

CaF₂ – Calcium Fluoride

CRYSTALLOGRAPHIC

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

OPTICAL

Refractive Index at ne	1.4349
Refractive Index at nF' - nC'	0.0043
Refractive Index at n10.6	1.2996
Thermal Coefficient of Refractive Index at 3.39 microns for Δ60 °C	(-0.95) ... (-1.17) x 10 ⁻⁵
Transmission Range, microns	0.15 - 9.0

THERMAL

Thermal Linear Expansion, °C⁻¹ for Δ60 °C	(16.5 ... 19.4) x 10 ⁻⁶
Thermal Conductivity, W/(m * °C) at 36 °C	9.71
Specific Heat Capacity, J/(kg * °C)	0.8876 x 10 ³
Thermal Stability, °C	20 Δ2
Melting Point, °C	1418

MECHANICAL

Density, g/cm³ at 20 °C	3.18
Mohs Hardness	4
Vickers Microhardness, Pa	165 x 10 ⁷
Constants of Elastic Compliance, Pa⁻¹	S11 = 6.83 x 10 ⁻¹² S12 = -1.53 x 10 ⁻¹² S44 = 29.58 x 10 ⁻¹²
Young Modulus (E), Pa	
in <100> direction	14.61 x 10 ¹⁰
in <111> direction	8.99 x 10 ¹⁰
Shear Modulus (G), Pa	

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in <100> direction	4.76 x 1010
in <111> direction	3.38 x 1010
Poisson Ratio	0.216

CHEMICAL

Molecular Weight	78.08
Solubility	
in water, gram/100 cm³	0.0016

REF. INDEX 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 $\zeta_i(\lambda)$ VS. WAVELENGTH λ

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

Custom sizes and specifications are available on request.

