

Calcium Fluoride (CaF₂)



APPLICATIONS: Calcium Fluoride has widespread IR application as spectroscopic windows, prisms and lenses. Especially pure grades of Calcium Fluoride find useful application in the UV and as UV Excimer laser windows. Calcium Fluoride is available doped with Europium as a beta and low energy gamma-ray scintillator.

Transmission Range	0.13 to 10 μ m
Refractive Index	1.39908 at 5 μ m (1) (2)
Reflection Loss	5.4% at 5 μ m
Absorption Coefficient	7.8 x 10 ⁻⁴ cm ⁻¹ @ 2.7 μ m
Reststrahlen Peak	35 μ m
dn/dT	-10.6 x 10 ⁻⁶ /°C (3)
dn/d μ = 0	1.7 μ m
Density	3.18 g/cc
Melting Point	1360°C
Thermal Conductivity	9.71 W m ⁻¹ K ⁻¹ (4)
Thermal Expansion	18.85 x 10 ⁻⁶ /°C (5)(6)
Hardness	Knoop 158.3 (100) with 500g indenter
Specific Heat Capacity	854 J Kg ⁻¹ K ⁻¹
Dielectric Constant	6.76 at 1MHz (7)
Youngs Modulus (E)	75.8 GPa (7)
Shear Modulus (G)	33.77 GPa (7)
Bulk Modulus (K)	82.71 GPa (7)
Elastic Coefficients	C ₁₁ = 164 C ₁₂ = 53 C ₄₄ = 33.7 (7)
Apparent Elastic Limit	36.54 MPa
Poisson Ratio	0.26

Solubility	0.0017g/100g water at 20°C
Molecular Weight	78.08
Class/Structure	Cubic (111) cleavage

Calcium fluoride is grown by vacuum Stockbarger technique in diameters of up to about 250mm. Material for IR use is grown using naturally mined fluorite, in large quantities at a relatively low cost. For UV applications chemically prepared raw material is generally used. For Excimer applications, we use only the highest grade of specially selected material and crystal.

REFERENCES:

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μ m	No	μ m	No	μ m	No
0.149	1.5800	0.161	1.5490	0.195	1.5000
0.200	1.4950	0.222	1.4800	0.248	1.4680
0.266	1.4621	0.280	1.4584	0.300	1.454
0.337	1.4481	0.400	1.4419	0.486	1.4370
0.588	1.4339	0.656	1.4325	0.687	1.4320
0.728	1.4314	0.884	1.4298	1.014	1.4288
1.100	1.4283	1.250	1.4275	1.650	1.4256
1.900	1.4244	2.058	1.4236	2.450	1.4214
2.700	1.4199	2.800	1.4192	3.050	1.4175
3.400	1.4149	4.000	1.4096	4.400	1.4057
4.800	1.4014	5.000	1.3991	5.304	1.3952
5.893	1.3871	6.483	1.3782	7.072	1.3681
7.661	1.357	8.251	1.3444	8.840	1.3308
9.429	1.3161				

