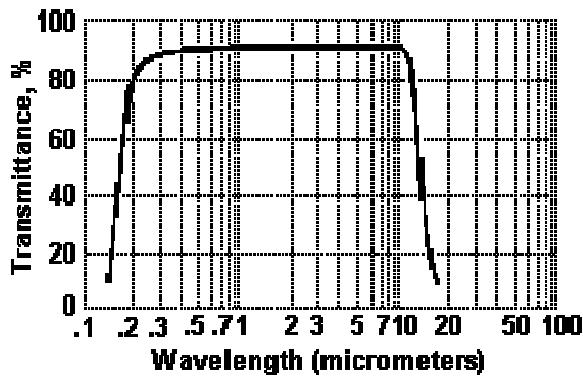


Barium Fluoride



(BaF₂)

Barium Fluoride is used for optical windows, lenses and prisms. The transmission range is 0.2 μm - 11 μm. Barium fluoride is grown by vacuum Stockbarger technique. Polishing is quicker than calcium fluoride using diamond pastes but more difficult to achieve surfaces that are free of streaks. Barium fluoride is less resistant to attack by water than Calcium Fluoride. Pronounced water attack occurs at 500 °C, but the material can be used to 800 °C in a dry environment. The material is relatively hard but is highly sensitive to thermal shock.

OPTICAL PROPERTIES

Transmission Range	0.13 to 10 microns
Refractive Index	1.4626 at 2.6 microns
Reflection Loss	6.9% at 2.6 μm (2 surfaces)
Reststrahlen Peak	47 microns
dN/dT	-15.2 x 10 ⁻⁶ /°C

PHYSICAL PROPERTIES

Density	4.89 g/cm ³
Melting Point	1280 °C
Thermal Conductivity	11.72 W/(m K) at 13 °C
Thermal Expansion	18.1 x 10 ⁻⁶ /°C at -100 to +200 °C
Hardness	Knoop 82 kg/mm ² with 500g indenter
Specific Heat Capacity	410 J/(kg K) at 27 °C
Dielectric Constant	7.33 at 2MHz
Young's Modulus (E)	53.07 GPa
Shear Modulus (G)	25.4 GPa
Bulk Modulus (K)	56.4 GPa
Elastic Coefficients	C ₁₁ = 89.2 MPa; C ₁₂ = 40.0 MPa; C ₁₄ = 25.4 MPa
Apparent Elastic Limit	26.89 MPa
Poisson Ratio	0.343

CHEMICAL PROPERTIES

Solubility	0.17g/100g water at 23°C
Molecular Weight	175.36
Class/Structure	Cubic (111) cleavage

Wavelength, μm	0.26	0.30	0.36	0.48	0.85	3.24
Refractive Index	1.51	1.50	1.49	1.48	1.47	1.46
Wavelength, μm	5.14	6.50	8.00	8.60	9.20	9.80
Refractive Index	1.45	1.44	1.43	1.42	1.41	1.40