



## Fused Silica

### Optical

Transmission Range :	180 nm to 2.2 $\mu\text{m}$
Refractive Index :	1.47012 at 400 nm
Reflection Loss :	7.0% at 400 nm (Losses from two surfaces)
Absorption Coefficient :	$10 \times 10^{-6} \text{ cm}^{-1}$ at 1.0 $\mu\text{m}$

### Physical

Density :	2.203 $\text{g/cm}^3$
Melting Point :	1600 $^{\circ}\text{C}$
Thermal Conductivity :	1.38 $\text{W m}^{-1} \text{ K}^{-1}$
Linear CTE :	$5.5 \times 10^{-7} /^{\circ}\text{C}$ @ RT
Specific Heat Capacity :	703 $\text{J Kg}^{-1} \text{ K}^{-1}$

### Mechanical

Youngs Modulus (E) :	73.1 GPa
Shear Modulus (G) :	31.2 GPa
Bulk Modulus (K) :	36.7 GPa
Rupture Modulus :	55 Mpa
Hardness :	500 Knoop (200g indenter)
Poisson Ratio :	0.17

### Chemical

Chemical Formula	$\text{SiO}_2$ amorphous
Solubility :	Insoluble in $\text{H}_2\text{O}$
Molecular Weight :	28.09 g/mole

### Notes

Fused Silica is hard with very low expansion.  
Fused silica is isotropic.  
Strong absorption in the IR due to hydroxyl groups being present.  
See Infrasil (or water-free) fused silica