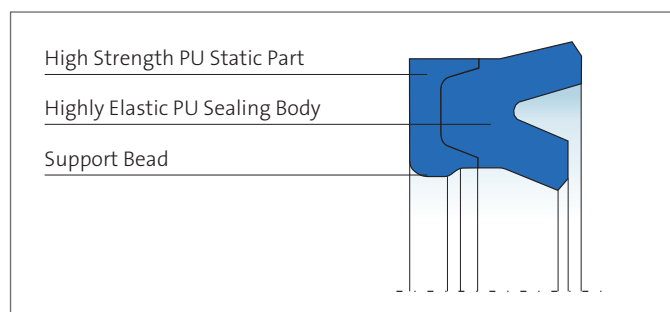


U-CUP HDR-2C

U-Cup HDR-2C is a high performance U-Cup made of two different polyurethane materials chemically bonded together, with an asymmetric profile and a support bead to prevent tilting, for sealing piston rods.



Applications

The U-Cup HDR-2C is mainly used as a single seal in the pressure range of up to 50 MPa. Suitable for standardized housings, the HDR-2C can also be used to optimize existing sealing solutions in terms of functionality and longevity.

Material

Material	Designation	Color
Polyurethane	92 AU 21100	light beige
Polyurethane	98 AU 928	white



VALUE TO THE CUSTOMER

- Suitable for high pressures and low temperatures
- Combination of a highly elastic polyurethane (sealing lip) with a high-strength polyurethane (non-pressure side)
- Safety against metallic contact due to high extrusion resistance (large extrusion gap possible)
- Functional reliability due to high flexibility of the sealing lip (fast reaction) in the event of radial deflection
- Longevity: up to +50 % longer service life compared to conventional seals
- Compact, cost-effective seal arrangement possible (no need for buffer seal)
- Simple and safe installation (one-piece element) in standard ISO installation spaces
- Extended temperature range (-50 °C to +110 °C)



TECHNICAL PROPERTIES

Operating Conditions

Medium	Materials 92 AU 21100 / 98 AU 928
Hydraulic Oils, HL, HLP	−50 ... +110 °C
HFA Fluids	+5 ... +50 °C
HFB Fluids	+5 ... +50 °C
HFC Fluids	−50 ... +40 °C
HFD Fluids	–
Water	+5 ... +50 °C
HETG (rape-seed oil)	−50 ... +60 °C
HEES (synth. ester)	−50 ... +80 °C
HEPG (glycol)	−50 ... +40 °C
Mineral Greases	−50 ... +110 °C
Pressure	50 MPa
Sliding Speed	0,5 m/s

The temperature limits of the medium/fluid are decisive and must be additionally checked.

The figures given are maximum values and must not be applied simultaneously.

Surface Finish

Peak-to-valley heights	R_a	R_{max}
Sliding Surface	0,05 ... 0,3 μm	$\leq 2,5 \mu\text{m}$
Groove	$\leq 1,6 \mu\text{m}$	$\leq 6,3 \mu\text{m}$
Groove Sides	$\leq 3,0 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

Material content M_r >50 % to max. 90 %, with cut depth $c = R_z/2$ and reference line $C_{ref} = 0 \%$

The long term behavior of a sealing element and its dependability against early failures are significantly influenced by the quality of the counter surface. Therefore a precise description and assessment of the surface is indispensable.

Based on recent findings, we recommend supplementing the above definition of surface finish for the sliding surface by the characteristics detailed in the following table. With these new characteristics derived from the material content, the only general description of the material content given in the past, especially with regard to the abrasiveness of the counter surface, is significantly improved. Please also consult our Technical Manual.

Surface finish of the sliding surfaces

Characteristic Value	Limit	
R_a	>0,05 μm	<0,30 μm
R_{max}	<2,5 μm	
R_{pkx}	<0,5 μm	
R_{pk}	<0,5 μm	
R_k	>0,25 μm	<0,7 μm
R_{vk}	>0,2 μm	<0,65 μm
R_{vtx}	>0,2 μm	<2,0 μm

The limit values listed in the table do not currently apply for ceramic or semi-ceramic counterfaces. Please also consult our Technical Manual.

Gap Dimension

The dimension D_2 is determined by factoring in the maximum permissible extrusion gap, the tolerances, the guide clearance, the deflection of the guide under load, and the tube expansion. The maximum permissible extrusion gap with a one-sided position of the piston rod is significantly determined by the maximum operating pressure and the temperature-dependent dimensional stability of the seal material. Please also consult our Technical Manual.

Profile Dimension T [mm]	Temp. [°C]	Max. permissible gap dimension [mm]			
		26 MPa	32 MPa	40 MPa	50 MPa
5,0	80	0,6	0,5	0,35	–
	100	0,45	0,35	0,3	–
7,5	80	1,1	0,85	0,6	0,4
	100	0,9	0,65	0,5	0,3



GLAND DESIGN

Tolerances

Diameter D [mm]	Tolerance
<200	H11

The tolerance for the diameters d and D_2 is specified in connection with the gap dimension calculation.

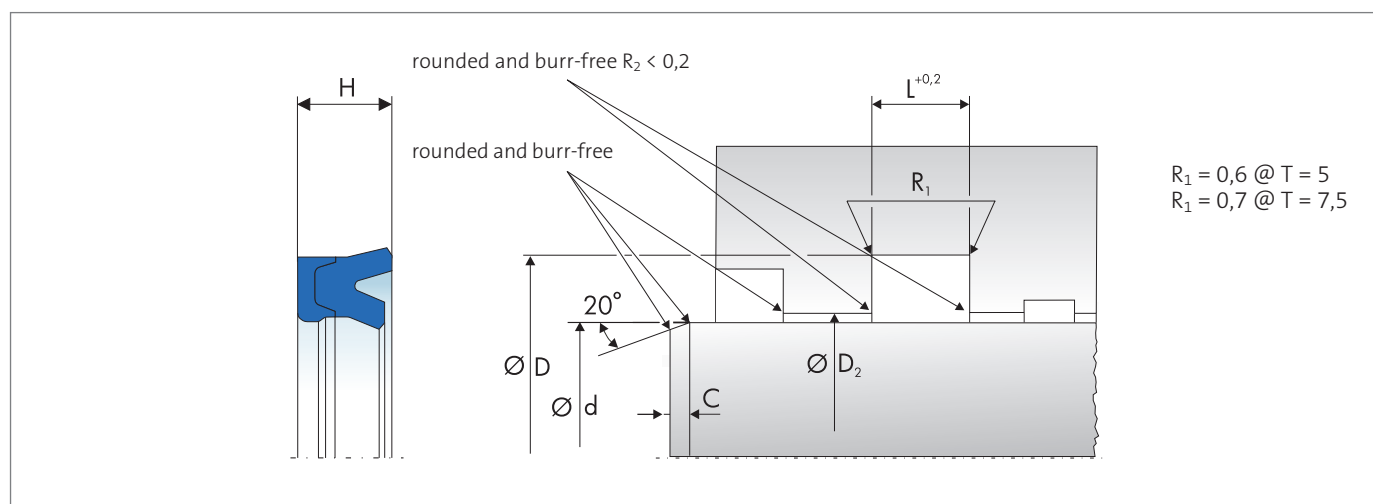
Design Notes

U-rings with a nominal dimension of $d > 25$ can generally be installed in a recessed groove using a fitting tool or by hand. Depending on the ratio of the nominal diameter to the profile dimension, in individual cases an axially accessible housing will be required here as well. Please note the general design remarks in our Technical Manual.

Installation

Reliable seal function is dependent on correct installation. Please also consult our Technical Manual

Installation Diagram



The information contained herein is believed to be reliable, but no representation, guarantees or warranties of any kind are made to its accuracy or suitability for any purpose. The information presented herein is based on laboratory testing and does not necessarily indicate end product performance. Full scale testing and end product performance are the responsibility of the user.

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