
Turcon[®] Excluder[®] G



Double Acting

Rubber Energized Double-acting
Scraper

Material:
Turcon[®] and Zurcon[®]



■ 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.

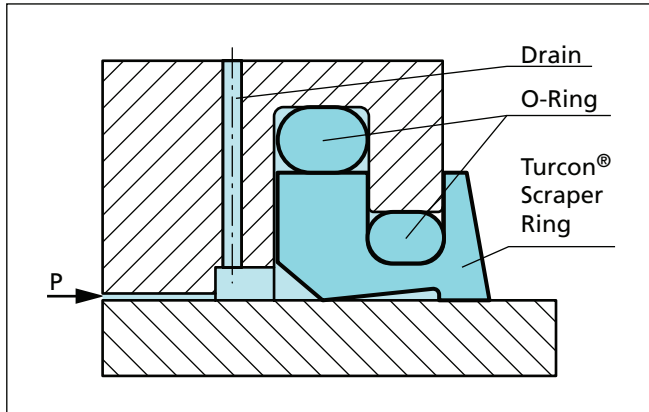


Figure 9 Turcon® Excluder G

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.

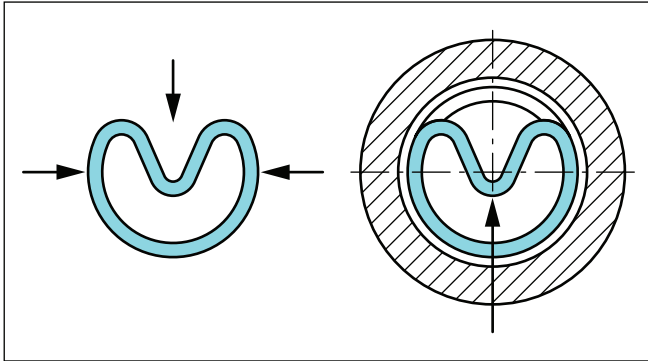


Figure 10 Installation of Turcon® Excluder® G

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.
Turcon® M12 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		
Turcon® T40 For lubricating and non-lubricating fluids High frequency and short strokes Water hydraulics Surface texture is not suitable for gas sealing Carbon fibre filled Colour: Grey	T40	NBR - 70	N	-30 to +100	Steel Steel, 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		
Turcon® T46 For lubricated hydraulics in linear motion High compressive strength High extrusion resistance Very good sliding and wear properties BAM tested Bronze filled Colour: Light to dark brown, which may have variations in shading	T46	NBR - 70	N	-30 to +100	Steel, hardened Steel, chrome plated (rod) Cast iron	5
		NBR - 70 Low temp.	T	-45 to +80		
		FKM - 70	V	-10 to +200		
Zurcon® Z51*** For mineral oil based fluids Very high abrasion and extrusion resistance For counter surface with rougher surface finish 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.
Zurcon® Z52*** 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		
Zurcon® Z80 For lubricating and non-lubricating fluids Water based fluids, air and gases Dry air pneumatics High abrasion and extrusion resistance For service in abrasive conditions and media with particles Good chemical resistance Limited temperature capability (-60 to +80 °C) UHMWPE (Ultra High Molecular Weight Polyethylene)	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

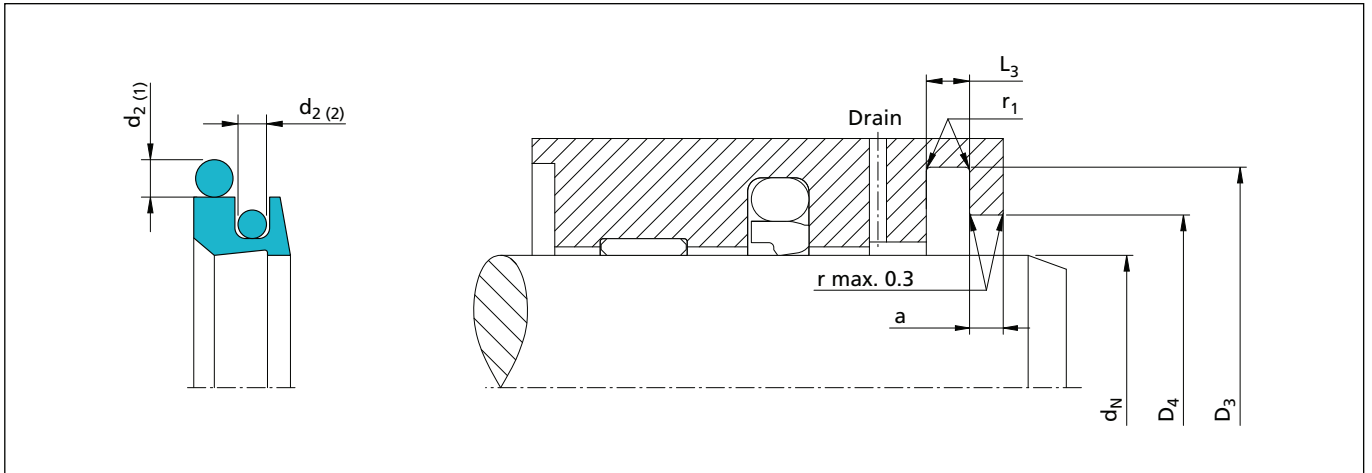


Figure 11 Installation drawing

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.

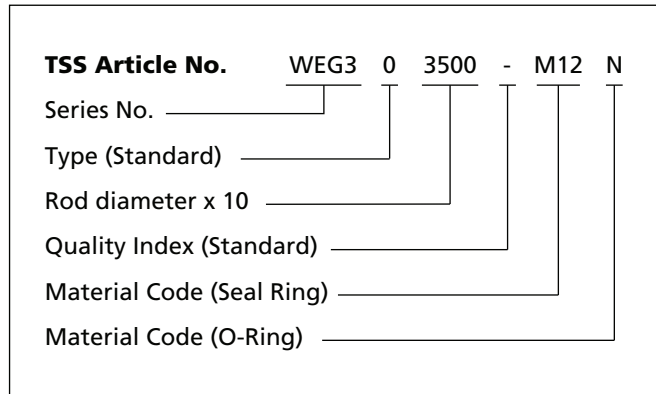


Table XIX Installation dimensions / TSS Part No.

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 _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
140.0	162.2	6.3	150.7	1.2	4.2	WEG101400	151.77 x 5.33	142.47 x 3.53
150.0	172.2	6.3	160.7	1.2	4.2	WEG101500	164.47 x 5,33	151.99 x 3.53
160.0	182.2	6.3	170.7	1.2	4.2	WEG101600	170.82 x 5.33	164.69 x 3.53
170.0	192.2	6.3	180.7	1.2	4.2	WEG101700	183.52 x 5.33	171.04 x 3.53
180.0	202.2	6.3	190.7	1.2	4.2	WEG101800	189.87 x 5.33	183.74 x 3.53
190.0	212.2	6.3	200.7	1.2	4.2	WEG101900	202.57 x 5.33	190.09 x 3.53
200.0	222.2	6.3	210.7	1.2	4.2	WEG102000	215.27 x 5.33	202.79 x 3.53
210.0	232.2	6.3	220.7	1.2	4.2	WEG102100	221.62 x 5.33	215.49 x 3.53
220.0	242.2	6.3	230.7	1.2	4.2	WEG102200	234.32 x 5.33	221.84 x 3.53
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
250.0	274.2	6.3	260.7	1.2	4.2	WEG202500	266.07 x 5.33	253.59 x 3.53
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
280.0	304.2	6.3	290.7	1.2	4.2	WEG202800	291.47 x 5.33	291.69 x 3.53
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
320.0	353.0	8.1	335.1	1.2	6.3	WEG303200	342.47 x 7.00	329.57 x 5.33
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
360.0	393.0	8.1	375.1	1.2	6.3	WEG303600	380.37 x 7.00	354.97 x 5.33
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

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
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.