

# Calcium Fluoride (CaF<sub>2</sub>)

Custom sizes and specifications are available

Crystal Structure: Monocrystalline, Polycrystalline

Types Available: IR Grade, UV Grade, Excimer Grade

## CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=5.642
	c = a
Cleavability	<111>, perfect
Orientation	<111>, <100>

## OPTICAL

Refractive Index at n <sub>e</sub>	1.4349
Refractive Index n <sub>F</sub> -n <sub>C</sub>	0.0043
Refractive Index at n <sub>10.6</sub>	1.2996
Thermal Coefficient of Refractive Index at 3.39 microns for +/-60°C	(-0.95)...(-1/17) x 10 <sup>-5</sup>
Transmission Range, Microns	0.15-9.0

## THERMAL

Thermal Linear Expansion, °C <sup>-1</sup> for +/-60°C	(16.5...19.4) x 10 <sup>-6</sup>
Thermal Conductivity, W/(m* °C) at 36 °C	9.71
Specific Heat Capacity, J/(kg * °C)	0.8876 x 10 <sup>3</sup>
Thermal Stability, °C	20 +/-2
Melting Point, °C	1418

## MECHANICAL

Density,g/cm <sup>3</sup> at 20°C	3.18
Mohs Hardness	4
Vickers Microhardness, Pa	165 x 10 <sup>7</sup>
Constants of Elastic Compliance, Pa <sup>-1</sup>	S <sub>11</sub> =6.38 x 10 <sup>-12</sup> S <sub>12</sub> =-1.53 x 10 <sup>-12</sup> S <sub>44</sub> =29.58 x 10 <sup>-12</sup>
Young Modulus (E), Pa	1418
In <100> direction	14.61 x 10 <sup>10</sup>
In <111> direction	8.99 x 10 <sup>10</sup>
Shear Modulus (G), Pa	
In <100> direction	4.76 x 10 <sup>10</sup>
In <111> direction	3.38 x 10 <sup>10</sup>
Poisson Ratio	0.216

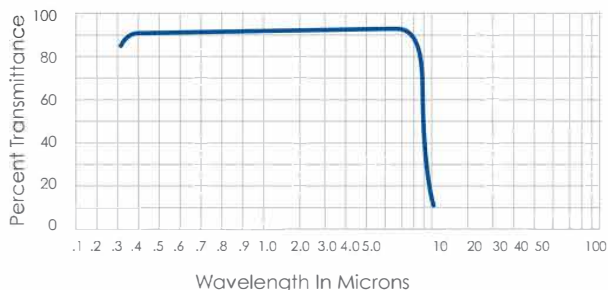
## CHEMICAL

Molecular Weight	78.08
Solubility in water, gram/100cm <sup>3</sup>	0.0016

\*IR Grade is the most commonly used grade in LightPath Technologies , however LightPath Technologies reserves the right to use any grade at its discretion.

Transmittance τ (λ) vs. Wavelength λ

IR Grade



Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.2	1.4951
0.5	1.4365
1.0	1.4289
2.0	1.4239
3.0	1.4179
4.0	1.4096
5.0	1.3990
6.0	1.3856
7.0	1.3693
8.0	1.3498
9.0	1.3268
10.0	1.3002
11.0	1.2676
12.0	1.2299

Internal Transmittance Ti (λ) vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.2	0.87
0.5	0.97
1.0	0.99
3.0	0.99
5.0	0.99
6.0	0.98
7.0	0.97
8.0	0.88
9.0	0.59
10.0	0.19

\*For Reference Only

