

BaTiO₃

Barium Titanate Crystal

BaTiO₃ is a very unique crystal with superior photo-refractive and ferroelectric properties. MTI supplies both substrate grade and photo-refractive grade BaTiO₃ single crystal with excellent quality and affordable price.



Typical Properties

Crystal Structure	Tetragonal (4m) : 9°C < T < 130.5 °C a=3.99 Å, c= 4.04 Å ,		
Growth Method	Top Seeded Solution Growth		
Melting Point	1600 °C		
Density	6.02 g/cm ³		
Dielectric constants	$\epsilon_a = 3700$, $\epsilon_c = 135$ (unclamped) $\epsilon_a = 2400$, $\epsilon_c = 60$ (clamped)		
Index of Refraction	515 nm	633 nm	800 nm
	n_o 2.4921	2.4160	2.3681
	n_e 2.4247	2.3630	2.3235
Transmission wavelength	0.45 ~ 6.30 μm		
Electro Optic Coefficients:	$r_{13}^T = 11.7 \pm 1.9 \text{ pm/V}$ $r_{33}^T = 112 \pm 10 \text{ pm/V}$ $r_{42}^T = 1920 \pm 180 \text{ pm/V}$		
Reflectivity of SPPC (at 0 deg. cut)	50 - 70 % (max. 77%) for $\lambda = 515 \text{ nm}$ 50 - 80 % (max: 86.8%) for $\lambda = 633 \text{ nm}$		
Two-wave mixing coupling constant:	10 -40 cm^{-1}		
Absorption loss:	λ : 515 nm	633 nm	800 nm
	α : 3.392 cm^{-1}	0.268 cm^{-1}	0.005 cm^{-1}
Standard BTO Crystal Products			
Substrate grade BTO (poled, but with domains)	5x5x1.0 mm, <100> or <001> ori. 1- 2 sides polished 10x10x1.0 mm, <100> or <001>ori. 1-2 sides polished		

- Special size components are available upon request.
- BTO crystal must be stored in temperature above 13 °C to avoid phase transition which will cause twin or domain inside crystal

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