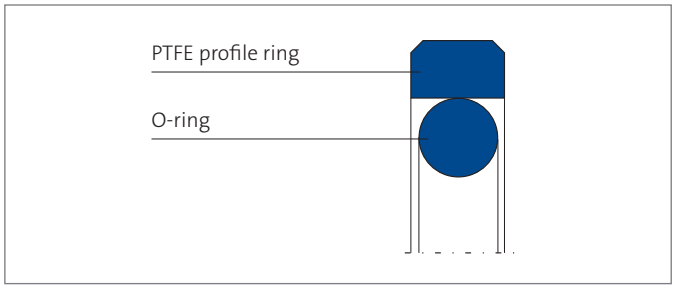
MERKEL OMEGAT OMK-MR

Merkel Omegat OMK-MR is a two-piece seal set for sealing pistons, consisting of a PTFE Profile ring and an O-ring as the pre-stressing element.



Application
The Omegat OMK-MR is used with pistons stressed from both sides in: rolling mills, handling equipment, marine hydraulics injection molding machines, presses, agricultural machinery, truck loading cranes, control and regulating devices.

Material

PTFE profile ring

Material	Designation	Color
PTFE-bronze compound	PTFE B602	brown
PTFE-glass-fiber-MoS2 compound	PTFE GM201	light-gray

O-ring

Material	Designation
Nitrile rubber	NBR
Fluoroelastomer	FKM

Other material combinations available on request.

VALUE TO THE CUSTOMER

- Enhanced operating reliability with tough operating parameters
- No “blow by” with fast load changes, due to pressure activation grooves
- Very good pressure resistance capability and hardness
- Good thermal conductivity
- High resistance to abrasion
- Low friction, stick-slip-free

FEATURES AND BENEFITS

Operating conditions

Material	PTFE B602/NBR	PTFE B602/FKM	PTFE GM201/NBR
Hydraulic oils, HL, HLP	–30 ... +100 °C	–10 ... +200 °C	–30 ... +100 °C
HFA fluids	–	–	+5 ... +60 °C
HFB fluids	–	–	+5 ... +60 °C
HFC fluids	–		–30 ... +60 °C
HFD fluids	–	–10 ... +200 °C	–
Water	–	–	+5 ... +100 °C
HETG (rape-seed oil)	–30 ... +80 °C	–10 ... +80 °C	–30 ... +80 °C
HEES (synth. ester)	–30 ... +80 °C	–10 ... +100 °C	–30 ... +80 °C
HEPG (glycol)	–30 ... +60 °C	–10 ... +80 °C	–30 ... +60 °C
Mineral greases	–30 ... +100 °C	–10 ... +200 °C	–30 ... +100 °C
Pressure	40 MPa	40 MPa	40 MPa
Sliding speed	5 m/s	5 m/s	5 m/s

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	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove sides	≤3,0 µm	≤15,0 µm

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

The long-time behavior of a sealing element and its dependability against early failures are crucially influenced by the quality of the counterface. A precise description and assessment of the surface is thus 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.

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.

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 pipe expansion.
The maximum permissible extrusion gap with a one-sided position of the piston is significantly determined by the maximum operating pressure and the temperature-dependent dimensional stability of the seal material. Please also consult our Technical Manual.

FEATURES AND BENEFITS

Profile dimension [mm]		Max. permissible gap dimension [mm]			
L	Profil	16 MPa	26 MPa	32 MPa	40 MPa
2,2	2,45	0,35	0,3	–	–
3,2	3,75	0,4	0,35	–	–
4,2	5,5	0,5	0,4	0,3	–
6,3	7,75	0,55	0,45	0,4	0,35
8,1	10,5	0,6	0,5	0,45	0,45
8,1	12,25	0,7	0,6	0,55	0,5
9,5	14	0,75	0,65	0,6	0,55

At an operating temperature of above 90 °C, and simultaneous exposure to an operating pressure of more than 26 MPa, we recommend the use of the material compound PTFE B602.

Tolerances

Diameter D [mm]	Tolerance
<500	h8
≥500	h7

The tolerance for the diameters D and d_2 is specified in connection with the gap dimension calculation. In typical hydraulic applications up to a nominal dimension of 1.000 mm, the tolerance fields f7 and f8 or H7 and H8 are usually chosen.

Design notes
Please note our general design remarks in our Technical Manual.

Installation & assembly
Please note our general remarks on hydraulic seal assembly in our Technical Manual.

Installation diagram