

Calcium Fluoride (CaF₂)

Custom sizes and specifications are available

GENERAL

Crystal structure Monocrystalline, Polycrystalline
Types available* IR Grade, UV Grade, Excimer Grade

CRYSTALLOGRAPHIC

Syngony Cubic
Symmetry Class m3m
Lattice Constants, Angstrom a=5.462
c=a
Cleavability <111>, perfect
Orientation <111>, <100>

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) x 10⁻⁵
Transmission Range, microns 0.15-9.0

THERMAL

Thermal Linear Expansion, deg C⁻¹
for +/-60 deg C (16.5...19.4) x 10⁻⁶
Thermal Conductivity, W/(m•deg C)
at 36 deg C 9.71
Specific Heat Capacity, J/(kg•deg C) 0.8876 x 10³
Thermal Stability, deg C 20 +/-2
Melting Point, deg C 1418

MECHANICAL

Density, g/cm³ at 20 deg C 3.18
Mohs Hardness 4
Vickers Microhardness, Pa 165 x 10⁷
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 10¹⁰
in <111> direction 8.99 x 10¹⁰
Shear Modulus (G), Pa
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

*IR Grade is the most commonly used grade in ISP Optics Catalog, however ISP Optics reserves the right to use any grade at its discretion.

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 τ_i (λ) vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.35	0.97
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 τ (λ) vs. Wavelength λ IR Grade

