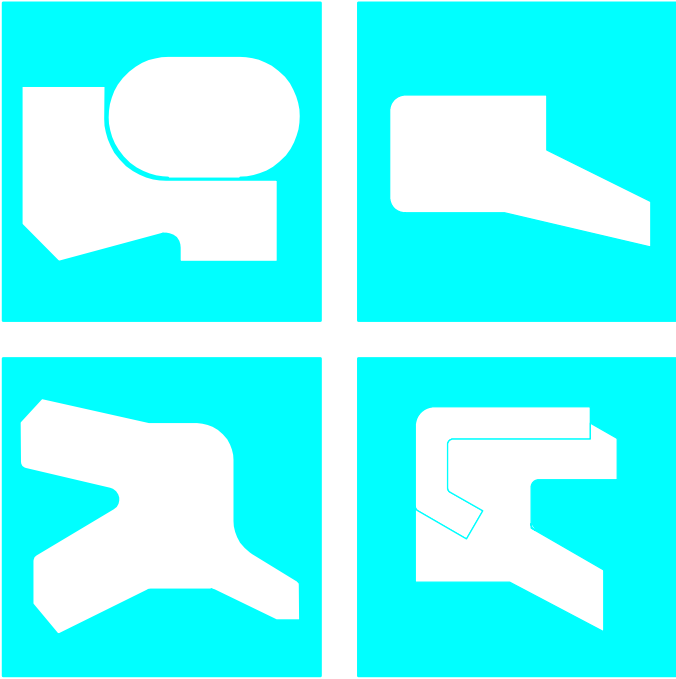

SCRAPERS



Scrapers

Contents

Choice of Scraper Element 4

Turcon® Excluder® 2 7

Turcon® Excluder® 5 15

Turcon® Excluder® 500 23

Scraper DA17 29

Scraper DA22 and RSW 35

Scraper DA24 41

Scraper WRM 45

Scraper ASW 51

Scraper PW 57

Scraper WNE 65

Scraper WNW 71

Scraper WRM/C and SA 75

Scraper WRM/PC 81

Scraper SWP 85

Metal Scraper 91

Non Standard Scrapers 97

■ 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.

Scrapers

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	ISO/DIN	mm	mm	Single	Double	°C	m/s	
Excluder® 2 	7	Industrial hydraulics Machine tools Injection molding machines Servo hydraulic cylinders Robotics	-	6 - 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 -30/ +100	15 2	Turcon® T46 Zurcon® Z52
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
Scraper DA 22  RSW	35	ISO standard cylinder Industrial hydraulic cylinders	6195 Type C	12 - 180	Split <18 Closed >18		X	-30/ +80	1	TPU
Scraper DA 24 	41	Mobile hydraulics Construction machinery Agriculture machinery	-	50 - 280	Closed		X	-30/ +80	0.5	TPU
Scraper WRM 	45	Agriculture machinery Handling equipment	-	12 - 260	Closed	X		-30/ +110	1	NBR
Scraper ASW 	51	Agriculture machinery Mobile hydraulic machinery	-	8 - 125	Split <14 Closed >14	X		-30/ +80	1	TPU

* The data above are maximum values and cannot be used at the same time.

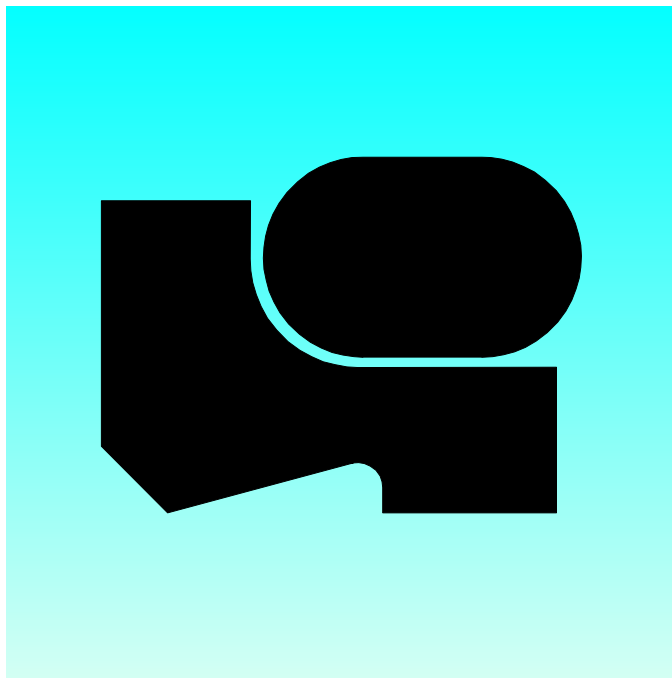
** Temperature Range is depending on choice of elastomer material.

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		-30/ +80	1	TPU
Scraper WNE 	65	Agriculture machinery Mobile hydraulic machinery	• •	• •	• •	-	8 - 250	Closed	X		-30/ +80	1	TPU
Scraper WNW 	71	Agriculture machinery Mobile hydraulic machinery ISO standard cylinder	• • •	• • •	• • •	6195 Type A	16 - 80	Closed	X		-30/ +80	1	TPU
Scraper WRM/C-SA 	75	Agriculture machinery Standard hydraulic cylinder	• •	• •		-	16 - 120	Open	X		-30/ +110	1	NBR + Metal
Scraper WRM/PC  WSA	81	Agriculture machinery Mobil hydraulic machinery	• •	• •	• •	-	16 - 175	Open	X		-30/ +80	1	TPU + Metal
Scraper SWP 	85	Construction machinery Link pin seals		• •	• •	-	25 - 190	Open	X		-30/ +80	1	TPU + Metal
Metal Wiper 	91	Agriculture machinery Mobile hydraulic machinery ISO standard cylinder	• • •	• • •	• • •	-	12 - 220	Open	X		-40/ +110	1	Metal + NBR + Brass

* The data above are maximum values and cannot be used at the same time.

TURCON[®] EXCLUDER[®] 2



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



Turcon® Excluder® 2

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.

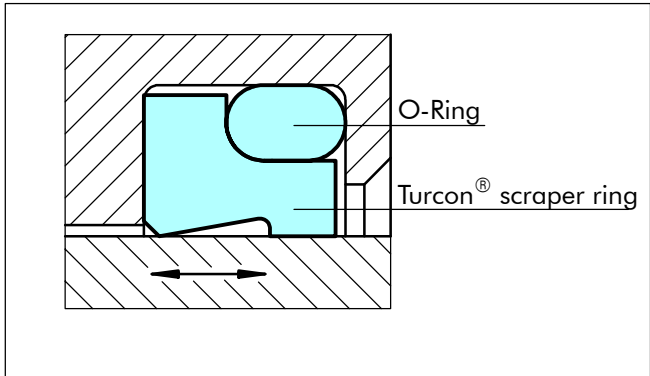


Figure 1 Turcon® Excluder® 2

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®)

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.

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, soft mating surfaces. 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

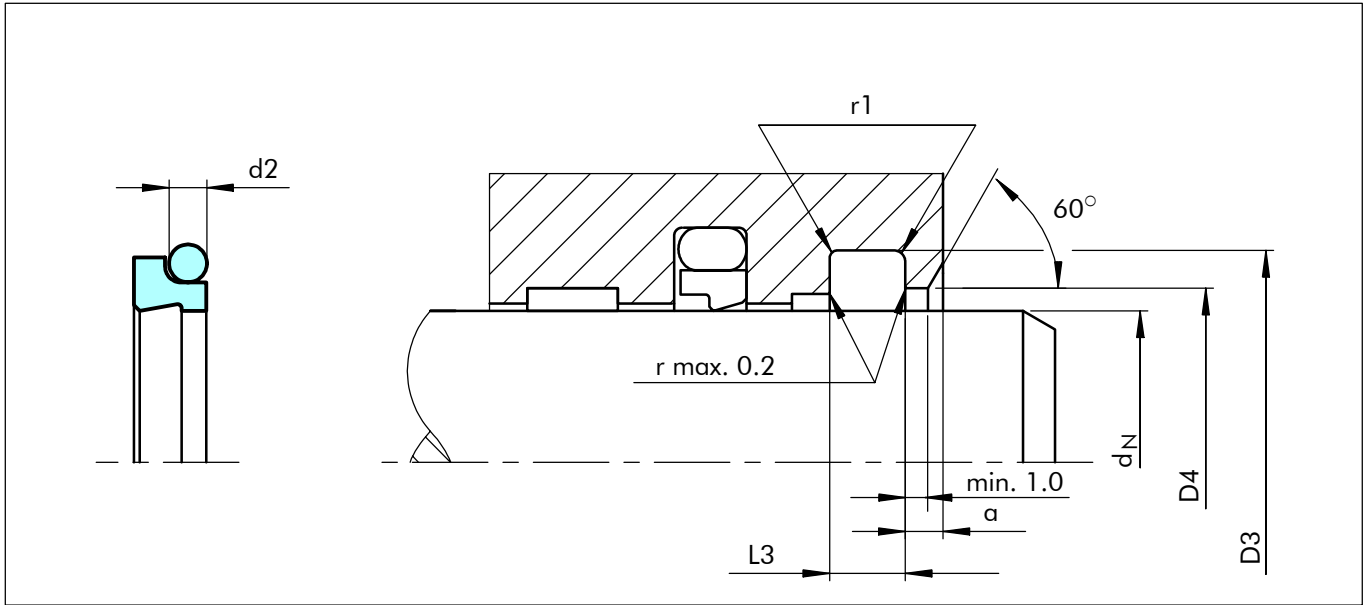


Figure 2 Installation drawing

Table IV Installation Dimensions

Series No.	Rod Diameter		Groove Diameter	Groove Width	Bore Diameter	Step Width	O-Ring Cross Section
	d _N f8/h9						
	Recommended Range	Extended Range	D ₃ H9	L ₃ +0.2	D ₄ H11	a min.	d ₂
WE30	6.0 - 11.9	6.0 - 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.: WE35X1200-T46N.

Order No.	WE31	00500	-	T46	N
Series No.					
Rod diameter x 10*					
Quality Index (Standard)					
Material code (scraper)					
Material code (O-Ring)					



Table V Preferred Series / 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.		
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	9.25 x 1.78
10.0	14.8	3.7	11.5	0.4	2.0	WE3000100	11.20 x 1.80
12.0	18.8	5.0	13.5	0.7	2.0	WE3100120	13.94 x 2.62
14.0	20.8	5.0	15.5	0.7	2.0	WE3100140	15.54 x 2.62
15.0	21.8	5.0	16.5	0.7	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	0.7	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	0.7	2.0	WE3100180	20.29 x 2.62
20.0	26.8	5.0	21.5	0.7	2.0	WE3100200	21.89 x 2.62
22.0	28.8	5.0	23.5	0.7	2.0	WE3100220	23.47 x 2.62
25.0	31.8	5.0	26.5	0.7	2.0	WE3100250	26.64 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	0.7	2.0	WE3100300	31.42 x 2.62
32.0	38.8	5.0	33.5	0.7	2.0	WE3100320	34.59 x 2.62
35.0	41.8	5.0	36.5	0.7	2.0	WE3100350	36.17 x 2.62
36.0	42.8	5.0	37.5	0.7	2.0	WE3100360	37.77 x 2.62
37.0	43.8	5.0	38.5	0.7	2.0	WE3100370	39.34 x 2.62
40.0	46.8	5.0	41.5	0.7	2.0	WE3100400	39.34 x 2.62
42.0	48.8	5.0	43.5	0.7	2.0	WE3100420	42.52 x 2.62
45.0	51.8	5.0	46.5	0.7	2.0	WE3100450	47.29 x 2.62
49.0	55.8	5.0	50.5	0.7	2.0	WE3100490	50.47 x 2.62
50.0	56.8	5.0	51.5	0.7	2.0	WE3100500	52.07 x 2.62
50.8	57.6	5.0	52.3	0.7	2.0	WE3100508	52.07 x 2.62
54.0	60.8	5.0	55.5	0.7	2.0	WE3100540	55.25 x 2.62
55.0	61.8	5.0	56.5	0.7	2.0	WE3100550	56.82 x 2.62
56.0	62.8	5.0	57.5	0.7	2.0	WE3100560	58.42 x 2.62
60.0	66.8	5.0	61.5	0.7	2.0	WE3100600	61.60 x 2.62
63.0	69.8	5.0	64.5	0.7	2.0	WE3100630	64.77 x 2.62
65.0	73.8	6.0	66.5	1.0	3.0	WE3200650	69.44 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	78.97 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	88.49 x 3.53
90.0	98.8	6.0	91.5	1.0	3.0	WE3200900	94.84 x 3.53
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	104.37 x 3.53
105.0	113.8	6.0	106.5	1.0	3.0	WE3201050	107.54 x 3.53

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.

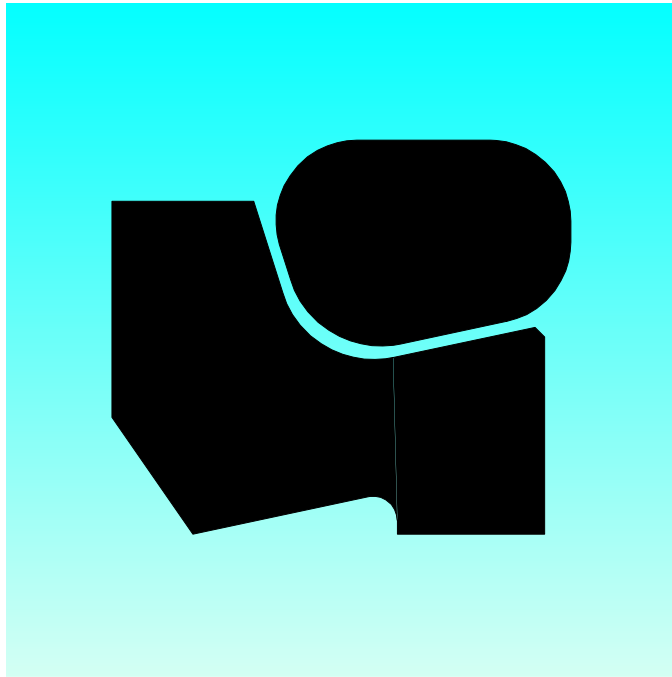


Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	Part No.	O-Ring Size
d _N f8/h9	D ₃ H9	L ₃ +0.2	D ₄ H11	r ₁ max.	a min.		
110.0	118.8	6.0	111.5	1.0	3.0	WE3201100	113.89 x 3.53
115.0	123.8	6.0	116.5	1.0	3.0	WE3201150	117.07 x 3.53
120.0	128.8	6.0	121.5	1.0	3.0	WE3201200	123.42 x 3.53
125.0	133.8	6.0	126.5	1.0	3.0	WE3201250	129.77 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	139.29 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	148.82 x 3.53
150.0	158.8	6.0	151.5	1.0	3.0	WE3201500	158.34 x 3.53
160.0	168.8	6.0	161.5	1.0	3.0	WE3201600	164.69 x 3.53
170.0	178.8	6.0	171.5	1.0	3.0	WE3201700	177.39 x 3.53
180.0	188.8	6.0	181.5	1.0	3.0	WE3201800	183.74 x 3.53
190.0	198.8	6.0	191.5	1.0	3.0	WE3201900	196.44 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	215.49 x 3.53
220.0	228.8	6.0	221.5	1.0	3.0	WE3202200	228.19 x 3.53
230.0	238.8	6.0	231.5	1.0	3.0	WE3202300	234.54 x 3.53
240.0	248.8	6.0	241.5	1.0	3.0	WE3202400	247.24 x 3.53
250.0	258.8	6.0	251.5	1.0	3.0	WE3202500	253.58 x 3.53
260.0	272.2	8.4	262.0	1.5	4.0	WE3302600	266.07 x 5.33
280.0	292.2	8.4	282.0	1.5	4.0	WE3302800	291.47 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	380.37 x 5.33
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	456.06 x 7.00
480.0	496.0	11.0	482.0	1.5	4.0	WE3404800	494.16 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	715.00 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	845.00 x 8.40
880.0	900.0	14.0	882.5	2.0	5.0	WE3508800	888.00 x 8.40
900.0	920.0	14.0	902.5	2.0	5.0	WE3509000	888.00 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.

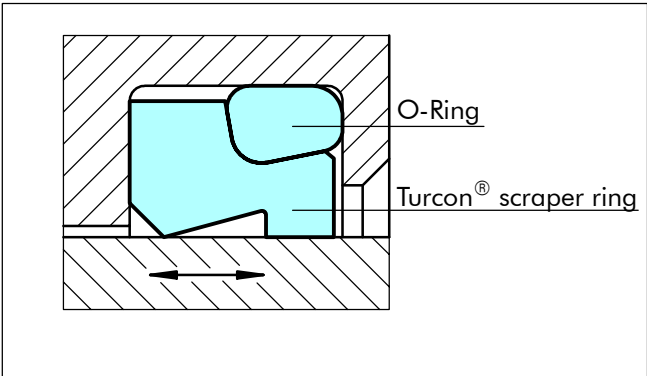


Figure 3 Turcon® Excluder® 5

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®).

Technical Data

- Speed: 15 m/s for Turcon® materials
2 m/s for Zurcon® materials
- Temperature: -45° C to +200° C (Turcon®)
-30° C to +100° C (Zurcon®)
- 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.

Materials

The following material combination has proven effective for most applications:

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

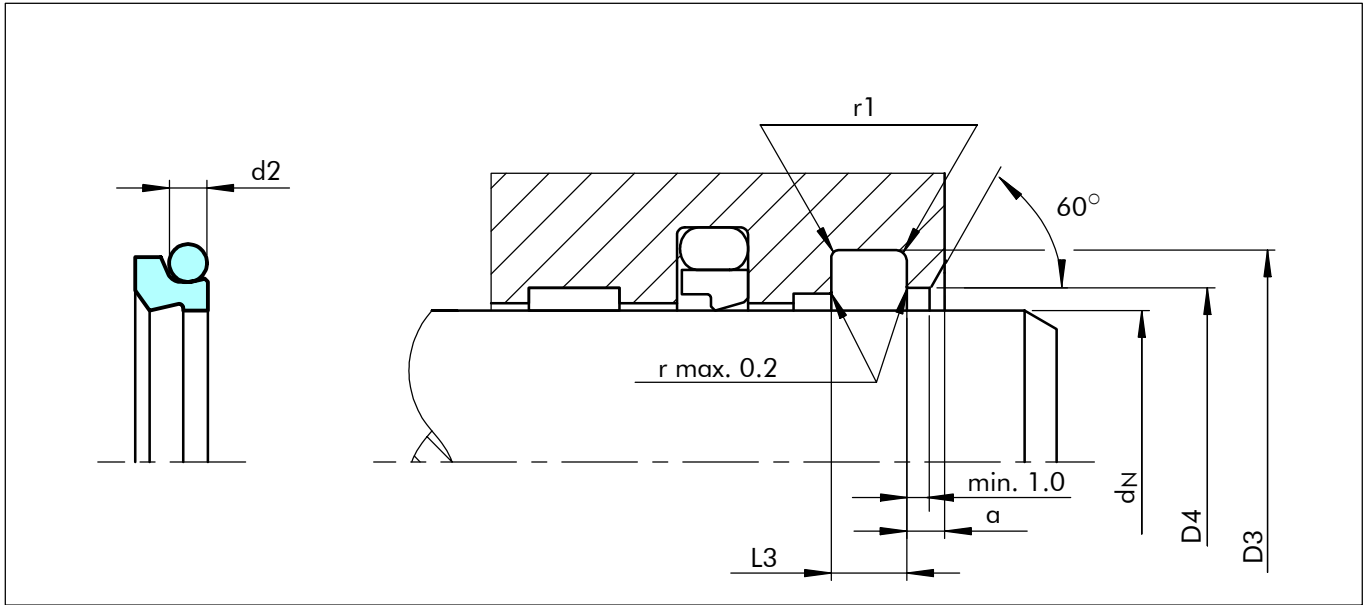


Figure 4 Installation drawing

Table VIII Installation Dimensions

Series No.	Rod Diameter		Groove Diameter	Groove Width	Bore Diameter	Step Width	O-Ring Cross Section
	d _N f8/h9						
	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 - 350.0	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.: WE55X1200-T46N.

Order No.	WE51	00500	-	T46	N
Series No.					
Rod diameter x 10*					
Quality Index (Standard)					
Material code (scraper)					
Material code (O-Ring)					



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	39.34 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	82.2	8.1	72.0	1.5	4.0	WE5200700	75.79 x 3.53
75.0	87.2	8.1	77.0	1.5	4.0	WE5200750	78.97 x 3.53
80.0	92.2	8.1	82.0	1.5	4.0	WE5200800	85.32 x 3.53
85.0	97.2	8.1	87.0	1.5	4.0	WE5200850	88.49 x 3.53
90.0	102.2	8.1	92.0	1.5	4.0	WE5200900	94.84 x 3.53
97.0	109.2	8.1	99.0	1.5	4.0	WE5200970	101.19 x 3.53
99.0	111.2	8.1	101.0	1.5	4.0	WE5200990	104.37 x 3.53
100.0	112.2	8.1	102.0	1.5	4.0	WE5201000	104.37 x 3.53
105.0	117.2	8.1	107.0	1.5	4.0	WE5201050	110.72 x 3.53
110.0	122.2	8.1	112.0	1.5	4.0	WE5201100	113.89 x 3.53
115.0	127.2	8.1	117.0	1.5	4.0	WE5201150	120.24 x 3.53
120.0	132.2	8.1	122.0	1.5	4.0	WE5201200	123.42 x 3.53
125.0	137.2	8.1	127.0	1.5	4.0	WE5201250	129.77 x 3.53
125.4	137.6	8.1	127.4	1.5	4.0	WE5201254	129.77 x 3.53
130.0	142.2	8.1	132.0	1.5	4.0	WE5201300	136.12 x 3.53
135.0	147.2	8.1	137.0	1.5	4.0	WE5201350	139.29 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	158.12 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	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

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.

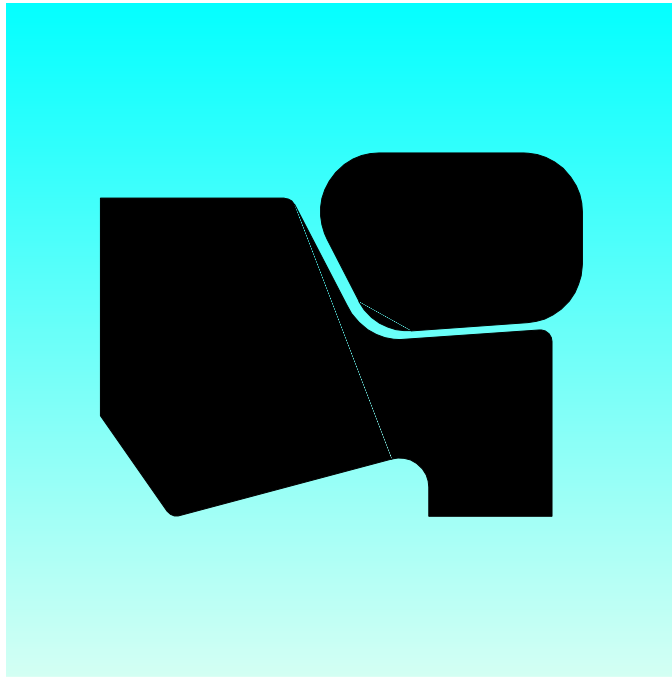


Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	Part No.	O-Ring Size
d _N f8/h9	D ₃ H9	L ₃ +0.2	D ₄ H11	r ₁ max.	a min.		
175.0	191.0	9.5	177.5	1.5	5.0	WE5301750	183.52 x 5.33
180.0	196.0	9.5	182.5	1.5	5.0	WE5301800	183.52 x 5.33
188.2	204.2	9.5	190.7	1.5	5.0	WE5301882	196.22 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	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	236.0	9.5	222.5	1.5	5.0	WE5302200	227.97 x 5.33
240.0	256.0	9.5	242.5	1.5	5.0	WE5302400	247.02 x 5.33
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	296.0	9.5	282.5	1.5	5.0	WE5302800	291.47 x 5.33
300.0	316.0	9.5	302.5	1.5	5.0	WE5303000	304.17 x 5.33
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	376.0	9.5	362.5	1.5	5.0	WE5303600	380.37 x 5.33
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	456.06 x 7.00
450.0	474.0	14.0	452.5	1.5	8.0	WE5404500	456.06 x 7.00
480.0	504.0	14.0	482.5	1.5	8.0	WE5404800	494.16 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	582.68 x 7.00
600.0	624.0	14.0	602.5	1.5	8.0	WE5406000	608.08 x 7.00
650.0	677.3	16.0	652.5	2.0	10.0	WE5506500	649.00 x 8.40
680.0	707.3	16.0	682.5	2.0	10.0	WE5506800	680.00 x 8.40
700.0	727.3	16.0	702.5	2.0	10.0	WE5507000	715.00 x 8.40
770.0	797.3	16.0	772.5	2.0	10.0	WE5507700	774.10 x 8.40
785.0	812.3	16.0	787.5	2.0	10.0	WE5507850	810.00 x 8.40
800.0	827.3	16.0	802.5	2.0	10.0	WE5508000	810.00 x 8.40
810.0	837.3	16.0	812.5	2.0	10.0	WE5508100	810.00 x 8.40
900.0	927.3	16.0	902.5	2.0	10.0	WE5509000	910.00 x 8.40
950.0	977.3	16.0	952.5	2.0	10.0	WE5509500	959.10 x 8.40
1000.0	1027.3	16.0	1002.5	2.0	10.0	WE55X1000	1010.0 x 8.40
1040.0	1067.3	16.0	1042.5	2.0	10.0	WE55X1040	1050.0 x 8.40
1130.0	1157.3	16.0	1132.5	2.0	10.0	WE55X1130	1140.0 x 8.40
1200.0	1227.3	16.0	1202.5	2.0	10.0	WE55X1200	1210.0 x 8.40
2600.0	2627.3	16.0	2602.5	2.0	10.0	WE55X2600	2610.0 x 8.40

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

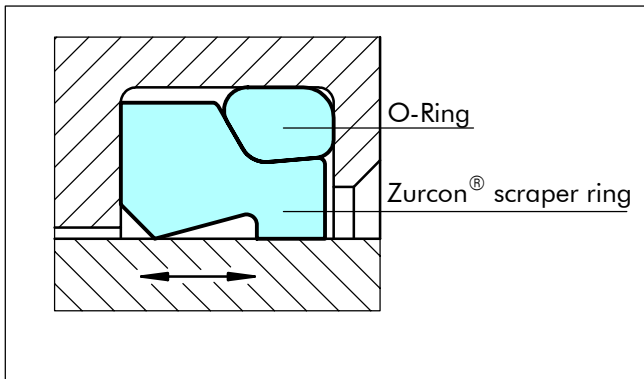


Figure 5 Zurcon[®] Excluder[®] 500

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

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.

Materials

Standard material:	
Excluder [®] 500:	Zurcon [®] Z05
Colour:	Turquoise
O-Ring:	NBR, 70 Shore A
Set:	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

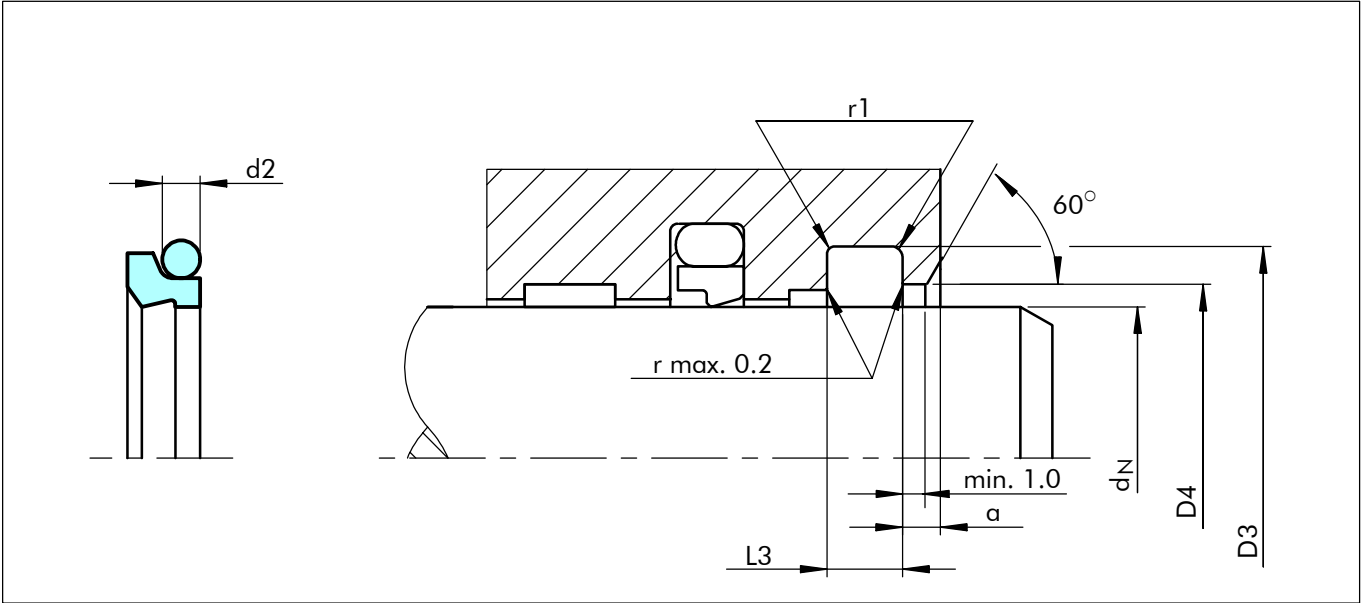


Figure 6 Installation drawing

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

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



Table XI Preferred Series / 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	39.34 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	1.5	4.0	WEP200700	75.79 x 3.53
75.0	87.2	8.1	77.0	1.5	4.0	WEP200750	78.97 x 3.53
80.0	92.2	8.1	82.0	1.5	4.0	WEP200800	85.32 x 3.53
85.0	97.2	8.1	87.0	1.5	4.0	WEP200850	88.49 x 3.53
90.0	102.2	8.1	92.0	1.5	4.0	WEP200900	94.84 x 3.53
95.0	107.2	8.1	97.0	1.5	4.0	WEP200950	101.19 x 3.53
100.0	112.2	8.1	102.0	1.5	4.0	WEP201000	104.37 x 3.53
105.0	117.2	8.1	107.0	1.5	4.0	WEP201050	110.72 x 3.53
110.0	122.2	8.1	112.0	1.5	4.0	WEP201100	113.89 x 3.53
120.0	132.2	8.1	122.0	1.5	4.0	WEP201200	123.42 x 3.53
125.0	137.2	8.1	127.0	1.5	4.0	WEP201250	129.77 x 3.53
130.0	142.2	8.1	132.0	1.5	4.0	WEP201300	136.12 x 3.53

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



B+S 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.

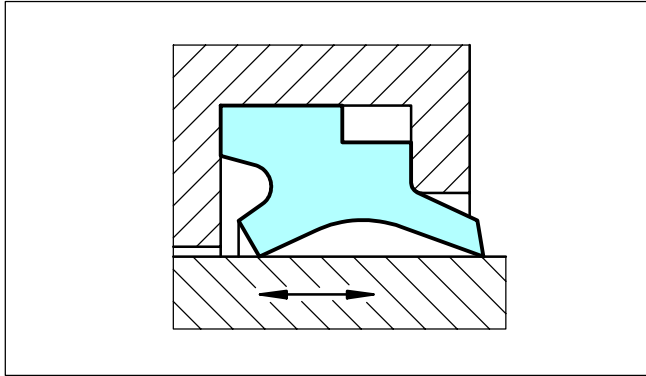


Figure 7 Scraper DA 17

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.

Material

Standard material: NBR, 90 Shore A

Ordering Example

Scraper DA 17
 Rod diameter: $d_N = 50.0 \text{ mm}$
 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

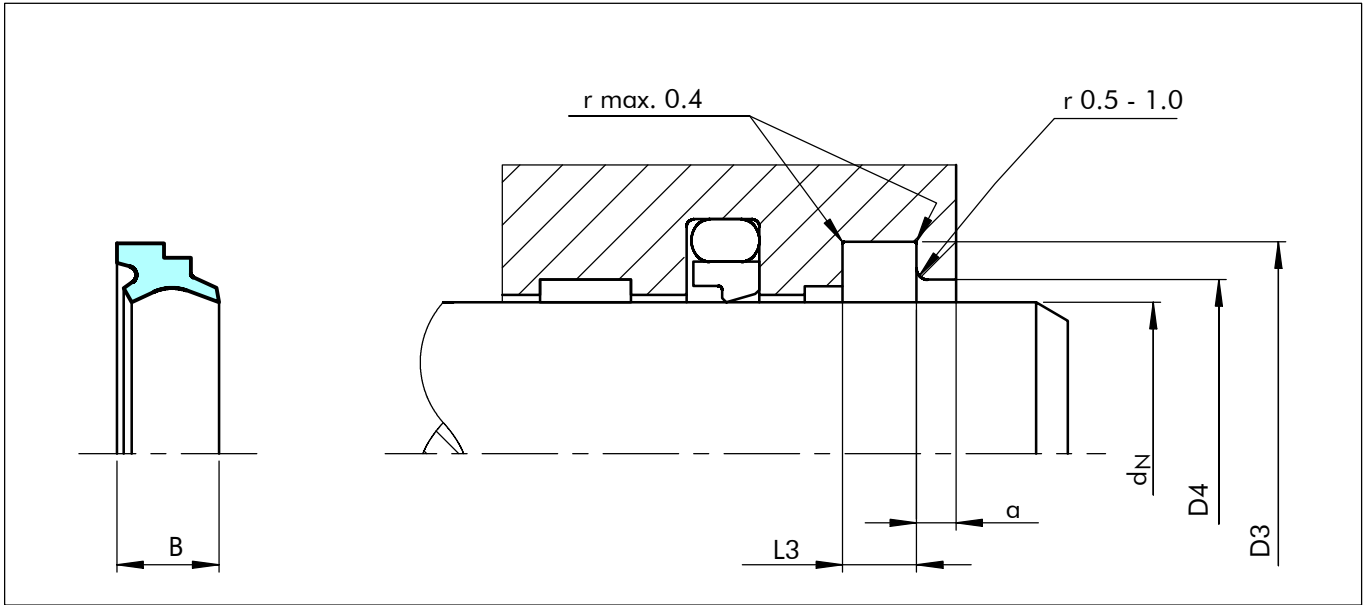


Figure 8 Installation drawing

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.



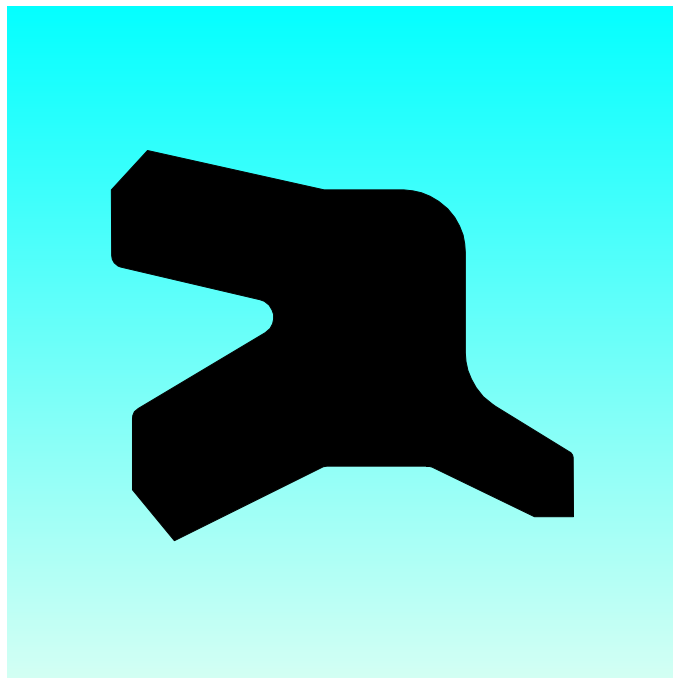
Scrapper DA 17

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.

SEALING PARTS RSW

B+S DA22



- Double Acting -

- Material -

- Polyurethane -



■ Scraper DA 22 and RSW

Description

These scrapers are double-acting polyurethane wipers 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.

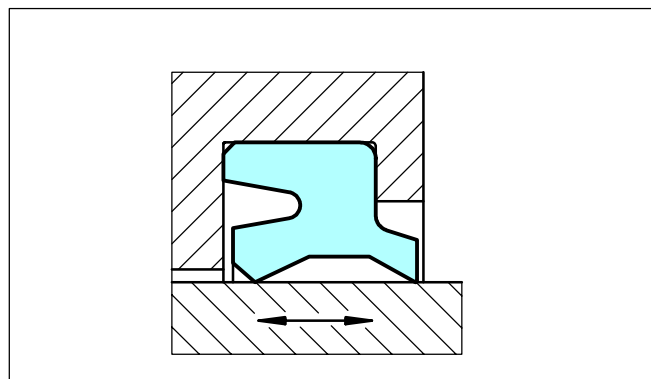


Figure 9 Scraper DA 22 - RSW

Advantages

- Good scraping effect
- Wear resistant, long service life
- Retaining residual oil film
- Standard elements for standardized installation grooves (DA 22)

Application Examples

Due to their outstanding wiping capacities, DA22 - RSW scrapers are 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:	-30°C to +80°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.

Materials

Standard application:

Polyurethane:	93 Shore A	
Sealing Parts code:	WU9L3	blue color
Busak+Shamban code:	WUAQ3	turquoise



Installation Recommendation

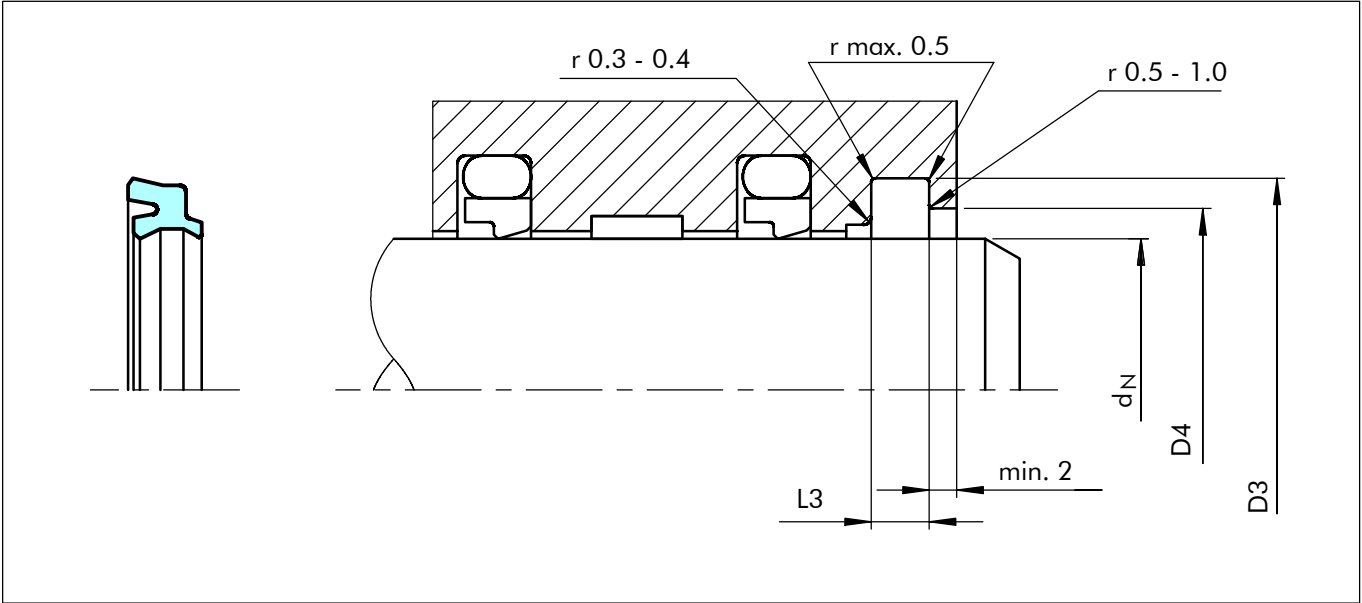


Figure 10 Installation drawing

Table XIII Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	B+S Ref. No.	Sealing Parts Ref. No.	Part No.
d _N f8/h9	D ₃ H9	L ₃ +0.1	D ₄ H11	Material Code		
				WUAQ3	WU9L3	
5.0	10.0	3.5	7.5	WD2200050	-	WD2200050
8.0	13.0	3.5	10.5	WD2200080	-	WD2200080
10.0	16.0	4.0	12.5	WD2200100	-	WD2200100
12.0	18.0	4.0	14.5	WD2200120	-	WD2200120
12.0	18.6	3.8	15.0	-	RSW12	WD2210120
14.0	20.0	4.0	16.5	WD2200140	-	WD2200140
14.0	20.6	3.8	17.0	-	RSW14	WD2210140
16.0	22.0	4.0	18.5	WD2200160	-	WD2200160
18.0	24.0	4.0	20.5	WD2200180	-	WD2200180
18.0	24.6	3.8	21.0	-	RSW18	WD2210180
20.0	26.0	4.0	22.5	WD2200200	-	WD2200200
20.0	28.6	5.3	23.0	-	RSW20	WD2210200
22.0	28.0	4.0	24.5	WD2200220	-	WD2200220
22.0	30.6	5.3	25.0	-	RSW22	WD2210220
24.0	32.6	5.3	27.0	-	RSW24	WD2210240

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. The listed products are technically equivalent but availability and pricing may vary.

Scraper DA 22 - RSW



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	B+S Ref. No.	Sealing Parts Ref. No.	Part No.
d _N f8/h9	D ₃ H9	L ₃ +0.1	D ₄ H11	Material Code		
				WUAQ3	WU9L3	
25.0	31.0	4.0	27.5	WD2200250	-	WD2200250
25.0	33.6	5.3	28.0	-	RSW25	WD2210250
28.0	36.0	5.0	31.0	WD2200280	-	WD2200280
28.0	36.6	5.3	31.0	-	RSW28	WD2210280
30.0	38.0	5.0	33.0	WD2200300	-	WD2200300
30.0	38.6	5.3	33.0	-	RSW30	WD2210300
32.0	40.0	5.0	35.0	WD2200320	-	WD2200320
32.0	40.6	5.3	35.0	-	RSW32	WD2210320
35.0	43.0	5.0	38.0	WD2200350	-	WD2200350
35.0	43.6	5.3	38.0	-	RSW35	WD2210350
36.0	44.0	5.0	39.0	WD2200360	-	WD2200360
36.0	44.6	5.3	39.0	-	RSW36	WD2210360
40.0	48.0	5.0	43.0	WD2200400	-	WD2200400
40.0	48.6	5.3	43.0	-	RSW 40	WD2210400
45.0	53.0	5.0	48.0	WD2200450	-	WD2200450
45.0	53.6	5.3	48.0	-	RSW45	WD2210450
50.0	58.0	5.0	53.0	WD2200500	-	WD2200500
50.0	58.6	5.3	53.0	-	RSW 50	WD2210500
55.0	63.6	5.3	58.0	-	RSW 55	WD2210550
55.0	65.0	6.0	58.0	WD2200550	-	WD2200550
56.0	64.6	5.3	59.0	-	RSW 56	WD2210560
56.0	66.0	6.0	59.0	WD2200560	-	WD2200560
58.0	68.0	6.0	61.0	WD2200580	-	WD2200580
60.0	68.6	5.3	63.0	-	RSW 60	WD2210600
60.0	70.0	6.0	63.0	WD2200600	-	WD2200600
63.0	71.6	5.3	66.0	-	RSW 63	WD2210630
63.0	73.0	6.0	66.0	WD2200630	-	WD2200630
65.0	73.6	5.3	68.0	-	RSW 65	WD2210650
65.0	75.0	6.0	68.0	WD2200650	-	WD2200650
70.0	78.6	5.3	73.0	-	RSW 70	WD2210700
70.0	80.0	6.0	73.0	WD2200700	-	WD2200700
75.0	83.6	5.3	78.0	-	RSW 75	WD2210750
75.0	85.0	6.0	78.0	WD2200750	-	WD2200750

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.
The listed products are technically equivalent but availability and pricing may vary.



Scrapper DA 22 - RSW

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	B+S Ref. No.	Sealing Parts Ref. No.	Part No.
d _N f8/h9	D ₃ H9	L ₃ +0.1	D ₄ H11	Material Code		
				WUAQ3	WU9L3	
78.0	88.0	6.0	81.0	WD2200780	-	WD2200780
80.0	88.6	5.3	83.0	-	RSW 80	WD2210800
80.0	90.0	6.0	83.0	WD2200800	-	WD2200800
85.0	95.0	6.0	88.0	WD2200850	-	WD2200850
85.0	97.2	7.1	91.0	-	RSW 85	WD2210850
90.0	100.0	6.0	93.0	WD2200900	-	WD2200900
90.0	102.2	7.1	96.0	-	RSW 90	WD2210900
100.0	110.0	6.0	103.0	WD2201000	-	WD2201000
100.0	112.2	7.1	106.0	-	RSW 100	WD2211000
110.0	122.2	7.1	116.6	-	RSW 110	WD2211100
110.0	125.0	8.5	114.0	WD2201100	-	WD2201100
120.0	135.0	8.5	124.0	WD2201200	-	WD2201200
125.0	140.0	8.5	129.0	WD2201250	-	WD2201250
140.0	155.0	8.5	144.0	WD2201400	-	WD2201400
150.0	165.0	8.5	154.0	WD2201500	-	WD2201500
160.0	175.0	8.5	164.0	WD2201600	-	WD2201600
180.0	195.0	8.5	184.0	WD2201800	-	WD2201800

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.

The listed products are technically equivalent but availability and pricing may vary.

Ordering Example

Rod diameter: d_N = 36 mm

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

D3 = 44.6 mm (see example 2)

Example 1

Part number: WD2200360

Material Code: WUAQ3

Sealing Parts Ref. No.: Not available

Example 2

Part number: WD2210360

Material Code: WU9L3

Sealing Parts Part No.: RSW36

B+S Ref. No.: Not available

Order No.

WD22

0

0360

-

WUAQ3

Series No.

Type (Standard)

Rod diameter x 10

Quality Index (see table)

Material-code

Order No.

WD22

1

0360

-

WU9L3

Series No.

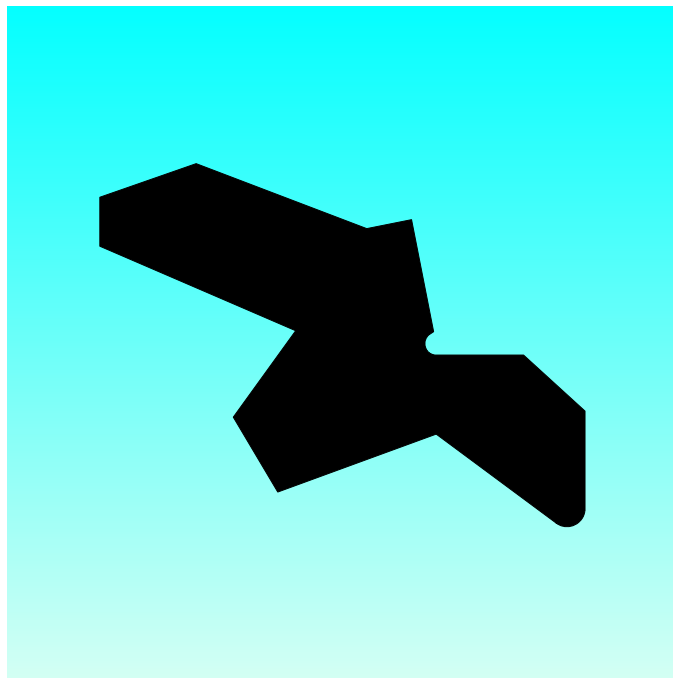
Type (Standard)

Rod diameter x 10

Quality Index (see table)

Material-code

B+S DA 24



- Double-acting -

- Material -

- Polyurethane -





■ Scraper DA 24

Description

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

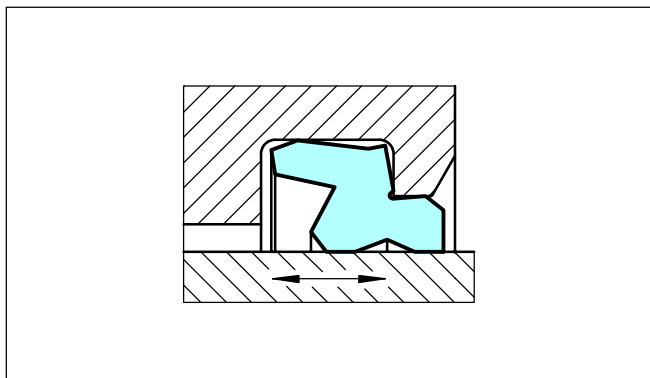


Figure 11 Scraper DA 24

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: -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.

Material

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

Polyester-Polyurethane: WUAQ3
93 Shore A



Scraper DA 24

Installation Recommendation

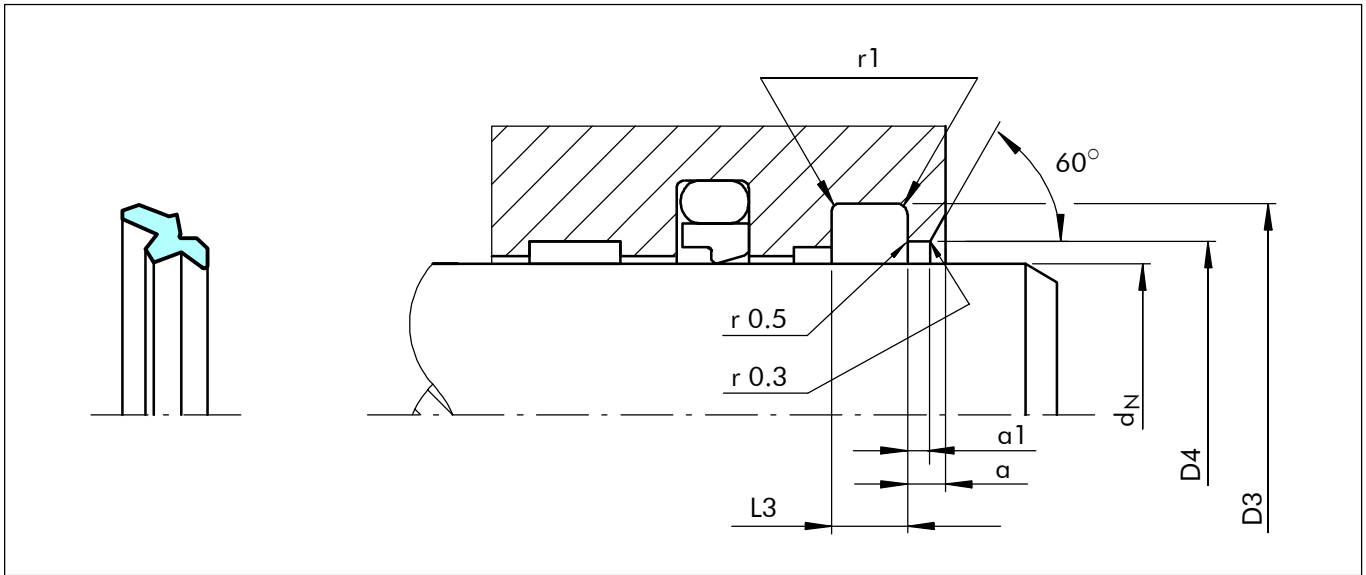


Figure 12 Installation drawing

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-WUAQ3
60.0	68.8	6.3	1.2	64.4	3.2	2.0	WD2400600-WUAQ3
70.0	82.2	8.1	1.6	76.0	4.0	2.5	WD2400700-WUAQ3
75.0	87.2	8.1	1.6	81.0	4.0	2.5	WD2400750-WUAQ3
80.0	92.2	8.1	1.6	86.0	4.0	2.5	WD2400800-WUAQ3
85.0	97.2	8.1	1.6	91.0	4.0	2.5	WD2400850-WUAQ3
90.0	102.2	8.1	1.6	96.0	4.0	2.5	WD2400900-WUAQ3
95.0	107.2	8.1	1.6	101.0	4.0	2.5	WD2400950-WUAQ3
100.0	112.2	8.1	1.6	106.0	4.0	2.5	WD2401000-WUAQ3
105.0	117.2	8.1	1.6	111.0	4.0	2.5	WD2401050-WUAQ3
110.0	122.2	8.1	1.6	116.0	4.0	2.5	WD2401100-WUAQ3
125.0	137.2	8.1	1.6	131.0	4.0	2.5	WD2401250-WUAQ3
140.0	156.0	9.5	2.0	148.0	5.0	3.0	WD2401400-WUAQ3
150.0	166.0	9.5	2.0	158.0	5.0	3.0	WD2401500-WUAQ3
160.0	176.0	9.5	2.0	168.0	5.0	3.0	WD2401600-WUAQ3
170.0	186.0	9.5	2.0	178.0	5.0	3.0	WD2401700-WUAQ3
180.0	196.0	9.5	2.0	188.0	5.0	3.0	WD2401800-WUAQ3
190.0	206.0	9.5	2.0	198.0	5.0	3.0	WD2401900-WUAQ3
200.0	216.0	9.5	2.0	208.0	5.0	3.0	WD2402000-WUAQ3
220.0	236.0	9.5	2.0	228.0	5.0	3.0	WD2402200-WUAQ3
240.0	256.0	9.5	2.0	248.0	5.0	3.0	WD2402400-WUAQ3
260.0	276.0	9.5	2.0	258.0	5.0	3.0	WD2402600-WUAQ3
280.0	296.0	9.5	2.0	288.0	5.0	3.0	WD2402800-WUAQ3

Other dimensions on request.

POLYPAC[®] 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.

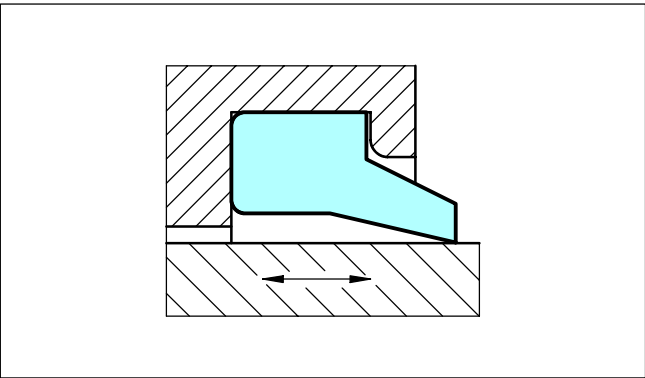


Figure 13 Scraper WRM

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.

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
Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index					
Material code					



Installation Recommendation

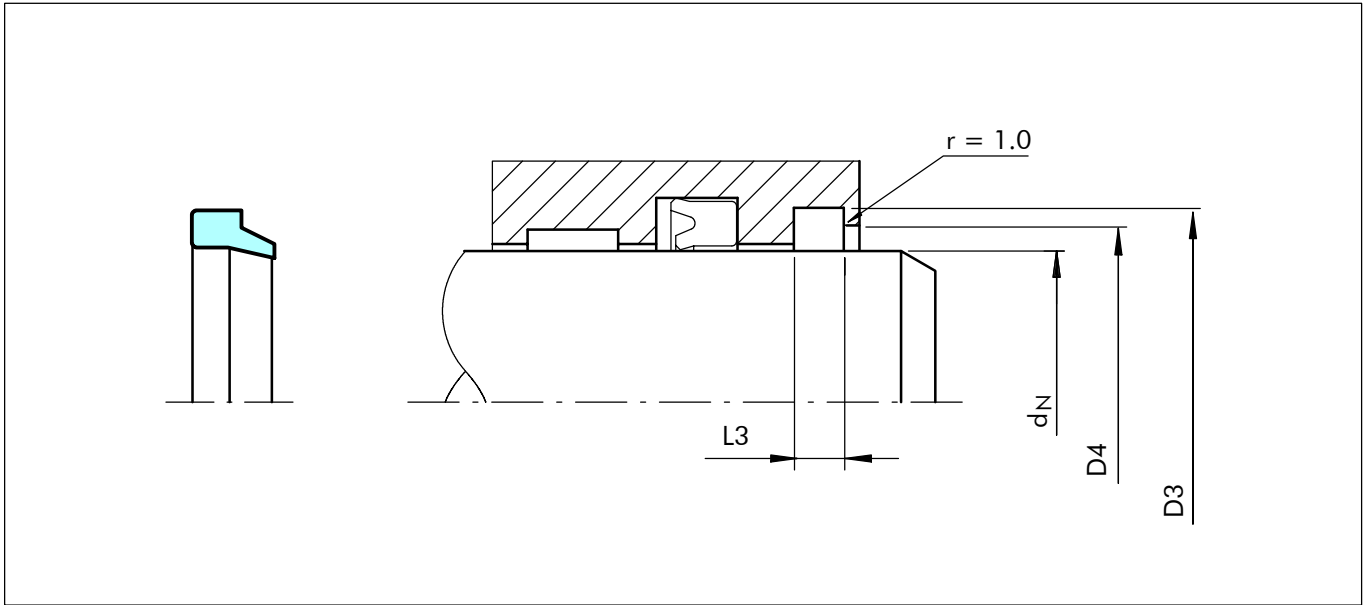


Figure 14 Installation drawing

Table XV Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Polypac Ref. No.	Part No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 +0.2		
12.0	18.6	3.8	15.0	WRM 047070	WAP000120
13.0	19.6	3.8	16.0	WRM 051074	WAP000130
14.0	20.6	3.8	17.0	WRM 055078	WAP000140
15.0	21.6	3.8	18.0	WRM 059082	WAP000150
16.0	22.6	3.8	19.0	WRM 062087	WAP000160
17.0	23.6	3.8	20.0	WRM 066094	WAP000170
18.0	24.6	3.8	21.0	WRM 070094	WAP000180
19.0	28.6	5.3	22.0	WRM 074110	WAP000190
20.0	28.6	5.3	23.0	WRM 078110	WAP000200
22.0	30.6	5.3	25.0	WRM 086118	WAP000220
24.0	32.6	5.3	27.0	WRM 094125	WAP000240
25.0	33.6	5.3	28.0	WRM 098129	WAP000250
26.0	34.6	5.3	29.0	WRM 102133	WAP000260
27.0	35.6	5.3	30.0	WRM 106137	WAP000270
28.0	36.6	5.3	31.0	WRM 110141	WAP000280
30.0	38.6	5.3	33.0	WRM 118149	WAP000300
32.0	40.6	5.3	35.0	WRM 125157	WAP000320
33.0	41.6	5.3	36.0	WRM 129161	WAP000330
35.0	43.6	5.3	38.0	WRM 137169	WAP000350
36.0	44.6	5.3	39.0	WRM 141173	WAP000360
38.0	46.6	5.3	41.0	WRM 149181	WAP000380



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Polypac Ref. No.	Part No.
d _N f8/h9	D ₃ H9	L ₃ +0.1	D ₄ +0.2		
40.0	48.6	5.3	43.0	WRM 157188	WAP000400
42.0	50.6	5.3	45.0	WRM 165196	WAP000420
45.0	53.6	5.3	48.0	WRM 177208	WAP000450
45.0	55.6	5.3	49.0	WRM 177216	WAP100450
46.0	54.6	5.3	49.0	WRM 181212	WAP000460
48.0	56.6	5.3	51.0	WRM 188220	WAP000480
49.0	57.6	5.3	52.0	WRM 193225	WAP000490
50.0	58.6	5.3	53.0	WRM 196228	WAP000500
50.0*	60.6	5.3	54.0	WRM 196236	WAP100500
50.8	60.9	5.8	55.5	WRM 200237	WAP000508
53.0*	61.6	5.3	56.0	WRM 208240	WAP000530
55.0*	63.6	5.3	58.0	WRM 216248	WAP000550
55.0	65.6	5.3	59.0	WRM 216255	WAP100550
56.0	64.6	5.3	59.0	WRM 220251	WAP000560
56.0*	66.6	5.3	60.0	WRM 220259	WAP100560
60.0	68.6	5.3	63.0	WRM 236267	WAP000600
63.0*	71.6	5.3	66.0	WRM 248279	WAP000630
63.0	73.6	5.3	67.0	WRM 248287	WAP100630
65.0	73.6	5.3	68.0	WRM 255287	WAP000650
65.0	75.6	5.3	69.0	WRM 255295	WAP100650
70.0*	76.0	4.3	72.0	WRM 275299	WAP000700
70.0	78.6	5.3	73.0	WRM 275307	WAP100700
70.0	80.6	5.3	72.0	WRM 275314	WAP200700
70.0	82.6	7.1	76.0	WRM 275322	WAP300700
72.0	80.6	5.3	75.0	WRM 283317	WAP000720
73.0	81.6	5.3	76.0	WRM 287318	WAP000730
75.0	83.6	5.3	78.0	WRM 295326	WAP000750
75.0	87.2	7.1	81.0	WRM 295345	WAP100750
76.5	88.7	7.1	82.5	WRM 301348	WAP000765
78.0	92.2	7.1	85.0	WRM 307362	WAP000780
80.0	88.6	5.3	83.0	WRM 314346	WAP000800
80.0	92.6	7.1	86.0	WRM 314362	WAP100800
83.0	91.6	5.3	86.0	WRM 326358	WAP000830
84.0	92.0	5.3	87.0	WRM 330362	WAP000840
85.0	93.6	5.3	88.0	WRM 334366	WAP000850
85.0	97.2	7.1	91.0	WRM 334381	WAP100850
88.0	100.2	7.1	94.0	WRM 346393	WAP000880
90.0	102.2	7.1	96.0	WRM 354401	WAP000900
95.0	107.2	7.1	101.0	WRM 374421	WAP000950
97.0	111.0	7.1	104.0	WRM 380437	WAP000970
100.0	112.2	7.1	106.0	WRM 393440	WAP001000
101.0	111.0	5.3	105.0	WRM 397437	WAP001010
103.0	115.2	7.1	109.0	WRM 405452	WAP001030
104.0	116.2	7.1	110.0	WRM 409457	WAP001040

* Available upon request

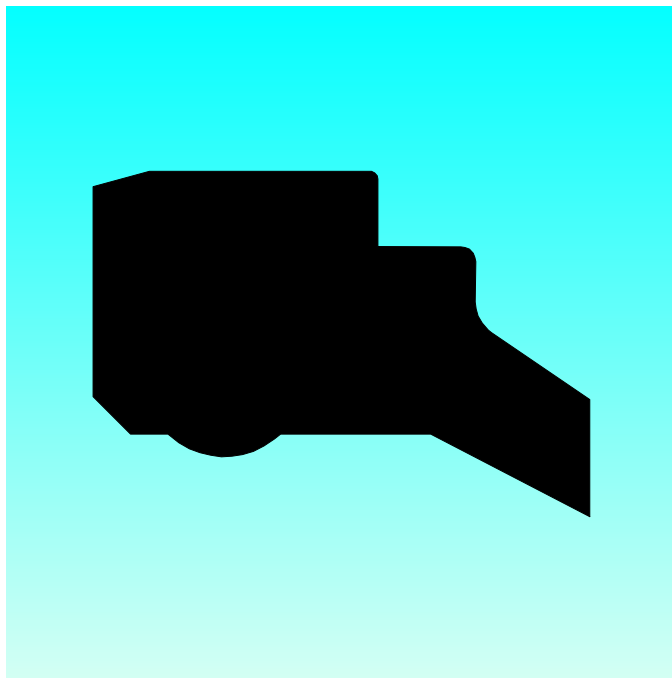


Scraper WRM

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Polypac Ref. No.	Part No.
d _N f8/h9	D ₃ +H9	L ₃ +0.1	D ₄ +0.2		
105.0	117.2	7.1	111.0	WRM 413460	WAP001050
110.0	122.2	7.1	116.0	WRM 433480	WAP001100
115.0	127.2	7.1	121.0	WRM 452500	WAP001150
116.0	128.2	7.1	121.0	WRM 456504	WAP001160
116.0	130.2	7.1	123.0	WRM 456511	WAP101160
118.0*	130.2	7.1	124.0	WRM 464511	WAP001180
120.0	128.6	5.3	123.0	WRM 472504	WAP001200
120.0	132.2	7.1	126.0	WRM 472519	WAP101200
121.0*	131.0	5.3	125.0	WRM 476515	WAP001210
125.0	137.2	7.1	131.0	WRM 492539	WAP001250
127.0	135.6	5.3	132.0	WRM 500531	WAP001270
127.0	139.2	7.1	133.0	WRM 500550	WAP101270
130.0	142.2	7.1	136.0	WRM 511559	WAP001300
135.0	147.2	7.1	141.0	WRM 531578	WAP001350
135.0	149.2	7.1	142.0	WRM 531582	WAP101350
140.0	152.2	7.1	146.0	WRM 551598	WAP001400
140.0	155.2	10.1	147.0	WRM 551610	WAP101400
145.0	157.2	7.1	151.0	WRM 570618	WAP001450
146.0*	158.0	6.3	152.0	WRM 575622/1	WAP001460
146.05	158.25	7.1	152.05	WRM 575622	WAP001461
150.0*	162.2	7.1	156.0	WRM 590637	WAP001500
155.0	169.2	7.1	162.0	WRM 610664	WAP001550
160.0	168.6	5.3	163.0	WRM 629661	WAP001600
160.0	175.2	10.1	168.0	WRM 629688	WAP101600
165.0	173.6	5.3	168.0	WRM 649681	WAP001650
165.0	177.2	7.1	171.0	WRM 649698	WAP101650
170.0	180.6	5.3	174.0	WRM 669708	WAP001700
170.0	185.2	10.1	178.0	WRM 669728	WAP101700
171.0	183.0	6.3	176.0	WRM 673720	WAP001710
175.0	189.2	7.1	182.0	WRM 688744	WAP001750
180.0	195.2	10.1	188.0	WRM 708767	WAP001800
187.0*	195.6	5.3	190.0	WRM 736768	WAP001870
196.0	210.2	7.1	203.0	WRM 771826	WAP001960
197.0	219.0	6.3	202.0	WRM 775823	WAP001970
200.0	215.2	10.1	207.0	WRM 787847	WAP002000
210.0	224.2	7.1	217.0	WRM 826883	WAP002100
210.0	225.0	7.0	217.0	WRM 826885	WAP102100
219.5	233.7	7.1	226.5	WRM 860919	WAP002195
223.0	235.0	6.3	228.0	WRM 878925	WAP002230
244.5	258.7	7.1	251.5	WRM 9621017	WAP002445
249.0	261.0	6.3	254.0	WRM 9801027	WAP002490
260.0	275.2	10.1	268.0	WRM 10241078	WAP002600

* Available upon request

B+S SCRAPER ASW



- Single Acting -

- Material -

- Polyurethane -





Scraper ASW

Description

The scraper ASW is a single-acting polyurethane scraper.

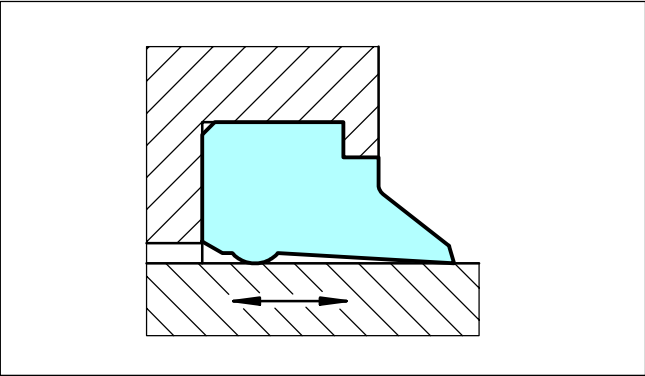


Figure 15 Scraper ASW

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:	-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.

Material

The standard material is a wear resistant polyurethane.

Standard material: Polyurethane, 93 Shore A
Material No. WUAQ3

Ordering Example

Scraper ASW	
Rod diameter:	$d_N = 50.0 \text{ mm}$
Part No.:	WSW000500 (from Table XVI)
Material:	WUAQ3

Order No.	WSW0	0	0500	-	WUAQ3
Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index					
Material code					

Installation Recommendation

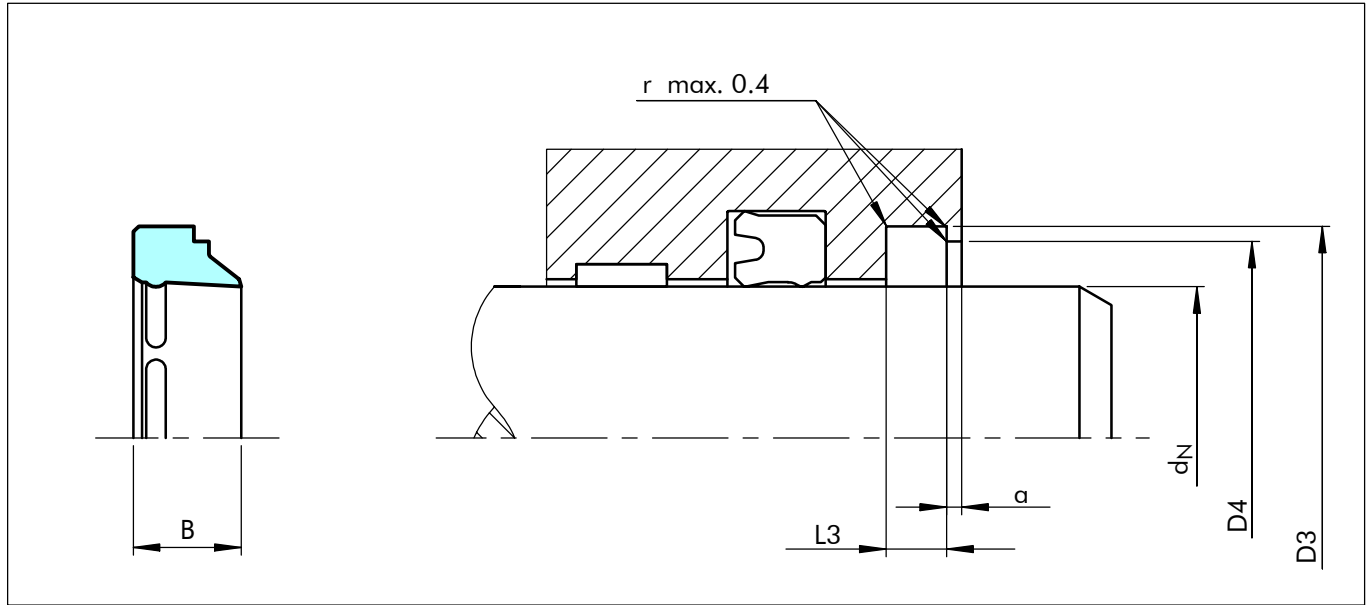


Figure 16 Installation drawing

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.

Scraper ASW

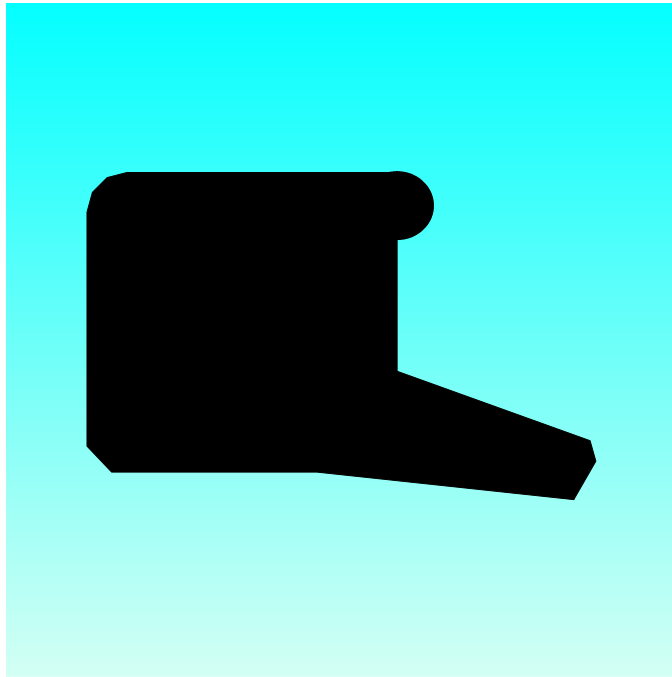


Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	Part No.
d _N f8/h9	D ₃ H9	L ₃ +0.2	D ₄ H11	a min.	B	
30.0	36.0	2.6	34.0	1.0	5.0	WSW100300
30.0	38.0	4.0	36.0	1.0	7.0	WSW000300
32.0	40.0	4.0	38.0	1.0	7.0	WSW000320
34.0	42.0	4.0	40.0	1.0	7.0	WSW000340
35.0	43.0	4.0	41.0	1.0	7.0	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
70.0	78.0	4.0	76.0	2.0	7.3	WSW100700
75.0	83.0	4.0	81.0	1.0	7.0	WSW000750
75.0	83.0	4.0	81.0	2.0	7.3	WSW100750
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
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.



SEALING PARTS 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.

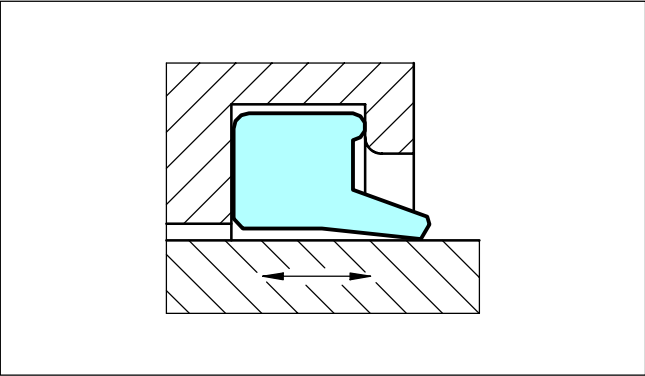


Figure 17 Scraper PW

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:	-30° 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.

Materials

Polyurethane:	93 Shore A
Sealing Parts code:	WU9L3 blue color

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.	WNP0	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 WNW.

Installation Recommendation

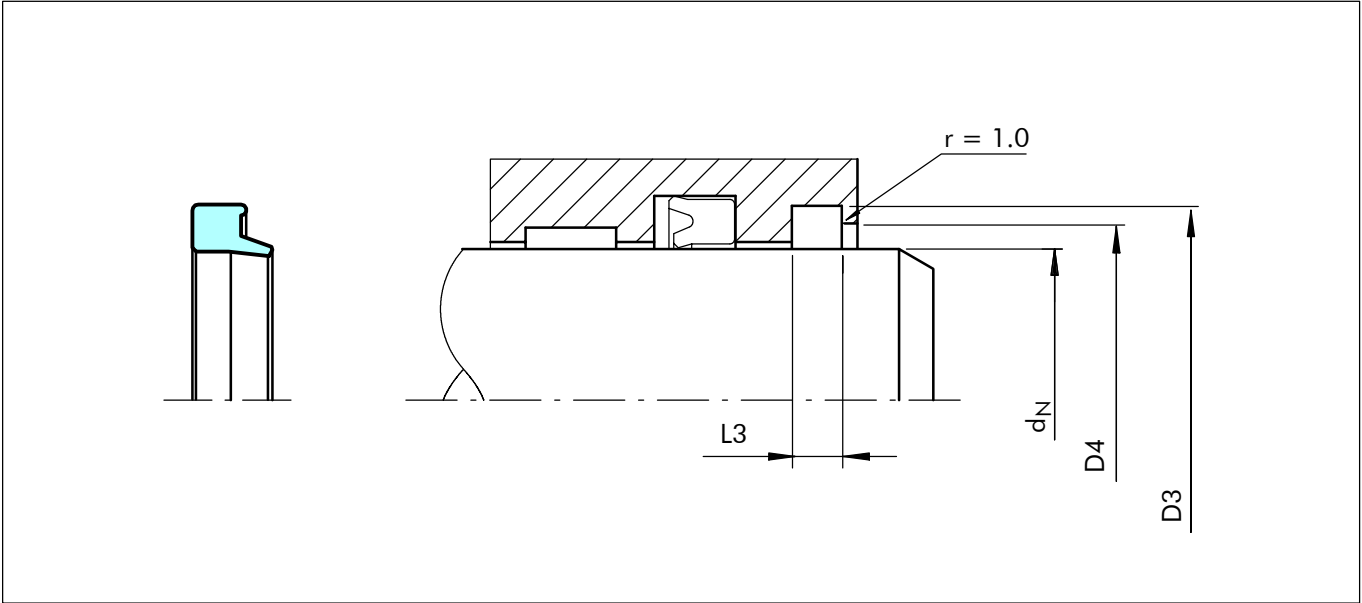


Figure 18 Installation drawing

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

Scraper PW



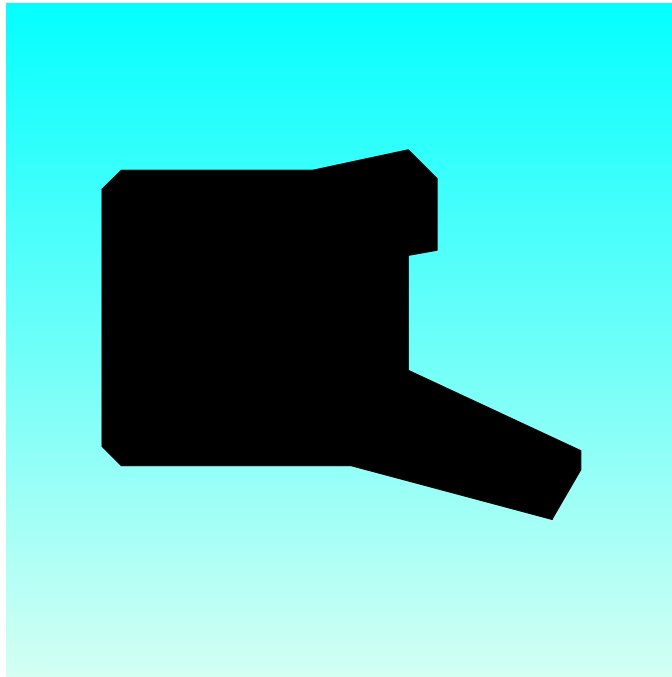
Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Sealing Parts Ref. No.	Part No.
d _N h9	D ₃ H9	L ₃ +0.1	D ₄ +0.2		
80.0	92.6	7.1	86.0	PW 80/1	WNP100800
85.0	93.6	5.3	88.0	PW 85/1	WNP100850
85.0	97.2	7.1	91.0	PW 85	WNP000850
90.0	100.0	7.0	94.0	PW 90/2	WNP200900
90.0	102.0	6.0	94.0	PW 90/1	WNP100900
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



B+S WNE



- Single Acting -**
- Dynamic + Static Sealing Lip -**
- Material -**
- 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.

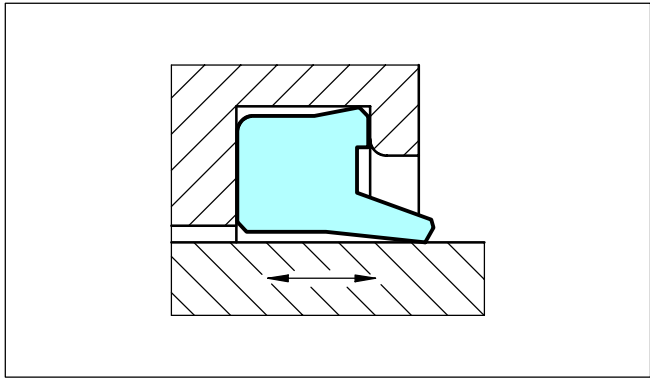


Figure 19 Scraper WNE

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 with
- Temperature: -30° 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.

Materials

- Polyurethane: 93 Shore A
- WNE material code: WUAQ3 turquoise

Ordering Example

For WNE scrapers

- Rod diameter: $d_N = 45 \text{ mm}$
- Groove diameter: $D3 = 53.6 \text{ mm}$
- Part number: WNE000450
- Material code: WUAQ3

Order No.	WNE0	0	0450	-	WUAQ3
Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index					
Material code					



Installation Recommendation

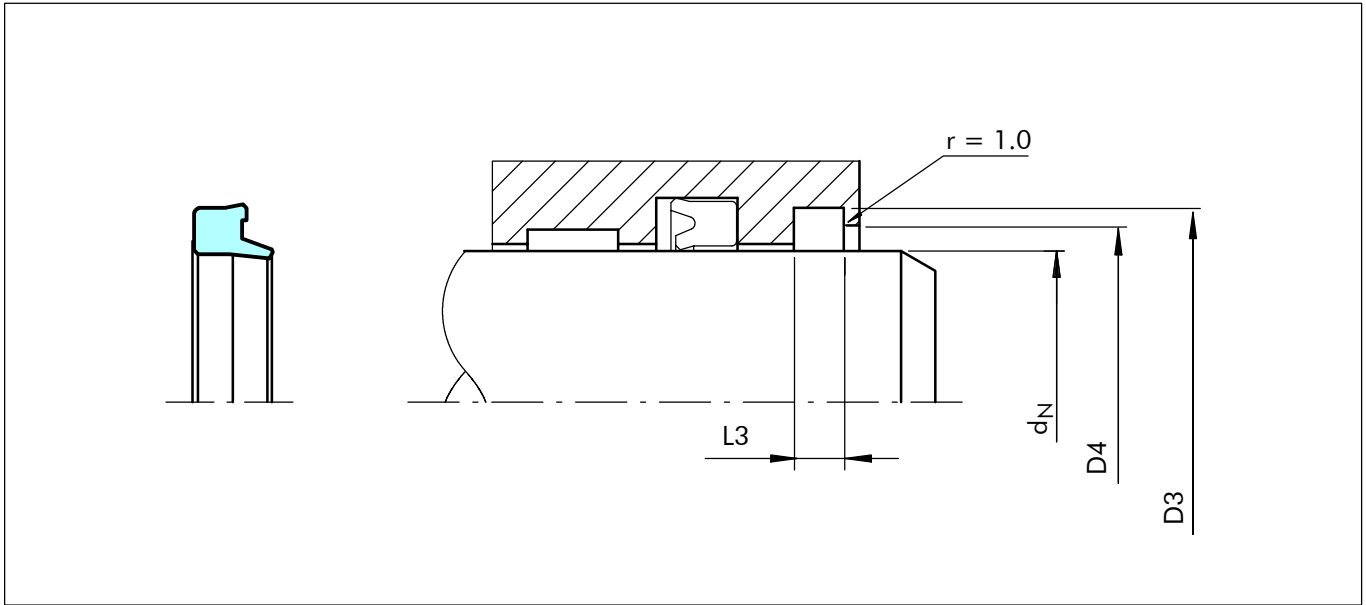


Figure 20 Installation drawing

Table XVIII Installation Dimensions / Part Numbers

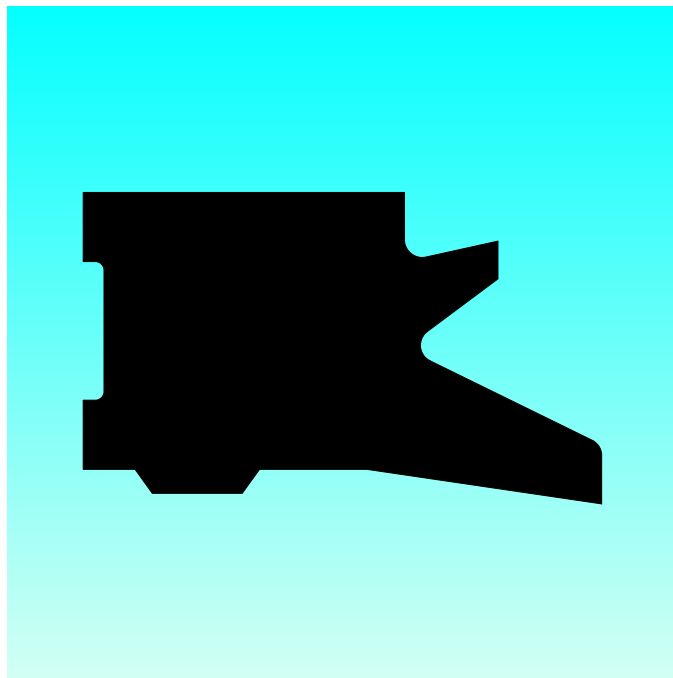
Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Part No.
d_N h9	D_3 H11	L_3 +0.1	D_4 +0.2	
8.0	14.6	3.8	11.0	WNE000080
10.0	16.6	3.8	13.0	WNE000100
12.0	18.6	3.8	15.0	WNE000120
13.0	19.6	3.8	16.0	WNE000130
14.0	20.6	3.8	17.0	WNE000140
15.0	21.6	3.8	18.0	WNE000150
16.0	22.6	3.8	19.0	WNE000160
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	58.0	5.3	53.0	WNE000500
50.0	58.6	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	WNE200600
60.0	68.6	5.3	63.0	WNE100600
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



B+S WNW



- **Single Acting** -
- **Additional Static Sealing Lip** -
- **Additional Supporting Bead** -
- **Material** -
- **Polyurethane** -



■ Scraper WNW

Description

WNW are polyurethane manufactured lipped wipers for the protection of cylinders against dirt. The static sealing lip and edge respectively ensure against the intrusion of dirt and fluids over the outer diameter. The support on the reverse side of the wiper prevents it from twisting.

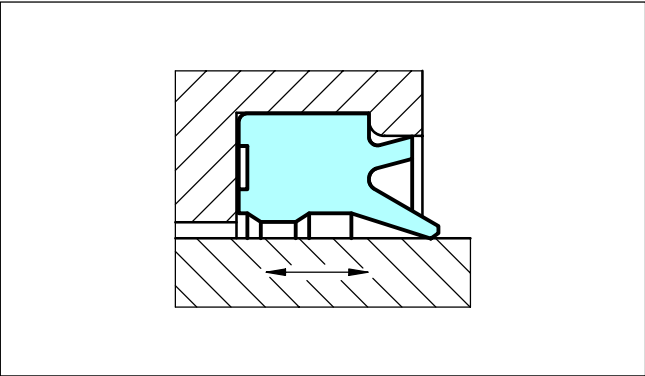


Figure 21 Scraper WNW

Advantages

- High wear resistance
- Very good static sealing performance due to additional seal lip at the housing
- Stable position of scraper in the housing
- Support bead with notches prevent pressure built up between scraper and seal
- Housings in accordance to ISO 6195 type A

Application Examples

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

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

Technical Data

Operating conditions

- Speed: Up to 1 m/s
- Temperature: -30° 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.

Materials

Standard application:

- Polyurethane: 93 Shore A
- Material Code: WUAQ3

Ordering Example

- Rod diameter: $d_N = 40\text{ mm}$
- Groove diameter: $D3 = 48\text{ mm}$
- Part number: WNW000400
- Material Code: WUAQ3

Order No.	WNW0	0	0400	-	WUAQ3
Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index (see table)					
Material-code					



Installation Recommendation

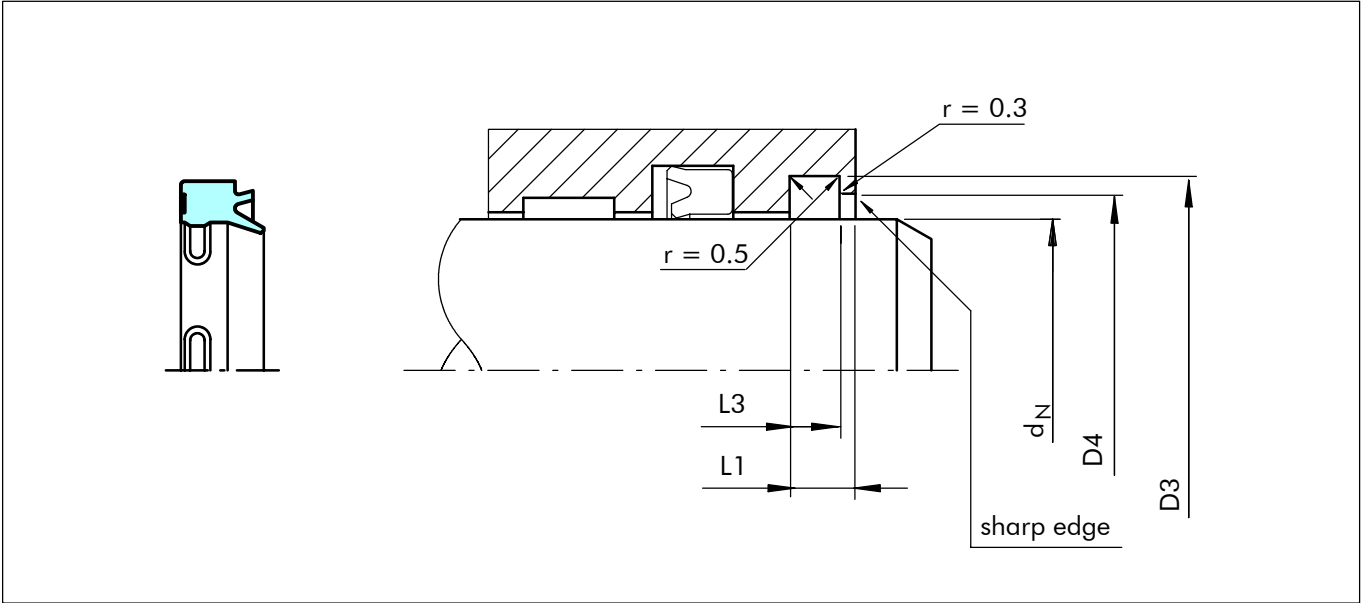


Figure 22 Installation drawing

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	WNW000160
18.0	26.0	23.5	5.0	7.0	WNW000180
20.0	28.0	25.5	5.0	7.0	WNW000200
22.0	30.0	27.5	5.0	7.0	WNW000220
25.0	33.0	30.5	5.0	7.0	WNW000250
28.0	36.0	33.5	5.0	7.0	WNW000280
32.0	40.0	37.5	5.0	7.0	WNW000320
36.0	44.0	41.5	5.0	7.0	WNW000360
40.0	48.0	45.5	5.0	7.0	WNW000400
45.0	53.0	50.5	5.0	7.0	WNW000450
50.0	58.0	55.5	5.0	7.0	WNW000500
56.0	66.0	63.0	6.3	8.3	WNW000560
63.0	73.0	70.0	6.3	8.3	WNW000630
70.0	80.0	77.0	6.3	8.3	WNW000700
80.0	90.0	87.0	6.3	8.3	WNW000800

POLYPAC[®] WRM/C

B+S SA



- Single Acting -
- With Metal Case -
- For open Groove Assembly -

- Material -
- NBR and Metal -





Scraper WRM/C - SA

Description

WRM/C and SA are mould-vulcanised single-acting elastomer scrapers, with integral metal reinforcement for open groove assembly. In conjunction with the scraper oversize, an exact fit is obtained in the housing.

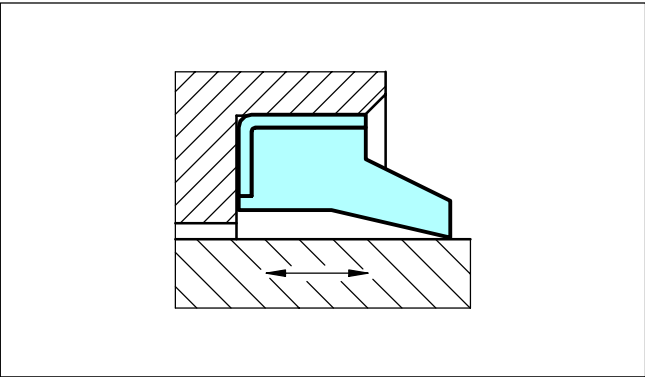


Figure 23 Scraper WRM/C + WSA

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.

Materials

Standard application:

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

Ordering Example

- Rod diameter: $d_N = 35\text{ mm}$
- Groove diameter: $D3 = 45\text{ mm}$
- Part number: WSA000350

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

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

Order No.	WSA0	0	0350	-	4N7W
Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index (see table)					
Material Set-code					
Polypac Ref. No.:	WRM 137177/C				



Scraper WRM/C - SA

Installation Recommendation

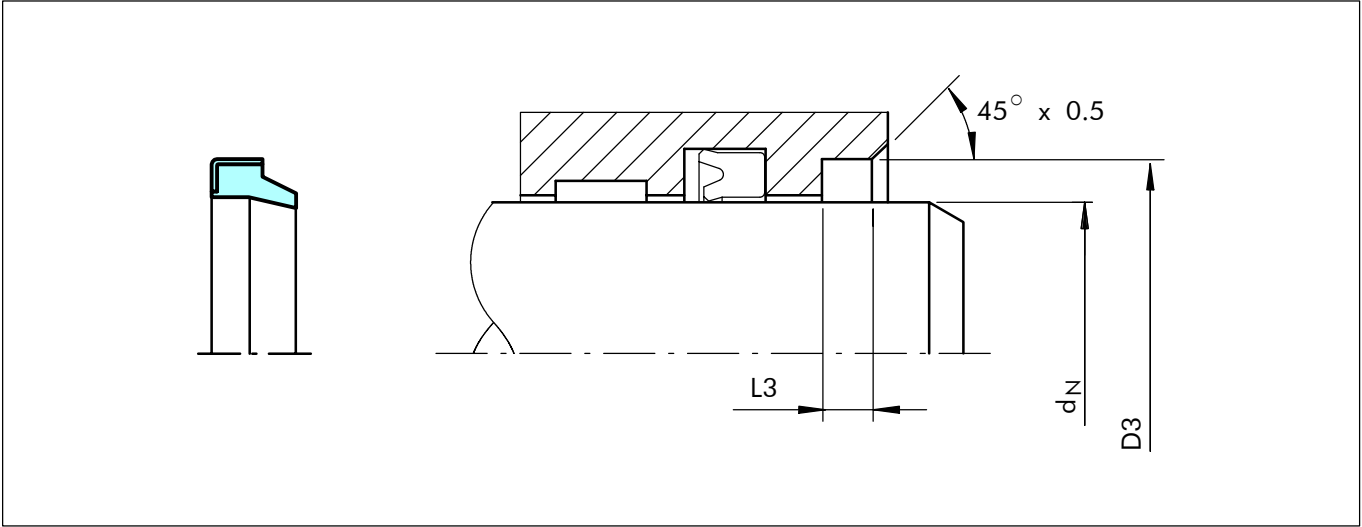


Figure 24 Installation drawing

Table XX Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	B+S Ref. No.	Polypac Ref. No.	Part No.
			Material Code		
d _N h9	D ₃ H8	L ₃ +0.1	N9MN	4N7W	
6.0	13.0	3.0	WSA000060	WRM 031059/C	WSA000060
8.0	15.0	3.0			WSA000080
10.0	16.0	3.0	WSA000100		WSA000100
10.0	16.0	3.5	WSA100100	WRM 039063/C	WSA200100
10.0	18.0	5.0		WRM 047070/C	WSA100100
12.0	18.0	5.0			WSA200120
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	WSA000140 WSA000160	WRM 055078/C	WSA100140
14.0	22.0	3.0		WSA000140	WSA000140
16.0	22.0	3.0		WSA000160	WSA000160
16.0	22.0	4.0	WSA200160 WSA000180	WRM 062086/C	WSA300160
16.0	26.0	5.0		WRM 062102/C	WSA200160
18.0	26.0	5.0			WSA000180
18.0	28.0	7.0	WSA100180		WSA100180
20.0	26.0	4.0	WSA000200		WSA000200
20.0	28.0	3.5	WSA200200		WSA200200
20.0	28.0	5.0	WSA300200	WRM 078118-1/C	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.

Scraper WRM/C - SA



Rod Diameter	Groove Diameter	Groove Width	B+S Ref. No.	Polypac Ref. No.	Part No.
			Material Code		
d _N h9	D ₃ H8	L ₃ +0.1	N9MN	4N7W	
20.0	30.0	7.0	WSA600200	WRM 078118/C	WSA600200
22.0	28.0	5.0	WSA000220		WSA000220
22.0	32.0	5.0		WRM 086125/C	WSA200220
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		WRM 098137-1/C	WSA200250
25.0	35.0	7.0	WSA100250		WSA100250
28.0	38.0	5.0	WSA000280		WSA000280
28.0	40.0	7.0	WSA100280		WSA100280
30.0	40.0	5.0	WSA000300	WRM 118157/C	WSA000300
30.0	40.0	7.0	WSA100300		WSA100300
30.0	45.0	5.0	WSA200300		WSA200300
32.0	42.0	5.0	WSA000320		WSA000320
32.0	42.0	5.0		WRM 125165/C	WSA300320
32.0	45.0	4.0	WSA100320		WSA100320
32.0	45.0	7.0	WSA200320	WRM 125177/C	WSA200320
35.0	45.0	7.0	WSA000350	WRM 137177/C	WSA000350
36.0	45.0	7.0	WSA000360		WSA000360
38.0	48.0	7.0	WSA000380	WRM 149188/C	WSA000380
40.0	50.0	5.0	WSA000400		WSA000400
40.0	50.0	5.0	WSA100400		WSA100400
40.0	50.0	7.0	WSA200400	WRM 157196/C	WSA200400
42.0	52.0	7.0	WSA000420		WSA000420
45.0	55.0	5.0		WRM 177216/C	WSA100450
45.0	55.0	7.0	WSA000450		WSA000450
45.0	55.0	10.0		WRM 177216-1/C	WSA200450
49.5	57.0	5.0		WRM 188228/C	WSA000495
50.0	56.0	5.0	WSA000500		WSA000500
50.0	60.0	5.0	WSA200500		WSA200500
50.0	60.0	5.0		WRM 196236-1/C	WSA500500
50.0	60.0	7.0	WSA300500		WSA300500
50.0	65.0	7.0	WSA400500		WSA400500
52.0	62.0	7.0	WSA000520	WRM 204244/C	WSA000520
55.0	63.0	7.0	WSA000550		WSA000550
55.0	65.0	5.0		WRM 216255-1/C	WSA200550
55.0	65.0	7.0	WSA100550	WRM 216255/C	WSA100550
55.0	70.0	7.0		WRM 216275/C	WSA300550
56.0	66.0	7.0	WSA000560		WSA000560
60.0	70.0	5.0		WRM 236275/C	WSA200600
60.0	70.0	7.0	WSA000600		WSA000600
60.0	74.0	5.0	WSA100600		WSA100600

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.

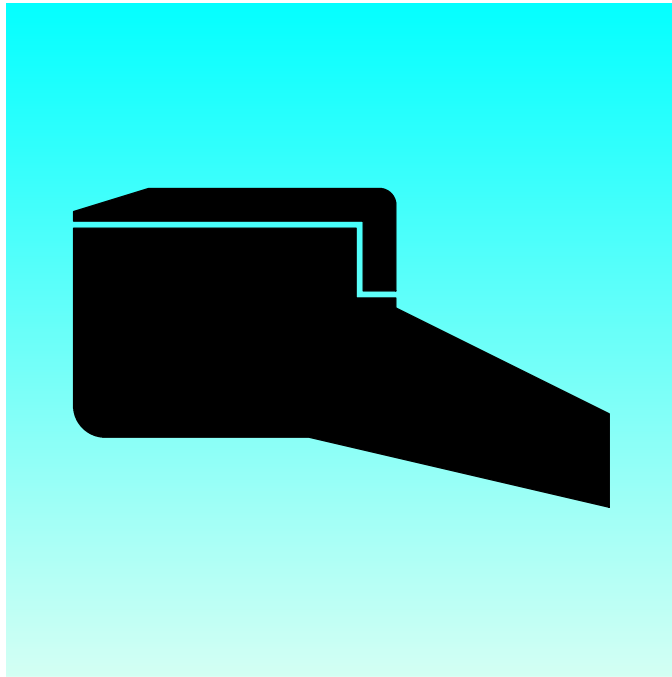


Scraper WRM/C - SA

Rod Diameter	Groove Diameter	Groove Width	B+S Ref. No.	Polypac Ref. No.	Part No.
			Material Code		
d _N h9	D ₃ H8	L ₃ +0.1	N9MN	4N7W	
63.0	75.0	7.0	WSA000630	WRM 255295/C	WSA000630
65.0	75.0	5.0			WSA100650
65.0	75.0	7.0	WSA000650		WSA000650
70.0	80.0	5.0	WSA000700	WRM 275314/C	WSA100700
70.0	80.0	7.0			WSA000700
75.0	83.0	7.0		WRM 295326/C	WSA100750
75.0	85.0	7.0	WSA000750	WRM 295334/C	WSA000750
80.0	88.0	7.0		WRM 314346/C	WSA100800
80.0	90.0	7.0	WSA000800	WRM 314354/C	WSA000800
85.0	95.0	7.0	WSA000850	WRM 334374/C	WSA000850
90.0	100.0	7.0	WSA000900	WRM 354393/C	WSA000900
95.0	105.0	7.0	WSA000950		WSA000950
100.0	110.0	7.0	WSA001000	WRM 393433/C	WSA001000
105.0	115.0	7.0	WSA001050		WSA001050
110.0	120.0	7.0	WSA001100	WRM 433472/C	WSA001100
115.0	125.0	7.0	WSA001150	WRM 472511/C	WSA001150
120.0	130.0	7.0	WSA001200		WSA001200
120.0	135.0	7.0	WSA101200		WSA101200
125.0	140.0	9.0	WSA001250	WRM 492551/C	WSA001250
130.0	145.0	9.0	WSA001300		WSA001300
130.0	145.0	12.0		WRM 511570/C	WSA101300
135.0	145.0	7.0	WSA001400	WRM 531570/C	WSA001350
135.0	150.0	9.0		WRM 531590/C	WSA101350
140.0	155.0	9.0		WRM 551610/C	WSA001400
140.0	160.0	10.0	WSA001500	WRM 551629/C	WSA101400
150.0	165.0	9.0			WSA001500
160.0	175.0	9.0		WSA001600	WSA001600
165.0	180.0	8.0	WSA001700	WRM 649708/C	WSA001650
170.0	185.0	10.0		WRM 669728/C	WSA001700
175.0	190.0	9.0		WRM 688748/C	WSA001750
180.0	195.0	10.0	WSA001800	WRM 708767/C	WSA001800
200.0	220.0	12.0	WSA002000	WRM 787866/C	WSA002000
220.0	235.0	10.0	WSA002200		WSA002200
230.0	245.0	8.0	WSA002700	WRM 905964/C	WSA002300
270.0	295.0	12.0			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.

POLYPAC[®] WRM/PC



- Single Acting -
- With Metal Case -
- For open Groove Assembly -
- Material -
- 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.

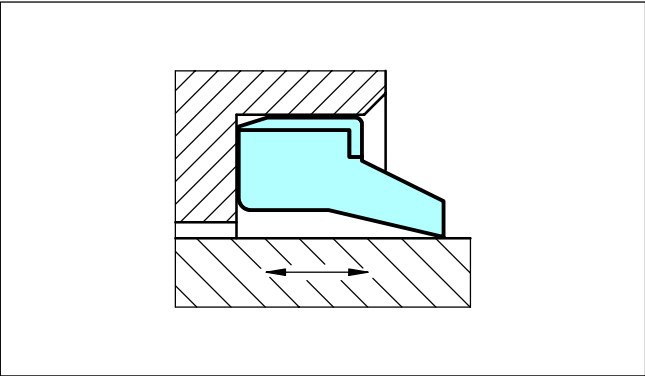


Figure 25 Scraper WRM/PC

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:	-30° C to +80°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.

Materials

Standard application:	
Polyurethane:	94 Shore A red
Metal case:	non alloyed steel DIN 1624
Material Set-Code	4U1W

Ordering Example

Rod diameter:	d _N = 40 mm
Groove diameter:	D3 = 50 mm
Part number:	WSP0 P 0400 -
Material Code:	4U1W
Polypac ref.:	WRM 157196/PC

Order No.	WSP0	P	0400	-	4U1W
Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index (see table)					
Material Set-code					



Scraper WRM/PC

Installation Recommendation

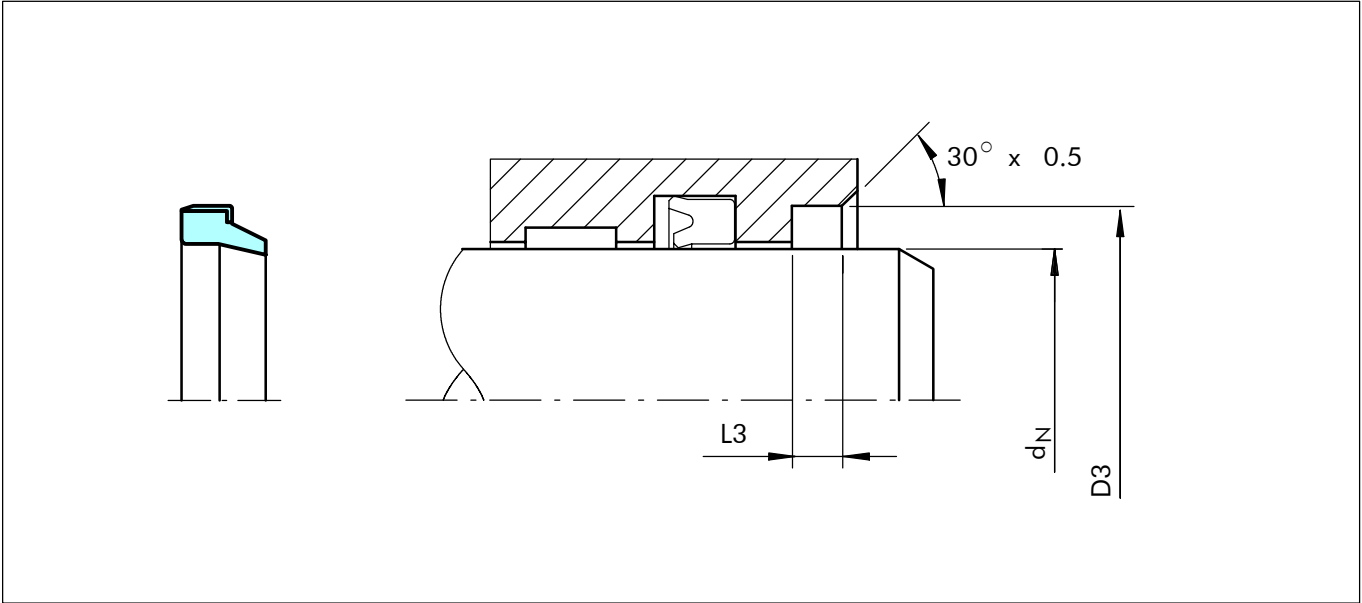
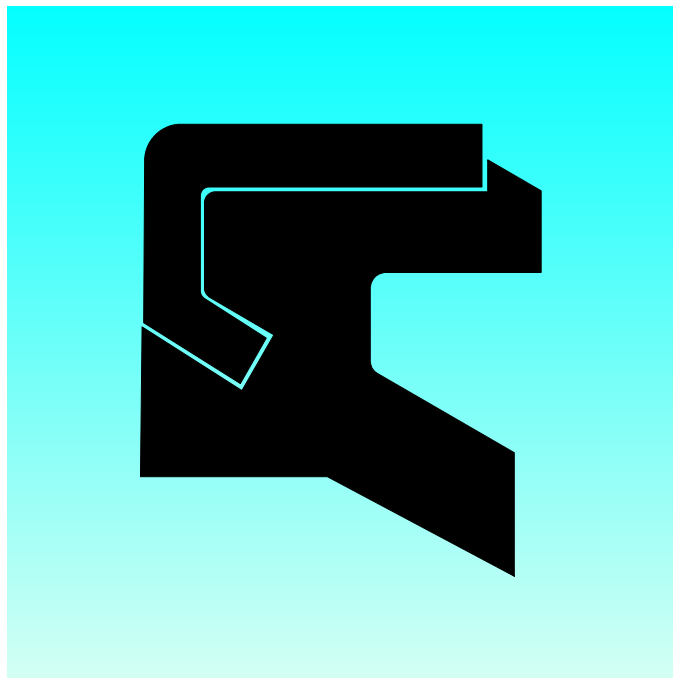


Figure 26 Installation drawing

Table XXI Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	Polypac Ref. No.	Part No.
dN h9	D3 H8	L3 +0.1		
16.00	22.00	3.0	WRM 062086/PC	WSP0P0160
20.00	30.00	7.0	WRM 078118/PC	WSP0P0200
30.00	40.60	5.5	WRM 118157/1/PC	WSP0P0300
38.10	50.80	7.0	WRM 150200/PC	WSP0P0381
40.00	50.00	5.3	WRM 157196/PC	WSP0P0400
50.00	60.00	7.0	WRM 196236/PC	WSP0P0500
50.80	63.50	7.0	WRM 200250/PC	WSP0P0508
55.00	65.00	7.0	WRM 216255/PC	WSP0P0550
57.15	70.00	7.0	WRM 225275/PC	WSP0P0572
60.00	70.00	7.0	WRM 236275/1/PC	WSP0P0600
63.50	76.20	7.0	WRM 250300/PC	WSP0P0635
75.00	83.00	7.0	WRM 295326/PC	WSP0P0750
76.20	88.90	7.0	WRM 300350/PC	WSP0P0762
80.00	90.00	7.0	WRM 314354/PC	WSP0P0800
95.00	105.00	7.0	WRM 374413/PC	WSP0P0950
105.00	115.00	7.0	WRM 413452/PC	WSP0P1050
175.00	190.00	9.0	WRM 688748/PC	WSP0P1750

POLYPAC[®] SWP



- Single Acting -**
- Metal Reinforcement -**
- For open Groove Assembly -**
- Material -**
- 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.

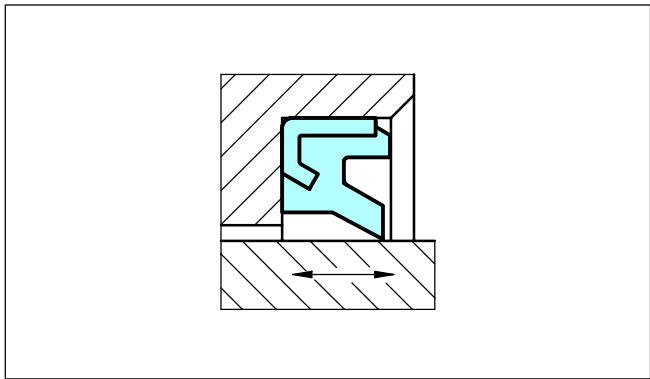


Figure 27 Scraper SWP

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: -30° C to +80°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.

Materials

Standard application:

- Polyurethane: 94 Shore A red
- Metal case: non alloyed steel
DIN 1624
- Material Set-Code 4U1W

Ordering Example

- Rod diameter: $d_N = 40 \text{ mm}$
- Groove diameter: $D3 = 50 \text{ mm}$
- Part number: WSP0 0 0400 -
- Material Set-Code: 4U1W (standard)
- Polypac ref.: SWP 4050

Order No.	WSP0	0	0400	-	4U1W
Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index (see table)					
Material Set-code					



Installation Recommendation

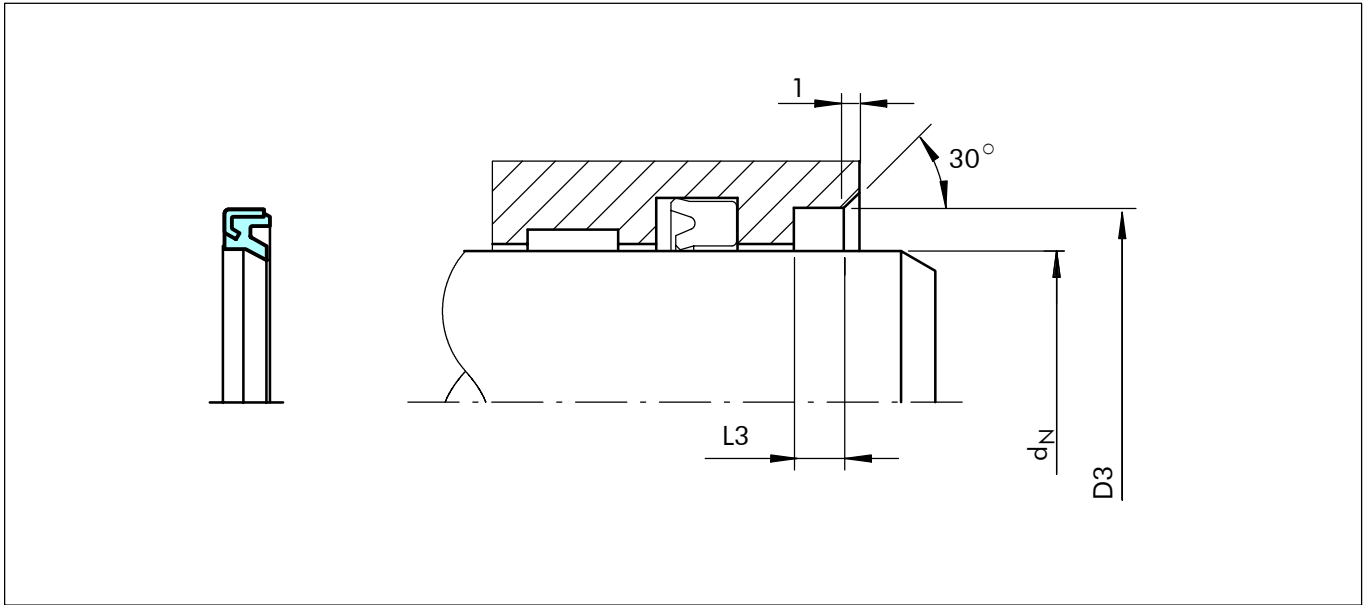


Figure 28 Installation drawing

Table XXII Installation Dimensions / Part Numbers

Rod Diameter	Groove Diameter	Groove Width	Polypac Ref. No.	Part No.
dN h9	D3 H8	L3 +0.1		
25.0	38.0	7.5	SWP 2538	WSP000250
30.0	40.0	4.0	*SWP 3040	WSP000300
30.0	43.0	7.5	SWP 3043	WSP100300
35.0	45.0	4.0	*SWP 3545	WSP000350
35.0	50.0	7.5	SWP 3550	WSP100350
36.0	48.0	6.0	SWP 3648	WSP000360
38.0	50.0	7.5	SWP 3850	WSP000380
40.0	50.0	4.0	*SWP 4050	WSP000400
40.0	52.0	6.0	SWP 4052	WSP100400
45.0	55.0	3.2	*SWP 4555/1	WSP000450
45.0	55.0	4.0	*SWP 4555	WSP100450
45.0	60.0	7.5	SWP 4560	WSP200450
50.0	60.0	4.0	*SWP 5060	WSP000500
50.0	63.0	4.0	*SWP 5063	WSP100500
50.0	65.0	7.5	SWP 5065	WSP200500
55.0	65.0	3.2	*SWP 5565	WSP000550
55.0	68.0	4.0	*SWP 5568	WSP100550
55.0	70.0	7.5	SWP 5570	WSP200550

* Can be used for “Link Pin Seal”

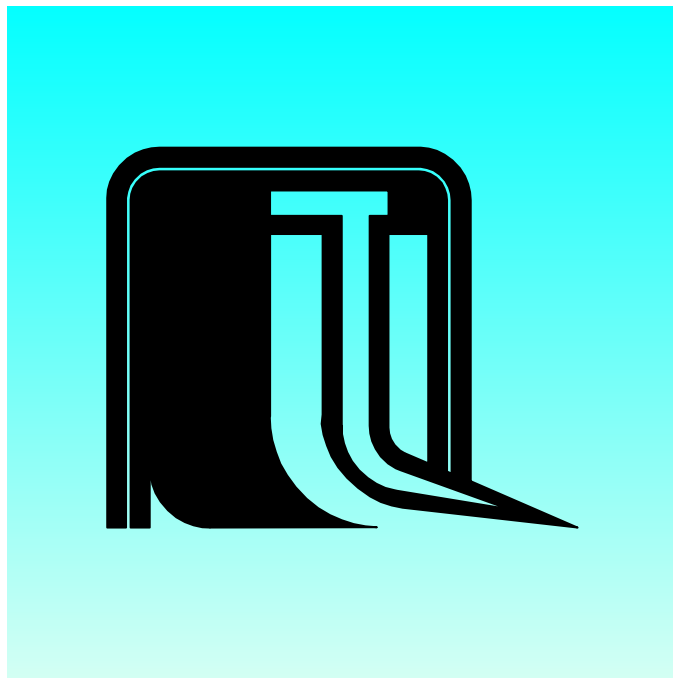


Rod Diameter	Groove Diameter	Groove Width	Polypac Ref. No.	Part No.
dn h9	D ₃ H8	L ₃ +0.1		
56.0	70.0	7.5	SWP 5670	WSP000560
60.0	75.0	4.0	*SWP 6075/1	WSP000600
60.0	75.0	7.5	SWP 6075	WSP100600
63.0	78.0	7.5	SWP 6378	WSP000630
65.0	80.0	5.0	*SWP 6580/1	WSP000650
65.0	80.0	7.5	SWP 6580	WSP100650
70.0	80.0	5.0	*SWP 7080	WSP000700
70.0	84.0	8.0	SWP 7084	WSP100700
70.0	85.0	4.0	SWP 7085/1	WSP200700
70.0	85.0	7.5	SWP 7085	WSP300700
71.0	86.0	5.0	*SWP 7186	WSP000710
75.0	90.0	7.5	SWP 7590	WSP000750
75.0	95.0	10.0	SWP 7595	WSP100750
76.5	96.5	10.0	SWP 7696	WSP000765
80.0	95.0	5.0	*SWP 8095/1	WSP000800
80.0	95.0	7.5	SWP 8095	WSP100800
80.0	100.0	10.0	SWP 80100	WSP200800
85.0	100.0	4.0	*SWP 85100/1	WSP000850
85.0	100.0	10.0	SWP 85100	WSP100850
85.0	105.0	10.0	SWP 85105	WSP200850
90.0	104.0	8.0	SWP 90104	WSP000900
90.0	105.0	6.0	*SWP 90105	WSP100900
90.0	110.0	10.0	SWP 90110	WSP200900
95.0	115.0	10.0	SWP 95115	WSP000950
99.0	115.0	7.5	SWP 99115	WSP000990
100.0	115.0	4.0	*SWP 100115/2	WSP001000
100.0	115.0	6.5	*SWP 100115/1	WSP101000
100.0	115.0	7.5	SWP 100115	WSP201000
100.0	120.0	10.0	SWP 100120	WSP301000
105.0	120.0	7.5	SWP 105120	WSP001050
110.0	125.0	4.0	SWP 110125/1	WSP001100
110.0	125.0	9.0	SWP 110125	WSP101100
110.0	130.0	10.0	SWP 110130	WSP201100
115.0	130.0	7.5	SWP 115130	WSP001150
120.0	140.0	10.0	SWP 120140	WSP001200
130.0	145.0	7.5	SWP 130145	WSP001300
160.0	175.0	10.0	SWP 160175	WSP001600
190.0	210.0	10.0	SWP 190210	WSP001900

* 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.

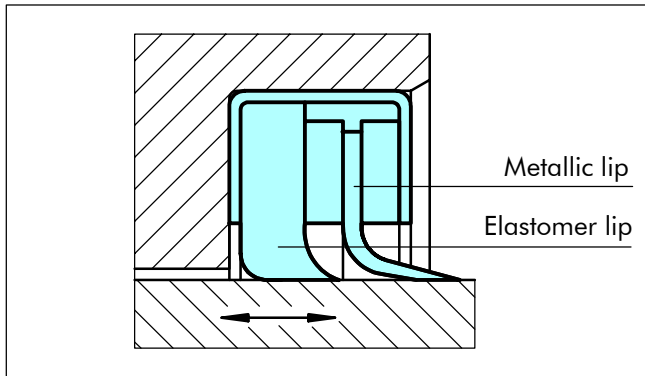


Figure 29 Metal scraper

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.

Materials

Inner scraper lip:	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

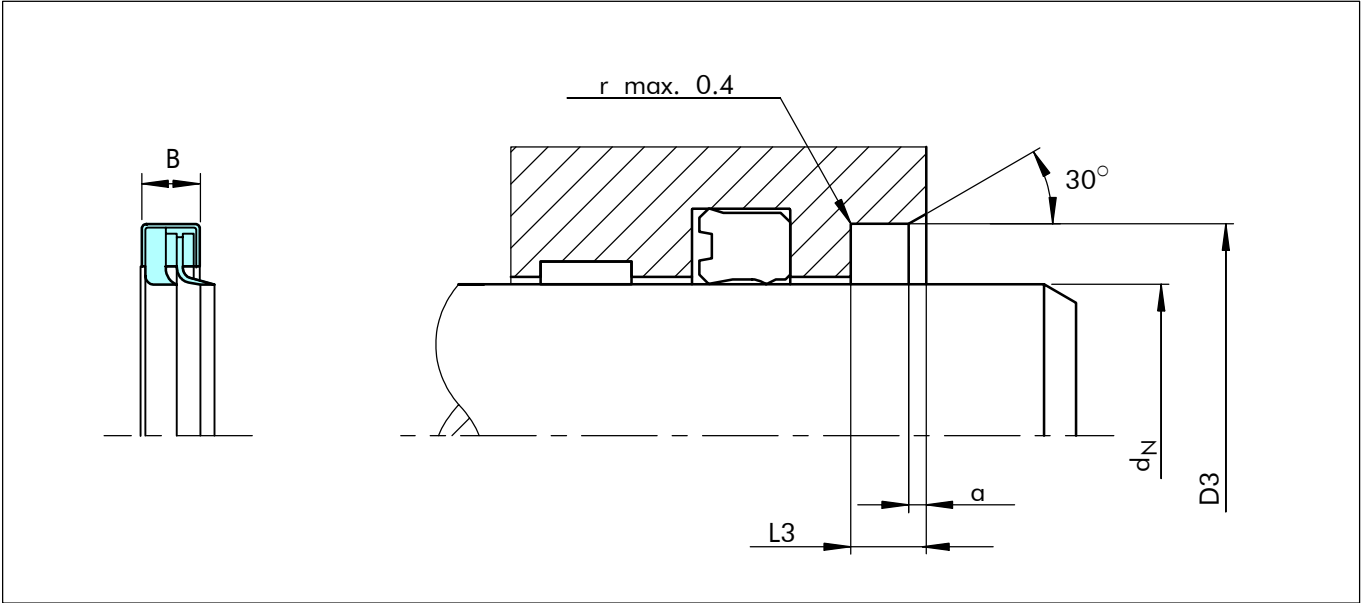


Figure 30 Installation drawing

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.

Metal Scraper



Rod Diameter	Groove Diameter	Groove Width	Chamfer	Width	Part No.
d_N f8/h9	D_3 H8	L_3 +0.2	α 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

Order No. WM01 00800 - N7 M S

Series No.

Rod diameter x 10

Quality Index (standard)

Maierial code (inner scraper lip)

Material code (housing)

Material code (outer scraper lip)



Metal Scraper

NON STANDARD SCRAPERS



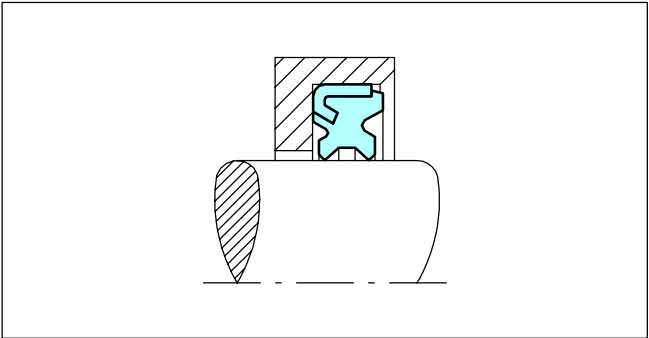
- Available upon Request -
- Old Series -
- Special Series -



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.

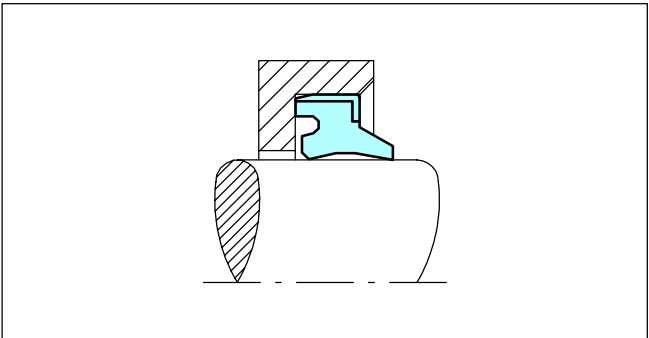
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
40 - 80	-	-30 to +80	Up to 0.5



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.

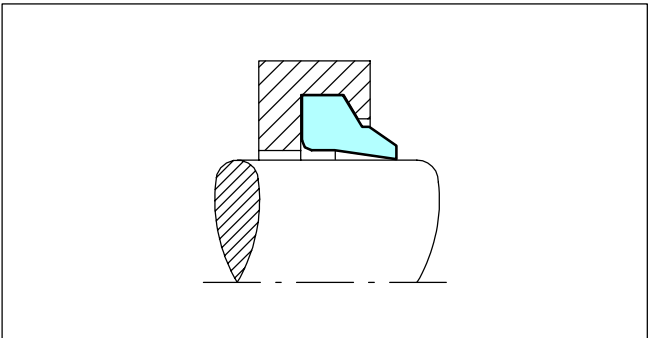
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
30 - 60	-	-30 to +80	Up to 0.5



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.

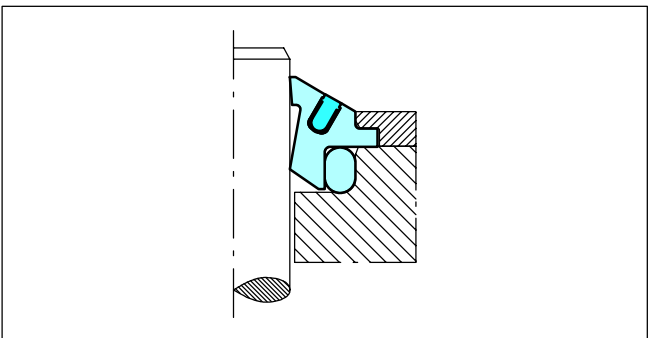
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
19 - 180	-	-30 to +110	Up to 0.5



**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



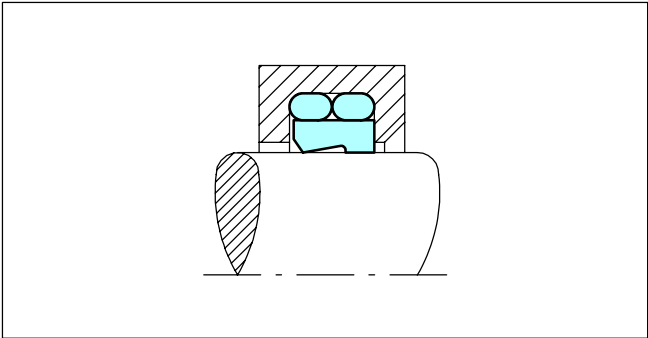


Non Standard Scrapers

Shamban Turcon® Excluder®

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

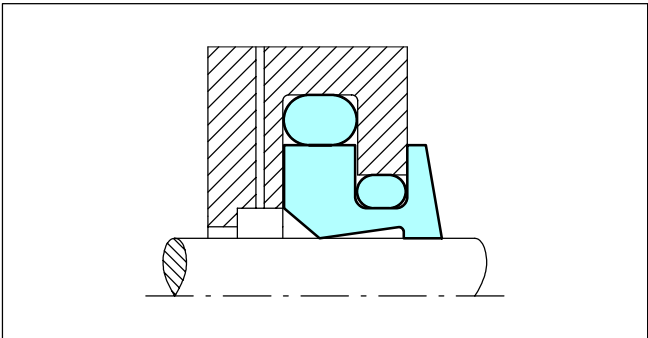
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
12 - 2600	-	-45 to +200	Up to 15



Shamban Turcon® Excluder® with extended scraping lip

Special Turcon® Excluder® 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.

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

