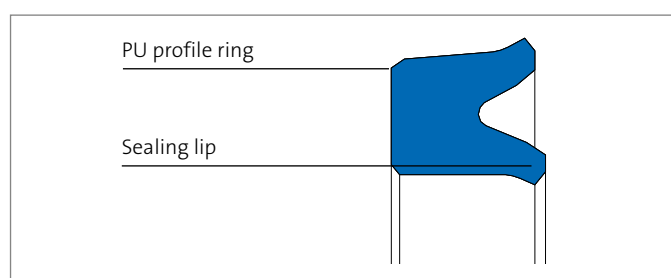


MERKEL U-RING TM 21



Merkel U-ring TM 21 is a single-acting U-ring made of polyurethane with an asymmetrical profile, retracted outer sealing lip and press fit at the inner diameter.



VALUES FOR THE CUSTOMER

- Very good static and dynamic tightness
- Highly wear resistant
- Broad temperature range
- Good media resistance
- Large range of dimensions

Applications

Piston seal for demanding requirements in heavy duty hydraulics, like Injection molding machines, presses, heavy machinery manufacture, large size cylinders.

Operating conditions

Material	95 AU V142	93 AU V167
Hydraulic oils, HL, HLP	−30 ... +110 °C	−25 ... +100 °C
HFA fluids	+5 ... +50 °C	+5 ... +60 °C
HFB fluids	+5 ... +50 °C	+5 ... +60 °C
HFC fluids	−30 ... +40 °C	−25 ... +40 °C
HFD fluids	–	–
Water	+5 ... +40 °C	+5 ... +60 °C
HETG (rape-seed oil)	−30 ... +60 °C	−25 ... +60 °C
HEES (synth. ester)	−30 ... +60 °C	−25 ... +60 °C
HEPG (glycol)	−30 ... +40 °C	−25 ... +50 °C
Mineral greases	−30 ... +110 °C	−25 ... +100 °C
Pressure	40 MPa	40 MPa
Sliding speed	0,5 m/s	0,5 m/s

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



FEATURES AND BENEFITS

Material

For diameter <500 mm

Material	Designation	Color
Polyurethane	95 AU V142	dark blue

For diameter >500 mm

Material	Designation	Color
Polyurethane	93 AU V167	red

Surface finish

Peak-to-valley heights	R_a	R_{max}
Sliding surface	0,05 ... 0,3 μm	$\leq 2,5 \mu\text{m}$
Groove base	$\leq 1,6 \mu\text{m}$	$\leq 6,3 \mu\text{m}$
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 face. 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 table below. With these new characteristics derived from the material content, the hitherto merely general description of the material content is significantly improved, not least in regard to the abrasiveness of the surface. Please also consult our technical manual.

Housing recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. 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_{vkx}	>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.

Housing recommendations for new design

D [mm]	d [mm]	L [mm]	C [mm]
>200 ... 630	D -30	25	9
>630 ... 800	D -40	32	11
>800 ... 2.000	D -50	40	13

Design notes

Please read our general design notes in our technical manual.



FEATURES AND BENEFITS

Recommended tolerances* in combination with Merkel guide rings KB

D	16 MPa				26 MPa				32 MPa				40 MPa			
Ø D [mm]	S	D	d	X2	S	D	d	X2	S	D	d	X2	S	D	d	X2
... 250	15	H8	h11	0,65	15	H8	h11	0,55	15	H8	h11	0,45	15	H8	h11	0,40
... 500	15	H8	h11	0,65	15	H8	h11	0,55	15	H8	h11	0,45	15	H8	h11	0,40
... 560	15	H8	h11	0,65	15	H8	h11	0,55	15	H7	h11	0,45	15	H8	h11	0,40
... 450	20	H8	h11	0,67	20	H8	h11	0,57	20	H8	h11	0,47	20	H8	h11	0,42
... 600	20	H8	h11	0,67	20	H8	h11	0,57	20	H7	h11	0,47	20	H8	h11	0,42
... 750	20	H8	h11	0,67	20	H8	h11	0,57	20	H7	h11	0,47	20	H8	h11	0,42
... 1000	25	H8	h11	0,70	25	H8	h11	0,60	25	H7	h11	0,47	25	H8	h11	0,42
... 1400	25	H7	h11	0,70	25	H7	h11	0,60	25	H7	h11	0,47	25	H7	h11	0,42

* Profiles according to "Housing recommendation for new designs"

Installation & assembly

Please contact our application consultants about different housings, e.g. in old plants. To achieve optimum running-in and operation behaviour, the U-rings should be oiled or greased slightly prior to use (initial lubrication).

Installation diagram

