



QUARTZ / SILICA

Quartz glass is an extremely versatile material used in a range of different applications. It has outstanding thermal properties, excellent optical transmission, with good electrical and corrosion performance.

There are two basic ways of making quartz / silica glass:

1. By melting silica grains either by gas or electrical heating (the type of heating affects some optical properties). This material can be transparent or, for some applications, opaque
2. By synthesising the glass from chemicals

This synthetic material, normally referred to as synthetic fused silica, has better optical properties and is somewhat more expensive than the other type.

In the UK, terms such as quartz, silica, fused quartz and fused silica tend to be used interchangeably. In the USA, quartz refers to material melted from grains, silica refers to the synthetic material.

Advantages: Incredibly thermally shock resistant (can be taken from red heat and plunged into water without cracking)
Low coefficient of thermal expansion
Optical transmission properties from ultra violet to infra red
Good chemical resistance
Excellent electrical insulator

Applications: Windows
Lenses
Mirror substrates
Crucibles, trays and boats
UV transmitting optics (synthetic fused silica)
IR transmitting optics
Metrology components

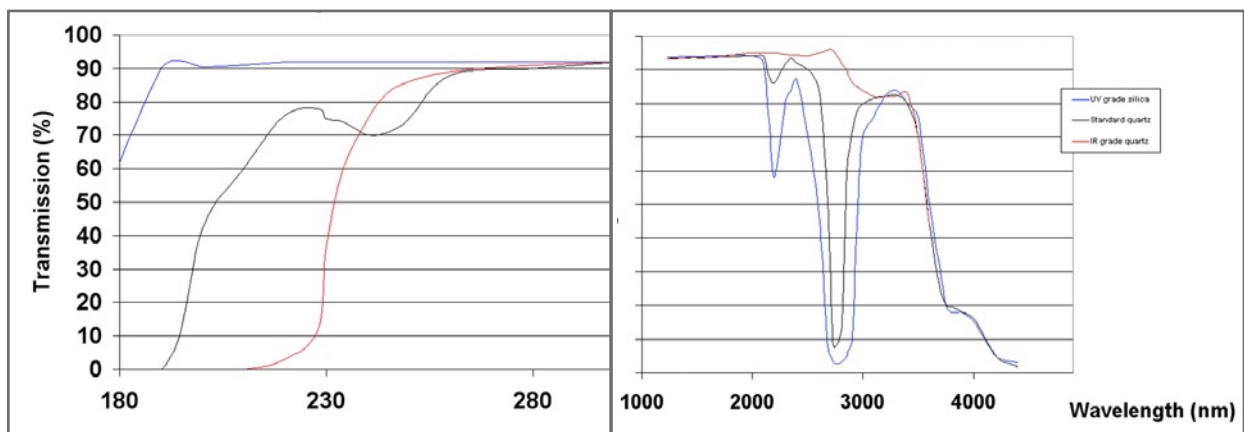


QUARTZ/SILICA (Continued)

PROPERTIES OF QUARTZ / SILICA

	PROPERTY	UNITS	
GENERAL	Chemical formula	n/a	SiO ₂
	Density	g/cm ³	2.2
MECHANICAL	Design tensile Strength	MPa	48
	Design compressive Strength	MPa	1100
	Young's Modulus	GPa	72
THERMAL	Max. use temperature	°C	950-1300
	Thermal Conductivity	W/m ^{°K}	1.4
	Coefficient of Linear Thermal Expansion	10 ⁻⁶ /°C	0.55
ELECTRICAL	Volume Resistance	Ωcm	10 ¹⁶
	Dielectric Constant		3.7
	Dielectric Strength	kV/mm	40

Transmission Curve for quartz / silica grades 10mm thick (including surface reflection losses)



Properties shown are typical values, they are not absolute material properties, and should be used for guidance only. It is recommended that materials and components are tested for their suitability for a specific application.

For more information and advice please discuss your application with our sales staff.