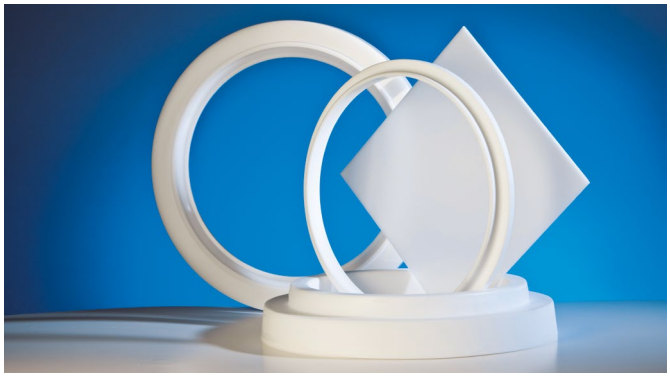
OM® 100

Applications

- Process chambers in high-end 8", 12", and 18" semiconductor manufacturing equipment
- Thermal insulators in the shape of flanges, spacers and plates

OM® 100 is an opaque high purity quartz glass. Evenly distributed, micron-sized pores yield excellent diffuse reflection and low transmission from UV to IR radiation. Heat radiation is efficiently blocked by only a few mm of OM® 100 bulk material.

The material density of OM® 100 is very close to the density of clear fused quartz. The unique microstructure results in a very smooth surface finish after flame polishing. Material shrinkage or the "orange-peel effect" known from other opaque fused silica is effectively avoided. Therefore, flame polished OM® 100 offers good sealing properties. Also the durability of OM® 100 is improved compared to other opaque material when exposed to HF acid. This allows more cleaning cycles in semiconductor process equipment.



OM® 100 features the typical viscosity and thermal properties of high purity quartz glass. Due to its high density OM® 100 can be easily welded to clear fused quartz with excellent welding seam quality. The mechanical strength is almost equivalent to clear fused quartz and superior to most competing materials.

Available Geometries & Dimensions

OM® 100 is available in ring shape and as round or rectangular solid. The dimensions like outer diameter, inner diameter, length, width and height of the manufactured OM® 100 blank can be tailored to customer needs. Please contact us to discuss the availability of your required dimension.

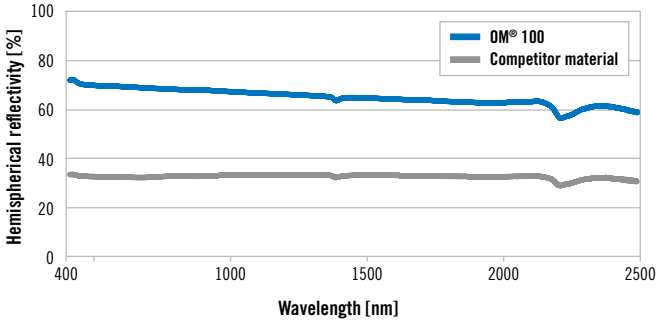
Chemical Properties (Typical Values)

Trace Element Concentration (ppm)

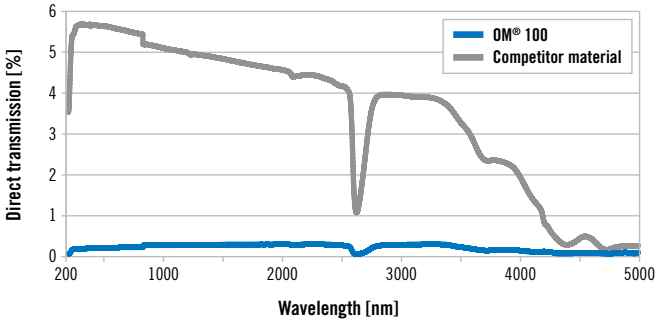
	Li	Na	K	Mg	Ca	Fe	Cu	Cr	Ni	Mn	Ti	Zr	Al	OH
OM® 100	0.1	0.1	0.2	< 0.03	0.4	0.1	< 0.01	< 0.01	< 0.01	< 0.03	1.1	1.0	15	n. s.

Optical Properties

Reflectivity from 3 mm thick plate

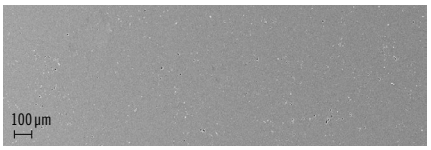


Transmission through 3 mm thick plate

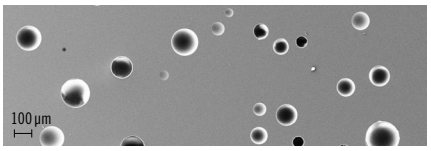


Microstructure

OM® 100



Competitor material



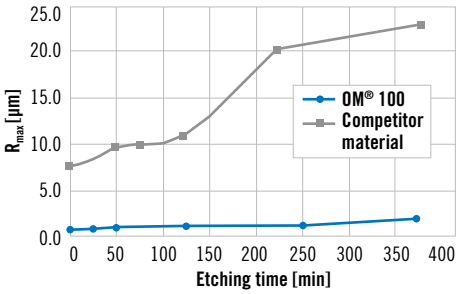
Images taken by scanning electron microscopy.

Etch Performance

OM® 100

Competitor material

Surface Roughness vs. Etching Time in 5 % HF



Thermal Properties

Temperature [°C]	Thermal conductivity [W/(m×K)]	Thermal expansion [‰] $(L_T - L_{20\,°C}) / L_{20\,°C}$	Specific Heat [J/(g×K)]
20	1.24	0.00	0.70
100	1.35	0.05	0.83
200	1.47	0.12	0.92
400	1.70	0.23	1.02
600	1.83	0.32	1.07
800	1.96	0.40	1.08
1000	2.10	0.47	1.11
1100	2.17	0.50	1.12

Physical Properties

Density	2.15 – 2.18 g/cm³
Porosity	< 2,3 %
Bubble Size	< 20 µm
Young's Modulus	54 kN/mm²
Bending Strength (3 Point)	84 N/mm²

Viscosity

Softening point (lg η = 7.6 dPa×s)	1730 °C
Annealing point (lg η = 13.0 dPa×s)	1200 °C
Strain point (lg η = 14.5 dPa×s)	1080 °C
Max. working temperature (continuous)	1100 °C
Max. working temperature (short term)	1300 °C

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