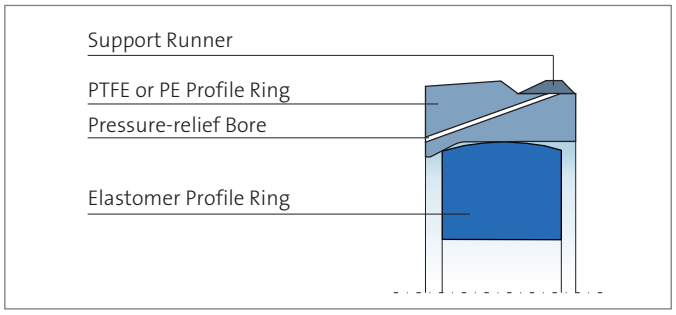
MERKEL OMEGAT OMK-ES PR

Merkel Omegat OMK-ES PR is a two-piece seal set for sealing pistons, consisting of a PTFE or PE profile ring with an integrated pressure-relief function, a support runner and an elastomer profile ring as the pre-stressing element.



Applications

- Primary seal in a sealing system
- Long strokes (more than 400 mm)
- High sliding speed (>0,5 m/s)
- Fast pressure drop in the main compartment

Material

PTFE or PE Profile Ring

Material	Designation	Color
PTFE-glass-fibre - MOS2 compound	PTFE GM201	light gray
PTFE-bronze-compound	PTFE B602	brown
PTFE-carbon-fiber-compound	PTFE C104	dark gray
Polyethylene PE-UHMW	PE E083	white

Elastomer Profile Ring

Material	Designation	Color
Nitrile Rubber	NBR	black
Fluoroelastomer	FKM	black

Other material combinations are available on request.

VALUE TO THE CUSTOMER

- Enhanced operating reliability of sealing systems with tough operating parameters (no continuous pressure build-up in the intermediate space)
- Extended service life of sealing systems due to stable long term behavior (improved stability against twisting due to the support runner)
- High resistance against extrusion (large deformation volume of the PTFE profile ring)
- Interchangeable with housings of the Merkel Omegat OMK-S series

TECHNICAL PROPERTIES

Operating Conditions

Material	PTFE GM201/NBR PTFE C104/NBR	PTFE B602/NBR	PE E083/NBR	PTFE GM201/FKM PTFE C104/FKM	PTFE B602/FKM
Hydraulic oils, HL, HLP	–30 ... +100 °C	–30 ... +100 °C	–30 ... +80 °C	–10 ... +200 °C	–10 ... +200 °C
HFA Fluids	+5 ... +60 °C	–	+5 ... +60 °C	+5 ... +60 °C	–
HFB Fluids	+5 ... +60 °C	–	+5 ... +60 °C	+5 ... +60 °C	–
HFC Fluids	–30 ... +60 °C	–	–30 ... +60 °C	–10 ... +60 °C	–
HFD Fluids	–	–	–	–10 ... +200 °C	–10 ... +200 °C
Water	+5 ... +100 °C	–	+5 ... +80 °C	–	–
HETG (rape-seed oil)	–30 ... +80 °C	–30 ... +80 °C	–30 ... +80 °C	–10 ... +80 °C	–10 ... +80 °C
HEES (synth. ester)	–30 ... +80 °C	–30 ... +80 °C	–30 ... +80 °C	–10 ... +100 °C	–10 ... +100 °C
HEPG (glycol)	–30 ... +60 °C	–30 ... +60 °C	–30 ... +60 °C	–10 ... +80 °C	–10 ... +80 °C
Mineral Greases	–30 ... +100 °C	–30 ... +100 °C	–30 ... +80 °C	–10 ... +200 °C	–10 ... +200 °C
Pressure	40 MPa	40 MPa	40 MPa	40 MPa	40 MPa
Sliding Speed	5 m/s	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 Mr >50 % to max. 90 %, with cut depth c = Rz/2 and reference line Cref = 0 %

The long term behavior of a sealing element and its dependability against early failures are crucially influenced by the quality of the counter surface. Therefore a precise description and assessment of the surface is critical.
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 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 consult our Technical Manual.

Tolerances

Diameter	Tolerance
d [mm]	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 H7 and H8 or h7 and h8 are usually chosen.

GLAND DESIGN

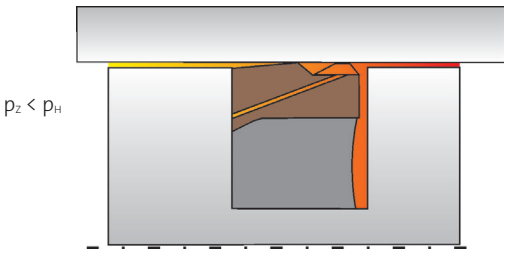
Gap Dimension
The dimension d_2 is determined by factoring the maximum permissible extrusion gap, the tolerances, the guide clearance, the deflection of the guide under load, and the pipe expansion. The maximum permissible extrusion gap with a one-sided position of the piston rod is significantly determined by the maximum operating pressure and the temperature-dependent dimensional stability of the seal material. Please consult our Technical Manual.

Function Principle
The Merkel Omegat OMK-ES PR features an integrated pressure relief function. As soon as the pressure in the intermediate space p_Z exceeds the pressure p_H in the main compartment, the seal reliably relieves the pressure.

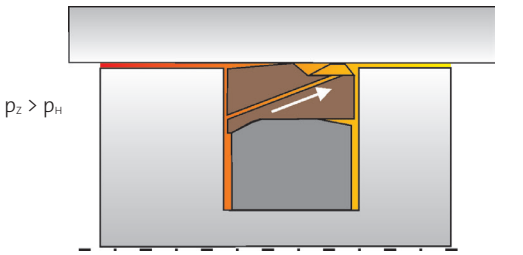
Profile dimension [mm]		Max. permissible gap dimension [mm]			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
12,5	12,5	0,75	0,65	0,55	0,5
15	15	0,75	0,65	0,55	0,5
17,5	17,5	0,75	0,65	0,55	0,5
20	20	0,8	0,7	0,6	0,55

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 and PTFE C104. The temperatur range ist generally limited to 80 °C when using PE.

Position in compartment – operation



Position in compartment – pressure relief



Installation Diagram