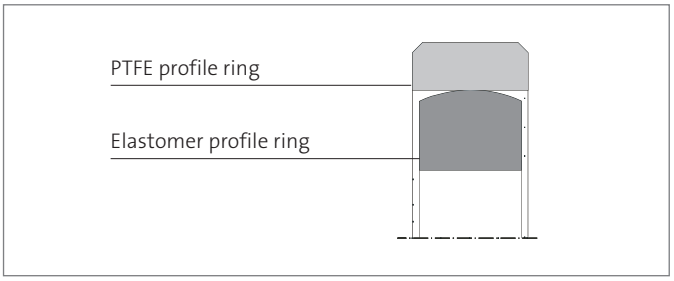
MERKEL OMEGAT OMK-S

Merkel Omegat OMK-S is a two-piece seal set for sealing pistons, consisting of a PTFE profile ring and an elastomer Profile ring as a pre-stress element.



Application
Specially designed for heavy duty, large size hydraulic cylinders, e. g. HAGC cylinders Seal set for tough applications Suitable for large sealing gaps

Material

PTFE Profile ring

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

Elastomer profile ring

Material	Designation
Nitrile rubber	NBR

Other material combinations available on request.

VALUE TO THE CUSTOMER

- Very high stability under pressure
- High torsional safety
- Very good extrusion safety
- High resistance to abrasion
- Good thermal conductivity
- Low friction, stick-slip free
- High contact pressure due to the elastomer profile ring

FEATURES AND BENEFITS

Operating conditions

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

Decisive for the functionality of the seal is the largest extrusion gap on the low pressure side of the seal during operation.
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.

Profile dimension [mm]		Max. permissible gap dimension [mm]			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
10	10	0,6	0,5	0,4	0,4
12,5	12,5	0,75	0,65	0,55	0,5
15	15	0,75	0,65	0,55	0,5
17,5	17,5	0,75	0,65	0,55	0,5
20	20	0,8	0,7	0,6	0,55

FEATURES AND BENEFITS

Tolerances

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

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 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. Please also consult our technical manual.

Design notes

Gap dimension might vary for special applications e. g. HAGC cylinder. Further details on request.
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