

Scrapers

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For exceptional operating conditions, please contact your Busak+Shamban representative.

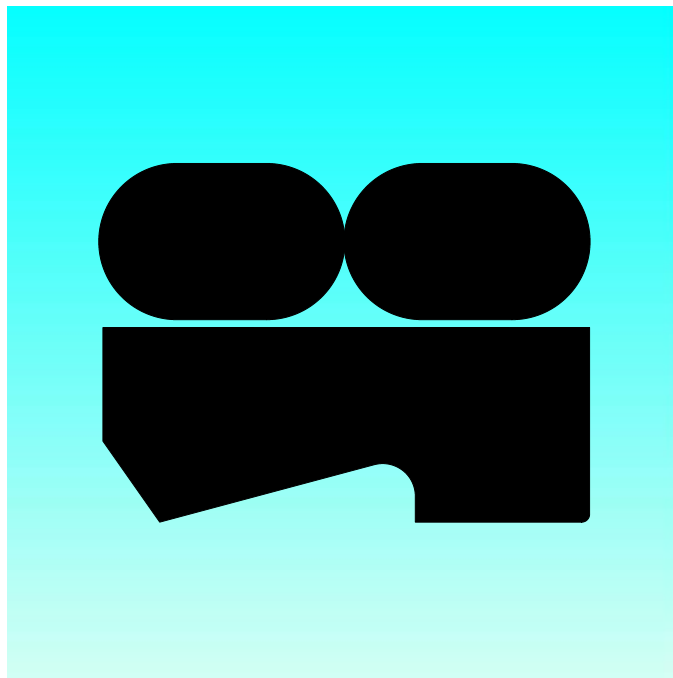
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TURCON[®] EXCLUDER[®] F



- Double Acting -
- Rubber Energised Scraper -
- Material -
- Turcon[®] and Zurcon[®] -





■ 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 maintain the pressure of the scraper lips against the sliding surface and compensate deflections of the piston rod.

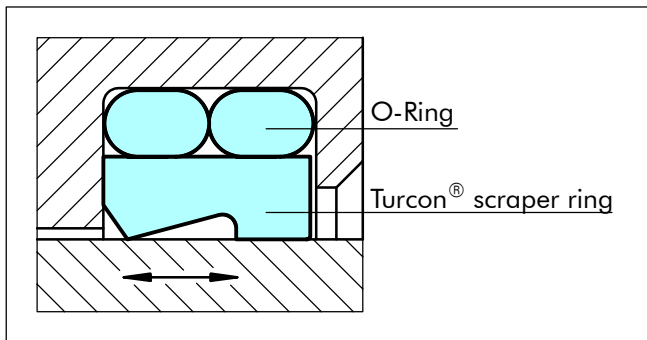


Figure 1 Turcon® Excluder® F

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 are preferably used in conjunction with our rod seals Turcon® Stepseal® K and 2K, 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®).

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

Speed:	15 m/s for Turcon® materials
	5 m/s for Zurcon® Z80
	1 m/s for Zurcon® Z51/52
Temperature:	-45° C to +200° C for Turcon® materials
	-45° C to +80° C for Z80
	-45° C to +100° 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), water, air and others, depending on the scraper and O-Ring material.

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

Available in all Turcon® and Zurcon® sealing materials.

Preferred materials:

Turcon® T46, T42, T49, T05 and Zurcon® Z52.

Design and Installation Instructions

Excluder® F scrapers are preferably installed in closed grooves (installation dimensions, see table II).



Materials

Available in all Turcon® and Zurcon® sealing materials.

Table I Turcon® and Zurcon® Materials for Excluder™ F

Material, Applications, Properties	Code	O-Ring Material	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
Turcon® T40 For all lubricating and non-lubricating hydraulic fluids, hydraulic oils without zinc, water hydraulic, soft mating surfaces. Surface texture not suitable for gases. Carbon fibre filled Colour: Grey	T40	NBR - 70 Shore A	N	-30 to +100	Steel Cast iron Stainless steel Aluminium Bronze Alloys	15
		NBR - Low temp. 70 Shore A	T	-45 to +80		
		FKM - 70 Shore A	V	-10 to +200		
		EPDM-70 Shore A	E**	-45 to +145		
Turcon® T46 Standard material for hydraulics, high compressive strength, good sliding and wear properties, good extrusion resistance, BAM tested. Bronze filled Colour: Greyish to dark brown	T46	NBR - 70 Shore A	N	-30 to +100	Steel tubes Steel, hardened Cast iron	15
		NBR - Low temp. 70 Shore A	T	-45 to +80		
		FKM - 70 Shore A	V	-10 to +200		
Zurcon® Z51*** For lubricating hydraulic fluids, high abrasion resistance , limited chemical resistance. Cast polyurethane Colour: Yellow to light-brown	Z51	NBR - 70 Shore A	N	-30 to +100	Steel Steel, hardened Cast iron Ceramic coating Stainless steel	1
		NBR - Low temp. 70 Shore A	T	-45 to +80		
Zurcon® Z52*** For lubricating hydraulic fluids, high abrasion resistance. Cast polyurethane Colour: Turquoise	Z52	NBR - 70 Shore A	N	-30 to +100	Steel Steel, hardened Steel, chromeplated Cast iron Stainless steel Aluminium Bronze Alloys	1
		NBR - Low temp. 70 Shore A	T	-45 to +80		
Zurcon® Z80 For lubricating and non-lubricating hydraulic fluids, high abrasion resistance, very good chemical resistance, limited temperature resistance. Ultra high molecular weight polyethylen Colour: White to off-white	Z80	NBR - 70 Shore A	N	-30 to +80	Steel Stainless steel Aluminium Bronze Ceramic coating	5
		NBR - Low temp. 70 Shore A	T	-45 to +80		

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil. BAM: Tested by "Bundes Anstalt Materialprüfung, Germany".

Highlighted materials are standard. **Material not suitable for mineral oils. *** max. Ø 2200 mm



Installation Recommendation

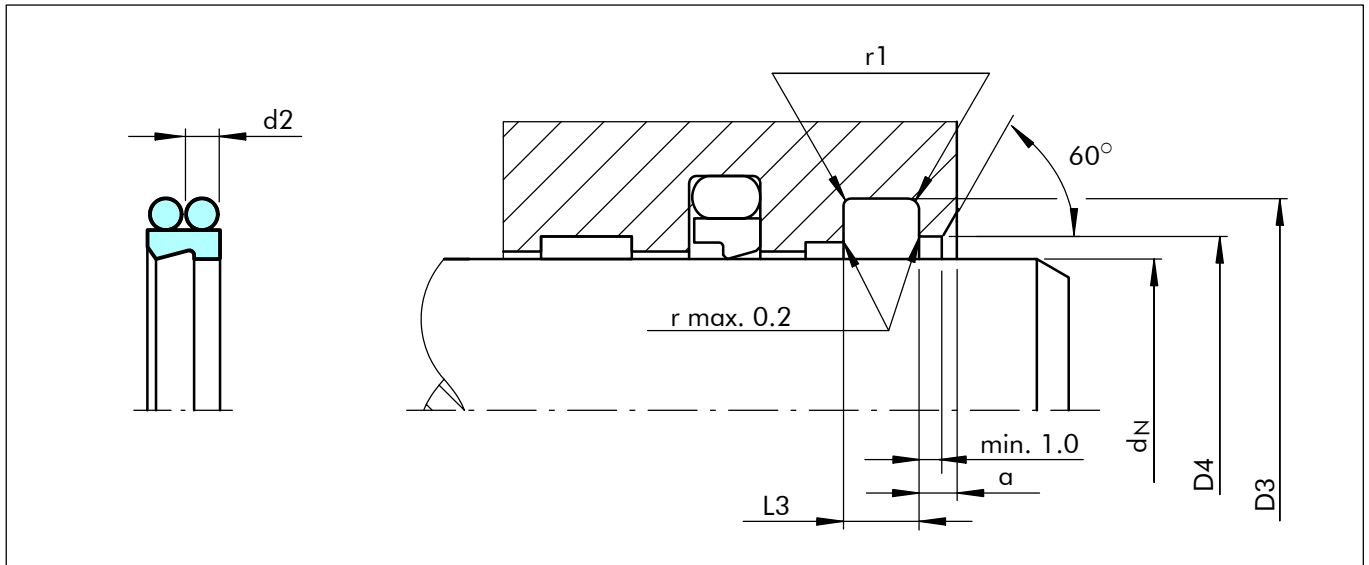


Figure 2 Installation drawing

Table II Installation Dimensions

Series No.	Rod Diameter d_N f8/h9		Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	O-Ring Cross Section
	Recommended Range	Extended Range	D_3 H9	L_3 +0.2/-0	D_4 H11	r_1 max.	a min.	d_2
WEMHF0	19.0 - 39.9	19.0 - 130.0	$d_N + 7.6$	4.2	$d + 1.0$	0.4	3.0	1.78
WEMHF1	40.0 - 69.9	30.0 - 250.0	$d_N + 8.8$	6.3	$d + 1.5$	1.0	3.0	2.62
WEMHF2	70.0 - 139.9	50.0 - 450.0	$d_N + 12.2$	8.1	$d + 2.0$	1.2	4.0	3.53
WEMHF3	140.0 - 399.9	80.0 - 650.0	$d_N + 16.0$	11.5	$d + 2.0$	2.0	5.0	5.33
WEMHF4	400.0 - 649.9	180.0 - 650.0	$d_N + 24.0$	15.5	$d + 2.5$	2.5	8.0	7.00
WEMHF5	650.0 - 999.9	300.0 - 999.9	$d_N + 27.3$	18.0	$d + 2.5$	2.5	10.0	8.40

Ordering example

Turcon[®] Excluder[®] F with O-Ring in NBR
 Rod diameter: $d_N = 50.0$ mm
 Series: WEMHF1
 Order No.: WEMHF10500T46N

Order No.	WEMHF1	0500	T46	N
Series No.				
Rod diameter x 10				
Material code (scraper)				
Material code (O-Ring)				



Table III Installation Dimensions / Part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	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	WEMHF00190	23.52 x 1.78
20.0	27.6	4.2	21.0	0.4	3.0	WEMHF00200	23.52 x 1.78
25.0	32.6	4.2	26.0	0.4	3.0	WEMHF00250	29.87 x 1.78
28.0	35.6	4.2	29.0	0.4	3.0	WEMHF00280	33.05 x 1.78
30.0	37.6	4.2	31.0	0.4	3.0	WEMHF00300	34.65 x 1.78
32.0	39.6	4.2	33.0	0.4	3.0	WEMHF00320	36.27 x 1.78
35.0	42.6	4.2	36.0	0.4	3.0	WEMHF00350	39.45 x 1.78
36.0	43.6	4.2	37.0	0.4	3.0	WEMHF00360	41.00 x 1.78
38.0	45.6	4.2	39.0	0.4	3.0	WEMHF00380	41.00 x 1.78
40.0	48.8	6.3	41.5	1.0	3.0	WEMHF10400	44.12 x 2.62
42.0	50.8	6.3	43.5	1.0	3.0	WEMHF10420	45.69 x 2.62
45.0	53.8	6.3	46.5	1.0	3.0	WEMHF10450	48.90 x 2.62
50.0	58.8	6.3	51.5	1.0	3.0	WEMHF10500	53.64 x 2.62
55.0	63.8	6.3	56.5	1.0	3.0	WEMHF10550	58.42 x 2.62
56.0	64.8	6.3	57.5	1.0	3.0	WEMHF10560	59.99 x 2.62
60.0	68.8	6.3	61.5	1.0	3.0	WEMHF10600	63.17 x 2.62
63.0	71.8	6.3	64.5	1.0	3.0	WEMHF10630	66.34 x 2.62
65.0	73.8	6.3	66.5	1.0	3.0	WEMHF10650	67.95 x 2.62
70.0	82.2	8.1	72.0	1.2	4.0	WEMHF20700	75.79 x 3.53
75.0	87.2	8.1	77.0	1.2	4.0	WEMHF20750	78.97 x 3.53
80.0	92.2	8.1	82.0	1.2	4.0	WEMHF20800	85.32 x 3.53
85.0	97.2	8.1	87.0	1.2	4.0	WEMHF20850	88.49 x 3.53
90.0	102.2	8.1	92.0	1.2	4.0	WEMHF20900	94.84 x 3.53
95.0	107.2	8.1	97.0	1.2	4.0	WEMHF20950	101.19 x 3.53
97.0	109.2	8.1	99.0	1.2	4.0	WEMHF20970	101.19 x 3.53
99.0	111.2	8.1	101.0	1.2	4.0	WEMHF20990	104.37 x 3.53
100.0	112.2	8.1	102.0	1.2	4.0	WEMHF21000	104.37 x 3.53
105.0	117.2	8.1	107.0	1.2	4.0	WEMHF21050	110.72 x 3.53
110.0	122.2	8.1	112.0	1.2	4.0	WEMHF21100	113.89 x 3.53
115.0	127.2	8.1	117.0	1.2	4.0	WEMHF21150	120.24 x 3.53
120.0	132.2	8.1	122.0	1.2	4.0	WEMHF21200	123.42 x 3.53
125.0	137.2	8.1	127.0	1.2	4.0	WEMHF21250	129.77 x 3.53
125.4	137.6	8.1	127.4	1.2	4.0	WEMHF21254	129.77 x 3.53
130.0	142.2	8.1	132.0	1.2	4.0	WEMHF21300	136.12 x 3.53
135.0	147.2	8.1	137.0	1.2	4.0	WEMHF21350	139.29 x 3.53
140.0	152.2	8.1	142.0	1.2	4.0	WEMHF21400	145.64 x 3.53
140.0	156.0	11.5	142.0	2.0	5.0	WEMHF31400	145.42 x 5.33
140.5	156.5	11.5	142.5	2.0	5.0	WEMHF31405	145.42 x 5.33
150.0	166.0	11.5	152.0	2.0	5.0	WEMHF31500	155.00 x 5.30



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	Part No.	O-Ring Size
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	r_1 max.	a min.		
153.0	169.0	11.5	155.0	2.0	5.0	WEMHF31530	158.12 x 5.33
155.0	171.0	11.5	157.0	2.0	5.0	WEMHF31550	158.12 x 5.33
160.0	176.0	11.5	162.0	2.0	5.0	WEMHF31600	164.47 x 5.33
165.0	181.0	11.5	167.0	2.0	5.0	WEMHF31650	170.82 x 5.33
170.0	186.0	11.5	172.0	2.0	5.0	WEMHF31700	175.00 x 5.30
175.0	191.0	11.5	177.0	2.0	5.0	WEMHF31750	180.00 x 5.30
180.0	196.0	11.5	182.0	2.0	5.0	WEMHF31800	183.52 x 5.33
188.2	204.2	11.5	190.2	2.0	5.0	WEMHF31882	196.22 x 5.33
190.0	206.0	11.5	192.0	2.0	5.0	WEMHF31900	196.22 x 5.33
192.0	208.0	11.5	194.0	2.0	5.0	WEMHF31920	196.22 x 5.33
200.0	216.0	11.5	202.0	2.0	5.0	WEMHF32000	202.57 x 5.33
210.0	226.0	11.5	212.0	2.0	5.0	WEMHF32100	215.27 x 5.33
211.0	227.0	11.5	213.0	2.0	5.0	WEMHF32110	215.27 x 5.33
220.0	236.0	11.5	222.0	2.0	5.0	WEMHF32200	227.97 x 5.33
230.0	246.0	11.5	232.0	2.0	5.0	WEMHF32300	234.32 x 5.33
240.0	256.0	11.5	242.0	2.0	5.0	WEMHF32400	247.02 x 5.33
245.0	261.0	11.5	247.0	2.0	5.0	WEMHF32450	247.02 x 5.33
250.0	266.0	11.5	252.0	2.0	5.0	WEMHF32500	253.37 x 5.33
260.0	276.0	11.5	262.0	2.0	5.0	WEMHF32600	266.07 x 5.33
265.0	281.0	11.5	267.0	2.0	5.0	WEMHF32650	272.00 x 5.30
270.0	286.0	11.5	272.0	2.0	5.0	WEMHF32700	278.77 x 5.33
280.0	296.0	11.5	282.0	2.0	5.0	WEMHF32800	290.00 x 5.30
285.0	301.0	11.5	287.0	2.0	5.0	WEMHF32850	291.47 x 5.33
290.0	306.0	11.5	292.0	2.0	5.0	WEMHF32900	291.47 x 5.33
295.0	311.0	11.5	297.0	2.0	5.0	WEMHF32950	300.00 x 5.30
300.0	316.0	11.5	302.0	2.0	5.0	WEMHF33000	304.17 x 5.33
310.0	326.0	11.5	312.0	2.0	5.0	WEMHF33100	315.00 x 5.30
320.0	336.0	11.5	322.0	2.0	5.0	WEMHF33200	329.57 x 5.33
330.0	346.0	11.5	332.0	2.0	5.0	WEMHF33300	329.57 x 5.33
340.0	356.0	11.5	342.0	2.0	5.0	WEMHF33400	345.00 x 5.30
350.0	366.0	11.5	352.0	2.0	5.0	WEMHF33500	354.97 x 5.33
355.0	371.0	11.5	357.0	2.0	5.0	WEMHF33550	354.97 x 5.33
360.0	376.0	11.5	362.0	2.0	5.0	WEMHF33600	365.00 x 5.30
375.0	391.0	11.5	377.0	2.0	5.0	WEMHF33750	380.37 x 5.33
380.0	396.0	11.5	382.0	2.0	5.0	WEMHF33800	387.00 x 5.30
400.0	416.0	11.5	402.0	2.0	5.0	WEMHF34000	405.26 x 5.33
400.0	424.0	15.5	402.5	2.5	8.0	WEMHF44000	412.00 x 7.00
410.0	434.0	15.5	412.5	2.5	8.0	WEMHF44100	417.96 x 7.00
420.0	444.0	15.5	422.5	2.5	8.0	WEMHF44200	430.66 x 7.00
440.0	464.0	15.5	442.5	2.5	8.0	WEMHF44400	450.00 x 7.00
450.0	474.0	15.5	452.5	2.5	8.0	WEMHF44500	460.00 x 7.00
460.0	484.0	15.5	462.5	2.5	8.0	WEMHF44600	468.76 x 7.00



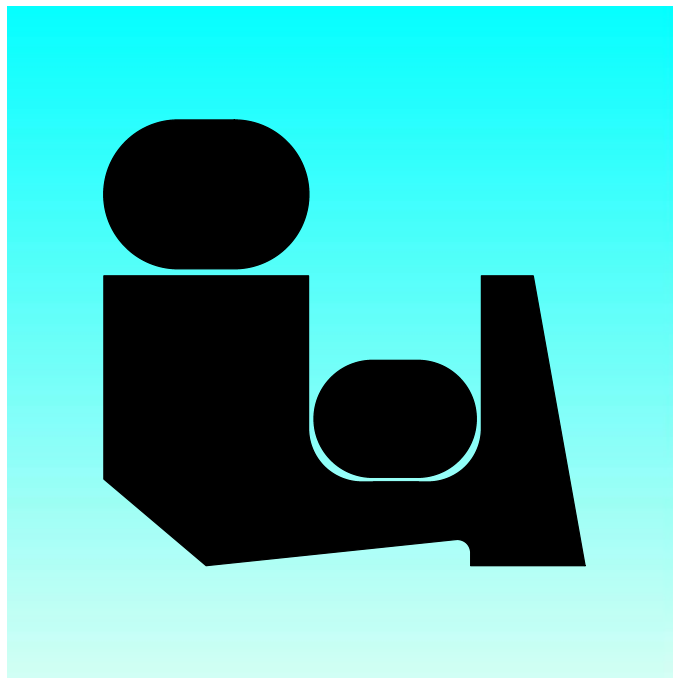
Turcon[®] Excluder[®] F

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	Part No.	O-Ring Size
d_N f8/h9	D₃ H9	L₃ +0.2	D₄ H11	r₁ max.	a min.		
470.0	494.0	15.5	472.5	2.5	8.0	WEMHF44700	481.46 x 7.00
480.0	504.0	15.5	482.5	2.5	8.0	WEMHF44800	494.16 x 7.00
500.0	524.0	15.5	502.5	2.5	8.0	WEMHF45000	506.86 x 7.00
520.0	544.0	15.5	522.5	2.5	8.0	WEMHF45200	532.26 x 7.00
550.0	574.0	15.5	552.5	2.5	8.0	WEMHF45500	557.66 x 7.00
560.0	584.0	15.5	562.5	2.5	8.0	WEMHF45600	560.00 x 7.00
575.0	599.0	15.5	577.5	2.5	8.0	WEMHF45750	582.68 x 7.00
580.0	604.0	15.5	582.5	2.5	8.0	WEMHF45800	582.68 x 7.00
600.0	624.0	15.5	602.5	2.5	8.0	WEMHF46000	608.08 x 7.00
630.0	654.0	15.5	632.5	2.5	8.0	WEMHF46300	633.48 x 7.00
640.0	664.0	15.5	642.5	2.5	8.0	WEMHF46400	650.00 x 7.00
650.0	677.3	18.0	652.5	2.5	10.0	WEMHF56500	649.00 x 8.40
660.0	687.3	18.0	662.5	2.5	10.0	WEMHF56600	670.00 x 8.40
670.0	697.3	18.0	672.5	2.5	10.0	WEMHF56700	680.00 x 8.40
680.0	707.3	18.0	682.5	2.5	10.0	WEMHF56800	680.00 x 8.40
700.0	727.3	18.0	702.5	2.5	10.0	WEMHF57000	715.00 x 8.40
720.0	747.3	18.0	722.5	2.5	10.0	WEMHF57200	740.00 x 8.40
725.0	752.3	18.0	727.5	2.5	10.0	WEMHF57250	740.00 x 8.40
730.0	757.3	18.0	732.5	2.5	10.0	WEMHF57300	740.00 x 8.40
740.0	767.3	18.0	742.5	2.5	10.0	WEMHF57400	740.00 x 8.40
750.0	777.3	18.0	752.5	2.5	10.0	WEMHF57500	760.00 x 8.40
770.0	797.3	18.0	772.5	2.5	10.0	WEMHF57700	774.10 x 8.40
780.0	807.3	18.0	782.5	2.5	10.0	WEMHF57800	790.30 x 8.40
785.0	812.3	18.0	787.5	2.5	10.0	WEMHF57850	790.30 x 8.40
800.0	827.3	18.0	802.5	2.5	10.0	WEMHF58000	810.00 x 8.40
810.0	837.3	18.0	812.5	2.5	10.0	WEMHF58100	810.00 x 8.40
820.0	847.3	18.0	822.5	2.5	10.0	WEMHF58200	830.00 x 8.40
830.0	857.3	18.0	832.5	2.5	10.0	WEMHF58300	845.00 x 8.40
850.0	877.3	18.0	852.5	2.5	10.0	WEMHF58500	865.00 x 8.40
875.0	902.3	18.0	877.5	2.5	10.0	WEMHF58750	888.00 x 8.40
900.0	927.3	18.0	902.5	2.5	10.0	WEMHF59000	918.00 x 8.40
950.0	977.3	18.0	952.5	2.5	10.0	WEMHF59500	959.10 x 8.40
975.0	1002.3	18.0	977.5	2.5	10.0	WEMHF59750	990.00 x 8.40
999.9	1027.2	18.0	1002.4	2.5	10.0	WEMHF59999	1014.0 x 8.40

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

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

TURCON[®] EXCLUDER[®] G



- Double Acting -
- Rubber Energised Scraper -

- Material -
- Turcon[®] and Zurcon[®] -





■ Turcon® Excluder® G

Description

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 maintain the pressure of the scraper lips against the sliding surface and compensate deflections of the piston rod.

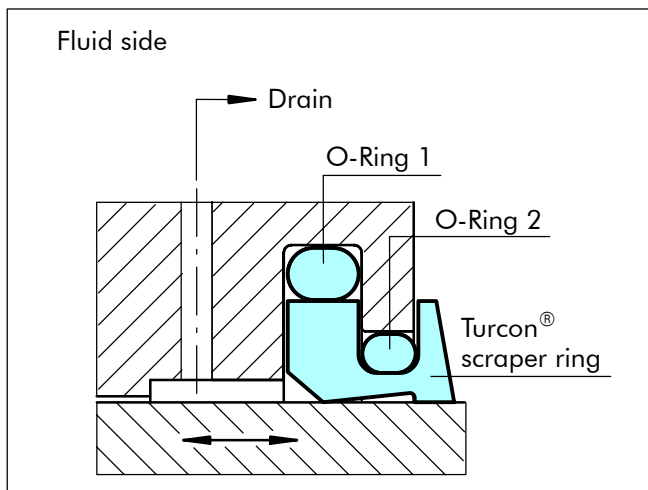


Figure 3 Turcon® Excluder® G

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 are 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®).

Disadvantages compared to Excluder® 2, 5 and F

- Require 2 pcs O-Rings
- 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

Speed:	5 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 -45° C to +80° C for Z80 -45° C to +100° 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), water, air and others, depending on the scraper and O-Ring material.

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

Available in all Turcon® and Zurcon® sealing materials.

Table IV Turcon® and Zurcon® Materials for Excluder® G

Material, Applications, Properties	Code	O-Ring Material	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
Turcon® T40 For all lubricating and non-lubricating hydraulic fluids, hydraulic oils without zinc, water hydraulic, soft mating surfaces. Surface texture not suitable for gases. Carbon fibre filled Colour: Grey	T40	NBR - 70 Shore A	N	-30 to +100	Steel Cast iron Stainless steel Aluminium Bronze Alloys	5
		NBR - Low temp. 70 Shore A	T	-45 to +80		
		FKM - 70 Shore A	V	-10 to +200		
		EPDM-70 Shore A	E**	-45 to +145		
Turcon® T46 Standard material for hydraulics, high compressive strength, good sliding and wear properties, good extrusion resistance, BAM tested. Bronze filled Colour: Greyish to dark brown	T46	NBR - 70 Shore A	N	-30 to +100	Steel tubes Steel, hardened Cast iron	5
		NBR - Low temp. 70 Shore A	T	-45 to +80		
		FKM - 70 Shore A	V	-10 to +200		
Zurcon® Z51*** For lubricating hydraulic fluids, high abrasion resistance , limited chemical resistance. Cast polyurethane Colour: Yellow to light-brown	Z51	NBR - 70 Shore A	N	-30 to +100	Steel Steel, hardened Cast iron Ceramic coating Stainless steel	1
		NBR - Low temp. 70 Shore A	T	-45 to +80		
Zurcon® Z52*** For lubricating hydraulic fluids, high abrasion resistance. Cast polyurethane Colour: Turquoise	Z52	NBR - 70 Shore A	N	-30 to +100	Steel Steel, hardened Steel, chromeplated Cast iron Stainless steel Aluminium Bronze Alloys	1
		NBR - Low temp. 70 Shore A	T	-45 to +80		
Zurcon® Z80 For lubricating and non-lubricating hydraulic fluids, high abrasion resistance , very good chemical resistance, limited temperature resistance. Ultra high molecular weight polyethylen Colour: White to off-white	Z80	NBR - 70 Shore A	N	-30 to +100****	Steel Stainless steel Aluminium Bronze Ceramic coating	2
		NBR - Low temp. 70 Shore A	T	-45 to +80		

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil. BAM: Tested by "Bundes Anstalt Materialprüfung, Germany".

Highlighted materials are standard. **Material not suitable for mineral oils. *** max. Ø 2200 mm ****max. temp. for Z80 is 80°C

Design and Installation Instructions

Excluder® G scrapers are always installed in closed grooves (installation dimensions, see table II).

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 Fig. 4.

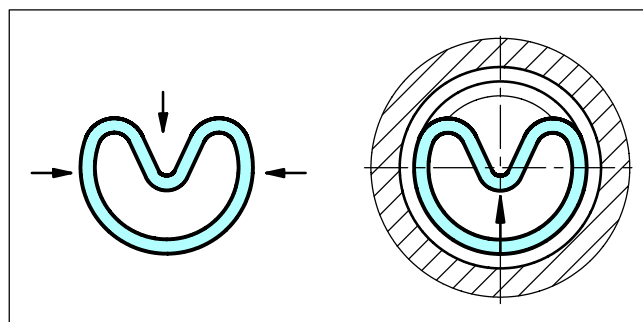


Figure 4 Place the Turcon® Excluder® G in compressed form into the groove and push against the Scraper in the direction of the arrow



Installation Recommendation

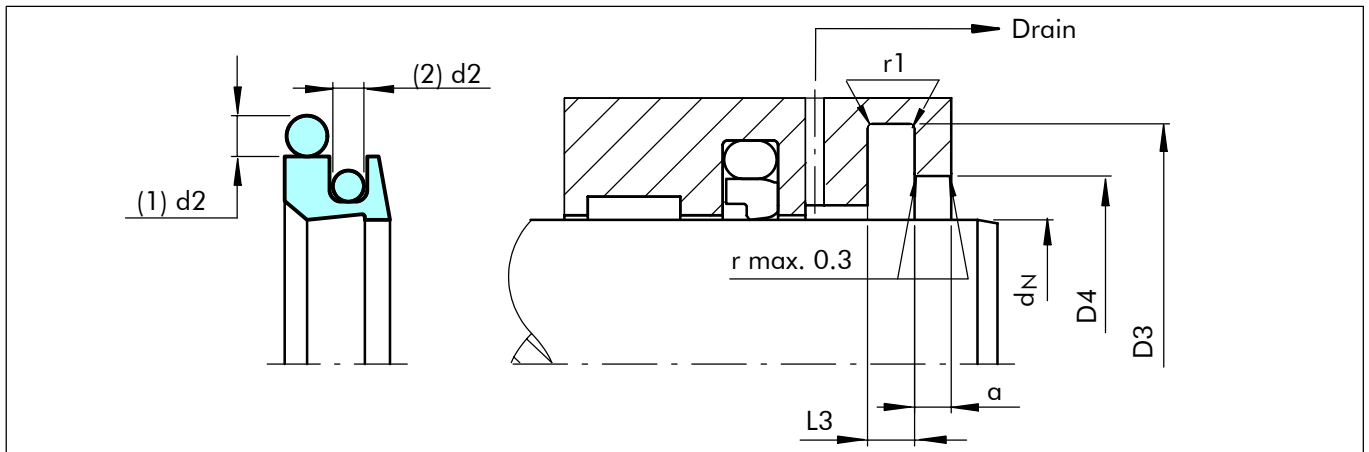


Figure 5 Installation drawing

Table V Installation Dimensions

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	Extended Range	D_3 H8	L_3 +0.2/-0	D_4 H8	r_1 max.	a +0/-0.1	d_2	d_2
WEMHG1	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
WEMHG2	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
WEMHG3	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
WEMHG4	630.0 - 999.9	500.0 -	$d_N + 36.5$	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 VI Minimum Installation Diameter

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

Table VII O-Ring sizes

Series No.	O-Ring 1 ($d_1 \times d_2$)	O-Ring 2 ($d_1 \times d_2$)
WEMHG1	($d_N + 12.0$) X 5.33	($d_N + 5.0$) X 3.53
WEMHG2	($d_N + 14.0$) X 5.33	($d_N + 5.0$) X 3.53
WEMHG3	($d_N + 20.0$) X 7.00	($d_N + 6.0$) X 5.33
WEMHG4	($d_N + 21.0$) X 8.40	($d_N + 6.0$) X 5.33

Ordering example

Turcon® Excluder® G with O-Rings in NBR
 Rod diameter: $d_N = 350.0$ mm
 Series: WEMHG3
 Order No.: WEMHG33500T46N

Order No.	WEMHG3	3500	T46	N
Series No.				
Rod diameter x 10				
Material code (scraper)				
Material code (O-Rings)				



Table VIII Installation Dimensions / Part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	Part No.
d_N f8/h9	D_3 H8	L_3 +0/-0.2	D_4 H8	r_1 max.	a +0/-0.1	
140.0	162.2	6.3	150.7	1.2	4.2	WEMHG11400
140.5	162.7	6.3	151.2	1.2	4.2	WEMHG11405
150.0	172.2	6.3	160.7	1.2	4.2	WEMHG11500
153.0	175.2	6.3	163.7	1.2	4.2	WEMHG11530
155.0	177.2	6.3	165.7	1.2	4.2	WEMHG11550
160.0	182.2	6.3	170.7	1.2	4.2	WEMHG11600
165.0	187.2	6.3	175.7	1.2	4.2	WEMHG11650
170.0	192.2	6.3	180.7	1.2	4.2	WEMHG11700
175.0	197.2	6.3	185.7	1.2	4.2	WEMHG11750
180.0	202.2	6.3	190.7	1.2	4.2	WEMHG11800
188.2	210.4	6.3	198.9	1.2	4.2	WEMHG11882
190.0	212.2	6.3	200.7	1.2	4.2	WEMHG11900
192.0	214.2	6.3	202.7	1.2	4.2	WEMHG11920
200.0	222.2	6.3	210.7	1.2	4.2	WEMHG12000
210.0	232.2	6.3	220.7	1.2	4.2	WEMHG12100
211.0	233.2	6.3	221.7	1.2	4.2	WEMHG12110
220.0	242.2	6.3	230.7	1.2	4.2	WEMHG12200
230.0	254.2	6.3	240.7	1.2	4.2	WEMHG22300
240.0	264.2	6.3	250.7	1.2	4.2	WEMHG22400
245.0	269.2	6.3	255.7	1.2	4.2	WEMHG22450
250.0	274.2	6.3	260.7	1.2	4.2	WEMHG22500
260.0	284.2	6.3	270.7	1.2	4.2	WEMHG22600
265.0	289.2	6.3	275.7	1.2	4.2	WEMHG22650
270.0	294.2	6.3	280.7	1.2	4.2	WEMHG22700
275.0	299.2	6.3	285.7	1.2	4.2	WEMHG22750
280.0	304.2	6.3	290.7	1.2	4.2	WEMHG22800
285.0	309.2	6.3	295.7	1.2	4.2	WEMHG22850
290.0	314.2	6.3	300.7	1.2	4.2	WEMHG22900
295.0	319.2	6.3	305.7	1.2	4.2	WEMHG22950
300.0	333.0	8.1	315.1	1.2	6.3	WEMHG33000
310.0	343.0	8.1	325.1	1.2	6.3	WEMHG33100
320.0	353.0	8.1	335.1	1.2	6.3	WEMHG33200
330.0	363.0	8.1	345.1	1.2	6.3	WEMHG33300
340.0	373.0	8.1	355.1	1.2	6.3	WEMHG33400
350.0	383.0	8.1	365.1	1.2	6.3	WEMHG33500
355.0	388.0	8.1	370.1	1.2	6.3	WEMHG33550
360.0	393.0	8.1	375.1	1.2	6.3	WEMHG33600
370.0	403.0	8.1	385.1	1.2	6.3	WEMHG33700
375.0	408.0	8.1	390.1	1.2	6.3	WEMHG33750



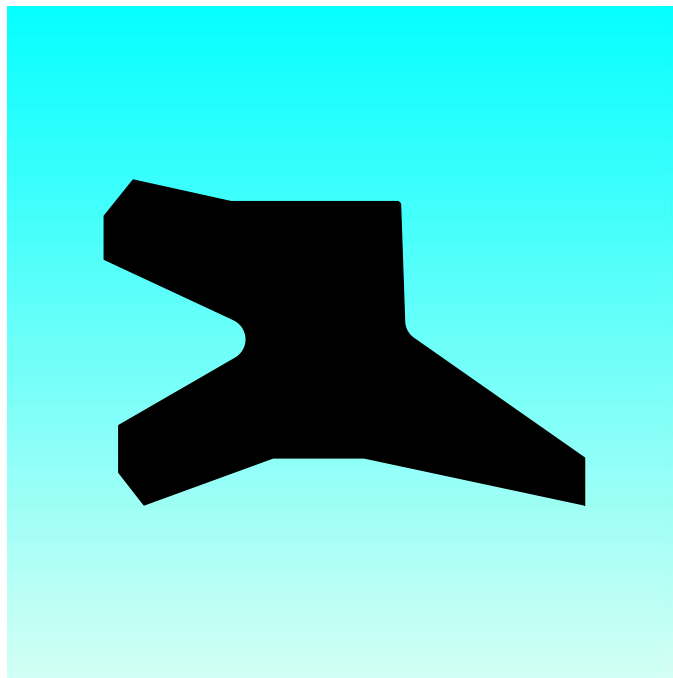
Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	Part No.
d_N f8/h9	D_3 H8	L_3 +0/-0.2	D_4 H8	r_1 max.	a +0/-0.1	
380.0	413.0	8.1	395.1	1.2	6.3	WEMHG33800
385.0	418.0	8.1	400.1	1.2	6.3	WEMHG33850
390.0	423.0	8.1	405.1	1.2	6.3	WEMHG33900
400.0	433.0	8.1	415.1	1.2	6.3	WEMHG34000
410.0	443.0	8.1	425.1	1.2	6.3	WEMHG34100
420.0	453.0	8.1	435.1	1.2	6.3	WEMHG34200
430.0	463.0	8.1	445.1	1.2	6.3	WEMHG34300
440.0	473.0	8.1	455.1	1.2	6.3	WEMHG34400
450.0	483.0	8.1	465.1	1.2	6.3	WEMHG34500
460.0	493.0	8.1	475.1	1.2	6.3	WEMHG34600
470.0	503.0	8.1	485.1	1.2	6.3	WEMHG34700
480.0	513.0	8.1	495.1	1.2	6.3	WEMHG34800
500.0	533.0	8.1	515.1	1.2	6.3	WEMHG35000
520.0	553.0	8.1	535.1	1.2	6.3	WEMHG35200
550.0	583.0	8.1	565.1	1.2	6.3	WEMHG35500
560.0	593.0	8.1	575.1	1.2	6.3	WEMHG35600
575.0	608.0	8.1	590.1	1.2	6.3	WEMHG35750
580.0	613.0	8.1	595.1	1.2	6.3	WEMHG35800
600.0	633.0	8.1	615.1	1.2	6.3	WEMHG36000
630.0	666.5	9.5	645.1	2.0	6.3	WEMHG46300
640.0	676.5	9.5	655.1	2.0	6.3	WEMHG46400
650.0	686.5	9.5	665.1	2.0	6.3	WEMHG46500
660.0	696.5	9.5	675.1	2.0	6.3	WEMHG46600
670.0	706.5	9.5	685.1	2.0	6.3	WEMHG46700
680.0	716.5	9.5	695.1	2.0	6.3	WEMHG46800
700.0	736.5	9.5	715.1	2.0	6.3	WEMHG47000
720.0	756.5	9.5	735.1	2.0	6.3	WEMHG47200
725.0	761.5	9.5	740.1	2.0	6.3	WEMHG47250
730.0	766.5	9.5	745.1	2.0	6.3	WEMHG47300
740.0	776.5	9.5	755.1	2.0	6.3	WEMHG47400
750.0	786.5	9.5	765.1	2.0	6.3	WEMHG47500
770.0	806.5	9.5	785.1	2.0	6.3	WEMHG47700
780.0	816.5	9.5	795.1	2.0	6.3	WEMHG47800
785.0	821.5	9.5	800.1	2.0	6.3	WEMHG47850
795.0	831.5	9.5	810.1	2.0	6.3	WEMHG47950
800.0	836.5	9.5	815.1	2.0	6.3	WEMHG48000
810.0	846.5	9.5	825.1	2.0	6.3	WEMHG48100
820.0	856.5	9.5	835.1	2.0	6.3	WEMHG48200
830.0	866.5	9.5	845.1	2.0	6.3	WEMHG48300
850.0	886.5	9.5	865.1	2.0	6.3	WEMHG48500
875.0	911.5	9.5	890.1	2.0	6.3	WEMHG48750
890.0	926.5	9.5	905.1	2.0	6.3	WEMHG48900



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	Part No.
d_N f8/h9	D₃ H8	L₃ +0/-0.2	D₄ H8	r₁ max.	a +0/-0.1	
900.0	936.5	9.5	915.1	2.0	6.3	WEMHG49000
950.0	986.5	9.5	965.1	2.0	6.3	WEMHG49500
970.0	1006.5	9.5	985.1	2.0	6.3	WEMHG49700
975.0	1011.5	9.5	990.1	2.0	6.3	WEMHG49750

The rod diameters in **bold** type comply with the recommendations of ISO 3320.
Other dimensions and all intermediate sizes up to 2.600 mm diameter including imperial (inch) sizes can be supplied upon request.

B+S SCRAPER DA27



- Double Acting -

- Material -

- Rubber -





■ Scraper DA27

Description

The scraper DA27 is a moulded double-acting elastomer scraper. It has two geometrically different scraper lips.

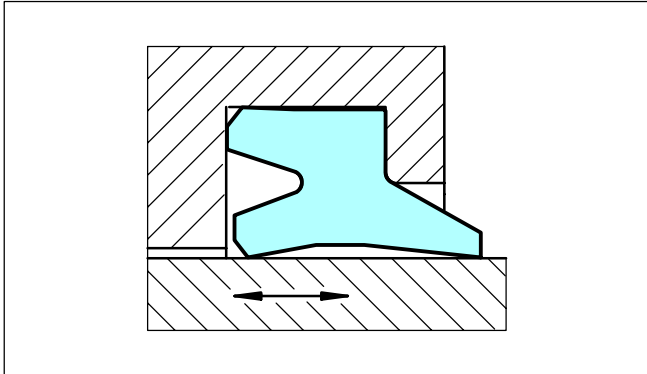


Figure 6 Scraper DA27

The scraper is preferably used for reciprocating piston rods and plunger pistons in large hydraulic cylinders. It prevents the penetration of dirt into the system and on the medium side holds back the residual oil film from the extending piston rod.

The scraper is preferably used in conjunction with our rod seal Turcon® Stepseal® K i.e. seals with a hydrodynamic back-pumping function.

Advantages

- Low friction
- Good scraping effect both inwards and outwards
- Simple, installation groove
- Compact design
- Easy installation and removal without tools

Technical Data

Speed:	up to 1 m/s
Temperature:	-30° C to +100° C
Media:	Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids and bio-oils with reduced temperature range due to media

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.

Surface Quality

Groove diameter: $R_z < 6.3$, $R_a < 1.6$
Rod diameter due to installed rod seal

Material

Standard material: NBR, 90 Shore A

Applications

- Presses
- Injection moulding machines
- Big size hydraulic cylinders

Processing

Most of the listed sizes and additional sizes are produced by vulcanisation from a master mould. This is indicated on the 5th digit of the part no. by a "V" for vulcanised scraper or a "O" for only moulded (high volume).

Sealing system design options

In some cases, like in long stroke applications, the volumen between the main seals and scraper can be filled with fluid during the outstroke.

To prevent pressure build up between the Scraper DA27 and the seal, a drain line is recommended or a manual notching of the inward lip. (One notch per circumference)

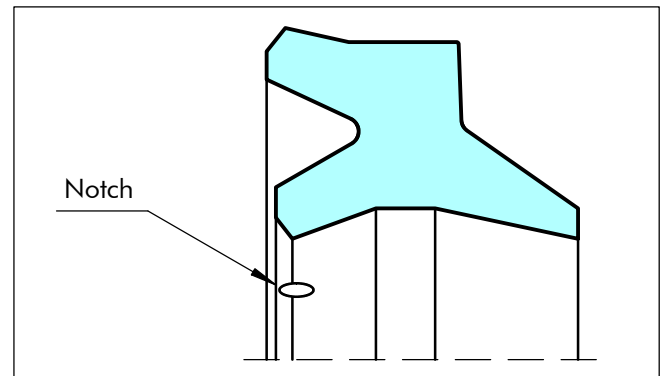


Figure 7 Scraper DA27



Scraper DA27

Installation Recommendation

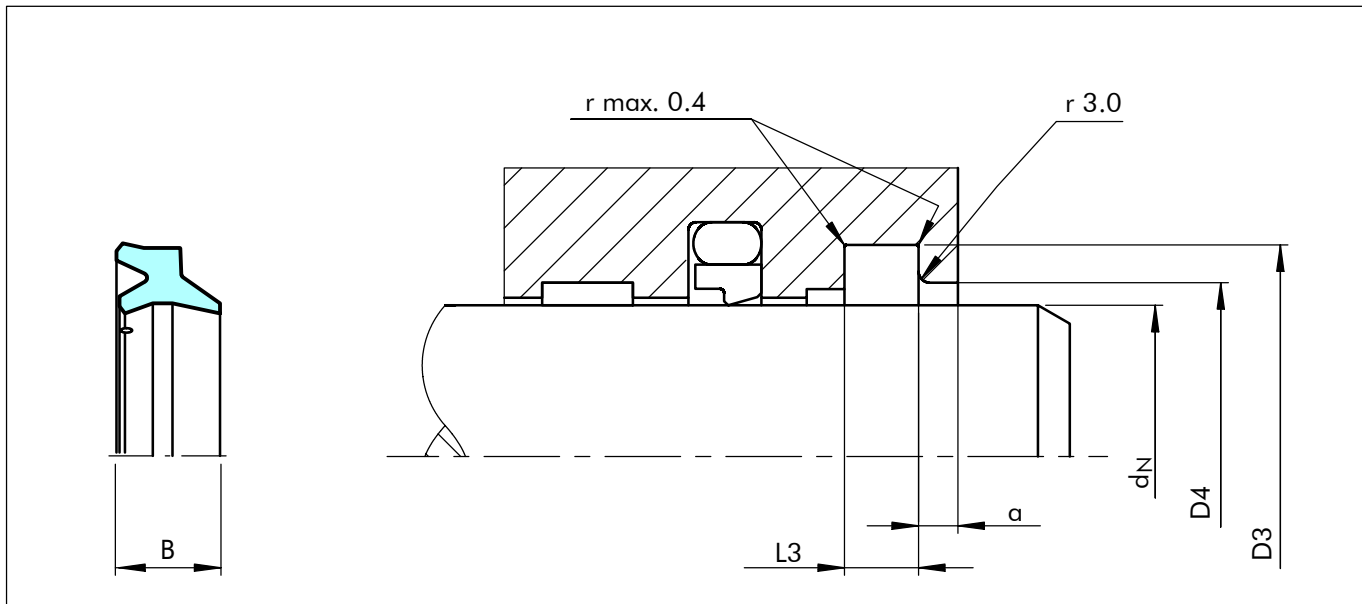


Figure 8 Installation drawing

Table IX Installation dimensions / Part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	Part No.
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	a min.	B	
400.0	430.0	18	415.0	9.0	27.0	WD27V4000
410.0	440.0	18	425.0	9.0	27.0	WD27V4100
420.0	450.0	18	435.0	9.0	27.0	WD27V4200
425.0	455.0	18	440.0	9.0	27.0	WD27V4250
430.0	460.0	18	445.0	9.0	27.0	WD27V4300
435.0	465.0	18	450.0	9.0	27.0	WD27V4350
440.0	470.0	18	455.0	9.0	27.0	WD27V4400
450.0	480.0	18	465.0	9.0	27.0	WD27V4500
460.0	490.0	18	475.0	9.0	27.0	WD27V4600
470.0	500.0	18	485.0	9.0	27.0	WD27V4700
480.0	510.0	18	495.0	9.0	27.0	WD27V4800
485.0	515.0	18	500.0	9.0	27.0	WD27V4850
490.0	520.0	18	505.0	9.0	27.0	WD27V4900
495.0	525.0	18	510.0	9.0	27.0	WD27V4950
500.0	530.0	18	515.0	9.0	27.0	WD27V5000
510.0	540.0	18	525.0	9.0	27.0	WD27V5100
520.0	550.0	18	535.0	9.0	27.0	WD27V5200
530.0	560.0	18	545.0	9.0	27.0	WD27V5300

Other dimensions on request

Scraper DA27



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	Part No.
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	a min.	B	
540.0	570.0	18	555.0	9.0	27.0	WD27V5400
550.0	580.0	18	565.0	9.0	27.0	WD27V5500
560.0	590.0	18	575.0	9.0	27.0	WD27V5600
570.0	600.0	18	585.0	9.0	27.0	WD27V5700
580.0	610.0	18	595.0	9.0	27.0	WD27V5800
585.0	615.0	18	600.0	9.0	27.0	WD27V5850
600.0	630.0	18	615.0	9.0	27.0	WD27V6000
610.0	640.0	18	625.0	9.0	27.0	WD27V6100
615.0	645.0	18	630.0	9.0	27.0	WD27V6150
620.0	650.0	18	635.0	9.0	27.0	WD27V6200
630.0	660.0	18	645.0	9.0	27.0	WD27V6300
640.0	670.0	18	655.0	9.0	27.0	WD27V6400
650.0	680.0	18	665.0	9.0	27.0	WD27V6500
660.0	690.0	18	675.0	9.0	27.0	WD27V6600
670.0	700.0	18	685.0	9.0	27.0	WD27V6700
680.0	710.0	18	695.0	9.0	27.0	WD27V6800
695.0	725.0	18	710.0	9.0	27.0	WD27V6950
700.0	730.0	18	715.0	9.0	27.0	WD27V7000
710.0	740.0	18	725.0	9.0	27.0	WD27V7100
720.0	750.0	18	735.0	9.0	27.0	WD27V7200
730.0	760.0	18	745.0	9.0	27.0	WD27V7300
740.0	770.0	18	755.0	9.0	27.0	WD27V7400
750.0	780.0	18	765.0	9.0	27.0	WD27V7500
760.0	790.0	18	775.0	9.0	27.0	WD27V7600
770.0	800.0	18	785.0	9.0	27.0	WD27V7700
780.0	810.0	18	795.0	9.0	27.0	WD27V7800
790.0	820.0	18	805.0	9.0	27.0	WD27V7900
800.0	830.0	18	815.0	9.0	27.0	WD27V8000
810.0	840.0	18	825.0	9.0	27.0	WD27V8100
820.0	850.0	18	835.0	9.0	27.0	WD27V8200
825.0	855.0	18	840.0	9.0	27.0	WD27V8250
840.0	870.0	18	855.0	9.0	27.0	WD27V8400
845.0	875.0	18	860.0	9.0	27.0	WD27V8450
850.0	880.0	18	865.0	9.0	27.0	WD27V8500
860.0	890.0	18	875.0	9.0	27.0	WD27V8600
870.0	900.0	18	885.0	9.0	27.0	WD27V8700
880.0	910.0	18	895.0	9.0	27.0	WD27V8800
885.0	915.0	18	900.0	9.0	27.0	WD27V8850
890.0	920.0	18	905.0	9.0	27.0	WD27V8900

Other dimensions on request



Scraper DA27

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	Part No.
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	a min.	B	
900.0	930.0	18	915.0	9.0	27.0	WD27V9000
920.0	950.0	18	935.0	9.0	27.0	WD27V9200
950.0	980.0	18	965.0	9.0	27.0	WD27V9500
1000.0	1030.0	18	1015.0	9.0	27.0	WD27Y1000
1010.0	1040.0	18	1025.0	9.0	27.0	WD27Y1010
1045.0	1075.0	18	1060.0	9.0	27.0	WD27Y1045
1050.0	1080.0	18	1065.0	9.0	27.0	WD27Y1050
1100.0	1130.0	18	1115.0	9.0	27.0	WD27Y1100
1220.0	1250.0	18	1235.0	9.0	27.0	WD27Y1220
1250.0	1280.0	18	1265.0	9.0	27.0	WD27Y1250
1300.0	1330.0	18	1315.0	9.0	27.0	WD27Y1300

Other dimensions on request

Ordering Example

Scraper DA27

Rod diameter:

Part No.:

Material:

$d_N = 500.0$ mm

WD27V5000 (from Table IX)

Standard material

NBR 90 Shore A, Code N9T52

Order No.	WD27	V	5000	-	N9T52
Series No.					
Type					
Rod diameter x 10					
Quality Index					
Material code					