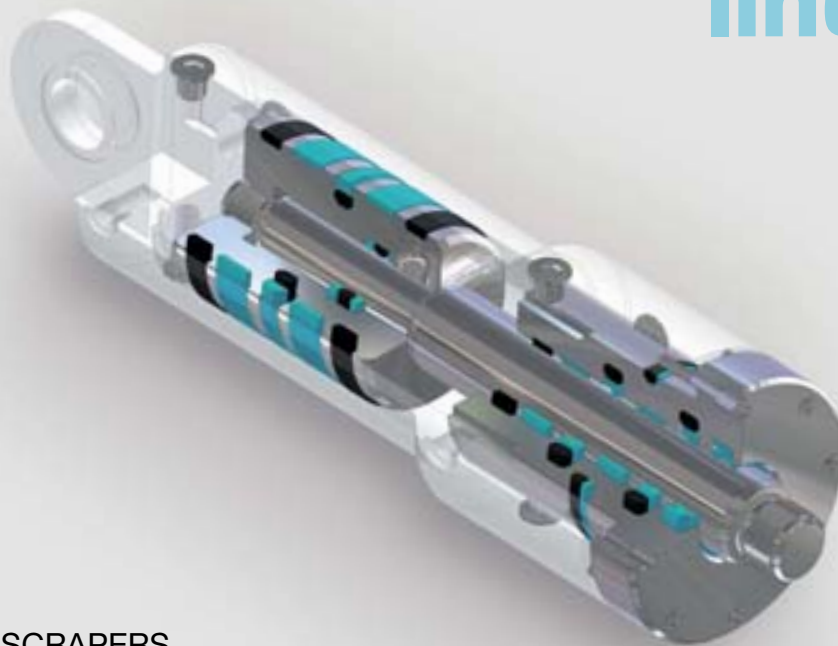


Hydraulic seals - linear



SCRAPERS



Your Partner for Sealing Technology



Your Partner for Sealing Technology

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

With 50-years experience, Trelleborg Sealing Solutions engineers support customers with design, prototyping, production, test and installation using state-of-the-art design tools. An international network of over 70 facilities worldwide includes 30 manufacturing sites, 8 strategically positioned research and development centers, including materials and development laboratories and locations specializing in design and applications.

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

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

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

ISO 9001:2000

ISO/TS 16949:2002

The information in this brochure is intended to be for general reference purposes only and is not intended to be a specific recommendation for any individual application. The application limits for pressure, temperature, speed and media given are maximum values determined in laboratory conditions. In application, due to the interaction of operating parameters, maximum values may not be achieved. It is vital therefore, that customers satisfy themselves as to the suitability of product and material for each of their individual applications. Any reliance on information is therefore at the user's own risk. In no event will Trelleborg Sealing Solutions be liable for any loss, damage, claim or expense directly or indirectly arising or resulting from the use of any information provided in this brochure. While every effort is made to ensure the accuracy of information contained herewith, Trelleborg Sealing Solutions cannot warrant the accuracy or completeness of information.

To obtain the best recommendation for a specific application, please contact your local Trelleborg Sealing Solutions marketing company.

This edition supersedes all previous brochures.

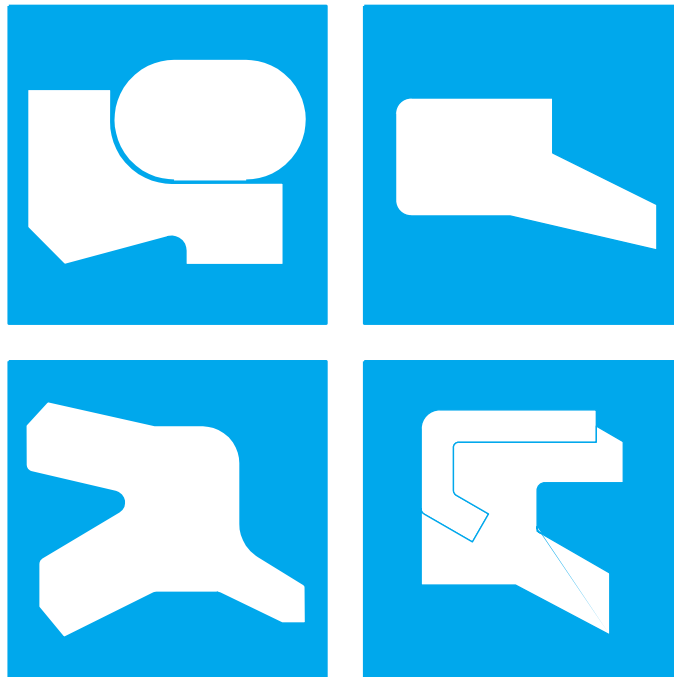
This brochure or any part of it may not be reproduced without permission.

© All trademarks are the property of Trelleborg AB.

The turquoise colour is a registered trademark of Trelleborg AB.

© Trelleborg AB, 2007. All rights reserved.

SCRAPERS





Scrapers

Contents

Choice of the Scraper Element	4
Turcon® Excluder® 2	9
Turcon® Excluder® 5	17
Zurcon® Excluder® 500	25
Scraper DA 17	31
Zurcon® Scraper DA 22	37
Zurcon® Scraper DA 24	43
Scraper WRM	49
Zurcon® Scraper ASW	57
Scraper PW	63
Zurcon® Scraper WNE	71
Zurcon® Scraper WNV	77
Scraper WRM/C and WSA	81
Zurcon® Scraper WRM/PC	89
Zurcon® Scraper SWP	95
Metal Scraper	101
Non Standard Scrapers	107

■ 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 Trelleborg Sealing Solutions, Sealing Parts and POLYPAC. All similar products are technically equivalent but availability and pricing may vary. For further information please contact your local Trelleborg Sealing Solutions 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
Type	Page	Field of Application			ISO/DIN	mm	mm	Single	Double	Temp. Range**	Speed	
			Light	Medium						Heavy	°C	
 Turcon® Excluder® 2	9	Industrial hydraulics	●	●	●	6195 Type D	4 - 2600	Split <30 Closed >30	X	-45/+200	15	Turcon® T46
		Machine tools	●	●	●							
		Injection molding machines	●	●	●							
		Servo hydraulic cylinders	●	●	●							
		Robotics	●	●	●							
 Turcon® Excluder® 5	17	Heavy duty mobile and industrial hydraulics	●	●	●	6195 Type D	20 - 2600	Split <30 Closed >30	X	-45/+200	15	Turcon® T46
		Presses	●	●	●							
		Steel mills	●	●	●							
 Zurcon® Excluder® 500	25	Mobile hydraulics	●	●	●	6195 Type D	12 - 130	Split <25 Closed >25	X	-30/+80	1	Zurcon® Z05
 Scraper DA 17	31	Industrial hydraulics	●	●		-	10 - 440	Split <18 Closed >18	X	-30/+110	1	NBR
		Machine tools	●	●								
		Presses	●	●								
 Zurcon® Scraper DA 22	37	ISO standard cylinder	●	●	●	6195 Type C	5 - 180	Split <18 Closed >18	X	-35/+100	1	Zurcon® Z201
		Industrial hydraulic cylinders	●	●	●							
 Zurcon® Scraper DA 24	43	Mobile hydraulics	●	●	●	-	50 - 280	Closed	X	-35/+100	0.5	Zurcon® Z201
		Construction machinery	●	●	●							
		Agriculture machinery	●	●	●							
 Scraper WRM	49	Agriculture machinery	●	●		-	12 - 260	Closed	X	-30/+110	1	NBR
		Handling equipment	●	●								

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

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


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	
		Light	Medium	Heavy								
 Zurcon® Scraper ASW	57	Agriculture machinery	●	●	-	8 - 125	Split <14 Closed >14	X		-35/+100	1	Zurcon® Z201
		Mobile hydraulic machinery	●	●								
 Scraper PW	63	Agriculture machinery	●	●	-	4 - 280	Closed	X		-35/+80	1	TPU
		Mobile hydraulic machinery	●	●								
 Zurcon® Scraper WNE	71	Agriculture machinery	●	●	-	8 - 250	Closed	X		-35/+100	1	Zurcon® Z201
		Mobile hydraulic machinery	●	●								
 Zurcon® Scraper WNV	77	Agriculture machinery	●	●	6195 Type A	16 - 100	Closed		X	-35/+100	1	Zurcon® Z201
		Mobile hydraulic machinery	●	●								
		ISO standard cylinder	●	●								
		Lift trucks	●	●								
		Cargo tailboards	●	●								
		Steering cylinders	●	●								
 Scraper WRM/C-WSA	81	Agriculture machinery	●	●	-	16 - 120	Open	X		-30/+110	1	NBR + Metal
		Standard hydraulic cylinder	●	●								
 Zurcon® Scraper WRM/PC WSA	89	Agriculture machinery	●	●	-	16 - 175	Open	X		-35/+100	1	Zurcon® Z201 + Metal
		Mobile hydraulic machinery	●	●								
 Zurcon® Scraper SWP	95	Construction machinery		●	-	25 - 190	Open	X		-35/+100	1	Zurcon® Z201 + Metal
		Link pin seals		●								

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

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

Scrapers

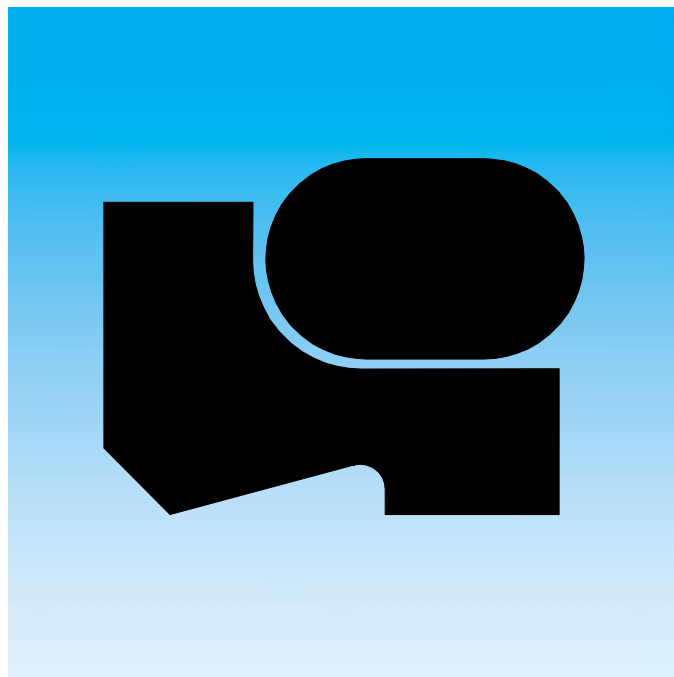
Scraper		Application			Standard	Size Range	Groove Type	Action		Technical Data*		Recommended Scraper Material
										Temp. Range**	Speed	
Type	Page	Field of Application			ISO/DIN	mm	mm	Single	Double	°C	m/s	
		Light	Medium	Heavy								
Metal Wiper 	101	Agriculture machinery	●	●	●	-	12 - 220	Open	X	-40/+110	1	Metal + NBR + Brass
		Mobile hydraulic machinery	●	●	●							
		ISO standard cylinder	●	●	●							

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

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

Scrapers

TURCON[®] EXCLUDER[®] 2



- Double Acting -
- Rubber Energised Double-acting Scraper -

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





■ Turcon® Excluder® 2

Description

The Turcon® Excluder® 2 is a double-acting scraper with two geometrically different scraper lips which are installed back-to-back. Excluder® 2 is always installed together with an elastic O-Ring in one groove. The scraper function is performed by the Excluder® 2. The O-Ring maintains the pressure of the scraper lips against the sliding surface and can compensate any deflections of the piston rod.

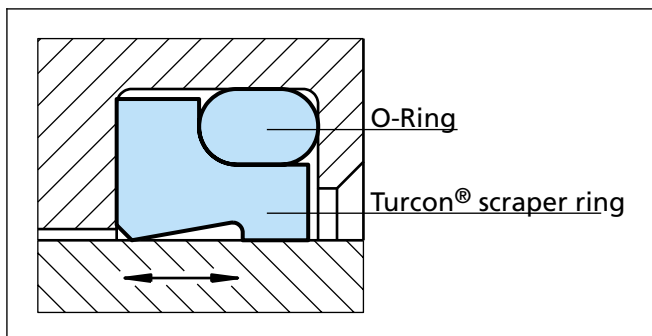


Figure 1 Turcon® Excluder® 2

Excluder® 2 has two functions:

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

Excluder® 2 are used in conjunction with the rod seal Turcon® Stepseal®, i.e. seals with hydrodynamic back-pumping function.

Advantages

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

Technical Data

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

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

The following material combination has proven effective for most applications:

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

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

Design and Installation Instructions

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

Table II Installation in Closed Grooves

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



Turcon[®] Excluder[®] 2

Table III Turcon[®] and Zurcon[®] Materials for Excluder[®] 2

Material, Applications, Properties	Code	O-Ring Material	Code	O-Ring Operating Temp.* °C	Mating Surface Material	Speed m/s max.
Turcon[®] T46 Standard material for hydraulics, high compressive strength, good sliding and wear properties, BAM tested. Bronze filled Colour: Greyish to dark brown	T46	NBR - 70 Shore A	N	-30 to +100	Steel, hardened Steel, chromeplated Cast iron	15
		NBR - Low temp. 70 Shore A	T	-45 to +80		
		FKM - 70 Shore A	V	-10 to +200		
Turcon[®] T40 For all lubricating and non-lubricating hydraulic fluids, hydraulic oils without zinc, water hydraulic, soft mating surfaces. Surface texture not suitable for gases. Carbon fibre filled Colour: Grey	T40	NBR - 70 Shore A	N	-30 to +100	Steel Steel, chromeplated Cast iron Stainless steel Aluminium Bronze Alloys	15
		NBR - Low temp. 70 Shore A	T	-45 to +80		
		FKM - 70 Shore A	V	-10 to +200		
		EPDM-70 Shore A	E**	-45 to +145		
Turcon[®] T05 For 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 Ceramic coating Aluminium Bronze Alloys	2
		NBR - Low temp. 70 Shore A	T	-45 to +80		

* The O-Ring Operation Temperature is only valid in mineral hydraulic oil. BAM: Tested by "Bundes Anstalt Materialprüfung, Germany".
 ■ Highlighted materials are standard. ** Material not suitable for mineral oils.



■ Installation Recommendation

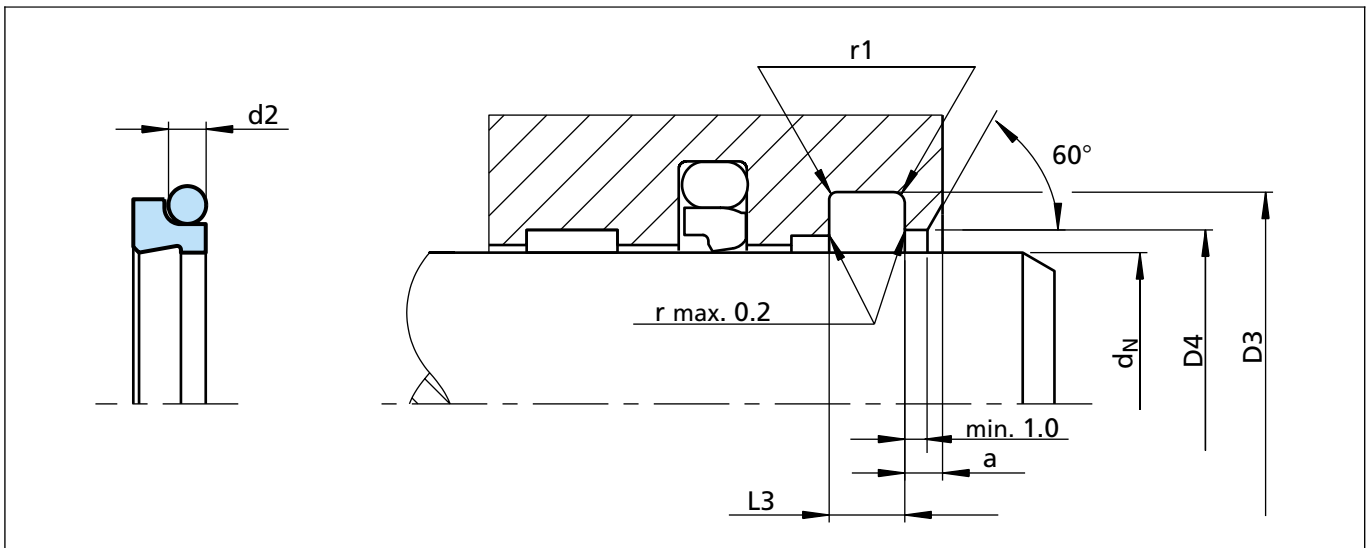


Figure 2 Installation drawing

Table IV Installation Dimensions

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



Turcon® Excluder® 2

Ordering Example

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

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

* For diameters ≥ 1000.0 mm multiply only by factor 1.
 Example WE35 for diameter 1200.0 mm.
 TSS Article No.: WE35X1200-T46N.

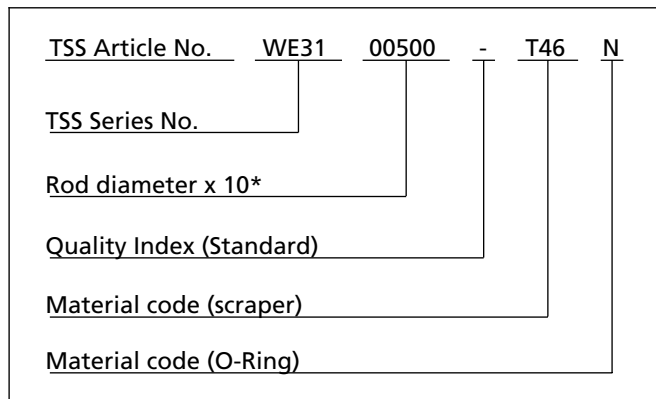


Table V Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	r_1 max.	a min		
4.0*)	8.8	3.7	5.5	0.4	2.0	WE3000040	5.60 x 1.80
5.0*)	9.8	3.7	6.5	0.4	2.0	WE3000050	6.70 x 1.80
6.0*)	10.8	3.7	7.5	0.4	2.0	WE3000060	7.65 x 1.78
8.0*)	12.8	3.7	9.5	0.4	2.0	WE3000080	9.50 x 1.80
10.0*)	14.8	3.7	11.5	0.4	2.0	WE3000100	11.80 x 1.80
12.0*)	18.8	5.0	13.5	0.8	2.0	WE3100120	13.94 x 2.62
14.0*)	20.8	5.0	15.5	0.8	2.0	WE3100140	15.54 x 2.62
15.0	21.8	5.0	16.5	0.8	2.0	WE3100150	17.12 x 2.62
16.0	20.8	3.7	17.5	0.4	2.0	WE3000160	17.17 x 1.78
16.0*)	22.8	5.0	17.5	0.8	2.0	WE3100160	18.00 x 2.65
18.0	22.8	3.7	19.5	0.4	2.0	WE3000180	19.00 x 1.80
18.0*)	24.8	5.0	19.5	0.8	2.0	WE3100180	20.29 x 2.62
20.0*)	26.8	5.0	21.5	0.8	2.0	WE3100200	21.89 x 2.62
22.0*)	28.8	5.0	23.5	0.8	2.0	WE3100220	23.47 x 2.62
25.0*)	31.8	5.0	26.5	0.8	2.0	WE3100250	26.64 x 2.62
28.0*)	34.8	5.0	29.5	0.8	2.0	WE3100280	29.82 x 2.62
30.0	34.8	3.7	31.5	0.4	2.0	WE3000300	31.47 x 1.78
30.0	36.8	5.0	31.5	0.8	2.0	WE3100300	31.42 x 2.62
32.0*)	38.8	5.0	33.5	0.8	2.0	WE3100320	34.59 x 2.62
35.0	41.8	5.0	36.5	0.8	2.0	WE3100350	36.17 x 2.62
36.0*)	42.8	5.0	37.5	0.8	2.0	WE3100360	37.77 x 2.62

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

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

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



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	r_1 max.	a min		
37.0	43.8	5.0	38.5	0.8	2.0	WE3100370	39.34 x 2.62
40.0*)	46.8	5.0	41.5	0.8	2.0	WE3100400	42.52 x 2.62
42.0	48.8	5.0	43.5	0.8	2.0	WE3100420	44.12 x 2.62
45.0*)	51.8	5.0	46.5	0.8	2.0	WE3100450	47.29 x 2.62
49.0	55.8	5.0	50.5	0.8	2.0	WE3100490	50.47 x 2.62
50.0*)	56.8	5.0	51.5	0.8	2.0	WE3100500	52.07 x 2.62
50.8	57.6	5.0	52.3	0.8	2.0	WE3100508	52.07 x 2.62
54.0	60.8	5.0	55.5	0.8	2.0	WE3100540	55.25 x 2.62
55.0	61.8	5.0	56.5	0.8	2.0	WE3100550	56.82 x 2.62
56.0*)	62.8	5.0	57.5	0.8	2.0	WE3100560	58.42 x 2.62
60.0	66.8	5.0	61.5	0.8	2.0	WE3100600	61.60 x 2.62
63.0*)	69.8	5.0	64.5	0.8	2.0	WE3100630	64.77 x 2.62
65.0	73.8	6.0	66.5	1.0	3.0	WE3200650	66.27 x 3.53
70.0	78.8	6.0	71.5	1.0	3.0	WE3200700	72.62 x 3.53
75.0	83.8	6.0	76.5	1.0	3.0	WE3200750	75.79 x 3.53
80.0	88.8	6.0	81.5	1.0	3.0	WE3200800	82.14 x 3.53
85.0	93.8	6.0	86.5	1.0	3.0	WE3200850	83.52 x 3.53
90.0	98.8	6.0	91.5	1.0	3.0	WE3200900	91.67 x 3.53
95.0	103.8	6.0	96.5	1.0	3.0	WE3200950	98.02 x 3.53
100.0	108.8	6.0	101.5	1.0	3.0	WE3201000	101.19 x 3.53
105.0	113.8	6.0	106.5	1.0	3.0	WE3201050	107.54 x 3.53
110.0	118.8	6.0	111.5	1.0	3.0	WE3201100	110.72 x 3.53
115.0	123.8	6.0	116.5	1.0	3.0	WE3201150	117.07 x 3.53
120.0	128.8	6.0	121.5	1.0	3.0	WE3201200	120.24 x 3.53
125.0	133.8	6.0	126.5	1.0	3.0	WE3201250	126.59 x 3.53
130.0	138.8	6.0	131.5	1.0	3.0	WE3201300	132.94 x 3.53
135.0	143.8	6.0	136.5	1.0	3.0	WE3201350	136.12 x 3.53
137.0	145.8	6.0	138.5	1.0	3.0	WE3201370	139.29 x 3.53
140.0	148.8	6.0	141.5	1.0	3.0	WE3201400	142.47 x 3.53
145.0	153.8	6.0	146.5	1.0	3.0	WE3201450	145.64 x 3.53
150.0	158.8	6.0	151.5	1.0	3.0	WE3201500	151.99 x 3.53
160.0	168.8	6.0	161.5	1.0	3.0	WE3201600	158.34 x 3.53
170.0	178.8	6.0	171.5	1.0	3.0	WE3201700	171.04 x 3.53
180.0	188.8	6.0	181.5	1.0	3.0	WE3201800	177.39 x 3.53
190.0	198.8	6.0	191.5	1.0	3.0	WE3201900	190.09 x 3.53
200.0	208.8	6.0	201.5	1.0	3.0	WE3202000	202.79 x 3.53

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

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

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



Turcon® Excluder® 2

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	r_1 max.	a min		
210.0	218.8	6.0	211.5	1.0	3.0	WE3202100	209.14 x 3.53
220.0	228.8	6.0	221.5	1.0	3.0	WE3202200	221.84 x 3.53
230.0	238.8	6.0	231.5	1.0	3.0	WE3202300	228.19 x 3.53
240.0	248.8	6.0	241.5	1.0	3.0	WE3202400	240.89 x 3.53
250.0	258.8	6.0	251.5	1.0	3.0	WE3202500	253.59 x 3.53
260.0	272.2	8.4	262.0	1.5	4.0	WE3302600	253.59 x 5.33
280.0	292.2	8.4	282.0	1.5	4.0	WE3302800	278.77 x 5.33
300.0	312.2	8.4	302.0	1.5	4.0	WE3303000	304.17 x 5.33
320.0	332.2	8.4	322.0	1.5	4.0	WE3303200	329.57 x 5.33
350.0	362.2	8.4	352.0	1.5	4.0	WE3303500	354.97 x 5.33
360.0	372.2	8.4	362.0	1.5	4.0	WE3303600	354.97 x 5.33
370.0	382.2	8.4	372.0	1.5	4.0	WE3303700	365.00 x 5.30
400.0	412.2	8.4	402.0	1.5	4.0	WE3304000	405.26 x 5.33
440.0	456.0	11.0	442.0	1.5	4.0	WE3404400	443.36 x 7.00
480.0	496.0	11.0	482.0	1.5	4.0	WE3404800	481.46 x 7.00
600.0	616.0	11.0	602.0	1.5	4.0	WE3406000	608.08 x 7.00
630.0	646.0	11.0	632.0	1.5	4.0	WE3406300	633.48 x 7.00
680.0	700.0	14.0	682.5	2.0	5.0	WE3506800	680.00 x 8.40
700.0	720.0	14.0	702.5	2.0	5.0	WE3507000	705.00 x 8.40
770.0	790.0	14.0	772.5	2.0	5.0	WE3507700	774.10 x 8.40
828.0	848.0	14.0	830.5	2.0	5.0	WE3508280	830.00 x 8.40
880.0	900.0	14.0	882.5	2.0	5.0	WE3508800	888.00 x 8.40
900.0	920.0	14.0	902.5	2.0	5.0	WE3509000	904.00 x 8.40
1030.0	1050.0	14.0	1032.5	2.0	5.0	WE35X1030	1035.0 x 8.40
1180.0	1200.0	14.0	1182.5	2.0	5.0	WE35X1180	1185.0 x 8.40

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

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

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

TURCON[®] EXCLUDER[®] 5



- Double Acting -
- Rubber Energised Double-acting Scraper -

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





■ Turcon® Excluder® 5*

Description

The Turcon® Excluder® 5 is a patented double-acting scraper with two geometrically different scraper lips which are installed back-to-back. The scraper is installed together with an O-Ring as elastic energizing element in one groove. The scraper function is performed by the Excluder® 5. The O-Ring maintains the pressure of the scraper lips against the sliding surface and can compensate deflections of the piston rod.

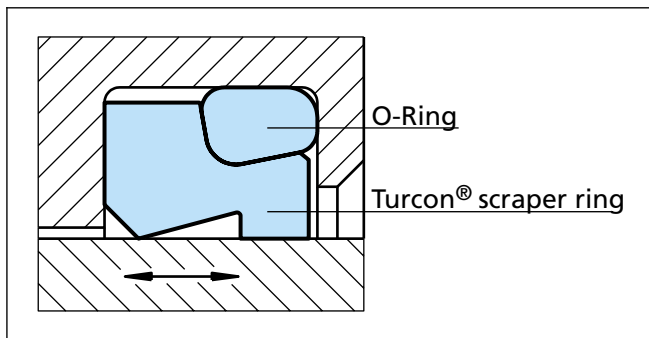


Figure 3 Turcon® Excluder® 5

Excluder® 5 has two functions:

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

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

Advantages

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

- Available for all diameters up to 2.600 mm (Turcon®), up to 2.200 mm (Zurcon®).
- ISO/DIN 6195 Type D installation dimensions

Technical Data

Speed:	15 m/s for Turcon® materials 2 m/s for Zurcon® materials
Temperature:	-45° C to +200° C (Turcon®) -45° C to +100° C (Zurcon®) (depending on O-Ring material)
Media:	Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids, environmentally safe hydraulic fluids (bio-oils), water, air and others, depending on the scraper and O-Ring material.

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

The following material combination has proven effective for most applications:

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

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.

* Patent-No. EP 023 5568



Turcon® Excluder® 5

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

Turcon® Excluder® 5 Series No.	Rod Diameter d _N	O-Ring Cross-Section d ₂
WE53	> 100.0	5.33
WE54	> 140.0	7.00
WE55	> 180.0	8.40

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

Material, Applications, Properties	Code	O-Ring Material	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, hydraulic oils without zinc, water hydraulic, soft mating surfaces. Surface texture not suitable for gases. Carbon fibre filled Colour: Grey	T40	NBR - 70 Shore A	N	-30 to +100	Steel Steel, chromeplated Cast iron Stainless steel Aluminium Bronze Alloys	15
		NBR - Low temp. 70 Shore A	T	-45 to +80		
		FKM - 70 Shore A	V	-10 to +200		
		EPDM-70 Shore A	E**	-45 to +145		
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 Ceramic coating Aluminium Bronze Alloys	2
		NBR - Low temp. 70 Shore A	T	-45 to +80		

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



■ Installation Recommendation

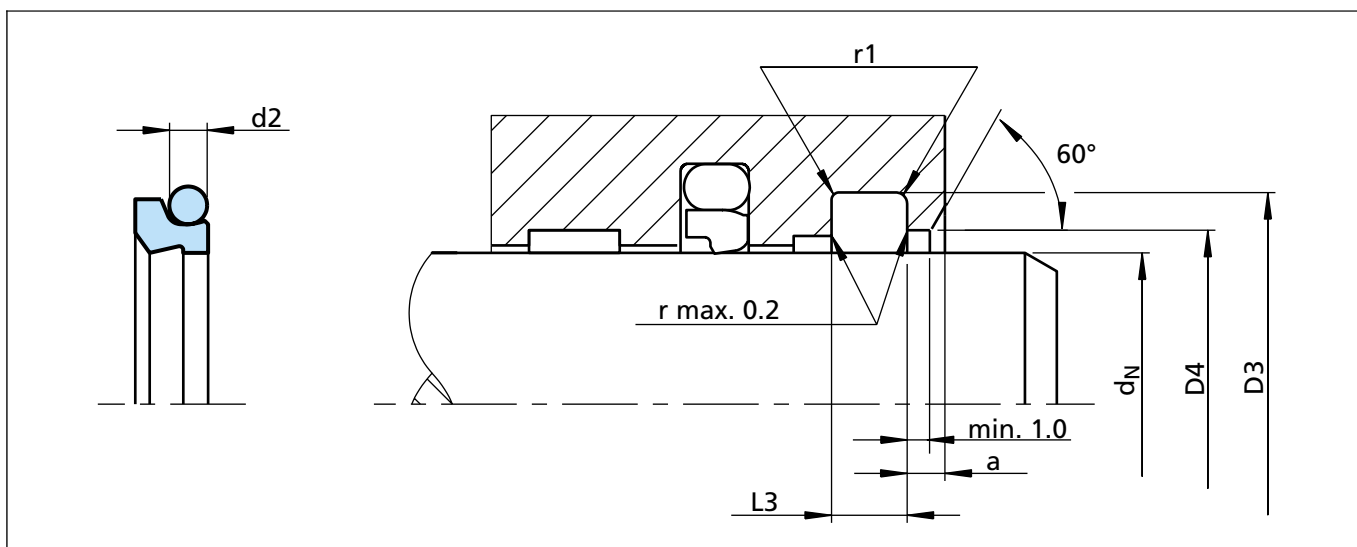


Figure 4 Installation drawing

Table VIII Installation Dimensions

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

Ordering example

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

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

* For diameters ≥ 1000.0 mm multiply only by factor 1.
 Example WE55 for diameter 1200.0 mm.
 TSS Article No.: WE55X1200-T46N.

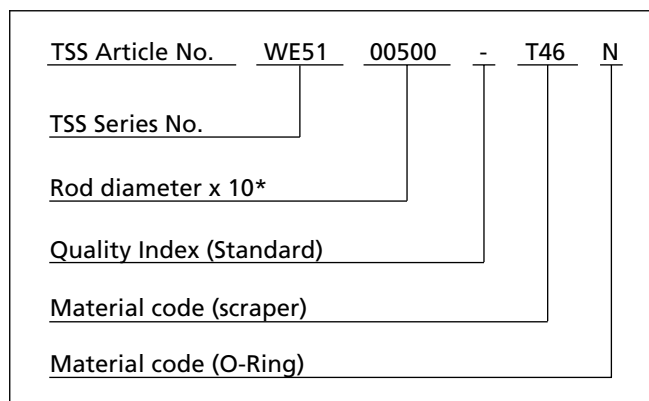




Table IX Installation Dimensions / TSS part numbers

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

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

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

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



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

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

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

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



Turcon® Excluder® 5

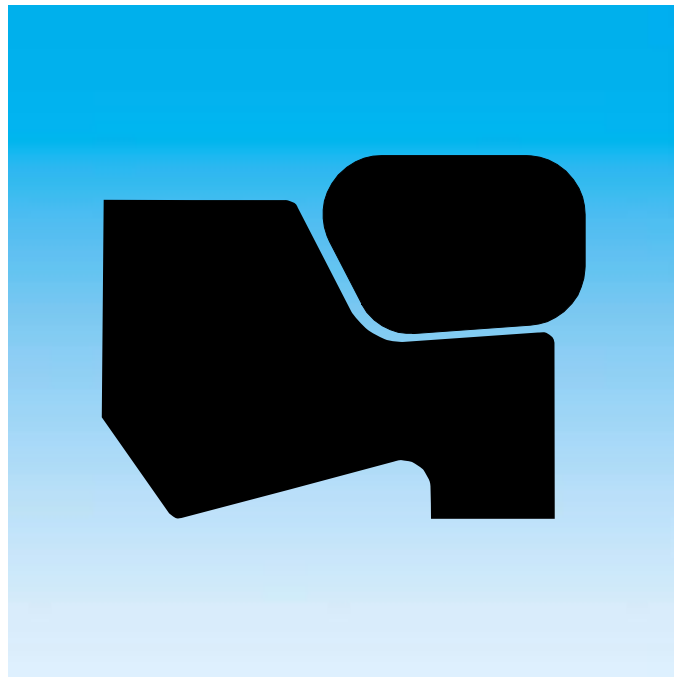
Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	r_1 max	a min.		
350.0	366.0	9.5	352.5	1.5	5.0	WE5303500	354.97 x 5.33
360.0*)	372.2	8.1	362.0	1.5	4.0	WE5203600	355.19 x 3.53
360.0*)	376.0	9.5	362.5	1.5	5.0	WE5303600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

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

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

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

ZURCON[®] EXCLUDER[®] 500



- Double Acting -
- Rubber Energised -
- Flexible Double-acting Scraper -

- Material -
- Zurcon[®] -





■ Zurcon® Excluder® 500*

Description

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

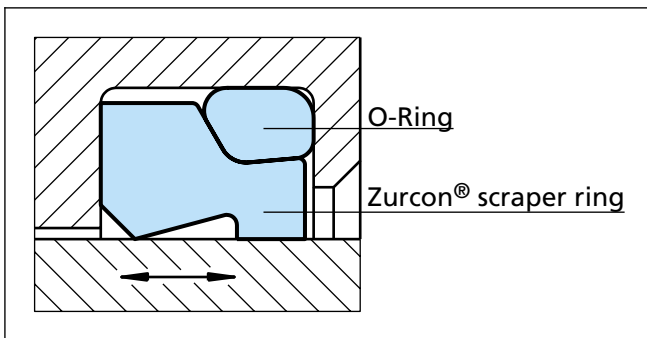


Figure 5 Zurcon® Excluder® 500

Advantages

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

Technical Data

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

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard material:

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

Design and Installation Instructions

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

For new constructions we recommend the scraper DA 24.

* Patent No. EP 023 5568



Installation Recommendation

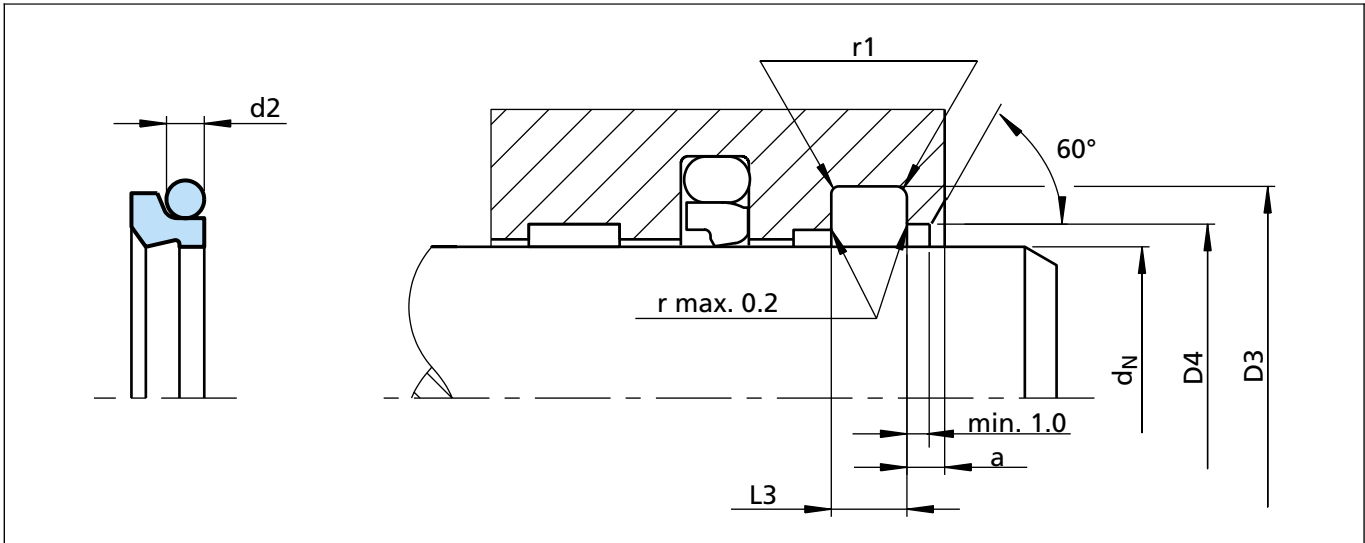


Figure 6 Installation drawing

Table X Installation Dimensions

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

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

Ordering Example

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

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



Table XI Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Radius	Step Width	TSS Part No.	O-Ring Size
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	r_1 max	a min.		
12.0	19.6	4.2	13.5	0.8	3.0	WEP000120	15.00 x 2.62
14.0	21.6	4.2	15.5	0.8	3.0	WEP000140	17.12 x 2.62
18.0	25.6	4.2	19.5	0.8	3.0	WEP000180	20.29 x 2.62
20.0	27.6	4.2	21.5	0.8	3.0	WEP000200	21.89 x 2.62
22.0	29.6	4.2	23.5	0.8	3.0	WEP000220	25.07 x 2.62
25.0	32.6	4.2	26.5	0.8	3.0	WEP000250	28.24 x 2.62
28.0	35.6	4.2	29.5	0.8	3.0	WEP000280	29.82 x 2.62
30.0	37.6	4.2	31.5	0.8	3.0	WEP000300	32.99 x 2.62
32.0	39.6	4.2	33.5	0.8	3.0	WEP000320	34.59 x 2.62
35.0	42.6	4.2	36.5	0.8	3.0	WEP000350	37.77 x 2.62
36.0	43.6	4.2	37.5	0.8	3.0	WEP000360	37.77 x 2.62
36.0	44.8	6.3	37.5	0.8	3.0	WEP100360	39.34 x 2.62
40.0*)	48.8	6.3	41.5	0.8	3.0	WEP100400	44.12 x 2.62
45.0*)	53.8	6.3	46.5	0.8	3.0	WEP100450	48.90 x 2.62
50.0*)	58.8	6.3	51.5	0.8	3.0	WEP100500	53.64 x 2.62
55.0	63.8	6.3	56.5	0.8	3.0	WEP100550	58.42 x 2.62
56.0*)	64.8	6.3	57.5	0.8	3.0	WEP100560	59.99 x 2.62
60.0	68.8	6.3	61.5	0.8	3.0	WEP100600	63.17 x 2.62
63.0*)	71.8	6.3	64.5	0.8	3.0	WEP100630	66.34 x 2.62
65.0	73.8	6.3	66.5	0.8	3.0	WEP100650	67.95 x 2.62
70.0*)	82.2	8.1	72.0	1.0	4.0	WEP200700	75.79 x 3.53
75.0	87.2	8.1	77.0	1.0	4.0	WEP200750	78.97 x 3.53
80.0*)	92.2	8.1	82.0	1.0	4.0	WEP200800	85.32 x 3.53
85.0	97.2	8.1	87.0	1.0	4.0	WEP200850	88.49 x 3.53
90.0*)	102.2	8.1	92.0	1.0	4.0	WEP200900	94.84 x 3.53
95.0	107.2	8.1	97.0	1.0	4.0	WEP200950	101.19 x 3.53
100.0*)	112.2	8.1	102.0	1.0	4.0	WEP201000	104.37 x 3.53
105.0	117.2	8.1	107.0	1.0	4.0	WEP201050	110.72 x 3.53
110.0*)	122.2	8.1	112.0	1.0	4.0	WEP201100	113.89 x 3.53
120.0	132.2	8.1	122.0	1.0	4.0	WEP201200	123.42 x 3.53
125.0*)	137.2	8.1	127.0	1.0	4.0	WEP201250	129.77 x 3.53
130.0	142.2	8.1	132.0	1.0	4.0	WEP201300	132.94 x 3.53

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

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

Other dimensions on request.



Zurcon[®] Excluder[®] 500

SCRAPER DA 17



- Double Acting -

- Material -

- Rubber -





■ Scraper DA 17

Description

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

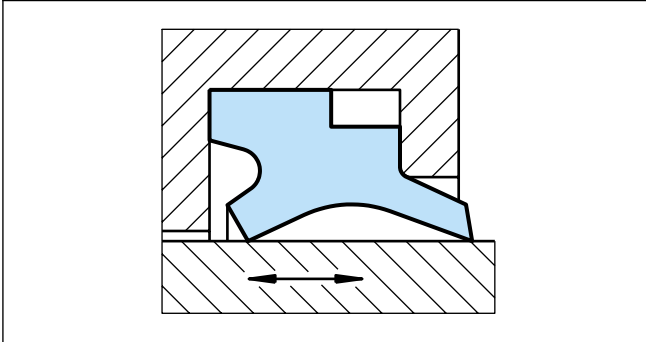


Figure 7 Scraper DA 17

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

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

Advantages

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

Technical Data

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

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Material

Standard material: NBR, 90 Shore A



Scraper DA 17

Installation Recommendation

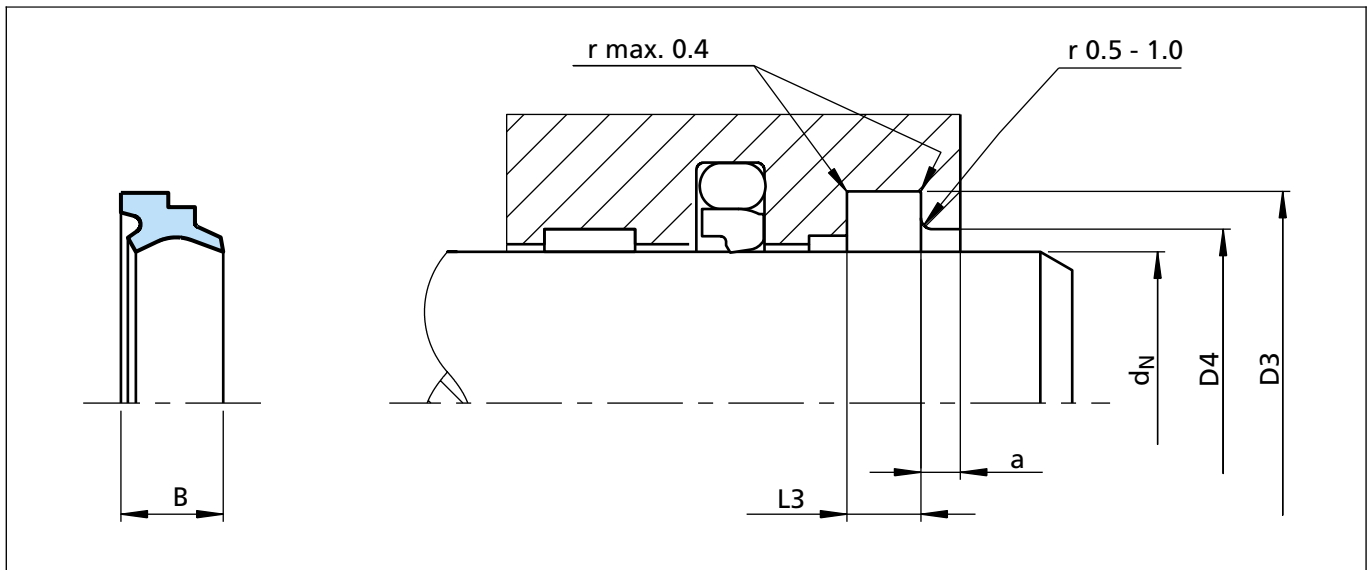


Figure 8 Installation drawing

Ordering Example

Scraper DA 17
 Rod diameter: $d_N = 50.0$ mm
 TSS Part No.: WD1700500 (from Table XII)
 Material: Standard material
 NBR 90 Shore A, Code N9

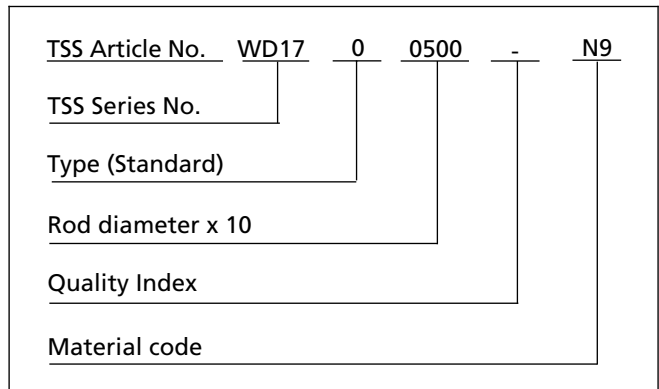


Table XII Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	TSS 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

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.



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	TSS Part No.
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	a min.	B	
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
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

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	TSS Part No.
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	a min.	B	
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	WD1701700
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
210.0	225.0	9.5	217.0	3.0	13.0	WD1702100
220.0	235.0	9.5	227.0	3.0	13.0	WD1702200
225.0	240.0	9.5	232.0	3.0	13.0	WD1702250
240.0	255.0	9.5	247.0	3.0	13.0	WD1702400
250.0	265.0	9.5	257.0	3.0	13.0	WD1702500
260.0	275.0	9.5	267.0	3.0	13.0	WD1702600
275.0	290.0	9.5	282.0	3.0	13.0	WD1702750
280.0	295.0	9.5	287.0	3.0	13.0	WD1702800
290.0	305.0	9.5	297.0	3.0	13.0	WD1702900
300.0	315.0	9.5	307.0	3.0	13.0	WD1703000
310.0	325.0	9.5	317.0	3.0	13.0	WD1703100
320.0	335.0	9.5	327.0	3.0	13.0	WD1703200
350.0	365.0	9.5	357.0	3.0	13.0	WD1703500
360.0	375.0	9.5	367.0	3.0	13.0	WD1703600
370.0	385.0	9.5	377.0	3.0	13.0	WD1703700
400.0	415.0	9.5	407.0	3.0	13.0	WD1704000
440.0	455.0	9.5	447.0	3.0	13.0	WD1704400

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

ZURCON[®] SCRAPER DA 22



- Double Acting -

- Material -

- Zurcon[®] Polyurethane -





■ Scraper DA 22

Description

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

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

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

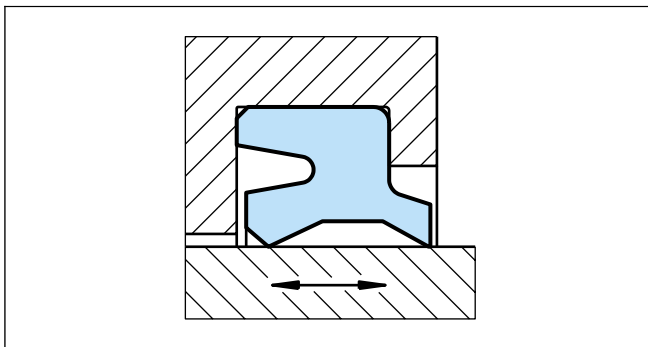


Figure 9 Scraper DA 22

Advantages

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

Application Examples

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

- ISO standard cylinders
- Hydraulic industrial cylinders
- Agriculture machinery

Technical Data

Operating conditions

Pressure

Scraper side: Atmospheric pressure

Seal side:

Pressures up to 2 MPa (20 bar)
a relief bore must be provided with higher pressures

Speed:

Up to 1 m/s

Temperature:

-35°C to +100°C

Media:

Mineral oils and greases

Groove type:

Closed

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard application:

Zurcon® Polyurethane: 92 Shore A

Material code:

Z201

Colour:

turquoise



■ Installation Recommendation

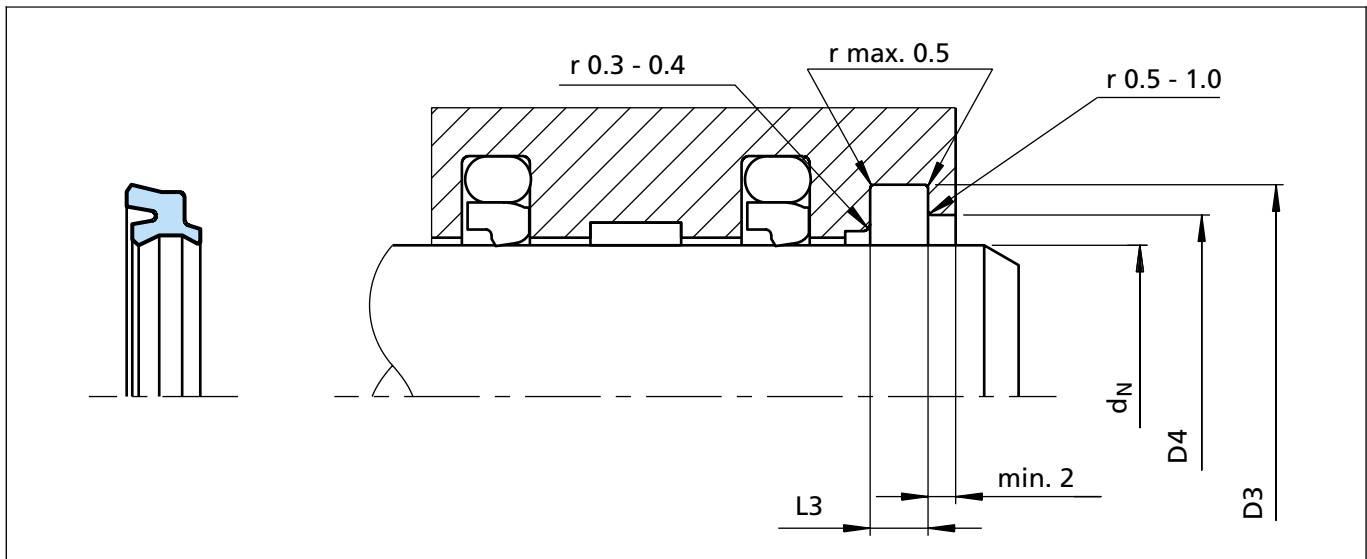


Figure 10 Installation drawing

Ordering Example

Rod diameter: $d_N = 36 \text{ mm}$
 Groove diameter: $D_3 = 44 \text{ mm}$ (see example 1)

Example 1

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

TSS Article No.	WD22	0	0360	-	Z201
TSS Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index (see table)					
Material-code					

Table XIII Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.	Old Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 H11		
5.0	10.0	3.5	7.5	WD2200050	-
8.0	13.0	3.5	10.5	WD2200080	-
10.0	16.0	4.0	12.5	WD2200100	-
12.0	18.0	4.0	14.5	WD2200120	-
12.0	18.6	3.8	15.0	WD2210120	RSW12
14.0	20.0	4.0	16.5	WD2200140	-

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



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.	Old Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 H11		
14.0	20.6	3.8	17.0	WD2210140	RSW14
16.0	22.0	4.0	18.5	WD2200160	-
18.0	24.0	4.0	20.5	WD2200180	-
18.0	24.6	3.8	21.0	WD2210180	RSW18
20.0	26.0	4.0	22.5	WD2200200	-
20.0	28.6	5.3	23.0	WD2210200	RSW20
22.0	28.0	4.0	24.5	WD2200220	-
22.0	30.6	5.3	25.0	WD2210220	RSW22
24.0	32.6	5.3	27.0	WD2210240	RSW24
25.0	31.0	4.0	27.5	WD2200250	-
25.0	33.6	5.3	28.0	WD2210250	RSW25
28.0	36.0	5.0	31.0	WD2200280	-
28.0	36.6	5.3	31.0	WD2210280	RSW28
30.0	38.0	5.0	33.0	WD2200300	-
30.0	38.6	5.3	33.0	WD2210300	RSW30
32.0	40.0	5.0	35.0	WD2200320	-
32.0	40.6	5.3	35.0	WD2210320	RSW32
35.0	43.0	5.0	38.0	WD2200350	-
35.0	43.6	5.3	38.0	WD2210350	RSW35
36.0	44.0	5.0	39.0	WD2200360	-
36.0	44.6	5.3	39.0	WD2210360	RSW36
40.0	48.0	5.0	43.0	WD2200400	-
40.0	48.6	5.3	43.0	WD2210400	RSW40
45.0	53.0	5.0	48.0	WD2200450	-
45.0	53.6	5.3	48.0	WD2210450	RSW45
50.0	58.0	5.0	53.0	WD2200500	-
50.0	58.6	5.3	53.0	WD2210500	RSW50
55.0	63.6	5.3	58.0	WD2210550	RSW55
55.0	65.0	6.0	58.0	WD2200550	-
56.0	64.6	5.3	59.0	WD2210560	RSW56
56.0	66.0	6.0	59.0	WD2200560	-
58.0	68.0	6.0	61.0	WD2200580	-
60.0	68.6	5.3	63.0	WD2210600	RSW60
60.0	70.0	6.0	63.0	WD2200600	-
63.0	71.6	5.3	66.0	WD2210630	RSW63
63.0	73.0	6.0	66.0	WD2200630	-

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.

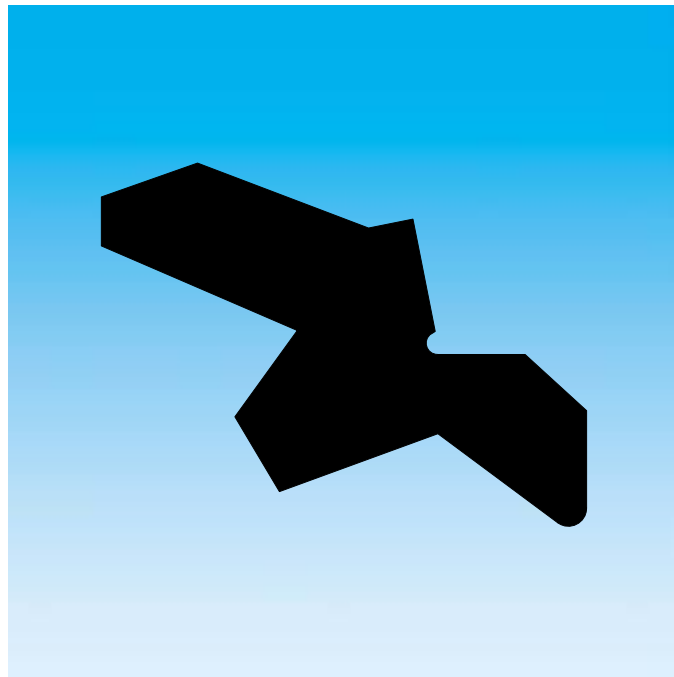


Zurcon® Scraper DA 22

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.	Old Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 H11		
65.0	73.6	5.3	68.0	WD2210650	RSW65
65.0	75.0	6.0	68.0	WD2200650	-
70.0	78.6	5.3	73.0	WD2210700	RSW70
70.0	80.0	6.0	73.0	WD2200700	-
75.0	83.6	5.3	78.0	WD2210750	RSW75
75.0	85.0	6.0	78.0	WD2200750	-
78.0	88.0	6.0	81.0	WD2200780	-
80.0	88.6	5.3	83.0	WD2210800	RSW80
80.0	90.0	6.0	83.0	WD2200800	-
85.0	95.0	6.0	88.0	WD2200850	-
85.0	97.2	7.1	91.0	WD2210850	RSW85
90.0	100.0	6.0	93.0	WD2200900	-
90.0	102.2	7.1	96.0	WD2210900	RSW90
100.0	110.0	6.0	103.0	WD2201000	-
100.0	112.2	7.1	106.0	WD2211000	RSW100
110.0	122.2	7.1	116.6	WD2211100	RSW110
110.0	125.0	8.5	114.0	WD2201100	-
120.0	135.0	8.5	124.0	WD2201200	-
125.0	140.0	8.5	129.0	WD2201250	-
140.0	155.0	8.5	144.0	WD2201400	-
150.0	165.0	8.5	154.0	WD2201500	-
160.0	175.0	8.5	164.0	WD2201600	-
180.0	195.0	8.5	184.0	WD2201800	-

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

ZURCON[®] SCRAPER DA 24



- Double-acting -

- Material -

- Zurcon[®] Polyurethane -





■ Scraper DA 24

Description

The scraper DA 24 is a double-acting scraper of polyurethane for severe operating conditions and heavy attack of dirt.

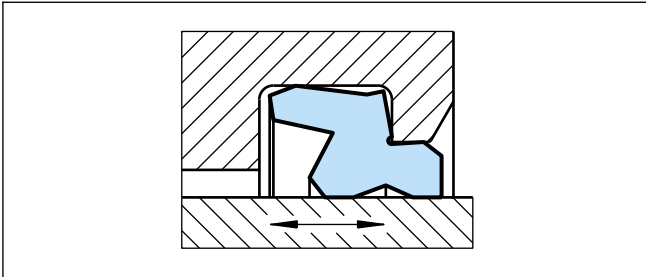


Figure 11 Scraper DA 24

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 DA 24 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
Trelleborg Sealing Solutions company

Temperature: -35°C to +100°C

Media: Mineral oil-based hydraulic fluids

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Material

The scraper DA 24 consists of Zurcon® polyurethane material with high wearability, low deformation and high resistance to extrusion.

Standard:

Special Polyurethane: Zurcon® Z201 92 Shore A

Colour: turquoise



■ Installation Recommendation

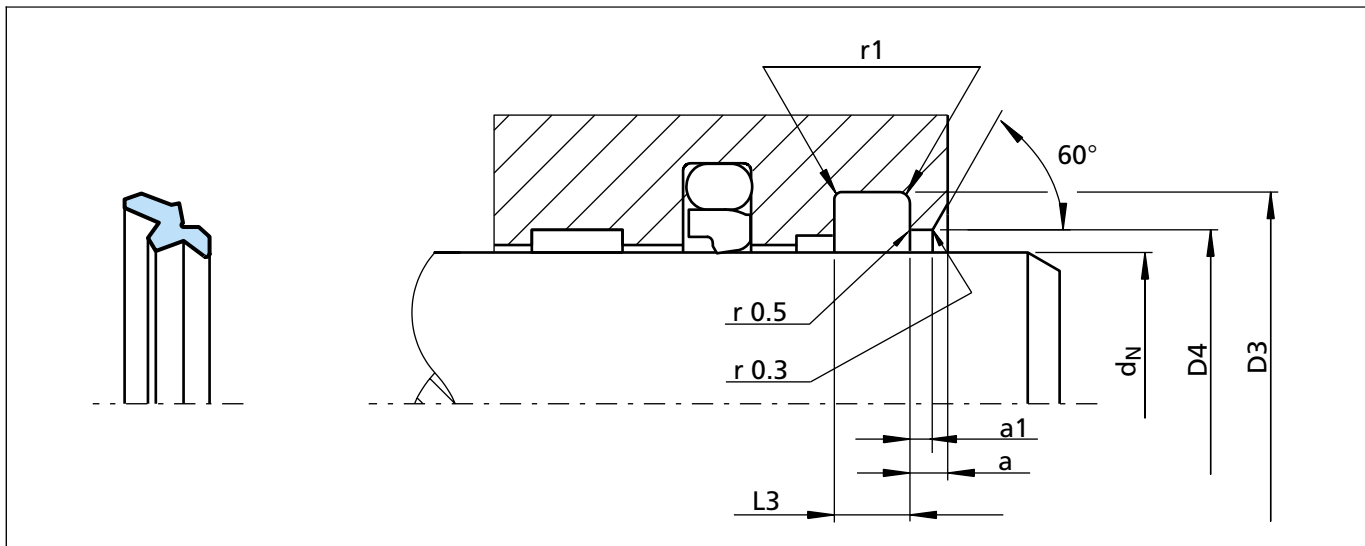


Figure 12 Installation drawing

Table XIV Installation Dimensions / TSS Article Numbers

Rod Diameter	Groove Diameter	Groove Width	Radius	Bore Diameter	Step Width	Step Width	TSS Article No.
d_N f8/h9	D_3 H9	L_3 +0.15	r_1 max	D_4 H9	a min.	a1 min.	
50.0	58.8	6.3	1.2	54.4	3.2	2.0	WD2400500-Z201
60.0	68.8	6.3	1.2	64.4	3.2	2.0	WD2400600-Z201
70.0	82.2	8.1	1.6	76.0	4.0	2.5	WD2400700-Z201
75.0	87.2	8.1	1.6	81.0	4.0	2.5	WD2400750-Z201
80.0	92.2	8.1	1.6	86.0	4.0	2.5	WD2400800-Z201
85.0	97.2	8.1	1.6	91.0	4.0	2.5	WD2400850-Z201
90.0	102.2	8.1	1.6	96.0	4.0	2.5	WD2400900-Z201
95.0	107.2	8.1	1.6	101.0	4.0	2.5	WD2400950-Z201
100.0	112.2	8.1	1.6	106.0	4.0	2.5	WD2401000-Z201
105.0	117.2	8.1	1.6	111.0	4.0	2.5	WD2401050-Z201
110.0	122.2	8.1	1.6	116.0	4.0	2.5	WD2401100-Z201
125.0	137.2	8.1	1.6	131.0	4.0	2.5	WD2401250-Z201
140.0	156.0	9.5	2.0	148.0	5.0	3.0	WD2401400-Z201
150.0	166.0	9.5	2.0	158.0	5.0	3.0	WD2401500-Z201
160.0	176.0	9.5	2.0	168.0	5.0	3.0	WD2401600-Z201
170.0	186.0	9.5	2.0	178.0	5.0	3.0	WD2401700-Z201
180.0	196.0	9.5	2.0	188.0	5.0	3.0	WD2401800-Z201
190.0	206.0	9.5	2.0	198.0	5.0	3.0	WD2401900-Z201
200.0	216.0	9.5	2.0	208.0	5.0	3.0	WD2402000-Z201

Other dimensions on request.



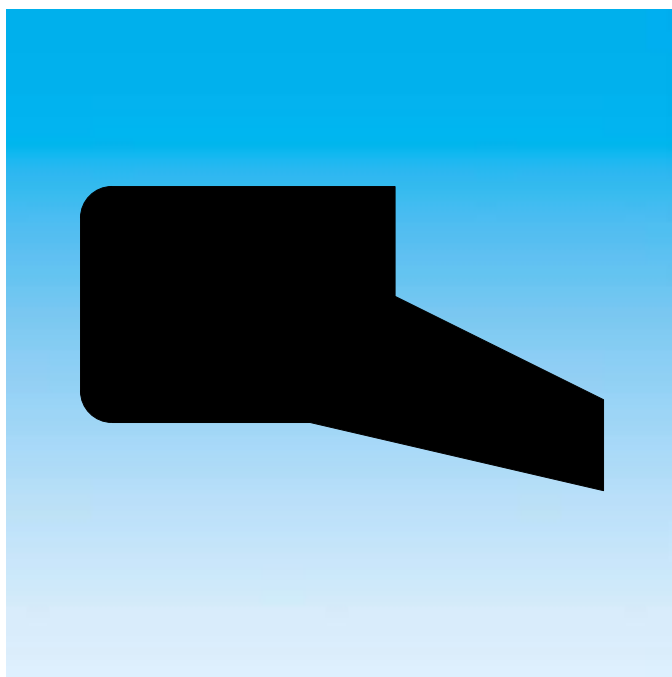
Rod Diameter	Groove Diameter	Groove Width	Radius	Bore Diameter	Step Width	Step Width	TSS Article No.
d_N f8/h9	D_3 H9	L_3 +0.15	r_1 max	D_4 H9	a min.	a1 min.	
220.0	236.0	9.5	2.0	228.0	5.0	3.0	WD2402200-Z201
240.0	256.0	9.5	2.0	248.0	5.0	3.0	WD2402400-Z201
260.0	276.0	9.5	2.0	258.0	5.0	3.0	WD2402600-Z201
280.0	296.0	9.5	2.0	288.0	5.0	3.0	WD2402800-Z201

Other dimensions on request.



Zurcon[®] Scraper DA 24

SCRAPER WRM



- Single Acting -

- Material -

- NBR Elastomer -





■ Scraper WRM

Description

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

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

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

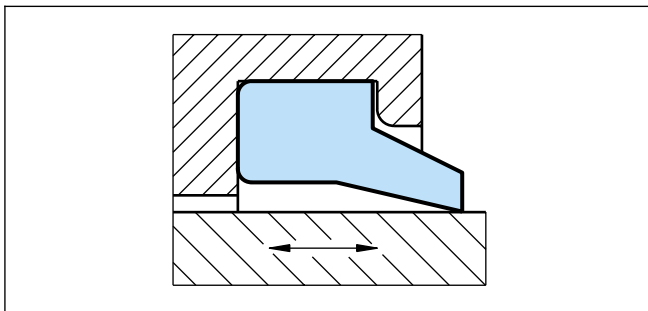


Figure 13 Scraper WRM

Advantages

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

Application Examples

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

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

Technical Data

Operating conditions

Speed: Up to 1 m/s

Temperature: -30° C to +110° C

Media: Mineral oil based hydraulic fluids, polyglycol-water emulsions, water-oil emulsions

Groove type: Closed

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard application:

Nitrile elastomer NBR 90 Shore A

Material code: N9T60

Polypac Ref. code: 2790



Installation Recommendation

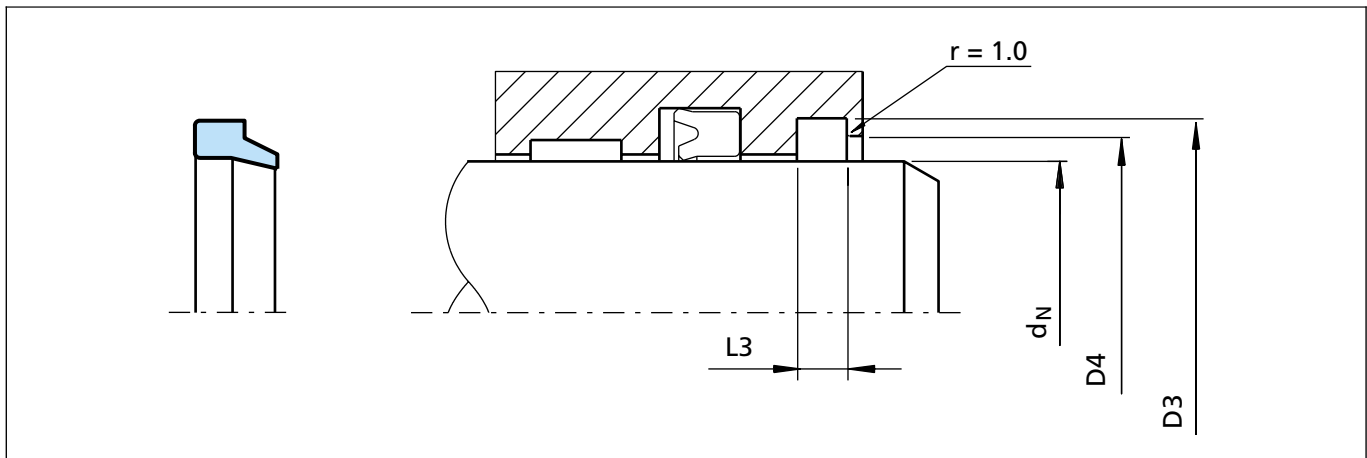


Figure 14 Installation drawing

Ordering Example

Rod diameter: $d_N = 40 \text{ mm}$
 TSS Part No.: WAP0 0 0400
 Material Code: N9T60 (standard)
 Polypac ref.: WRM 157188

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

Table XV Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.	Polypac Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 +0.2		
12.0	18.6	3.8	15.0	WAP000120	WRM047070
13.0	19.6	3.8	16.0	WAP000130	WRM051074
14.0	20.6	3.8	17.0	WAP000140	WRM055078
15.0	21.6	3.8	18.0	WAP000150	WRM059082
16.0	22.6	3.8	19.0	WAP000160	WRM062087
17.0	23.6	3.8	20.0	WAP000170	WRM066094
18.0	24.6	3.8	21.0	WAP000180	WRM070094
19.0	28.6	5.3	22.0	WAP000190	WRM074110
20.0	28.6	5.3	23.0	WAP000200	WRM078110

* Available upon request



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.	Polypac Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 +0.2		
22.0	30.6	5.3	25.0	WAP000220	WRM086118
24.0	32.6	5.3	27.0	WAP000240	WRM094125
25.0	31.6	5.3	28.0	WAP100250	WRM098122/S
25.0	33.6	5.3	28.0	WAP000250	WRM098129
26.0	34.6	5.3	29.0	WAP000260	WRM102133
27.0	35.6	5.3	30.0	WAP000270	WRM106137
28.0	36.6	5.3	31.0	WAP000280	WRM110141
30.0	38.6	5.3	33.0	WAP000300	WRM118149
31.0	41.0	6.0	34.0	WAP000310	WRM4544907
32.0	40.6	5.3	35.0	WAP000320	WRM125157
33.0	41.6	5.3	36.0	WAP000330	WRM129161
35.0	43.6	5.3	38.0	WAP000350	WRM137169
36.0	44.6	5.3	39.0	WAP000360	WRM141173
38.0	46.6	5.3	41.0	WAP000380	WRM149181
40.0	48.6	5.3	43.0	WAP000400	WRM157188
42.0	50.6	5.3	45.0	WAP000420	WRM165196
45.0	53.6	5.3	48.0	WAP000450	WRM177208
45.0	55.6	5.3	49.0	WAP100450	WRM177216
46.0	54.6	5.3	49.0	WAP000460	WRM181212
48.0	56.6	5.3	51.0	WAP000480	WRM188220
49.0	57.6	5.3	52.0	WAP000490	WRM193225
50.0	58.6	5.3	53.0	WAP000500	WRM196228
50.0*	60.6	5.3	54.0	WAP100500	WRM196236
50.8	60.9	5.8	55.5	WAP000508	WRM200237
53.0*	61.6	5.3	56.0	WAP000530	WRM208240
55.0*	63.6	5.3	58.0	WAP000550	WRM216248
55.0	65.6	5.3	59.0	WAP100550	WRM216255
56.0	64.6	5.3	59.0	WAP000560	WRM220251
56.0*	66.6	5.3	60.0	WAP100560	WRM220259
60.0	66.6	5.3	63.0	WAP200600	WRM236259
60.0	68.6	5.3	63.0	WAP000600	WRM236267
63.0*	71.6	5.3	66.0	WAP000630	WRM248279
63.0	73.6	5.3	67.0	WAP100630	WRM248287
65.0	73.6	5.3	68.0	WAP000650	WRM255287
65.0	75.6	5.3	69.0	WAP100650	WRM255295
70.0*	76.0	4.3	72.0	WAP000700	WRM275299

* Available upon request



Scraper WRM

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.	Polypac Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 +0.2		
70.0	78.6	5.3	73.0	WAP100700	WRM275307
70.0	80.6	5.3	72.0	WAP200700	WRM275314
70.0	82.6	7.1	76.0	WAP300700	WRM275322
72.0	80.6	5.3	75.0	WAP000720	WRM283317
73.0	81.6	5.3	76.0	WAP000730	WRM287318
75.0	83.6	5.3	78.0	WAP000750	WRM295326
75.0	87.2	7.1	81.0	WAP100750	WRM295345
76.5	88.7	7.1	82.5	WAP000765	WRM301348
78.0	92.2	7.1	85.0	WAP000780	WRM307362
80.0	88.6	5.3	83.0	WAP000800	WRM314346
80.0	92.6	7.1	86.0	WAP100800	WRM314362
83.0	91.6	5.3	86.0	WAP000830	WRM326358
84.0	92.0	5.3	87.0	WAP000840	WRM330362
85.0	93.6	5.3	88.0	WAP000850	WRM334366
85.0	97.2	7.1	91.0	WAP100850	WRM334381
88.0	100.2	7.1	94.0	WAP000880	WRM346393
90.0	102.2	7.1	96.0	WAP000900	WRM354401
95.0	107.2	7.1	101.0	WAP000950	WRM374421
97.0	111.0	7.1	104.0	WAP000970	WRM380437
100.0	112.2	7.1	106.0	WAP001000	WRM393440
101.0	111.0	5.3	105.0	WAP001010	WRM397437
103.0	115.2	7.1	109.0	WAP001030	WRM405452
104.0	116.2	7.1	110.0	WAP001040	WRM409457
105.0	117.2	7.1	111.0	WAP001050	WRM413460
110.0	122.2	7.1	116.0	WAP001100	WRM433480
115.0	127.2	7.1	121.0	WAP001150	WRM452500
116.0	128.2	7.1	121.0	WAP001160	WRM456504
116.0	130.2	7.1	123.0	WAP101160	WRM456511
118.0*	130.2	7.1	124.0	WAP001180	WRM464511
120.0	128.6	5.3	123.0	WAP001200	WRM472504
120.0	132.2	7.1	126.0	WAP101200	WRM472519
121.0*	131.0	5.3	125.0	WAP001210	WRM476515
125.0	137.2	7.1	131.0	WAP001250	WRM492539
127.0	135.6	5.3	132.0	WAP001270	WRM500531
127.0	139.2	7.1	133.0	WAP101270	WRM500550
130.0	142.2	7.1	136.0	WAP001300	WRM511559

* Available upon request

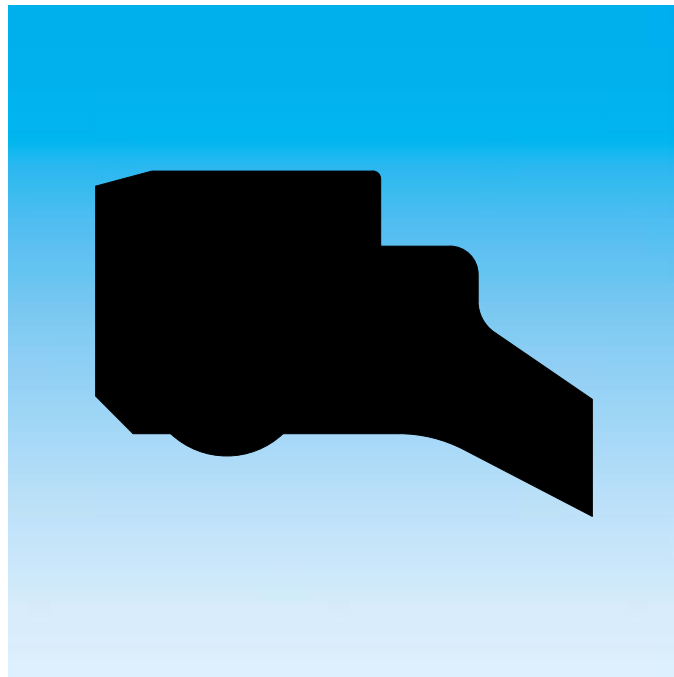


Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.	Polypac Ref. No.
d_N f8/h9	D_3 H9	L_3 +0.1	D_4 +0.2		
135.0	147.2	7.1	141.0	WAP001350	WRM531578
135.0	149.2	7.1	142.0	WAP101350	WRM531582
140.0	152.2	7.1	146.0	WAP001400	WRM551598
140.0	155.2	10.1	147.0	WAP101400	WRM551610
145.0	157.2	7.1	151.0	WAP001450	WRM570618
146.0*	158.0	6.3	152.0	WAP001460	WRM575622/1
146.05	158.25	7.1	152.05	WAP001461	WRM575622
150.0*	162.2	7.1	156.0	WAP001500	WRM590637
155.0	169.2	7.1	162.0	WAP001550	WRM610664
160.0	168.6	5.3	163.0	WAP001600	WRM629661
160.0	175.2	10.1	168.0	WAP101600	WRM629688
165.0	173.6	5.3	168.0	WAP001650	WRM649681
165.0	177.2	7.1	171.0	WAP101650	WRM649698
170.0	180.6	5.3	174.0	WAP001700	WRM669708
170.0	185.2	10.1	178.0	WAP101700	WRM669728
171.0	183.0	6.3	176.0	WAP001710	WRM673720
175.0	189.2	7.1	182.0	WAP001750	WRM688744
180.0	195.2	10.1	188.0	WAP001800	WRM708767
187.0*	195.6	5.3	190.0	WAP001870	WRM736768
196.0	210.2	7.1	203.0	WAP001960	WRM771826
197.0	219.0	6.3	202.0	WAP001970	WRM775823
200.0	215.2	10.1	207.0	WAP002000	WRM787847
210.0	224.2	7.1	217.0	WAP002100	WRM826883
210.0	225.0	7.0	217.0	WAP102100	WRM826885
219.5	233.7	7.1	226.5	WAP002195	WRM860919
223.0	235.0	6.3	228.0	WAP002230	WRM878925
244.5	258.7	7.1	251.5	WAP002445	WRM9621017
249.0	261.0	6.3	254.0	WAP002490	WRM9801027
260.0	275.2	10.1	268.0	WAP002600	WRM10241078

* Available upon request



ZURCON[®] SCRAPER ASW



- Single Acting -

- Material -

- Zurcon[®] Polyurethane -





■ Scraper ASW

Description

The scraper ASW is a single-acting polyurethane scraper.

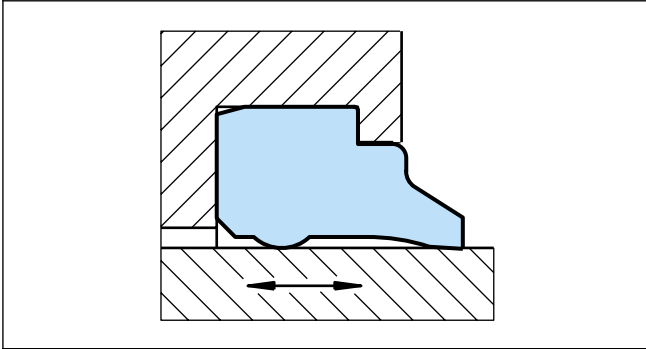


Figure 15 Scraper ASW

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

Advantages

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

Technical Data

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

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Material

The standard material is a wear resistant Zurcon® polyurethane.

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



■ Installation Recommendation

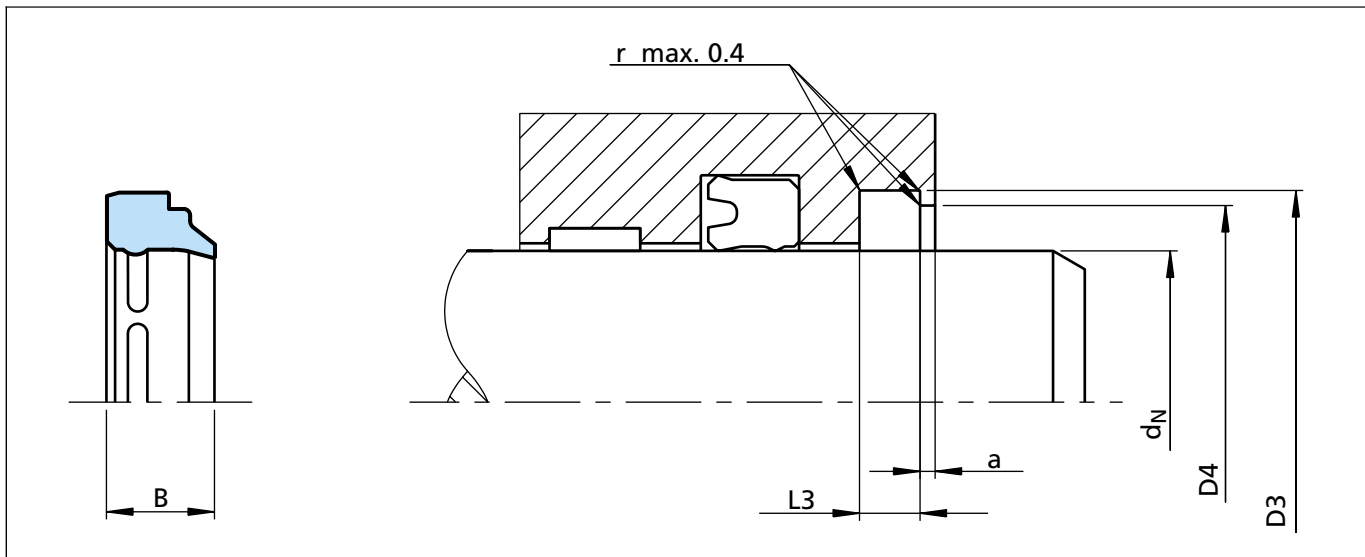


Figure 16 Installation drawing

Ordering Example

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

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

Table XVI Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	TSS 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

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



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	TSS Part No.
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	a min	B	
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
30.0	36.0	2.6	34.0	1.0	5.0	WSW100300
30.0	38.0	4.0	36.0	1.0	7.0	WSW000300
32.0	40.0	4.0	38.0	1.0	7.0	WSW000320
34.0	42.0	4.0	40.0	1.0	7.0	WSW000340
35.0	43.0	4.0	41.0	1.0	7.0	WSW000350
36.0	44.0	4.0	42.0	1.0	7.0	WSW000360
38.0	46.0	4.0	44.0	1.0	7.0	WSW000380
40.0	48.0	4.0	46.0	1.0	7.0	WSW000400
42.0	50.0	4.0	48.0	1.0	7.0	WSW000420
45.0	53.0	4.0	51.0	1.0	7.0	WSW000450
50.0	58.0	4.0	56.0	1.0	7.0	WSW000500
52.0	60.0	4.0	58.0	1.0	7.0	WSW000520
55.0	63.0	4.0	61.0	1.0	7.0	WSW000550
56.0	64.0	4.0	62.0	1.0	7.0	WSW000560
60.0	68.0	4.0	66.0	1.0	7.0	WSW000600
63.0	71.0	4.0	69.0	1.0	7.0	WSW000630
65.0	73.0	4.0	71.0	1.0	7.0	WSW000650
70.0	78.0	4.0	76.0	1.0	7.0	WSW000700
75.0	83.0	4.0	81.0	1.0	7.0	WSW000750
80.0	88.0	4.0	86.0	1.0	7.0	WSW000800
85.0	93.0	4.0	91.0	1.0	7.0	WSW000850
90.0	98.0	4.0	96.0	1.0	7.0	WSW000900
100.0	108.0	4.0	106.0	1.0	7.0	WSW001000
105.0	113.0	4.0	111.0	1.0	7.0	WSW001050

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.

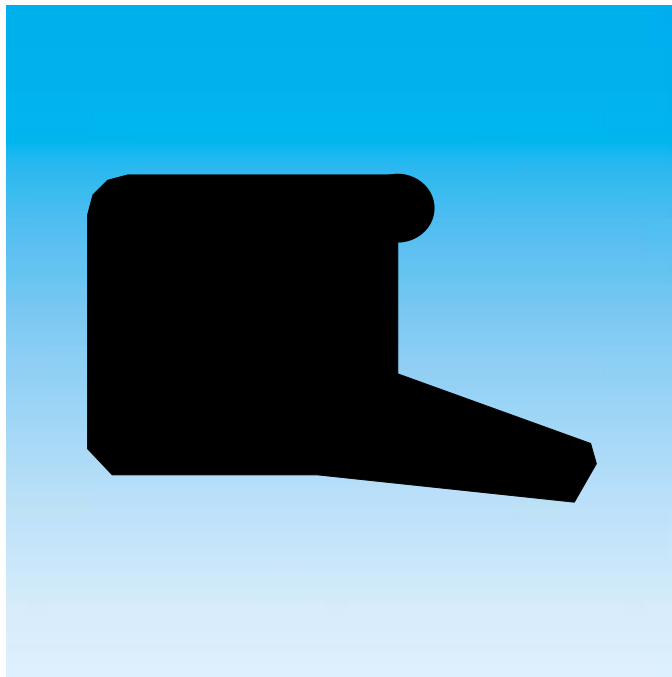


Zurcon® Scraper ASW

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	TSS Part No.
d_N f8/h9	D_3 H9	L_3 +0.2	D_4 H11	a min	B	
110.0	122.0	5.5	119.0	1.5	10.0	WSW001100
120.0	132.0	5.5	129.0	1.5	10.0	WSW001200
125.0	137.0	5.5	134.0	1.5	10.0	WSW001250
140.0	152.0	5.5	149.0	1.5	10.0	WSW001400
150.0	162.0	5.5	159.0	1.5	10.0	WSW001500
160.0	172.0	5.5	169.0	1.5	10.0	WSW001600
180.0	192.0	5.5	189.0	1.5	10.0	WSW001800

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

SCRAPER PW



- Single Acting -
- Dynamic + Static Sealing Lip -

- Material -
- Polyurethane -





■ Scraper PW

Description

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

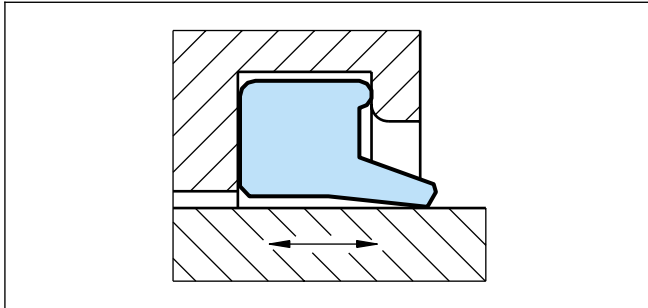


Figure 17 Scraper PW

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

Advantages

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

Application Examples

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

- Mobile hydraulic machinery
- Agriculture machinery

Technical Data

Operating conditions

Speed: Up to 1 m/s

Temperature: -35° C to +80° C

Media: Mineral oil based hydraulic fluids

Groove type: Closed

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Polyurethane: 92 Shore A

Material code: WU9L3

Colour: blue



Scraper PW

■ Installation Recommendation (For new applications use scraper type WNE)

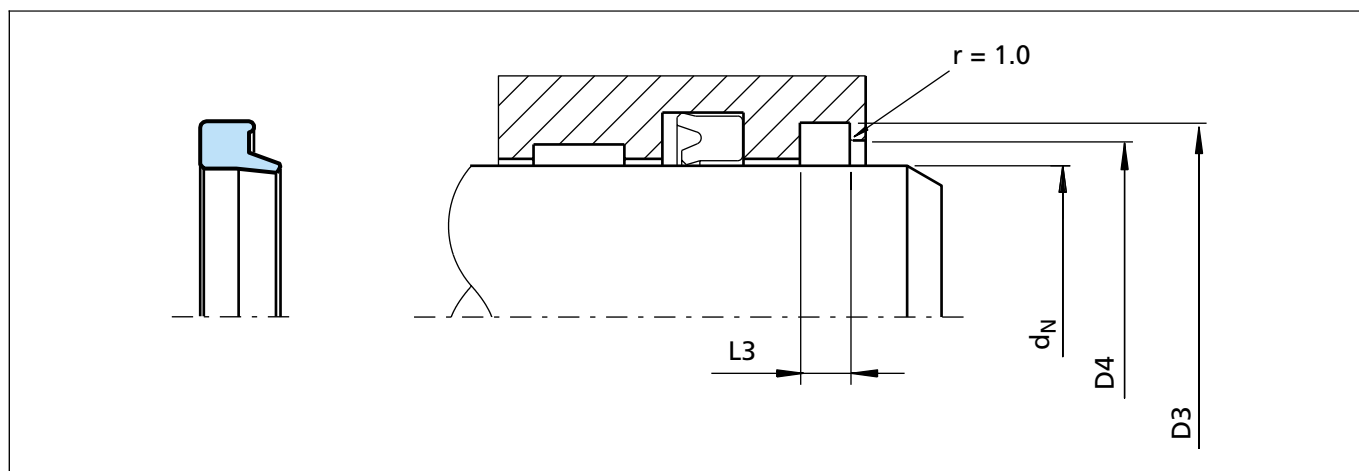


Figure 18 Installation drawing

Ordering Example

Rod diameter:	$d_N = 45 \text{ mm}$
Groove diameter:	$D_3 = 53.6 \text{ mm}$
TSS Part No.:	WNP000450
Material code:	WU9L3
Sealing Parts Ref.:	PW 45

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

TSS Article No.	WNP0	0	0450	-	WU9L3
TSS Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index					
Material code					

Table XVII Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Sealing Parts Ref. No.	TSS Part No.
$d_N \text{ h9}$	$D_3 \text{ H9}$	$L_3 +0.1$	$D_4 +0.2$		
4.0	12.0	3.0	9.0	PW4	WNP100040
5.0	12.0	2.8	9.0	PW5/S	WNP100050
6.0	12.0	3.0	9.0	PW6/S	WNP100060
8.0	14.6	3.8	11.0	PW8	WNP000080
9.0	13.0	2.5	12.0	PW9/S	WNP100090
10.0	15.0	1.0	13.0	PW10/S	WNP100100
10.0	16.6	3.8	13.0	PW10	WNP000100
12.0	18.6	3.8	15.0	PW12	WNP000120
14.0	20.6	3.8	17.0	PW14	WNP000140

Scraper PW



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Sealing Parts Ref. No.	TSS Part No.
d_N h9	D_3 H9	L_3 +0.1	D_4 +0.2		
15.0	21.6	3.8	18.0	PW15	WNP000150
15.0	27.0	5.0	24.0	PW15/S	WNP100150
16.0	22.5	3.0	19.0	PW16/1	WNP100160
16.0	22.6	3.8	19.0	PW16	WNP000160
18.0	24.6	3.8	21.0	PW18	WNP000180
20.0	26.0	3.4	23.0	PW20/1	WNP100200
20.0	28.6	5.3	23.0	PW20	WNP000200
20.0	30.0	5.4	27.0	PW20/S	WNP200200
22.0	30.6	2.2	25.0	PW22/1B	WNP100220
22.0	30.6	5.3	25.0	PW22	WNP000220
24.0	32.6	2.2	27.0	PW24/1B	WNP100240
24.0	32.6	5.3	27.0	PW24	WNP000240
25.0	33.6	5.3	28.0	PW25	WNP000250
28.0	36.6	5.3	31.0	PW28	WNP000280
30.0	38.6	5.3	33.0	PW30	WNP100300
30.0	40.0	3.0	34.5	PW30/1B	WNP200300
32.0	40.0	3.7	35.0	PW32/1B	WNP100320
32.0	40.6	5.3	35.0	PW32	WNP000320
35.0	40.0	3.7	37.0	PW35/2B	WNP400350
35.0	43.6	5.0	38.0	PW35/1	WNP200350
35.0	43.6	5.3	38.0	PW35	WNP100350
35.0	45.0	4.0	39.0	PW35/1B	WNP300350
36.0	44.6	5.3	39.0	PW36	WNP000360
38.0	46.6	5.3	41.0	PW38	WNP000380
38.0	48.5	4.8	41.0	PW38/1	WNP100380
40.0	48.6	5.3	43.0	PW40	WNP000400
42.0	50.6	5.3	45.0	PW42	WNP100420
45.0	53.6	5.3	48.0	PW45	WNP000450
45.0	55.6	5.3	48.0	PW45/1	WNP100450
45.0	60.0	4.2	53.0	PW45/1B	WNP200450
46.0	54.6	5.3	49.0	PW46	WNP000460
50.0	58.6	5.3	53.0	PW50	WNP100500
50.0	60.6	5.3	53.0	PW50/1	WNP200500
50.0	65.5	4.2	58.0	PW50/1B	WNP300500
53.0	61.6	5.3	56.0	PW53	WNP100530
55.0	63.6	5.3	58.0	PW55	WNP000550



Scraper PW

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Sealing Parts Ref. No.	TSS Part No.
$d_N h9$	$D_3 H9$	$L_3 +0.1$	$D_4 +0.2$		
55.0	65.6	5.3	58.0	PW55/1	WNP100550
56.0	64.6	5.3	59.0	PW56	WNP000560
56.0	66.6	5.3	59.0	PW56/1	WNP100560
60.0	68.6	5.3	63.0	PW60	WNP100600
60.0	70.6	5.5	66.5	PW60/S	WNP200600
63.0	71.6	5.3	66.0	PW63	WNP000630
65.0	73.6	5.3	68.0	PW65	WNP000650
65.0	76.6	6.0	71.5	PW65/1	WNP100650
67.0	76.6	5.5	71.0	PW67/S	WNP100670
70.0	78.6	5.3	73.0	PW70	WNP100700
70.0	80.0	5.0	74.0	PW70/2	WNP000700
70.0	80.0	7.0	74.0	PW70/3	WNP300700
70.0	82.6	7.1	76.0	PW70/1	WNP200700
73.0	81.6	5.3	76.0	PW73	WNP000730
73.0	83.6	7.3	76.0	PW73/1	WNP100730
75.0	83.6	5.3	78.0	PW75	WNP000750
75.0	87.2	7.1	81.0	PW75/1	WNP100750
78.0	86.0	5.0	81.0	PW78/2	WNP200780
78.0	88.6	5.5	84.5	PW78/S	WNP100780
78.0	92.2	7.1	85.0	PW78	WNP000780
80.0	88.6	5.3	83.0	PW80	WNP000800
80.0	92.6	7.1	86.0	PW80/1	WNP100800
85.0	93.6	5.3	88.0	PW85/1	WNP100850
85.0	97.2	7.1	91.0	PW85	WNP000850
90.0	100.0	7.0	94.0	PW90/2	WNP200900
90.0	102.0	6.0	94.0	PW90/1	WNP100900
90.0	102.2	7.1	96.0	PW90	WNP000900
92.0	103.6	5.5	97.0	PW92/S	WNP100920
93.0	101.0	5.0	96.0	PW93/1	WNP000930
93.0	123.0	5.0	115.0	PW93/S	WNP200930
95.0	105.0	10.0	99.0	PW95/1	WNP100950
95.0	107.2	7.1	101.0	PW95	WNP000950
97.0	105.0	5.0	100.0	PW97/2	WNP100970
99.0	109.6	5.5	105.5	PW99/S	WNP000990
100.0	112.2	6.0	104.0	PW100/1	WNP201000
100.0	112.2	7.1	106.0	PW100	WNP101000

Scraper PW



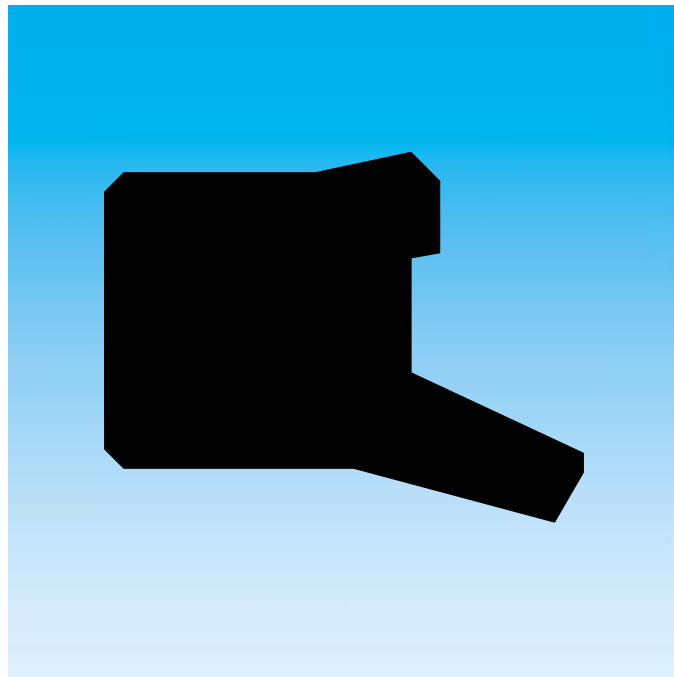
Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Sealing Parts Ref. No.	TSS Part No.
d_N h9	D_3 H9	L_3 +0.1	D_4 +0.2		
110.0	122.2	7.1	116.0	PW110	WNP101100
112.0	124.2	7.1	118.0	PW112	WNP101120
115.0	127.0	10.0	121.0	PW115/1	WNP101150
115.0	127.2	7.1	121.0	PW115	WNP001150
118.0	126.0	5.0	121.0	PW118/2	WNP101180
120.0	130.6	5.5	126.5	PW120/S	WNP201200
120.0	132.2	7.1	126.0	PW120	WNP101200
125.0	137.2	7.1	131.0	PW125	WNP001250
128.0	140.2	7.1	134.0	PW128	WNP101280
130.0	142.2	7.1	136.0	PW130	WNP101300
135.0	147.2	7.1	141.0	PW135	WNP001350
140.0	148.6	6.0	143.0	PW140/2	WNP201400
140.0	152.2	7.1	146.0	PW140	WNP001400
140.0	155.0	9.0	147.0	PW140/1	WNP101400
141.0	151.6	5.5	147.5	PW141/S	WNP001410
143.0	151.0	5.5	146.0	PW143/2	WNP101430
145.0	157.2	7.1	151.0	PW145	WNP001450
145.0	160.0	8.0	152.0	PW145/1	WNP101450
148.0	160.0	7.0	152.0	PW148/1	WNP101480
150.0	162.2	7.1	156.0	PW150	WNP001500
150.0	165.0	7.5	156.0	PW150/1	WNP101500
160.0	172.2	7.1	166.0	PW160/1	WNP001600
160.0	175.2	10.1	168.0	PW160	WNP101600
162.0	172.6	5.5	168.0	PW162/S	WNP101620
163.0	175.2	7.1	169.0	PW163	WNP101630
170.0	178.6	5.3	173.0	PW170/1B	WNP101700
170.0	185.2	10.1	178.0	PW170	WNP001700
180.0	195.2	10.1	188.0	PW180	WNP001800
180.0	200.0	7.0	188.0	PW180/1	WNP101800
183.0	193.6	5.5	189.0	PW183/S	WNP101830
188.0	200.2	7.1	194.0	PW188	WNP101880
190.0	205.2	10.1	198.0	PW190	WNP001900
190.0	210.0	10.1	200.0	PW190/1	WNP101900
200.0	215.2	10.1	208.0	PW200	WNP002000
210.0	225.2	10.1	218.0	PW210	WNP102100
220.0	235.2	10.1	228.0	PW220	WNP002200



Scraper PW

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Sealing Parts Ref. No.	TSS Part No.
d_N h9	D_3 H9	L_3 +0.1	D_4 +0.2		
220.0	240.0	10.1	228.0	PW220/1	WNP102200
230.0	245.2	10.1	238.0	PW230	WNP102300
240.0	255.2	10.1	248.0	PW240	WNP102400
250.0	265.2	10.1	258.0	PW250	WNP102500
257.0	267.6	5.5	264.0	PW257/S	WNP102570
280.0	300.0	10.2	290.0	PW280/1	WNP102800

ZURCON[®] SCRAPER WNE



- Single Acting -
- Dynamic + Static Sealing Lip -

- Material -
- Zurcon[®] Polyurethane -





■ Scraper WNE

Description

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

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

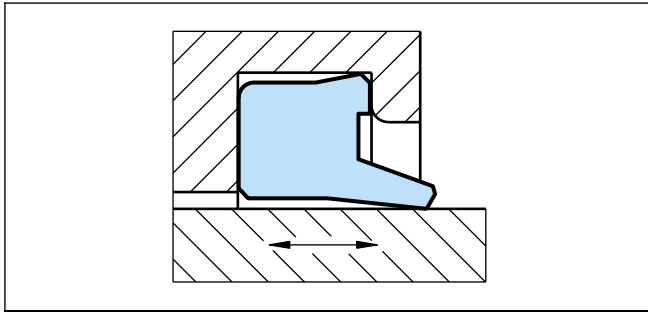


Figure 19 Scraper WNE

Advantages

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

Application Examples

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

- Mobile hydraulic machinery
- Agriculture machinery

Technical Data

Operating conditions

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

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

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



■ Installation Recommendation

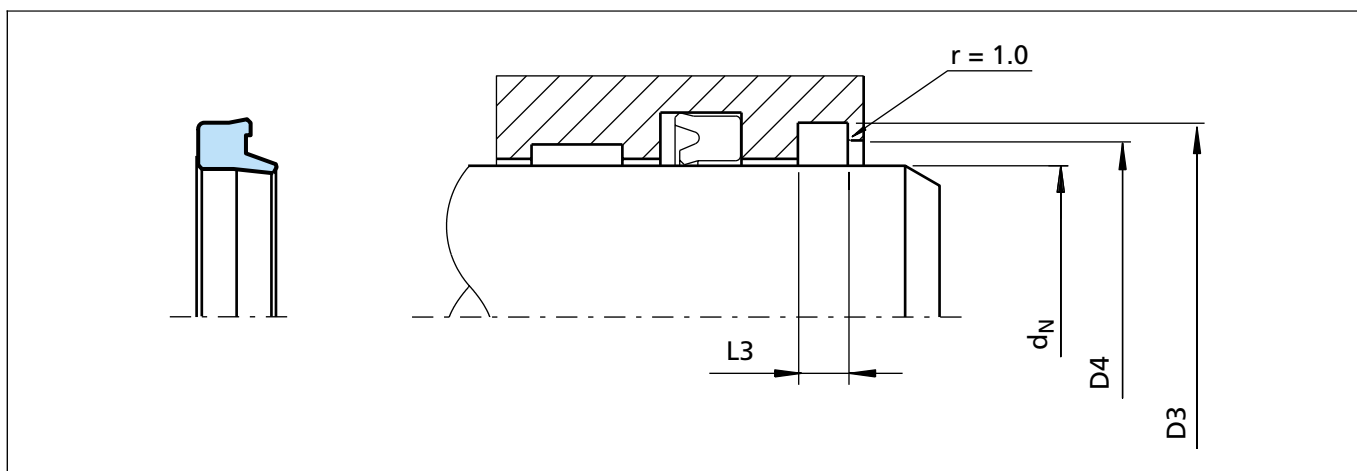


Figure 20 Installation drawing

Ordering Example

For WNE scrapers

Rod diameter: $d_N = 45 \text{ mm}$

Groove diameter: $D_3 = 53.6 \text{ mm}$

TSS Part No.: WNE000450

Material code: Z201

TSS Article No.	WNE0	0	0450	-	Z201
TSS Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index					
Material code					

Table XVIII Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.
$d_N \text{ h9}$	$D_3 \text{ H11}$	$L_3 \text{ } +0.1$	$D_4 \text{ } +0.2$	
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



Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.
d_N h9	D_3 H11	L_3 +0.1	D_4 +0.2	
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
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	WNE100600
60.0	68.6	5.3	63.0	WNE200600
60.0	70.0	5.0	63.0	WNE000600
61.0	69.6	5.3	64.0	WNE000610
63.0	71.6	5.3	66.0	WNE000630
65.0	73.6	5.3	68.0	WNE000650
70.0	78.6	5.3	73.0	WNE100700
70.0	80.0	5.0	73.0	WNE000700
75.0	83.6	5.3	78.0	WNE000750
75.0	87.2	7.1	81.0	WNE100750
76.0	84.6	5.3	79.0	WNE000760
80.0	88.6	5.3	83.0	WNE000800
85.0	93.6	5.3	88.0	WNE100850
85.0	97.2	7.1	91.0	WNE000850
90.0	102.2	7.1	96.0	WNE000900
91.0	99.6	5.3	94.0	WNE000910
95.0	107.2	7.1	101.0	WNE000950
100.0	112.0	7.1	106.0	WNE001000
100.0	112.2	7.1	106.0	WNE101000
107.0	115.6	5.3	110.0	WNE001070
110.0	122.2	7.1	116.0	WNE001100



Zurcon® Scraper WNE

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.
$d_N h9$	$D_3 H11$	$L_3 +0.1$	$D_4 +0.2$	
120.0	132.0	7.1	126.0	WNE001200
120.0	132.2	7.1	126.0	WNE101200
125.0	137.2	7.1	131.0	WNE001250
126.0	134.6	5.3	129.0	WNE001260
135.0	147.2	7.1	141.0	WNE001350
140.0	152.2	7.1	146.0	WNE001400
140.0	155.0	9.0	146.5	WNE101400
160.0	175.2	10.1	168.0	WNE101600
180.0	195.2	10.1	188.0	WNE001800
200.0	215.2	10.1	208.0	WNE002000
220.0	235.2	10.1	228.0	WNE002200
250.0	265.2	10.1	258.0	WNE002500

ZURCON[®] SCRAPER WNV



- Double Acting -

- Material -

- Zurcon[®] Polyurethane -





■ Scraper WNV

Description

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

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

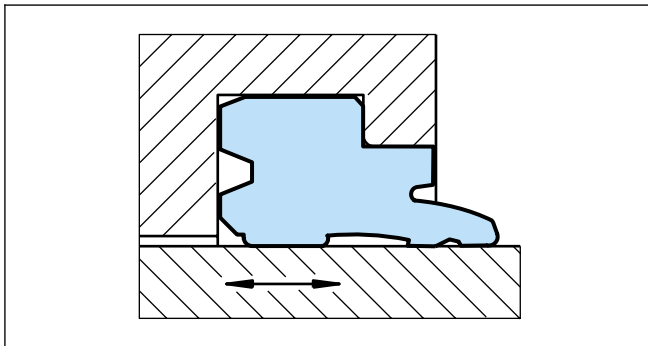


Figure 21 Scraper WNV

Advantages

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

Application Examples

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

Technical Data

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

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

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



■ Installation Recommendation

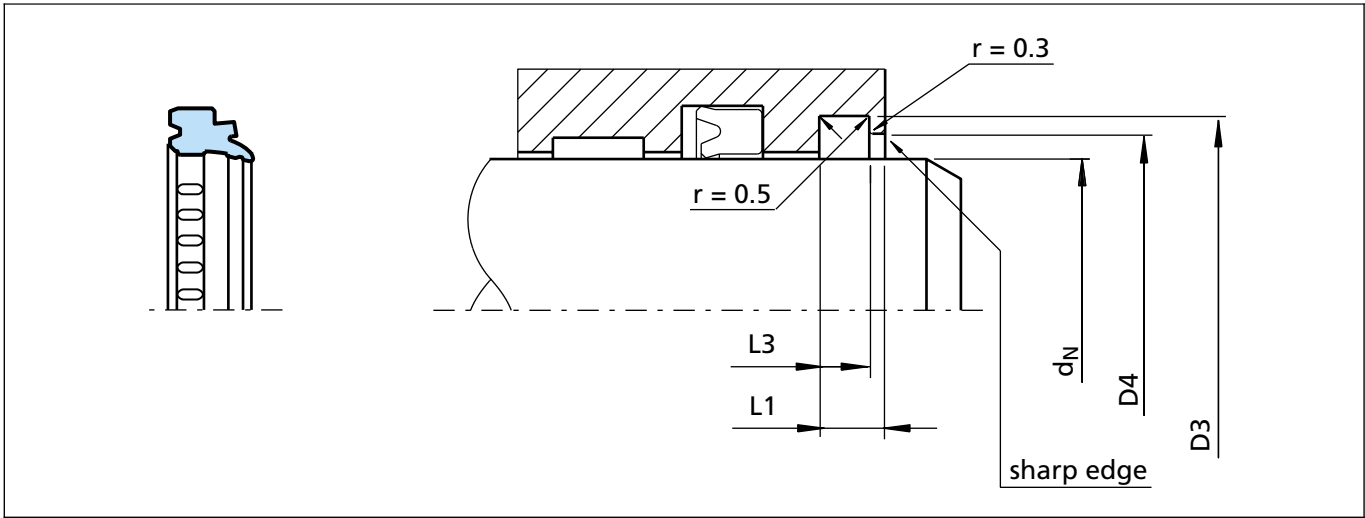


Figure 22 Installation drawing

Ordering Example

Rod diameter: $d_N = 45.0$ mm
 Groove diameter: $D_3 = 53.0$ mm
 TSS Part No.: WNV000450 (from Table XIX)
 Material code: Z201

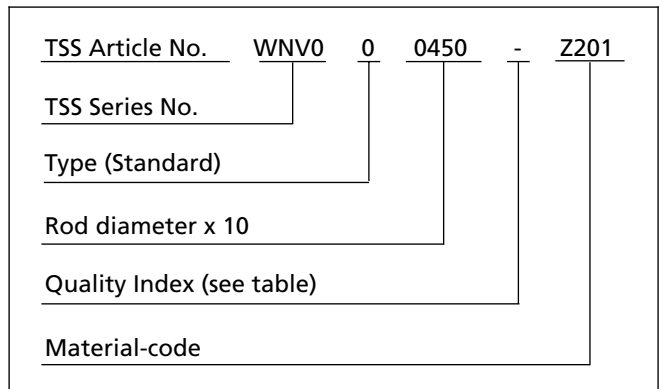
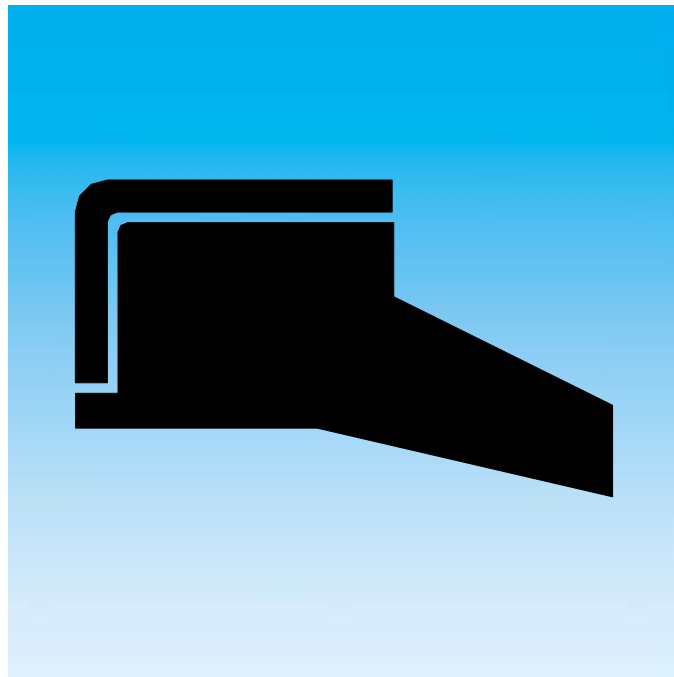


Table XIX Installation Dimensions / TSS part numbers

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

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

SCRAPER WSA



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

- Material -
- NBR and Metal -





■ Scraper WSA

Description

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

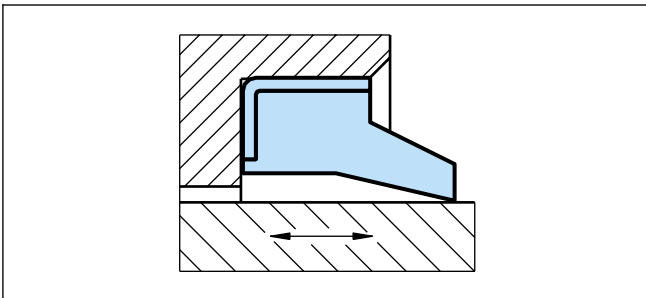


Figure 23 Scraper WSA

Advantages

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

Application Examples

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

Technical Data

Operating conditions

Speed: Up to 1 m/s

Temperature: -30° C to +110° C

Media: Mineral oil based hydraulic fluids.
polyglycol-water emulsions, water-oil emulsions

Groove type: Open

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard application:

Material: NBR 90 Shore A + Metal

TSS code: N9MN



■ Installation Recommendation

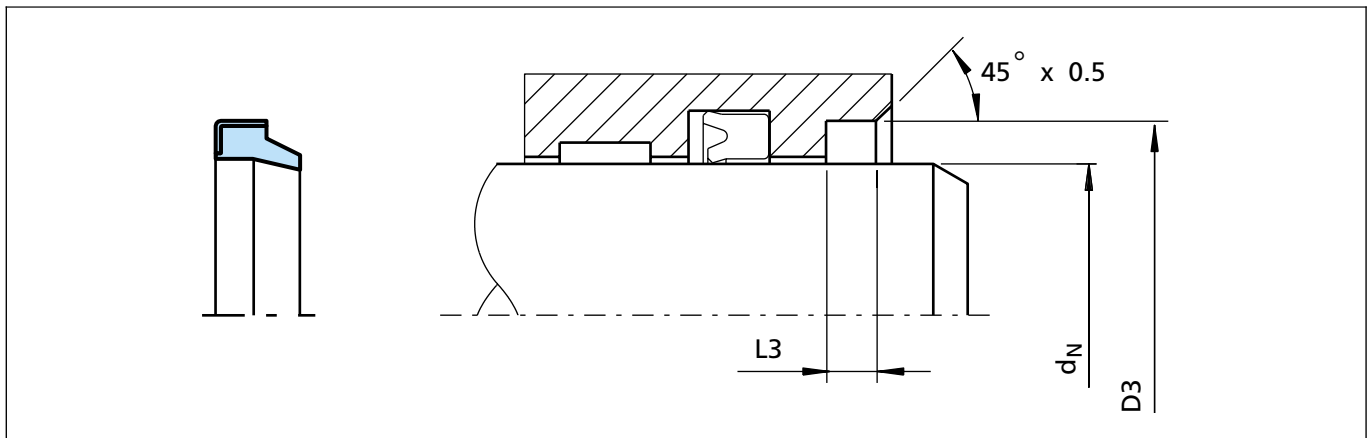


Figure 24 Installation drawing

Ordering Example

Rod diameter: $d_N = 35 \text{ mm}$
 Groove diameter: $D_3 = 45 \text{ mm}$
 TSS Part No.: WSA000350

Material set code:
 TSS: N9MN

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

Table XX Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	TSS Part No.
d_N h9	D_3 H8	L_3 +0.1	
6.0	13.0	3.0	WSA000060
8.0	15.0	3.0	WSA000080
10.0	16.0	3.0	WSA000100
10.0	18.0	5.0	WSA100100
12.0	18.0	5.0	WSA200120
12.0	20.0	4.0	WSA000120
12.0	22.0	5.0	WSA100120
13.0	18.0	3.0	WSA000130
14.0	20.0	4.0	WSA100140

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



Rod Diameter	Groove Diameter	Groove Width	TSS Part No.
d_N h9	D_3 H8	L_3 +0.1	
14.0	22.0	3.0	WSA000140
16.0	22.0	4.0	WSA000160
16.0	26.0	5.0	WSA200160
16.0	28.0	5.0	WSA300160
18.0	26.0	5.0	WSA000180
18.0	28.0	5.0	WSA300180
18.0	28.0	7.0	WSA100180
20.0	26.0	4.0	WSA000200
20.0	28.0	3.5	WSA200200
20.0	28.0	5.0	WSA300200
20.0	30.0	4.0	WSA400200
20.0	30.0	5.0	WSA500200
20.0	30.0	7.0	WSA600200
22.0	28.0	5.0	WSA000220
22.0	32.0	5.0	WSA200220
22.0	32.0	7.0	WSA100220
24.0	35.0	5.0	WSA000240
25.0	35.0	5.0	WSA200250
25.0	35.0	5.0	WSA000250
25.0	35.0	7.0	WSA100250
28.0	38.0	5.0	WSA000280
28.0	40.0	7.0	WSA100280
30.0	40.0	5.0	WSA000300
30.0	40.0	7.0	WSA100300
30.0	45.0	5.0	WSA200300
32.0	42.0	5.0	WSA000320
32.0	42.0	7.0	WSA400320
32.0	44.0	4.0	WSA300320
32.0	45.0	4.0	WSA100320
32.0	45.0	7.0	WSA200320
35.0	45.0	7.0	WSA000350
36.0	45.0	7.0	WSA000360
38.0	48.0	7.0	WSA000380
40.0	50.0	5.0	WSA100400
40.0	50.0	5.0	WSA000400
40.0	50.0	7.0	WSA200400

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



Scraper WSA

Rod Diameter	Groove Diameter	Groove Width	TSS Part No.
d_N h9	D_3 H8	L_3 +0.1	
42.0	52.0	7.0	WSA000420
45.0	55.0	5.0	WSA100450
45.0	55.0	7.0	WSA000450
50.0	56.0	5.0	WSA000500
50.0	60.0	5.0	WSA200500
50.0	60.0	5.0	WSA500500
50.0	60.0	7.0	WSA300500
50.0	65.0	7.0	WSA400500
52.0	62.0	7.0	WSA000520
55.0	63.0	7.0	WSA000550
55.0	65.0	5.0	WSA200550
55.0	65.0	7.0	WSA100550
55.0	70.0	7.0	WSA300550
56.0	66.0	7.0	WSA000560
60.0	70.0	5.0	WSA200600
60.0	70.0	7.0	WSA000600
60.0	74.0	5.0	WSA100600
63.0	75.0	7.0	WSA000630
65.0	75.0	5.0	WSA100650
65.0	75.0	7.0	WSA000650
70.0	80.0	5.0	WSA100700
70.0	80.0	7.0	WSA000700
75.0	83.0	7.0	WSA100750
75.0	85.0	7.0	WSA000750
80.0	88.0	7.0	WSA100800
80.0	90.0	7.0	WSA000800
85.0	95.0	7.0	WSA000850
90.0	100.0	7.0	WSA000900
95.0	105.0	7.0	WSA000950
100.0	110.0	7.0	WSA001000
105.0	115.0	7.0	WSA001050
110.0	120.0	7.0	WSA001100
115.0	125.0	7.0	WSA001150
120.0	130.0	7.0	WSA001200
120.0	135.0	7.0	WSA101200
125.0	140.0	9.0	WSA001250

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

Scraper WSA



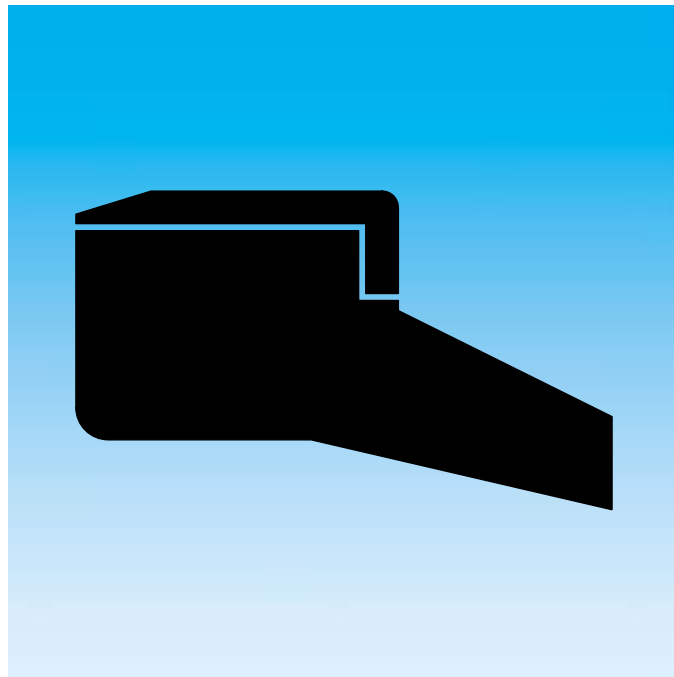
Rod Diameter	Groove Diameter	Groove Width	TSS Part No.
d_N h9	D_3 H8	L_3 +0.1	
130.0	145.0	9.0	WSA001300
135.0	145.0	7.0	WSA001350
140.0	155.0	9.0	WSA001400
140.0	160.0	10.0	WSA101400
150.0	165.0	9.0	WSA001500
160.0	175.0	9.0	WSA001600
170.0	185.0	10.0	WSA001700
175.0	190.0	9.0	WSA001750
180.0	195.0	10.0	WSA001800
200.0	220.0	12.0	WSA002000
220.0	235.0	10.0	WSA002200
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.



Scraper WSA

ZURCON[®] SCRAPER WRM/PC



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

- Material -
- Zurcon[®] Polyurethane + Metal -





■ Scraper WRM/PC

Description

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

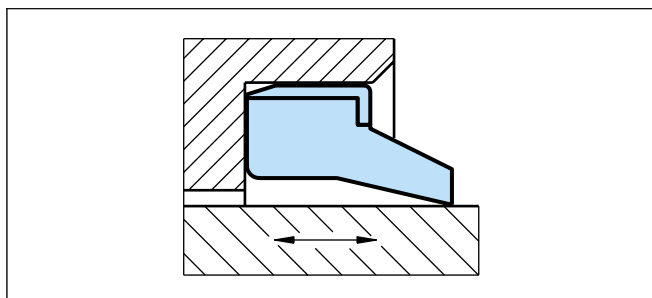


Figure 25 Scraper WRM/PC

Advantages

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

Application Examples

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

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

Technical Data

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

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard application

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



■ Installation Recommendation

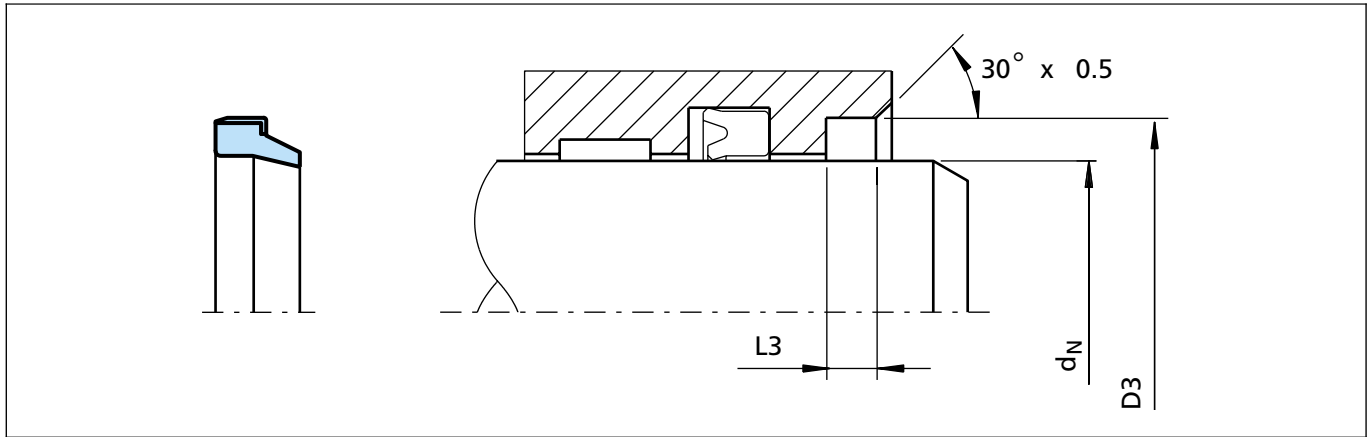


Figure 26 Installation drawing

Ordering Example

Rod diameter: $d_N = 40 \text{ mm}$
 Groove diameter: $D_3 = 50 \text{ mm}$
 TSS Part No.: WSA0 P 0400 -
 Material Set-Code: Z2022
 Polypac ref.: WRM 157196/PC

TSS Article No.	WSA0	P	0400	-	Z2022
TSS Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index (see table)					
Material Set-code					

Table XXI Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	TSS Part No.	Polypac Ref. No.
d_N h9	D_3 H8	L_3 +0.1		
16.00	22.00	4.0	WSA0P0160	WRM062086/PC
20.00	30.00	7.0	WSA0P0200	WRM078118/PC
30.00	40.00	5.0	WSA0P0300	WRM118157/1/PC
38.10	50.80	7.0	WSA0P0381	WRM150200/PC
40.00	50.00	5.0	WSA0P0400	WRM157196/PC
50.00	60.00	7.0	WSA0P0500	WRM196236/PC
50.80	63.50	7.0	WSA0P0508	WRM200250/PC
55.00	65.00	7.0	WSA0P0550	WRM216255/PC
57.15	70.00	7.0	WSA0P0572	WRM225275/PC
60.00	70.00	7.0	WSA0P0600	WRM236275/1/PC
63.50	76.20	7.0	WSA0P0635	WRM250300/PC
75.00	83.00	7.0	WSA0P0750	WRM295326/PC

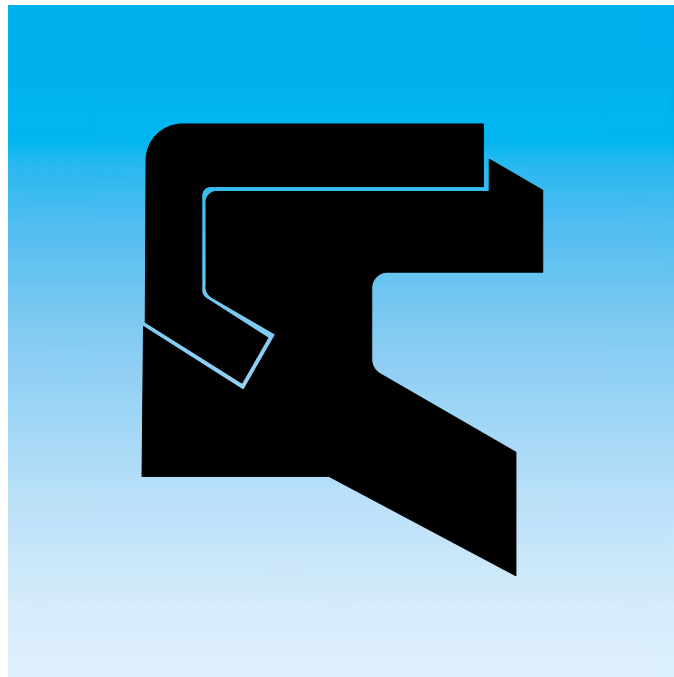


Rod Diameter	Groove Diameter	Groove Width	TSS Part No.	Polypac Ref. No.
d_N h9	D₃ H8	L₃ +0.1		
76.20	88.90	7.0	WSA0P0762	WRM300350/PC
80.00	90.00	7.0	WSA0P0800	WRM314354/PC
95.00	105.00	7.0	WSA0P0950	WRM374413/PC
105.00	115.00	7.0	WSA0P1050	WRM413452/PC
175.00	190.00	9.0	WSA0P1750	WRM688748/PC



Zurcon[®] Scraper WRM/PC

ZURCON[®] SCRAPER SWP



- Single Acting -
- Metal Reinforcement -
- For open Groove Assembly -

- Material -
- Zurcon[®] Polyurethane + Metal -





■ Scraper SWP

Description

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

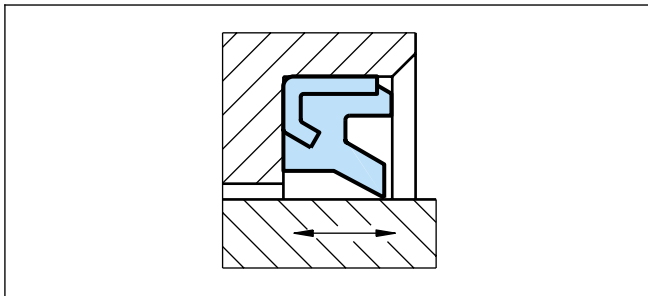


Figure 27 Scraper SWP

Advantages

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

Application Examples

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

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

Technical Data

Operating conditions

Speed: Up to 1 m/s

Temperature: -35° C to +100°C

Media: Mineral oil based hydraulic fluids

Groove type: Open

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

Standard application

Zurcon® Polyurethane: 92 Shore A

Colour: turquoise

Metal case: non alloyed steel
DIN 1624

Material Set-Code: Z2022



■ Installation Recommendation

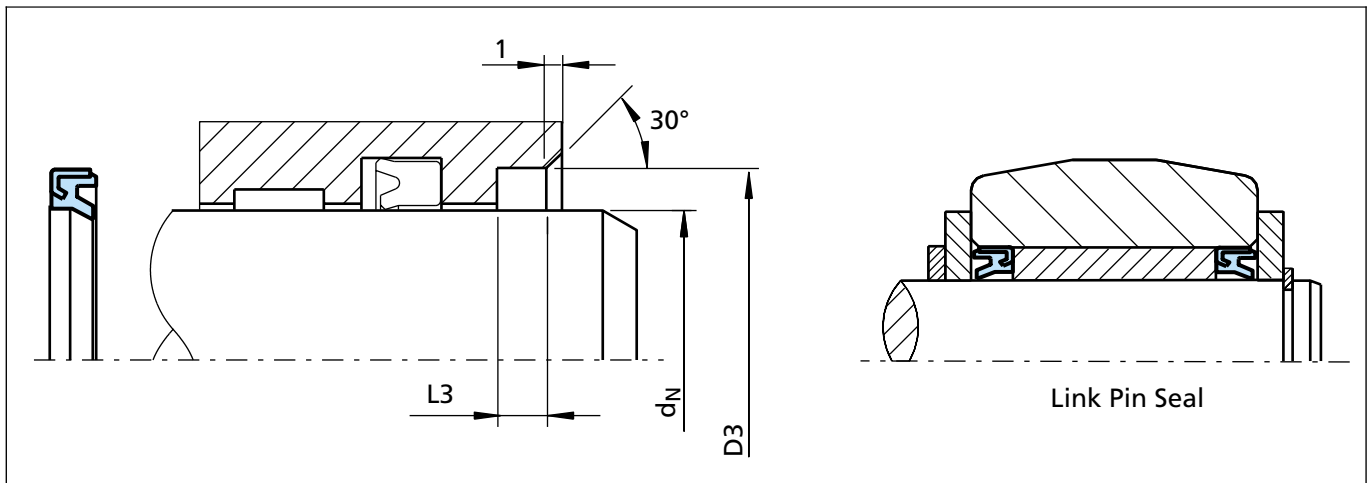


Figure 28 Installation drawing

Ordering Example

Rod diameter: $d_N = 40 \text{ mm}$
 Groove diameter: $D_3 = 50 \text{ mm}$
 TSS Part No.: WSP0 0 0400 -
 Material Set-Code: Z2022 (standard)
 Polypac ref.: SWP 4050

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

Table XXII Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	TSS Part No.	Polypac Ref. No.
$d_N \text{ h9}$	$D_3 \text{ H8}$	$L_3 \text{ } +0.1$		
25.0	38.0	7.5	WSP000250	SWP2538
30.0	40.0	4.0	WSP000300	*SWP3040
30.0	43.0	7.5	WSP100300	SWP3043
35.0	45.0	4.0	WSP000350	*SWP3545
35.0	50.0	7.5	WSP100350	SWP3550
36.0	48.0	6.0	WSP000360	SWP3648
38.0	50.0	7.5	WSP000380	SWP3850
40.0	50.0	4.0	WSP000400	*SWP4050
40.0	52.0	6.0	WSP100400	SWP4052

* Can be used for "Link Pin Seal"



Rod Diameter	Groove Diameter	Groove Width	TSS Part No.	Polypac Ref. No.
d_N h9	D_3 H8	L_3 +0.1		
45.0	55.0	3.2	WSP000450	*SWP4555/1
45.0	55.0	4.0	WSP100450	*SWP4555
45.0	60.0	7.5	WSP200450	SWP4560
50.0	60.0	4.0	WSP000500	*SWP5060
50.0	63.0	4.0	WSP100500	*SWP5063
50.0	65.0	7.5	WSP200500	SWP5065
55.0	65.0	3.2	WSP000550	*SWP5565
55.0	68.0	4.0	WSP100550	*SWP5568
55.0	70.0	7.5	WSP200550	SWP5570
56.0	70.0	7.5	WSP000560	SWP5670
60.0	75.0	4.0	WSP000600	*SWP6075/1
60.0	75.0	7.5	WSP100600	SWP6075
63.0	78.0	7.5	WSP000630	SWP6378
65.0	80.0	5.0	WSP000650	*SWP6580/1
65.0	80.0	7.5	WSP100650	SWP6580
70.0	80.0	5.0	WSP000700	*SWP7080
70.0	84.0	8.0	WSP100700	SWP7084
70.0	85.0	4.0	WSP200700	SWP7085/1
70.0	85.0	7.5	WSP300700	SWP7085
71.0	86.0	5.0	WSP000710	*SWP7186
75.0	90.0	7.5	WSP000750	SWP7590
75.0	95.0	10.0	WSP100750	SWP7595
76.5	96.5	10.0	WSP000765	SWP7696
80.0	95.0	5.0	WSP000800	*SWP8095/1
80.0	95.0	7.5	WSP100800	SWP8095
80.0	100.0	10.0	WSP200800	SWP80100
85.0	100.0	4.0	WSP000850	*SWP85100/1
85.0	100.0	10.0	WSP100850	SWP85100
85.0	105.0	10.0	WSP200850	SWP85105
90.0	104.0	8.0	WSP000900	SWP90104
90.0	105.0	6.0	WSP100900	*SWP90105
90.0	110.0	10.0	WSP200900	SWP90110
95.0	115.0	10.0	WSP000950	SWP95115
99.0	115.0	7.5	WSP000990	SWP99115
100.0	115.0	4.0	WSP001000	*SWP100115/2
100.0	115.0	6.5	WSP101000	*SWP100115/1

* Can be used for "Link Pin Seal"

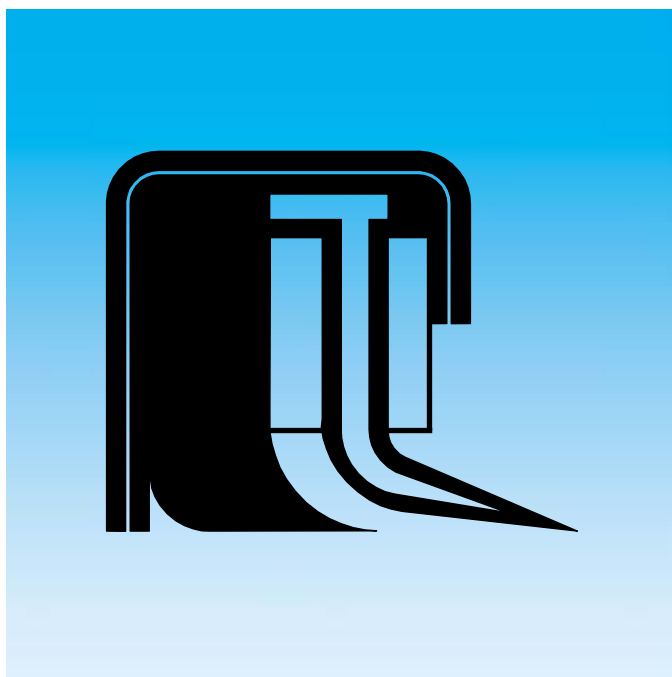


Zurcon® Scraper SWP

Rod Diameter	Groove Diameter	Groove Width	TSS Part No.	Polypac Ref. No.
d_N h9	D₃ H8	L₃ +0.1		
100.0	115.0	7.5	WSP201000	SWP100115
100.0	120.0	10.0	WSP301000	SWP100120
105.0	120.0	7.5	WSP001050	SWP105120
110.0	125.0	4.0	WSP001100	SWP110125/1
110.0	125.0	9.0	WSP101100	SWP110125
110.0	130.0	10.0	WSP201100	SWP110130
115.0	130.0	7.5	WSP001150	SWP115130
115.0	130.0	9.0	WSP101150	SWP115130/1
120.0	140.0	10.0	WSP001200	SWP120140
130.0	145.0	7.5	WSP001300	SWP130145
160.0	175.0	10.0	WSP001600	SWP160175
190.0	210.0	10.0	WSP001900	SWP190210

* 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.

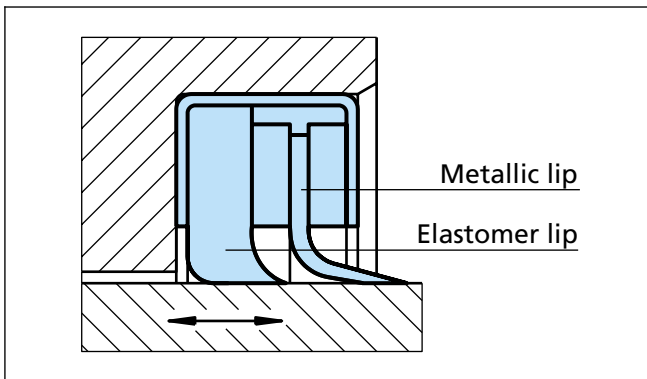


Figure 29 Metal Scraper

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:	-30°C to +120°C
Media:	Mineral oil-based hydraulic fluids, flame retardant hydraulic fluids (HFA, HFB, HFC), water, air, etc.

Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value. Temperature range also dependent on medium.

Materials

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

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



Metal Scraper

Installation Recommendation

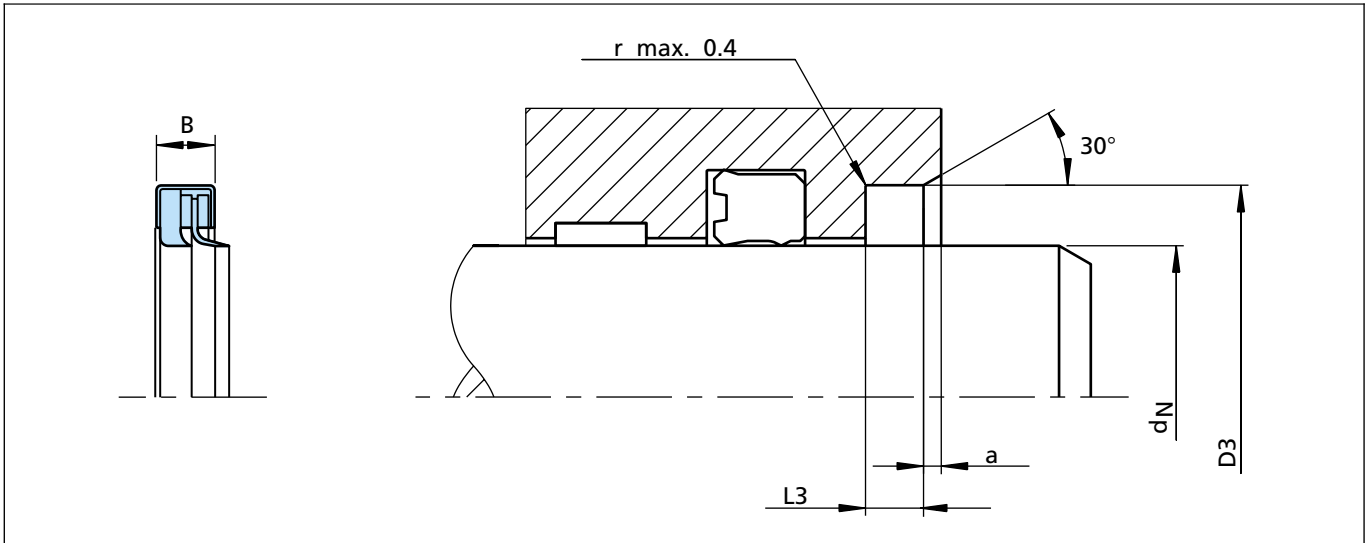


Figure 30 Installation drawing

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
 TSS Part No.: WM0100800 (from Table XXIII)
 Material: Standard materials
 Material code N7MS

TSS Article No.	WM01	00800	-	N7	M	S
TSS Series No.						
Rod diameter x 10						
Quality Index (standard)						
Material code (inner scraper lip)						
Material code (housing)						
Material code (outer scraper lip)						

Table XXIII Installation Dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Chamfer	Width	TSS 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

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

Metal Scraper



Rod Diameter	Groove Diameter	Groove Width	Chamfer	Width	TSS Part No.
d_N f8/h9	D_3 H8	L_3 +0.2	a min.	B	
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
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.



Metal Scraper

NON STANDARD SCRAPERS



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

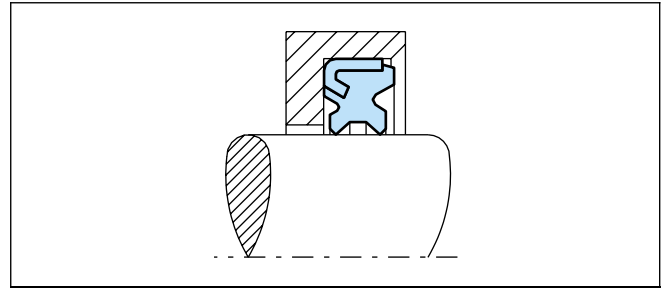




Polypac® TWP

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.

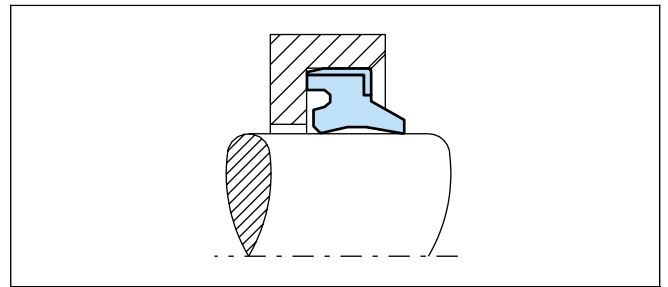
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
40 - 80	-	-35 to +100	Up to 0.5



Polypac® UWR/PC

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

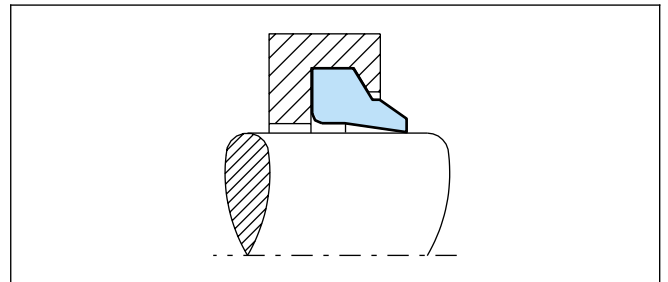
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
35 - 150	-	-35 to +100	Up to 0.5



Polypac® WRS

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

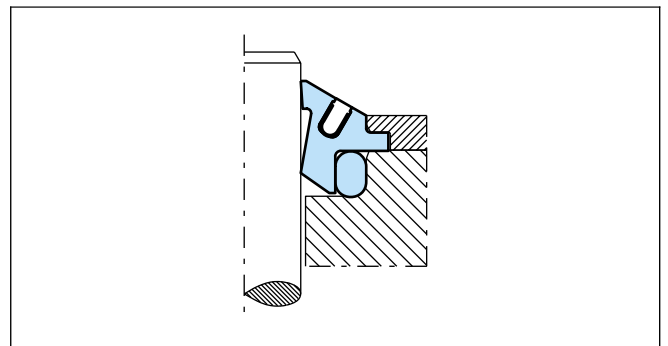
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
19 - 180	-	-30 to +110	Up to 0.5



Shamban Turcon® Excluder® with advanced scraping lip

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

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



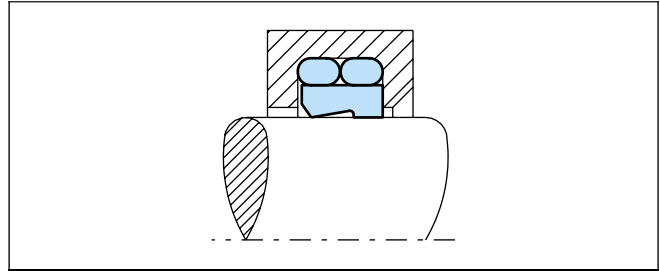


Non Standard Scrapers

Shamban Turcon® Excluder® F

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

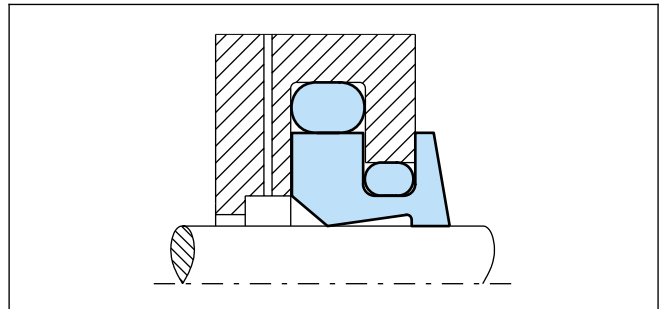
Diameter Range mm	Pressure Range MPa	Temperature Range °C	Velocity m/s
12 - 2600	-	-45 to +200	Up to 15



Shamban Turcon® Excluder® G with extended scraping lip

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

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



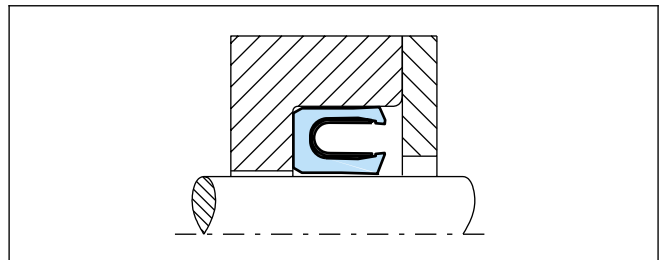
Shamban Turcon® Variseal® for hydraulic components working in aggressive environments

The Turcon® Variseal® M2S is a single acting scraper consisting of a U-shaped scraper jacket and a V-shaped corrosion resistant spring.

The characteristic of the Turcon® Variseal® M2S is that due to the use of chemically inert materials it can form an effective barrier protecting the sealing system in harsh environments. The Turcon® Variseal® M2S can be used as a seal, especially for highly viscous media and media containing particles.

Interchangeable with O-Ring/Back-up Ring combination after MIL - G - 5514F and ISO 6194

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



For further information:

Europe	Telephone	America	Telephone
AUSTRIA - Vienna (ALBANIA, BOSNIA AND HERZEGOVINA, CROATIA, HUNGARY, MACEDONIA, SERBIA AND MONTENEGRO, SLOVENIA)	+43 (1) 406 47 33	AMERICAS - Fort Wayne, IN	+1 (260) 749 9631
BELGIUM - Dion-Valmont (LUXEMBOURG)	+32 (10) 22 57 50	BRAZIL - Sao Paulo	+55 (11) 3372 4500
BULGARIA - Sofia (ROMANIA, RUSSIA)	+359 2 96 99 510	CANADA - Ontario	+1 (416) 213 9444
CZECH REPUBLIC - Rakovnik (SLOVAKIA)	+420 313 529 111	MEXICO - Mexico D.F.	+52 55 57 19 50 05
DENMARK - Hillerød	+45 4822 8080	USA, East - Philadelphia, PA	+1 (610) 828 3209
FINLAND - Vantaa (ESTONIA, LATVIA, LITHUANIA)	+358 (0)9 8256 110	USA, Great Lakes - Fort Wayne, IN	+1 (260) 749 6781
FRANCE - Maisons-Laffitte	+33 (0)1 30 86 56 00	USA, Midwest - Lombard, IL	+1 (630) 268 9915
GERMANY - Stuttgart	+49 (711) 7 86 40	USA, Mountain - Broomfield, CO	+1 (303) 469 1357
GREECE	+41 (21) 6314111	USA, Northwest - Portland, OR	+1 (503) 595 6565
ITALY - Livorno	+39 (0586) 22 61 11	USA, South - N. Charleston, SC	+1 (843) 747 7656
THE NETHERLANDS - Barendrecht	+31 (10) 29 22 111	USA, Southwest - Houston, TX	+1 (713) 461 3495
NORWAY - Oslo	+47 22 64 60 80	USA, West - Torrance, CA	+1 (310) 371 1025
POLAND - Warsaw	+48 (22) 8 63 30 11		
SPAIN - Madrid (PORTUGAL)	+34 91 710 5730	Asia	Telephone
SWEDEN - Jönköping	+46 (36) 34 15 00	ASIA PACIFIC REGIONAL	+65 (6)265 6883
SWITZERLAND - Crissier	+41 (21) 631 41 11	CHINA - Hong Kong	+852 (2)366 9165
TURKEY	+41 (21) 6314111	INDIA - Bangalore	+91 (80) 2655 5157
UNITED KINGDOM - Solihull (EIRE)	+44 (0)121 744 1221	JAPAN - Tokyo	+81 (3) 5633 8008
		KOREA - Gyunggi-Do	+82 (31) 386 3283
		MALAYSIA - Kuala Lumpur	+60 (0) 3 9059 6388
		TAIWAN - Taichung	+886 (4) 23 58 00 82
		THAILAND - Bangkok	+66 (0) 2732-2861
		SINGAPORE	
		and all other countries in Asia	+65 (6)293 2500
AFRICA REGIONAL	+41 (21) 6314111		
MIDDLE EAST REGIONAL	+41 (21) 6314111		

www.tss.trelleborg.com

