HBQ® 100

High Purity Black Opaque Quartz For Enhanced Thermal Management

Applications

- Semiconductor single-wafer and batch process tools
- Thermal homogenization of process environment
- Blocking of radiation from certain process environments
- Baffle plates, pedestal plates, door plates, dummy wafers, heater covers

HBQ® 100 is a black opaque high purity quartz glass composite. Its key value addition to the well-known white opaque (OM® 100) and clear fused (HSQ® 300) quartz solutions in the market are the absorption of ultra-violet (UV) up to beginning medium-wave infrared (MWIR) radiation. Optical emissivity is designed to mimic that of silicon when heated. On the contrary thermal conductivity – among most other physical properties – is low, thus matching that of industry standard fused quartz materials.

The composition of this semiconductor process suitable material was engineered to keep contamination of the process environment as small as possible without introducing foreign / unwanted dopants. Therefore the materials main ingredients are silicon dioxide (fused quartz) and silicon.

Available Geometries & Dimensions

HBQ® 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 HBQ® 100 blank can be tailored to customer needs. Please contact us to discuss the availability of your required dimension.

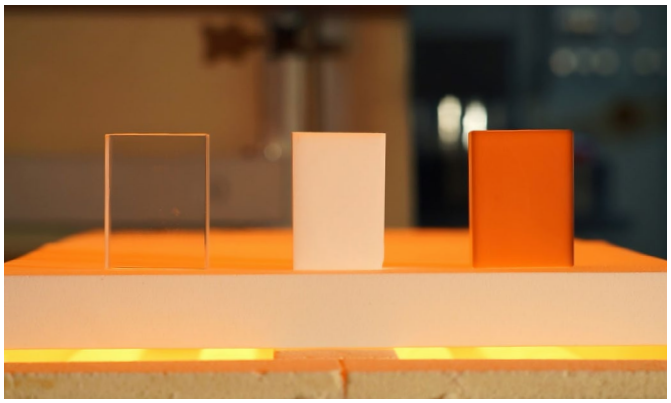
Chemical Properties (Typical Values)

Trace Element Concentration (ppm)

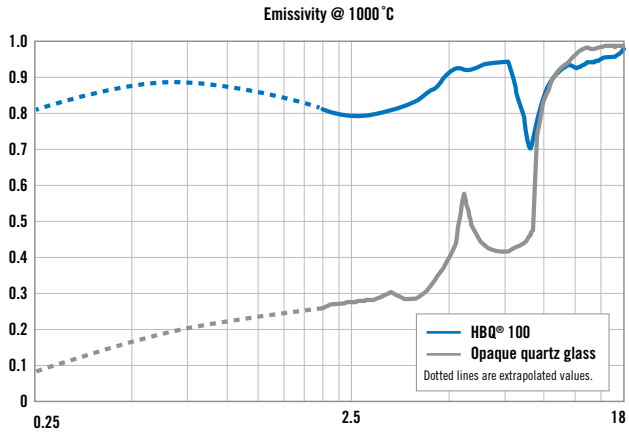
	Li	Na	K	Mg	Ca	Fe	Cu	Cr	Ni	Mn	Ti	Zr	Al	OH
HBQ® 100	0.1	0.1	0.2	< 0.03	0.4	0.2	< 0.01	< 0.01	< 0.03	< 0.03	1.1	1.0	15	n. s.
HSQ® 300	0.5	0.2	0.3	< 0.03	0.5	0.1	0.01	< 0.01	< 0.01	< 0.03	1.1	1.0	15	< 30
OM® 100	0.1	0.1	0.2	< 0.03	0.4	0.1	< 0.01	< 0.01	< 0.01	< 0.03	1.1	1.0	15	n. s.

Emissivity (comparison to industry standard fused quartz)

Emissivity @ 1000 °C



HBQ® @ 1000 °C | Opaque quartz glass @ 1000 °C



Physical Properties

Feature	HBQ® 100	electrically fused quartz glass (e.g. HSQ® 300)
Density g/cm³	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

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Germany
Heraeus Quarzglas GmbH & Co. KG
Heraeus Conamic
Kleinostheim, Germany
Phone: +49 6181 35-7444
conamic.basematerials.eu@heraeus.com

USA
Heraeus Quartz North America, LLC.
Heraeus Conamic
Chandler, Arizona, USA
Phone: +1 678 714-4306
conamic.basematerials.us@heraeus.com

UK
Heraeus Conamic UK Ltd.
Wallsend, UK
Phone: +44 191 2598-411
conamic.basematerials.eu@heraeus.com

Korea
Heraeus Korea Corporation
Heraeus Conamic Anseong Factory
Miyang-myeon, Gyeonggi-do, Korea
Phone: +82 31 671-7601
conamic.basematerials.kr@heraeus.com

China
Heraeus ShinEtsu Quartz (China) Inc.
Pudong, Shanghai, China
Phone: +86 21 6867 2266-809
conamic.basematerials.cn@heraeus.com

Japan
Shin-Etsu Quartz Products Co., Ltd.
Shinagawa, Tokyo, Japan
Phone: +81 3 6737-0221
division3@sqp.co.jp

Taiwan
Heraeus Materials Technology Taiwan Ltd.
Taipei, Taiwan
Phone: +886 2 2627-1111
conamic.basematerials.tw@heraeus.com

www.heraeus-conamic.com