

Z-cut Cultured Crystal Quartz Windows

BPO supplies optical quality cultured quartz windows and blanks. Z-oriented components are available up to 3.000" in diameter. Very few materials match the useful transmission range and physical properties of optical quality cultured quartz. This material is reproducible, available and affordable.

For over 40 years, BPO specialists have been selecting appropriate quality and cuts of crystal quartz for optical and electronic applications. Critical visual inspection, x-ray diffraction orientation of one or more planes and acid-etch topographical evaluation ensure the most appropriate material to fill your specific needs.

Our windows are chemically polished. The process used to remove the last few microns of material from each surface is basically a mild etch and produces a true single-crystal surface. The polished windows meet or exceed most standard commercial quality requirements. While flatness and parallelism vary with diameter and thickness, wedge is usually less than 0.0005".

For more stringent processing requirements, we can supply inspected, oriented blanks for final finishing at an optical facility of your choice.

A representative inventory of finished windows is maintained. Diameters from 0.500" to 3.000", and thicknesses from 0.020" to 1.000" are available. UV grade windows and blanks are available for more demanding optical and electronic applications. We regularly supply crystal quartz substrates as thin as 0.001", and radiation absorption plates to 2.000" in thickness.

Standard Tolerances

Diameter	+/- 0.003"
Thickness	+/- 0.001"
Surface Finish	Chemical polish: meets or exceeds 60-10 with respect to processing induced artifacts
Flatness	Within 5 waves at 6:1 ratio
Parallelism	Within 0.0005"
Orientation	+/- 30 minutes of requested plane
Minimum edge chamfers	

Other orientational and dimensional tolerances available

Material Characteristics

Optical Properties	
Useful transmission range	0.15 to 3.5 microns
Far IR	-50 to 200+ microns
Inclusions	3 per cc (greater than 25 microns)
Optical homogeneity	1/10 th fringe per inch (UV grade)
Optical activity parallel to Z axis	21° 43'/mm (sodium light)
Index of refraction	1.55 (visible light)
Physical / Electronic Properties	
Chemical formula	SiO ₂
Crystal class	Trigonal
Density	2.66 x 10 ³ kg/m ³ @ 25°C
Melting point	1750°C
Curie point	573°C
Moh's hardness	7
Specific gravity	2.649 @ 20°C
Dielectric constant	e ₁₁ = 4.58 e ₃₃ = 4.70
Molecular weight	60.1
Solubility	Non-hydroscopic in most atmospheric liquids
Expansion coefficients	At 0°C (10 ⁻⁶): parallel to Z -7.0 perpendicular to Z -12.9

Questions? [Contact us](#) to discuss your particular application.