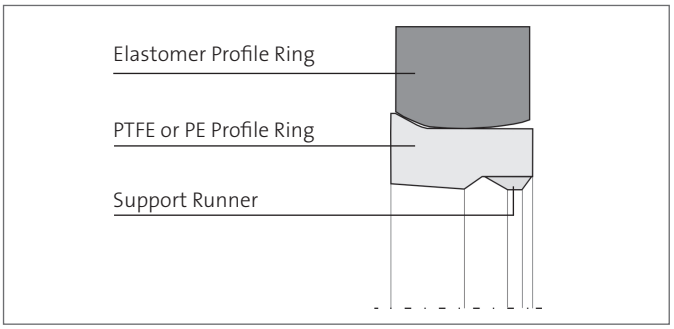
MERKEL OMEGAT OMS-S SR

Merkel Omegat OMS-S SR is a two-piece seal set for sealing piston rods, consisting of a PTFE or PE profile ring, a support runner and an elastomer profile ring as the pre-stressing element.



VALUES FOR THE CUSTOMER

- Can be used as an individual seal in a sealing system with a double wiper (short-stroke)
- Stable long term behavior due to high stability against twisting (support runner)
- Consistently high sealing effect due to optimized force flow to the sealing edge (elastomer profile ring)
- High resistance against extrusion (large deformation volume)
- Shaft-friendly seal material

Applications

- Short strokes (up to 10 mm)
- Diameters starting at 310 mm

Material

PTFE or PE Profile Ring

Material	Designation	Color
PTFE-glass-fiber-MoS2-compound	PTFE GM201	light gray
PTFE-carbon-fiber-compound	PTFE C104	dark gray
Polyethylene PE-UHMW	PE E083	white

Elastomer Profile Ring

Material	Designation	Color
Nitrile Rubber	NBR	black

Other material combinations are available on request.

TECHNICAL PROPERTIES

Operating Conditions

Material	PTFE GM201/NBR PTFE C104/NBR	PE E083/NBR
Hydraulic oils, HL, HLP	−30 ... +100 °C	−30 ... +100 °C
HFA Fluids	+5 ... +60 °C	+5 ... +60 °C
HFB Fluids	+5 ... +60 °C	+5 ... +60 °C
HFC Fluids	−30 ... +60 °C	−30 ... +60 °C
HFD Fluids	–	–
Water	+5 ... +100 °C	+5 ... +80 °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 ... +80 °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	≤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 C_{ref} = 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. See also Merkel Technical Manual.
Hardness of the counter surface 55–60 HRC at a hardness penetration depth of >0,5 mm.

Gap Dimension

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.

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 PTFE C104.

GLAND DESIGN

Tolerances

Diameter D [mm]	Tolerance
<500	H8
≥500	H7

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 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 consult our Technical Manual).

Design Remarks
Please note the general design remarks in our Technical Manual.

Installation
A reliable sealing function depends on careful installation of the seal. Please consult our Technical Manual.

Installation Diagram