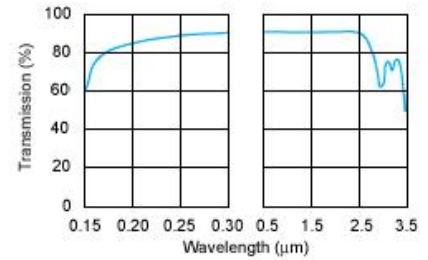




# Crystal Quartz (SiO<sub>2</sub>)

Optical Quality Cultured Crystal Quartz features high transmittance in ultraviolet, visible and infrared spectrum from 190 to 2900 nm, birefringence, ability to rotate plane polarized light, high damage threshold and resistance to scratching. Optical quality material is virtually bubble and inclusion free.



## Main Properties:

Chemical Formula	SiO <sub>2</sub>
Molecular Weight	60.06
Density, g/cm <sup>3</sup>	2.635-2.660
Crystal Class	Hexagonal
Transmission Range, μm	0.4-3.5
Reflection Loss,% for two surfaces at 2 μm	8.2
Dielectric Constant for 3x10 <sup>7</sup> Hz at 295 K	
perpendicular	4.34
parallel	4.27
Melting Temperature, K	1740
Thermal Conductivity, W/(m K)	
at 20 K (parallel/perpendicular)	720/370
at 194 K (parallel/perpendicular)	20/10
at 323 K (parallel/perpendicular)	10.7/6.2
Thermal Expansion, 1/K at 273-253 K	
parallel	7.64x10 <sup>-6</sup>
perpendicular	14.0x10 <sup>-6</sup>
Specific Heat, cal/(g K) at 273 K	0.17
Debye Temperature, K	470
Bandgap, eV	8.4
Solubility in water	None
Mohs Hardness	7
Knoop Hardness, kg/mm <sup>2</sup>	741
Young's Modulus, GPa	
perpendicular	76.5
parallel	97.2
Shear Modulus, GPa	31.14
Bulk Modulus, GPa	36.4

## Refractive Index:

Wavelength (μm)	n <sub>o</sub>	n <sub>e</sub>
0.185	1.65751	1.68988
0.198	1.65087	1.66394
0.231	1.61395	1.62555
0.340	1.56747	1.57737
0.394	1.55846	1.56805
0.434	1.55396	1.56339
0.508	1.54822	1.55746
0.5893	1.54424	1.55335
0.768	1.53903	1.54794
0.8325	1.53773	1.54661
0.9914	1.53514	1.54392
1.1592	1.53283	1.54152
1.3070	1.53090	1.53951
1.3958	1.52977	1.53832
1.4792	1.52865	1.53716
1.5414	1.52781	1.53630
1.6815	1.52583	1.53422
1.7614	1.52468	1.53301
1.9457	1.52184	1.53004
2.0531	1.52005	1.52823
2.30	1.51561	
2.60	1.50986	
3.00	1.49953	
3.50	1.48451	
4.00	1.46617	
4.20	1.4569	
5.00	1.417	
6.45	1.274	
7.00	1.167	

## Specifications:

<b>Size:</b>	Ø5.0mm, Ø10.0mm, Ø20.0mm, Ø50mm, Ø80.0mm, Ø12.7mm, Ø25.4mm, Ø50.8mm, Ø76.2mm, 5.0x5.0mm, 10.0x10.0mm, 20.0x20.0mm, 50x50mm, 80.0x80.0mm, 12.7x12.7mm, 25.4x25.4mm, 50.8x50.8mm, 76.2x76.2mm	<b>Material:</b>	Optical Quality Cultured Crystal Quartz
		<b>Orientation</b>	<100>, <111>, <110>
		<b>Flatness:</b>	λ/4
		<b>Parallelism:</b>	<1 arc minute
		<b>Surface</b>	40/20
<b>Thickness:</b>	0.5mm, 1.0mm, 2.0mm, 3.0mm, 4.0mm	<b>Bevel:</b>	0.25mm x 45°
<b>Tolerance:</b>	±0.10mm	<b>Coating:</b>	Available upon request