Heraeus Material

HSQ 100

HSQ 100 is a single step, electrically fused quartz glass which possesses excellent properties that qualify the material for semiconductor applications. Highly purified natural quartz sand is used as the raw material.

Special features of this:
Quartz glass of semiconductor quality

Products and applications of it:

Bar plate and tube material

Chemical purity – Typical trace elements and OH content in quartz glass (ppm by weight oxide)

Elements	Al	Ca	Cl	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ti	Zr	OH Content
HSQ 100	15	0.5	n. s.	<0.05	<0.05	0.1	0.4	0.6	0.05	<0.05	0.3	1.1	0.7	<30*

*(For HSQ 100 rods. OH content of other HSQ 100 semi-finished products on customer request.)

HSQ 300

HSQ 300 is the standard quality of Heraeus Quartz glass for semiconductor applications. This electrically fused quartz glass often exceeds the strict purity requirements set forth by the semiconductor industry. The multi-step production process strongly reduces the bubble content and leads to higher material homogeneity.

Special features of this:

Quartz glass of semiconductor quality, thermally stable up to 1160 °C (preliminary: 1300 °C), low heat conductivity of 1,38–2,68 W/mK, alkali metal content < 1.5 ppm, OH content < 30 ppm

Products and applications of it:

Semiconductor processes with various high purity requirements from room temperature to high temperatures: CVD tubes, diffusion furnaces, epitaxy chambers, etching systems; optical applications; tubes, bars, rods, blocks, HSQ 330 P E Tubes, bars, rods, blocks, plates, discs plates, discs, flanges

Chemical purity – Typical trace elements and OH content in quartz glass (ppm by weight oxide)

Elements	Al	Ca	Cl	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ti	Zr	OH Content
HSQ 300*	15	0.5	n. s.	<0.05	<0.05	0.1	0.4	0.6	0.05	<0.05.	0.3	1.1	0.7	<30

* Tubes made of these materials can be stabilized with a special surface treatment. Stabilization is achieved by including a thin (approx. 20 µm) uniform layer of cristobalite to form on the outer tube surface upon its first exposure to elevated temperature.

HSQ 400 / HSQ 800

HSQ 400

HSQ 400 combines the excellent properties of HSQ 300 – high purity, low thermal expansion, good optical transmittance and low bubble content – with the advantage of long process lifetime at high temperatures. This property derives from a special surface treatment that introduces a stabilization layer during running in of the product.

Special features of this:

Temperature resistance by specific recrystallization

Products and applications of it:

Long-term high-temperature processes over 1160 °C

HSQ 800

HSQ800 combines highest purity requirements with increased process stability at high temperatures. This property is similarly achieved by surface stabilization of HSQ700. Please contact us for more information on this product.

Special features of this:

Low alkali content and temperature resistance by specific recrystallization

Products and applications of it:

Long-term high-temperature processes over 1160 °C with maximum purity requirements

Chemical purity – Typical trace elements and OH content in the bulk in quartz glass (ppm by weight oxide)

Elements	Al	Ca	Cl	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ti	Zr	OH Content
HSQ 400	15	0.5	n. s.	<0.05	< 0.05	0.1	0.4	0.6	0.05	<0.05.	0.3	1.1	0.7	<30
HSQ 800	15	0.5	n. s.	<0.05	<0.05	0.1	0.1	0.05	0.05	<0.05	0.05	1.1	0.7	<30

Overview of Quartz Base Material Grades That We Supply

Overview of Quartz Base Material Grades

Materials	Raw material	Production	Characteristics/Special features	Products and applications
CFQ 099	P	E	Standard quartz glass for industry grade	Bar, plate and tube material
HSQ 100	P	E	Quartz glass of semiconductor quality	Bar, plate and tube material
HSQ 300	P	E	Quartz glass of semiconductor quality, thermally stable up to 1160 °C (preliminary: 1300 °C), low heat conductivity of 1,38–2,68 W/mK, alkali metal content < 1.5 ppm, OH content < 30 ppm	Semiconductor processes with various high purity requirements from room temperature to high temperatures: CVD tubes, diffusion furnaces, epitaxy chambers, etching systems; optical applications; tubes, bars, rods, blocks, HSQ 330 P E Tubes, bars, rods, blocks, plates, discs plates, discs, flanges
HSQ 330	P	E	Tubes, bars, rods, blocks, plates, discs with guaranteed chemical purity	Semiconductor processes with various high purity requirements from room temperature to high temperatures: CVD tubes, diffusion furnaces, epitaxy chambers, etching systems; optical applications; tubes, bars, rods, blocks, HSQ 330 P E Tubes, bars, rods, blocks, plates, discs plates, discs, flanges
HSQ 400	P	E	Temperature resistance by specific recrystallization	Long-term high-temperature processes over 1160 °C
HSQ 700	P	E	Low alkali content by particle size of higher purity, alkali metal/OH content (< 0.05 ppm / < 30 ppm)	Semiconductor processes with very high purity requirements
HSQ 800	P	E	Low alkali content and temperature resistance by specific recrystallization	Long-term high-temperature processes over 1160 °C with maximum purity requirements
HSQ 900	SF	S	Ultra-pure, OH < 0.2 ppm, highest total impurities in the ppb range, minimum number of defect centers	Applications with highest requirements for highest purity, e. g. semiconductor processes
HSQ 910	SF	S	Ultra-pure, OH < 250 ppm, total impurities in the ppb range, minimum number of defect centers	Applications with highest requirements for highest purity, e. g. semiconductor processes
HSQ 351	P	F	OH content 175 ppm	Diffusion barrier with highest purity requirements
HSQ 751	P	F	OH content 175 ppm, higher purity	Diffusion barrier with highest purity requirements and low bubble content
OM 100	P	C	Opaque material of highest purity with micropores, IR and temperature screening, diffuse reflection in the infrared and optical wavelength range	Thermal insulator, IR stopper with semiconductor purity, spacers, flanges, plates
OFM 70 Rotosil®	P	A	Opaque material, highly resistant to corrosion, high temperatures, thermal shocks and electrical influences, tolerates high concentrations of sulphuric acid and hot chlorination of metal batch mixtures and minerals	Tubes, crucibles, plates, flanges for precious metal recycling, luminescent material industry, high temperature processes electric filter production, chemical technology (container, tubes, dishes etc.), hot chlorination to clean or separate substances, calcination and pyrolytic deposition
OFM 370	P	A	Like OFM-70, but higher chemical purity	onto substrates
OFM 970	SF	S	Like OFM-70, but synthetic purity	

P = pegmatite, NRC = natural rock crystal, CC = cultured crystal, SF = synthetic fused silica

E = electric, F = flame, S = synthetic, C = ceramic, A = arc molten