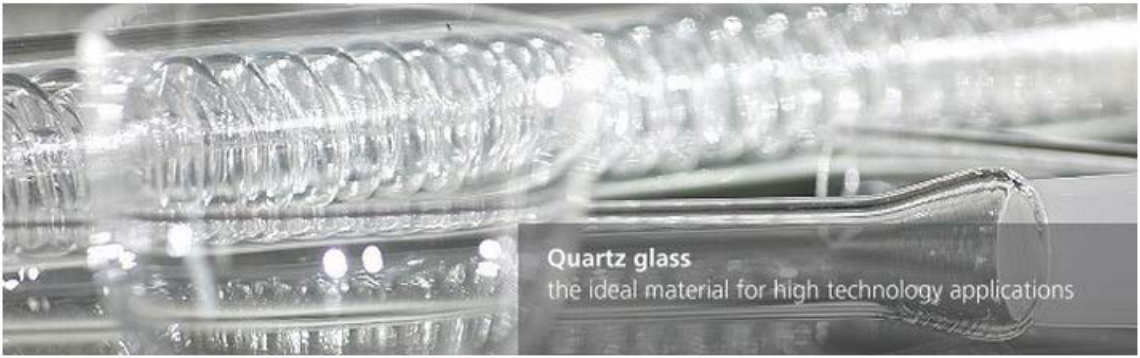
Material information quartz glass



Due to the combination of several special material properties, quartz glass or silica glass, also known as fused silica, is one of the most unusual and valuable materials, without which many applications in research and industry would be simply inconceivable. Many inventions and developments which significantly affect our daily lives were only made possible by the use of quartz glass.

In contrast to common, conventional types of glass, quartz glass is made from pure silicon dioxide (SiO_2), without the admixture of soda, calcium oxide or other additives. It is almost free of impurities, and is therefore the purest form of glass, with an unusually high glass transition point of approx. 1200 °C, which makes its processing into tubes, laboratory glass, apparatus and discs more difficult. The distinction is made between natural quartz glass and synthetic quartz glass, which depending on the preliminary material and manufacturing processes, only contain impurities in the ppm range (for normal quartz glass) or the ppb range (for synthetic quartz glass).

The following combination of the special thermal, electrical, chemical, mechanical and optical properties in a single material makes quartz glass indispensible for high-technology applications:

- high thermal shock resistance with low thermal expansion
- high transmission from the UV to the IR spectrum range
- high chemical resistance and purity
- high electrical insulation properties
- high radiation resistance
- high temperature resistance and softening temperature

Quartz glass is also available in opaque form and in selected compositions, in order to adapt the optical transparency to special wavelengths (transmission / absorption) and the physical and chemical properties to the requirements of special applications.