Zurcon® U-Cup RU2

Single-acting U-Cup

Asymmetric, Double Lip,
Compact

Material:
Zurcon®

U-Cup RU2

Description

Today, U-Cups are used primarily as seals for piston rods in hydraulic cylinders. U-Cups in polyurethane are proven elements, due to their good mechanical properties, for standard cylinder construction, particularly for mobile hydraulics under rough operating conditions. The U-Cup RU2 is a double lip seal in a compact design.

TYPE RU2

The compact U-Cup type RU2 is designed for small grooves. It is thus particularly suitable for use in space-saving designs. The compact form provides a high sealing effect even with low system pressures.

The U-Cup has two sealing lips in the dynamic sealing zone. The compact form with two sealing lips provides an improvement in the leakage behavior at low system pressures. Due to the incorporation of an oil trap between the two sealing lips, friction at pressures above approximately 10 MPa is reduced. Furthermore, the second sealing lip prevents the entry of dirt from the atmosphere side.

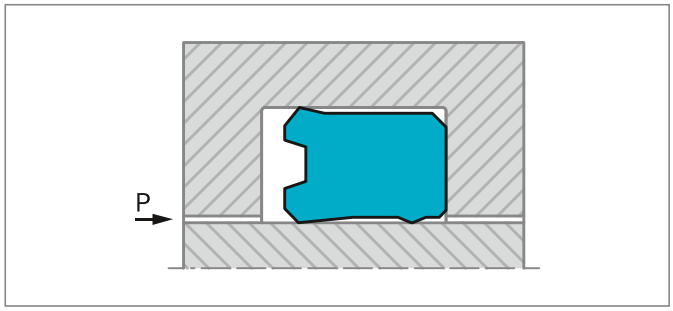

Figure 45: U-Cup, type RU2

METHOD OF OPERATION

The sealing effect of the U-Cup comes from the intrinsic preload of the seal body and from the compression of the seal lips during installation. In operating conditions, the radial mechanical contact forces are superimposed by the system pressure.

At low stroke speeds, U-Cups can tend to have a stick-slip effect due to an inadequate lubrication film formation in the seal clearance and to their material properties. This behavior corresponds to the Stribeck curve described in the relevant literature.

ADVANTAGES

- Good sealing effect at high and low pressures
- Good abrasion resistance, wear-resistant
- Unaffected by sudden loads
- Suitable for small grooves
- Simple installation

OPERATING CONDITIONS

Pressure:	Max. 35 MPa
Speed:	Up to 0.5 m/s
Temperature:	Use in mineral oils: -35 °C to +110 °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 depends on media.

MATERIAL

Standard Zurcon® :	Z20
Special Polyurethane:	93 Shore A
Temperature:	-35 °C to +110 °C
Color:	turquoise

SEAL CLEARANCE

Guide values for the radial clearance between rod and gland in relation to the operating pressure and rod diameter can be found in the table below.

Table 32: Radial Clearance

Operating max. Pressure MPa	Radial Clearance S_{max}	
	d_N < 60 mm	d_N > 60 mm
5	0.40	0.50
10	0.30	0.40
20	0.20	0.30
30	0.15	0.20
40	0.10	0.15

The values for S_{max} given in this table apply to all types for the low-pressure side of the U-Cup. They are designed for an operating temperature of 60 °C.

Table 33: Material Selection

Material Code	Material Description	Temperatur Range	Application
Zurcon® Z20	High performance Polyurethane 94 Shore A; standard grade for hydraulic	-35 °C to +110 °C	Excellent abrasion and extrusion resistance, minimal swelling in mineral oil, acceptable hydrolysis resistance.
Zurcon® Z22	High performance Polyurethane 93 Shore A; Premium grade for low temperature	-50 °C to +110 °C	Wide range of working temperatures with very good compression set performance at very low temperature. Excellent balance between swelling in mineral oil and hydrolysis resistance.

Installation Recommendation

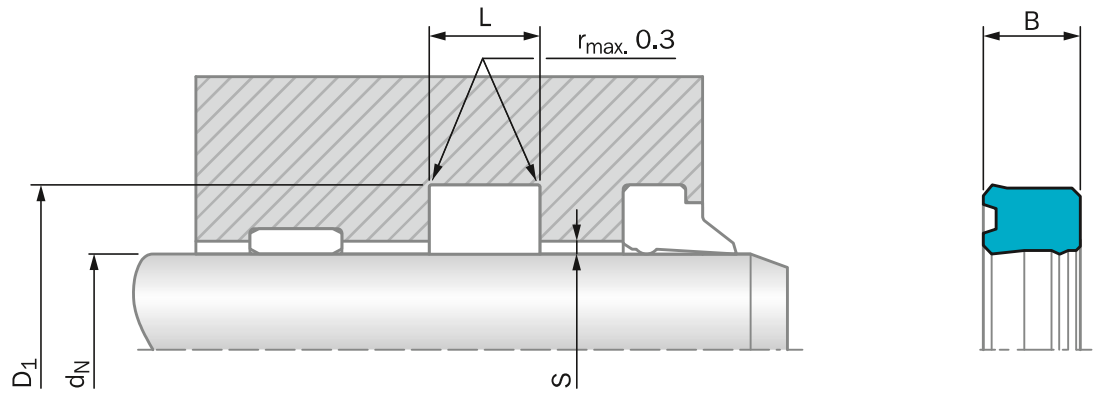

Figure 46: Installation Drawing

Dimensions "S" (see table on previous page)

ORDERING EXAMPLE

U-Cup Type RU2

Rod Diameter:	d_N = 45.0 mm
Groove Diameter:	D_1 = 55.0 mm
Groove Width:	L = 6.3 mm
TSS Part No.:	RU2300450 -

TSS Article No. RU23 0 0450 - Z20

- TSS Series No.
- Type (Standard)
- Rod Diameter x 10
- Quality Index (Standard)
- Material Code

MATERIAL

Standard Zurcon® :	Z20
Special Polyurethane:	93 Shore A
Color:	turquoise

Table 34: Installation Dimensions / TSS Article No.

Rod Diameter	Groove Diameter	Groove Width	Seal Width	TSS Part No.
d_N f8/h9	D_1 H10	L +0.2	B	
*6.0	14.0	6.3	5.8	RU2000060
*8.0	16.0	6.3	5.8	RU2200080
*10.0	18.0	6.3	5.8	RU2000100
*12.0	20.0	6.3	5.8	RU2100120
*14.0	22.0	6.3	5.8	RU2100140
*16.0	24.0	6.3	5.8	RU2000160
*18.0	26.0	6.3	5.8	RU2100180
20.0	28.0	6.3	5.8	RU2100200

Rod Diameter	Groove Diameter	Groove Width	Seal Width	TSS Part No.
d_N f8/h9	D_1 H10	L +0.2	B	
***20.0**	**30.0**	**8.0**	**7.0**	**RU2300200**
22.0	**30.0**	**6.3**	**5.8**	**RU2300220**
24.0	32.0	6.3	5.7	RU2000240
25.0	**33.0**	**6.3**	**5.7**	**RU2000250**
***25.0**	**35.0**	**8.0**	**7.0**	**RU2400250**
*25.0	35.0	9.0	8.0	RU2500250
28.0	36.0	6.3	5.8	RU2000280
***28.0**	**38.0**	**6.3**	**5.8**	**RU2300280**
***28.0**	**38.0**	**8.0**	**7.0**	**RU2400280**
32.0	**42.0**	**8.0**	**7.0**	**RU2100320**
36.0	44.0	6.3	5.8	RU2000360
36.0	**46.0**	**8.0**	**7.3**	**RU2300360**
40.0	**50.0**	**8.0**	**7.0**	**RU2500400**
45.0	53.0	6.3	5.8	RU2000450
45.0	**55.0**	**6.3**	**5.7**	**RU2300450**
45.0	**55.0**	**8.0**	**7.0**	**RU2500450**
50.0	**60.0**	**8.0**	**7.0**	**RU2400500**
56.0	66.0	7.5	6.5	RU2100560
56.0	**71.0**	**12.5**	**11.5**	**RU2200560**
63.0	**78.0**	**12.5**	**11.5**	**RU2100630**
70.0	80.0	7.5	6.5	RU2200700
80.0	**95.0**	**12.5**	**11.5**	**RU2100800**
90.0	100.0	7.5	6.5	RU2000900
90.0	**105.0**	**12.5**	**11.4**	**RU2400900**
110.0	125.0	10.5	9.5	RU2001100
110.0	**130.0**	**16.0**	**15.0**	**RU2101100**
140.0	**160.0**	**16.0**	**15.0**	**RU2201400**

Dimensions and TSS Part Numbers in bold according to ISO 5597. * Split groove
Additional dimensions can be delivered on request.