.5	3.2	TG5100200	23.47 x 2.62	210.0	225.5	6.3	TG5302100	221.62 x 5.33
22.0	29.5	3.2	TG5100220	25.07 x 2.62	220.0	235.5	6.3	TG5302200	227.97 x 5.33
25.0	32.5	3.2	TG5100250	28.24 x 2.62	230.0	245.5	6.3	TG5302300	240.67 x 5.33
28.0	35.5	3.2	TG5100280	31.42 x 2.62	240.0	255.5	6.3	TG5302400	247.02 x 5.33
30.0	37.5	3.2	TG5100300	34.59 x 2.62	250.0	265.5	6.3	TG5302500	266.07 x 5.30
32.0	39.5	3.2	TG5100320	36.17 x 2.62	280.0	301.0	8.1	TG5402800	291.47 x 7.00
35.0	42.5	3.2	TG5100350	39.34 x 2.62	300.0	321.0	8.1	TG5403000	304.17 x 7.00
36.0	43.5	3.2	TG5100360	39.34 x 2.62	320.0	341.0	8.1	TG5403200	329.57 x 7.00
40.0	51.0	4.2	TG5200400	47.22 x 3.53	350.0	371.0	8.1	TG5403500	354.97 x 7.00
42.0	53.0	4.2	TG5200420	47.22 x 3.53	360.0	381.0	8.1	TG5403600	367.67 x 7.00
45.0	56.0	4.2	TG5200450	50.39 x 3.53	400.0	421.0	8.1	TG5404000	405.26 x 7.00
48.0	59.0	4.2	TG5200480	53.57 x 3.53	500.0	521.0	8.1	TG5405000	506.86 x 7.00*
50.0	61.0	4.2	TG5200500	56.74 x 3.53	600.0	621.0	8.1	TG5406000	608.08 x 7.00*
52.0	63.0	4.2	TG5200520	59.92 x 3.53	700.0	728.0	9.5	TG5507000	712.90 x 8.40*
55.0	66.0	4.2	TG5200550	59.92 x 3.53	800.0	828.0	9.5	TG5508000	812.90 x 8.40*
56.0	67.0	4.2	TG5200560	63.09 x 3.53	900.0	928.0	9.5	TG5509000	912.90 x 8.40*
60.0	71.0	4.2	TG5200600	66.27 x 3.53	1,000.0	1,028.0	9.5	TG55X1000	1,012.90 x 8.40*
63.0	74.0	4.2	TG5200630	69.44 x 3.53	1,500.0	1,528.0	9.5	TG55X1500	1,512.90 x 8.40*
65.0	76.0	4.2	TG5200650	72.62 x 3.53	2,000.0	2,028.0	9.5	TG55X9200	2,012.90 x 8.40*
70.0	81.0	4.2	TG5200700	75.79 x 3.53	2,500.0	2,528.0	9.5	TG55X2500	2,512.90 x 8.40*
75.0	86.0	4.2	TG5200750	82.14 x 3.53	The shaft diameters printed in bold type conform to the recommendations of ISO 3320. Other dimensions and all intermediate sizes up to 2,200 mm diameter for Z53 and Z54 (2,600 mm for Z80) including inch sizes can be supplied. * Theoretical ideal O-Ring size				
80.0	91.0	4.2	TG5200800	85.32 x 3.53					
85.0	96.0	4.2	TG5200850	91.67 x 3.53					
90.0	101.0	4.2	TG5200900	98.02 x 3.53					
95.0	106.0	4.2	TG5200950	101.19 x 3.53					
100.0	111.0	4.2	TG5201000	107.54 x 3.53					
105.0	116.0	4.2	TG5201050	110.72 x 3.53					
110.0	121.0	4.2	TG5201100	117.07 x 3.53					
115.0	126.0	4.2	TG5201150	120.24 x 3.53					
120.0	131.0	4.2	TG5201200	126.59 x 3.53					
125.0	136.0	4.2	TG5201250	132.94 x 3.5					
130.0	141.0	4.2	TG5201300	136.12 x 3.53					
135.0	150.5	6.3	TG5201300	142.24 x 5.33					
140.0	155.5	6.3	TG5301400	148.59 x 5.33					



■ Installation Recommendation for Bore

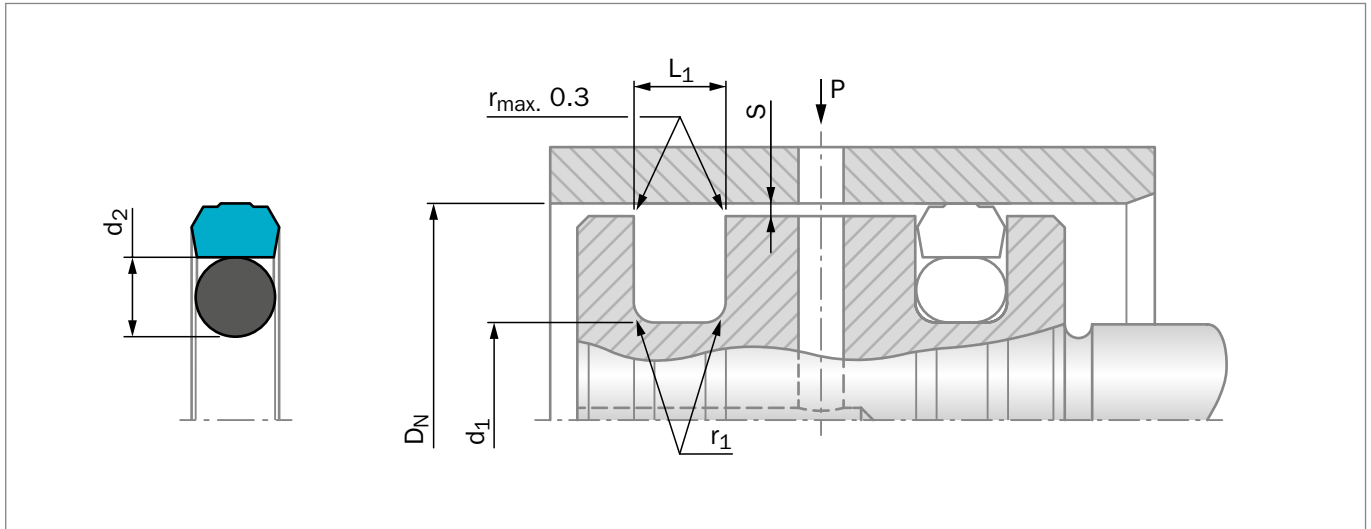


Figure 145: Installation Drawing

Table 96: Installation Dimensions – Standard Recommendations

Series Number	Bore Diameter D_N H9		Groove Diameter*	Groove Width	Radius	Radial Clearance S_{max} *		O-Ring Cross-Section-Ø
	Standard Range	Available Range	d_1 h9	$L_1 +0.2$	r_1	10 MPa	30 MPa	d_2
TG60	12 - 19.9	10 - 24.9	$D_N - 4.9$	2.20	0.40	0.20	-	1.78
TG61	20 - 39.9	14 - 69.9	$D_N - 7.5$	3.20	0.60	0.25	0.15	2.62
TG62	40 - 132.9	22 - 199.9	$D_N - 11.0$	4.20	1.00	0.30	0.20	3.53
TG63	133 - 255.9	40 - 329.9	$D_N - 15.5$	6.30	1.30	0.35	0.25	5.33
TG64	256 - 669.9	133 - 690.0	$D_N - 21.0$	8.10	1.80	0.40	0.25	7.00
TG65	670 - 999.9	670 - 999.9	$D_N - 28.0$	9.50	2.50	0.45	0.30	8.40
TG65X**	1,000 - 2,700	-	$D_N - 28.0$	9.50	2.50	0.45	0.30	8.40

* For max. temperature = +60 °C at the seal.

** Z53 and Z54 max. Ø 2,300 mm

ORDERING EXAMPLE

Zurcon® Roto Glyd Ring® S, complete with O-Ring, standard application:

Series:	TG62 from Table 96
Bore diameter:	$D_N = 80.0$ mm
TSS Part No.:	TG6200800 from Table 97

Select the material from Table 93. The corresponding code numbers are appended to the TSS Part No. Together they form the TSS Article No. The TSS Article No. for all intermediate sizes not shown in Table 97 can be determined following the example opposite.

TSS Article No.	TG62	0	0800	-	Z54	N
Series No.						
Type (Standard)						
Bore Diameter x 10***						
Quality Index (Standard)						
Material Code (Seal Ring)						
Material Code (O-Ring)						

*** For diameters $D_N \geq 1,000.0$ mm multiply only by factor 1.

Example: TG65X for diameter D_N 1,200.0 mm

TSS Article No.: TG65X**1200** - Z54N.


Table 97: Standard Installation Dimensions / TSS Part No.

Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Sizes	Bore Dia.	Groove Dia.	Groove Width	TSS Part No.	O-Ring Sizes
D_N H9	d_1 h9	L_1 +0.2			D_N H9	d_1 h9	L_1 +0.2		
12.0	7.1	2.2	TG6000120	7.10 x 1.80	200.0	184.5	6.3	TG6302000	189.87 x 5.33
14.0	9.1	2.2	TG6000140	9.25 x 1.78	210.0	194.5	6.3	TG6302100	196.22 x 5.33
15.0	10.1	2.2	TG6000150	10.60 x 1.80	220.0	204.5	6.3	TG6302200	208.92 x 5.33
16.0	11.1	2.2	TG6000160	11.20 x 1.80	230.0	214.5	6.3	TG6302300	215.27 x 5.33
18.0	13.1	2.2	TG6000180	13.20 x 1.80	240.0	224.5	6.3	TG6302400	227.92 x 5.33
20.0	12.5	3.2	TG6100200	12.37 x 2.62	250.0	234.5	6.3	TG6302500	240.67 x 5.33
22.0	14.5	3.2	TG6100220	14.50 x 2.65	280.0	259.0	8.1	TG6402800	266.07 x 7.00
25.0	17.5	3.2	TG6100250	18.00 x 2.65	300.0	279.0	8.1	TG6403000	278.77 x 7.00
28.0	20.5	3.2	TG6100280	20.29 x 2.65	320.0	299.0	8.1	TG6403200	304.17 x 7.00
30.0	22.5	3.2	TG6100300	23.47 x 2.65	350.0	329.0	8.1	TG6403500	329.57 x 7.00
32.0	24.5	3.2	TG6100320	25.07 x 2.65	400.0	379.0	8.1	TG6404000	380.37 x 7.00
35.0	27.5	3.2	TG6100350	28.24 x 2.65	420.0	399.0	8.1	TG6404200	405.26 x 7.00
40.0	29.0	4.2	TG6200400	29.75 x 3.53	450.0	429.0	8.1	TG6404500	430.66 x 7.00
42.0	31.0	4.2	TG6200420	31.35 x 3.53	480.0	459.0	8.1	TG6404800	468.76 x 7.00
45.0	34.0	4.2	TG6200450	34.52 x 3.53	500.0	479.0	8.1	TG6405000	481.38 x 7.00
48.0	37.0	4.2	TG6200480	37.69 x 3.53	600.0	579.0	8.1	TG6406000	582.68 x 7.00
50.0	39.0	4.2	TG6200500	40.87 x 3.53	700.0	672.0	9.5	TG6507000	670.00 x 8.40*
52.0	41.0	4.2	TG6200520	40.87 x 3.53	800.0	772.0	9.5	TG6508000	770.30 x 8.40*
55.0	44.0	4.2	TG6200550	44.04 x 3.53	900.0	872.0	9.5	TG6509000	870.30 x 8.40*
56.0	45.0	4.2	TG6200560	47.22 x 3.53	1,000.0	972.0	9.5	TG65X1000	970.30 x 8.40*
60.0	49.0	4.2	TG6200600	50.39 x 3.53	1,500.0	1,472.0	9.5	TG65X1500	1,470.30 x 8.40*
63.0	52.0	4.2	TG6200630	53.57 x 3.53	2,000.0	1,972.0	9.5	TG65X2000	1,970.30 x 8.40*
65.0	54.5	4.2	TG6300650	56.74 x 5.33	2,500.0	2,472.0	9.5	TG65X2500	2,470.30 x 8.40*
80.0	69.0	4.2	TG6200800	69.44 x 3.53					
85.0	74.0	4.2	TG6200850	75.79 x 3.53					
90.0	79.0	4.2	TG6200900	78.97 x 3.53					
95.0	84.0	4.2	TG6200950	85.32 x 3.53					
100.0	89.0	4.2	TG6201000	91.67 x 3.53					
110.0	99.0	4.2	TG6201100	101.19 x 3.53					
115.0	104.0	4.2	TG6201150	104.37 x 3.53					
120.0	109.0	4.2	TG6201200	110.72 x 3.53					
125.0	114.0	4.2	TG6201250	117.07 x 3.53					
130.0	119.0	4.2	TG6201300	120.24 x 3.53					
135.0	119.5	6.3	TG6301350	120.02 x 5.33					
140.0	124.5	6.3	TG6301400	126.37 x 5.33					
150.0	134.5	6.3	TG6301500	135.89 x 5.33					
160.0	144.5	6.3	TG6301600	145.42 x 5.33					
170.0	154.5	6.3	TG6301700	158.12 x 5.33					
180.0	164.5	6.3	TG6301800	164.47 x 5.33					
190.0	174.5	6.3	TG6301900	177.17 x 5.33					

The bore diameters printed in **bold** type conform to the recommendations of ISO 3320.

Other dimensions and all intermediate sizes up to 2,300 mm diameter for Z53 and Z54 (2,700 mm for Z80) including inch sizes can be supplied.

* Theoretical ideal O-Ring size