

# Barium Fluoride (BaF<sub>2</sub>)

Custom sizes and specifications are available

## CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=6.196
	c=a
Cleavability	(111), perfect

## OPTICAL

Refractive Index at $n_e$	1.4759
Refractive Index $n_F - n_C$	0.0059
Refractive Index at $n_{10.6}$	1.3926
Refractive Index $n_{8.0} - n_{12.5}$	0.0673
Thermal Coefficient of Refractive Index at 3.39 microns for +/-60 deg C	(-1.27)... (-1.51) x 10 <sup>-5</sup>
Transmission Range, microns	0.15-12.5
Absorbance $\mu (\lambda), \text{cm}^{-1}$	
at 0.2 microns	0.2
at 0.4 microns	0.08
at 10.6 microns	0.13

## THERMAL

Thermal Linear Expansion, deg C <sup>-1</sup> for +/-60 deg C	(16.5...19.2) x 10 <sup>-6</sup>
Thermal Conductivity, W/(m•deg C) at 38 deg C	7.1
Specific Heat Capacity, J/(kg•deg C)	0.456 x 10 <sup>3</sup>
Thermal Stability, deg C	10 +/-2
Melting Point, deg C	1354

## MECHANICAL

Density, g/cm <sup>3</sup> at 20 deg C	4.83
Mohs Hardness	3
Vickers Microhardness, Pa	82 x 10 <sup>7</sup>
Constants of Elastic Compliance, Pa <sup>-1</sup>	$S_{11}=15.30 \times 10^{-12}$ $S_{12}=-4.69 \times 10^{-12}$ $S_{44}=39.47 \times 10^{-12}$

Young Modulus (E), Pa	
in <100> direction	6.54 x 10 <sup>10</sup>
in <111> direction	6.63 x 10 <sup>10</sup>
Shear Modulus (G), Pa	
in <100> direction	2.51 x 10 <sup>10</sup>
in <111> direction	2.53 x 10 <sup>10</sup>
Poisson Ratio	0.307

## CHEMICAL

Molecular Weight	175.3
Solubility	
in water, gram/100 cm <sup>3</sup>	0.17
in acids	soluble

## Refr. Index n vs. Wavelength $\lambda$

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.2	1.5573
0.5	1.4779
1.0	1.4686
2.0	1.4647
3.0	1.4612
4.0	1.4558
5.0	1.4511
6.0	1.4441
7.0	1.4357
8.0	1.4258
9.0	1.4144
10.0	1.4014
11.0	1.3865
12.0	1.3696
12.5	1.3585
15.0	1.3050

## Internal Transmittance $\tau_i (\lambda)$ vs. Wavelength $\lambda$

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.2	0.70
0.5	0.96
1.0	0.97
3.0	0.97
5.0	0.97
6.0	0.97
7.0	0.97
8.0	0.97
9.0	0.97
10.0	0.85
12.0	0.42

