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# Turcon<sup>®</sup> Excluder<sup>®</sup> 2



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Double Acting

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Rubber Energized Double-acting  
Scraper

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**Material:**  
Turcon<sup>®</sup> and Zurcon<sup>®</sup>

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## ■ Turcon® Excluder® 2



### Description

The Turcon® Excluder® 2 is a double-acting scraper with two geometrically different scraper lips which are installed back-to-back.

Excluder® 2 is always installed together with an elastic O-Ring in one groove. The scraper function is performed by the Excluder® 2. The O-Ring maintains the pressure of the scraper lips against the sliding surface and can compensate any deflections of the piston rod.

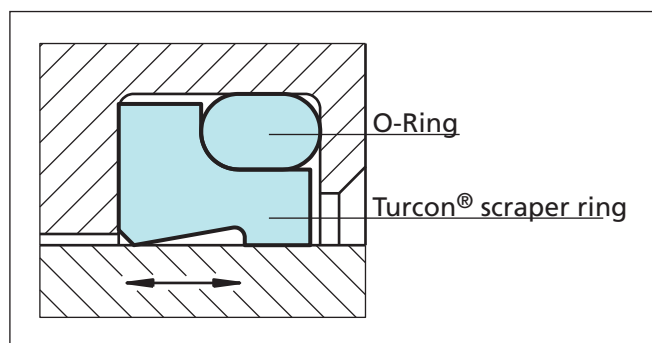


Figure 1 Turcon® Excluder® 2

Excluder® 2 has two functions:

- Scrape contaminants from the retracting piston rod and thus to protect the system from soiling
- Hold back the residual oil film on the extending piston rod on the medium side.

Excluder® 2 is used in conjunction with our rod seals Turcon® Stepseal® 2K or Zurcon® Rimseal, i.e. seals with hydrodynamic backpumping function.

### Advantages

- Outstanding sliding properties
- Stick-slip-free, no sticking
- Can compensate for deflections of the piston rod or plunger
- Space-saving construction
- Very good scraping effect against outside contaminants, even with firmly adhered dirt, etc.
- Very good scraping effect from the inside against the residual oil film adhering to the surface of the piston rod
- Very high resistance to hydraulic media
- Available for all diameters up to 2.600 mm (Turcon®) and up to 2.200 mm (Zurcon® Z51/Z52)
- ISO/DIN 6195 Type D installation dimensions

### Technical Data

Operating conditions:

Speed: Up to 15 m/s for Turcon® materials  
Up to 2 m/s for Zurcon® materials

Temperature: 45 °C to +200 °C (Turcon®)  
-45 °C to +110 °C (Zurcon® Z51/Z52)  
-60 °C to +80 °C (Zurcon® Z80)  
(depending on O-Ring materials)

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 O-Ring material compatibility.

#### 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.

### Materials

The following material combinations have proven effective for hydraulic applications:

All round material for light to medium 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® Excluder® 2: 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® Excluder® 2: 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 III.



## Design and Installation Instructions

Excluder® 2 scrapers can be installed in split and closed grooves (installation dimensions, see Table IV). Installation in closed grooves is dependent on the rod diameter, profile cross-section of the scraper and on the cord cross-section of the corresponding O-Ring, see Table II.

**Table II Installation in Closed Grooves**

Turcon® Excluder® 2 Series No.	Rod Diameter d	O-Ring Cross-Section d <sub>2</sub>
WE30	> 30	1.78
WE31	> 30	2.62
WE32	> 40	3.53
WE33	> 50	5.33
WE34	> 110	7.00
WE35	> 140	8.40

**Table III Turcon® and Zurcon® Materials for Excluder® 2**

Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
<b>Turcon® M12</b> First material choice for 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 scrapers 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	15
		NBR - 70 Low temp.	T	-45 to +80	Steel, hardened Steel, chrome plated (rod)	
		FKM - 70	V	-10 to +200	Steel plated Cast iron Stainless steel Titanium	
<b>Turcon® T40</b> For lubricating and non-lubricating fluids High frequency and short strokes <b>Water hydraulics</b> Surface texture is not suitable for gas sealing Carbon fibre filled Colour: Grey	T40	NBR - 70	N	-30 to +100	Steel	15
		NBR - 70 Low temp.	T	-45 to +80	Steel, chrome plated (rod) Cast iron	
		FKM - 70	V	-10 to +200	Stainless steel	
		EPDM-70	E**	-45 to +145	Aluminium	
<b>Turcon® T46</b> 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	15
		NBR - 70 Low temp.	T	-45 to +80	Steel, chrome plated (rod) Cast iron	
		FKM - 70	V	-10 to +200		

\* The O-Ring Operation Temperature is only valid in mineral hydraulic oil (except EPDM). \*\* Material not suitable for mineral oils.  
 \*\*\* Max. ø 2200 BAM: Tested by "Bundesanstalt Materialprüfung, Germany".  Highlighted materials are standard.



Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
<b>Zurcon® Z51***</b> For mineral oil based fluids Very high abrasion and extrusion resistance For counter surface with rougher surface finish Hard to install Limited chemical resistance Max. working temperature 110 °C Cast polyurethane Colour: Yellow to light-brown	Z51	NBR - 70	N	-30 to +100	Steel	2
		NBR - 70 Low temp.	T	-45 to +80	Steel, hardened Cast iron Ceramic coating Stainless steel	
<b>Zurcon® Z52***</b> For mineral oil based fluids High abrasion resistance For counter surface with rougher surface finish Good extrusion resistance Limited chemical resistance Max. working temperature 110 °C Cast polyurethane Colour: Turquoise	Z52	NBR - 70	N	-30 to +100	Steel	2
		NBR - 70 Low temp.	T	-45 to +80	Steel, hardened Steel, chrome plated (rod) Cast iron Stainless steel Aluminium	
<b>Zurcon® Z80</b> 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)	Z80	NBR - 70	N	-30 to (+100)	Steel	2
		NBR - 70 Low temp.	T	-45 to +80	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). \*\* Material not suitable for mineral oils.  
 \*\*\* Max. ø 2200 BAM: Tested by "Bundesanstalt Materialprüfung, Germany".  Highlighted materials are standard.



## Installation Recommendation

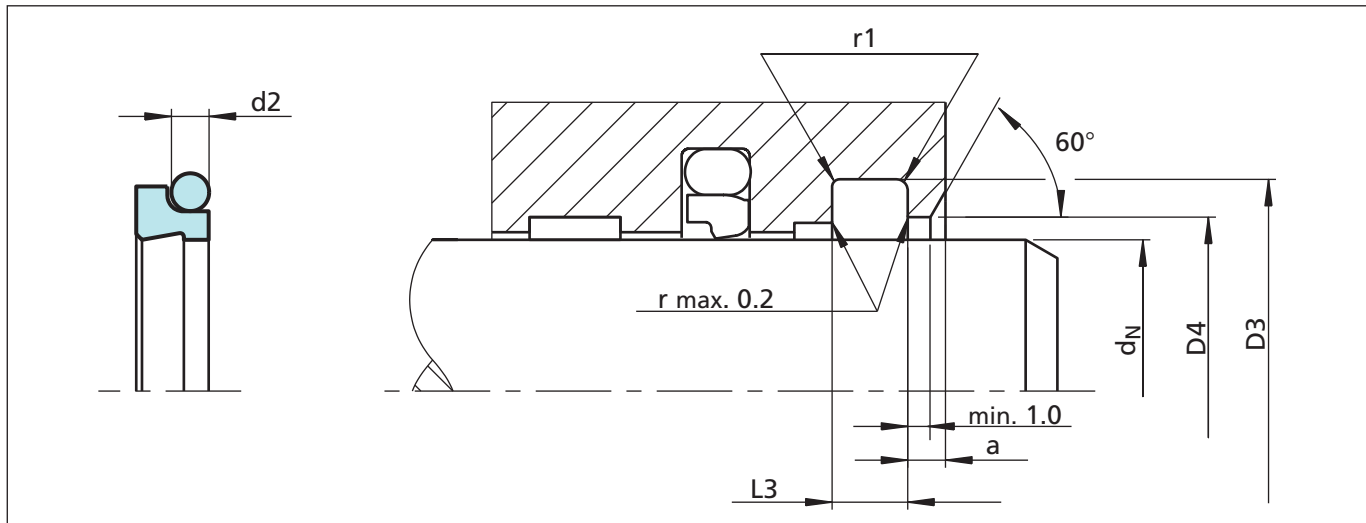


Figure 2 Installation drawing

Table IV Installation dimensions

Series No.	Rod Diameter $d_N$ f8/h9		Groove Diameter $D_3$ H9	Groove Width $L_3 + 0.2$	Bore Diameter $D_4$ H11	Step Width $a$ min.	O-Ring Cross-Section $d_2$
	Recommended Range	Extended Range					
WE30	4.0 - 11.9	4.0 - 130.0	$d_N + 4.8$	3.7	$d + 1.5$	2.0	1.78
WE31	12.0 - 64.9	10.0 - 245.0	$d_N + 6.8$	5.0	$d + 1.5$	2.0	2.62
WE32	65.0 - 250.9	25.0 - 400.0	$d_N + 8.8$	6.0	$d + 1.5$	3.0	3.53
WE33	251.0 - 420.9	40.0 - 655.0	$d_N + 12.2$	8.4	$d + 2.0$	4.0	5.33
WE34	421.0 - 650.9	110.0 - 655.0	$d_N + 16.0$	11.0	$d + 2.0$	4.0	7.00
WE35	651.0 - 999.9	140.0 - 999.9	$d_N + 20.0$	14.0	$d + 2.5$	5.0	8.40
WE35X	$\geq 1000.0$	$\geq 1000.0$	$d_N + 20.0$	14.0	$d + 2.5$	5.0	8.40

For diameters > 400 mm we recommend the use of Turcon® Excluder® 5.

### Ordering Example

Turcon® Excluder® 2 with O-Ring, NBR  
 Rod diameter:  $d_N = 50.0$  mm  
 Series: WE31 (from Table IV)  
 TSS Part No.: WE3100500 (from Table V)

Select the material from Table III. The corresponding code numbers are appended to the TSS Part No. (from Table V). Together they form the TSS Article No.  
 For all intermediate sizes not shown in Table V, the TSS Article No. can be determined from the example opposite.

\* For diameters  $\geq 1000.0$  mm multiply only by factor 1. Example WE35 for diameter 1200.0 mm.  
 TSS Article No.: WE35X1200-M12N.

TSS Article No.	WE31	00500	-	M12	N
TSS Series No.					
Rod diameter x 10*					
Quality Index (Standard)					
Material code (scraper)					
Material code (O-Ring)					



**Table V Installation dimensions / TSS part numbers**

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
$d_N$ f8/h9	$D_3$ H9	$L_3$ +0.2	$D_4$ H11	$r_1$ max.	$a$ min		
<b>4.0*)</b>	<b>8.8</b>	<b>3.7</b>	<b>5.5</b>	<b>0.4</b>	<b>2.0</b>	<b>WE3000040</b>	<b>5.60 x 1.80</b>
<b>5.0*)</b>	<b>9.8</b>	<b>3.7</b>	<b>6.5</b>	<b>0.4</b>	<b>2.0</b>	<b>WE3000050</b>	<b>6.70 x 1.80</b>
<b>6.0*)</b>	<b>10.8</b>	<b>3.7</b>	<b>7.5</b>	<b>0.4</b>	<b>2.0</b>	<b>WE3000060</b>	<b>7.65 x 1.78</b>
<b>8.0*)</b>	<b>12.8</b>	<b>3.7</b>	<b>9.5</b>	<b>0.4</b>	<b>2.0</b>	<b>WE3000080</b>	<b>9.50 x 1.80</b>
<b>10.0*)</b>	<b>14.8</b>	<b>3.7</b>	<b>11.5</b>	<b>0.4</b>	<b>2.0</b>	<b>WE3000100</b>	<b>11.80 x 1.80</b>
<b>12.0*)</b>	<b>18.8</b>	<b>5.0</b>	<b>13.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100120</b>	<b>13.94 x 2.62</b>
<b>14.0*)</b>	<b>20.8</b>	<b>5.0</b>	<b>15.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100140</b>	<b>15.54 x 2.62</b>
15.0	21.8	5.0	16.5	0.8	2.0	WE3100150	17.12 x 2.62
<b>16.0</b>	<b>20.8</b>	<b>3.7</b>	<b>17.5</b>	<b>0.4</b>	<b>2.0</b>	<b>WE3000160</b>	<b>17.17 x 1.78</b>
<b>16.0*)</b>	<b>22.8</b>	<b>5.0</b>	<b>17.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100160</b>	<b>18.00 x 2.65</b>
<b>18.0</b>	<b>22.8</b>	<b>3.7</b>	<b>19.5</b>	<b>0.4</b>	<b>2.0</b>	<b>WE3000180</b>	<b>19.00 x 1.80</b>
<b>18.0*)</b>	<b>24.8</b>	<b>5.0</b>	<b>19.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100180</b>	<b>20.29 x 2.62</b>
<b>20.0*)</b>	<b>26.8</b>	<b>5.0</b>	<b>21.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100200</b>	<b>21.89 x 2.62</b>
<b>22.0*)</b>	<b>28.8</b>	<b>5.0</b>	<b>23.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100220</b>	<b>23.47 x 2.62</b>
<b>25.0*)</b>	<b>31.8</b>	<b>5.0</b>	<b>26.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100250</b>	<b>26.64 x 2.62</b>
<b>28.0*)</b>	<b>34.8</b>	<b>5.0</b>	<b>29.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100280</b>	<b>29.82 x 2.62</b>
30.0	34.8	3.7	31.5	0.4	2.0	WE3000300	31.47 x 1.78
30.0	36.8	5.0	31.5	0.8	2.0	WE3100300	31.42 x 2.62
<b>32.0*)</b>	<b>38.8</b>	<b>5.0</b>	<b>33.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100320</b>	<b>34.59 x 2.62</b>
35.0	41.8	5.0	36.5	0.8	2.0	WE3100350	36.17 x 2.62
<b>36.0*)</b>	<b>42.8</b>	<b>5.0</b>	<b>37.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100360</b>	<b>37.77 x 2.62</b>
37.0	43.8	5.0	38.5	0.8	2.0	WE3100370	39.34 x 2.62
<b>40.0*)</b>	<b>46.8</b>	<b>5.0</b>	<b>41.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100400</b>	<b>42.52 x 2.62</b>
42.0	48.8	5.0	43.5	0.8	2.0	WE3100420	44.12 x 2.62
<b>45.0*)</b>	<b>51.8</b>	<b>5.0</b>	<b>46.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100450</b>	<b>47.29 x 2.62</b>
49.0	55.8	5.0	50.5	0.8	2.0	WE3100490	50.47 x 2.62
<b>50.0*)</b>	<b>56.8</b>	<b>5.0</b>	<b>51.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100500</b>	<b>52.07 x 2.62</b>
50.8	57.6	5.0	52.3	0.8	2.0	WE3100508	52.07 x 2.62
54.0	60.8	5.0	55.5	0.8	2.0	WE3100540	55.25 x 2.62
55.0	61.8	5.0	56.5	0.8	2.0	WE3100550	56.82 x 2.62
<b>56.0*)</b>	<b>62.8</b>	<b>5.0</b>	<b>57.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100560</b>	<b>58.42 x 2.62</b>
60.0	66.8	5.0	61.5	0.8	2.0	WE3100600	61.60 x 2.62
<b>63.0*)</b>	<b>69.8</b>	<b>5.0</b>	<b>64.5</b>	<b>0.8</b>	<b>2.0</b>	<b>WE3100630</b>	<b>64.77 x 2.62</b>
65.0	73.8	6.0	66.5	1.0	3.0	WE3200650	66.27 x 3.53
<b>70.0</b>	<b>78.8</b>	<b>6.0</b>	<b>71.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3200700</b>	<b>72.62 x 3.53</b>
75.0	83.8	6.0	76.5	1.0	3.0	WE3200750	75.79 x 3.53

The rod diameters in **bold** type comply with the recommendations of ISO 3320.

\*) Installation in grooves according to ISO 6195 Type D.

Other dimensions and all intermediate sizes up to 2.600 mm diameter including imperial (inch) sizes can be supplied.



# Turcon® Excluder® 2

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
$d_N$ f8/h9	$D_3$ H9	$L_3$ +0.2	$D_4$ H11	$r_1$ max.	a min		
<b>80.0</b>	<b>88.8</b>	<b>6.0</b>	<b>81.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3200800</b>	<b>82.14 x 3.53</b>
85.0	93.8	6.0	86.5	1.0	3.0	WE3200850	83.52 x 3.53
<b>90.0</b>	<b>98.8</b>	<b>6.0</b>	<b>91.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3200900</b>	<b>91.67 x 3.53</b>
95.0	103.8	6.0	96.5	1.0	3.0	WE3200950	98.02 x 3.53
<b>100.0</b>	<b>108.8</b>	<b>6.0</b>	<b>101.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3201000</b>	<b>101.19 x 3.53</b>
105.0	113.8	6.0	106.5	1.0	3.0	WE3201050	107.54 x 3.53
<b>110.0</b>	<b>118.8</b>	<b>6.0</b>	<b>111.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3201100</b>	<b>110.72 x 3.53</b>
115.0	123.8	6.0	116.5	1.0	3.0	WE3201150	117.07 x 3.53
120.0	128.8	6.0	121.5	1.0	3.0	WE3201200	120.24 x 3.53
<b>125.0</b>	<b>133.8</b>	<b>6.0</b>	<b>126.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3201250</b>	<b>126.59 x 3.53</b>
130.0	138.8	6.0	131.5	1.0	3.0	WE3201300	132.94 x 3.53
135.0	143.8	6.0	136.5	1.0	3.0	WE3201350	136.12 x 3.53
137.0	145.8	6.0	138.5	1.0	3.0	WE3201370	139.29 x 3.53
<b>140.0</b>	<b>148.8</b>	<b>6.0</b>	<b>141.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3201400</b>	<b>142.47 x 3.53</b>
145.0	153.8	6.0	146.5	1.0	3.0	WE3201450	145.64 x 3.53
150.0	158.8	6.0	151.5	1.0	3.0	WE3201500	151.99 x 3.53
<b>160.0</b>	<b>168.8</b>	<b>6.0</b>	<b>161.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3201600</b>	<b>158.34 x 3.53</b>
170.0	178.8	6.0	171.5	1.0	3.0	WE3201700	171.04 x 3.53
<b>180.0</b>	<b>188.8</b>	<b>6.0</b>	<b>181.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3201800</b>	<b>177.39 x 3.53</b>
190.0	198.8	6.0	191.5	1.0	3.0	WE3201900	190.09 x 3.53
<b>200.0</b>	<b>208.8</b>	<b>6.0</b>	<b>201.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3202000</b>	<b>202.79 x 3.53</b>
210.0	218.8	6.0	211.5	1.0	3.0	WE3202100	209.14 x 3.53
<b>220.0</b>	<b>228.8</b>	<b>6.0</b>	<b>221.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3202200</b>	<b>221.84 x 3.53</b>
230.0	238.8	6.0	231.5	1.0	3.0	WE3202300	228.19 x 3.53
240.0	248.8	6.0	241.5	1.0	3.0	WE3202400	240.89 x 3.53
<b>250.0</b>	<b>258.8</b>	<b>6.0</b>	<b>251.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE3202500</b>	<b>253.59 x 3.53</b>
260.0	272.2	8.4	262.0	1.5	4.0	WE3302600	253.59 x 5.33
<b>280.0</b>	<b>292.2</b>	<b>8.4</b>	<b>282.0</b>	<b>1.5</b>	<b>4.0</b>	<b>WE3302800</b>	<b>278.77 x 5.33</b>
300.0	312.2	8.4	302.0	1.5	4.0	WE3303000	304.17 x 5.33
<b>320.0</b>	<b>332.2</b>	<b>8.4</b>	<b>322.0</b>	<b>1.5</b>	<b>4.0</b>	<b>WE3303200</b>	<b>329.57 x 5.33</b>
350.0	362.2	8.4	352.0	1.5	4.0	WE3303500	354.97 x 5.33
<b>360.0</b>	<b>372.2</b>	<b>8.4</b>	<b>362.0</b>	<b>1.5</b>	<b>4.0</b>	<b>WE3303600</b>	<b>354.97 x 5.33</b>
370.0	382.2	8.4	372.0	1.5	4.0	WE3303700	365.00 x 5.30
400.0	412.2	8.4	402.0	1.5	4.0	WE3304000	405.26 x 5.33
440.0	456.0	11.0	442.0	1.5	4.0	WE3404400	443.36 x 7.00
480.0	496.0	11.0	482.0	1.5	4.0	WE3404800	481.46 x 7.00

The rod diameters in **bold** type comply with the recommendations of ISO 3320.

\*) Installation in grooves according to ISO 6195 Type D.

Other dimensions and all intermediate sizes up to 2.600 mm diameter including imperial (inch) sizes can be supplied.





Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
<b>d<sub>N</sub></b> f8/h9	<b>D<sub>3</sub></b> H9	<b>L<sub>3</sub></b> +0.2	<b>D<sub>4</sub></b> H11	<b>r<sub>1</sub></b> max.	<b>a</b> min		
600.0	616.0	11.0	602.0	1.5	4.0	WE3406000	608.08 x 7.00
630.0	646.0	11.0	632.0	1.5	4.0	WE3406300	633.48 x 7.00
680.0	700.0	14.0	682.5	2.0	5.0	WE3506800	680.00 x 8.40
700.0	720.0	14.0	702.5	2.0	5.0	WE3507000	705.00 x 8.40
770.0	790.0	14.0	772.5	2.0	5.0	WE3507700	774.10 x 8.40
828.0	848.0	14.0	830.5	2.0	5.0	WE3508280	830.00 x 8.40
880.0	900.0	14.0	882.5	2.0	5.0	WE3508800	888.00 x 8.40
900.0	920.0	14.0	902.5	2.0	5.0	WE3509000	904.00 x 8.40
1030.0	1050.0	14.0	1032.5	2.0	5.0	WE35X1030	1035.0 x 8.40
1180.0	1200.0	14.0	1182.5	2.0	5.0	WE35X1180	1185.0 x 8.40

The rod diameters in **bold** type comply with the recommendations of ISO 3320.

\*) Installation in grooves according to ISO 6195 Type D.

Other dimensions and all intermediate sizes up to 2.600 mm diameter including imperial (inch) sizes can be supplied.



## Turcon<sup>®</sup> Excluder<sup>®</sup> 2

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# Turcon<sup>®</sup> Excluder<sup>®</sup> 5



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Double Acting

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Rubber Energized  
Double-acting Scraper

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**Material:**  
Turcon<sup>®</sup> and Zurcon<sup>®</sup>

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## ■ Turcon® Excluder® 5\*



### Description

The Turcon® Excluder® 5 is a patented double-acting scraper with two geometrically different scraper lips which are installed back-to-back.

The scraper is installed together with an O-Ring as elastic energizing element in one groove. The scraper function is performed by the Excluder® 5. The O-Ring maintains the pressure of the scraper lips against the sliding surface and can compensate deflections of the piston rod.

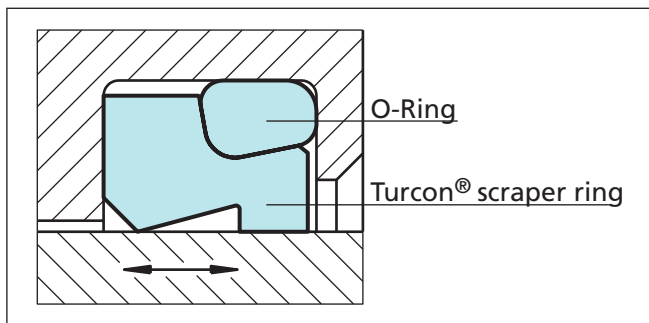


Figure 3 Turcon® Excluder® 5

Excluder® 5 has two functions:

- Scrape contaminants from the retracting piston rod and thus to protect the system from soiling
- Hold back the residual oil film on the extending piston rod on the medium side.

Excluder® 5 is used in conjunction with our rod seals Turcon® Stepseal® 2K or Zurcon® Rimseal, i.e. seals with a hydrodynamic back-pumping function. In contrast to the Excluder® 2, they are used particularly for heavy-duty applications such as in construction machinery, presses, etc.

### Advantages

- Outstanding sliding properties
- Stick-slip-free, no sticking (Turcon® material)
- Tough scraper for heavy-duty operation
- Can compensate for deflections of the piston rod or plunger
- Very good scraping effect even against firmly adhered dirt, etc.
- Very good scraping effect from the inside against the residual oil film adhering to the surface of the piston rod
- Identical installation with that of the Zurcon® Excluder® 500

- Very high resistance to hydraulic media
- Available for all diameters up to 2.600 mm (Turcon®), up to 2.200 mm (Zurcon® Z51/Z52).
- ISO/DIN 6195 Type D installation dimensions

### Technical Data

Operating conditions:

Speed:	Up to 15 m/s for Turcon® materials Up to 2 m/s for Zurcon® materials
Temperature:	-45 °C to +200 °C (Turcon®) -45 °C to +110 °C (Zurcon® Z51/Z52) -60 °C to +80 °C (Zurcon® Z80) (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 scraper and O-Ring material compatibility.

#### 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.

### Materials

The following material combinations has proven effective for most applications:

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® Excluder® 5:	Turcon® M12
O-Ring:	NBR, 70 Shore A    N FKM, 70 Shore A    V
Set code:	M12N or M12V



# Turcon® Excluder® 5

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

Turcon® Excluder® 5: 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 VII.

## Design and Installation Instructions

Excluder® 5 scrapers can be installed in split and closed grooves (installation dimensions, see Table VIII).

Installation in closed grooves is dependent on the rod diameter, profile cross-section of the scraper and on the cross-section of the corresponding O-Ring, see Table VI.

\* Patent-No. EP 023 5568

**Table VI Installation in Closed Grooves**

Turcon® Excluder® 5 Series No.	Rod Diameter $d_N$	O-Ring Cross-Section $d_2$
WE50	> 30.0	2.62
WE51	> 40.0	2.62
WE52	> 70.0	3.53
WE53	> 100.0	5.33
WE54	> 140.0	7.00
WE55	> 180.0	8.40

**Table VII Turcon® and Zurcon® Materials for Excluder® 5**

Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
<b>Turcon® M12</b> First material choice for 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 scrapers 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) Cast iron Stainless steel Titanium	15
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
<b>Turcon® T40</b> For lubricating and non-lubricating fluids High frequency and short strokes <b>Water hydraulics</b> Surface texture is not suitable for gas sealing Carbon fibre filled Colour: Grey	T40	NBR - 70	N	-30 to +100	Steel Steel, chrome plated (rod) Cast iron Stainless steel Aluminium	15
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
		EPDM-70	E**	-45 to +145		
<b>Turcon® T46</b> 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	15
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		

\* The O-Ring Operation Temperature is only valid in mineral hydraulic oil (except EPDM). \*\* Material not suitable for mineral oils. BAM: Tested by "Bundesanstalt Materialprüfung, Germany".  Highlighted materials are standard.



Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
<b>Zurcon® Z51***</b> For mineral oil based fluids Linear and slowly turning movements Very high abrasion and extrusion resistance For counter surface with rougher surface finish Hard to install Limited chemical resistance Max. working temperature 110 °C Cast polyurethane Colour: Yellow to light-brown	Z51	NBR - 70	N	-30 to +100	Steel	2
		NBR - 70 Low temp.	T	-45 to +80	Steel, hardened Cast iron Ceramic coating Stainless steel	
<b>Zurcon® Z52***</b> For mineral oil based fluids High abrasion resistance For counter surface with rougher surface finish Good extrusion resistance Limited chemical resistance Max. working temperature 110 °C Cast polyurethane Colour: Turquoise	Z52	NBR - 70	N	-30 to +100	Steel	1
		NBR - 70 Low temp.	T	-45 to +80	Steel, hardened Steel, chrome plated (rod) Cast iron Stainless steel Aluminium	
<b>Zurcon® Z80</b> 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)	Z80	NBR - 70	N	-30 to (+100)	Steel	2
		NBR - 70 Low temp.	T	-45 to +80	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). \*\* Material not suitable for mineral oils.  
 BAM: Tested by "Bundesanstalt Materialprüfung, Germany".  Highlighted materials are standard.



## Installation Recommendation

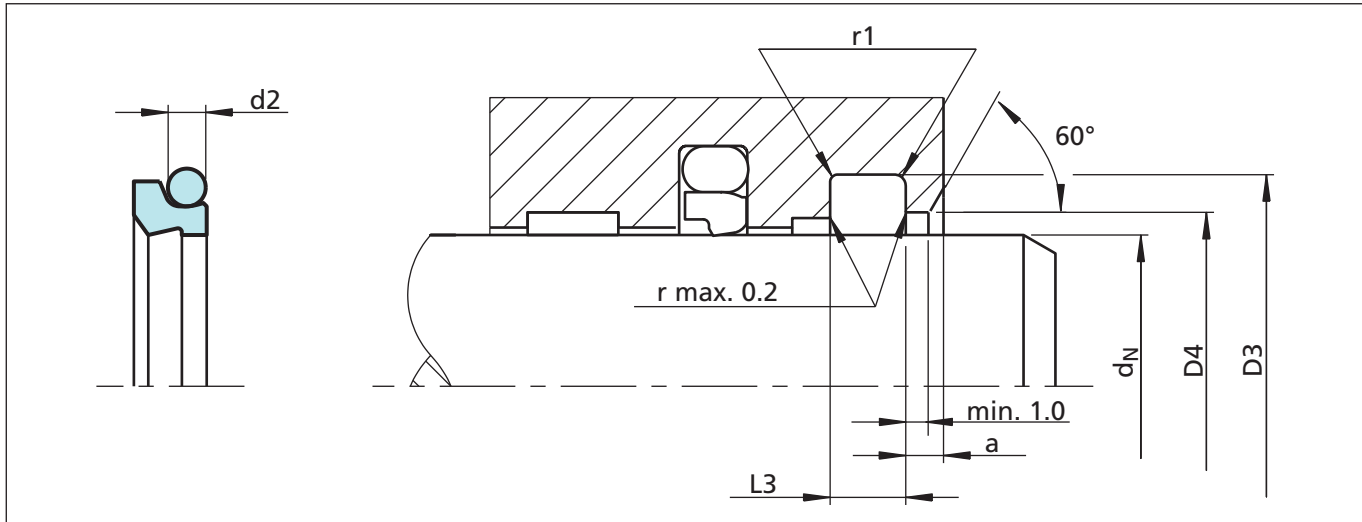


Figure 4 Installation drawing

Table VIII Installation dimensions

Series No.	Rod Diameter $d_N$ f8/h9		Groove Diameter	Groove Width	Bore Diameter	Step Width	O-Ring Cross-Section
	Recommended Range	Extended Range	$D_3$ H9	$L_3$ +0.2	$D_4$ H11	a min	$d_2$
WE50	19.0 - 39.9	19.0 - 100.0	$d_N + 7.6$	4.2	$d + 1.5$	3.0	2.62
WE51	40.0 - 69.9	30.0 - 200.0	$d_N + 8.8$	6.3	$d + 1.5$	3.0	2.62
WE52	70.0 - 139.9	70.0 - 360.0	$d_N + 12.2$	8.1	$d + 2.0$	4.0	3.53
WE53	140.0 - 399.9	100.0 - 650.0	$d_N + 16.0$	9.5	$d + 2.5$	5.0	5.33
WE54	400.0 - 649.9	200.0 - 650.0	$d_N + 24.0$	14.0	$d + 2.5$	8.0	7.00
WE55	650.0 - 999.9	400.0 - 999.9	$d_N + 27.3$	16.0	$d + 2.5$	10.0	8.40
WE55X	$\geq 1000$	$\geq 1000$	$d_N + 27.3$	16.0	$d + 2.5$	10.0	8.40

### Ordering example

Turcon® Excluder® 5 with O-Ring in NBR  
 Rod diameter:  $d_N = 50.0$  mm  
 Series: WE51 (from Table VIII)  
 TSS Part No.: WE5100500 (from Table IX)

Select the material from Table VII. The corresponding code numbers are appended to the TSS Part No. (from Table IX). Together they form the TSS Article No.  
 For all intermediate sizes not shown in Table IX, the TSS Article No. can be determined from the example opposite.

\* For diameters  $\geq 1000.0$  mm multiply only by factor 1. Example WE55 for diameter 1200.0 mm. TSS Article No.: WE55X1200-M12N.

TSS Article No.	WE51	00500	-	M12	N
TSS Series No.					
Rod diameter x 10*					
Quality Index (Standard)					
Material code (scraper)					
Material code (O-Ring)					





Table IX Installation dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
$d_N$ f8/h9	$D_3$ H9	$L_3$ +0.2	$D_4$ H11	$r_1$ max	a min.		
<b>20.0</b>	<b>27.6</b>	<b>4.2</b>	<b>21.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5000200</b>	<b>21.89 x 2.62</b>
<b>25.0</b>	<b>32.6</b>	<b>4.2</b>	<b>26.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5000250</b>	<b>28.24 x 2.62</b>
<b>28.0</b>	<b>35.6</b>	<b>4.2</b>	<b>29.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5000280</b>	<b>29.82 x 2.62</b>
30.0	37.6	4.2	31.5	0.8	3.0	WE5000300	32.99 x 2.62
<b>32.0</b>	<b>39.6</b>	<b>4.2</b>	<b>33.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5000320</b>	<b>34.59 x 2.62</b>
<b>36.0</b>	<b>43.6</b>	<b>4.2</b>	<b>37.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5000360</b>	<b>37.77 x 2.62</b>
<b>40.0*)</b>	<b>48.8</b>	<b>6.3</b>	<b>41.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5100400</b>	<b>44.12 x 2.62</b>
42.0	50.8	6.3	43.5	0.8	3.0	WE5100420	45.69 x 2.62
<b>45.0*)</b>	<b>53.8</b>	<b>6.3</b>	<b>46.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5100450</b>	<b>48.90 x 2.62</b>
<b>50.0*)</b>	<b>58.8</b>	<b>6.3</b>	<b>51.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5100500</b>	<b>53.64 x 2.62</b>
55.0	63.8	6.3	56.5	0.8	3.0	WE5100550	58.42 x 2.62
<b>56.0*)</b>	<b>64.8</b>	<b>6.3</b>	<b>57.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5100560</b>	<b>59.99 x 2.62</b>
60.0	68.8	6.3	61.5	0.8	3.0	WE5100600	63.17 x 2.62
<b>63.0*)</b>	<b>71.8</b>	<b>6.3</b>	<b>64.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5100630</b>	<b>66.34 x 2.62</b>
65.0	73.8	6.3	66.5	0.8	3.0	WE5100650	67.95 x 2.62
<b>70.0*)</b>	<b>78.8</b>	<b>6.3</b>	<b>71.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WE5100700</b>	<b>72.69 x 2.62</b>
<b>70.0*)</b>	<b>82.2</b>	<b>8.1</b>	<b>72.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5200700</b>	<b>75.79 x 3.53</b>
75.0	87.2	8.1	77.0	1.0	4.0	WE5200750	78.97 x 3.53
<b>80.0*)</b>	<b>88.8</b>	<b>6.3</b>	<b>81.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE5100800</b>	<b>82.22 x 2.62</b>
<b>80.0*)</b>	<b>92.2</b>	<b>8.1</b>	<b>82.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5200800</b>	<b>85.32 x 3.53</b>
85.0	97.2	8.1	87.0	1.0	4.0	WE5200850	88.49 x 3.53
<b>90.0*)</b>	<b>98.8</b>	<b>6.3</b>	<b>91.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE5100900</b>	<b>94.92 x 2.62</b>
<b>90.0*)</b>	<b>102.2</b>	<b>8.1</b>	<b>92.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5200900</b>	<b>94.84 x 3.53</b>
97.0	109.2	8.1	99.0	1.0	4.0	WE5200970	101.19 x 3.53
99.0	111.2	8.1	101.0	1.0	4.0	WE5200990	104.37 x 3.53
<b>100.0*)</b>	<b>108.8</b>	<b>6.3</b>	<b>101.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE5101000</b>	<b>101.27 x 2.62</b>
<b>100.0*)</b>	<b>112.2</b>	<b>8.1</b>	<b>102.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5201000</b>	<b>104.37 x 3.53</b>
105.0	117.2	8.1	107.0	1.0	4.0	WE5201050	110.72 x 3.53
<b>110.0*)</b>	<b>118.8</b>	<b>6.3</b>	<b>111.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE5101100</b>	<b>113.97 x 2.62</b>
<b>110.0*)</b>	<b>122.2</b>	<b>8.1</b>	<b>112.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5201100</b>	<b>113.89 x 3.53</b>
115.0	127.2	8.1	117.0	1.0	4.0	WE5201150	120.24 x 3.53
120.0	132.2	8.1	122.0	1.0	4.0	WE5201200	123.42 x 3.53
<b>125.0*)</b>	<b>133.8</b>	<b>6.3</b>	<b>126.5</b>	<b>1.0</b>	<b>3.0</b>	<b>WE5101250</b>	<b>126.67 x 2.62</b>

The rod diameters in **bold** type comply with the recommendations of ISO 3320.

\*) Installation in grooves according to ISO 6195 Type D.

Other dimensions and all intermediate sizes up to 2.600 mm diameter including imperial (inch) sizes can be supplied.



# Turcon® Excluder® 5

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
$d_N$ f8/h9	$D_3$ H9	$L_3$ +0.2	$D_4$ H11	$r_1$ max	a min.		
<b>125.0*)</b>	<b>137.2</b>	<b>8.1</b>	<b>127.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5201250</b>	<b>129.77 x 3.53</b>
125.4	137.6	8.1	127.4	1.0	4.0	WE5201254	129.77 x 3.53
130.0	142.2	8.1	132.0	1.0	4.0	WE5201300	136.12 x 3.53
135.0	147.2	8.1	137.0	1.0	4.0	WE5201350	139.29 x 3.53
<b>140.0*)</b>	<b>152.2</b>	<b>8.1</b>	<b>142.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5201400</b>	<b>145.64 x 3.53</b>
<b>140.0*)</b>	<b>156.0</b>	<b>9.5</b>	<b>142.5</b>	<b>1.5</b>	<b>5.0</b>	<b>WE5301400</b>	<b>145.42 x 5.33</b>
140.5	156.5	9.5	143.0	1.5	5.0	WE5301405	145.42 x 5.33
150.0	166.0	9.5	152.5	1.5	5.0	WE5301500	151.77 x 5.33
153.0	169.0	9.5	155.5	1.5	5.0	WE5301530	158.12 x 5.33
155.0	171.0	9.5	157.5	1.5	5.0	WE5301550	158.12 x 5.33
<b>160.0*)</b>	<b>172.2</b>	<b>8.1</b>	<b>162.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5201600</b>	<b>164.69 x 3.53</b>
<b>160.0*)</b>	<b>176.0</b>	<b>9.5</b>	<b>162.5</b>	<b>1.5</b>	<b>5.0</b>	<b>WE5301600</b>	<b>164.47 x 5.33</b>
165.0	181.0	9.5	167.5	1.5	5.0	WE5301650	170.82 x 5.33
170.0	186.0	9.5	172.5	1.5	5.0	WE5301700	177.17 x 5.33
175.0	191.0	9.5	177.5	1.5	5.0	WE5301750	177.17 x 5.33
<b>180.0*)</b>	<b>192.2</b>	<b>8.1</b>	<b>182.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5201800</b>	<b>183.74 x 3.53</b>
<b>180.0*)</b>	<b>196.0</b>	<b>9.5</b>	<b>182.5</b>	<b>1.5</b>	<b>5.0</b>	<b>WE5301800</b>	<b>183.52 x 5.33</b>
188.2	204.2	9.5	190.7	1.5	5.0	WE5301882	189.87 x 5.33
190.0	206.0	9.5	192.5	1.5	5.0	WE5301900	196.22 x 5.33
192.0	208.0	9.5	194.5	1.5	5.0	WE5301920	196.22 x 5.33
<b>200.0*)</b>	<b>212.2</b>	<b>8.1</b>	<b>202.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5202000</b>	<b>202.79 x 3.53</b>
<b>200.0*)</b>	<b>216.0</b>	<b>9.5</b>	<b>202.5</b>	<b>1.5</b>	<b>5.0</b>	<b>WE5302000</b>	<b>202.57 x 5.33</b>
211.0	227.0	9.5	213.5	1.5	5.0	WE5302110	215.27 x 5.33
<b>220.0*)</b>	<b>232.2</b>	<b>8.1</b>	<b>222.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5202200</b>	<b>221.84 x 3.53</b>
<b>220.0*)</b>	<b>236.0</b>	<b>9.5</b>	<b>222.5</b>	<b>1.5</b>	<b>5.0</b>	<b>WE5302200</b>	<b>221.62 x 5.33</b>
240.0	256.0	9.5	242.5	1.5	5.0	WE5302400	247.02 x 5.33
<b>250.0*)</b>	<b>262.2</b>	<b>8.1</b>	<b>252.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WE5202500</b>	<b>253.59 x 3.53</b>
<b>250.0*)</b>	<b>266.0</b>	<b>9.5</b>	<b>252.5</b>	<b>1.5</b>	<b>5.0</b>	<b>WE5302500</b>	<b>253.37 x 5.33</b>
260.0	276.0	9.5	262.5	1.5	5.0	WE5302600	266.07 x 5.33
270.0	286.0	9.5	272.5	1.5	5.0	WE5302700	278.77 x 5.33
<b>280.0*)</b>	<b>292.2</b>	<b>8.1</b>	<b>282.0</b>	<b>1.5</b>	<b>4.0</b>	<b>WE5202800</b>	<b>278.99 x 3.53</b>
<b>280.0*)</b>	<b>296.0</b>	<b>9.5</b>	<b>282.5</b>	<b>1.5</b>	<b>5.0</b>	<b>WE5302800</b>	<b>278.77 x 5.33</b>
300.0	316.0	9.5	302.5	1.5	5.0	WE5303000	304.17 x 5.33
<b>320.0*)</b>	<b>332.2</b>	<b>8.1</b>	<b>322.0</b>	<b>1.5</b>	<b>4.0</b>	<b>WE5203200</b>	<b>329.79 x 3.53</b>
<b>320.0*)</b>	<b>336.0</b>	<b>9.5</b>	<b>322.5</b>	<b>1.5</b>	<b>5.0</b>	<b>WE5303200</b>	<b>329.57 x 5.33</b>
330.0	346.0	9.5	332.5	1.5	5.0	WE5303300	329.57 x 5.33

The rod diameters in **bold** type comply with the recommendations of ISO 3320.

\*) Installation in grooves according to ISO 6195 Type D.

Other dimensions and all intermediate sizes up to 2.600 mm diameter including imperial (inch) sizes can be supplied.



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
$d_N$ f8/h9	$D_3$ H9	$L_3$ +0.2	$D_4$ H11	$r_1$ max	$a$ min.		
350.0	366.0	9.5	352.5	1.5	5.0	WE5303500	354.97 x 5.33
<b>360.0*)</b>	<b>372.2</b>	<b>8.1</b>	<b>362.0</b>	<b>1.5</b>	<b>4.0</b>	<b>WE5203600</b>	<b>355.19 x 3.53</b>
<b>360.0*)</b>	<b>376.0</b>	<b>9.5</b>	<b>362.5</b>	<b>1.5</b>	<b>5.0</b>	<b>WE5303600</b>	<b>365.00 x 5.30</b>
380.0	396.0	9.5	382.5	1.5	5.0	WE5303800	380.37 x 5.33
400.0	424.0	14.0	402.5	1.5	8.0	WE5404000	405.26 x 7.00
440.0	464.0	14.0	442.5	1.5	8.0	WE5404400	443.36 x 7.00
450.0	474.0	14.0	452.5	1.5	8.0	WE5404500	456.06 x 7.00
480.0	504.0	14.0	482.5	1.5	8.0	WE5404800	481.46 x 7.00
500.0	524.0	14.0	502.5	1.5	8.0	WE5405000	506.86 x 7.00
560.0	584.0	14.0	562.5	1.5	8.0	WE5405600	557.66 x 7.00
600.0	624.0	14.0	602.5	1.5	8.0	WE5406000	608.08 x 7.00
650.0	677.3	16.0	652.5	2.0	10.0	WE5506500	649.00 x 8.40
680.0	707.3	16.0	682.5	2.0	10.0	WE5506800	680.00 x 8.40
700.0	727.3	16.0	702.5	2.0	10.0	WE5507000	715.00 x 8.40
770.0	797.3	16.0	772.5	2.0	10.0	WE5507700	774.10 x 8.40
785.0	812.3	16.0	787.5	2.0	10.0	WE5507850	810.00 x 8.40
800.0	827.3	16.0	802.5	2.0	10.0	WE5508000	810.00 x 8.40
810.0	837.3	16.0	812.5	2.0	10.0	WE5508100	810.00 x 8.40
900.0	927.3	16.0	902.5	2.0	10.0	WE5509000	910.00 x 8.40
950.0	977.3	16.0	952.5	2.0	10.0	WE5509500	959.10 x 8.40
1000.0	1027.3	16.0	1002.5	2.0	10.0	WE55X1000	1010.0 x 8.40
1040.0	1067.3	16.0	1042.5	2.0	10.0	WE55X1040	1050.0 x 8.40
1130.0	1157.3	16.0	1132.5	2.0	10.0	WE55X1130	1140.0 x 8.40
1200.0	1227.3	16.0	1202.5	2.0	10.0	WE55X1200	1210.0 x 8.40
2600.0	2627.3	16.0	2602.5	2.0	10.0	WE55X2600	2610.0 x 8.40

The rod diameters in **bold** type comply with the recommendations of ISO 3320.

\*) Installation in grooves according to ISO 6195 Type D.

Other dimensions and all intermediate sizes up to 2.600 mm diameter including imperial (inch) sizes can be supplied.

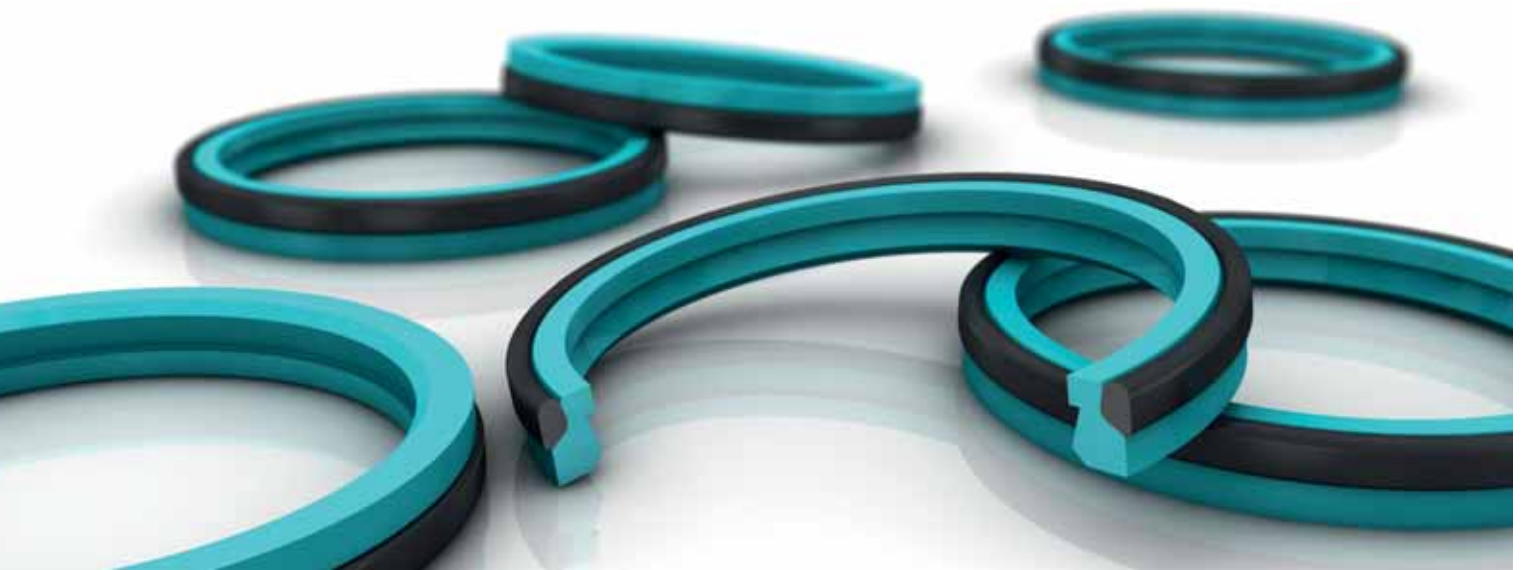


## Turcon<sup>®</sup> Excluder<sup>®</sup> 5

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# Zurcon<sup>®</sup> Excluder<sup>®</sup> 500



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Double Acting

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Rubber Energized

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Flexible Double-acting Scraper

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**Material:**  
Zurcon<sup>®</sup>

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## ■ Zurcon® Excluder® 500\*



### Description

Zurcon® Excluder® 500 is a patented double-acting scraper. It has an identical design and function as that of the Turcon® Excluder® 5 and is fully interchangeable with this scraper. It is more flexible and thus easy to install, but cannot withstand such high speeds and temperatures as the Excluder® 5. The Excluder® 500 is injection moulded from high-grade wear-resistant polyurethane. It is suitable as an inexpensive scraper element where large quantities are required. It is preferably used in conjunction with our rod seal Turcon® Stepseal® 2K with hydrodynamic back-pumping function.

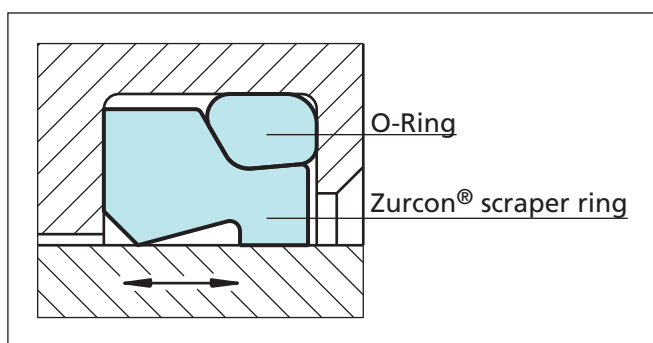


Figure 5 Zurcon® Excluder® 500

### Advantages

- High abrasion resistance, suitable for heavy-duty applications
- Good scraping effect both internal and external
- High flexibility
- Compensates radial deflections of the piston rod
- Identical in installation with Excluder® 5
- Low cost, economical solution
- ISO/DIN 6195 Type D installation dimensions

### Technical Data

Speed:	Max. 1 m/s
Temperature:	-30 °C to +80 °C
Media:	Mineral oil-based hydraulic fluids.

#### 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.

### Materials

Standard material:

Excluder® 500:	Zurcon® Z05
Colour:	Turquoise
O-Ring:	NBR, 70 Shore A
Set Code:	Z05N

### Design and Installation Instructions

Excluder 500® scrapers can be installed in split and closed grooves. Installation in closed grooves is possible above a rod diameter of 25 mm. For smaller diameters, a split groove is recommended.

For new constructions we recommend the scraper DA 24.

\* Patent No. EP 023 5568



## Installation Recommendation

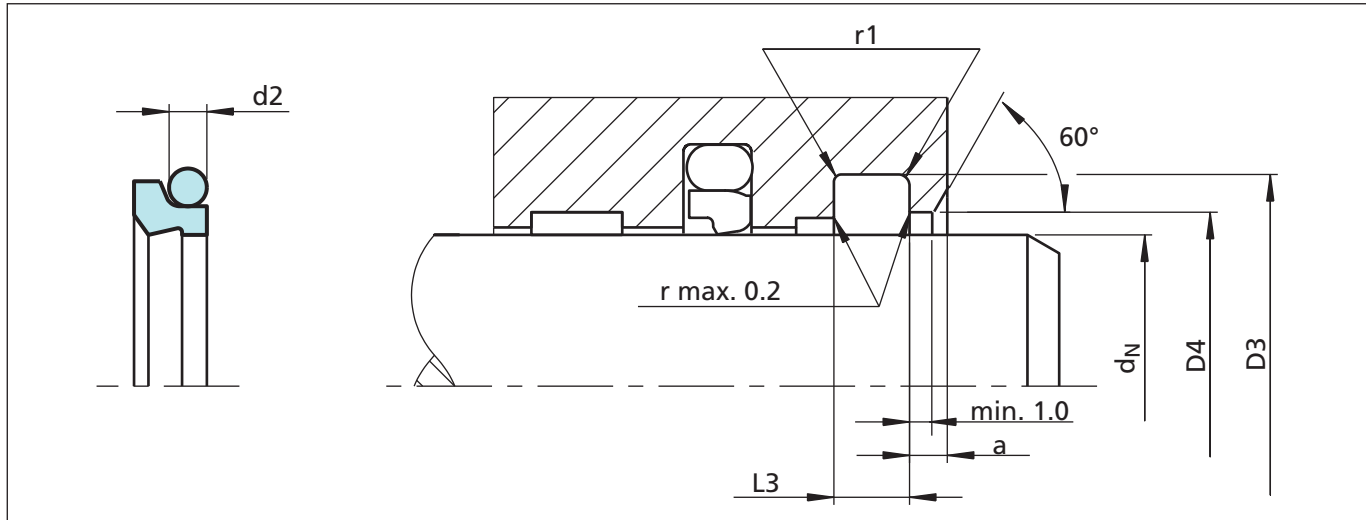


Figure 6 Installation drawing

Table X Installation dimensions

Series No.	Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	O-Ring Cross Section
	$d_N$ f8/h9	$D_3$ H9	$L_3 + 0.2$	$D_4$ H11	a min	$d_2$
WEP0	12.0 - 36.0	$d_N + 7.6$	4.2	$d_N + 1.5$	3.0	2.62
WEP1	36.0 - 65.0	$d_N + 8.8$	6.3	$d_N + 1.5$	3.0	2.62
WEP2	70.0 - 130.0	$d_N + 12.2$	8.1	$d_N + 2.0$	4.0	3.53

Up to 25 mm diameter we recommend the use of a split groove.

### Ordering Example

Zurcon® Excluder 500® with O-Ring  
 Rod diameter:  $d_N = 50.0$  mm  
 Series: WEP1 (from Table X)  
 TSS Part No.: WEP100500 (from Table XI)  
 Materials: Excluder® of Zurcon® Z05  
 O-Ring of NBR 70 Shore A

TSS Article No.	WEP1	00500	-	Z05	N
TSS Series No.					
Rod diameter x 10					
Quality Index (Standard)					
Material code (scraper)					
Material code (O-Ring)					





Table XI Installation dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
dN f8/h9	D <sub>3</sub> H9	L <sub>3</sub> +0.2	D <sub>4</sub> H11	r <sub>1</sub> max	a min.		
<b>12.0</b>	<b>19.6</b>	<b>4.2</b>	<b>13.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP000120</b>	<b>15.00 x 2.62</b>
<b>14.0</b>	<b>21.6</b>	<b>4.2</b>	<b>15.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP000140</b>	<b>17.12 x 2.62</b>
<b>18.0</b>	<b>25.6</b>	<b>4.2</b>	<b>19.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP000180</b>	<b>20.29 x 2.62</b>
<b>20.0</b>	<b>27.6</b>	<b>4.2</b>	<b>21.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP000200</b>	<b>21.89 x 2.62</b>
<b>22.0</b>	<b>29.6</b>	<b>4.2</b>	<b>23.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP000220</b>	<b>25.07 x 2.62</b>
<b>25.0</b>	<b>32.6</b>	<b>4.2</b>	<b>26.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP000250</b>	<b>28.24 x 2.62</b>
<b>28.0</b>	<b>35.6</b>	<b>4.2</b>	<b>29.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP000280</b>	<b>29.82 x 2.62</b>
30.0	37.6	4.2	31.5	0.8	3.0	WEP000300	32.99 x 2.62
<b>32.0</b>	<b>39.6</b>	<b>4.2</b>	<b>33.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP000320</b>	<b>34.59 x 2.62</b>
35.0	42.6	4.2	36.5	0.8	3.0	WEP000350	37.77 x 2.62
<b>36.0</b>	<b>43.6</b>	<b>4.2</b>	<b>37.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP000360</b>	<b>37.77 x 2.62</b>
<b>36.0</b>	<b>44.8</b>	<b>6.3</b>	<b>37.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP100360</b>	<b>39.34 x 2.62</b>
<b>40.0*)</b>	<b>48.8</b>	<b>6.3</b>	<b>41.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP100400</b>	<b>44.12 x 2.62</b>
<b>45.0*)</b>	<b>53.8</b>	<b>6.3</b>	<b>46.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP100450</b>	<b>48.90 x 2.62</b>
<b>50.0*)</b>	<b>58.8</b>	<b>6.3</b>	<b>51.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP100500</b>	<b>53.64 x 2.62</b>
55.0	63.8	6.3	56.5	0.8	3.0	WEP100550	58.42 x 2.62
<b>56.0*)</b>	<b>64.8</b>	<b>6.3</b>	<b>57.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP100560</b>	<b>59.99 x 2.62</b>
60.0	68.8	6.3	61.5	0.8	3.0	WEP100600	63.17 x 2.62
<b>63.0*)</b>	<b>71.8</b>	<b>6.3</b>	<b>64.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEP100630</b>	<b>66.34 x 2.62</b>
65.0	73.8	6.3	66.5	0.8	3.0	WEP100650	67.95 x 2.62
<b>70.0*)</b>	<b>82.2</b>	<b>8.1</b>	<b>72.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEP200700</b>	<b>75.79 x 3.53</b>
75.0	87.2	8.1	77.0	1.0	4.0	WEP200750	78.97 x 3.53
<b>80.0*)</b>	<b>92.2</b>	<b>8.1</b>	<b>82.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEP200800</b>	<b>85.32 x 3.53</b>
85.0	97.2	8.1	87.0	1.0	4.0	WEP200850	88.49 x 3.53
<b>90.0*)</b>	<b>102.2</b>	<b>8.1</b>	<b>92.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEP200900</b>	<b>94.84 x 3.53</b>
95.0	107.2	8.1	97.0	1.0	4.0	WEP200950	101.19 x 3.53
<b>100.0*)</b>	<b>112.2</b>	<b>8.1</b>	<b>102.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEP201000</b>	<b>104.37 x 3.53</b>
105.0	117.2	8.1	107.0	1.0	4.0	WEP201050	110.72 x 3.53
<b>110.0*)</b>	<b>122.2</b>	<b>8.1</b>	<b>112.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEP201100</b>	<b>113.89 x 3.53</b>
120.0	132.2	8.1	122.0	1.0	4.0	WEP201200	123.42 x 3.53
<b>125.0*)</b>	<b>137.2</b>	<b>8.1</b>	<b>127.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEP201250</b>	<b>129.77 x 3.53</b>
130.0	142.2	8.1	132.0	1.0	4.0	WEP201300	132.94 x 3.53

The rod diameters in **bold** type comply with the recommendations of ISO 3320.

\*) Installation in grooves according to ISO 6195 Type D.

Other dimensions on request.



## Zurcon<sup>®</sup> Excluder<sup>®</sup> 500

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# Turcon<sup>®</sup> Excluder<sup>®</sup> F



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Double Acting

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Rubber Energized Double-acting  
Scraper

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**Material:**  
Turcon<sup>®</sup> and Zurcon<sup>®</sup>

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## ■ Turcon® Excluder® F



### Description

The Turcon® Excluder® F is a double-acting scraper with two geometrically different scraper lips, which are positioned back-to-back.

The scraper is always installed with 2 O-Rings as elastic energizing elements in one groove. The scraper function itself is performed by the Excluder® F, Turcon® element. The O-Rings maintains the pressure of the scraper lips against the sliding surface and compensates deflections of the piston rod.

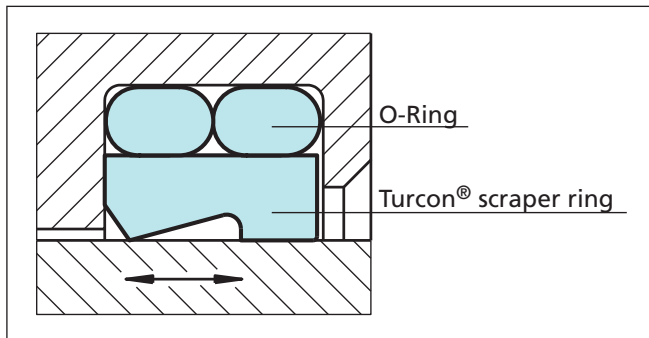


Figure 7 Turcon® Excluder F

### Excluder® F has two functions:

- Scrape contaminants from the retracting piston rod and thus to protect the system from soiling
- Hold back the residual oil film on the extending piston rod on the medium side.
- Excluder® F is preferably used in conjunction with our rod seals Turcon® Stepseal® 2K or Zurcon® Rimseal, i.e. seals with a hydrodynamic back-pumping function. Application wise the Excluder® F is placed between Excluder® 2 and Excluder® 5 for medium to "light-heavy" duty such as in:
  - Light construction machinery
  - Truck crane
  - Agriculture machines
  - Hydraulic presses
  - Injection moulding machines
  - Hydraulic actuators

### Advantages

In principle the same as for Excluder® 2 and 5:

- Outstanding sliding properties
- Stick-slip-free, no sticking for Turcon® materials
- Tough scraper particular in Zurcon® materials
- Can compensate for deflections of the piston rod or plunger

- Very good scraping effect even against firmly adhered dirt, etc.
- Very good sealing effect from the inside against the residual oil film adhering to the surface of the piston rod
- Identical installation as the Zurcon® Excluder® 500 and Excluder® 5 from WE50 to WE52
- Very high resistance to hydraulic media
- Available for diameters from 19 up to 2.600 mm (Turcon®), up to 2.200 mm (Zurcon® Z51/Z52)
- ISO/DIN 6195 Type D installation on recommended dimensions from ø40 to ø140 mm.

### Disadvantages compared to Excluder® 2 and 5

- Require 2 pcs O-Rings
- Not completely axially locked in the groove
- More disposed to wrong installation.

### Advantages compared to Excluder® 2 and 5

- Easier installation in closed groove
- Improved radial flexibility
- Improved sealing function due to O-Ring arrangement.

### Technical Data

Operating conditions:

Speed: 15 m/s for Turcon® materials  
2 m/s for Zurcon® Z80  
1 m/s for Zurcon® Z51/Z52

Temperature: -45 °C to +200 °C for Turcon® materials  
-60 °C to +80 °C for Zurcon® Z80  
-45 °C to +110 °C for Zurcon® Z51/Z52  
(depending on O-Ring materials)

Media: Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids, environmentally safe hydraulic fluids (bio-oils), phosphate ester, water, air and others, depending on scraper and O-ring material compatibility.

### 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, environment, temperature and media.



## Materials

The following material combination has proven effective for most applications:

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® Excluder® F: 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:

Excluder® F 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 XII

## Design and Installation Instructions

All Excluder® F scrapers are preferably installed in closed grooves - installation dimensions see Table XIII.



**Table XII Turcon® and Zurcon® Materials for Excluder® F**

Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
<b>Turcon® M12</b> First material choice for 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 scrapers 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	15
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
<b>Turcon® T40</b> For lubricating and non-lubricating fluids High frequency and short strokes <b>Water hydraulics</b> Surface texture is not suitable for gas Carbon fibre filled Colour: Grey	T40	NBR - 70	N	-30 to +100	Steel Steel, chrome plated (rod) Cast iron Stainless steel Aluminium	15
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
		EPDM-70	E**	-45 to +145		
<b>Turcon® T46</b> 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	15
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
<b>Zurcon® Z51***</b> For mineral oil based fluids Very high abrasion and extrusion resistance For counter surface with rougher surface finish Hard to install 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 Cast iron Ceramic coating Stainless steel	1
		NBR - 70 Low temp.	T	-45 to +80		

\* The O-Ring Operation Temperature is only valid in mineral hydraulic oil, except EPDM. BAM: Tested by "Bundesanstalt Materialprüfung, Germany". \*\* Material not suitable for mineral oils.  
 \*\*\* max. ø 2200 mm  Highlighted materials are standard.



# Turcon® Excluder® F

Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
<b>Zurcon® Z52***</b> For mineral oil based fluids High abrasion resistance For counter surface with rougher surface finish Good extrusion resistance Limited chemical resistance Max. working temperature 110 °C Cast polyurethane Colour: Turquoise.	<b>Z52</b>	NBR - 70	N	-30 to +100	Steel Steel, hardened Steel, chrome plated (rod) Cast iron Stainless steel Aluminium	1
		NBR - 70 Low temp.	T	-45 to +80		
<b>Zurcon® Z80</b> 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)	<b>Z80</b>	NBR - 70	N	-30 to (+100)	Steel Steel, chrome plated (rod) Stainless steel Aluminium Ceramic coating	2
		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. BAM: Tested by "Bundesanstalt Materialprüfung, Germany". \*\* Material not suitable for mineral oils.

\*\*\* max. ø 2200 mm  Highlighted materials are standard.





■ Installation Recommendation

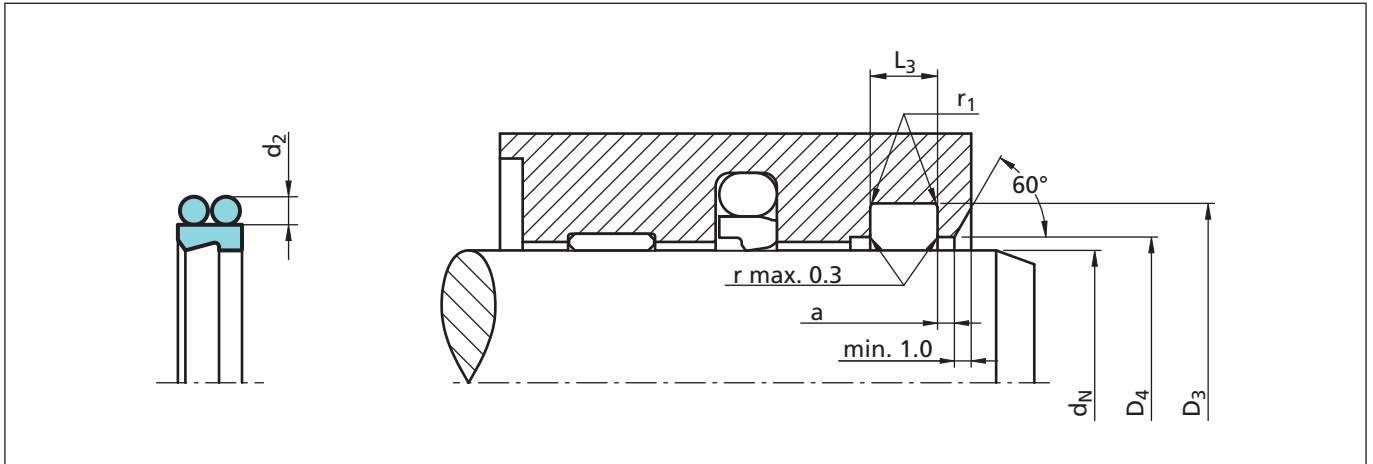


Figure 8 Installation drawing

Table XIII Installation dimensions – Standard recommendations

Series No.	Rod dN f8/h9		Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	O-Ring Cross-Section
	Recommended Range	Available Range	D <sub>3</sub> H9	L <sub>3</sub> +0.2	D <sub>4</sub> H11	r <sub>1</sub> max.	a min.	d <sub>2</sub>
WEF0	19.0 - 39.9	19.0 - 130.0	d <sub>N</sub> + 7.6	4.2	d + 1.0	0.4	3.0	1.78
WEF1	40.0 - 69.9	30.0 - 250.0	d <sub>N</sub> + 8.8	6.3	d + 1.5	1.0	3.0	2.62
WEF2	70.0 - 139.9	50.0 - 450.0	d <sub>N</sub> + 12.2	8.1	d + 2.0	1.2	4.0	3.53
WEF3	140.0 - 399.9	80.0 - 650.0	d <sub>N</sub> + 16.0	11.5	d + 2.0	2.0	5.0	5.33
WEF4	400.0 - 649.9	180.0 - 650.0	d <sub>N</sub> + 24.0	15.5	d + 2.5	2.5	8.0	7.00
WEF5	650.0 - 999.9	300.0 - 999.9	d <sub>N</sub> + 27.3	18.0	d + 2.5	2.5	10.0	8.40

Sizes above 1000.0 mm are available on special part number.

Ordering example

Turcon® Excluder® F complete with O-Ring in NBR, standard application:

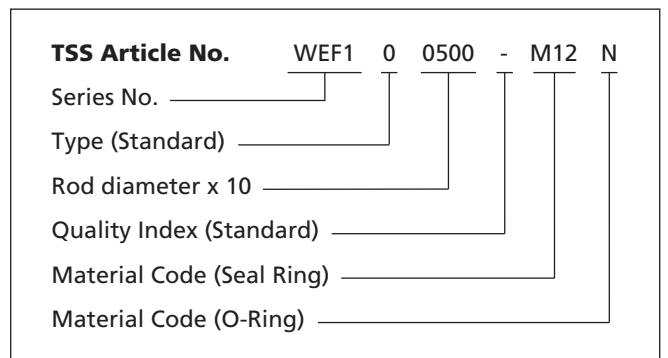
Series: WEF1 (from Table XIII)  
 Rod diameter: d<sub>N</sub> = 50.0 mm  
 TSS Part No.: WEF100500 (from Table XIV)

Select the material from Table XII.

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 not shown in Table XIV can be determined following the example below.





# Turcon® Excluder® F

Table XIV Installation dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
$d_N$ f8/h9	$D_3$ H9	$L_3$ +0.2	$D_4$ H11	$r_1$ max.	$a$ min.		
19.0	26.6	4.2	20.0	0.4	3.0	WEF000190	23.52 x 1.78
<b>20.0</b>	<b>27.6</b>	<b>4.2</b>	<b>21.0</b>	<b>0.4</b>	<b>3.0</b>	<b>WEF000200</b>	<b>23.52 x 1.78</b>
<b>25.0</b>	<b>32.6</b>	<b>4.2</b>	<b>26.0</b>	<b>0.4</b>	<b>3.0</b>	<b>WEF000250</b>	<b>29.87 x 1.78</b>
<b>28.0</b>	<b>35.6</b>	<b>4.2</b>	<b>29.0</b>	<b>0.4</b>	<b>3.0</b>	<b>WEF000280</b>	<b>33.05 x 1.78</b>
30.0	37.6	4.2	31.0	0.4	3.0	WEF000300	34.65 x 1.78
<b>32.0</b>	<b>39.6</b>	<b>4.2</b>	<b>33.0</b>	<b>0.4</b>	<b>3.0</b>	<b>WEF000320</b>	<b>36.27 x 1.78</b>
35.0	42.6	4.2	36.0	0.4	3.0	WEF000350	39.45 x 1.78
<b>36.0</b>	<b>43.6</b>	<b>4.2</b>	<b>37.0</b>	<b>0.4</b>	<b>3.0</b>	<b>WEF000360</b>	<b>41.00 x 1.78</b>
38.0	45.6	4.2	39.0	0.4	3.0	WEF000380	41.00 x 1.78
<b>40.0*)</b>	<b>48.8</b>	<b>6.3</b>	<b>41.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEF100400</b>	<b>44.12 x 2.62</b>
42.0	50.8	6.3	43.5	0.8	3.0	WEF100420	45.69 x 2.62
<b>45.0*)</b>	<b>53.8</b>	<b>6.3</b>	<b>46.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEF100450</b>	<b>48.90 x 2.62</b>
<b>50.0*)</b>	<b>58.8</b>	<b>6.3</b>	<b>51.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEF100500</b>	<b>53.64 x 2.62</b>
55.0	63.8	6.3	56.5	0.8	3.0	WEF100550	58.42 x 2.62
<b>56.0*)</b>	<b>64.8</b>	<b>6.3</b>	<b>57.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEF100560</b>	<b>59.99 x 2.62</b>
60.0	68.8	6.3	61.5	0.8	3.0	WEF100600	63.17 x 2.62
<b>63.0*)</b>	<b>71.8</b>	<b>6.3</b>	<b>64.5</b>	<b>0.8</b>	<b>3.0</b>	<b>WEF100630</b>	<b>66.34 x 2.62</b>
65.0	73.8	6.3	66.5	0.8	3.0	WEF100650	67.95 x 2.62
<b>70.0*)</b>	<b>82.2</b>	<b>8.1</b>	<b>72.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEF200700</b>	<b>75.79 x 3.53</b>
75.0	87.2	8.1	77.0	1.0	4.0	WEF200750	78.97 x 3.53
<b>80.0*)</b>	<b>92.2</b>	<b>8.1</b>	<b>82.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEF200800</b>	<b>85.32 x 3.53</b>
85.0	97.2	8.1	87.0	1.0	4.0	WEF200850	88.49 x 3.53
<b>90.0*)</b>	<b>102.2</b>	<b>8.1</b>	<b>92.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEF200900</b>	<b>94.84 x 3.53</b>
95.0	107.2	8.1	97.0	1.0	4.0	WEF200950	101.19 x 3.53
<b>100.0*)</b>	<b>112.2</b>	<b>8.1</b>	<b>102.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEF201000</b>	<b>104.37 x 3.53</b>
105.0	117.2	8.1	107.0	1.0	4.0	WEF201050	110.72 x 3.53
<b>110.0*)</b>	<b>122.2</b>	<b>8.1</b>	<b>112.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEF201100</b>	<b>113.89 x 3.53</b>
115.0	127.2	8.1	117.0	1.0	4.0	WEF201150	120.24 x 3.53
120.0	132.2	8.1	122.0	1.0	4.0	WEF201200	123.42 x 3.53
<b>125.0*)</b>	<b>137.2</b>	<b>8.1</b>	<b>127.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEF201250</b>	<b>129.77 x 3.53</b>
130.0	142.2	8.1	132.0	1.0	4.0	WEF201300	136.12 x 3.53
135.0	147.2	8.1	137.0	1.0	4.0	WEF201350	139.29 x 3.53
<b>140.0*)</b>	<b>152.2</b>	<b>8.1</b>	<b>142.0</b>	<b>1.0</b>	<b>4.0</b>	<b>WEF201400</b>	<b>145.64 x 3.53</b>
<b>140.0</b>	<b>156.0</b>	<b>11.5</b>	<b>142.0</b>	<b>2.0</b>	<b>5.0</b>	<b>WEF301400</b>	<b>145.42 x 5.33</b>
145.0	161.0	11.5	147.0	2.0	5.0	WEF301450	148.49 x 5.33
150.0	166.0	11.5	152.0	2.0	5.0	WEF301500	155.00 x 5.30



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
$d_N$ f8/h9	$D_3$ H9	$L_3$ +0.2	$D_4$ H11	$r_1$ max.	a min.		
155.0	171.0	11.5	157.0	2.0	5.0	WEF301550	158.12 x 5.33
<b>160.0</b>	<b>176.0</b>	<b>11.5</b>	<b>162.0</b>	<b>2.0</b>	<b>5.0</b>	<b>WEF301600</b>	<b>164.47 x 5.33</b>
165.0	181.0	11.5	167.0	2.0	5.0	WEF301650	170.82 x 5.33
170.0	186.0	11.5	172.0	2.0	5.0	WEF301700	175.00 x 5.30
175.0	191.0	11.5	177.0	2.0	5.0	WEF301750	180.00 x 5.30
<b>180.0</b>	<b>196.0</b>	<b>11.5</b>	<b>182.0</b>	<b>2.0</b>	<b>5.0</b>	<b>WEF301800</b>	<b>183.52 x 5.33</b>
185.0	201.0	11.5	187.0	2.0	5.0	WEF301850	189.87 x 5.33
190.0	206.0	11.5	192.0	2.0	5.0	WEF301900	196.22 x 5.33
195.0	211.0	11.5	197.0	2.0	5.0	WEF301950	196.22 x 5.33
<b>200.0</b>	<b>216.0</b>	<b>11.5</b>	<b>202.0</b>	<b>2.0</b>	<b>5.0</b>	<b>WEF302000</b>	<b>202.57 x 5.33</b>
210.0	226.0	11.5	212.0	2.0	5.0	WEF302100	215.27 x 5.33
<b>220.0</b>	<b>236.0</b>	<b>11.5</b>	<b>222.0</b>	<b>2.0</b>	<b>5.0</b>	<b>WEF302200</b>	<b>227.97 x 5.33</b>
230.0	246.0	11.5	232.0	2.0	5.0	WEF302300	234.32 x 5.33
240.0	256.0	11.5	242.0	2.0	5.0	WEF302400	247.02 x 5.33
<b>250.0</b>	<b>266.0</b>	<b>11.5</b>	<b>252.0</b>	<b>2.0</b>	<b>5.0</b>	<b>WEF302500</b>	<b>253.37 x 5.33</b>
260.0	276.0	11.5	262.0	2.0	5.0	WEF302600	266.07 x 5.33
270.0	286.0	11.5	272.0	2.0	5.0	WEF302700	278.77 x 5.33
<b>280.0</b>	<b>296.0</b>	<b>11.5</b>	<b>282.0</b>	<b>2.0</b>	<b>5.0</b>	<b>WEF302800</b>	<b>290.00 x 5.30</b>
290.0	306.0	11.5	292.0	2.0	5.0	WEF302900	291.47 x 5.33
300.0	316.0	11.5	302.0	2.0	5.0	WEF303000	304.17 x 5.33
310.0	326.0	11.5	312.0	2.0	5.0	WEF303100	315.00 x 5.30
<b>320.0</b>	<b>336.0</b>	<b>11.5</b>	<b>322.0</b>	<b>2.0</b>	<b>5.0</b>	<b>WEF303200</b>	<b>329.57 x 5.33</b>
330.0	346.0	11.5	332.0	2.0	5.0	WEF303300	329.57 x 5.33
340.0	356.0	11.5	342.0	2.0	5.0	WEF303400	345.00 x 5.30
350.0	366.0	11.5	352.0	2.0	5.0	WEF303500	354.97 x 5.33
<b>360.0</b>	<b>376.0</b>	<b>11.5</b>	<b>362.0</b>	<b>2.0</b>	<b>5.0</b>	<b>WEF303600</b>	<b>365.00 x 5.30</b>
370.0	386.0	11.5	372.0	2.0	5.0	WEF303700	365.00 x 5.30
380.0	396.0	11.5	382.0	2.0	5.0	WEF303800	387.00 x 5.30
390.0	406.0	11.5	392.0	2.0	5.0	WEF303900	380.37 x 5.33
400.0	416.0	11.5	402.0	2.0	5.0	WEF304000	405.26 x 5.33
400.0	424.0	15.5	402.5	2.5	8.0	WEF404000	412.00 x 7.00
420.0	444.0	15.5	422.5	2.5	8.0	WEF404200	430.66 x 7.00
440.0	464.0	15.5	442.5	2.5	8.0	WEF404400	450.00 x 7.00
460.0	484.0	15.5	462.5	2.5	8.0	WEF404600	468.76 x 7.00
480.0	504.0	15.5	482.5	2.5	8.0	WEF404800	494.16 x 7.00
500.0	524.0	15.5	502.5	2.5	8.0	WEF405000	506.86 x 7.00



## Turcon® Excluder® F

<b>Rod Diameter</b>	<b>Groove Diameter</b>	<b>Groove Width</b>	<b>Bore Diameter</b>	<b>Radius</b>	<b>Step Width</b>	<b>TSS Part No.</b>	<b>O-Ring Size</b>
<b><math>d_N</math> f8/h9</b>	<b><math>D_3</math> H9</b>	<b><math>L_3</math> +0.2</b>	<b><math>D_4</math> H11</b>	<b><math>r_1</math> max.</b>	<b>a min.</b>		
525.0	549.0	15.5	527.5	2.5	8.0	WEF405250	532.26 x 7.00
550.0	574.0	15.5	552.5	2.5	8.0	WEF405500	557.66 x 7.00
575.0	599.0	15.5	577.5	2.5	8.0	WEF405750	582.68 x 7.00
600.0	624.0	15.5	602.5	2.5	8.0	WEF406000	608.08 x 7.00
625.0	649.0	15.5	627.5	2.5	8.0	WEF406250	633.48 x 7.00
650.0	677.3	18.0	652.5	2.5	10.0	WEF506500	649.00 x 8.40
675.0	702.3	18.0	677.5	2.5	10.0	WEF506750	686.80 x 8.40
700.0	727.3	18.0	702.5	2.5	10.0	WEF507000	715.00 x 8.40
725.0	752.3	18.0	727.5	2.5	10.0	WEF507250	740.00 x 8.40
750.0	777.3	18.0	752.5	2.5	10.0	WEF507500	760.00 x 8.40
775.0	802.0	18.0	777.5	2.5	10.0	WEF507750	786.80 x 8.40
800.0	827.3	18.0	802.5	2.5	10.0	WEF508000	810.00 x 8.40
825.0	852.3	18.0	827.5	2.5	10.0	WEF508250	836.80 x 8.40
850.0	877.3	18.0	852.5	2.5	10.0	WEF508500	865.00 x 8.40
875.0	902.3	18.0	877.5	2.5	10.0	WEF508750	888.00 x 8.40
900.0	927.3	18.0	902.5	2.5	10.0	WEF509000	918.00 x 8.40
925.0	952.3	18.0	927.5	2.5	10.0	WEF509250	936.80 x 8.40
950.0	977.3	18.0	952.5	2.5	10.0	WEF509500	959.10 x 8.40
975.0	1002.3	18.0	977.5	2.5	10.0	WEF509750	990.00 x 8.40
999.9	1027.2	18.0	1002.4	2.5	10.0	WEF509999	1014.00 x 8.40

The rod diameters in **bold** type comply with the recommendations of ISO 3320

\*) Installation in grooves according to ISO 6195 Type D

Other dimensions and all intermediate sizes up to 2600 mm diameter including imperial (inch) sizes can be supplied upon request.

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# Turcon<sup>®</sup> Excluder<sup>®</sup> G



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Double Acting

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Rubber Energized Double-acting  
Scraper

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**Material:**  
Turcon<sup>®</sup> and Zurcon<sup>®</sup>

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## ■ Turcon® Excluder® G



The Turcon® Excluder® G is a double-acting scraper with two geometrically different scraper lips, which are positioned back-to-back. The scraper is always installed with 2 O-Rings as elastic energizing elements. The scraper function itself is performed by the Turcon® Excluder® G element. The O-Rings maintains the pressure of the scraper lips against the sliding surface and compensates deflections of the piston rod.

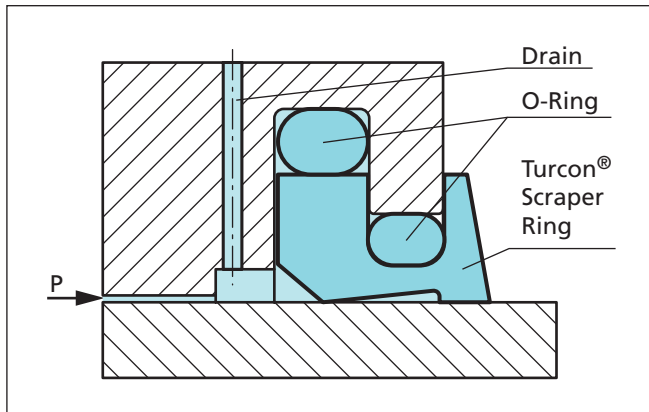


Figure 9 Turcon® Excluder G

### Excluder® G has two functions:

- Scrape contaminants from the retracting piston rod and thus to protect the system from soiling
- Hold back the residual fluid film on the extending piston rod on the fluid side.

Excluder® G is preferably used in heavily dirty environments where it is mandatory to prevent dirt from being trapped in front of the scraper element e.g. when the rod is facing upwards, typically for bigger rod diameters in applications like:

- Mining equipment
- Hydraulic presses
- Steelworks
- Heavy construction machinery
- Offshore installations
- Water works

### Advantages

In principle the same as for Excluder® 2, 5 and F.

- Outstanding sliding properties
- Stick-slip-free, no sticking (for Turcon® materials)

- Tough scraper (particular in Zurcon® materials)
- Can compensate for deflections of the piston rod or plunger
- Good scraping effect even against firmly adhered dirt, etc.
- Good sealing effect from the inside against the residual fluid film adhering to the surface of the piston rod
- Very high resistance to hydraulic media (Turcon®)
- Available for diameters from 100 up to 2.600 mm (Turcon®), up to 2.200 mm (Zurcon® Z51/Z52).

### Disadvantages compared to Excluder® 2, 5 and F

- Require 2 pcs O-Rings in different sizes
- Drain required
- Demanding installation operation
- Only available for diameter above 100 mm

### Advantages compared to Excluder® 2, 5 and F

- No dirt trapping because of extended scraping lip

### Technical Data

Operating conditions:

Speed: 5 m/s (Turcon®)  
2 m/s for Zurcon® Z80  
1 m/s for Zurcon® Z51/Z52

Temperature: -45 °C to +200 °C (Turcon®)  
-60 °C to +80 °C (Zurcon® Z80)  
-45 °C to +110 °C (Zurcon® Z51/Z52)  
(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 scraper ring and O-Ring material compatibility.

#### 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, environment, temperature and media.



## Installation Instructions

Excluder® G scrapers are always installed in closed grooves - installation dimensions see Table XVI.

First O-Ring 1 is installed in the groove. O-Ring 2 is mounted on the scraper ring before compressed into a kidney-shape and placed in the groove see Figure 10.

Place the Turcon® Excluder® G in compressed form into the groove and push against the Scraper in the direction of the arrow at Figure 10.

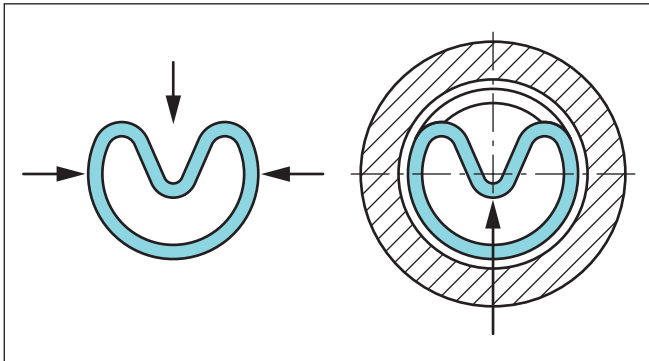


Figure 10 Installation of Turcon® Excluder® G

## Materials

The following material combination has proven effective for most applications:

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® Excluder® G: 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® Excluder® G: 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 XV.





**Table XV Turcon® and Zurcon® Materials for Excluder® G**

Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
<b>Turcon® M12</b> First material choice for 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 scrapers 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) Cast iron Stainless steel Titanium	5
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
<b>Turcon® T40</b> For lubricating and non-lubricating fluids High frequency and short strokes <b>Water hydraulics</b> Surface texture is not suitable for gas sealing Carbon fibre filled Colour: Grey	T40	NBR - 70	N	-30 to +100	Steel Steel, chrome plated (rod) Cast iron Stainless steel Aluminium	5
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
		EPDM-70	E**	-45 to +145		
<b>Turcon® T46</b> 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	5
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
<b>Zurcon® Z51***</b> For mineral oil based fluids Very high abrasion and extrusion resistance For counter surface with rougher surface finish Hard to install 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 Cast iron Ceramic coating Stainless steel	1
		NBR - 70 Low temp.	T	-45 to +80		

\* The O-Ring Operation Temperature is only valid in mineral hydraulic oil, except EPDM. BAM: Tested by "Bundesanstalt Materialprüfung, Germany". \*\* Material not suitable for mineral oils. \*\*\* max. Ø 2200 mm  Highlighted materials are standard.



# Turcon® Excluder® G

Material, Applications, Properties	Code	O-Ring Material Shore A	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
<b>Zurcon® Z52***</b> For mineral oil based fluids High abrasion resistance For counter surface with rougher surface finish Good extrusion resistance Limited chemical resistance Max. working temperature 110 °C Cast polyurethane Colour: Turquoise	Z52	NBR - 70	N	-30 to +100	Steel Steel, hardened Steel, chrome plated (rod) Cast iron Stainless steel Aluminium	1
		NBR - 70 Low temp.	T	-45 to +80		
<b>Zurcon® Z80</b> 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)	Z80	NBR - 70	N	-30 to (+100)	Steel Steel, chrome plated (rod) Stainless steel Aluminium Ceramic coating	2
		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. BAM: Tested by "Bundesanstalt Materialprüfung, Germany". \*\* Material not suitable for mineral oils. \*\*\* max. Ø 2200 mm  Highlighted materials are standard.



■ Installation Recommendation

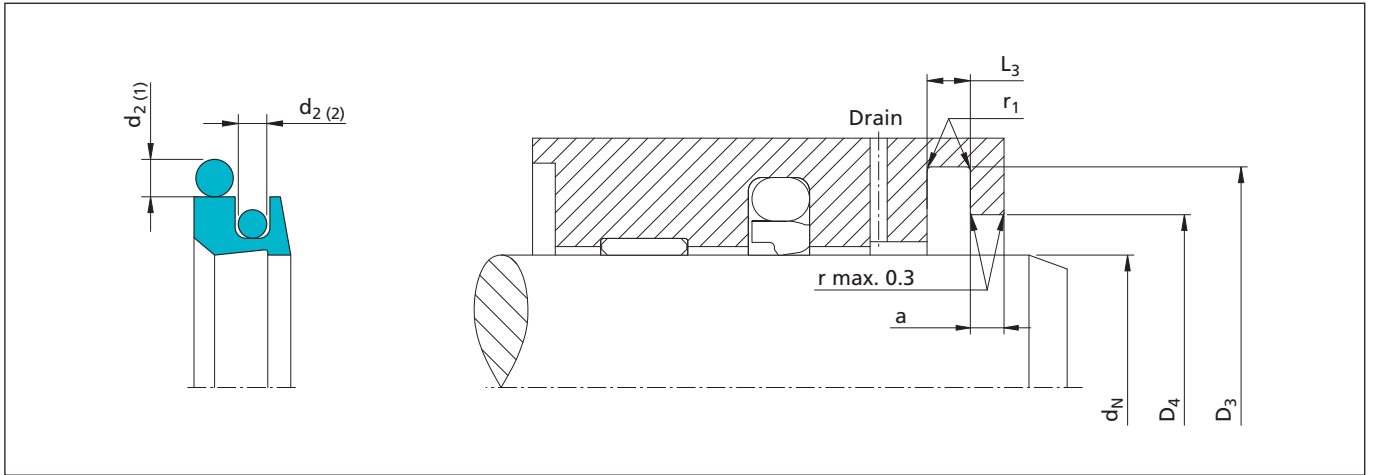


Figure 11 Installation drawing

Table XVI Installation dimensions – Standard recommendations

Series No.	Rod Diameter $d_N$ f8/h9		Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	O-Ring 1 Cross-Section	O-Ring 2 Cross-Section
	Recommended Range	Available Range	$D_3$ H8	$L_3$ +0.2/-0	$D_4$ H8	$r_1$	$a$ +0/-0.1	$d_{2(1)}$	$d_{2(2)}$
WEG1	140.0 - 229.9	100.0 - 450.0	$d_N + 22.2$	6.3	$d_N + 10.7$	1.2	4.2	5.33	3.53
WEG2	230.0 - 299.9	220.0 - 450.0	$d_N + 24.2$	6.3	$d_N + 10.7$	1.2	4.2	5.33	3.53
WEG3	300.0 - 629.9	250.0 - 650.0	$d_N + 33.0$	8.1	$d_N + 15.1$	1.2	6.3	7.00	5.33
WEG4	630.0 - 999.9	550.0 - 999.9	$d_N + 36.5$	9.5	$d_N + 15.1$	2.0	6.3	8.40	5.33

Sizes above 1000.0 mm are available on special part number.

Table XVII Minimum Installation Diameter

Materials	Zurcon® Z52	Turcon® Materials	Zurcon® Z51 and Z80
Rod diameter (min.)	100 mm	120 mm	140 mm

Table XVIII Calculation of O-Ring ID Diameter

Series No.	O-Ring 1	O-Ring 2
WEG1	$(d_N + 12.0) \times 5.33$	$(d_N + 5.0) \times 3.53$
WEG2	$(d_N + 14.0) \times 5.33$	$(d_N + 5.0) \times 3.53$
WEG3	$(d_N + 20.0) \times 7.00$	$(d_N + 6.0) \times 5.33$
WEG4	$(d_N + 21.0) \times 8.40$	$(d_N + 6.0) \times 5.33$



# Turcon® Excluder® G

## Ordering example

Turcon® Excluder® G complete with O-Rings in NBR, standard application:

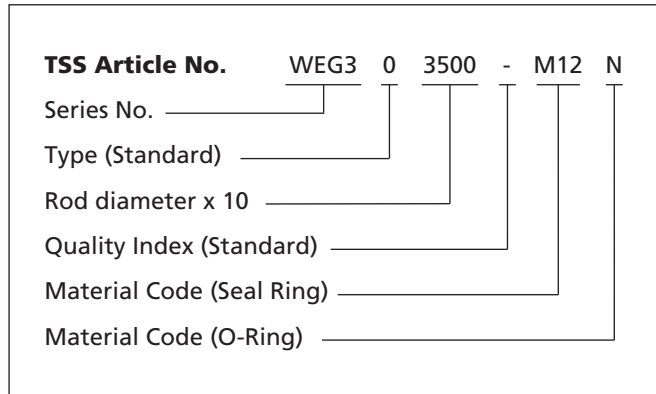
Series: WEG3 (from Table XVI).  
 Rod diameter: dN = 350.0 mm.  
 TSS Part No.: WEG303500 (from Table XIX).

Select the material from Table XV.

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 not shown in Table XIX can be determined following the example beside.



**Table XIX Installation dimensions / TSS Part No.**

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring 1 Cross-Section	O-Ring 2 Cross-Section
d <sub>N</sub> f8/h9	D <sub>3</sub> H8	L <sub>3</sub> +0/-0.2	D <sub>4</sub> H8	r <sub>1</sub> max.	a +0/-0.1		d <sub>1</sub>	d <sub>2</sub>
<b>140.0</b>	<b>162.2</b>	<b>6.3</b>	<b>150.7</b>	<b>1.2</b>	<b>4.2</b>	<b>WEG101400</b>	<b>151.77 x 5.33</b>	<b>142.47 x 3.53</b>
150.0	172.2	6.3	160.7	1.2	4.2	WEG101500	164.47 x 5,33	151.99 x 3.53
<b>160.0</b>	<b>182.2</b>	<b>6.3</b>	<b>170.7</b>	<b>1.2</b>	<b>4.2</b>	<b>WEG101600</b>	<b>170.82 x 5.33</b>	<b>164.69 x 3.53</b>
170.0	192.2	6.3	180.7	1.2	4.2	WEG101700	183.52 x 5.33	171.04 x 3.53
<b>180.0</b>	<b>202.2</b>	<b>6.3</b>	<b>190.7</b>	<b>1.2</b>	<b>4.2</b>	<b>WEG101800</b>	<b>189.87 x 5.33</b>	<b>183.74 x 3.53</b>
190.0	212.2	6.3	200.7	1.2	4.2	WEG101900	202.57 x 5.33	190.09 x 3.53
<b>200.0</b>	<b>222.2</b>	<b>6.3</b>	<b>210.7</b>	<b>1.2</b>	<b>4.2</b>	<b>WEG102000</b>	<b>215.27 x 5.33</b>	<b>202.79 x 3.53</b>
210.0	232.2	6.3	220.7	1.2	4.2	WEG102100	221.62 x 5.33	215.49 x 3.53
<b>220.0</b>	<b>242.2</b>	<b>6.3</b>	<b>230.7</b>	<b>1.2</b>	<b>4.2</b>	<b>WEG102200</b>	<b>234.32 x 5.33</b>	<b>221.84 x 3.53</b>
230.0	254.2	6.3	240.7	1.2	4.2	WEG202300	247.02 x 5.33	234.54 x 3.53
240.0	264.2	6.3	250.7	1.2	4.2	WEG202400	253.37 x 5.33	247.24 x 3.53
<b>250.0</b>	<b>274.2</b>	<b>6.3</b>	<b>260.7</b>	<b>1.2</b>	<b>4.2</b>	<b>WEG202500</b>	<b>266.07 x 5.33</b>	<b>253.59 x 3.53</b>
260.0	284.2	6.3	270.7	1.2	4.2	WEG202600	278.77 x 5.33	266.29 x 3.53
270.0	294.2	6.3	280.7	1.2	4.2	WEG202700	278.77 x 5.33	278.99 x 3.53
<b>280.0</b>	<b>304.2</b>	<b>6.3</b>	<b>290.7</b>	<b>1.2</b>	<b>4.2</b>	<b>WEG202800</b>	<b>291.47 x 5.33</b>	<b>291.69 x 3.53</b>
290.0	314.2	6.3	300.7	1.2	4.2	WEG202900	304.17 x 5.33	291.69 x 3.53
300.0	333.0	8.1	315.1	1.2	6.3	WEG303000	316.87 x 7.00	304.17 x 5.33
310.0	343.0	8.1	325.1	1.2	6.3	WEG303100	329.57 x 7.00	304.17 x 5.33
<b>320.0</b>	<b>353.0</b>	<b>8.1</b>	<b>335.1</b>	<b>1.2</b>	<b>6.3</b>	<b>WEG303200</b>	<b>342.47 x 7.00</b>	<b>329.57 x 5.33</b>
330.0	363.0	8.1	345.1	1.2	6.3	WEG303300	354.97 x 7.00	329.57 x 5.33
340.0	373.0	8.1	355.1	1.2	6.3	WEG303400	354.97 x 7.00	354.97 x 5.33

The rod diameters in **bold** type comply with the recommendations of ISO 3320.

Other dimensions and all intermediate sizes up to 2600 mm diameter including imperial (inch) sizes can be supplied upon request.



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring 1 Cross-Section	O-Ring 2 Cross-Section
$d_N$ f8/h9	$D_3$ H8	$L_3$ +0/-0.2	$D_4$ H8	$r_1$ max.	$a$ +0/-0.1		$d_1$	$d_2$
350.0	383.0	8.1	365.1	1.2	6.3	WEG303500	367.67 x 7.00	354.97 x 5.33
<b>360.0</b>	<b>393.0</b>	<b>8.1</b>	<b>375.1</b>	<b>1.2</b>	<b>6.3</b>	<b>WEG303600</b>	<b>380.37 x 7.00</b>	<b>354.97 x 5.33</b>
370.0	403.0	8.1	385.1	1.2	6.3	WEG303700	393.07 x 7.00	380.37 x 5.33
380.0	413.0	8.1	395.1	1.2	6.3	WEG303800	405.26 x 7.00	380.37 x 5.33
390.0	423.0	8.1	405.1	1.2	6.3	WEG303900	417.96 x 7.00	405.26 x 5.33
400.0	433.0	8.1	415.1	1.2	6.3	WEG304000	417.96 x 7.00	405.26 x 5.33
410.0	443.0	8.1	425.1	1.2	6.3	WEG304100	430.66 x 7.00	405.26 x 5.33
420.0	453.0	8.1	435.1	1.2	6.3	WEG304200	443.36 x 7.00	430.66 x 5.33
430.0	463.0	8.1	445.1	1.2	6.3	WEG304300	456.06 x 7.00	430.66 x 5.33
440.0	473.0	8.1	455.1	1.2	6.3	WEG304400	468.76 x 7.00	456.06 x 5.33
450.0	483.0	8.1	465.1	1.2	6.3	WEG304500	468.76 x 7.00	456.06 x 5.33
460.0	493.0	8.1	475.1	1.2	6.3	WEG304600	481.46 x 7.00	456.06 x 5.33
470.0	503.0	8.1	485.1	1.2	6.3	WEG304700	494.16 x 7.00	481.38 x 5.33
480.0	513.0	8.1	495.1	1.2	6.3	WEG304800	506.86 x 7.00	481.38 x 5.33
500.0	533.0	8.1	515.1	1.2	6.3	WEG305000	532.26 x 7.00	506.78 x 5.33
520.0	553.0	8.1	535.1	1.2	6.3	WEG305200	532.26 x 7.00	532.18 x 5.33
550.0	583.0	8.1	565.1	1.2	6.3	WEG305500	557.66 x 7.00	557.58 x 5.33
560.0	593.0	8.1	575.1	1.2	6.3	WEG305600	582.68 x 7.00	582.68 x 5.33
580.0	613.0	8.1	595.1	1.2	6.3	WEG305800	608.08 x 7.00	582.68 x 5.33
600.0	633.0	8.1	615.1	1.2	6.3	WEG306000	608.08 x 7.00	608.08 x 5.33
630.0	666.5	9.5	645.1	2.0	6.3	WEG406300	649.00 x 8.40	633.48 x 5.33
640.0	676.5	9.5	655.1	2.0	6.3	WEG406400	661 x 8.40	658.48 x 5.33
650.0	686.5	9.5	665.1	2.0	6.3	WEG406500	671 x 8.40	658.88 x 5.33
660.0	696.5	9.5	675.1	2.0	6.3	WEG406600	680.00 x 8.40	666 x 5.33
670.0	706.5	9.5	685.1	2.0	6.3	WEG406700	691 x 8.40	676 x 5.33
680.0	716.5	9.5	695.1	2.0	6.3	WEG406800	715.00 x 8.40	686 x 5.33
700.0	736.5	9.5	715.1	2.0	6.3	WEG407000	715.00 x 8.40	706 x 5.33
720.0	756.5	9.5	735.1	2.0	6.3	WEG407200	740.00 x 8.40	726 x 5.33
730.0	766.5	9.5	745.1	2.0	6.3	WEG407300	740.00 x 8.40	736 x 5.33
740.0	776.5	9.5	755.1	2.0	6.3	WEG407400	761 x 8.40	746 x 5.33
750.0	786.5	9.5	765.1	2.0	6.3	WEG407500	774.10 x 8.40	756 x 5.33
770.0	806.5	9.5	785.1	2.0	6.3	WEG407700	791 x 8.40	776 x 5.33
780.0	816.5	9.5	795.1	2.0	6.3	WEG407800	810.00 x 8.40	786 x 5.33
800.0	836.5	9.5	815.1	2.0	6.3	WEG408000	810.00 x 8.40	806 x 5.33
810.0	846.5	9.5	825.1	2.0	6.3	WEG408100	831 x 8.40	816 x 5.33
820.0	856.5	9.5	835.1	2.0	6.3	WEG408200	845.00 x 8.40	826 x 5.33
830.0	866.5	9.5	845.1	2.0	6.3	WEG408300	865.00 x 8.40	836 x 5.33

The rod diameters in **bold** type comply with the recommendations of ISO 3320.  
Other dimensions and all intermediate sizes up to 2600 mm diameter including imperial (inch) sizes can be supplied upon request.



## Turcon® Excluder® G

<b>Rod Diameter</b>	<b>Groove Diameter</b>	<b>Groove Width</b>	<b>Bore Diameter</b>	<b>Radius</b>	<b>Step Width</b>	<b>TSS Part No.</b>	<b>O-Ring 1 Cross-Section</b>	<b>O-Ring 2 Cross-Section</b>
<b><math>d_N</math> f8/h9</b>	<b><math>D_3</math> H8</b>	<b><math>L_3</math> +0/-0.2</b>	<b><math>D_4</math> H8</b>	<b><math>r_1</math> max.</b>	<b><math>a</math> +0/-0.1</b>		<b><math>d_1</math></b>	<b><math>d_2</math></b>
850.0	886.5	9.5	865.1	2.0	6.3	WEG408500	888.00 x 8.40	856 x 5.33
890.0	926.5	9.5	905.1	2.0	6.3	WEG408900	911 x 8.40	896 x 5.33
900.0	936.5	9.5	915.1	2.0	6.3	WEG409000	934.10 x 8.40	906 x 5.33
950.0	986.5	9.5	965.1	2.0	6.3	WEG409500	971 x 8.40	956 x 5.33
970.0	1006.5	9.5	985.1	2.0	6.3	WEG409700	991 x 8.40	976 x 5.33

The rod diameters in **bold** type comply with the recommendations of ISO 3320.

Other dimensions and all intermediate sizes up to 2600 mm diameter including imperial (inch) sizes can be supplied upon request.