
Scraper DA17



Double Acting

Material:
Rubber



■ Scraper DA 17



Description

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

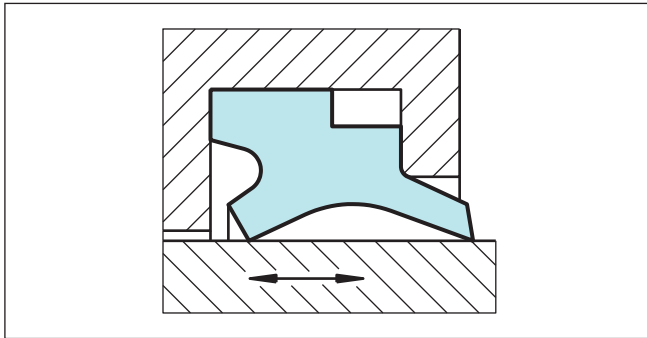


Figure 12 Scraper DA 17

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

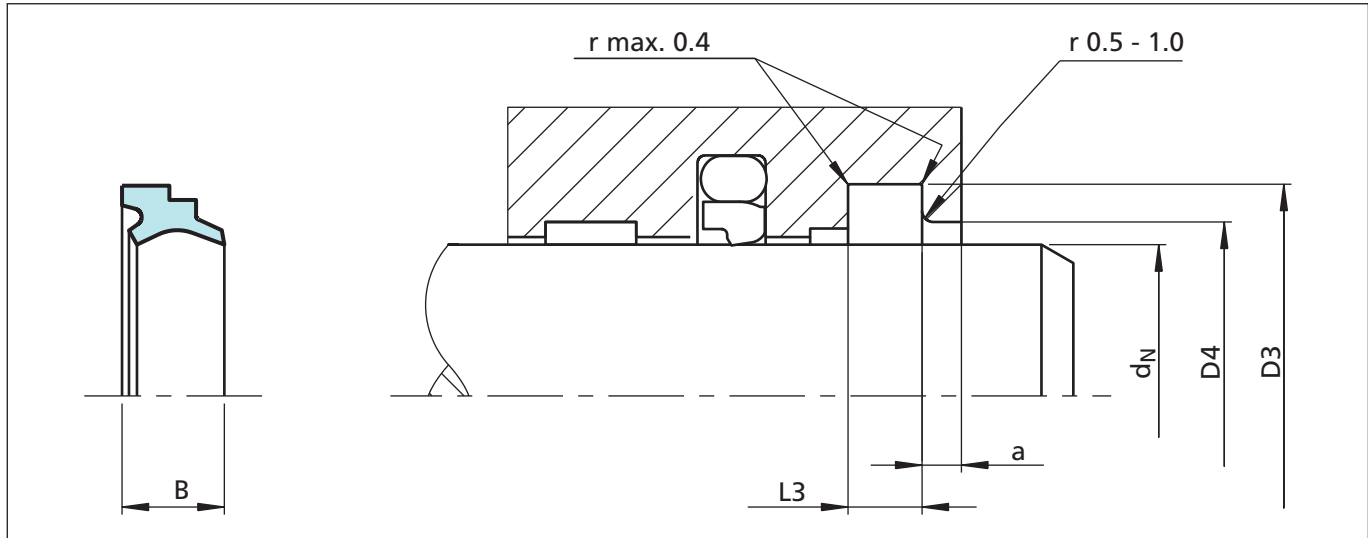


Figure 13 Installation drawing

Ordering Example

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

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

Table XX Installation dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	TSS Part No.
d_N f8/h9	D3 H9	$L_3 +0.2$	D4 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	D3 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.

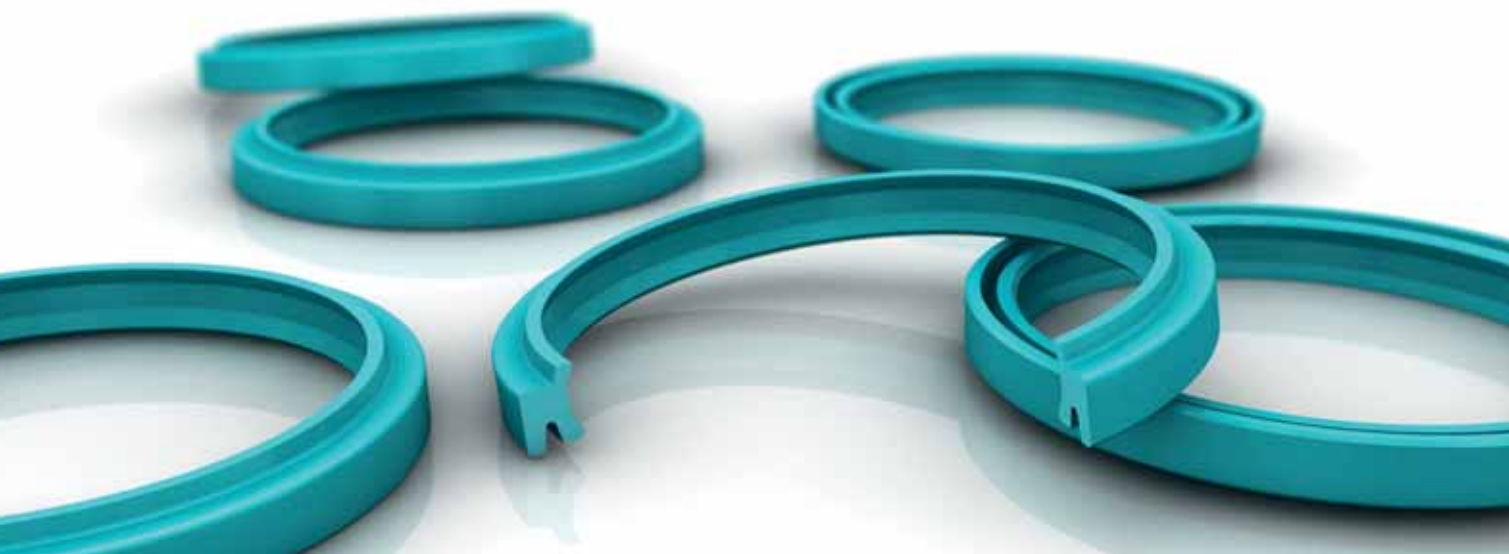


Scraper DA 17

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	Step Width	Width	TSS Part No.
d_N f8/h9	D3 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[®]



■ 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.

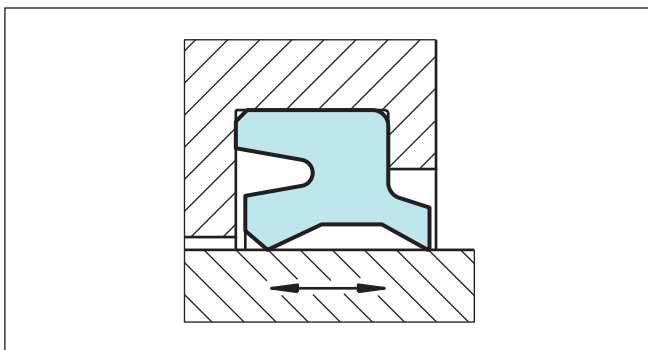


Figure 14 Scraper DA 22

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

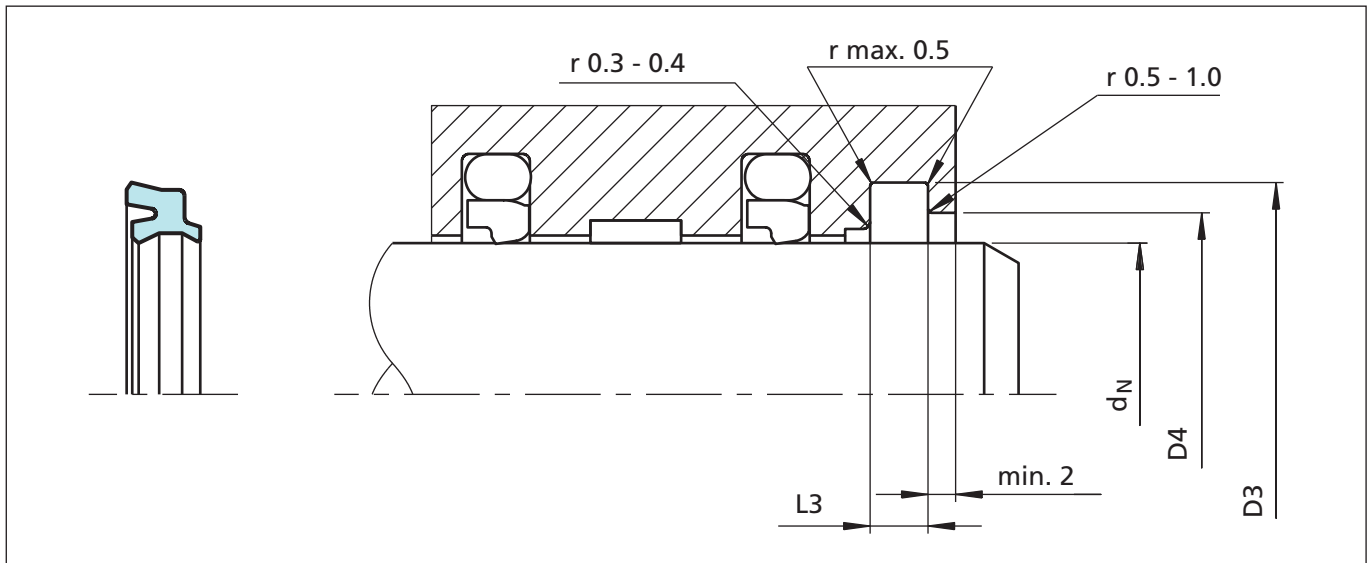


Figure 15 Installation drawing

Ordering Example

Rod diameter: $d_N = 36$ mm
 Groove diameter: $D3 = 44$ 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 XXI Installation dimensions / TSS part numbers

Rod Diameter	Groove Diameter	Groove Width	Bore Diameter	TSS Part No.
d_N f8/h9	D3 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
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.
d_N f8/h9	D3 H9	$L_3 +0.1$	D4 H11	
14.0	20.6	3.8	17.0	WD2210140
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
20.0	26.0	4.0	22.5	WD2200200
20.0	28.6	5.3	23.0	WD2210200
22.0	28.0	4.0	24.5	WD2200220
22.0	30.6	5.3	25.0	WD2210220
24.0	32.6	5.3	27.0	WD2210240
25.0	31.0	4.0	27.5	WD2200250
25.0	33.6	5.3	28.0	WD2210250
28.0	36.0	5.0	31.0	WD2200280
28.0	36.6	5.3	31.0	WD2210280
30.0	38.0	5.0	33.0	WD2200300
30.0	38.6	5.3	33.0	WD2210300
32.0	40.0	5.0	35.0	WD2200320
32.0	40.6	5.3	35.0	WD2210320
35.0	43.0	5.0	38.0	WD2200350
35.0	43.6	5.3	38.0	WD2210350
36.0	44.0	5.0	39.0	WD2200360
36.0	44.6	5.3	39.0	WD2210360
40.0	48.0	5.0	43.0	WD2200400
40.0	48.6	5.3	43.0	WD2210400
45.0	53.0	5.0	48.0	WD2200450
45.0	53.6	5.3	48.0	WD2210450
50.0	58.0	5.0	53.0	WD2200500
50.0	58.6	5.3	53.0	WD2210500
55.0	63.6	5.3	58.0	WD2210550
55.0	65.0	6.0	58.0	WD2200550
56.0	64.6	5.3	59.0	WD2210560
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
60.0	70.0	6.0	63.0	WD2200600
63.0	71.6	5.3	66.0	WD2210630
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.
d_N f8/h9	D3 H9	L_3 +0.1	D4 H11	
65.0	73.6	5.3	68.0	WD2210650
65.0	75.0	6.0	68.0	WD2200650
70.0	78.6	5.3	73.0	WD2210700
70.0	80.0	6.0	73.0	WD2200700
75.0	83.6	5.3	78.0	WD2210750
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
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
90.0	100.0	6.0	93.0	WD2200900
90.0	102.2	7.1	96.0	WD2210900
100.0	110.0	6.0	103.0	WD2201000
100.0	112.2	7.1	106.0	WD2211000
110.0	122.2	7.1	116.6	WD2211100
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 & Venting Version



Double Acting

Material:
Zurcon[®]



■ Zurcon® Scraper DA24



Description

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

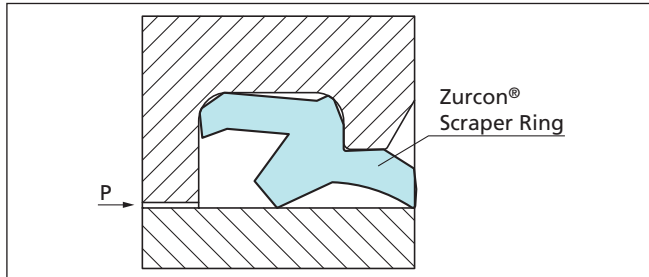


Figure 16 Scraper DA24: Standard Version

A new improved design available now in two different versions has been recently developed by Trelleborg Sealing Solutions to enhance the overall performances.

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 thanks to the sharp, knife cut, scraping lip.

The outer scraper lip leans against the housing. This ensures an optimum sealing force and further it prevents the ingress of dirt and water across the groove bottom. Also in case of high level of external contamination and dirt or rod eccentricity under side load the scraper effect remains stable. The improved design reduces the friction with less heat generated and a longer service life.

The new design of DA24 is now available in two versions: standard and venting.

DA24 is produced in Zurcon®, the Trelleborg Sealing Solutions proprietary thermoplastic polyurethane material specially developed for sealing applications. This provides long service life under harsh working conditions and resistance against installation damage

Advantages

- Very good scraper effect of the outward lip
- Very good sealing effect due to a trimmed inner sealing lip: Provides optimum contact pressure for efficient sealing and wiping of residual oil film.
- Reliable at side steering of the piston rod
- Sturdy and wear-resistant
- Simple installation
- Advanced friction characteristics
- Limited heat generation extending service life

- Stability in the groove securing function
- Robust outer scraper lip supported by a housing recess, it ensures a high contact force on the rod

Venting Version Feature

In some situations when there is pressure build-up behind the scraper, the scraper can be pushed out of the groove causing total sealing system failure.

Zurcon® Scraper DA24 Venting Version has axial holes through the section which operate as pressure relief valves, allowing oil to be released in the case of overpressure.

Once the pressure is build-up the outer lip is temporarily activated through the axial holes and the pressure is released avoiding system failure. With improved stability in the groove the Zurcon® Scraper DA24 Venting Version becomes one of the most efficient scrapers available on the market.

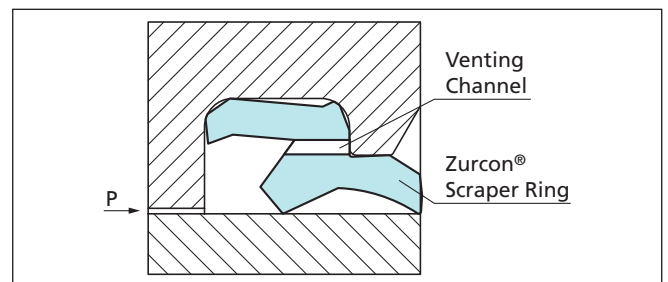
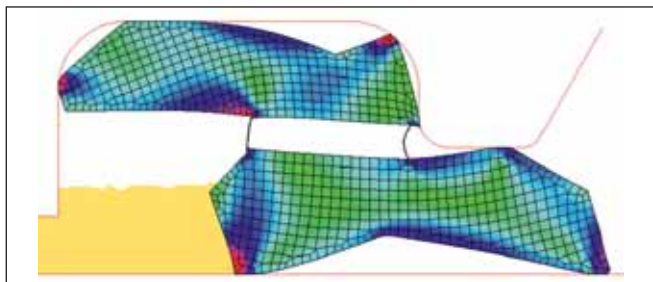


Figure 17 Scraper DA24: Venting Version

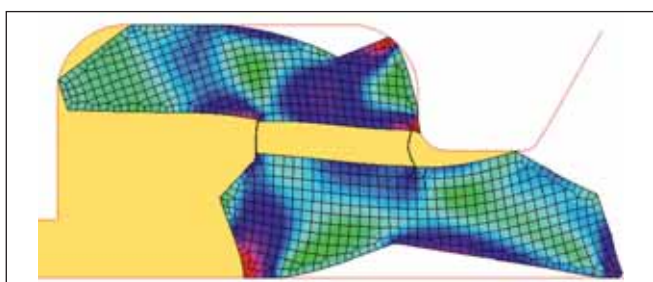


Zurcon® Scraper DA 24

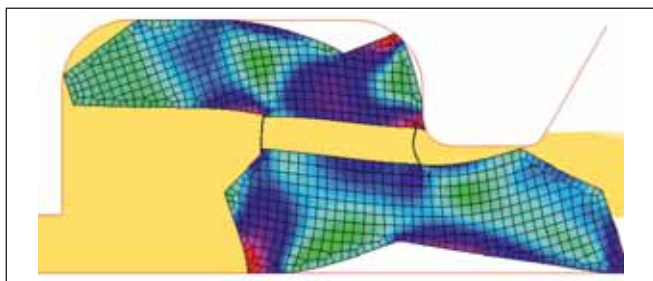
Method of operation for Venting version



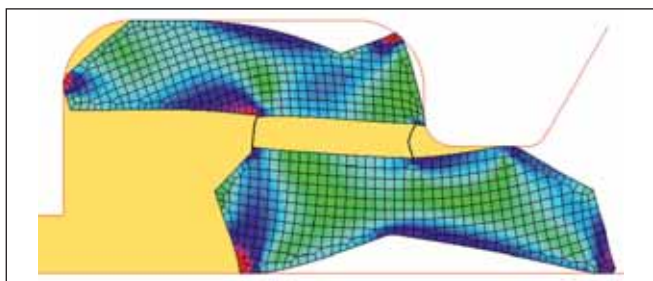
1. Pressurized oil flows through holes in the profile at the top of the scraping lip.



2. The scraping lip is pressed to the rod during pressure build-up.



3. A gap opens up between scraping lip and housing at a certain pressure level.



4. The oil is released and pressure is relieved.

Application Examples

The scraper DA24 is especially suitable for application in:

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

Technical Data

Operating conditions:

Pressure: standard version: max. 5 MPa
venting version: max. 2 MPa

Velocity: Up to 0.5 m/s
at high strokes and higher speed,
please contact your local
Trelleborg Sealing Solutions company

Temperature: -35 °C to +110 °C

Media: Hydraulic fluids based on mineral oil

Materials - Standard application:

The scraper DA 24 consists of Zurcon® polyurethane material with excellent wear and extrusion resistance and low deformation under load.

Special Polyurethane: Zurcon® Z201 92 Shore A

Set reference: Z201

Colour: turquoise

Premium Materials – Hydrolysis Resistance:

Zurcon® Z24 Premium polyurethane

Set reference: Z24

The Zurcon® polyurethane has high abrasion resistance, a low compression set, high extrusion resistance and a wide temperature range.

Important Note:

The above stated limits for pressure and speed are maximum values individually. Friction heat generated by the combination of pressure and speed may cause local heat built-up. Care should be taken not to apply high values for pressure and speed at the same time.



■ Installation Recommendation

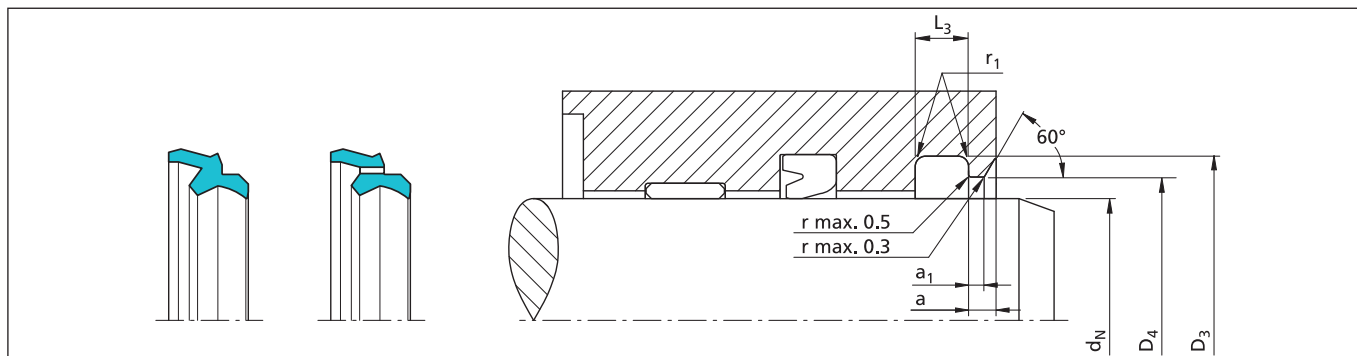


Figure 18 Installation drawing

Table XXII Preferred Series / Order No.

Rod Diameter	Groove Diameter	Groove Width	Radius	Bore Diameter	Step Width	Step Width	TSS Article No. Standard Version
d_N f8/h9	D_3 H9	L_3 +0.15	r_1 max.	D_4 H9	a min.	a_1 min.	
45.0	53.8	6.3	1.2	49.4	3.2	2.0	WD2410450
50.0	58.8	6.3	1.2	54.4	3.2	2.0	WD2410500
56.0	64.8	6.3	1.2	60.4	3.2	2.0	WD2410560
60.0	68.8	6.3	1.2	64.4	3.2	2.0	WD2410600
70.0	82.2	8.1	1.6	76.0	4.0	2.5	WD2410700
75.0	87.2	8.1	1.6	81.0	4.0	2.5	WD2410750
80.0	92.2	8.1	1.6	86.0	4.0	2.5	WD2410800
85.0	97.2	8.1	1.6	91.0	4.0	2.5	WD2410850
90.0	102.2	8.1	1.6	96.0	4.0	2.5	WD2410900
95.0	107.2	8.1	1.6	101.0	4.0	2.5	WD2410950
100.0	112.2	8.1	1.6	106.0	4.0	2.5	WD2411000
105.0	117.2	8.1	1.6	111.0	4.0	2.5	WD2411050
110.0	122.2	8.1	1.6	116.0	4.0	2.5	WD2411100
115.0	127.2	8.1	1.6	121.0	4.0	2.5	WD2411150
125.0	137.2	8.1	1.6	131.0	4.0	2.5	WD2411250
140.0	156.0	9.5	2.0	148.0	5.0	3.0	WD2411400
150.0	166.0	9.5	2.0	158.0	5.0	3.0	WD2411500
160.0	176.0	9.5	2.0	168.0	5.0	3.0	WD2411600
170.0	186.0	9.5	2.0	178.0	5.0	3.0	WD2411700
180.0	196.0	9.5	2.0	188.0	5.0	3.0	WD2411800
200.0	216.0	9.5	2.0	208.0	5.0	3.0	WD2412000
220.0	236.0	9.5	2.0	228.0	5.0	3.0	WD2412200
240.0	256.0	9.5	2.0	248.0	5.0	3.0	WD2412400
260.0	276.0	9.5	2.0	268.0	5.0	3.0	WD2412600
280.0	296.0	9.5	2.0	288.0	5.0	3.0	WD2412800
290.0	306.0	9.5	2.0	298.0	5.0	3.0	WD2412900

Other dimensions on request



Zurcon® Scraper DA 24

Ordering Example

Standard Version:

Rod diameter: $d_N = 50$ mm
Groove diameter: $D3 = 58.8$ mm
Groove width: $L3 = 6.3$ mm
TSS Article No.: WD2410500
Material: Standard material Z201

TSS Article No.	WD24	1	0500	-	Z201
TSS Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index (see table)					
Material-code					

Venting Version:

Rod diameter: $d_N = 140$ mm
Groove diameter: $D3 = 156$ mm
Groove width: $L3 = 9.5$ mm
TSS Article No.: WD24H1400
Material: Standard material Z201

TSS Article No.	WD24	H	1400	-	Z201
TSS Series No.					
Type (Venting version)					
Rod diameter x 10					
Quality Index (see table)					
Material-code					