

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

Custom sizes and specifications are available

## CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=5.462
	c=a
Cleavability	(111), perfect

## OPTICAL

Refractive Index at $n_e$	1.4349
Refractive Index $n_F - n_C$	0.0043
Refractive Index at $n_{10.6}$	1.2996
Thermal Coefficient of Refractive Index at 3.39 microns for +/- 60 deg C	$(-0.95)... (-1.17) \times 10^{-5}$
Transmission Range, microns	0.15-9.0

## THERMAL

Thermal Linear Expansion, deg C <sup>-1</sup> for +/- 60 deg C	$(16.5...19.4) \times 10^{-6}$
Thermal Conductivity, W/(m•deg C) at 36 deg C	9.71
Specific Heat Capacity, J/(kg•deg C)	$0.8876 \times 10^3$
Thermal Stability, deg C	20 +/- 2
Melting Point, deg C	1418

## MECHANICAL

Density, g/cm <sup>3</sup> at 20 deg C	3.18
Mohs Hardness	4
Vickers Microhardness, Pa	$165 \times 10^7$
Constants of Elastic Compliance, Pa <sup>-1</sup>	$S_{11}=6.83 \times 10^{-12}$ $S_{12}=-1.53 \times 10^{-12}$ $S_{44}=29.58 \times 10^{-12}$

Young Modulus (E), Pa in <100> direction	$14.61 \times 10^{10}$
in <111> direction	$8.99 \times 10^{10}$
Shear Modulus (G), Pa in <100> direction	$4.76 \times 10^{10}$
in <111> direction	$3.38 \times 10^{10}$
Poisson Ratio	0.216

## CHEMICAL

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

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

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 $\tau_i$ ( $\lambda$ ) vs. Wavelength $\lambda$

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
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

## Transmittance $\tau$ ( $\lambda$ ) vs. Wavelength $\lambda$

