

# Zurcon® U-Cup RU9





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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.

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Facilities are certified to ISO 9001:2000 and ISO/TS 16949:2002. Trelleborg Sealing Solutions is backed by the experiences and resources of one of the world's foremost experts in polymer technology: the Trelleborg Group.

ISO 9001:2000

ISO/TS 16949:2002

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## ■ Zurcon® U-Cup RU9

### Introduction

Rod seals are particularly exposed to pressure and friction. A long service life is a specific requirement of piston rods. Features such as wear and extrusion resistance, media and temperature compatibility, low friction, compact installation dimensions and ease of assembly are also essential and require the introduction of new products and materials. It is against this background that we have developed the Zurcon® U-Cup RU9.

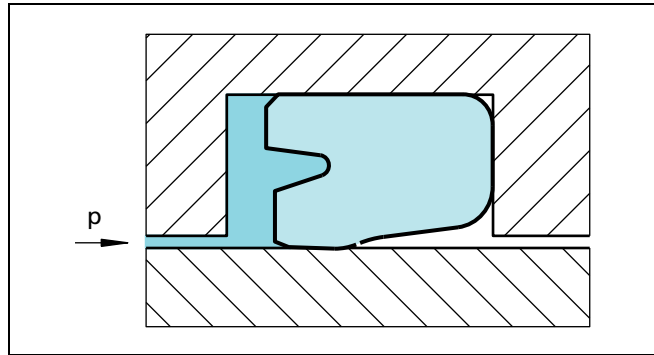


Figure 1 U-Cup, type RU9

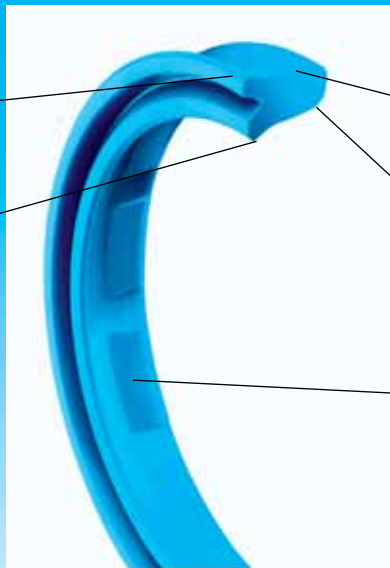
### Description

Due to its special design, behind the dynamic seal lip, the Zurcon® U-Cup RU9 with its structure of slide segments interspersed by back-pumping channels features excellent back-pumping ability across the entire pressure range. The dynamic seal slide segments also have a micro-structure with excellent tribological and sealing characteristics. As well as increasing the sealing ability of the U-Cup RU9, this also ensures a constant lubrication film underneath the seal sliding surface, reducing breakaway force even after prolonged periods of rest and reduces dynamic friction force.

### ■ Characteristics

Trimmed sealing lip  
High interference  
Excellent static tightness

Trimmed sealing lip  
High dynamic and static tightness



Expansion free space to reduce friction at the dynamic surface

Expansion free space for increased extrusion resistance

Slide segment for increased backpumping ability  
Reduced friction  
Low heat generation



**Friction**

The friction force of U-Cups dramatically increases between 2.5 and 10 MPa. The Zurcon® U-Cup RU9 has a unique feature. As the system pressure increases, the contact surface between the U-Cup and the piston rod increases. Once a specific system pressure is reached, the seal deforms to such an extent that its entire friction-generating inside surface gets in contact with the piston rod. Due to the special design of Zurcon® U-Cup RU9 there is improved pressure distribution on the rod. The resulting tribological benefits restrict the increase in friction. When we compare the friction values of conventional U-Cups with those of the Zurcon® U-Cup RU9 the results are self-evident.

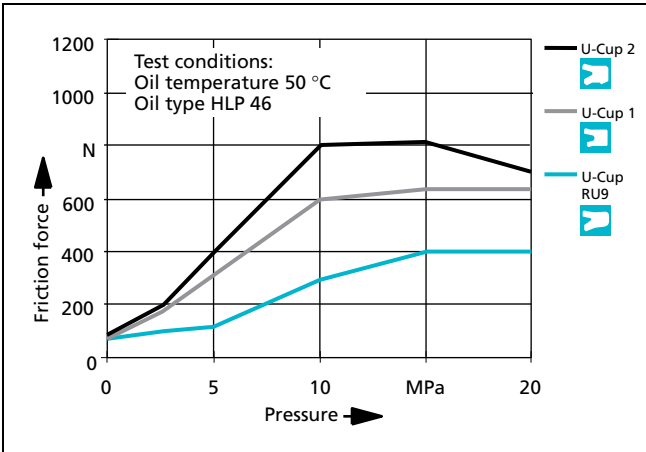


Figure 2 Friction dependent on pressure

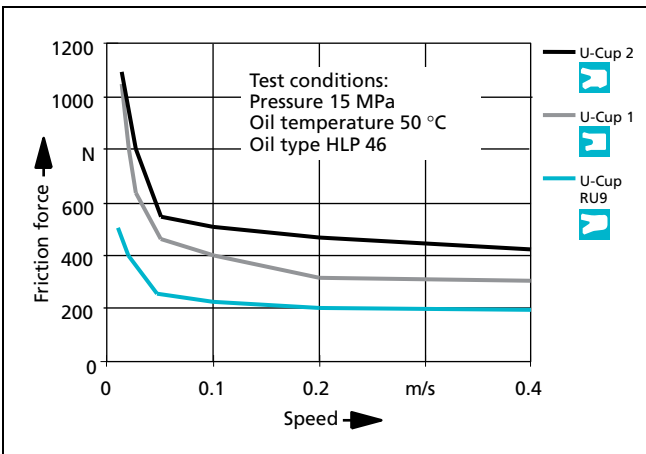


Figure 3 Friction dependent on speed

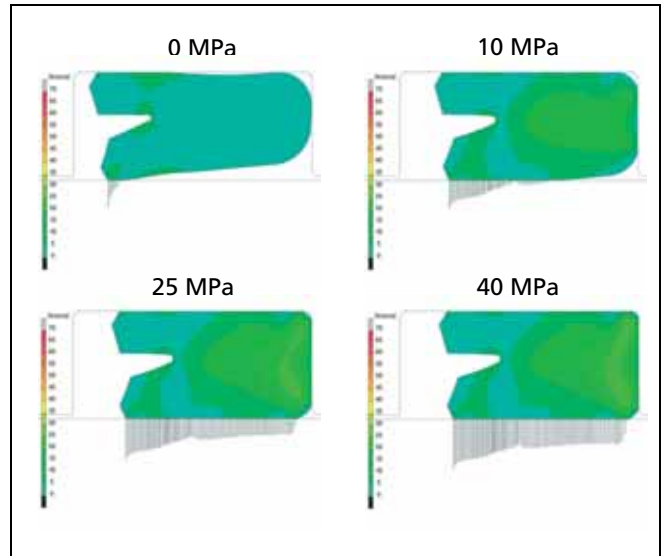


Figure 4 How the Zurcon® U-Cup RU9 performs under pressure

**Sealing Performance**

The high sealing performance is achieved by:

- Interference fit at the external diameter
- Special shape of both trimmed seal lips
- Controlled pressure distribution and hydrodynamic back-pumping ability over a wide pressure range

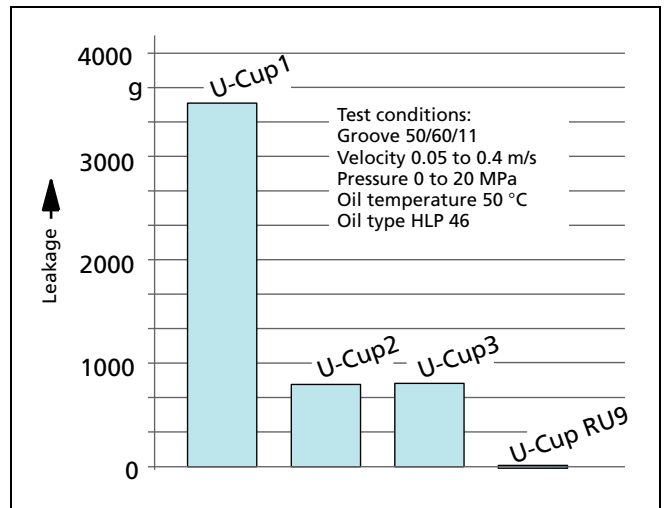


Figure 5 Leakage performance dependent on U-Cup type



## Radial clearance

The new Zurcon® RU9 design combined with the special compound properties shows a better extrusion resistance compared to standard U-Cup under all working conditions. The hardware clearance can be increased significantly.

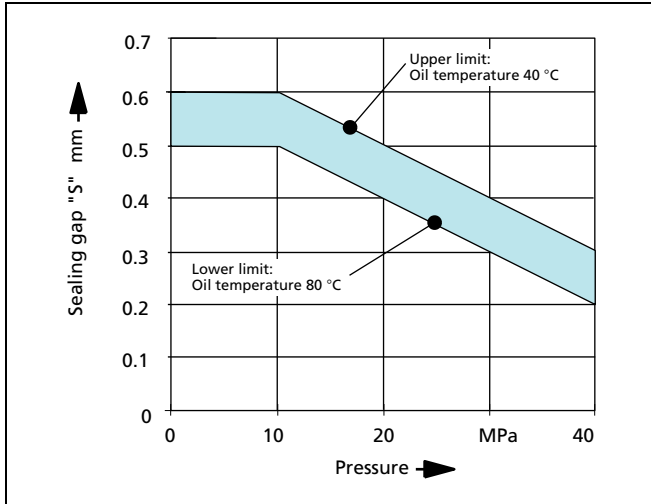


Figure 6 Radial clearance "S" as function of pressure

## Advantages

- Lower friction than standard U-Cups
- Lower heat generation than standard U-Cups
- High extrusion resistance
- Excellent dynamic and static sealing
- Optimum environment protection
- Back pumping ability over the entire pressure range achieved by grooved profile
- Suitable with the Zurcon® Buffer Seal as secondary seal in "tandem design"
- Suitable for sealing systems with double scraper
- Seal stability within the groove

## Application Examples

Zurcon® U-Cup RU9 can be used in all applications in which previously a conventional U-Cup was applied, such as:

- Hydraulic cylinders
- Construction machinery
- Fork lifts
- Truck cranes
- Telescopic cylinders
- Agricultural machines
- Machine tools
- Injection moulding machines
- Hydraulic presses
- Gas spring

In medium/heavy duty applications the preferred solution for tandem rod sealing systems is the combination with the Zurcon® Buffer Seal primary seal and Zurcon® U-Cup RU9 in conjunction with a double acting scraper.

## Materials

Zurcon® Z20 Standard polyurethane 93 Shore A  
Zurcon® Z22 Premium polyurethane 93 Shore A

Colour: Turquoise

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

## Technical Data

Operating conditions:

Pressure: Up to 40 MPa

Velocity: Up to 0.5 m/s

Temperature:

Zurcon® Z20 Stan-	-35 °C to +110 °C
dard:	
Zurcon® Z22	-45 °C to +110 °C
Premium:	

Media:

Hydraulic fluids based on mineral oil: -35 °C to +110 °C  
Synthetic and natural ester HEES, HETG: up to +60 °C  
Flame-retardant hydraulic fluids HFA/HFB: up to +40 °C

### 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 Recommendations - Metric Sizes

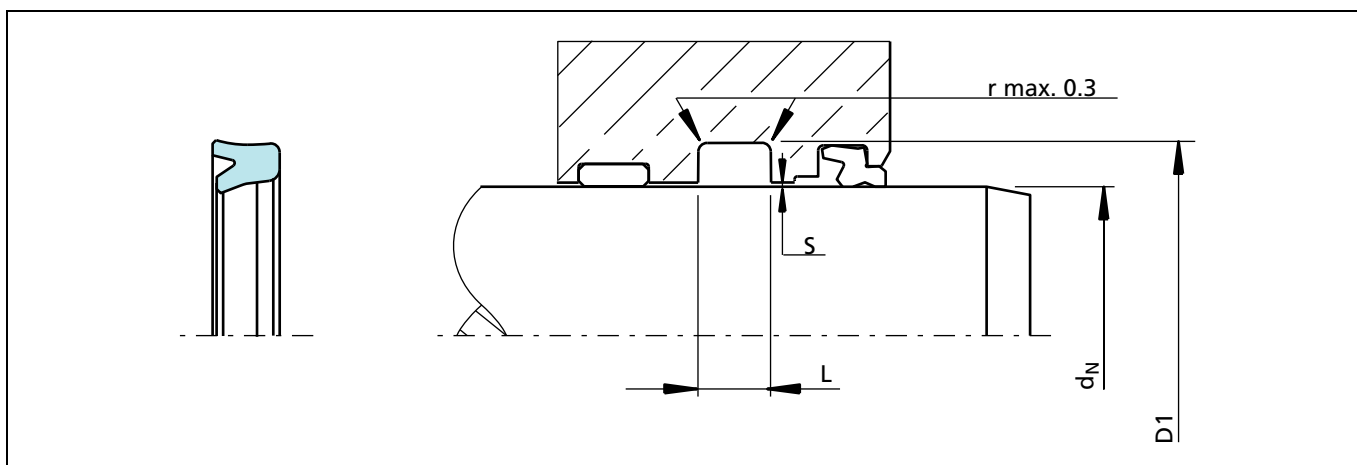


Figure 7 Installation drawing, Dimension "S" see figure 6

**Ordering Example (Metric)**

Zurcon® U-Cup Type RU9

Rod diameter:

$d_N = 20.0$  mm

Groove diameter:

$D1 = 28.0$  mm

Groove width:

$L = 6.3$  mm

TSS Part No.:

RU9000200 -

**Material**

Standard Zurcon®:

Z20

Special polyurethane:

93 Shore A

Colour:

turquoise

TSS Article No.	RU90	0	0200	-	Z20
TSS Series No.					
Type (Standard)					
Rod diameter x 10					
Quality Index (Standard)					
Material code					

**Table I Preferred Series / TSS Article No. (Metric)**

Rod Diameter	Groove Diameter	Groove Width	TSS Article No.
$d_N$ f8/h9	$D1$ H10	$L + 0.25$	
<b>16.0</b>	<b>24.0</b>	<b>6.3</b>	<b>RU9000160-Z20</b>
<b>18.0</b>	<b>26.0</b>	<b>6.3</b>	<b>RU9000180-Z20</b>
<b>20.0</b>	<b>28.0</b>	<b>6.3</b>	<b>RU9000200-Z20</b>
<b>22.0</b>	<b>30.0</b>	<b>6.3</b>	<b>RU9000220-Z20</b>
<b>25.0</b>	<b>33.0</b>	<b>6.3</b>	<b>RU9000250-Z20</b>
<b>28.0</b>	<b>36.0</b>	<b>6.3</b>	<b>RU9000280-Z20</b>
<b>28.0</b>	<b>38.0</b>	<b>8.0</b>	<b>RU9100280-Z20</b>
<b>32.0</b>	<b>42.0</b>	<b>8.0</b>	<b>RU9000320-Z20</b>
<b>36.0</b>	<b>44.0</b>	<b>6.3</b>	<b>RU9100360-Z20</b>

Dimensions and TSS article numbers printed in **bold** according to ISO 5597



## Zurcon® U-Cup RU9

Rod Diameter	Groove Diameter	Groove Width	TSS Article No.
<b>d<sub>N</sub> f8/h9</b>	<b>D1 H10</b>	<b>L + 0.25</b>	
36.0	44.0	9.0	RU9000360-Z20
<b>36.0</b>	<b>46.0</b>	<b>8.0</b>	<b>RU9200360-Z20</b>
<b>40.0</b>	<b>50.0</b>	<b>8.0</b>	<b>RU9000400-Z20</b>
<b>45.0</b>	<b>55.0</b>	<b>6.3</b>	<b>RU9100450-Z20</b>
<b>45.0</b>	<b>55.0</b>	<b>8.0</b>	<b>RU9000450-Z20</b>
<b>50.0</b>	<b>60.0</b>	<b>8.0</b>	<b>RU9000500-Z20</b>
<b>50.0</b>	<b>65.0</b>	<b>12.5</b>	<b>RU9100500-Z20</b>
55.0	65.0	8.0	RU9000550-Z20
<b>56.0</b>	<b>71.0</b>	<b>12.5</b>	<b>RU9000560-Z20</b>
60.0	68.0	7.0	RU9100600-Z20
60.0	75.0	12.5	RU9000600-Z20
<b>63.0</b>	<b>78.0</b>	<b>12.5</b>	<b>RU9000630-Z20</b>
65.0	75.0	8.0	RU9000650-Z20
<b>70.0</b>	<b>85.0</b>	<b>12.5</b>	<b>RU9000700-Z20</b>
75.0	83.0	7.0	RU9000750-Z20
<b>80.0</b>	<b>95.0</b>	<b>12.5</b>	<b>RU9100800-Z20</b>
90.0	100.0	7.5	RU9100900-Z20
<b>90.0</b>	<b>105.0</b>	<b>12.5</b>	<b>RU9000900-Z20</b>
<b>100.0</b>	<b>120.0</b>	<b>16.0</b>	<b>RU9001000-Z20</b>
105.0	120.0	12.5	RU9001050-Z20
110.0	120.0	11.0	RU9101100-Z20
<b>110.0</b>	<b>130.0</b>	<b>16.0</b>	<b>RU9001100-Z20</b>
115.0	125.0	11.0	RU9001150-Z20
120.0	135.0	12.5	RU9001200-Z20
<b>125.0</b>	<b>145.0</b>	<b>16.0</b>	<b>RU9001250-Z20</b>
<b>140.0</b>	<b>160.0</b>	<b>16.0</b>	<b>RU9001400-Z20</b>

Dimensions and TSS article numbers printed in **bold** according to ISO 5597







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