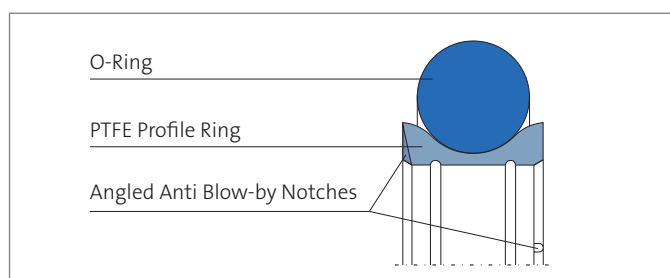


OMEGAT OMS-CS CAP SEAL FOR AEROSPACE



Omevat OMS-CS Cap Seal is a two-piece rod seal set, consisting of an engineered PTFE ring and an O-Ring as energizer.



VALUE TO THE CUSTOMER

- Low breakaway and running friction
- Excellent wear and extrusion characteristics
- Chemical compatibility with Aerospace fluids and greases
- Angled anti blow-by notches and lubrication grooves
- Fits in all AS4716 and MIL-G-5514F glands

Application

Rod seal specifically designed for use in dynamic, reciprocating applications when low friction is required.

Material

PTFE Profile Ring

Material	Designation	Color	Specification
Graphite filled PTFE	Quantum® PTFE Q78-2	Dark Gray	AMS-3678/2
Carbon Fiber filled PTFE	Quantum® PTFE Q78-8	Gray	AMS-3678/8
Mineral & Moly filled PTFE	Quantum® PTFE Q78-12	Dark Gray	AMS-3678/12
Aromatic Polymer filled PTFE	Quantum® PTFE Q78-15	Beige	AMS-3678/15



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Material

O-Ring

Material	Designation	Specification	Temperature	Fluids Commonly Used
NBR	N456	AMS-P-83461	-65°F to +275°F -54°C to +135°C	MIL-PRF-5606 / MIL-PRF-83282 / MIL-PRF-87257
EPDM	E454	NAS 1613 Rev 6 NF L 17-241/41B8	-67°F to +302°F -55°C to +150°C	All commercially available AS1241 phosphate ester hydraulic fluids.
FKM	V75	AMS7276 NF L 17-164/64C8	-20°F to +400°F -29°C to +204°C	MIL-PRF-7808 / MIL-PRF-23699
FKM (low temp.)	V199	AMS7287 AMS-R-83485	-40°F to +400°F -40°C to +204°C	MIL-PRF-7808 / MIL-PRF-23699 HTS Fluids

Other material combinations available on request.

Surface Finish

Peak-to-valley heights	R_a	R_{max}
Sliding surface	2 to 12 μ inch (0.05 to 0.3 μ m)	\leq 99 μ inch (\leq 2.5 μ m)
Groove	\leq 63 μ inch (\leq 1.6 μ m)	\leq 248 μ inch (\leq 6.3 μ m)
Groove sides	\leq 119 μ inch (\leq 3.0 μ m)	\leq 591 μ inch (\leq 15.0 μ m)

Material content $M_1 > 50\%$ to max. 90%, with cut depth $c = R_z/2$ and reference line $Cr_{ref} = 0\%$. The service life of the sealing element is significantly influenced by the quality of the dynamic surface finish. A precise description and assessment of the surface is a must. Limiting values for standard surface parameters are listed in the table above.

In order to significantly improve seal life, a more detailed description of the surface, beyond R_a and R_{max} , is necessary. We recommend referencing the table to the right for additional parameters of the R_k group and their limits.

Surface Finish of the Sliding Surfaces

Characteristic value	Limit	
R_a	$>2 \mu$ inch ($>0.05 \mu$ m)	$<12 \mu$ inch ($<0.30 \mu$ m)
R_{max}	$<99 \mu$ inch ($<2.5 \mu$ m)	
R_{pkx}	$<20 \mu$ inch ($<0.5 \mu$ m)	
R_{pk}	$<20 \mu$ inch ($<0.5 \mu$ m)	
R_k	$>10 \mu$ inch ($>0.25 \mu$ m)	$<28 \mu$ inch ($<0.7 \mu$ m)
R_{vk}	$>8 \mu$ inch ($>0.2 \mu$ m)	$<26 \mu$ inch ($<0.65 \mu$ m)
R_{vtx}	$>8 \mu$ inch ($>0.2 \mu$ m)	$<79 \mu$ inch ($<2.0 \mu$ m)

The limit values listed in the table do not currently apply for ceramic or semi-ceramic dynamic surfaces.



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Dash No.	G ₀ Zero Backup Width min. / max. [Inch]	G ₁ One Backup Width min. / max. [Inch]	G ₂ Two Backup Width min. / max. [Inch]	S Nominal Radial Gland Height [Inch]	R Radius min. / max. [Inch]	C Axial Chamfer Length [Inch]	D Diametrical Clearance max. [Inch]
004 - 009	0.098 / 0.103 (2.49 / 2.62 mm)	0.154 / 0.164 (3.90 / 4.17 mm)	0.210 / 0.220 (5.33 / 5.59 mm)	0.055 (1.40 mm)	0.005 / 0.015 (0.13 / 0.38 mm)	0.079 (2.00 mm)	0.004 (0.10 mm)
010 - 012	0.094 / 0.099 (2.39 / 2.51 mm)	0.150 / 0.160 (3.81 / 4.06 mm)	0.207 / 0.217 (5.26 / 5.51 mm)				0.004 (0.10 mm)
013 - 028							0.005 (0.13 mm)
104 - 109	0.141 / 0.151 (3.58 / 3.84 mm)	0.183 / 0.193 (4.65 / 4.90 mm)	0.245 / 0.255 (6.22 / 6.48 mm)	0.087 (2.21 mm)	0.005 / 0.015 (0.13 / 0.38 mm)	0.118 (3.00 mm)	0.004 (0.10 mm)
110 - 126							0.005 (0.13 mm)
127 - 129							0.006 (0.15 mm)
130 - 132							0.006 (0.15 mm)
133 - 140							0.007 (0.18 mm)
141 - 149							0.007 (0.18 mm)
210 - 222	0.188 / 0.198 (4.78 / 4.95 mm)	0.235 / 0.245 (5.97 / 6.22 mm)	0.304 / 0.314 (7.72 / 7.98 mm)	0.121 (3.07 mm)	0.010 / 0.025 (0.25 / 0.64 mm)	0.138 (3.50 mm)	0.005 (0.13 mm)
223 - 224							0.006 (0.15 mm)
225 - 227							0.007 (0.18 mm)
228 - 243							0.007 (0.18 mm)
244 - 245							0.007 (0.18 mm)
246 - 247							0.008 (0.20 mm)
325 - 327							0.006 (0.15 mm)
328 - 329	0.281 / 0.291 (7.14 / 7.39 mm)	0.334 / 0.344 (8.48 / 8.74 mm)	0.424 / 0.434 (10.77 / 11.02 mm)	0.186 (4.72 mm)	0.020 / 0.035 (0.51 / 0.89 mm)	0.217 (5.50 mm)	0.007 (0.18 mm)
330 - 345							0.007 (0.18 mm)
346 - 349							0.007 (0.18 mm)
425 - 438	0.375 / 0.385 (9.53 / 9.78 mm)	0.475 / 0.485 (12.07 / 12.32 mm)	0.579 / 0.589 (14.71 / 14.96 mm)	0.239 (6.06 mm)	0.020 / 0.035 (0.51 / 0.89 mm)	0.315 (8.00 mm)	0.009 (0.23 mm)
439 - 445							0.010 (0.25 mm)
446							0.010 (0.25 mm)
447 - 460							0.010 (0.25 mm)

Important Note Regarding Diametrical Clearance D

The maximum diametrical clearance D correlates with the maximum permissible extrusion gap. The maximum permissible extrusion gap with an eccentric position of the rod is significantly determined by the maximum operating pressure, temperature and the material properties of the seal.

Manufacturing tolerances and side loads during operation, as well as the elastic behavior of the guide elements under load and temperature, must be considered as well.

Target is not to exceed the limits of diametrical clearance and simultaneously to avoid metal-to-metal contact of rod and housing during operation.



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Special Design of the Anti Blow-By Notches

The FEM analysis of a pressurized Omegat OMS-CS seal reveals a typical pressure peak within the O-ring at the rounded edge of the PTFE profile ring (Fig. 1).

Freudenberg's angled anti blow-by notches avoid additional sharp edges at this mostly stressed area of the O-Ring. That means maximum protection of the O-Ring preventing premature failure.

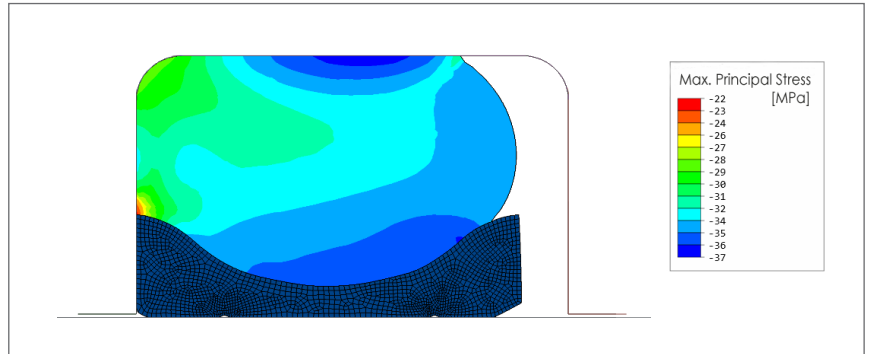
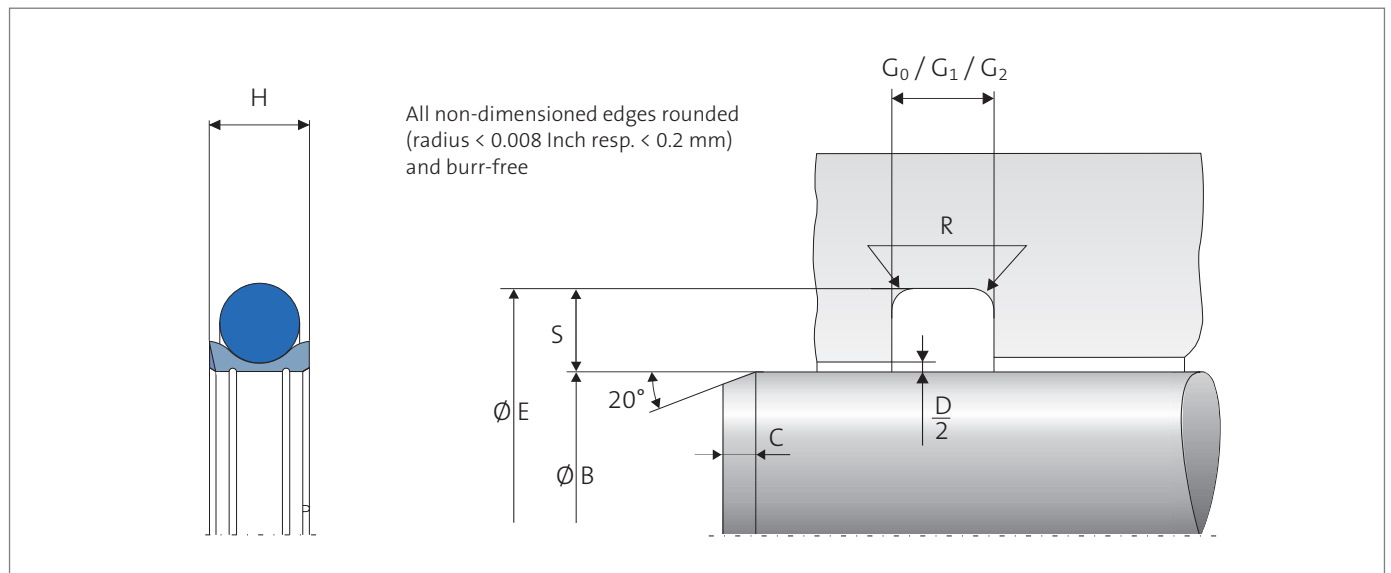


Fig. 1: FEM analysis of a pressurized Omegat OMS-CS seal at 35 MPa

Installation Diagram



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