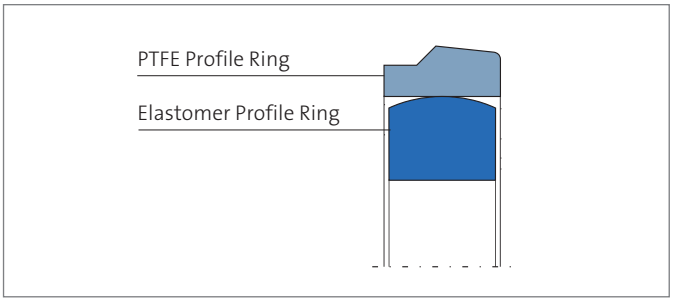
MERKEL OMEGAT OMK-ES

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



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

Application

Merkel Omegat OMK-ES is intended for use with one-side-impacted pistons. The Omegat OMK-ES series is specially designed for large diameter and heavy hydraulic applications. Used e. g. in injection molding machines, industrial presses, ship machinery, manipulators, steel mills, steel-water constructions, large size cylinders.

Material

PTFE Profile Ring

Material	Designation	Color
PTFE-bronze Compound	PTFE B602	Brown
PTFE-glass-fiber-MoS2 Compound	PTFE GM201	Light Gray
PTFE-carbon-fiber-compound	PTFE C104	Dark Gray

O-Ring

Material	Designation
Nitrile Rubber	NBR
Fluoroelastomer	FKM

Other material combinations available on request.

FEATURES AND BENEFITS

Operating Conditions

Material	PTFE B602/NBR	PTFE GM201/NBR PTFE C104/NBR	PTFE B602/FKM	PTFE GM201/FKM PTFE C104/FKM
Hydraulic Oils, HL, HLP	–30 ... +100 °C	–30 ... +100 °C	–10 ... +200 °C	–10 ... +200 °C
HFA Fluids	–	+5 ... +60 °C	–	+5 ... +60 °C
HFB Fluids	–	+5 ... +60 °C	–	+5 ... +60 °C
HFC Fluids	–	–30 ... +60 °C	–	–10 ... +60 °C
HFD Fluids	–	–	–10 ... +200 °C	–10 ... +200 °C
Water	–	+5 ... +100 °C	–	–
HETG (rape-seed oil)	–30 ... +80 °C	–30 ... +80 °C	–10 ... +80 °C	–10 ... +80 °C
HEES (synth. ester)	–30 ... +80 °C	–30 ... +80 °C	–10 ... +100 °C	–10 ... +100 °C
HEPG (glycol)	–30 ... +60 °C	–30 ... +60 °C	–10 ... +80 °C	–10 ... +80 °C
Mineral Greases	–30 ... +100 °C	–30 ... +100 °C	–10 ... +200 °C	–10 ... +200 °C
Pressure	40 MPa	40 MPa	40 MPa	40 MPa
Running Speed	5 m/s	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	≤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 counter surface. 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.

FEATURES AND BENEFITS

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

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. AGC 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