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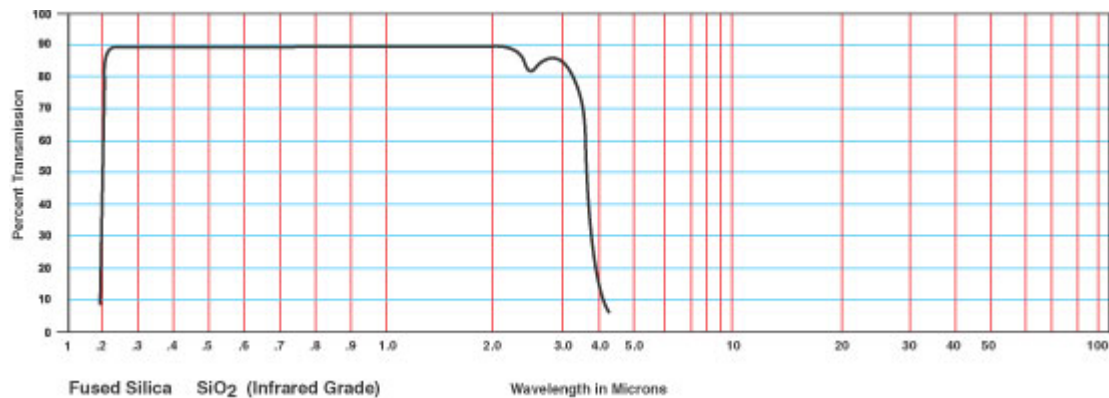
Title: Optical Material / Crystals (Infrared)

Material / Specification: Quartz Crystal for 0.12 to 7µm transmission

Range / Description: OPM-QuartzCrystal

Crystalline Quartz is used as a wave retardation medium. Its properties are of use in quarter-wave plates and in polarisers. Quartz is tough but should not be processed or used at temperatures greater than 490 °C

Internal Transmittance



Refractive Index n vs. Wavelength λ <i>no=Ordinary ne=extraordinary</i>																
λ , MKM	0.20	0.25	0.30	0.40	0.50	0.64	1.00	1.20	1.40	1.60	1.80	2.50	3.00	---	---	---
no	1.64	1.60	1.57	1.55	1.54	1.54	1.53	1.53	1.52	1.52	1.52	1.51	1.49	---	---	---
ne	1.66	1.61	1.58	1.56	1.55	1.55	1.54	1.54	1.53	1.53	1.53	1.51	1.50	---	---	---

Optical Properties	
Transmission Range	0.4 to 3 μ m (also >40 μ m)
Refractive Index	No 1.54421; Ne 1.55333 at
Refractive Loss	8.8% at 0.6 μ m
Crystal/Class Structure	Trigonal (hex)
Cleavage Plane	n/a

Thermal Properties	
Thermal Expansion	7.1 (para) 13.2 (perp) $\times 10^{-6}/^{\circ}\text{C}$
Thermal Conductivity	10.7 (para) 6.2 (perp) $\text{W m}^{-1} \text{K}^{-1}$ at 323 K
Melting Point	1467 °C
Specific Heat Capacity	710 $\text{J Kg}^{-1} \text{K}^{-1}$

Mechanical Properties	
Density	2.649 g/cc
Hardness (Knoop)	741 with 500g indenter
Youngs Modulus	97.2 (para) 76.5 (perp) GPa
Shear Modulus	31.14 GPa
Bulk Modulus	36.4 GPa
Poisson Ratio	n/a
Elastic Limit	n/a
Molecular Weight	60.06

Chemical Properties	
Solubility	Insoluble in water