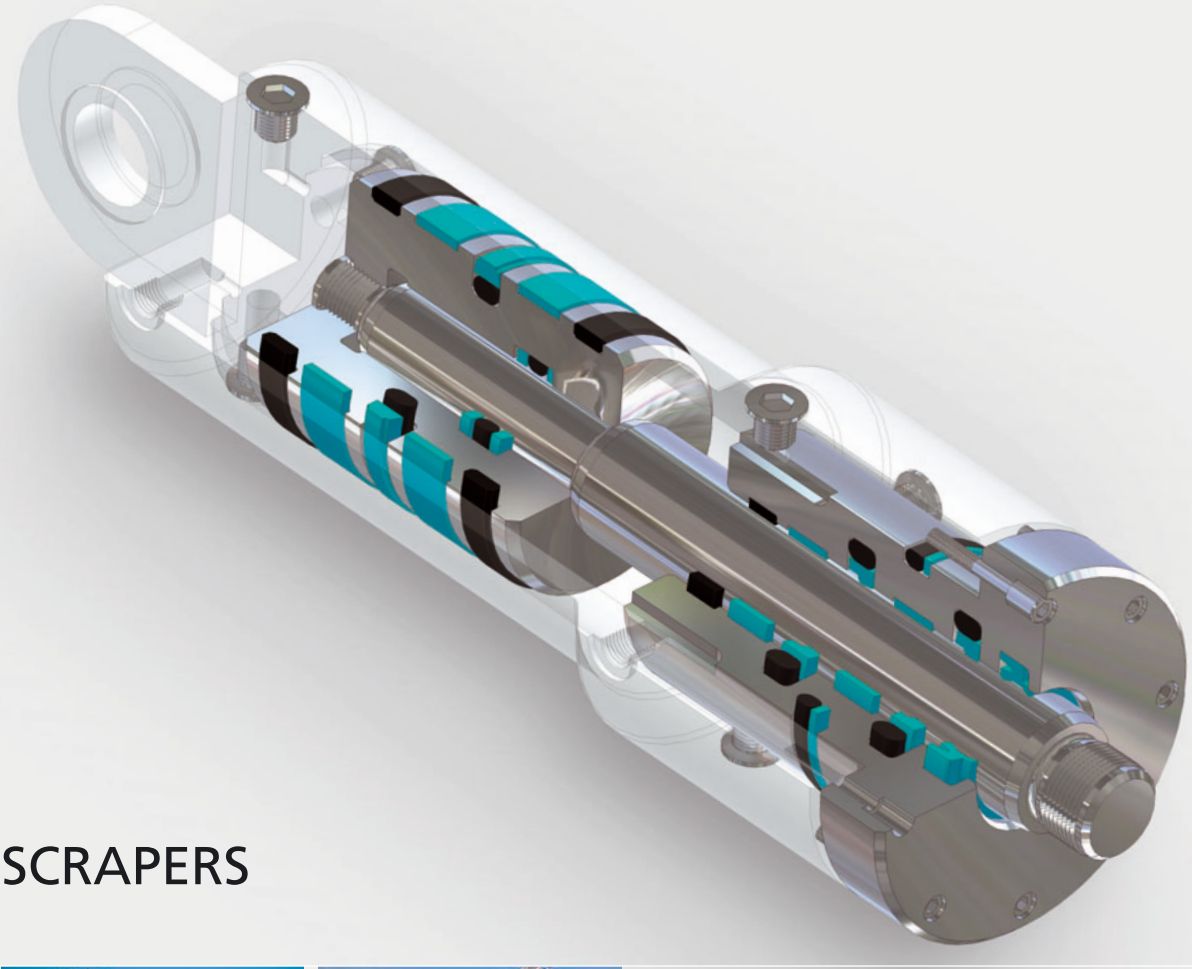
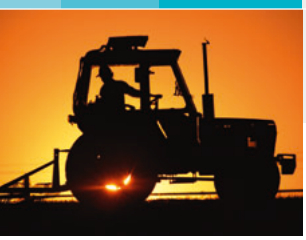
Hydraulic seals – linear

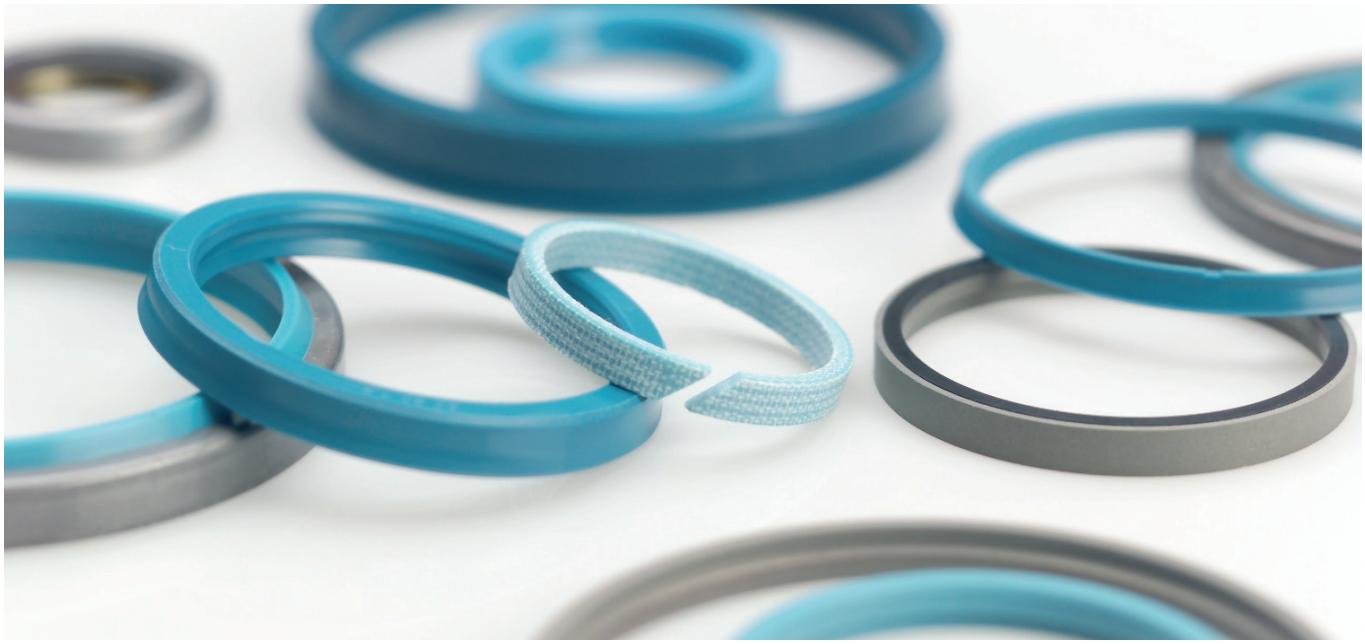


SCRAPERS



Your Partner for Sealing Technology

Busak+Shamban



Your Partner for Sealing Technology

Busak+Shamban is a major international sealing force, uniquely placed to offer dedicated design and development from our market leading product and material portfolio; a one-stop shop providing the best in elastomer, thermoplastic, PTFE and composite technologies for applications in aerospace, industrial, and automotive industries.

With 50-years experience, Busak+Shamban engineers support customers with design, prototyping, production, test and installation using state-of-the-art design tools. An international network of over 60 facilities worldwide includes 32 manufacturing sites, strategically positioned research and development centres, including materials and development laboratories and locations specialising in design and applications.

Developing and formulating materials in-house, we utilise the resource of our material database, including over 2,000 proprietary compounds and a range of unique products.

Busak+Shamban fulfil challenging service requirements, supplying standard parts in volume or a single custom-manufactured component, through our integrated logistical support, which effectively delivers over 40,000 sealing products to customers worldwide.

Facilities are certified to ISO 9001:2000 and ISO/TS 16949:2002, with many manufacturing sites also working to QS9000 and VDA 6.1. Busak+Shamban, as the global sales and marketing organisation of Trelleborg Sealing Solutions, is backed by the experiences and resources of one of the world's foremost experts in polymer technology, Trelleborg AB.

ISO 9001:2000

ISO/TS 16949:2002

To obtain the best recommendation for a specific application, please contact your local Busak+Shamban marketing company.

This edition supersedes all previous brochures.

Busak+Shamban

Linear Seals

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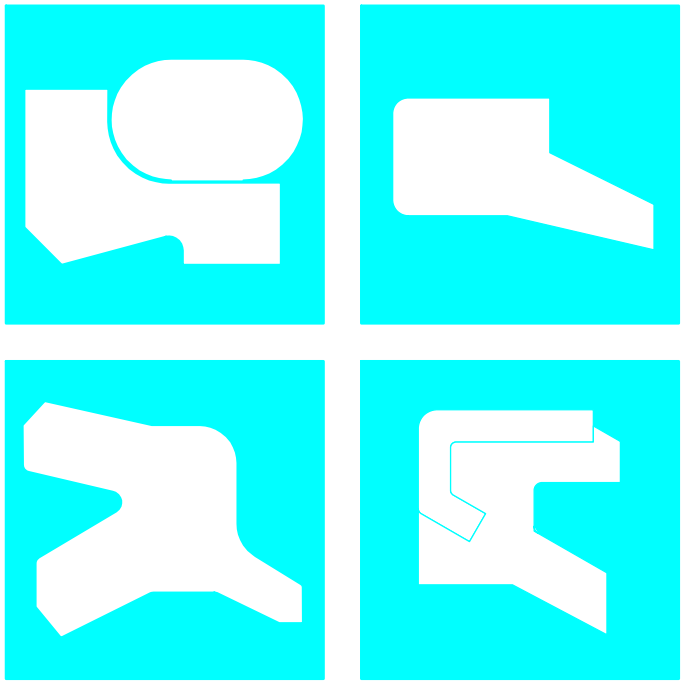


Contents

Choice of the Scraper Element

Scrapers are installed in hydraulic cylinders to wipe any dirt, foreign particles, chips, moisture, etc. from the piston rods as they are retracted into the system, thus preventing contamination of the hydraulic medium which would otherwise damage wear rings, seals and other components.

Single and double-acting scrapers can be used, depending on the application and the sealing system. They differ quite distinctly in their function: single-acting scrapers are designed to keep out contamination from the outside; double-acting scrapers have the additional function of optimising the sealing system and scraping off the existing residual fluid film, to avoid any external leakage.

In order to satisfy both the different technical and economic demands, there is a complete range of scrapers with optimised geometries made with high-quality materials.

Before selecting the scraper and the material, it is essential to know all the desired functional parameters. The table on following pages allows a preliminary choice of the scraper type and material, according to the specific requirements of the application.

Further general informations together with specific design and installation instructions for the particular scraper type and material can be found.

This Catalogue is a compilation of the preferred product ranges of Busak+Shamban, Sealing Parts and POLYPAC. All similar products are technically equivalent but availability and pricing may vary. For further information please contact your local Busak+Shamban company.

Note on Ordering

All multi-element standard scrapers are generally supplied as a complete set. The supply includes scraper and energizing element. The O-Ring does not have to be ordered separately. It is also possible, however, to use other O-Ring materials from our O-Ring Catalogue. In this case, please order the scraper and O-Ring separately.

Older designs of scrapers no longer contained in this catalogue obviously continue to be available. When possible, however, for new applications we recommend the use of DIN/ISO series listed in the catalogue.

The sizes contained in this catalogue are generally available from stock and can be supplied at short notice. We reserve the right to modify our article structure without prior notice.

Please do not hesitate to contact our Technical Department for further information on specific applications and special technical questions.

Table I Selection Criteria for Scrapers

Scraper		Application				Standard	Size Range	Groove Type	Action		Technical Data*		Recommended Scraper Material
											Temp. Range**	Speed	
Type	Page	Field of Application	Light	Medium	Heavy	ISO/DIN	mm	mm	Single	Double	°C	m/s	
Excluder® 2 	7	Industrial hydraulics Machine tools Injection molding machines Servo hydraulic cylinders Robotics	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	-	4 - 2600	Split <30 Closed >30		X	-45/ +200	15	Turcon® T46
Excluder® 5 	15	Heavy duty mobile and industrial hydraulics Presses Steel mills	● ● ●	● ● ●	● ● ●	-	20 - 2600 20 - 2200	Split <30 Closed >30		X	-45/ +200 -45/ +100	15 2	Turcon® T46 Zurcon® Z52
Zurcon® Excluder® 500 	23	Mobile hydraulics	●	●	●	-	12 - 130	Split <25 Closed >25		X	-30/ +80	1	Zurcon® Z05
Scraper DA 17 	29	Industrial hydraulics Machine tools Presses	● ● ●	● ● ●		-	10 - 440	Split <18 Closed >18		X	-30/ +110	1	NBR
Zurcon® Scraper DA 22 	35	ISO standard cylinder Industrial hydraulic cylinders	● ●	● ●	● ●	6195 Type C	5 - 180	Split <18 Closed >18		X	-35/ +100	1	Zurcon® Z201
Zurcon® Scraper DA 24 	41	Mobile hydraulics Construction machinery Agriculture machinery	● ● ●	● ● ●	● ● ●	-	50 - 280	Closed		X	-35/ +100	0.5	Zurcon® Z201
Scraper WRM 	45	Agriculture machinery Handling equipment	● ●	● ●		-	12 - 260	Closed	X		-30/ +110	1	NBR
Zurcon® Scraper ASW 	51	Agriculture machinery Mobile hydraulic machinery	● ●	● ●		-	8 - 125	Split <14 Closed >14	X		-35/ +100	1	Zurcon® Z201

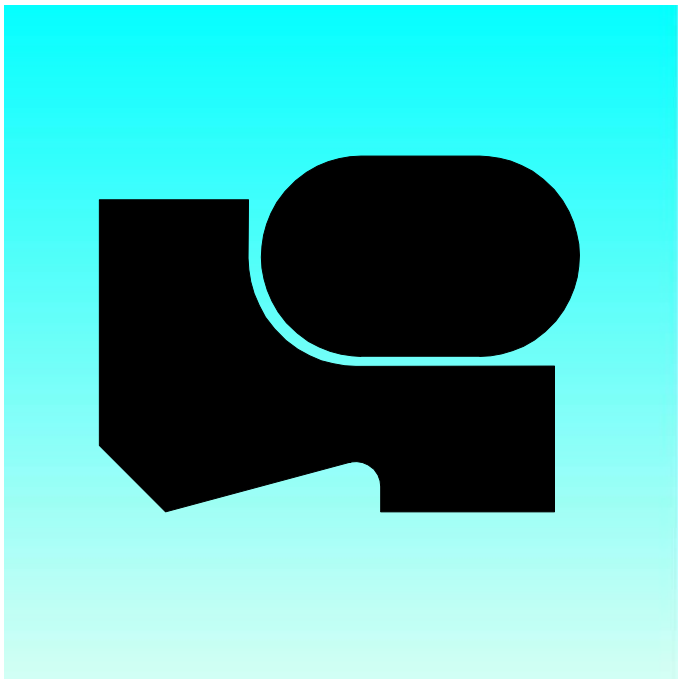
* The data abowe are maximum values and cannot be used at the same time.
** Temperature Range is depending on choise of elastomer material and Media.

Scrapers

Scraper		Application				Standard	Size Range	Groove Type	Action		Technical Data*		Recom-mended Scraper Material
											Temp. Range**	Speed	
Type	Page	Field of Application	Light	Medium	Heavy	ISO/DIN	mm	mm	Single	Double	°C	m/s	
Scraper PW 	57	Agriculture machinery **Mobile hydraulic** machinery	● ●	● ●		-	4 - 280	Closed	X		-35/ +80	1	TPU
Zurcon® Scraper WNE 	65	Agriculture machinery Mobile hydraulic machinery	● ●	● ●	● ●	-	8 - 250	Closed	X		-35/ +100	1	Zurcon® Z201
Zurcon® Scraper WNV 	71	Agriculture machinery Mobile hydraulic machinery **ISO standard** cylinder Lift trucks Cargo tailboards Steering cylinders	● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ●	6195 Type A	16 - 100	Closed		X	-35/ +100	1	Zurcon® Z201
Scraper WRM/C-WSA 	75	Agriculture machinery **Standard hydraulic** cylinder	● ●	● ●		-	16 - 120	Open	X		-30/ +110	1	NBR + Metal
Zurcon® Scraper WRM/PC  WSA	81	Agriculture machinery Mobil hydraulic **machinery**	● ●	● ●	● ●	-	16 - 175	Open	X		-35/ +100	1	Zurcon® Z201 + Metal
Zurcon® Scraper SWP 	85	Construction machinery Link pin seals		● ●	● ●	-	25 - 190	Open	X		-35/ +100	1	Zurcon® Z201 + Metal
Metal Wiper 	91	Agriculture machinery Mobile hydraulic machinery ISO standard cylinder	● ● ●	● ● ●	● ● ●	-	12 - 220	Open	X		-40/ +110	1	Metal + NBR + Brass

* The data abowe are maximum values and cannot be used at the same time.
** Temperature Range is depending on choise of elastomer material and Media.

TURCON® EXCLUDER® 2



- Double Acting -

- Rubber Energised Double-acting Scraper -

- Material -

- Turcon® and Zurcon® -

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.

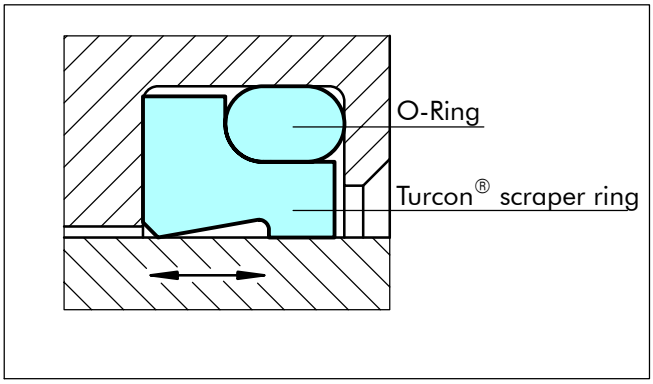


Figure 1 Turcon® Excluder® 2

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 are used in conjunction with the rod seal Turcon® Stepseal®, i.e. seals with hydrodynamic back-pumping 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®)
- ISO/DIN 6195 Type D installation dimensions

Technical Data

Speed:	15 m/s for Turcon® materials
Temperature:	-45° C to +200° C (depending on O-Ring material)
Media:	Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids, environmentally safe hydraulic fluids (bio-oils), water, air and others, depending on the 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, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

The following material combination has proven effective for most applications:

Excluder® 2:	Turcon® T46
O-Ring:	NBR, 70 Shore A

For other applications, other material combinations as listed in Table III, may also be used.

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_2
WE30	> 30	1.78
WE31	> 30	2.62
WE32	> 30	3.53
WE33	> 40	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	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
Turcon® T46 **Standard material** for hydraulics, high compressive strength, good sliding and wear properties, **BAM tested.** Bronze filled Colour: Greyish to dark brown	T46	NBR - 70 Shore A	N	-30 to +100	Steel, hardened Steel, chromeplated Cast iron	15
		NBR - Low temp. 70 Shore A	T	-45 to +80		
		FKM - 70 Shore A	V	-10 to +200		
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 Steel, chromeplated 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® T05 For all lubricating hydraulic fluids, hard mating surfaces, **very good slide properties, low friction.** Colour: Turquoise	T05	NBR - 70 Shore A	N	-30 to +100	Steel, hardened Steel, chromeplated	15
		NBR - Low temp. 70 Shore A	T	-45 to +80		
		FKM - 70 Shore A	V	-10 to +200		
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	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.

Installation Recommendation

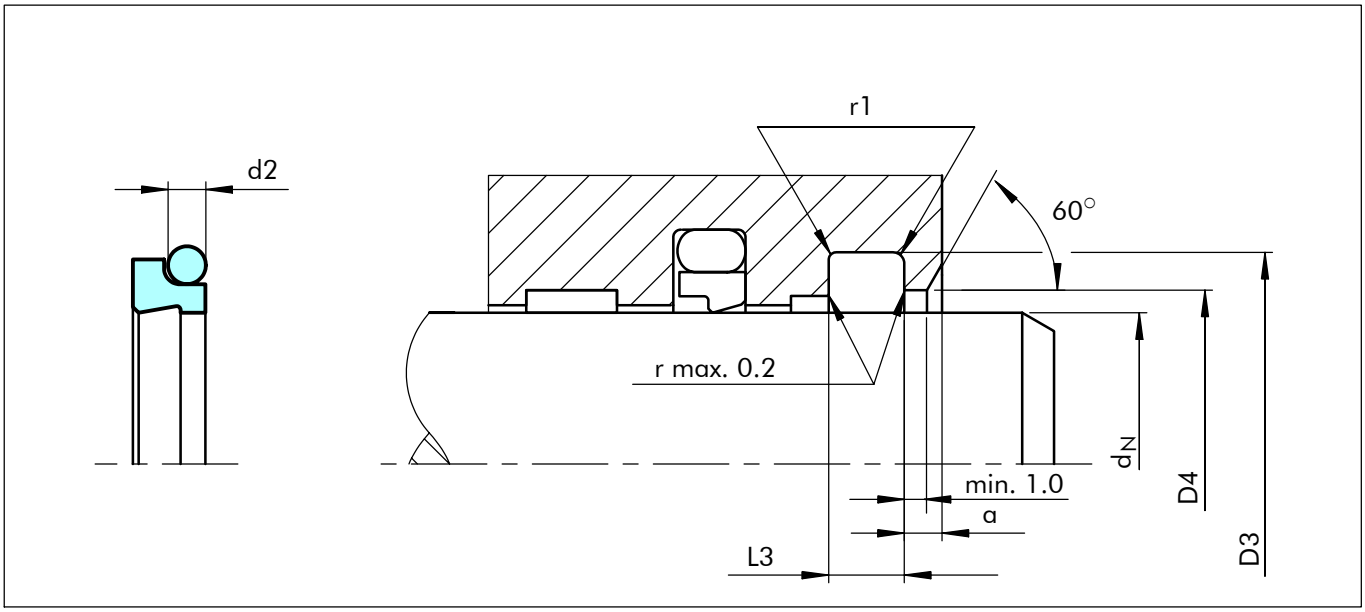


Figure 2 Installation drawing

Table IV 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
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	> 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)
Part No.: WE3100500 (from Table V)

Select the material from Table III. The corresponding code numbers are appended to the Part No. (from Table V). Together they form the Order No.
For all intermediate sizes not shown in Table V, the Order No. can be determined from the example opposite.
*For diameters ≥ 1000.0 mm multiply only by factor 1.
Example: WE35 for diameter 1200.0 mm.
Order no.: WE35**X1200**-T46N.

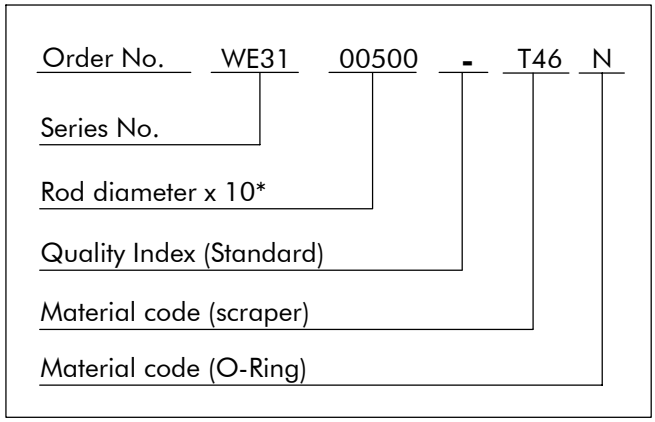


Table V Installation Dimensions / Part Numbers

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.		
4.0*)	**8.8**	**3.7**	**5.5**	**0.4**	**2.0**	**WE3000040**	**5.60 x 1.80**
5.0*)	**9.8**	**3.7**	**6.5**	**0.4**	**2.0**	**WE3000050**	**6.70 x 1.80**
6.0*)	**10.8**	**3.7**	**7.5**	**0.4**	**2.0**	**WE3000060**	**7.65 x 1.78**
8.0*)	**12.8**	**3.7**	**9.5**	**0.4**	**2.0**	**WE3000080**	**9.50 x 1.80**
10.0*)	**14.8**	**3.7**	**11.5**	**0.4**	**2.0**	**WE3000100**	**11.80 x 1.80**
12.0*)	**18.8**	**5.0**	**13.5**	**0.8**	**2.0**	**WE3100120**	**13.94 x 2.62**
14.0*)	**20.8**	**5.0**	**15.5**	**0.8**	**2.0**	**WE3100140**	**15.54 x 2.62**
15.0	21.8	5.0	16.5	0.8	2.0	WE3100150	17.12 x 2.62
16.0	**20.8**	**3.7**	**17.5**	**0.4**	**2.0**	**WE3000160**	**17.17 x 1.78**
16.0*)	**22.8**	**5.0**	**17.5**	**0.8**	**2.0**	**WE3100160**	**18.00 x 2.65**
18.0	**22.8**	**3.7**	**19.5**	**0.4**	**2.0**	**WE3000180**	**19.00 x 1.80**
18.0*)	**24.8**	**5.0**	**19.5**	**0.8**	**2.0**	**WE3100180**	**20.29 x 2.62**
20.0*)	**26.8**	**5.0**	**21.5**	**0.8**	**2.0**	**WE3100200**	**21.89 x 2.62**
22.0*)	**28.8**	**5.0**	**23.5**	**0.8**	**2.0**	**WE3100220**	**23.47 x 2.62**
25.0*)	**31.8**	**5.0**	**26.5**	**0.8**	**2.0**	**WE3100250**	**26.64 x 2.62**
28.0*)	**34.8**	**5.0**	**29.5**	**0.8**	**2.0**	**WE3100280**	**29.82 x 2.62**
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
32.0*)	**38.8**	**5.0**	**33.5**	**0.8**	**2.0**	**WE3100320**	**34.59 x 2.62**
35.0	41.8	5.0	36.5	0.8	2.0	WE3100350	36.17 x 2.62
36.0*)	**42.8**	**5.0**	**37.5**	**0.8**	**2.0**	**WE3100360**	**37.77 x 2.62**
37.0	43.8	5.0	38.5	0.8	2.0	WE3100370	39.34 x 2.62
40.0*)	**46.8**	**5.0**	**41.5**	**0.8**	**2.0**	**WE3100400**	**42.52 x 2.62**
42.0	48.8	5.0	43.5	0.8	2.0	WE3100420	44.12 x 2.62
45.0*)	**51.8**	**5.0**	**46.5**	**0.8**	**2.0**	**WE3100450**	**47.29 x 2.62**
49.0	55.8	5.0	50.5	0.8	2.0	WE3100490	50.47 x 2.62
50.0*)	**56.8**	**5.0**	**51.5**	**0.8**	**2.0**	**WE3100500**	**52.07 x 2.62**
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
56.0*)	**62.8**	**5.0**	**57.5**	**0.8**	**2.0**	**WE3100560**	**58.42 x 2.62**
60.0	66.8	5.0	61.5	0.8	2.0	WE3100600	61.60 x 2.62
63.0*)	**69.8**	**5.0**	**64.5**	**0.8**	**2.0**	**WE3100630**	**64.77 x 2.62**
65.0	73.8	6.0	66.5	1.0	3.0	WE3200650	66.27 x 3.53
70.0	**78.8**	**6.0**	**71.5**	**1.0**	**3.0**	**WE3200700**	**72.62 x 3.53**
75.0	83.8	6.0	76.5	1.0	3.0	WE3200750	75.79 x 3.53
80.0	**88.8**	**6.0**	**81.5**	**1.0**	**3.0**	**WE3200800**	**82.14 x 3.53**
85.0	93.8	6.0	86.5	1.0	3.0	WE3200850	83.52 x 3.53
90.0	**98.8**	**6.0**	**91.5**	**1.0**	**3.0**	**WE3200900**	**91.67 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.

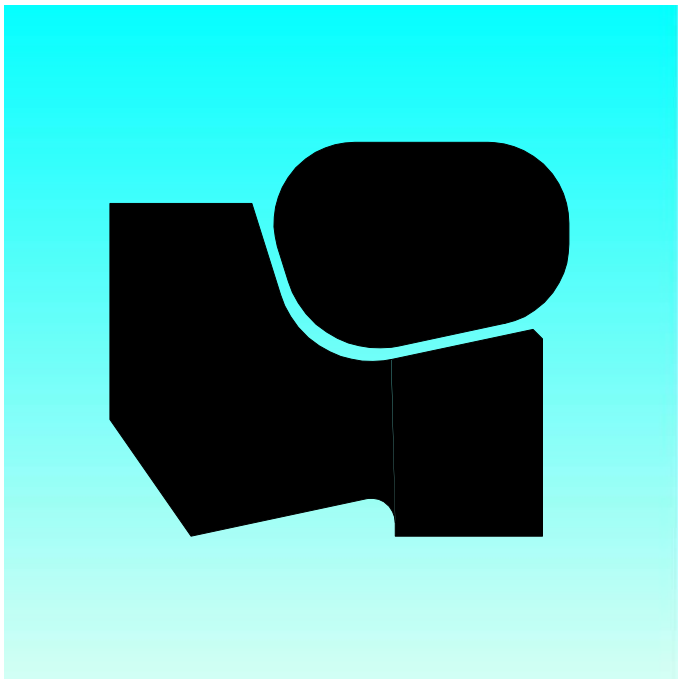
Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	Part No.	O-Ring Size
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	r_1 max.	a min.		
95.0	103.8	6.0	96.5	1.0	3.0	WE3200950	98.02 x 3.53
100.0	**108.8**	**6.0**	**101.5**	**1.0**	**3.0**	**WE3201000**	**101.19 x 3.53**
105.0	113.8	6.0	106.5	1.0	3.0	WE3201050	107.54 x 3.53
110.0	**118.8**	**6.0**	**111.5**	**1.0**	**3.0**	**WE3201100**	**110.72 x 3.53**
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
125.0	**133.8**	**6.0**	**126.5**	**1.0**	**3.0**	**WE3201250**	**126.59 x 3.53**
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
140.0	**148.8**	**6.0**	**141.5**	**1.0**	**3.0**	**WE3201400**	**142.47 x 3.53**
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
160.0	**168.8**	**6.0**	**161.5**	**1.0**	**3.0**	**WE3201600**	**158,34 x 3.53**
170.0	178.8	6.0	171.5	1.0	3.0	WE3201700	171.04 x 3.53
180.0	**188.8**	**6.0**	**181.5**	**1.0**	**3.0**	**WE3201800**	**177.39 x 3.53**
190.0	198.8	6.0	191.5	1.0	3.0	WE3201900	190.09 x 3.53
200.0	**208.8**	**6.0**	**201.5**	**1.0**	**3.0**	**WE3202000**	**202.79 x 3.53**
210.0	218.8	6.0	211.5	1.0	3.0	WE3202100	209.14 x 3.53
220.0	**228.8**	**6.0**	**221.5**	**1.0**	**3.0**	**WE3202200**	**221.84 x 3.53**
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
250.0	**258.8**	**6.0**	**251.5**	**1.0**	**3.0**	**WE3202500**	**253.59 x 3.53**
260.0	272.2	8.4	262.0	1.5	4.0	WE3302600	253.59 x 5.33
280.0	**292.2**	**8.4**	**282.0**	**1.5**	**4.0**	**WE3302800**	**278.77 x 5.33**
300.0	312.2	8.4	302.0	1.5	4.0	WE3303000	304.17 x 5.33
320.0	**332.2**	**8.4**	**322.0**	**1.5**	**4.0**	**WE3303200**	**329.57 x 5.33**
350.0	362.2	8 .4	352.0	1.5	4.0	WE3303500	354.97 x 5.33
360.0	**372.2**	**8.4**	**362.0**	**1.5**	**4.0**	**WE3303600**	**354.97 x 5.33**
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
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

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.

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

TURCON® EXCLUDER® 5



- Double Acting -

- Rubber Energised Double-acting Scraper -

- Material -

- Turcon® and Zurcon® -

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.

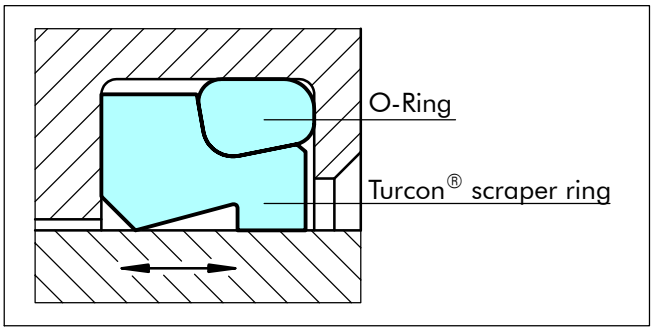


Figure 3 Turcon® Excluder® 5

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 are preferably used in conjunction with our rod seal Turcon® Stepseal®, 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®).
- ISO/DIN 6195 Type D installation dimensions

Technical Data

Speed:	15 m/s for Turcon® materials 2 m/s for Zurcon® materials
Temperature:	-45° C to +200° C (Turcon®) -45° C to +100° C (Zurcon®) (depending on O-Ring material)
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, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

The following material combination has proven effective for most applications:

Excluder® 5:	Turcon® T46
O-Ring:	NBR, 70 Shore A
Set Code:	T46N

For other applications, other material combinations as listed in Table VII, may also be used.

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.

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

* Patent No. EP 023 5568

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

Material, Applications, Properties	Code	O-Ring Material	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
Turcon® T46 **Standard material** for hydraulics, high compressive strength, good sliding and wear properties, **BAM tested.** Bronze filled Colour: Greyish to dark brown	T46	NBR - 70 Shore A	N	-30 to +100	Steel, hardened Steel, chromeplated	15
		NBR - Low temp. 70 Shore A	T	-45 to +80		
		FKM - 70 Shore A	V	-10 to +200		
Turcon® T40 For all lubricating and non-lubricating hydraulic fluids, **soft mating surfaces.** Surface texture not suitable for gases. Carbon fibre filled Colour: Grey	T40	NBR - 70 Shore A	N	-30 to +100	Steel Steel, chromeplated 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		
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	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.

Installation Recommendation

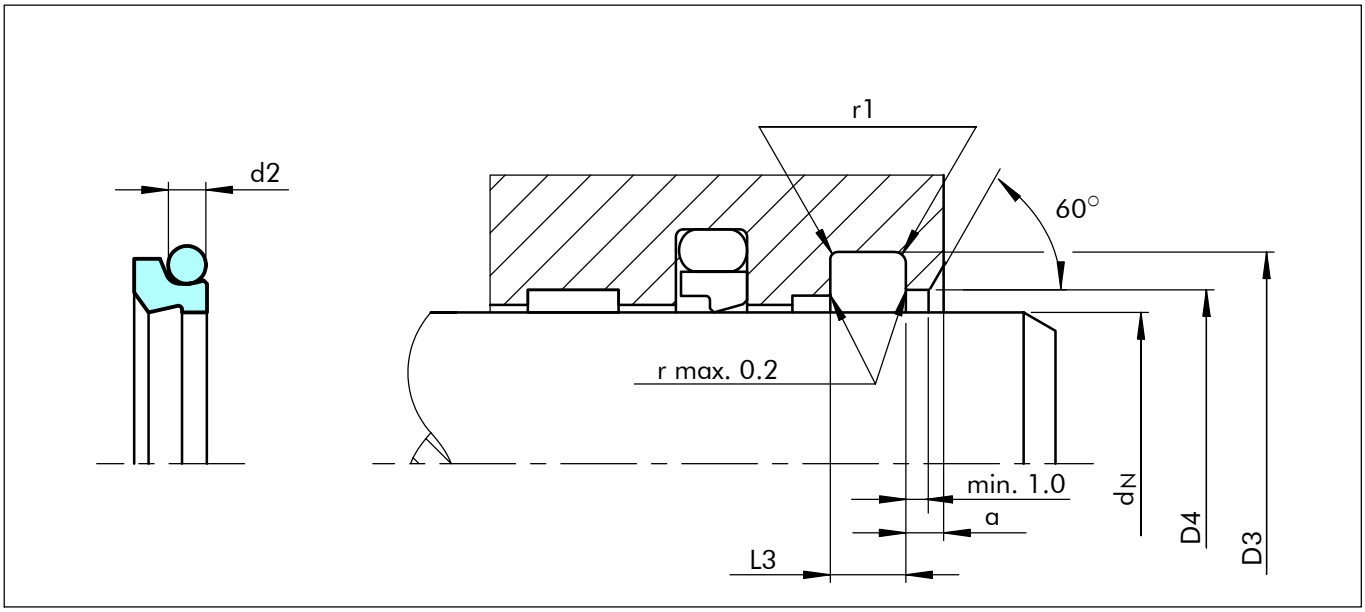


Figure 4 Installation drawing

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	> 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)
Part No.: WE5100500 (from Table IX)

Select the material from Table VII. The corresponding code numbers are appended to the Part No. (from Table IX). Together they form the Order No.
For all intermediate sizes not shown in Table IX, the Order No. can be determined from the example opposite.
*For diameters ≥ 1000.0 mm multiply only by factor 1.
Example: WE55 for diameter 1200.0 mm.
Order no.: WE55**X1200**-T46N.

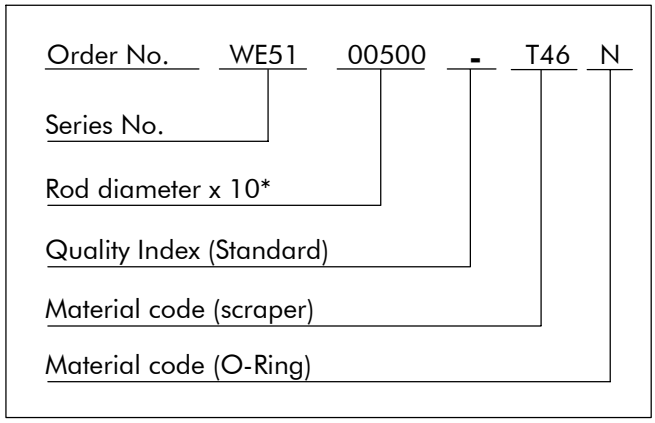


Table IX Installation Dimensions / Part numbers

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.		
20.0	**27.6**	**4.2**	**21.5**	**0.8**	**3.0**	**WE5000200**	**21.89 x 2.62**
25.0	**32.6**	**4.2**	**26.5**	**0.8**	**3.0**	**WE5000250**	**28.24 x 2.62**
28.0	**35.6**	**4.2**	**29.5**	**0.8**	**3.0**	**WE5000280**	**29.82 x 2.62**
30.0	37.6	4.2	31.5	0.8	3.0	WE5000300	32.99 x 2.62
32.0	**39.6**	**4.2**	**33.5**	**0.8**	**3.0**	**WE5000320**	**34.59 x 2.62**
36.0	**43.6**	**4.2**	**37.5**	**0.8**	**3.0**	**WE5000360**	**37.77 x 2.62**
40.0*)	**48.8**	**6.3**	**41.5**	**0.8**	**3.0**	**WE5100400**	**44.12 x 2.62**
42.0	50.8	6.3	43.5	0.8	3.0	WE5100420	45.69 x 2.62
45.0*)	**53.8**	**6.3**	**46.5**	**0.8**	**3.0**	**WE5100450**	**48.90 x 2.62**
50.0*)	**58.8**	**6.3**	**51.5**	**0.8**	**3.0**	**WE5100500**	**53.64 x 2.62**
55.0	63.8	6.3	56.5	0.8	3.0	WE5100550	58.42 x 2.62
56.0*)	**64.8**	**6.3**	**57.5**	**0.8**	**3.0**	**WE5100560**	**59.99 x 2.62**
60.0	68.8	6.3	61.5	0.8	3.0	WE5100600	63.17 x 2.62
63.0*)	**71.8**	**6.3**	**64.5**	**0.8**	**3.0**	**WE5100630**	**66.34 x 2.62**
65.0	73.8	6.3	66.5	0.8	3.0	WE5100650	67.95 x 2.62
70.0*)	**78.8**	**6.3**	**71.5**	**0.8**	**3.0**	**WE5100700**	**72.69 x 2.62**
70.0*)	**82.2**	**8.1**	**72.0**	**1.0**	**4.0**	**WE5200700**	**75.79 x 3.53**
75.0	87.2	8.1	77.0	1.0	4.0	WE5200750	78.97 x 3.53
80.0*)	**88.8**	**6.3**	**81.5**	**1.0**	**3.0**	**WE5100800**	**82.22 x 2.62**
80.0*)	**92.2**	**8.1**	**82.0**	**1.0**	**4.0**	**WE5200800**	**85.32 x 3.53**
85.0	97.2	8.1	87.0	1.0	4.0	WE5200850	88.49 x 3.53
90.0*)	**98.8**	**6.3**	**91.5**	**1.0**	**3.0**	**WE5100900**	**94.92 x 2.62**
90.0*)	**102.2**	**8.1**	**92.0**	**1.0**	**4.0**	**WE5200900**	**94.84 x 3.53**
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
100.0*)	**108.8**	**6.3**	**101.5**	**1.0**	**3.0**	**WE5101000**	**101.27 x 2.62**
100.0*)	**112.2**	**8.1**	**102.0**	**1.0**	**4.0**	**WE5201000**	**104.37 x 3.53**
105.0	117.2	8.1	107.0	1.0	4.0	WE5201050	110.72 x 3.53
110.0*)	**118.8**	**6.3**	**111.5**	**1.0**	**3.0**	**WE5101100**	**113.97 x 2.62**
110.0*)	**122.2**	**8.1**	**112.0**	**1.0**	**4.0**	**WE5201100**	**113.89 x 3.53**
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
125.0*)	**133.8**	**6.3**	**126.5**	**1.0**	**3.0**	**WE5101250**	**126.67 x 2.62**
125.0*)	**137.2**	**8.1**	**127.0**	**1.0**	**4.0**	**WE5201250**	**129.77 x 3.53**
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

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.

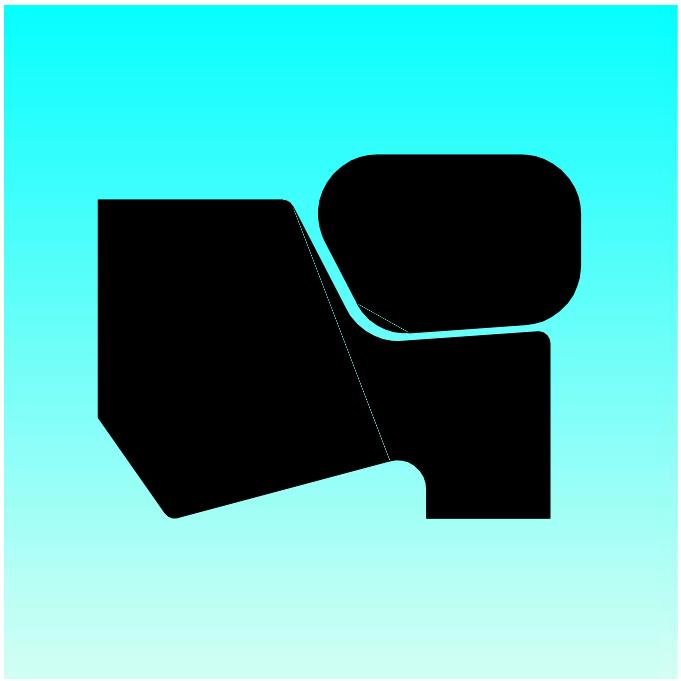
Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	Part No.	O-Ring Size
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	r_1 max.	a min.		
135.0	147.2	8.1	137.0	1.0	4.0	WE5201350	139.29 x 3.53
140.0*)	**152.2**	**8.1**	**142.0**	**1.0**	**4.0**	**WE5201400**	**145.64 x 3.53**
140.0*)	**156.0**	**9.5**	**142.5**	**1.5**	**5.0**	**WE5301400**	**145.42 x 5.33**
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
160.0*)	**172.2**	**8.1**	**162.0**	**1.0**	**4.0**	**WE5201600**	**164.69 x 3.53**
160.0*)	**176.0**	**9.5**	**162.5**	**1.5**	**5.0**	**WE5301600**	**164.47 x 5.33**
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
180.0*)	**192.2**	**8.1**	**182.0**	**1.0**	**4.0**	**WE5201800**	**183.74 x 3.53**
180.0*)	**196.0**	**9.5**	**182.5**	**1.5**	**5.0**	**WE5301800**	**183.52 x 5.33**
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
200.0*)	**212.2**	**8.1**	**202.0**	**1.0**	**4.0**	**WE5202000**	**202.79 x 3.53**
200.0*)	**216.0**	**9.5**	**202.5**	**1.5**	**5.0**	**WE5302000**	**202.57 x 5.33**
211.0	227.0	9.5	213.5	1.5	5.0	WE5302110	215.27 x 5.33
220.0*)	**232.2**	**8.1**	**222.0**	**1.0**	**4.0**	**WE5202200**	**221.84 x 3.53**
220.0*)	**236.0**	**9.5**	**222.5**	**1.5**	**5.0**	**WE5302200**	**221.62 x 5.33**
240.0	256.0	9.5	242.5	1.5	5.0	WE5302400	247.02 x 5.33
250.0*)	**262.2**	**8.1**	**252.0**	**1.0**	**4.0**	**WE5202500**	**253.59 x 3.53**
250.0*)	**266.0**	**9.5**	**252.5**	**1.5**	**5.0**	**WE5302500**	**253.37 x 5.33**
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
280.0*)	**292.2**	**8.1**	**282.0**	**1.5**	**4.0**	**WE5202800**	**278.99 x 3.53**
280.0*)	**296.0**	**9.5**	**282.5**	**1.5**	**5.0**	**WE5302800**	**278.77 x 5.33**
300.0	316.0	9.5	302.5	1.5	5.0	WE5303000	304.17 x 5.33
320.0*)	**332.2**	**8.1**	**322.0**	**1.5**	**4.0**	**WE5203200**	**329.79 x 3.53**
320.0*)	**336.0**	**9.5**	**322.5**	**1.5**	**5.0**	**WE5303200**	**329.57 x 5.33**
330.0	346.0	9.5	332.5	1.5	5.0	WE5303300	329.57 x 5.33
350.0	366.0	9.5	352.5	1.5	5.0	WE5303500	354.97 x 5.33
360.0*)	**372.2**	**8.1**	**362.0**	**1.5**	**4.0**	**WE5203600**	**355.19 x 3.53**
360.0*)	**376.0**	**9.5**	**362.5**	**1.5**	**5.0**	**WE5303600**	**365.00 x 5.30**
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

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	Part No.	O-Ring Size
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	r_1 max.	a min.		
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

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

ZURCON® EXCLUDER® 500



- Double Acting -

- Rubber Energised-

- Flexible Double-acting Scraper -

- Material -

- Zurcon® -

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® with hydrodynamic back-pumping function.

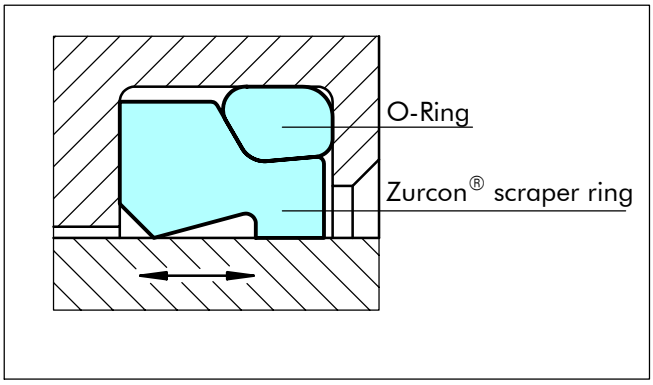


Figure 5 Zurcon® Excluder® 500

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

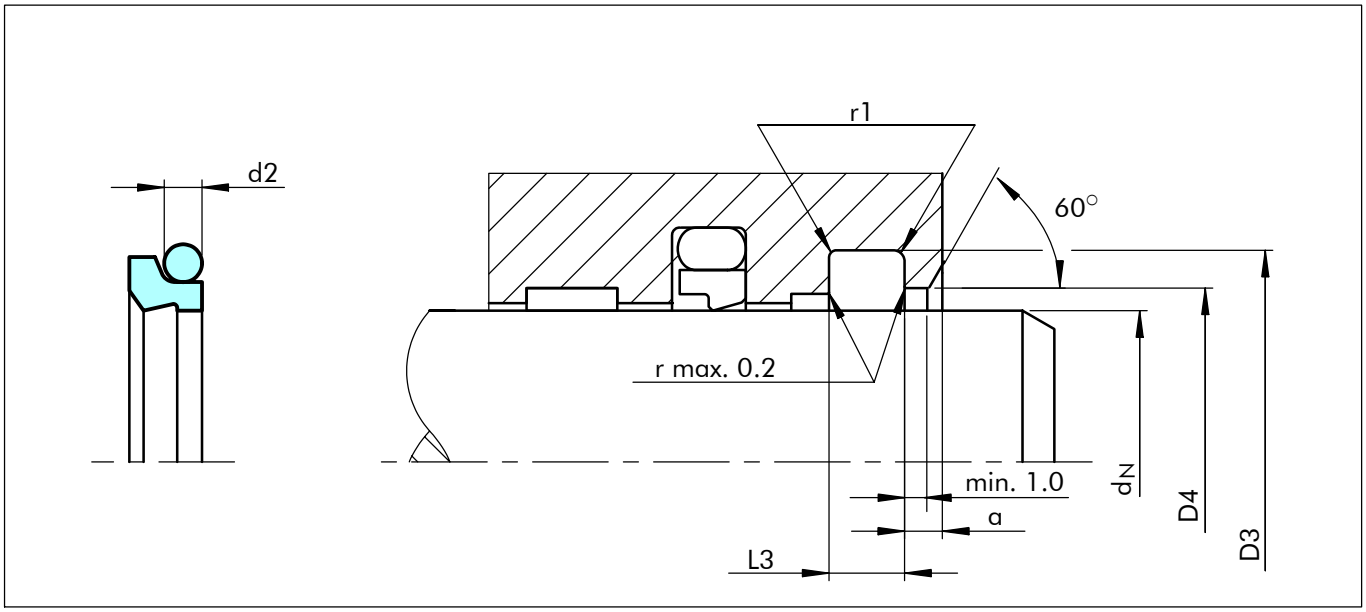


Figure 6 Installation drawing

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)
Part No.: WEP100500 (from Table XI)
Materials: Excluder® of Zurcon® Z05
O-Ring of NBR 70 Shore A

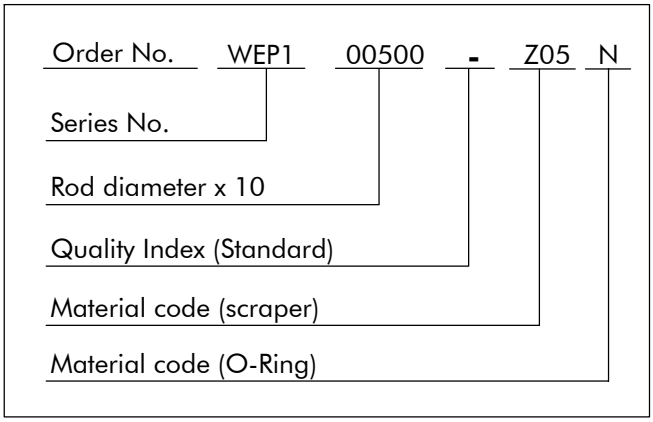


Table XI Installation Dimensions / Part Numbers

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.		
12.0	**19.6**	**4.2**	**13.5**	**0.8**	**3.0**	**WEP000120**	**15.00 x 2.62**
14.0	**21.6**	**4.2**	**15.5**	**0.8**	**3.0**	**WEP000140**	**17.12 x 2.62**
18.0	**25.6**	**4.2**	**19.5**	**0.8**	**3.0**	**WEP000180**	**20.29 x 2.62**
20.0	**27.6**	**4.2**	**21.5**	**0.8**	**3.0**	**WEP000200**	**21.89 x 2.62**
22.0	**29.6**	**4.2**	**23.5**	**0.8**	**3.0**	**WEP000220**	**25.07 x 2.62**
25.0	**32.6**	**4.2**	**26.5**	**0.8**	**3.0**	**WEP000250**	**28.24 x 2.62**
28.0	**35.6**	**4.2**	**29.5**	**0.8**	**3.0**	**WEP000280**	**29.82 x 2.62**
30.0	37.6	4.2	31.5	0.8	3.0	WEP000300	32.99 x 2.62
32.0	**39.6**	**4.2**	**33.5**	**0.8**	**3.0**	**WEP000320**	**34.59 x 2.62**
35.0	42.6	4.2	36.5	0.8	3.0	WEP000350	37.77 x 2.62
36.0	**43.6**	**4.2**	**37.5**	**0.8**	**3.0**	**WEP000360**	**37.77 x 2.62**
36.0	**44.8**	**6.3**	**37.5**	**0.8**	**3.0**	**WEP100360**	**39.34 x 2.62**
40.0*)	**48.8**	**6.3**	**41.5**	**0.8**	**3.0**	**WEP100400**	**44.12 x 2.62**
45.0*)	**53.8**	**6.3**	**46.5**	**0.8**	**3.0**	**WEP100450**	**48.90 x 2.62**
50.0*)	**58.8**	**6.3**	**51.5**	**0.8**	**3.0**	**WEP100500**	**53.64 x 2.62**
55.0	63.8	6.3	56.5	0.8	3.0	WEP100550	58.42 x 2.62
56.0*)	**64.8**	**6.3**	**57.5**	**0.8**	**3.0**	**WEP100560**	**59.99 x 2.62**
60.0	68.8	6.3	61.5	0.8	3.0	WEP100600	63.17 x 2.62
63.0*)	**71.8**	**6.3**	**64.5**	**0.8**	**3.0**	**WEP100630**	**66.34 x 2.62**
65.0	73.8	6.3	66.5	0.8	3.0	WEP100650	67.95 x 2.62
70.0*)	**82.2**	**8.1**	**72.0**	**1.0**	**4.0**	**WEP200700**	**75.79 x 3.53**
75.0	87.2	8.1	77.0	1.0	4.0	WEP200750	78.97 x 3.53
80.0*)	**92.2**	**8.1**	**82.0**	**1.0**	**4.0**	**WEP200800**	**85.32 x 3.53**
85.0	97.2	8.1	87.0	1.0	4.0	WEP200850	88.49 x 3.53
90.0*)	**102.2**	**8.1**	**92.0**	**1.0**	**4.0**	**WEP200900**	**94.84 x 3.53**
95.0	107.2	8.1	97.0	1.0	4.0	WEP200950	101.19 x 3.53
100.0*)	**112.2**	**8.1**	**102.0**	**1.0**	**4.0**	**WEP201000**	**104.37 x 3.53**
105.0	117.2	8.1	107.0	1.0	4.0	WEP201050	110.72 x 3.53
110.0*)	**122.2**	**8.1**	**112.0**	**1.0**	**4.0**	**WEP201100**	**113.89 x 3.53**
120.0	132.2	8.1	122.0	1.0	4.0	WEP201200	123.42 3.53
125.0*)	**137.2**	**8.1**	**127.0**	**1.0**	**4.0**	**WEP201250**	**129.77 x 3.53**
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.

SCRAPER DA17

- Double Acting -

- Material -

- Rubber -

Scraper DA 17

Description

The scraper DA 17 is a moulded double-acting elastomer scraper. It has two geometrically different scraper lips.

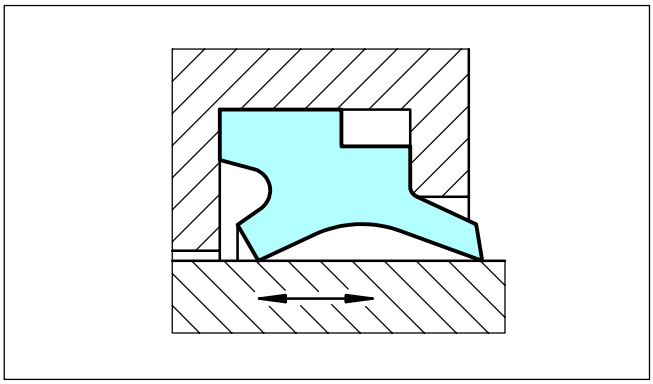


Figure 7 Scraper DA 17

The scraper is preferably used for reciprocating piston rods and plunger pistons in 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®, i.e. seals with a hydrodynamic back-pumping function.

Advantages

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

Technical Data

Speed:	up to 1 m/s
Temperature:	-30° C to +110° C
Media:	Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids (HFA, HFB, HFC), water, air, etc.

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.

Material

Standard material: NBR, 90 Shore A

Ordering Example

Scraper DA 17

Rod diameter:	d_N = 50.0 mm
Part No.:	WD1700500 (from Table XII)
Material:	Standard material NBR 90 Shore A, Code N9

Order No.	WD17	0	0500	-	N9
	Series No.				
		Type (Standard)			
			Rod diameter x 10		
				Quality Index	
					Material code

Installation Recommendation

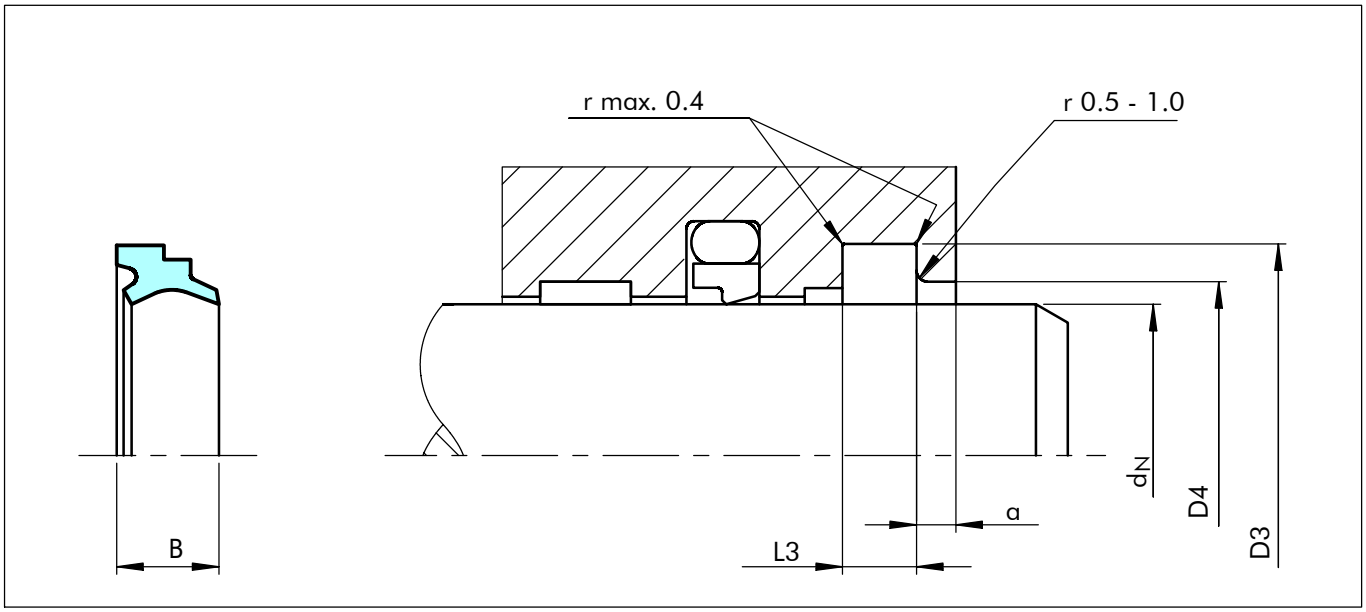


Figure 8 Installation drawing

Table XII 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	
10.0	**18.0**	**6.0**	**13.5**	**2.0**	**8.0**	**WD1700100**
12.0	**20.0**	**6.0**	**15.5**	**2.0**	**8.0**	**WD1700120**
14.0	**22.0**	**6.0**	**17.5**	**2.0**	**8.0**	**WD1700140**
15.0	23.0	6.0	18.5	2.0	8.0	WD1700150
16.0	**24.0**	**6.0**	**19.5**	**2.0**	**8.0**	**WD1700160**
18.0	**26.0**	**6.0**	**21.5**	**2.0**	**8.0**	**WD1700180**
20.0	**28.0**	**6.0**	**23.5**	**2.0**	**8.0**	**WD1700200**
22.0	**30.0**	**6.0**	**25.5**	**2.0**	**8.0**	**WD1700220**
24.0	32.0	6.0	27.5	2.0	8.0	WD1700240
25.0	**33.0**	**6.0**	**28.5**	**2.0**	**8.0**	**WD1700250**
28.0	**36.0**	**6.0**	**31.5**	**2.0**	**8.0**	**WD1700280**
30.0	38.0	6.0	33.5	2.0	8.0	WD1700300
32.0	**40.0**	**6.0**	**35.5**	**2.0**	**8.0**	**WD1700320**
35.0	43.0	6.0	38.5	2.0	8.0	WD1700350
36.0	**44.0**	**6.0**	**39.5**	**2.0**	**8.0**	**WD1700360**
37.0	45.0	6.0	40.5	2.0	8.0	WD1700370
38.0	46.0	6.0	41.5	2.0	8.0	WD1700380
40.0	**48.0**	**6.0**	**43.5**	**2.0**	**8.0**	**WD1700400**

The rod diameters in bold type comply with the recommendations of ISO 3320.
Intermediate sizes above 125 mm diameter can also be supplied in impact vulcanised form.
Other dimensions on request. Up to 18 mm diameter we recommend a split groove.

Scraper DA 17

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	
42.0	50.0	6.0	45.5	2.0	8.0	WD1700420
45.0	**53.0**	**6.0**	**48.5**	**2.0**	**8.0**	**WD1700450**
46.0	54.0	6.0	49.5	2.0	8.0	WD1700460
48.0	56.0	6.0	51.5	2.0	8.0	WD1700480
50.0	**58.0**	**6.0**	**53.5**	**2.0**	**8.0**	**WD1700500**
52.0	60.0	6.0	55.5	2.0	8.0	WD1700520
55.0	63.0	6.0	58.5	2.0	8.0	WD1700550
56.0	**64.0**	**6.0**	**59.5**	**2.0**	**8.0**	**WD1700560**
60.0	68.0	6.0	63.5	2.0	8.0	WD1700600
63.0	**71.0**	**6.0**	**66.5**	**2.0**	**8.0**	**WD1700630**
65.0	73.0	6.0	68.5	2.0	8.0	WD1700650
68.0	76.0	6.0	71.5	2.0	8.0	WD1700680
70.0	**78.0**	**6.0**	**73.5**	**2.0**	**8.0**	**WD1700700**
75.0	83.0	6.0	78.5	2.0	8.0	WD1700750
80.0	**88.0**	**6.0**	**83.5**	**2.0**	**8.0**	**WD1700800**
85.0	93.0	6.0	88.5	2.0	8.0	WD1700850
90.0	**98.0**	**6.0**	**93.5**	**2.0**	**8.0**	**WD1700900**
95.0	103.0	6.0	98.5	2.0	8.0	WD1700950
100.0	**108.0**	**6.0**	**103.5**	**2.0**	**8.0**	**WD1701000**
105.0	117.0	8.2	110.0	3.0	11.0	WD1701050
110.0	**122.0**	**8.2**	**115.0**	**3.0**	**11.0**	**WD1701100**
115.0	127.0	8.2	120.0	3.0	11.0	WD1701150
120.0	132.0	8.2	125.0	3.0	11.0	WD1701200
125.0	**137.0**	**8.2**	**130.0**	**3.0**	**11.0**	**WD1701250**
130.0	142.0	8.2	135.0	3.0	11.0	WD1701300
135.0	147.0	8.2	140.0	3.0	11.0	WD1701350
140.0	**152.0**	**8.2**	**145.0**	**3.0**	**11.0**	**WD1701400**
145.0	157.0	8.2	150.0	3.0	11.0	WD1701450
150.0	162.0	8.2	155.0	3.0	11.0	WD1701500
155.0	167.0	8.2	160.0	3.0	11.0	WD1701550
160.0	**172.0**	**8.2**	**165.0**	**3.0**	**11.0**	**WD1701600**
165.0	177.0	8.2	170.0	3.0	11.0	WD1701650
170.0	182.0	8.2	175.0	3.0	11.0	WD17 01700
180.0	**192.0**	**8.2**	**185.0**	**3.0**	**11.0**	**WD1701800**
185.0	197.0	8.2	190.0	3.0	11.0	WD1701850
190.0	202.0	8.2	195.0	3.0	11.0	WD1701900
195.0	207.0	8.2	200.0	3.0	11.0	WD1701950
200.0	**212.0**	**8.2**	**205.0**	**3.0**	**11.0**	**WD1702000**
205.0	220.0	9.5	212.0	3.0	13.0	WD1702050

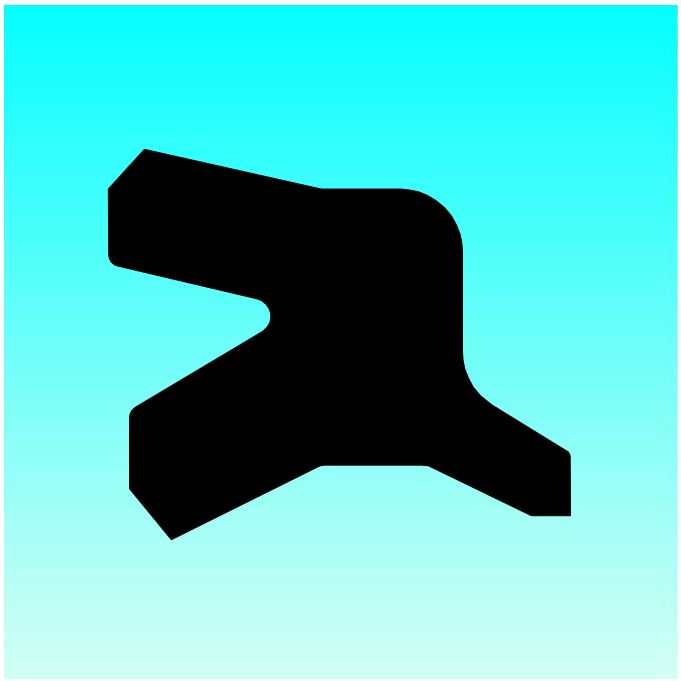
The rod diameters in bold type comply with the recommendations of ISO 3320.
Intermediate sizes above 125 mm diameter can also be supplied in impact vulcanised form.
Other dimensions on request. Up to 18 mm diameter we recommend a split groove.

Scraper DA 17

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**	
210.0	225.0	9.5	217.0	3.0	13.0	WD1702100
220.0	**235.0**	**9.5**	**227.0**	**3.0**	**13.0**	**WD1702200**
225.0	240.0	9.5	232.0	3.0	13.0	WD1702250
240.0	255.0	9.5	247.0	3.0	13.0	WD1702400
250.0	**265.0**	**9.5**	**257.0**	**3.0**	**13.0**	**WD1702500**
260.0	275.0	9.5	267.0	3.0	13.0	WD1702600
275.0	290.0	9.5	282.0	3.0	13.0	WD1702750
280.0	**295.0**	**9.5**	**287.0**	**3.0**	**13.0**	**WD1702800**
290.0	305.0	9.5	297.0	3.0	13.0	WD1702900
300.0	315.0	9.5	307.0	3.0	13.0	WD1703000
310.0	325.0	9.5	317.0	3.0	13.0	WD1703100
320.0	**335.0**	**9.5**	**327.0**	**3.0**	**13.0**	**WD1703200**
350.0	365.0	9.5	357.0	3.0	13.0	WD1703500
360.0	**375.0**	**9.5**	**367.0**	**3.0**	**13.0**	**WD1703600**
370.0	385.0	9.5	377.0	3.0	13.0	WD1703700
400.0	415.0	9.5	407.0	3.0	13.0	WD1704000
440.0	455.0	9.5	447.0	3.0	13.0	WD1704400

The rod diameters in bold type comply with the recommendations of ISO 3320.
Intermediate sizes above 125 mm diameter can also be supplied in impact vulcanised form.
Other dimensions on request. Up to 18 mm diameter we recommend a split groove.

ZURCON® SCRAPER DA22



- Double Acting -

- Material -

- Zurcon® Polyurethane -

Scraper DA 22

Description

The scraper is a double-acting polyurethane wiper for closed groove installation. Significant improvements are achieved regarding the profile geometry and material used if compared with conventional elastomeric scrapers.

The scraper lip is designed in a particular way that it reliably scrapes off the dirt but leaves a residual oil film on the rod, which is required for correct operation. The radial squeeze is sufficient to remove particles, dust and water.

The scraping lip facing inwards is designed in a way that it assumes a sealing function even under low pressure. The static seal is achieved by a tight radial fit between the scraper body and the groove.

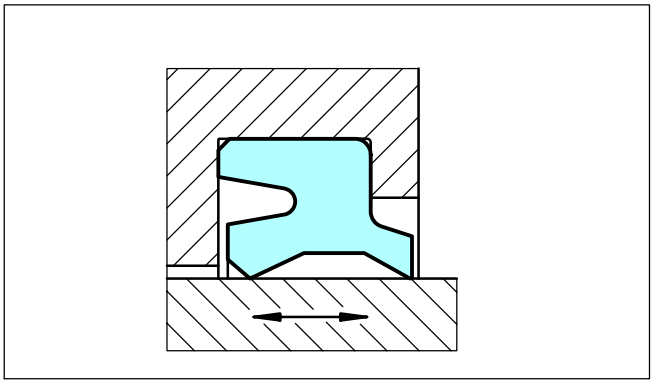


Figure 9 Scraper DA 22

Advantages

- Good scraping effect
- Wear resistant, long service life
- Retaining residual oil film
- Standard elements for standardized installation grooves.

Application Examples

Due to the outstanding wiping capacities, DA22 scraper is recommended wherever there are dusty and humid conditions and especially for the following applications:

- ISO standard cylinders
- Hydraulic industrial cylinders
- Agriculture machinery

Technical Data

Operating conditions

Pressure Scraper side:	Atmospheric pressure
Seal side:	Pressures up to 2 MPa (20 bar) a relief bore must be provided with higher pressures
Speed:	Up to 1 m/s
Temperature:	-35°C to +100°C
Media:	Mineral oils and greases
Groove type:	Closed

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 application:

Zurcon® Polyurethane:	92 Shore A
Material code:	Z201
Colour:	turquoise

Installation Recommendation

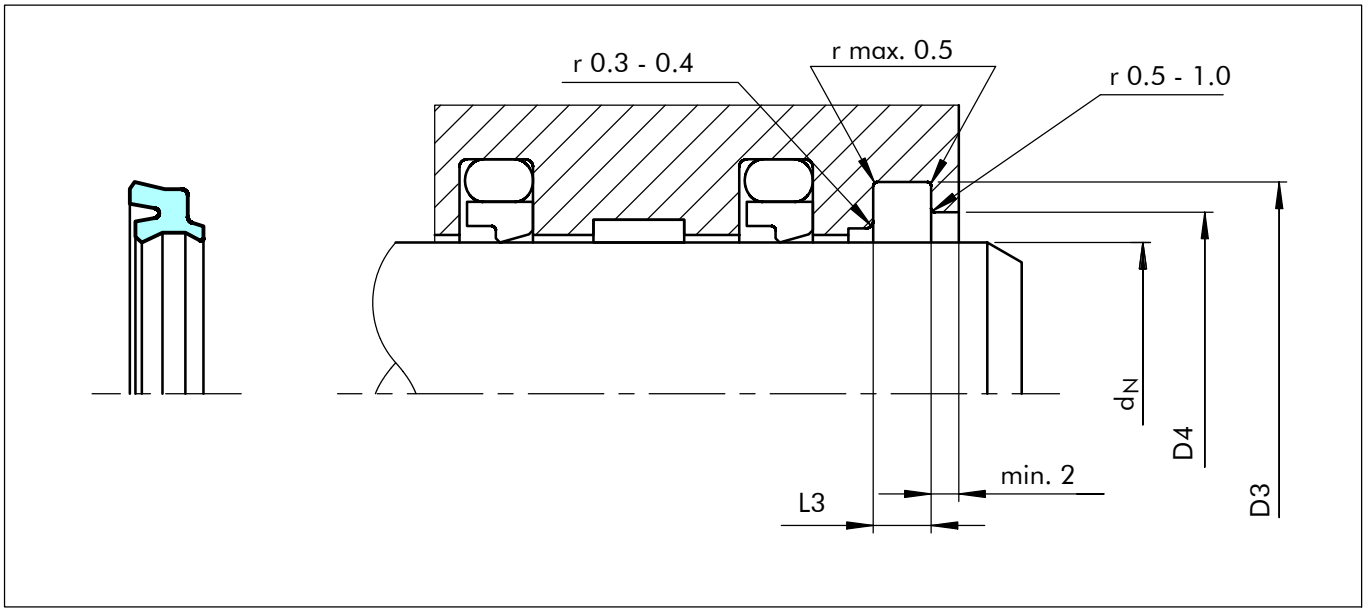


Figure 10 Installation drawing

Table XIII Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Part No.	Old Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 H11		
5.0	10.0	3.5	7.5	WD2200050	-
8.0	13.0	3.5	10.5	WD2200080	-
10.0	16.0	4.0	12.5	WD2200100	-
12.0	**18.0**	**4.0**	**14.5**	**WD2200120**	**-**
12.0	18.6	3.8	15.0	WD2210120	RSW12
14.0	**20.0**	**4.0**	**16.5**	**WD2200140**	**-**
14.0	20.6	3.8	17.0	WD2210140	RSW14
16.0	22.0	4.0	18.5	WD2200160	-
18.0	**24.0**	**4.0**	**20.5**	**WD2200180**	**-**
18.0	24.6	3.8	21.0	WD2210180	RSW18
20.0	26.0	4.0	22.5	WD2200200	-
20.0	28.6	5.3	23.0	WD2210200	RSW20
22.0	**28.0**	**4.0**	**24.5**	**WD2200220**	**-**
22.0	30.6	5.3	25.0	WD2210220	RSW22
24.0	32.6	5.3	27.0	WD2210240	RSW24
25.0	31.0	4.0	27.5	WD2200250	-
25.0	33.6	5.3	28.0	WD2210250	RSW25
28.0	**36.0**	**5.0**	**31.0**	**WD2200280**	**-**

The sizes in bold type comply with ISO 6195. installation groove Type C. Other sizes on request.
Up to 18 mm diameter we recommend a split groove.

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Part No.	Old Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 H11		
28.0	36.6	5.3	31.0	WD2210280	RSW28
30.0	38.0	5.0	33.0	WD2200300	-
30.0	38.6	5.3	33.0	WD2210300	RSW30
32.0	40.0	5.0	35.0	WD2200320	-
32.0	40.6	5.3	35.0	WD2210320	RSW32
35.0	43.0	5.0	38.0	WD2200350	-
35.0	43.6	5.3	38.0	WD2210350	RSW35
36.0	**44.0**	**5.0**	**39.0**	**WD2200360**	**-**
36.0	44.6	5.3	39.0	WD2210360	RSW36
40.0	48.0	5.0	43.0	WD2200400	-
40.0	48.6	5.3	43.0	WD2210400	RSW 40
45.0	**53.0**	**5.0**	**48.0**	**WD2200450**	**-**
45.0	53.6	5.3	48.0	WD2210450	RSW45
50.0	58.0	5.0	53.0	WD2200500	-
50.0	58.6	5.3	53.0	WD2210500	RSW 50
55.0	63.6	5.3	58.0	WD2210550	RSW 55
55.0	65.0	6.0	58.0	WD2200550	-
56.0	64.6	5.3	59.0	WD2210560	RSW 56
56.0	**66.0**	**6.0**	**59.0**	**WD2200560**	**-**
58.0	68.0	6.0	61.0	WD2200580	-
60.0	68.6	5.3	63.0	WD2210600	RSW 60
60.0	70.0	6.0	63.0	WD2200600	-
63.0	71.6	5.3	66.0	WD2210630	RSW 63
63.0	73.0	6.0	66.0	WD2200630	-
65.0	73.6	5.3	68.0	WD2210650	RSW 65
65.0	75.0	6.0	68.0	WD2200650	-
70.0	78.6	5.3	73.0	WD2210700	RSW 70
70.0	**80.0**	**6.0**	**73.0**	**WD2200700**	**-**
75.0	83.6	5.3	78.0	WD2210750	RSW 75
75.0	85.0	6.0	78.0	WD2200750	-
78.0	88.0	6.0	81.0	WD2200780	-
80.0	88.6	5.3	83.0	WD2210800	RSW 80
80.0	90.0	6.0	83.0	WD2200800	-
85.0	95.0	6.0	88.0	WD2200850	-
85.0	97.2	7.1	91.0	WD2210850	RSW 85
90.0	**100.0**	**6.0**	**93.0**	**WD2200900**	**-**

The sizes in bold type comply with ISO 6195. installation groove Type C.
Up to 18 mm diameter we recommend a split groove.

Other sizes on request.

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Part No.	Old Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 H11		
90.0	102.2	7.1	96.0	WD2210900	RSW 90
100.0	110.0	6.0	103.0	WD2201000	-
100.0	112.2	7.1	106.0	WD2211000	RSW 100
110.0	122.2	7.1	116.6	WD2211100	RSW 110
110.0	**125.0**	**8.5**	**114.0**	**WD2201100**	**-**
120.0	135.0	8.5	124.0	WD2201200	-
125.0	140.0	8.5	129.0	WD2201250	-
140.0	**155.0**	**8.5**	**144.0**	**WD2201400**	**-**
150.0	165.0	8.5	154.0	WD2201500	-
160.0	175.0	8.5	164.0	WD2201600	-
180.0	195.0	8.5	184.0	WD2201800	-

The sizes in bold type comply with ISO 6195. installation groove Type C.
Up to 18 mm diameter we recommend a split groove.

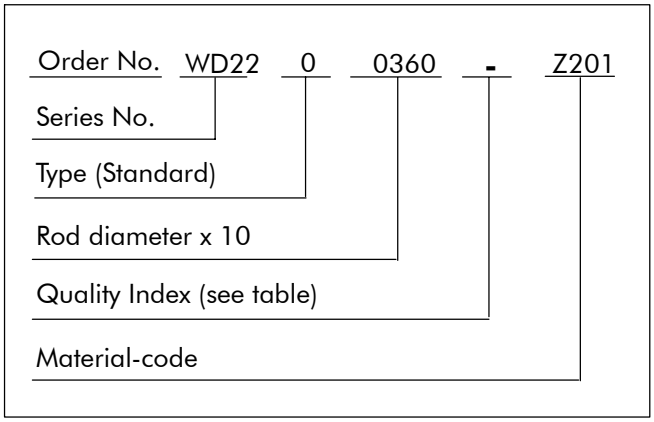
Other sizes on request.

Ordering Example

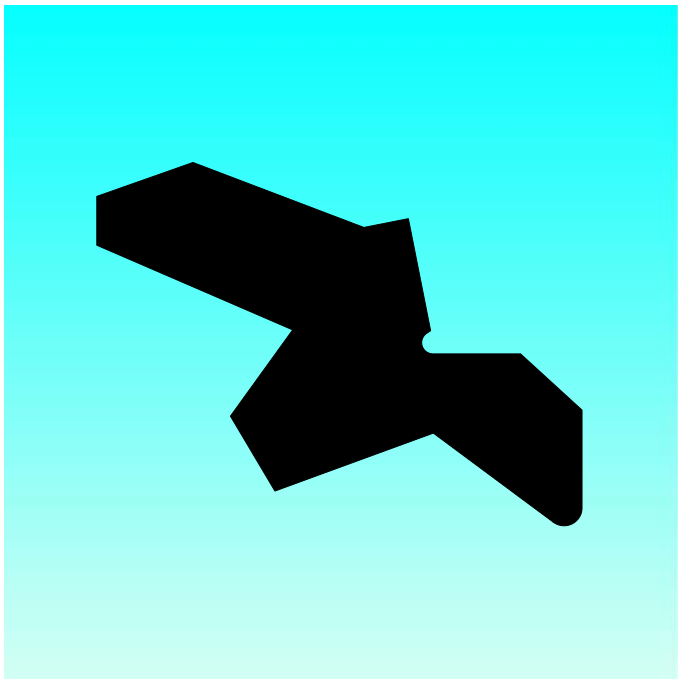
Rod diameter: d_N = 36 mm
Groove diameter: D3 = 44 mm (see example 1)

Example 1

Part number: WD2200360
Material Code: Z201
Old Ref. No.: Not available



ZURCON® SCRAPER DA 24



- Double-acting -

- Material -

- Zurcon® Polyurethane -

Scraper DA 24

Description

The scraper DA24 is a double-acting scraper of polyurethane for severe operating conditions and heavy attack of dirt.

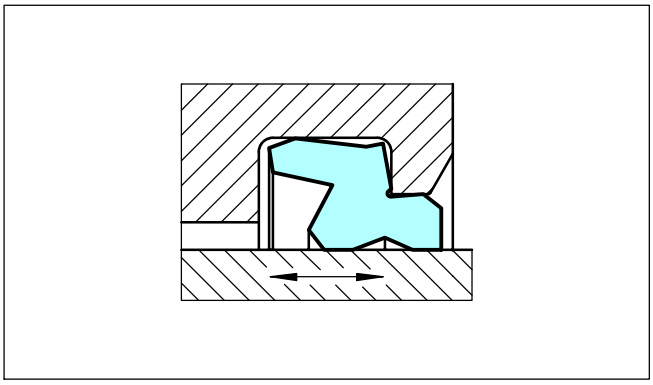


Figure 11 Scraper DA 24

The special design of the inward-facing sealing lip contributes to an optimum contact pressure resulting in a very high scraper effect of the residual oil film.

The outward-facing scraper lip leans against the housing. This ensures an optimum sealing force and further it prevents the penetration of dirt and water across the groove bottom. Also at heavy attacks of dirt and side steering of the piston rod the scraper effect remains stable. The material polyurethane ensures a high service life, also at heavy requirements, and it is proof against installation damage.

Advantages

- Very good scraper effect of the outward lip
- Very good sealing effect of the inward lip
- Reliable at side steering of the piston rod
- Sturdy and wear-resistant
- Simple installation

Application examples

The scraper DA 24 is especially suitable for application in:

- Construction machinery
- Agriculture- and forestry machinery
- Mobile hydraulic
- High attack of dirt
- Side steering of piston rod

Scraper DA24 is especially used in connection with our Rod Seals Turcon® Stepseal®, Zurcon® Rimseal.

Technical Data

Operating conditions:

Pressure:	max. 5 MPa
Speed:	up to 0.5 m/s at high strokes and higher speed, please contact your local Busak+Shamban company
Temperature:	-35°C to +100°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.

Material

The scraper DA24 consists of Zurcon® polyurethane material with high wearability, low deformation and high resistance to extrusion.

Standard:

Special Polyurethane:	Zurcon® Z201	92 Shore A
Colour:	turquoise	

Installation Recommendation

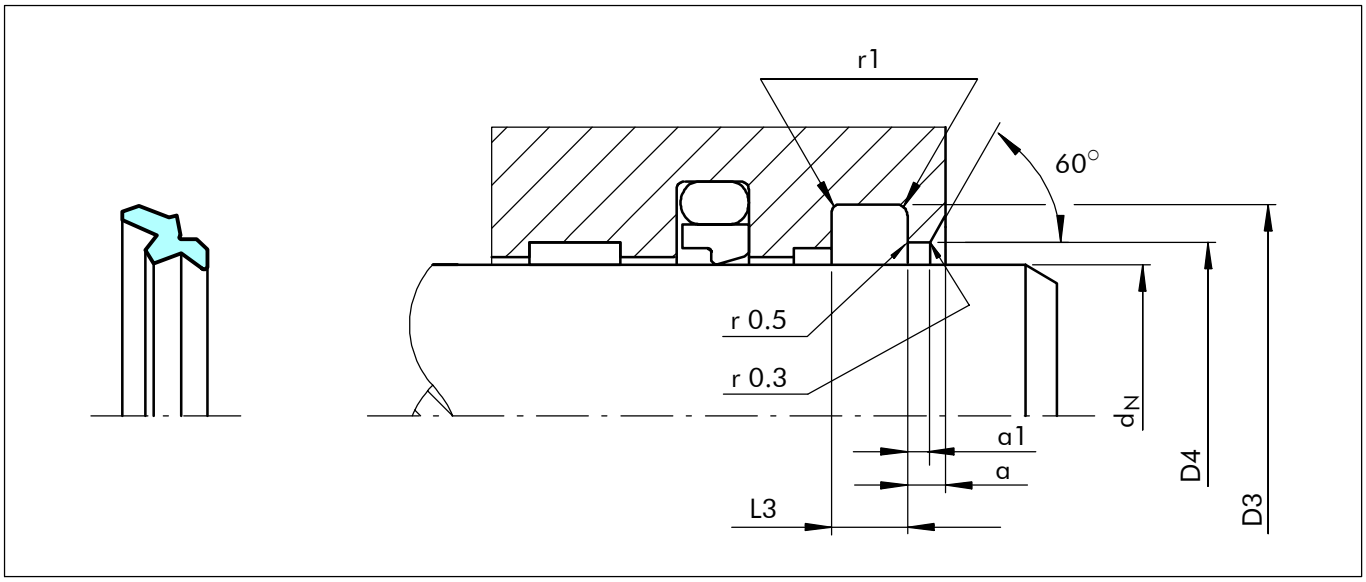


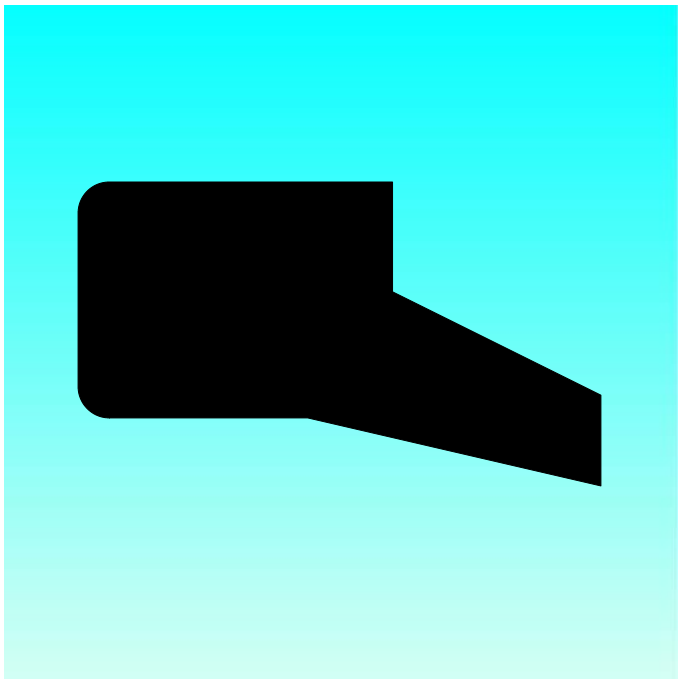
Figure 12 Installation drawing

Table XIV Installation Dimensions / Order Numbers

Rod Diameter	Groove Diameter	Groove Width	Radius	Bore Diameter	Step Width	Step Width	Order No.
d_N f8/h9	D_3 H9	L_3 +0.15	r1 max.	D_4 H9	a min.	a1 min.	
50.0	58.8	6.3	1.2	54.4	3.2	2.0	WD2400500-Z201
60.0	68.8	6.3	1.2	64.4	3.2	2.0	WD2400600-Z201
70.0	82.2	8.1	1.6	76.0	4.0	2.5	WD2400700-Z201
75.0	87.2	8.1	1.6	81.0	4.0	2.5	WD2400750-Z201
80.0	92.2	8.1	1.6	86.0	4.0	2.5	WD2400800-Z201
85.0	97.2	8.1	1.6	91.0	4.0	2.5	WD2400850-Z201
90.0	102.2	8.1	1.6	96.0	4.0	2.5	WD2400900-Z201
95.0	107.2	8.1	1.6	101.0	4.0	2.5	WD2400950-Z201
100.0	112.2	8.1	1.6	106.0	4.0	2.5	WD2401000-Z201
105.0	117.2	8.1	1.6	111.0	4.0	2.5	WD2401050-Z201
110.0	122.2	8.1	1.6	116.0	4.0	2.5	WD2401100-Z201
125.0	137.2	8.1	1.6	131.0	4.0	2.5	WD2401250-Z201
140.0	156.0	9.5	2.0	148.0	5.0	3.0	WD2401400-Z201
150.0	166.0	9.5	2.0	158.0	5.0	3.0	WD2401500-Z201
160.0	176.0	9.5	2.0	168.0	5.0	3.0	WD2401600-Z201
170.0	186.0	9.5	2.0	178.0	5.0	3.0	WD2401700-Z201
180.0	196.0	9.5	2.0	188.0	5.0	3.0	WD2401800-Z201
190.0	206.0	9.5	2.0	198.0	5.0	3.0	WD2401900-Z201
200.0	216.0	9.5	2.0	208.0	5.0	3.0	WD2402000-Z201
220.0	236.0	9.5	2.0	228.0	5.0	3.0	WD2402200-Z201
240.0	256.0	9.5	2.0	248.0	5.0	3.0	WD2402400-Z201
260.0	276.0	9.5	2.0	258.0	5.0	3.0	WD2402600-Z201
280.0	296.0	9.5	2.0	288.0	5.0	3.0	WD2402800-Z201

Other dimensions on request.

SCRAPER WRM



- Single Acting -

- Material -

- NBR Elastomer -

Scraper WRM

Description

Scraper rings are essential components of any hydraulic or pneumatic equipment.

These are protection components for axial moving rods: they ensure that foreign matter is not introduced into the system, avoiding costly wear and damage to all the internal components including seals.

WRM scrapers are manufactured in nitrile elastomer with precision machined wiper lip, which produces a very effective wiping action.

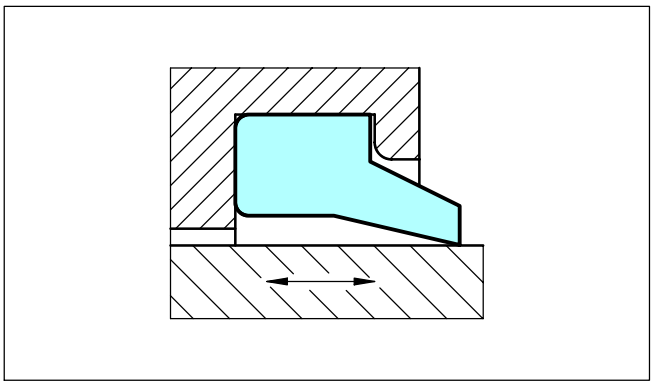


Figure 13 Scraper WRM

Advantages

- Space-saving construction
- Low cost, economical solution
- Simple, easy-construction groove
- Easy installation and removal without tools

Application Examples

Due to their outstanding wiping capacities WRM scrapers are recommended wherever there are dusty and humid conditions and especially for the following applications:

- Valve spindles
- Slide valves
- Hydraulic cylinders
- Agriculture machinery

Technical Data

Operating conditions

Speed:	Up to 1 m/s
Temperature:	-30° C to +110° C
Media:	Mineral oil based hydraulic fluids, polyglycol-water emulsions, water-oil emulsions
Groove type:	Closed

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 application:

Nitrile elastomer	NBR 90 Shore A
Material code:	N9T60
Polypac Ref. code:	2790

Ordering Example

Rod diameter:	d_N = 40 mm
Part number:	WAP0 0 0400
Material Code:	N9T60 (standard)
Polypac ref.:	WRM 157188

Order No. WAP0 0 0400 - N9T60

- WAP0 — Series No.
- 0 — Type (Standard)
- 0400 — Rod diameter x 10
- - — Quality Index
- N9T60 — Material code

Installation Recommendation

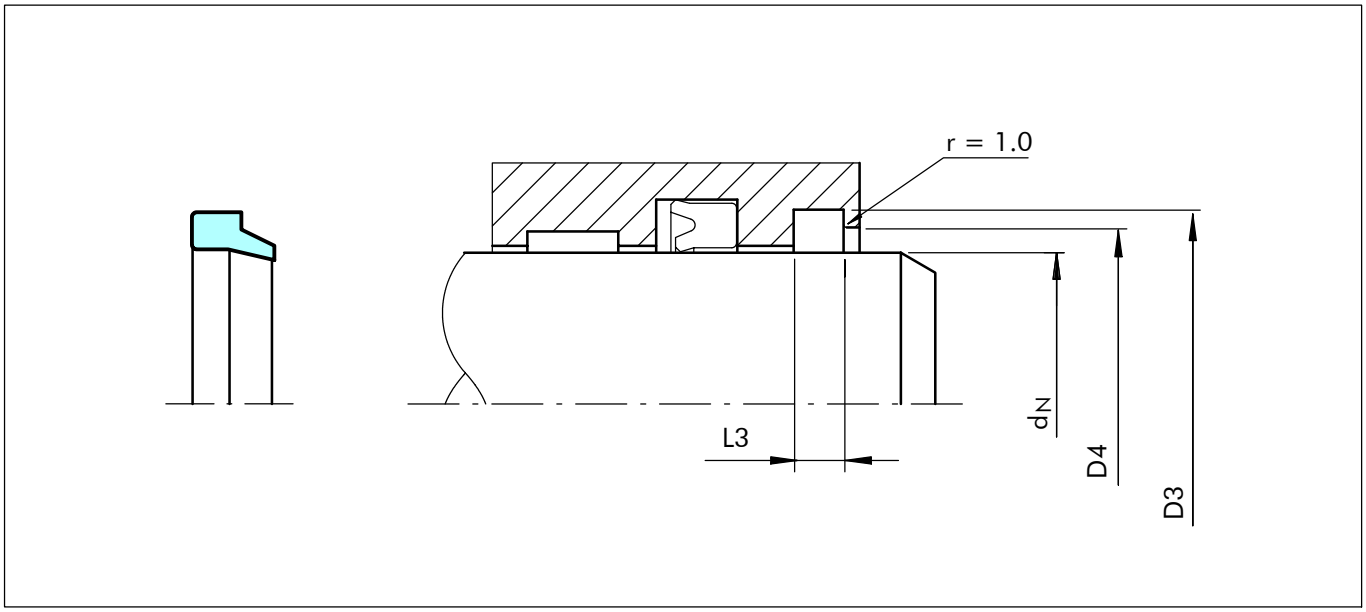


Figure 14 Installation drawing

Table XV Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Part No.	Polypac Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 +0.2		
12,0	18,6	3,8	15,0	WAP000120	WRM 047070
13,0	19,6	3,8	16,0	WAP000130	WRM 051074
14,0	20,6	3,8	17,0	WAP000140	WRM 055078
15,0	21,6	3,8	18,0	WAP000150	WRM 059082
16,0	22,6	3,8	19,0	WAP000160	WRM 062087
17,0	23,6	3,8	20,0	WAP000170	WRM 066094
18,0	24,6	3,8	21,0	WAP000180	WRM 070094
19,0	28,6	5,3	22,0	WAP000190	WRM 074110
20,0	28,6	5,3	23,0	WAP000200	WRM 078110
22,0	30,6	5,3	25,0	WAP000220	WRM 086118
24,0	32,6	5,3	27,0	WAP000240	WRM 094125
25,0	31,6	5,3	28,0	WAP100250	WRM 098122/S
25,0	33,6	5,3	28,0	WAP000250	WRM 098129
26,0	34,6	5,3	29,0	WAP000260	WRM 102133
27,0	35,6	5,3	30,0	WAP000270	WRM 106137
28,0	36,6	5,3	31,0	WAP000280	WRM 110141
30,0	38,6	5,3	33,0	WAP000300	WRM 118149
31,0	41,0	6,0	34,0	WAP000310	WRM 4544907
32,0	40,6	5,3	35,0	WAP000320	WRM 125157
33,0	41,6	5,3	36,0	WAP000330	WRM 129161
35,0	43,6	5,3	38,0	WAP000350	WRM 137169

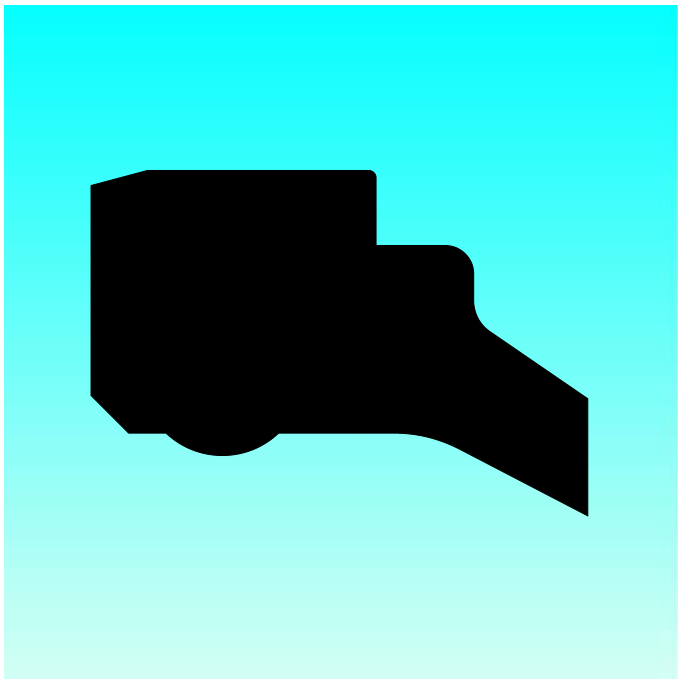
Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Part No.	Polypac Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 +0.2		
36,0	44,6	5,3	39,0	WAP000360	WRM 141173
38,0	46,6	5,3	41,0	WAP000380	WRM 149181
40,0	48,6	5,3	43,0	WAP000400	WRM 157188
42,0	50,6	5,3	45,0	WAP000420	WRM 165196
45,0	53,6	5,3	48,0	WAP000450	WRM 177208
45,0	55,6	5,3	49,0	WAP100450	WRM 177216
46,0	54,6	5,3	49,0	WAP000460	WRM 181212
48,0	56,6	5,3	51,0	WAP000480	WRM 188220
49,0	57,6	5,3	52,0	WAP000490	WRM 193225
50,0	58,6	5,3	53,0	WAP000500	WRM 196228
50,0*	60,6	5,3	54,0	WAP100500	WRM 196236
50,8	60,9	5,8	55,5	WAP000508	WRM 200237
53,0*	61,6	5,3	56,0	WAP000530	WRM 208240
55,0*	63,6	5,3	58,0	WAP000550	WRM 216248
55,0	65,6	5,3	59,0	WAP100550	WRM 216255
56,0	64,6	5,3	59,0	WAP000560	WRM 220251
56,0*	66,6	5,3	60,0	WAP100560	WRM 220259
60,0	66,6	5,3	63,0	WAP200600	WRM 236259
60,0	68,6	5,3	63,0	WAP000600	WRM 236267
63,0*	71,6	5,3	66,0	WAP000630	WRM 248279
63,0	73,6	5,3	67,0	WAP100630	WRM 248287
65,0	73,6	5,3	68,0	WAP000650	WRM 255287
65,0	75,6	5,3	69,0	WAP100650	WRM 255295
70,0*	76,0	4,3	72,0	WAP000700	WRM 275299
70,0	78,6	5,3	73,0	WAP100700	WRM 275307
70,0	80,6	5,3	72,0	WAP200700	WRM 275314
70,0	82,6	7,1	76,0	WAP300700	WRM 275322
72,0	80,6	5,3	75,0	WAP000720	WRM 283317
73,0	81,6	5,3	76,0	WAP000730	WRM 287318
75,0	83,6	5,3	78,0	WAP000750	WRM 295326
75,0	87,2	7,1	81,0	WAP100750	WRM 295345
76,5	88,7	7,1	82,5	WAP000765	WRM 301348
78,0	92,2	7,1	85,0	WAP000780	WRM 307362
80,0	88,6	5,3	83,0	WAP000800	WRM 314346
80,0	92,6	7,1	86,0	WAP100800	WRM 314362
83,0	91,6	5,3	86,0	WAP000830	WRM 326358
84,0	92,0	5,3	87,0	WAP000840	WRM 330362
85,0	93,6	5,3	88,0	WAP000850	WRM 334366
85,0	97,2	7,1	91,0	WAP100850	WRM 334381
88,0	100,2	7,1	94,0	WAP000880	WRM 346393
90,0	102,2	7,1	96,0	WAP000900	WRM 354401
95,0	107,2	7,1	101,0	WAP000950	WRM 374421
97,0	111,0	7,1	104,0	WAP000970	WRM 380437
100,0	112,2	7,1	106,0	WAP001000	WRM 393440
101,0	111,0	5,3	105,0	WAP001010	WRM 397437

* Available upon request

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Part No.	Polypac Ref. No.
d_N f8/h9	D_3 +H9	L_3 +0.1	D_4 +0.2		
103,0	115,2	7,1	109,0	WAP001030	WRM 405452
104,0	116,2	7,1	110,0	WAP001040	WRM 409457
105,0	117,2	7,1	111,0	WAP001050	WRM 413460
110,0	122,2	7,1	116,0	WAP001100	WRM 433480
115,0	127,2	7,1	121,0	WAP001150	WRM 452500
116,0	128,2	7,1	121,0	WAP001160	WRM 456504
116,0	130,2	7,1	123,0	WAP101160	WRM 456511
118,0*	130,2	7,1	124,0	WAP001180	WRM 464511
120,0	128,6	5,3	123,0	WAP001200	WRM 472504
120,0	132,2	7,1	126,0	WAP101200	WRM 472519
121,0*	131,0	5,3	125,0	WAP001210	WRM 476515
125,0	137,2	7,1	131,0	WAP001250	WRM 492539
127,0	135,6	5,3	132,0	WAP001270	WRM 500531
127,0	139,2	7,1	133,0	WAP101270	WRM 500550
130,0	142,2	7,1	136,0	WAP001300	WRM 511559
135,0	147,2	7,1	141,0	WAP001350	WRM 531578
135,0	149,2	7,1	142,0	WAP101350	WRM 531582
140,0	152,2	7,1	146,0	WAP001400	WRM 551598
140,0	155,2	10,1	147,0	WAP101400	WRM 551610
145,0	157,2	7,1	151,0	WAP001450	WRM 570618
146,0*	158,0	6,3	152,0	WAP001460	WRM 575622/1
146,05	158,25	7,1	152,05	WAP001461	WRM 575622
150,0*	162,2	7,1	156,0	WAP001500	WRM 590637
155,0	169,2	7,1	162,0	WAP001550	WRM 610664
160,0	168,6	5,3	163,0	WAP001600	WRM 629661
160,0	175,2	10,1	168,0	WAP101600	WRM 629688
165,0	173,6	5,3	168,0	WAP001650	WRM 649681
165,0	177,2	7,1	171,0	WAP101650	WRM 649698
170,0	180,6	5,3	174,0	WAP001700	WRM 669708
170,0	185,2	10,1	178,0	WAP101700	WRM 669728
171,0	183,0	6,3	176,0	WAP001710	WRM 673720
175,0	189,2	7,1	182,0	WAP001750	WRM 688744
180,0	195,2	10,1	188,0	WAP001800	WRM 708767
187,0*	195,6	5,3	190,0	WAP001870	WRM 736768
196,0	210,2	7,1	203,0	WAP001960	WRM 771826
197,0	219,0	6,3	202,0	WAP001970	WRM 775823
200,0	215,2	10,1	207,0	WAP002000	WRM 787847
210,0	224,2	7,1	217,0	WAP002100	WRM 826883
210,0	225,0	7,0	217,0	WAP102100	WRM 826885
219,5	233,7	7,1	226,5	WAP002195	WRM 860919
223,0	235,0	6,3	228,0	WAP002230	WRM 878925
244,5	258,7	7,1	251,5	WAP002445	WRM 9621017
249,0	261,0	6,3	254,0	WAP002490	WRM 9801027
260,0	275,2	10,1	268,0	WAP002600	WRM 10241078

* Available upon request

ZURCON® SCRAPER ASW



- Single Acting -

- Material -

- Zurcon® Polyurethane -

Scraper ASW

Description

The scraper ASW is a single-acting polyurethane scraper.

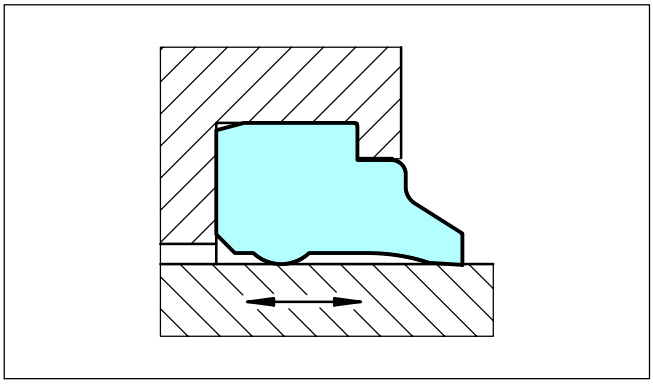


Figure 15 Scraper ASW

The special feature of this scraper is an additional supporting bead on the inner surface. It prevents tilting or twisting of the scraper in the groove. At the same time this support improves the firm seating in the groove, thus preventing the penetration of impurities via the back of the scraper. This represents a technical improvement compared with similar scraper types.

Advantages

- Simple groove design
- Very good scraping effect, wear resistant
- No tilting or twisting in the groove
- Simple installation
- Flush fitting with the outer surface

Technical Data

Speed:	Up to 1 m/s
Temperature:	-35°C to +100°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.

Material

The standard material is a wear resistant Zurcon® polyurethane.

Standard material:	Polyurethane, 92 Shore A Material No. Z201
Colour:	turquoise

Ordering Example

Scraper ASW

Rod diameter:	d_N = 50.0 mm
Part No.:	WSW000500 (from Table XVI)
Material:	Z201

Order No.	WSW0	0	0500	-	Z201
	Series No.				
		Type (Standard)			
			Rod diameter x 10		
				Quality Index	
					Material code

Installation Recommendation

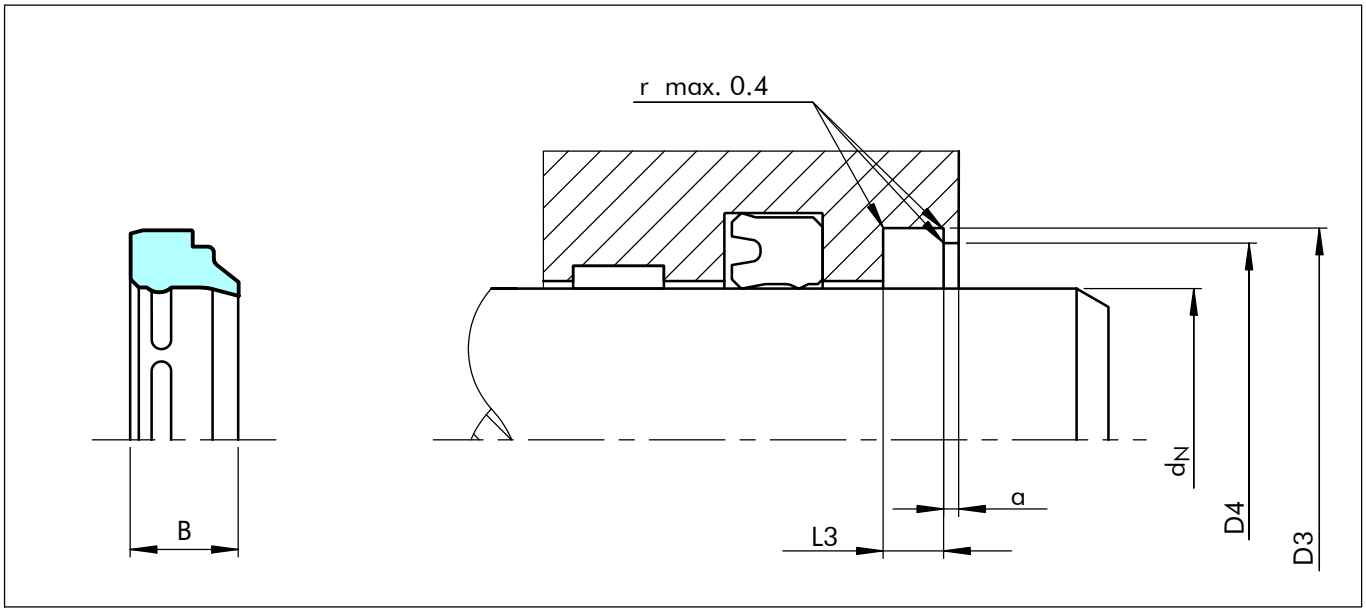


Figure 16 Installation drawing

Table XVI Installation Dimensions / Part Numbers

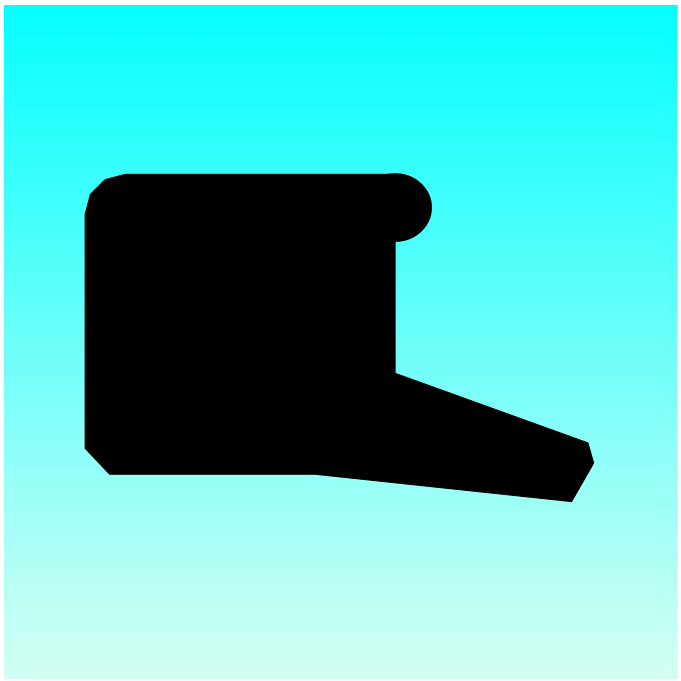
Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	Part No.
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	a min.	B	
6.0	**10.0**	**2.0**	**9.0**	**1.0**	**4.0**	**WSW000060**
8.0	**14.0**	**2.6**	**12.0**	**1.0**	**5.0**	**WSW000080**
10.0	**16.0**	**2.6**	**14.0**	**1.0**	**5.0**	**WSW000100**
10.0	**18.0**	**4.0**	**16.0**	**1.0**	**7.0**	**WSW100100**
12.0	**18.0**	**2.6**	**16.0**	**1.0**	**5.0**	**WSW000120**
12.0	**20.0**	**4.0**	**18.0**	**1.0**	**7.0**	**WSW100120**
14.0	**20.0**	**2.6**	**18.0**	**1.0**	**5.0**	**WSW000140**
14.0	**22.0**	**4.0**	**20.0**	**1.0**	**7.0**	**WSW100140**
15.0	23.0	4.0	21.0	1.0	7.0	WSW000150
16.0	**24.0**	**4.0**	**22.0**	**1.0**	**7.0**	**WSW000160**
18.0	**26.0**	**4.0**	**24.0**	**1.0**	**7.0**	**WSW000180**
20.0	**26.0**	**2.6**	**24.0**	**1.0**	**5.0**	**WSW100200**
20.0	**28.0**	**4.0**	**26.0**	**1.0**	**7.0**	**WSW000200**
22.0	**30.0**	**4.0**	**28.0**	**1.0**	**7.0**	**WSW000220**
24.0	32.0	4.0	30.0	1.0	7.0	WSW000240
25.0	**31.0**	**2.6**	**29.0**	**1.0**	**5.0**	**WSW100250**
25.0	**33.0**	**4.0**	**31.0**	**1.0**	**7.0**	**WSW000250**
28.0	**36.0**	**4.0**	**34.0**	**1.0**	**7.0**	**WSW000280**

The rod diameters in bold type comply with the recommendations of ISO 3320.
Other dimensions on request. A split groove is required up to 14 mm diameter.

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	
30.0	36.0	2.6	34.0	1.0	5.0	WSW100300
30.0	38.0	4.0	36.0	1.0	7.0	WSW000300
32.0	**40.0**	**4.0**	**38.0**	**1.0**	**7.0**	**WSW000320**
34.0	42.0	4.0	40.0	1.0	7.0	WSW000340
35.0	43.0	4.0	41.0	1.0	7.0	WSW000350
36.0	**44.0**	**4.0**	**42.0**	**1.0**	**7.0**	**WSW000360**
38.0	46.0	4.0	44.0	1.0	7.0	WSW000380
40.0	**48.0**	**4.0**	**46.0**	**1.0**	**7.0**	**WSW000400**
42.0	50.0	4.0	48.0	1.0	7.0	WSW000420
45.0	**53.0**	**4.0**	**51.0**	**1.0**	**7.0**	**WSW000450**
50.0	**58.0**	**4.0**	**56.0**	**1.0**	**7.0**	**WSW000500**
52.0	60.0	4.0	58.0	1.0	7.0	WSW000520
55.0	63.0	4.0	61.0	1.0	7.0	WSW000550
56.0	**64.0**	**4.0**	**62.0**	**1.0**	**7.0**	**WSW000560**
60.0	68.0	4.0	66.0	1.0	7.0	WSW000600
63.0	**71.0**	**4.0**	**69.0**	**1.0**	**7.0**	**WSW000630**
65.0	73.0	4.0	71.0	1.0	7.0	WSW000650
70.0	**78.0**	**4.0**	**76.0**	**1.0**	**7.0**	**WSW000700**
75.0	83.0	4.0	81.0	1.0	7.0	WSW000750
80.0	**88.0**	**4.0**	**86.0**	**1.0**	**7.0**	**WSW000800**
85.0	93.0	4.0	91.0	1.0	7.0	WSW000850
90.0	**98.0**	**4.0**	**96.0**	**1.0**	**7.0**	**WSW000900**
100.0	**108.0**	**4.0**	**106.0**	**1.0**	**7.0**	**WSW001000**
105.0	113.0	4.0	111.0	1.0	7.0	WSW001050
110.0	**122.0**	**5.5**	**119.0**	**1.5**	**10.0**	**WSW001100**
120.0	132.0	5.5	129.0	1.5	10.0	WSW001200
125.0	**137.0**	**5.5**	**134.0**	**1.5**	**10.0**	**WSW001250**
140.0	**152.0**	**5.5**	**149.0**	**1.5**	**10.0**	**WSW001400**
150.0	162.0	5.5	159.0	1.5	10.0	WSW001500
160.0	**172.0**	**5.5**	**169.0**	**1.5**	**10.0**	**WSW001600**
180.0	**192.0**	**5.5**	**189.0**	**1.5**	**10.0**	**WSW001800**

The rod diameters in bold type comply with the recommendations of ISO 3320.
Other dimensions on request. A split groove is required up to 14 mm diameter.

SCRAPER PW



- Single Acting -

- Dynamic + Static Sealing Lip -

- Material -

- Polyurethane -

Scraper PW

Description

These scrapers are manufactured in polyurethane. The static sealing lip ensures against the intrusion of dirt and fluids over the outer diameter.

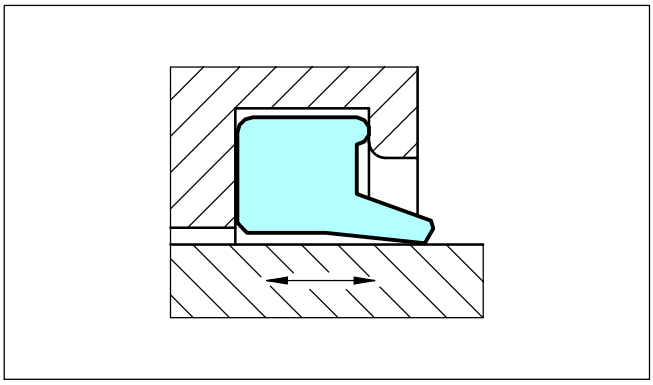


Figure 17 Scraper PW

The scraper PW has no interference at the outside diameter and can have a radial movement due rod deviations.

Advantages

- High wear resistance
- Good prevention against external fluid intrusion
- Compensation of radial rod excursion
- Easy installation
- Space-saving construction

Application Examples

These scrapers are recommended wherever there are dusty and humid conditions and especially for the following applications:

- Mobile hydraulic machinery
- Agriculture machinery

Technical Data

Operating conditions

Speed:	Up to 1 m/s
Temperature:	-35° C to +80° C
Media:	Mineral oil based hydraulic fluids
Groove type:	Closed

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

Polyurethane:	92 Shore A
Material code:	WU9L3
Colour:	blue

Ordering Example

Rod diameter:	d_N = 45 mm
Groove diameter:	D3 = 53.6 mm
Part number:	WNP000450
Material code:	WU9L3
Sealing Parts Ref.:	PW 45

Order No.	WNP	0	0450	-	WU9L3
	Series No.				
		Type (Standard)			
			Rod diameter x 10		
				Quality Index	
					Material code

For new constructions please use the scrapers type WNE and WNV.

Installation Recommendation (For new applications use scraper type WNE)

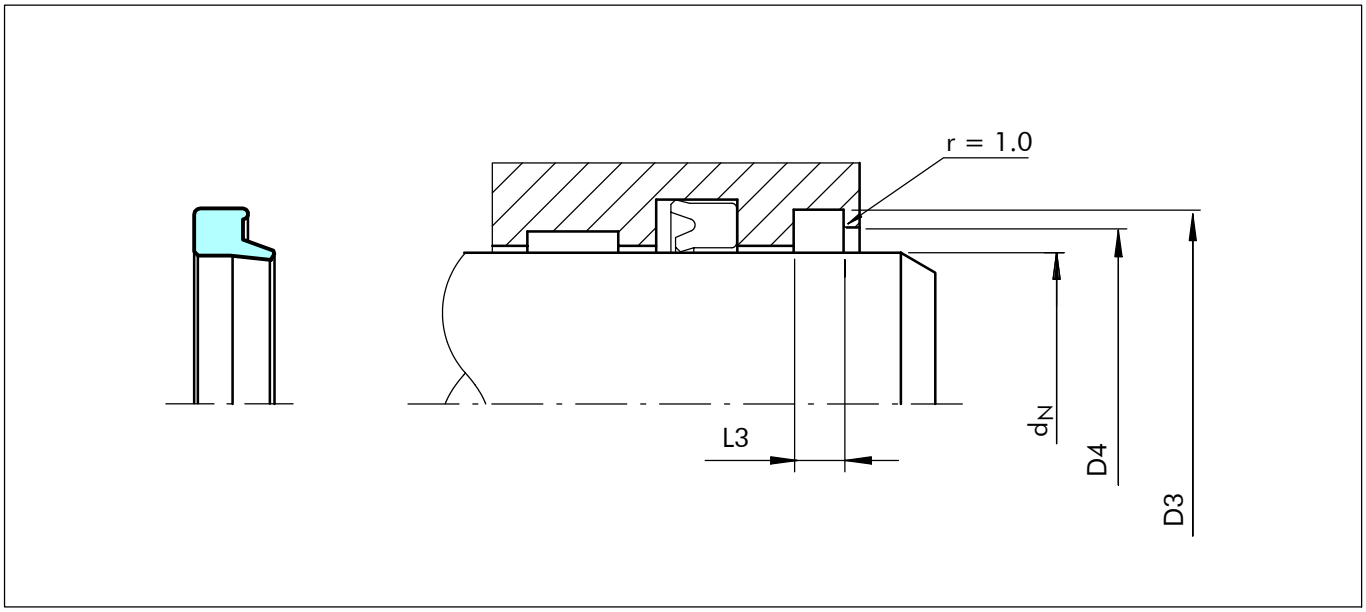


Figure 18 Installation drawing

Table XVII Installation Dimensions / Part Numbers

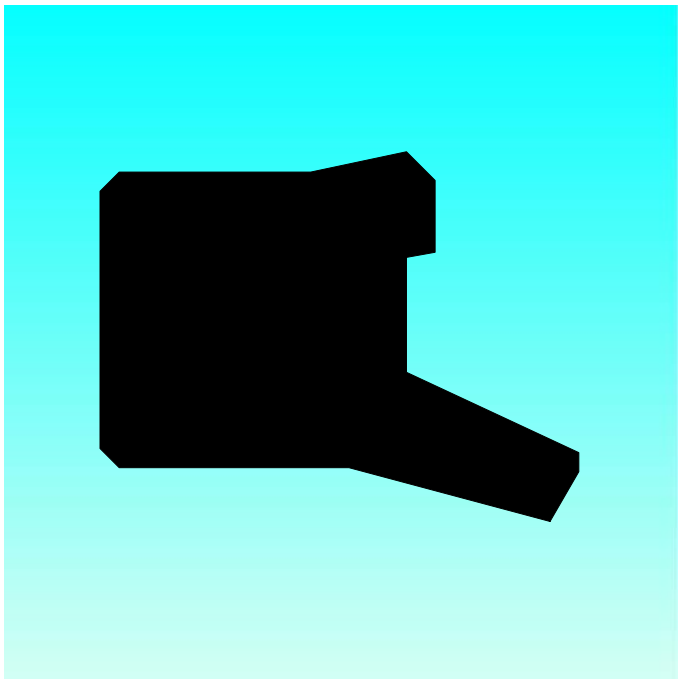
Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Sealing Parts Ref. No.	Part No.
d_N h9	D_3 H9	L_3 +0.1	D_4 +0.2		
4.0	12.0	3.0	9.0	PW 4	WNP100040
5.0	12.0	2.8	9.0	PW 5/S	WNP100050
6.0	12.0	3.0	9.0	PW 6/S	WNP100060
8.0	14.6	3.8	11.0	PW 8	WNP000080
9.0	13.0	2.5	12.0	PW 9/S	WNP100090
10.0	15.0	1.0	13.0	PW 10/S	WNP100100
10.0	16.6	3.8	13.0	PW 10	WNP000100
12.0	18.6	3.8	15.0	PW 12	WNP000120
14.0	20.6	3.8	17.0	PW 14	WNP000140
15.0	21.6	3.8	18.0	PW 15	WNP000150
15.0	27.0	5.0	24.0	PW 15/S	WNP100150
16.0	22.5	3.0	19.0	PW 16/1	WNP100160
16.0	22.6	3.8	19.0	PW 16	WNP000160
18.0	24.6	3.8	21.0	PW 18	WNP000180
20.0	26.0	3.4	23.0	PW 20/1	WNP100200
20.0	28.6	5.3	23.0	PW 20	WNP000200
20.0	30.0	5.4	27.0	PW 20/S	WNP200200
22.0	30.6	2.2	25.0	PW 22/1B	WNP100220
22.0	30.6	5.3	25.0	PW 22	WNP000220
24.0	32.6	2.2	27.0	PW 24/1B	WNP100240
24.0	32.6	5.3	27.0	PW 24	WNP000240

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Sealing Parts Ref. No.	Part No.
d_N h9	D_3 H9	L_3 +0.1	D_4 +0.2		
25.0	33.6	5.3	28.0	PW 25	WNP000250
28.0	36.6	5.3	31.0	PW 28	WNP000280
30.0	38.6	5.3	33.0	PW 30	WNP100300
30.0	40.0	3.0	34.5	PW 30/1B	WNP200300
32.0	40.0	3.7	35.0	PW 32/1 B	WNP100320
32.0	40.6	5.3	35.0	PW 32	WNP000320
35.0	40.0	3.7	37.0	PW 35/2B	WNP400350
35.0	43.6	5.0	38.0	PW 35/1	WNP200350
35.0	43.6	5.3	38.0	PW 35	WNP100350
35.0	45.0	4.0	39.0	PW 35/1B	WNP300350
36.0	44.6	5.3	39.0	PW 36	WNP000360
38.0	46.6	5.3	41.0	PW 38	WNP000380
38.0	48.5	4.8	41.0	PW 38/1	WNP100380
40.0	48.6	5.3	43.0	PW 40	WNP000400
42.0	50.6	5.3	45.0	PW 42	WNP100420
45.0	53.6	5.3	48.0	PW 45	WNP000450
45.0	55.6	5.3	48.0	PW 45/1	WNP100450
45.0	60.0	4.2	53.0	PW 45/1B	WNP200450
46.0	54.6	5.3	49.0	PW 46	WNP000460
50.0	58.6	5.3	53.0	PW 50	WNP100500
50.0	60.6	5.3	53.0	PW 50/1	WNP200500
50.0	65.5	4.2	58.0	PW 50/1B	WNP300500
53.0	61.6	5.3	56.0	PW 53	WNP100530
55.0	63.6	5.3	58.0	PW 55	WNP000550
55.0	65.6	5.3	58.0	PW 55/1	WNP100550
56.0	64.6	5.3	59.0	PW 56	WNP000560
56.0	66.6	5.3	59.0	PW 56/1	WNP100560
60.0	68.6	5.3	63.0	PW 60	WNP100600
60.0	70.6	5.5	66.5	PW 60/S	WNP200600
63.0	71.6	5.3	66.0	PW 63	WNP000630
65.0	73.6	5.3	68.0	PW 65	WNP000650
65.0	76.6	6.0	71.5	PW 65/1	WNP100650
67.0	76.6	5.5	71.0	PW 67/S	WNP100670
70.0	78.6	5.3	73.0	PW 70	WNP100700
70.0	80.0	5.0	74.0	PW 70/2	WNP000700
70.0	80.0	7.0	74.0	PW 70/3	WNP300700
70.0	82.6	7.1	76.0	PW 70/1	WNP200700
73.0	81.6	5.3	76.0	PW 73	WNP000730
73.0	83.6	7.3	76.0	PW 73/1	WNP100730
75.0	83.6	5.3	78.0	PW 75	WNP000750
75.0	87.2	7.1	81.0	PW 75/1	WNP100750
78.0	86.0	5.0	81.0	PW 78/2	WNP200780
78.0	88.6	5.5	84.5	PW 78/S	WNP100780
78.0	92.2	7.1	85.0	PW 78	WNP000780
80.0	88.6	5.3	83.0	PW 80	WNP000800

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Sealing Parts Ref. No.	Part No.
d_N h9	D_3 H9	L_3 +0.1	D_4 +0.2		
80.0	92.6	7.1	86.0	PW 80/1	WNP100800
85.0	93.6	5.3	88.0	PW 85/1	WNP100850
85.0	97.2	7.1	91.0	PW 85	WNP000850
90.0	100.0	7.0	94.0	PW 90/2	WNP200900
90.0	102.0	6.0	94.0	PW 90/1	WNP100900
90.0	102.2	7.1	96.0	PW 90	WNP000900
92.0	103.6	5.5	97.0	PW 92/S	WNP100920
93.0	101.0	5.0	96.0	PW 93/1	WNP000930
93.0	123.0	5.0	115.0	PW 93/S	WNP200930
95.0	105.0	10.0	99.0	PW 95/1	WNP100950
95.0	107.2	7.1	101.0	PW 95	WNP000950
97.0	105.0	5.0	100.0	PW 97/2	WNP100970
99.0	109.6	5.5	105.5	PW 99/S	WNP000990
100.0	112.2	6.0	104.0	PW 100/1	WNP201000
100.0	112.2	7.1	106.0	PW 100	WNP101000
110.0	122.2	7.1	116.0	PW 110	WNP101100
112.0	124.2	7.1	118.0	PW 112	WNP101120
115.0	127.0	10.0	121.0	PW 115/1	WNP101150
115.0	127.2	7.1	121.0	PW 115	WNP001150
118.0	126.0	5.0	121.0	PW 118/2	WNP101180
120.0	130.6	5.5	126.5	PW 120/S	WNP201200
120.0	132.2	7.1	126.0	PW 120	WNP101200
125.0	137.2	7.1	131.0	PW 125	WNP001250
128.0	140.2	7.1	134.0	PW 128	WNP101280
130.0	142.2	7.1	136.0	PW 130	WNP101300
135.0	147.2	7.1	141.0	PW 135	WNP001350
140.0	148.6	6.0	143.0	PW 140/2	WNP201400
140.0	152.2	7.1	146.0	PW 140	WNP001400
140.0	155.0	9.0	147.0	PW 140/1	WNP101400
141.0	151.6	5.5	147.5	PW 141/S	WNP001410
143.0	151.0	5.5	146.0	PW 143/2	WNP101430
145.0	157.2	7.1	151.0	PW 145	WNP001450
145.0	160.0	8.0	152.0	PW 145/1	WNP101450
148.0	160.0	7.0	152.0	PW 148/1	WNP101480
150.0	162.2	7.1	156.0	PW 150	WNP001500
150.0	165.0	7.5	156.0	PW 150/1	WNP101500
160.0	172.2	7.1	166.0	PW 160/1	WNP001600
160.0	175.2	10.1	168.0	PW 160	WNP101600
162.0	172.6	5.5	168.0	PW 162/S	WNP101620
163.0	175.2	7.1	169.0	PW 163	WNP101630
170.0	178.6	5.3	173.0	PW 170/1B	WNP101700
170.0	185.2	10.1	178.0	PW 170	WNP001700
180.0	195.2	10.1	188.0	PW 180	WNP001800
180.0	200.0	7.0	188.0	PW 180/1	WNP101800
183.0	193.6	5.5	189.0	PW 183/S	WNP101830

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Sealing Parts Ref. No.	Part No.
d_N h9	D_3 H9	L_3 +0.1	D_4 +0.2		
188.0	200.2	7.1	194.0	PW 188	WNP101880
190.0	205.2	10.1	198.0	PW 190	WNP001900
190.0	210.0	10.1	200.0	PW 190/1	WNP101900
200.0	215.2	10.1	208.0	PW 200	WNP002000
210.0	225.2	10.1	218.0	PW 210	WNP102100
220.0	235.2	10.1	228.0	PW 220	WNP002200
220.0	240.0	10.1	228.0	PW 220/1	WNP102200
230.0	245.2	10.1	238.0	PW 230	WNP102300
240.0	255.2	10.1	248.0	PW 240	WNP102400
250.0	265.2	10.1	258.0	PW 250	WNP102500
257.0	267.6	5.5	264.0	PW 257/S	WNP102570
280.0	300.0	10.2	290.0	PW 280/1	WNP102800

ZURCON® SCRAPER WNE



- Single Acting -

- Dynamic + Static Sealing Lip -

- Material -

- Zurcon® Polyurethane -

Scraper WNE

Description

These scrapers are manufactured in polyurethane. The static sealing lip ensures against the intrusion of dirt and fluids over the outer diameter.

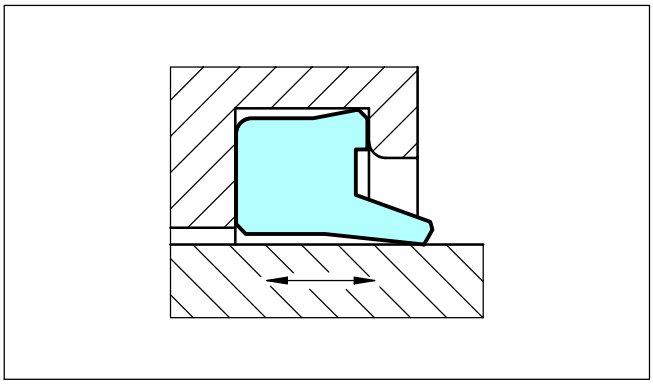


Figure 19 Scraper WNE

The scraper WNE has an interference to the groove outside diameter.

Advantages

- High wear resistance
- Good prevention against external fluid intrusion
- Easy installation
- Space-saving construction

Application Examples

These scrapers are recommended wherever there are dusty and humid conditions and especially for the following applications:

- Mobile hydraulic machinery
- Agriculture machinery

Technical Data

Operating conditions

Speed:	Up to 1 m/s
Temperature:	-35° C to +100° C
Media:	Mineral oil based hydraulic fluids
Groove type:	Closed

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

Zurcon® Polyurethane:	92 Shore A
Material code:	Z201
Colour:	turquoise

Ordering Example

For WNE scrapers

Rod diameter:	d_N = 45 mm
Groove diameter:	D3 = 53.6 mm
Part number:	WNE000450
Material code:	Z201

Order No.	WNE	0	0450	-	Z201
	Series No.				
		Type (Standard)			
			Rod diameter x 10		
				Quality Index	
					Material code

Installation Recommendation

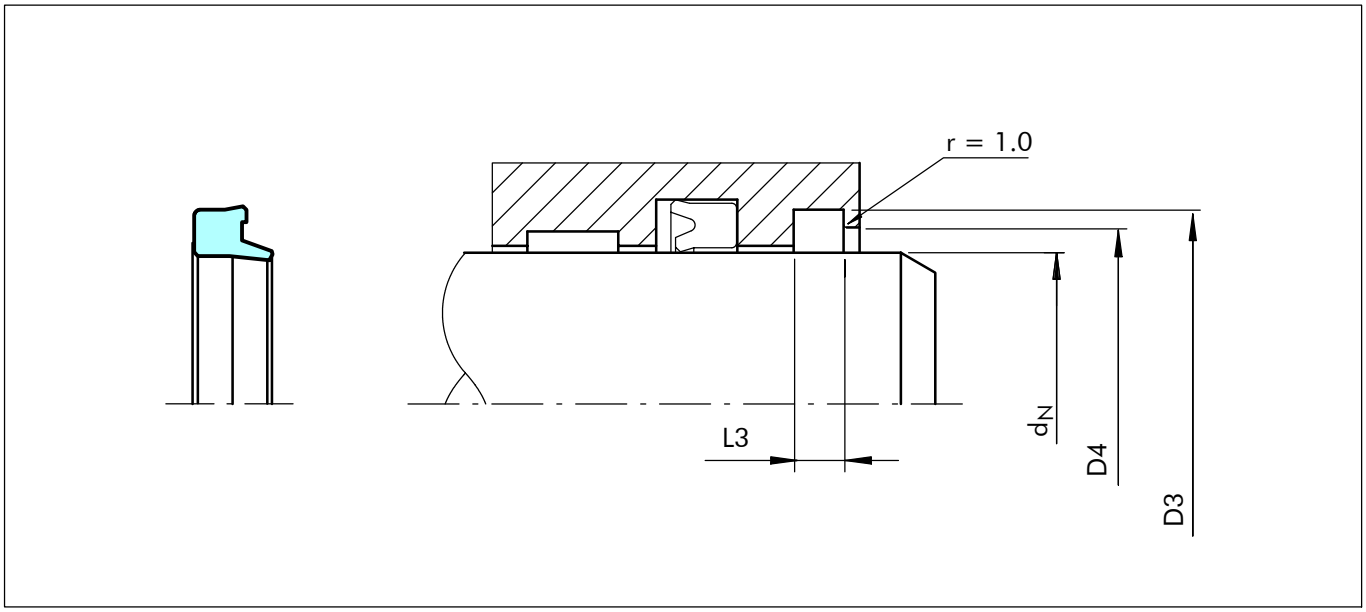


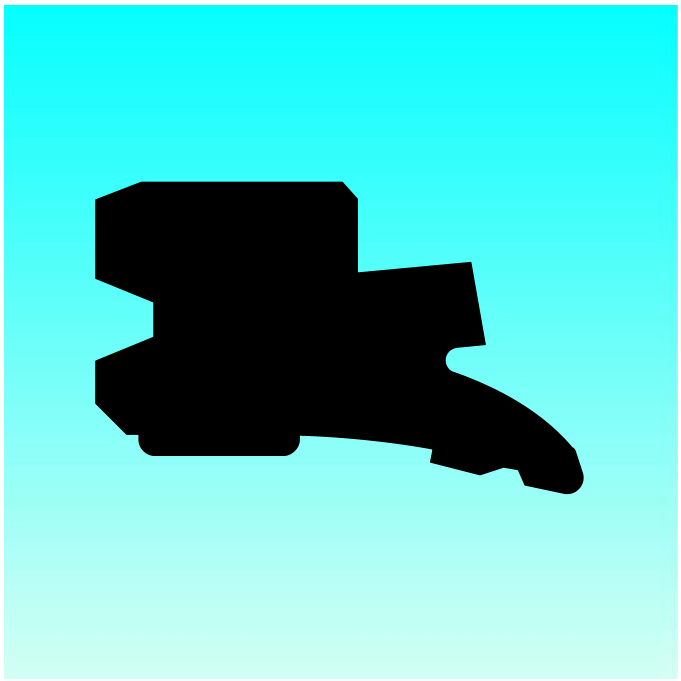
Figure 20 Installation drawing

Table XVIII Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Part No.
d_N h9	D_3 H11	L_3 +0.1	D_4 +0.2	
8.0	14.6	3.8	11.0	WNE000080
10.0	16.6	3.8	13.0	WNE000100
12.0	18.6	3.8	15.0	WNE000120
13.0	19.6	3.8	16.0	WNE000130
14.0	20.6	3.8	17.0	WNE000140
15.0	21.6	3.8	18.0	WNE000150
16.0	22.6	3.8	19.0	WNE000160
18.0	24.6	3.8	21.0	WNE000180
20.0	28.6	5.3	23.0	WNE000200
22.0	30.6	5.3	25.0	WNE000220
24.0	32.6	5.3	27.0	WNE000240
25.0	33.6	5.3	28.0	WNE000250
28.0	36.6	5.3	31.0	WNE000280
30.0	38.0	5.3	33.0	WNE000300
30.0	38.6	5.3	33.0	WNE100300
32.0	40.6	5.3	35.0	WNE000320
35.0	43.0	5.3	38.0	WNE000350
35.0	43.6	5.3	38.0	WNE100350
36.0	44.6	5.3	39.0	WNE000360
38.0	46.6	5.3	41.0	WNE000380
40.0	48.6	5.3	43.0	WNE000400

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Part No.
d_N h9	D_3 H11	L_3 +0.1	D_4 +0.2	
45.0	53.6	5.3	48.0	WNE000450
46.0	54.6	5.3	49.0	WNE000460
50.0	58.6	5.3	53.0	WNE000500
50.0	58.0	5.3	53.0	WNE100500
55.0	63.6	5.3	58.0	WNE000550
56.0	64.6	5.3	59.0	WNE000560
60.0	68.0	5.3	63.0	WNE100600
60.0	68.6	5.3	63.0	WNE200600
60.0	70.0	5.0	63.0	WNE000600
61.0	69.6	5.3	64.0	WNE000610
63.0	71.6	5.3	66.0	WNE000630
65.0	73.6	5.3	68.0	WNE000650
70.0	78.6	5.3	73.0	WNE100700
70.0	80.0	5.0	73.0	WNE000700
75.0	83.6	5.3	78.0	WNE000750
75.0	87.2	7.1	81.0	WNE100750
76.0	84.6	5.3	79.0	WNE000760
80.0	88.6	5.3	83.0	WNE000800
85.0	93.6	5.3	88.0	WNE100850
85.0	97.2	7.1	91.0	WNE000850
90.0	102.2	7.1	96.0	WNE000900
91.0	99.6	5.3	94.0	WNE000910
95.0	107.2	7.1	101.0	WNE000950
100.0	112.0	7.1	106.0	WNE001000
100.0	112.2	7.1	106.0	WNE101000
107.0	115.6	5.3	110.0	WNE001070
110.0	122.2	7.1	116.0	WNE001100
120.0	132.0	7.1	126.0	WNE001200
120.0	132.2	7.1	126.0	WNE101200
125.0	137.2	7.1	131.0	WNE001250
126.0	134.6	5.3	129.0	WNE001260
135.0	147.2	7.1	141.0	WNE001350
140.0	152.2	7.1	146.0	WNE001400
140.0	155.0	9.0	146.5	WNE101400
160.0	175.2	10.1	168.0	WNE101600
180.0	195.2	10.1	188.0	WNE001800
200.0	215.2	10.1	208.0	WNE002000
220.0	235.2	10.1	228.0	WNE002200
250.0	265.2	10.1	258.0	WNE002500

ZURCON® SCRAPER WNV



- Double Acting -

- Material -

- Zurcon® Polyurethane -

Scraper WNV

Description

WNV is a double acting scraper in material Zurcon® polyurethane Z 201. The dynamic scraping lip is specially designed with an additional inwards sealing edge to keep the residual oil film in the system.If the volume of this oil film can not be backpumped by the main rod seal (e.g. u.cup) a pressure built up between u-cup and scraper will be prevented by releasing this pressure by liftening of the scraper lip.

The static sealing lip and edge respectively ensure against the intrusion of dirt and fluids (e.g. water) over the outer diameter of the scraper.The support on the reverse side of the scraper prevents it from twisting in the groove.

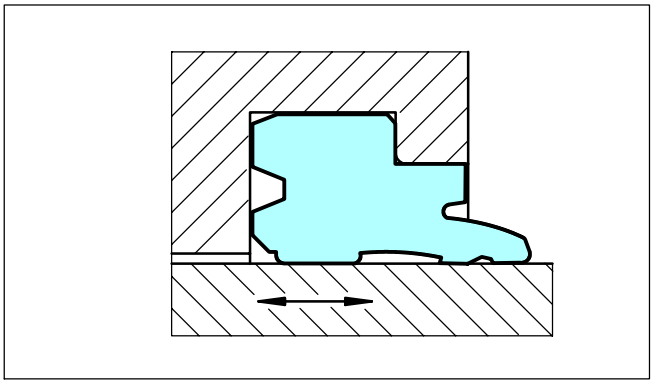


Figure 21 Scraper WNV

Advantages

- Double acting
- Pressure release function
- Good static sealing performance due to additional seal lip at the housing
- Stable position of scraper in the housing
- Support bead with notches to support release function
- Housings in accordance to ISO 6195 type A

Application Examples

- Mobile hydraulic machinery
- ISO-standard cylinders application
- Agriculture machinery
- Lift trucks
- Cargo tailboards
- Steering cylinders

Technical Data

Speed:	Up to 1 m/s
Temperature:	-35° C to +100° C
Media:	Mineral oil based hydraulic fluids
Groove type:	Closed

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 application:

Zurcon® Polyurethane:	92 Shore A
Material code:	Z201
Colour:	turquoise

Ordering Example

Rod diameter:	d_N = 45.0 mm
Groove diameter:	D_3 = 53.0 mm
Part number:	WNV000450 (from Table XIX)
Material code:	Z201

Order No. WNV0 0 0450 - Z201

- WNV0 — Series No.
- 0 — Type (Standard)
- 0450 — Rod diameter x 10
- - — Quality Index (see table)
- Z201 — Material-code

Installation Recommendation

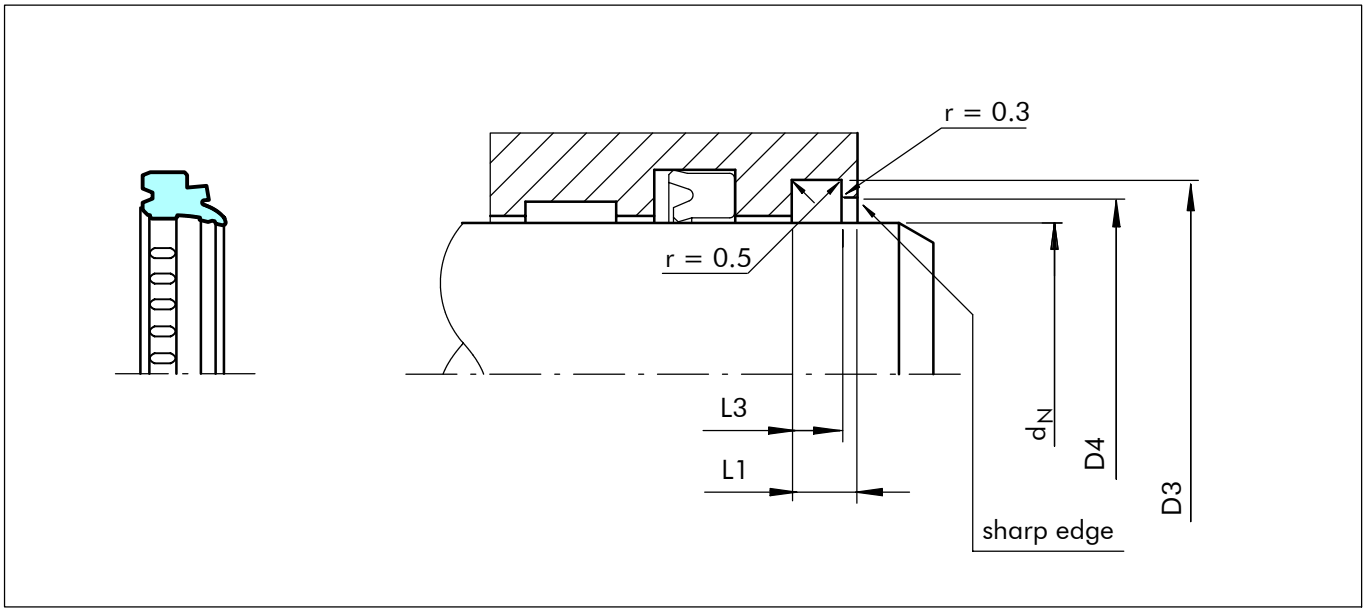


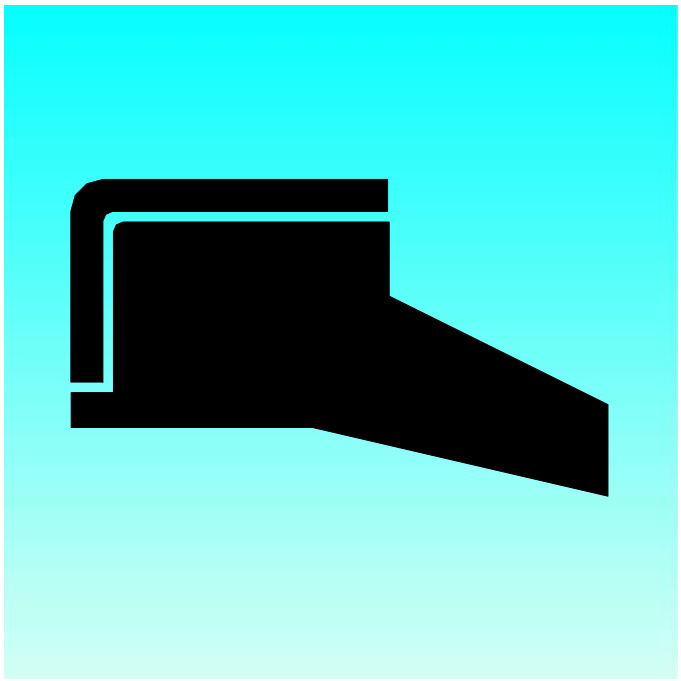
Figure 22 Installation drawing

Table XIX Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Bore Diameter	Groove Width	Depth	Part No.
d_N h9	D_3 H8	D_4 H8	L_3 +0.2	L_1 +0.2	
16.0	24.0	21.5	5.0	7.0	WNV000160
32.0	40.0	37.5	5.0	7.0	WNV000320
36.0	44.0	41.5	5.0	7.0	WNV000360
45.0	53.0	50.5	5.0	7.0	WNV000450
50.0	58.0	55.5	5.0	7.0	WNV000500
60.0	68.0	66.0	4.0	7.0	WNV000600
70.0	80.0	77.0	6.3	8.3	WNV000700
100.0	115.0	110.0	9.5	12.0	WNV001000

The rod diameters in **bold** type comply with the recommendations of ISO 6195 Type A installation dimensions

SCRAPER WSA



- Single Acting -

- With Metal Case -

- For open Groove Assembly -

- Material -

- NBR and Metal -

Scraper WSA

Description

The scraper WSA is a mould-vulcanised single-acting elastomer scraper, with integral metal reinforcement for open groove assembly. In conjunction with the scraper oversize, an exact fit is obtained in the housing.

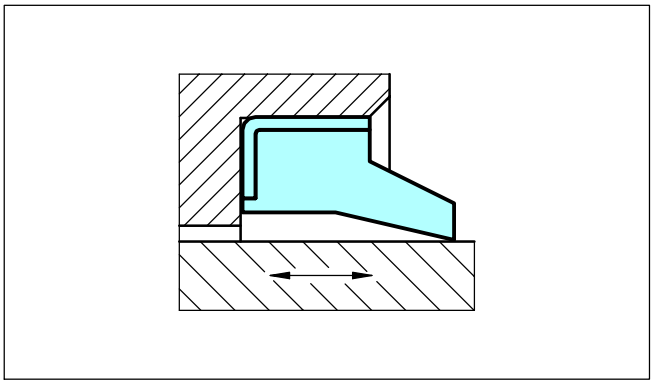


Figure 23 Scraper WSA

Advantages

- Space-saving construction
- Low cost, economical solution
- Simple, easy-construction groove
- Firm fit in the groove due to metallic press fit

Application Examples

- Hydraulic cylinders
- Agriculture machinery
- Construction machinery
- Lift trucks
- Mobile hydraulic

Technical Data

Operating conditions

Speed:	Up to 1 m/s
Temperature:	-30° C to +110° C
Media:	Mineral oil based hydraulic fluids. polyglycol-water emulsions, water-oil emulsions
Groove type:	Open

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 application:

Material:	NBR 90 Shore A + Metal
B+S code:	N9MN
Polypac code:	4N7W

Ordering Example

Rod diameter:	d_N = 35 mm
Groove diameter:	D3 = 45 mm
Part number:	WSA000350

Material set code:	
Polypac:	4N7W
B+S:	N9MN

Order No. WSA0 0 0350 - N9MN

- WSA0 — Series No.
- 0 — Type (Standard)
- 0350 — Rod diameter x 10
- - — Quality Index (see table)
- N9MN — Material Set-code

Order No. WSA0 0 0350 - 4N7W

- WSA0 — Series No.
- 0 — Type (Standard)
- 0350 — Rod diameter x 10
- - — Quality Index (see table)
- 4N7W — Material Set-code

Polypac Ref. No.: WRM 137177/C

Installation Recommendation

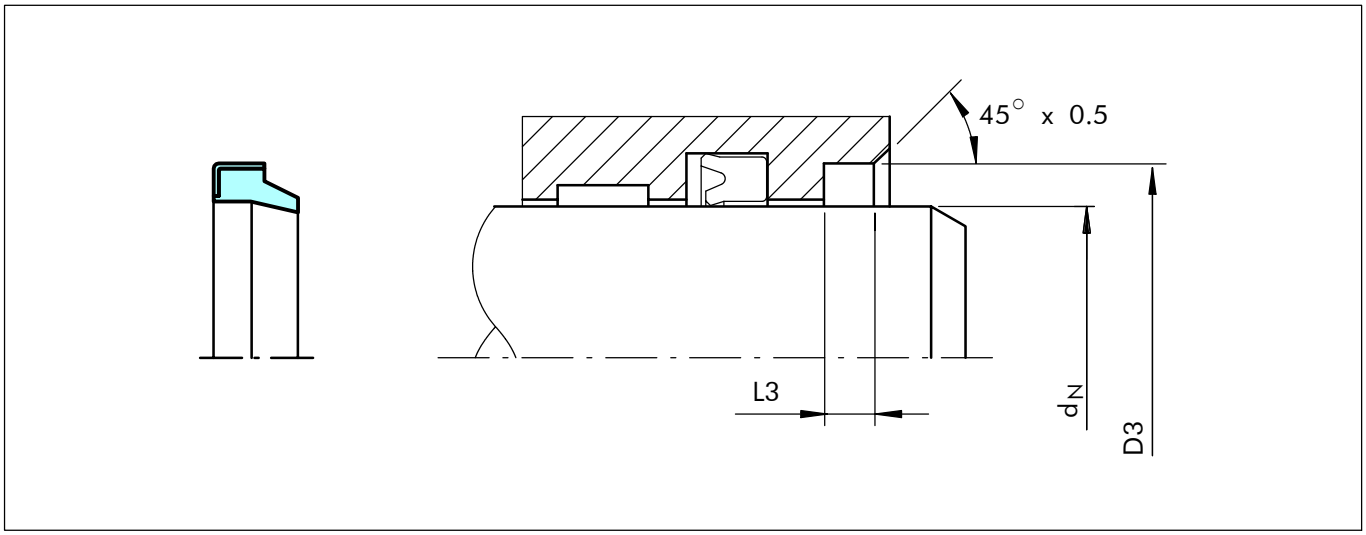


Figure 24 Installation drawing

Table XX Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	Part No.	B+S Ref. No.	Polypac Ref. No.
				Material Code	
d_N h9	D_3 H8	L_3 +0.1		N9MN	4N7W
6.0	13.0	3.0	WSA000060	WSA000060	
8.0	15.0	3.0	WSA000080		WRM 031059/C
10.0	16.0	3.0	WSA000100	WSA000100	
10.0	**18.0**	**5.0**	**WSA100100**	**WSA100100**	
12.0	18.0	5.0	WSA200120		WRM 047070/C
12.0	20.0	4.0	WSA000120	WSA000120	
12.0	22.0	5.0	WSA100120	WSA100120	
13.0	18.0	3.0	WSA000130	WSA000130	
14.0	20.0	4.0	WSA100140		WRM 055078/C
14.0	22.0	3.0	WSA000140	WSA000140	
16.0	22.0	4.0	WSA000160	WSA000160	WRM 062086/C
16.0	26.0	5.0	WSA200160	WSA200160	
16.0	28.0	5.0	WSA300160	WSA300160	
18.0	26.0	5.0	WSA000180	WSA000180	
18.0	28.0	5.0	WSA300180		WRM 070110/C
18.0	**28.0**	**7.0**	**WSA100180**	**WSA100180**	
20.0	26.0	4.0	WSA000200	WSA000200	
20.0	28.0	3.5	WSA200200	WSA200200	WRM078110/C
20.0	28.0	5.0	WSA300200	WSA300200	
20.0	30.0	4.0	WSA400200	WSA400200	
20.0	30.0	5.0	WSA500200	WSA500200	

The sizes in **bold** type comply with ISO 6195. installation groove Type B. Other sizes on request.
The listed products are technically equivalent but availability and pricing may vary.

Rod Diameter	Groove Diameter	Groove Width	Part No.	B+S Ref. No.	Polypac Ref. No.
				Material Code	
d_N h9	D_3 H8	L_3 +0.1		N9MN	4N7W
20.0	**30.0**	**7.0**	**WSA600200**	**WSA600200**	**WRM 078118/C**
22.0	28.0	5.0	WSA000220	WSA000220	
22.0	32.0	5.0	WSA200220		WRM 086125/C
22.0	**32.0**	**7.0**	**WSA100220**	**WSA100220**	
24.0	35.0	5.0	WSA000240	WSA000240	
25.0	35.0	5.0	WSA000250	WSA000250	
25.0	35.0	5.0	WSA200250		WRM 098137-1/C
25.0	**35.0**	**7.0**	**WSA100250**	**WSA100250**	**WRM 098137/C**
28.0	38.0	5.0	WSA000280	WSA000280	
28.0	40.0	7.0	WSA100280	WSA100280	
30.0	40.0	5.0	WSA000300	WSA000300	WRM 118157/C
30.0	40.0	7.0	WSA100300	WSA100300	WRM 118157/1/C
30.0	45.0	5.0	WSA200300	WSA200300	
32.0	42.0	5.0	WSA000320	WSA000320	WRM 125165/C
32.0	45.0	4.0	WSA100320	WSA100320	
32.0	45.0	7.0	WSA200320	WSA200320	
32.0	44.0	4.0	WSA300320	WSA300320	
32.0	42.0	7.0	WSA400320	WSA400320	
35.0	45.0	7.0	WSA000350	WSA000350	WRM 137177/C
36.0	45.0	7.0	WSA000360	WSA000360	WRM 141177/C
38.0	48.0	7.0	WSA000380	WSA000380	WRM 149188/C
40.0	50.0	5.0	WSA000400	WSA000400	
40.0	50.0	5.0	WSA100400	WSA100400	
40.0	**50.0**	**7.0**	**WSA200400**	**WSA200400**	**WRM 157196/C**
42.0	52.0	7.0	WSA000420	WSA000420	
45.0	55.0	5.0	WSA100450		WRM 177216/C
45.0	**55.0**	**7.0**	**WSA000450**	**WSA000450**	
50.0	56.0	5.0	WSA000500	WSA000500	
50.0	60.0	5.0	WSA200500	WSA200500	
50.0	60.0	5.0	WSA500500		WRM 196236-1/C
50.0	**60.0**	**7.0**	**WSA300500**	**WSA300500**	**WRM 196236/C**
50.0	65.0	7.0	WSA400500	WSA400500	
52.0	62.0	7.0	WSA000520	WSA000520	
55.0	63.0	7.0	WSA000550	WSA000550	WRM 216248/C
55.0	65.0	5.0	WSA200550		WRM 216255-1/C
55.0	65.0	7.0	WSA100550	WSA100550	WRM 216255/C
55.0	70.0	7.0	WSA300550		WRM 216275/C
56.0	**66.0**	**7.0**	**WSA000560**	**WSA000560**	
60.0	70.0	5.0	WSA200600		WRM 236275/C
60.0	70.0	7.0	WSA000600	WSA000600	WRM 236275/1/C
60.0	74.0	5.0	WSA100600	WSA100600	
63.0	75.0	7.0	WSA000630	WSA000630	

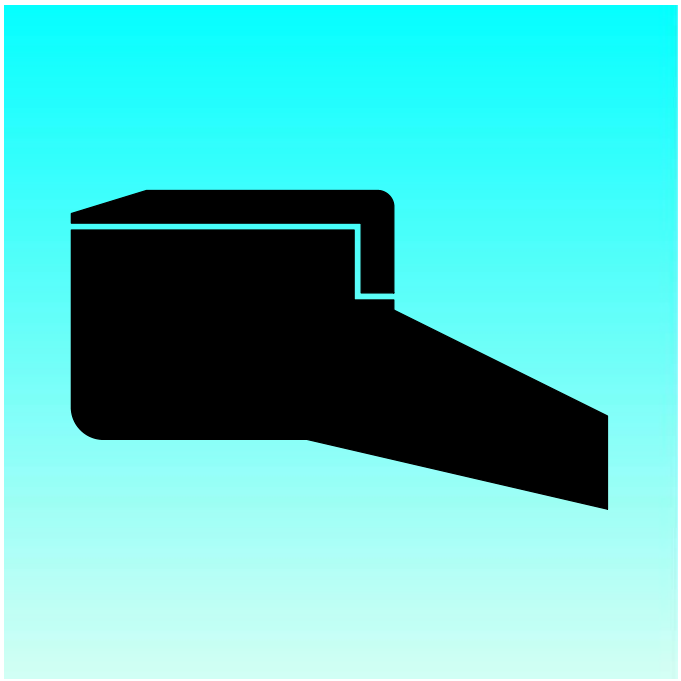
The sizes in **bold** type comply with ISO 6195. installation groove Type B. Other sizes on request.
The listed products are technically equivalent but availability and pricing may vary.

Scraper WSA

Rod Diameter	Groove Diameter	Groove Width	Part No.	B+S Ref. No.	Polypac Ref. No.
				Material Code	
d_N h9	D_3 H8	L_3 +0.1		N9MN	4N7W
65.0	75.0	5.0	WSA100650		WRM 255295/C
65.0	75.0	7.0	WSA000650	WSA000650	
70.0	80.0	5.0	WSA100700		WRM 275314/C
70.0	**80.0**	**7.0**	**WSA000700**	**WSA000700**	**WRM 275314/1/C**
75.0	83.0	7.0	WSA100750		WRM 295326/C
75.0	85.0	7.0	WSA000750	WSA000750	WRM 295334/C
80.0	88.0	7.0	WSA100800		WRM 314346/C
80.0	**90.0**	**7.0**	**WSA000800**	**WSA000800**	**WRM 314354/C**
85.0	95.0	7.0	WSA000850	WSA000850	WRM 334374/C
90.0	**100.0**	**7.0**	**WSA000900**	**WSA000900**	**WRM 354393/C**
95.0	105.0	7.0	WSA000950	WSA000950	
100.0	110.0	7.0	WSA001000	WSA001000	WRM 393433/C
105.0	115.0	7.0	WSA001050	WSA001050	
110.0	120.0	7.0	WSA001100	WSA001100	WRM 433472/C
115.0	125.0	7.0	WSA001150	WSA001150	
120.0	130.0	7.0	WSA001200	WSA001200	WRM 472511/C
120.0	135.0	7.0	WSA101200	WSA101200	
125.0	**140.0**	**9.0**	**WSA001250**	**WSA001250**	
130.0	145.0	9.0	WSA001300	WSA001300	
135.0	145.0	7.0	WSA001350		WRM 531570/C
140.0	**155.0**	**9.0**	**WSA001400**	**WSA001400**	**WRM 551610/C**
140.0	160.0	10.0	WSA101400		WRM 551629/C
150.0	165.0	9.0	WSA001500	WSA001500	WRM 590649/C
160.0	**175.0**	**9.0**	**WSA001600**	**WSA001600**	
170.0	185.0	10.0	WSA001700	WSA001700	WRM 669728/C
175.0	190.0	9.0	WSA001750		WRM 688748/C
180.0	195.0	10.0	WSA001800	WSA001800	WRM 708767/C
200.0	220.0	12.0	WSA002000	WSA002000	WRM 787866/C
220.0	235.0	10.0	WSA002200	WSA002200	
270.0	295.0	12.0	WSA002700	WSA002700	

The sizes in **bold** type comply with ISO 6195. installation groove Type B. Other sizes on request.
The listed products are technically equivalent but availability and pricing may vary.

ZURCON® SCRAPER WRM/PC



- Single Acting -

- With Metal Case -

- For open Groove Assembly -

- Material -

- Zurcon® Polyurethane + Metal -

Scraper WRM/PC

Description

WRM/PC are polyurethane manufactured lipped wipers with integrated metal reinforcement for open groove assembly. These are typically used in medium duty applications where there is abrasion due to solid matter on rod surface.

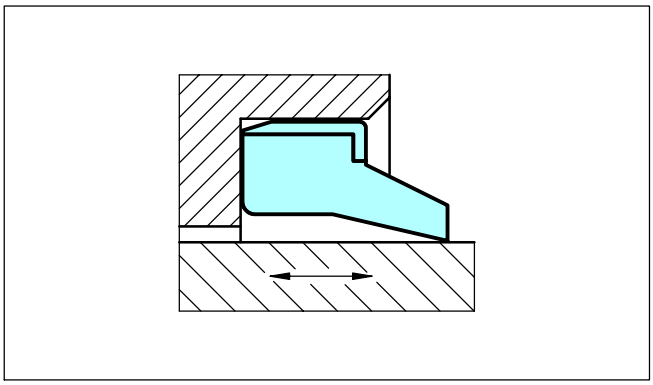


Figure 25 Scraper WRM/PC

Advantages

- Space-saving construction
- High wear resistance
- Simple, easy-construction groove
- Firm fit in the groove due to metallic press fit
- Accurate closure at the cylinder head

Application Examples

Due to their outstanding wiping capacities WRM/PC scrapers are recommended wherever there are dusty and humid conditions and especially for the following applications:

- Mobile hydraulic machinery
- Agriculture machinery
- Construction machinery
- Lift trucks

Technical Data

Speed:	Up to 1 m/s
Temperature:	-35° C to +100°C
Media:	Mineral oil based hydraulic fluids
Groove type:	Open

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 application

Zurcon® Polyurethane:	92 Shore A
Colour:	turquoise
Metal case:	non alloyed steel DIN 1624
Material Set-Code:	Z2021

Ordering Example

Rod diameter:	d_N = 40 mm
Groove diameter:	D3 = 50 mm
Part number:	WSA0 P 0400 -
Material Set-Code:	Z2021
Polypac ref.:	WRM 157196/PC

Order No.	WSA0	P	0400	-	Z2021
	Series No.				
		Type (Standard)			
			Rod diameter x 10		
				Quality Index (see table)	
					Material Set-code

Installation Recommendation

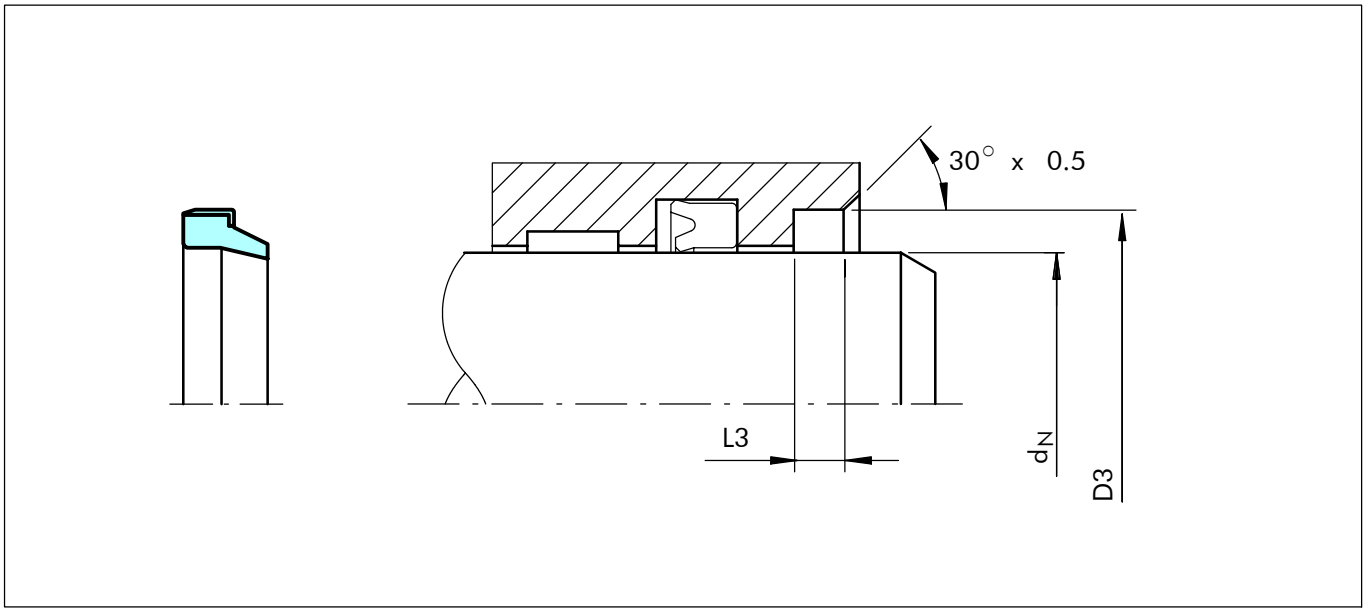
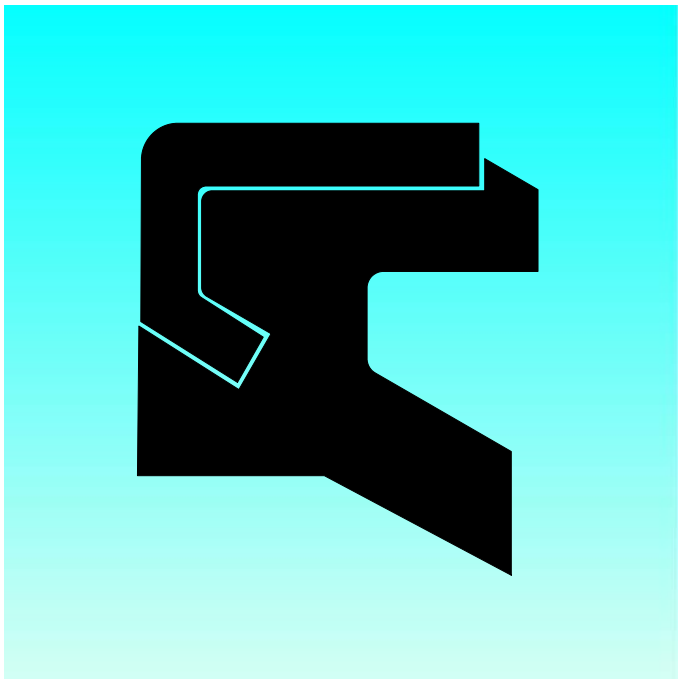


Figure 26 Installation drawing

Table XXI Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	Part No.	Polypac Ref. No.
d_N h9	D_3 H8	L_3 +0.1		
16.00	22.00	4.0	WSA0P0160	WRM 062086/PC
20.00	30.00	7.0	WSA0P0200	WRM 078118/PC
30.00	40.00	5.0	WSA0P0300	WRM 118157/1/PC
38.10	50.80	7.0	WSA0P0381	WRM 150200/PC
40.00	50.00	5.0	WSA0P0400	WRM 157196/PC
50.00	60.00	7.0	WSA0P0500	WRM 196236/PC
50.80	63.50	7.0	WSA0P0508	WRM 200250/PC
55.00	65.00	7.0	WSA0P0550	WRM 216255/PC
57.15	70.00	7.0	WSA0P0572	WRM 225275/PC
60.00	70.00	7.0	WSA0P0600	WRM 236275/1/PC
63.50	76.20	7.0	WSA0P0635	WRM 250300/PC
75.00	83.00	7.0	WSA0P0750	WRM 295326/PC
76.20	88.90	7.0	WSA0P0762	WRM 300350/PC
80.00	90.00	7.0	WSA0P0800	WRM 314354/PC
95.00	105.00	7.0	WSA0P0950	WRM 374413/PC
105.00	115.00	7.0	WSA0P1050	WRM 413452/PC
175.00	190.00	9.0	WSA0P1750	WRM 688748/PC

ZURCON® SCRAPER SWP



- Single Acting -

- Metal Reinforcement -

- For open Groove Assembly -

- Material -

- Zurcon® Polyurethane + Metal -

Scraper SWP

Description

SWP are polyurethane manufactured lipped wipers with integrated metal reinforcement for open groove assembly. These are typically used in severe applications where there is abrasion due to solid matter on rod surface.

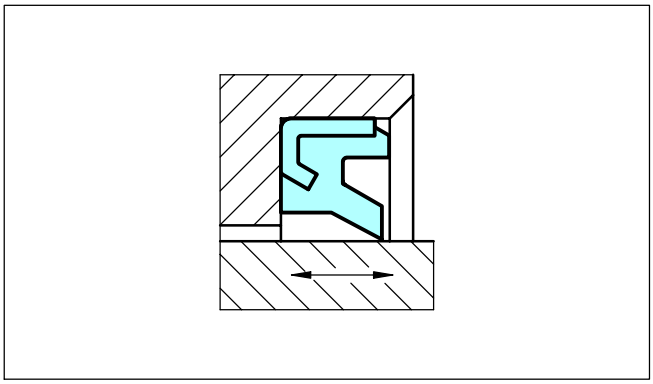


Figure 27 Scraper SWP

Advantages

- Space-saving construction
- Simple small installation groove
- Firm fit in the groove due to metallic press fit
- At regreasing of drag bearing, the scraper lip opens at low overpressure; old grease can escape
- High wear resistance

Application Examples

Due to their outstanding wiping capacities SWP scrapers are recommended wherever there are dusty and humid conditions and especially for the following applications:

- Mobile hydraulic machinery
- Construction machinery
- Link pin seals
- Lift trucks
- Truck cargo cranes
- Agriculture machinery

Technical Data

Operating conditions

Speed:	Up to 1 m/s
Temperature:	-35° C to +100°C
Media:	Mineral oil based hydraulic fluids
Groove type:	Open

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 application

Zurcon® Polyurethane:	92 Shore A
Colour:	turquoise
Metal case:	non alloyed steel DIN 1624
Material Set-Code	Z2022

Ordering Example

Rod diameter:	d_N = 40 mm
Groove diameter:	D3 = 50 mm
Part number:	WSP0 0 0400 -
Material Set-Code:	Z2022 (standard)
Polypac ref.:	SWP 4050

Order No.	WSP0	0	0400	-	Z2022
	Series No.				
		Type (Standard)			
			Rod diameter x 10		
				Quality Index (see table)	
					Material Set-code

Installation Recommendation

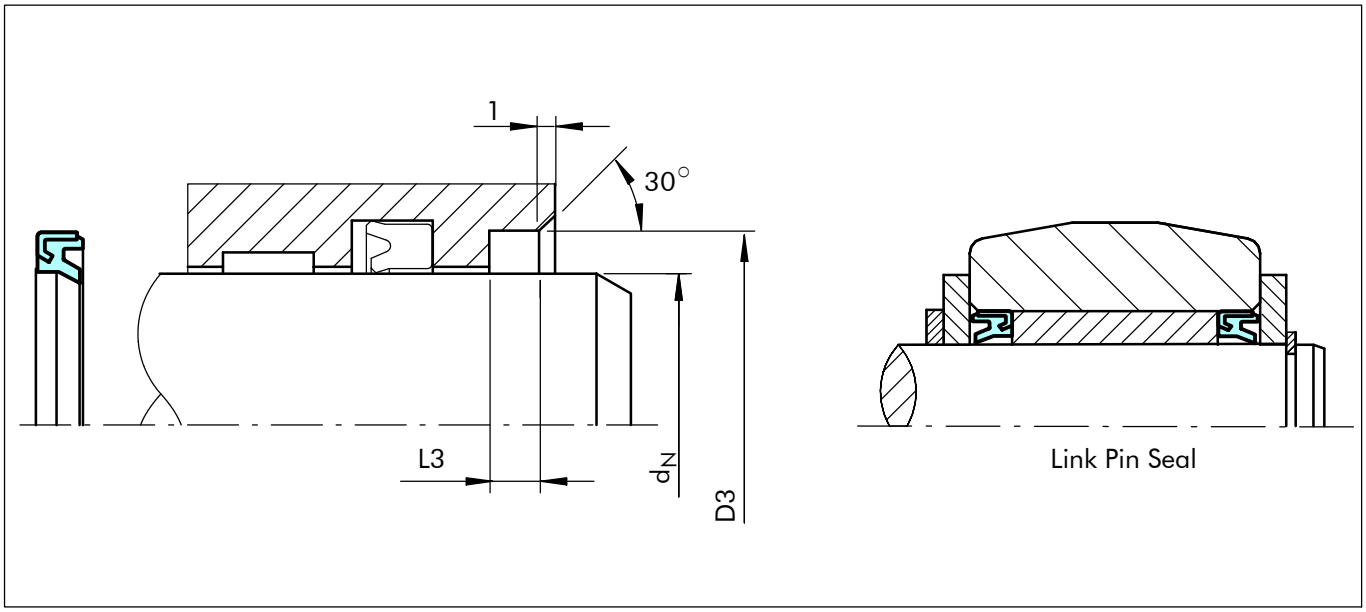


Figure 28 Installation drawing

Table XXII Installation Dimensions / Part Numbers

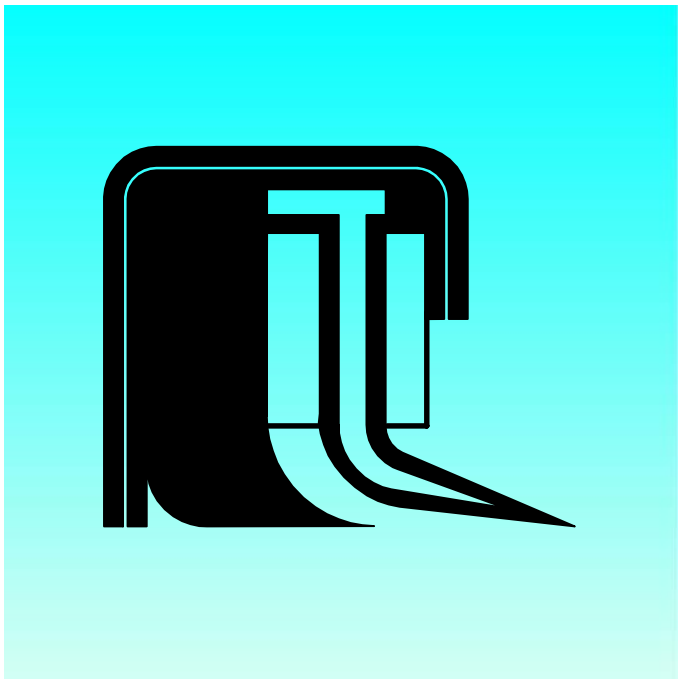
Rod Diameter	Groove Diameter	Groove Width	Part No.	Polypac Ref. No.
d_N h9	D_3 H8	L_3 +0.1		
25.0	38.0	7.5	WSP000250	SWP 2538
30.0	40.0	4.0	WSP000300	*SWP 3040
30.0	43.0	7.5	WSP100300	SWP 3043
35.0	45.0	4.0	WSP000350	*SWP 3545
35.0	50.0	7.5	WSP100350	SWP 3550
36.0	48.0	6.0	WSP000360	SWP 3648
38.0	50.0	7.5	WSP000380	SWP 3850
40.0	50.0	4.0	WSP000400	*SWP 4050
40.0	52.0	6.0	WSP100400	SWP 4052
45.0	55.0	3.2	WSP000450	*SWP 4555/1
45.0	55.0	4.0	WSP100450	*SWP 4555
45.0	60.0	7.5	WSP200450	SWP 4560
50.0	60.0	4.0	WSP000500	*SWP 5060
50.0	63.0	4.0	WSP100500	*SWP 5063
50.0	65.0	7.5	WSP200500	SWP 5065
55.0	65.0	3.2	WSP000550	*SWP 5565
55.0	68.0	4.0	WSP100550	*SWP 5568
55.0	70.0	7.5	WSP200550	SWP 5570

* Can be used for "Link Pin Seal"

Rod Diameter	Groove Diameter	Groove Width	Part No.	Polypac Ref. No.
d_N h9	D_3 H8	L_3 +0.1		
56,0	70,0	7,5	WSP000560	SWP 5670
60,0	75,0	4,0	WSP000600	*SWP 6075/1
60,0	75,0	7,5	WSP100600	SWP 6075
63,0	78,0	7,5	WSP000630	SWP 6378
65,0	80,0	5,0	WSP000650	*SWP 6580/1
65,0	80,0	7,5	WSP100650	SWP 6580
70,0	80,0	5,0	WSP000700	*SWP 7080
70,0	84,0	8,0	WSP100700	SWP 7084
70,0	85,0	4,0	WSP200700	SWP 7085/1
70,0	85,0	7,5	WSP300700	SWP 7085
71,0	86,0	5,0	WSP000710	*SWP 7186
75,0	90,0	7,5	WSP000750	SWP 7590
75,0	95,0	10,0	WSP100750	SWP 7595
76,5	96,5	10,0	WSP000765	SWP 7696
80,0	95,0	5,0	WSP000800	*SWP 8095/1
80,0	95,0	7,5	WSP100800	SWP 8095
80,0	100,0	10,0	WSP200800	SWP 80100
85,0	100,0	4,0	WSP000850	*SWP 85100/1
85,0	100,0	10,0	WSP100850	SWP 85100
85,0	105,0	10,0	WSP200850	SWP 85105
90,0	104,0	8,0	WSP000900	SWP 90104
90,0	105,0	6,0	WSP100900	*SWP 90105
90,0	110,0	10,0	WSP200900	SWP 90110
95,0	115,0	10,0	WSP000950	SWP 95115
99,0	115,0	7,5	WSP000990	SWP 99115
100,0	115,0	4,0	WSP001000	*SWP 100115/2
100,0	115,0	6,5	WSP101000	*SWP 100115/1
100,0	115,0	7,5	WSP201000	SWP 100115
100,0	120,0	10,0	WSP301000	SWP 100120
105,0	120,0	7,5	WSP001050	SWP 105120
110,0	125,0	4,0	WSP001100	SWP 110125/1
110,0	125,0	9,0	WSP101100	SWP 110125
110,0	130,0	10,0	WSP201100	SWP 110130
115,0	130,0	7,5	WSP001150	SWP 115130
115,0	130,0	9,0	WSP101150	SWP 115130/1
120,0	140,0	10,0	WSP001200	SWP 120140
130,0	145,0	7,5	WSP001300	SWP 130145
160,0	175,0	10,0	WSP001600	SWP 160175
190,0	210,0	10,0	WSP001900	SWP 190210

* Can be used for "Link Pin Seal"

METAL SCRAPER



- Single Acting -

- Metal and Elastomer Scraper Lips -

- Material -

- NBR, Metal and Brass -

Metal Scraper

Description

The metal scraper is a single-acting special scraper with two different scraper lips - a thin metallic lip and a elastomer lip. The two scraper lips are arranged in tandem behind one another in a compact metal housing.

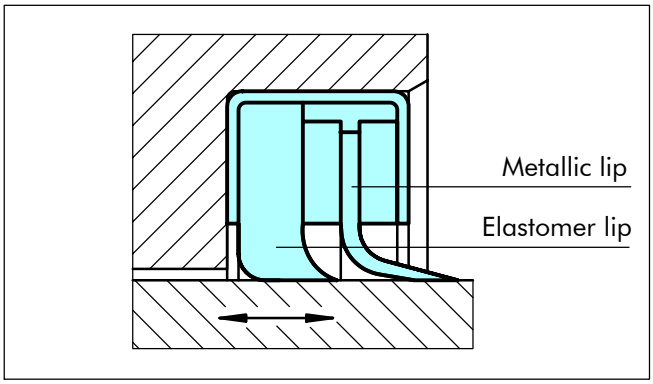


Figure 29 Metal scraper

The metal scraper lip is designed to remove firmly adhering soiling and ice particles. The secondary lip of elastomer material enhances the overall scraping effect, i.e. fine sand grains, water and similar foreign matter are reliably scraped off. Both scraper lips have a smaller diameter than the nominal diameter of the piston rod, thus ensuring a tight fit of the scraper lips. The metallic lip is guided flexibly in radial direction and can easily follow any possible deflections of the piston rod.

Advantages

- Very good scraping effect, even with firmly adhering dirt, e.g. mud, ice
- Very abrasion resistant
- Tight fit in the groove due to the metal case
- Easy installation in open grooves

Technical Data

Speed:	Max. 1 m/s with reciprocating movements
Temperature:	-40°C to +120°C
Media:	Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids (HFA, HFB, HFC),water, air, etc.

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

Inner scraper lip:	Acrylonitrile butadiene rubber, NBR, 70 Shore A Code N7
Metal housing:	Sheet metal 1.0204 (AISI 1008) or similar Code M
Outer scraper lip:	Brass Code S

Other materials for scraper lips and housing available on request. Also available in an imperial (inch) size range.

Installation Recommendation

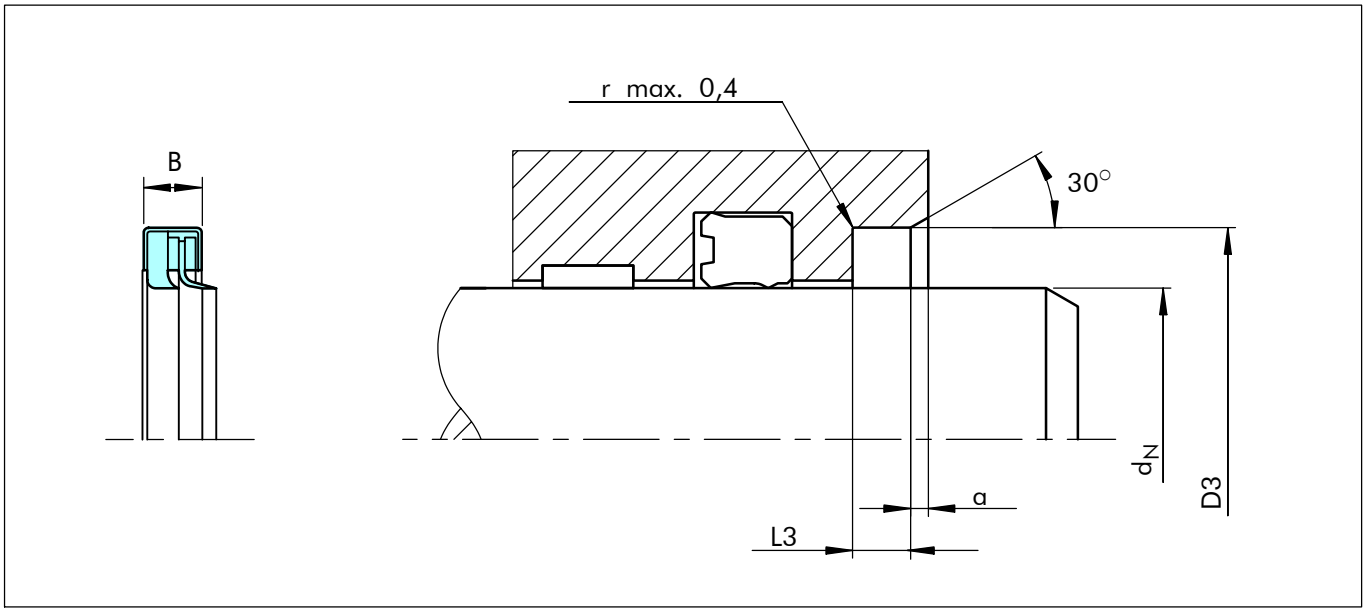


Figure 30 Installation drawing

Table XXIII Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	Chamfer	Width	Part No.
d_N f8/h9	D_3 H8	L_3 +0.2	a min.	B	
12.0	**25.0**	**7.0**	**2.0**	**6.5**	**WM0000120**
14.0	**27.0**	**7.0**	**2.0**	**6.5**	**WM0000140**
15.0	28.0	7.0	2.0	6.5	WM0000150
16.0	**29.0**	**7.0**	**2.0**	**6.5**	**WM0000160**
18.0	**31.0**	**7.0**	**2.0**	**6.5**	**WM0000180**
20.0	**33.0**	**7.0**	**2.0**	**6.5**	**WM0000200**
22.0	**35.0**	**7.0**	**2.0**	**6.5**	**WM0000220**
25.0	**38.0**	**7.0**	**2.0**	**6.5**	**WM0000250**
28.0	**41.0**	**7.0**	**2.0**	**6.5**	**WM0000280**
30.0	43.0	7.5	2.0	7.0	WM0000300
32.0	**45.0**	**7.5**	**2.0**	**7.0**	**WM0000320**
35.0	48.0	7. 5	2.0	7.0	WM0000350
36.0	**49.0**	**7.5**	**2.0**	**7.0**	**WM0000360**
38.0	51.0	7.5	2.0	7.0	WM0000380
40.0	**53.0**	**7.5**	**2.0**	**7.0**	**WM0200400**
45.0	**58.0**	**7.5**	**2.0**	**7.0**	**WM0000450**
50.0	**64.0**	**8.0**	**2.0**	**7.5**	**WM0000500**
55.0	69.0	8.0	2.0	7.5	WM0000550

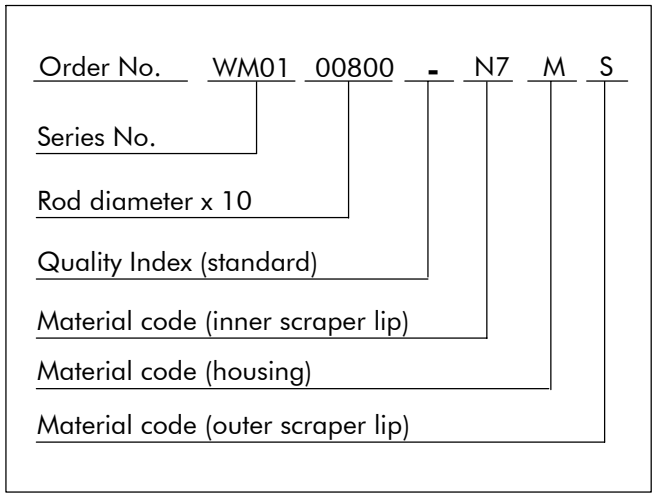
The rod diameters in bold type comply with the recommendations of ISO 3320. Other sizes on request.

Rod Diameter	Groove Diameter	Groove Width	Chamfer	Width	Part No.
d_N f8/h9	D_3 H8	L_3 +0.2	a min.	B	
58.0	72.0	8.0	2.0	7.5	WM0000580
60.0	74.0	8.0	2.0	7.5	WM0000600
63.0	**77.0**	**8.0**	**2.0**	**7.5**	**WM0000630**
65.0	79.0	8.0	2.0	7.5	WM0000650
70.0	**84.0**	**8.0**	**2.0**	**7.5**	**WM0000700**
75.0	89.0	8.0	2.0	7.5	WM0000750
80.0	**96.0**	**8.5**	**2.0**	**8.0**	**WM0100800**
85.0	101.0	8.5	2.0	8.0	WM0000850
90.0	**106.0**	**8.5**	**2.0**	**8.0**	**WM0000900**
95.0	111.0	8.5	2.0	8.0	WM0000950
100.0	**120.0**	**9.0**	**3.0**	**8.5**	**WM0001000**
110.0	**130.0**	**9.0**	**3.0**	**8.5**	**WM0001100**
120.0	140.0	9.0	3.0	8.5	WM0001200
130.0	150.0	9.0	3.0	8.5	WM0001300
140.0	**160.0**	**9.0**	**3.0**	**8.5**	**WM0001400**
150.0	170.0	9.0	3.0	8.5	WM0101500
160.0	**180.0**	**9.0**	**3.0**	**8.5**	**WM0001600**
170.0	190.0	9.0	3.0	8.5	WM0001700
180.0	**200.0**	**12.0**	**3.0**	**10.0**	**WM0001800**
200.0	**230.0**	**12.0**	**3.0**	**10.0**	**WM0102000**
210.0	230.0	12.0	3.0	10.0	WM0002100
220.0	**250.0**	**12.0**	**3.0**	**10.0**	**WM0002200**

The rod diameters in bold type comply with the recommendations of ISO 3320. Other sizes on request. Inch sizes can be supplied.

Ordering Example

Metal scraper
Rod diameter: d_N = 80.00 mm
Groove diameter: D_3 = 96.00 mm
Groove width: L_3 = 8.50 mm
Part No.: WM0100800 (from Table XXIII)
Material: Standard materials
Material code N7MS



NON STANDARD SCRAPERS

- Available upon Request -

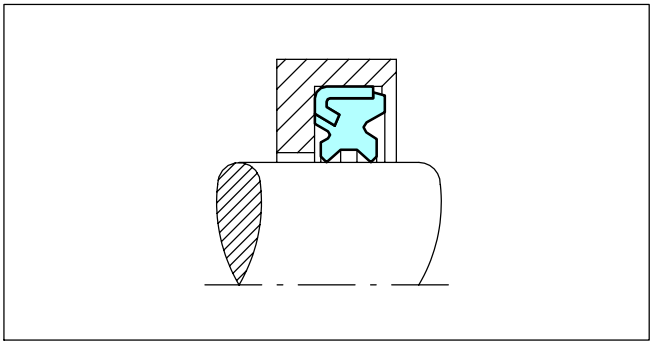
- Old Series -

- Special Series -

Polypac® TWP

The scraper TWP are polyurethane manufactured double lip with integrated metal reinforcement for open groove assembly. These are typically used in heavy duty applications like excavators and earth moving machine.

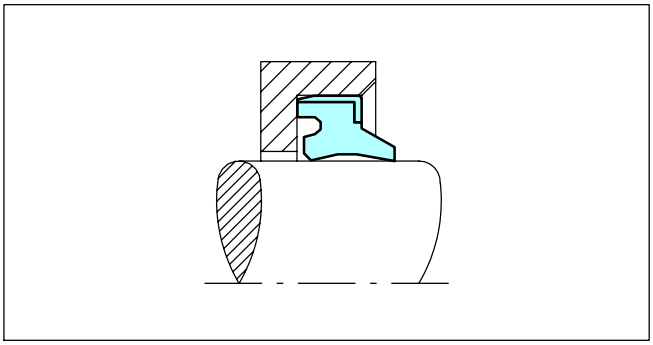
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
40 - 80	-	-35 to +100	Up to 0.5



Polypac® UWR/PC

The UWR/PC is double-acting polyurethane wiper with integrated metal reinforcement for open groove assembly. The double lip guaranties a reliable scraper effect in one side and the sealing function of the oil film on the other.

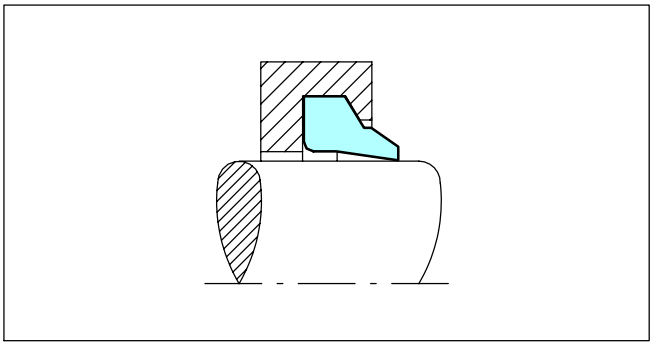
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
35 - 150	-	-35 to +100	Up to 0.5



Polypac® WRS

The WRS is a medium to heavy duty single acting wiper, manufactured in nitrile elastomer with precision machined wiper lip. A feature of this wiper ring is the raised bead moulded around the base of the ring which forms a "line" seal to prevent liquids or semi liquids seeping into the cylinder via the underside of the seal.

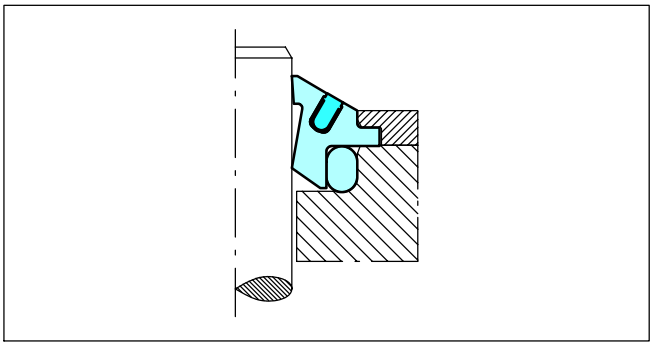
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
19 - 180	-	-30 to +110	Up to 0.5



Shamban Turcon® Excluder® with advanced scraping lip

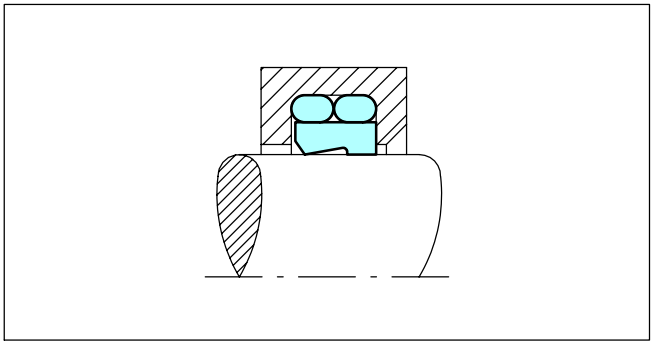
This special Turcon® Excluder® is double acting and used in medium to heavy-duty applications, where a gap between the rod and the gland in front of the Excluder® is not wanted. The scraping lip activated by embedded metal spring or O-Ring makes it very effective in abrasive dusty environment even when the cylinder rod is pointing upwards.

Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
40 - 2600	-	-45 to +200	Up to 15



Shamban Turcon® Excluder® F

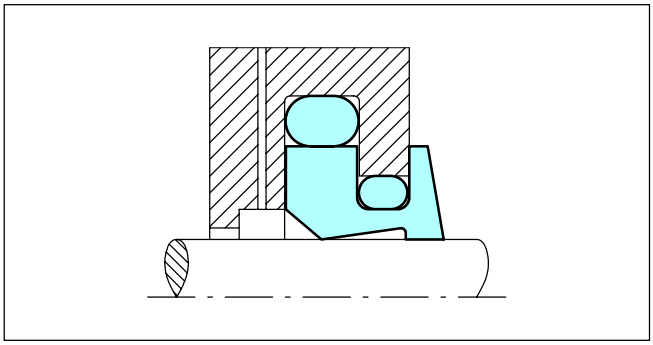
Turcon® Excluder® F is double acting and used in medium to heavy-duty applications. Now available on standard part number. Simple, closed groove design and easy mounting. Fits into ISO 6195 Type C and similar grooves on request.



Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
12 - 2600	-	-45 to +200	Up to 15

Shamban Turcon® Excluder® G with extended scraping lip

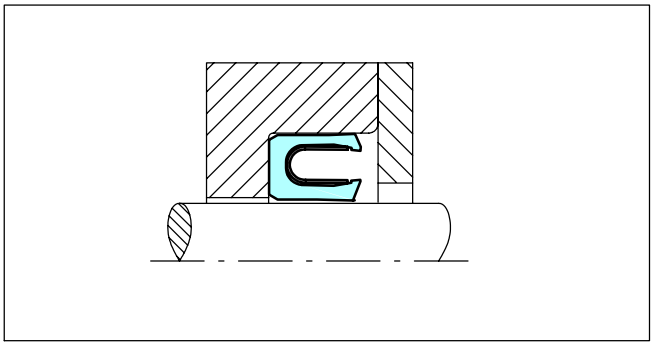
Turcon® Excluder® G used in heavy-duty applications, where a gap between the rod and the gland in front of the Excluder® is not wanted. Especially for abrasive dusty environment. Now available on standard part number.



Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
120 - 2600	-	-45 to +200	Up to 15

Shamban Turcon® Variseal® for hydraulic components working in aggressive environments

The Turcon® Variseal® **M2S** is a single acting scraper consisting of a U-shaped scraper jacket and a V-shaped corrosion resistant spring.
The characteristic of the Turcon® Variseal® M2S is that due to the use of chemically inert materials it can form an effective barrier protecting the sealing system in harsh environments. The Turcon® Variseal® M2S can be used as a seal, especially for highly viscous media and media containing particles.
Interchangeable with O-Ring/Back-up Ring combination after MIL - G - 5514F and ISO 6194



Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
3 - 2600	-	-70 to +260	Up to 10

For further information:

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