

HBQ® 100

Dummy- & Filler-Wafers For Semiconductor Furnace Applications

Your CoO solution

- **Improved layer adhesion** in semiconductor CVD processes – less replacement due to cracking or peel off in SiO₂ and Nitride CVD & ALD processes
- Potentially resulting in **less tool downtime** and less chamber conditioning cycles
- **Reduces reclaim cost** for standard silicon wafers due to increase of deposited layer thickness
- Black opacity and IR-blockage enable **automatic loading** of HBQ® 100 wafers by common wafer handling systems (IR-controlled or vacuum-controlled)
- **Heat homogenization** ability adjacent to the wafer due to **high – silicon like – emissivity** combined with **low thermal conductivity**
- Composite based on **high purity quartz glass**, ensuring highly pure process chamber – no outgassing from the material is detected up to 1300°C



HBQ® Wafers exemplarily shown in a CVD Boat

Dimensions, tolerances and available geometries*

Diameter	(6")–150 mm; (8")–200 mm
Diameter tolerance	± 0.3 mm
Thickness	800 µm
Thickness tolerance	± 50 µm
Surface roughness (Ra)	< 0.5 µm

The wafer **edge** profile is **SEMI standard** compliant. Wafers are **cleaned in clean room class 1000** compliant to Fed 209 (class 6 compliant to ISO 14644) and **boxed in "Entegris Ultrapak®"** (or comparable) wafer carriers.

*300mm diameter and other geometries (e.g. customer specific baffle-plates or adiabatic-plates) available on request

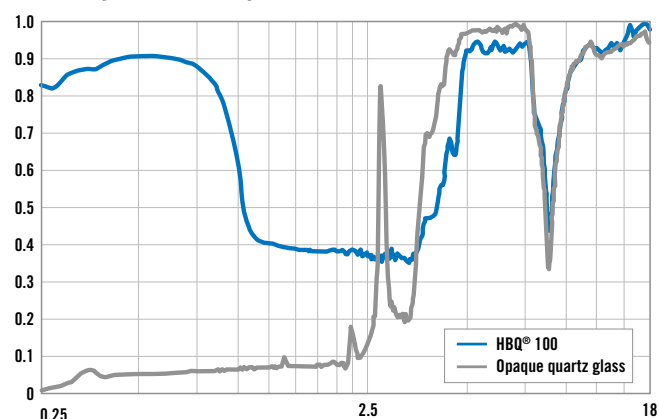
Chemical purity compared to standard quartz

Typical impurity levels (ppm)

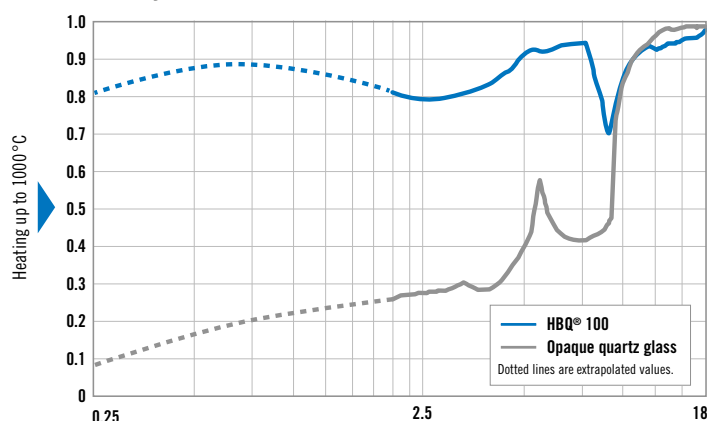
	Li	Na	K	Mg	Ca	Fe	Cu	Cr	Ni	Mn	Ti	Zr	Al	OH
HBQ® 100	0.1	0.1	0.2	<0.03	0.4	0.2	<0.01	<0.01	<0.03	<0.03	1.1	1.0	15	n. s.
HSQ® 300	0.5	0.2	0.3	<0.03	0.5	0.1	0.01	<0.01	<0.01	<0.03	1.1	1.0	15	< 30
OM® 100	0.1	0.1	0.2	<0.03	0.4	0.1	<0.01	<0.01	<0.01	<0.03	1.1	1.0	15	n. s.

Emissivity (compared to opaque quartz glass)

Emissivity @ room temperature



Emissivity @ 1000 °C



Physical Properties

Feature	HBQ® 100	electrically fused quartz glass (e.g. HSQ® 300)
Density g/cm ³	2.19 – 2.20	2.203
Porosity	< 0.5 %	0 %
Pore size	< 10 µm	–
CTE (0...900 °C)	0.57×10^{-6}	0.48×10^{-6}
Max. working temp – continuous	1160 °C	1160 °C
Max. working temp – short term	1300 °C	1300 °C
Specific heat [J/(gK)], 20 °C	0.75	0.77
Specific heat [J/(gK)], 500 °C	1.10	0.96
Specific heat [J/(gK)], 900 °C	1.12	1.05
Heat conductivity [W/(mK)], 20 °C	1.49	1.38
Heat conductivity [W/(mK)], 700 °C	1.99	2.50
Heat conductivity [W/(mK)], 1000 °C	2.17	2.70
Dielectric constant (ε), RT, 1 kHz	4.04	3.70
Dielectric constant (ε), RT, 1 MHz	3.76	3.70
Dielectric constant (ε), RT, 13.56 MHz	3.82	3.72
Dielectric loss angle (tan δ), 1 MHz	64.3×10^{-4}	1.0×10^{-4}
Dielectric loss angle (tan δ), 13.56 MHz	90×10^{-4}	1.0×10^{-4}

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