

Calcium Fluoride (CaF₂) Windows

- UV to IR wavelength range 0.18-8 μm
- Excellent as the security inspection windows

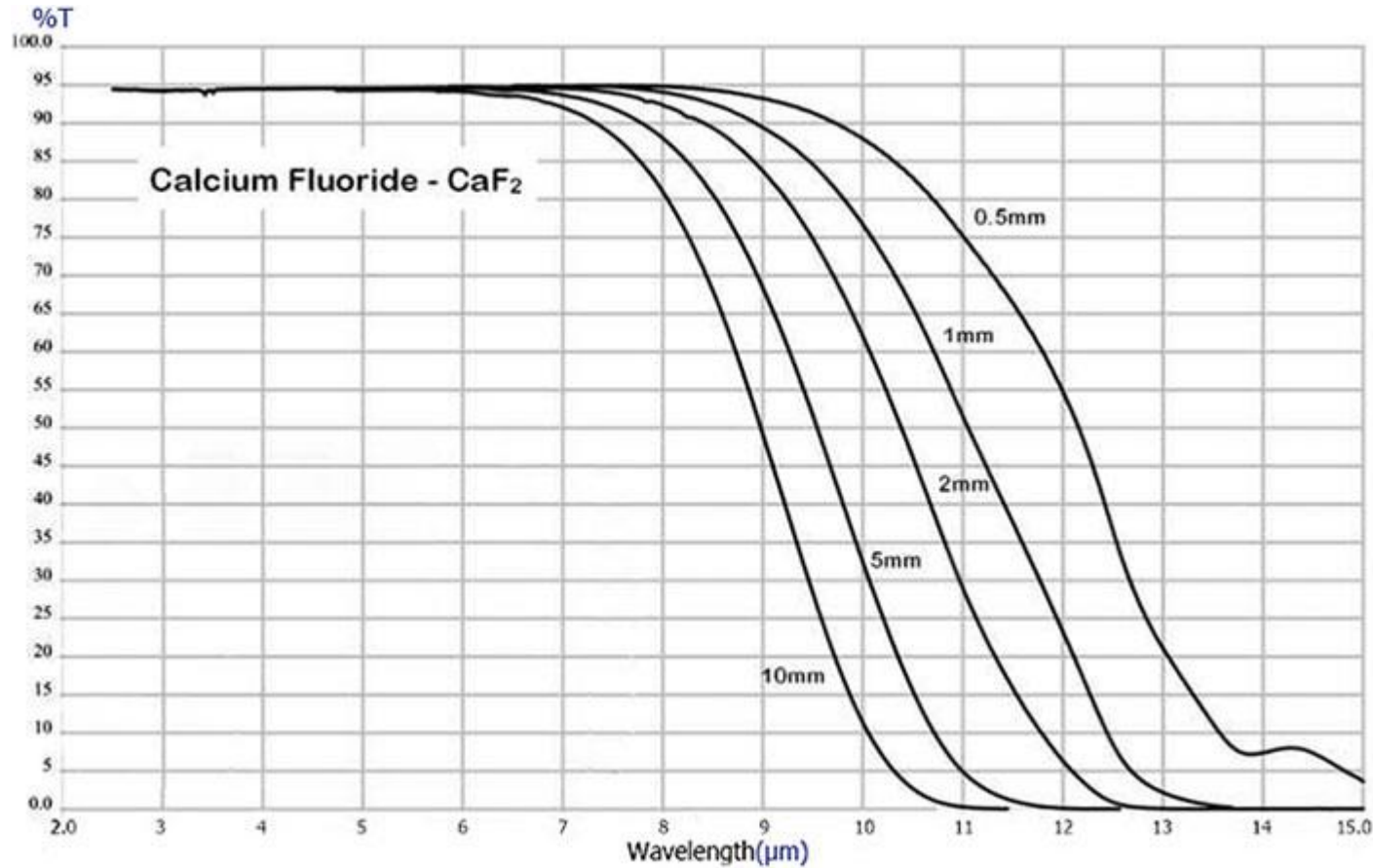
Due to its high average transmission and low chromatic aberration relative to other IR materials, **calcium fluoride**(CaF₂) is an excellent choice for windows and lenses for spectroscopy applications in the deep UV to near IR wavelength range (180 nm-8 μm). For its good transmission properties at LWIR range, the CaF₂ are often selected as the windows for **thermal imaging** security inspections in electric power facilities and petroleum industries. A protective coated could be made on the windows surface to improve its deliquescence properties.



Specifications

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Materials	IR grade Calcium fluoride crystals
Aperture	>90%
Dimension Tolerance	+0.0/-0.2mm
Thickness Tolerance	+/-0.2mm
Surface Quality	80/50 S/D
Parallelism	1 arc minute
Chamfer	0.3-0.5mmx45degree
Coating	Optional protective coating

Transmission curve of the CaF₂ windows of different thickness



Basic Propertie

Physical and optical properties	
Transmission Range	0.13 to 10 μm
Refractive Index	1.39908 at 5 μm (1) (2)
Reflection Loss	5.4% at 5 μm
Absorption Coefficient	$7.8 \times 10^{-4} \text{ cm}^{-1}$ @ 2.7 μm
Reststrahlen Peak	35 μm
dn/dT	$-10.6 \times 10^{-6}/^\circ\text{C}$ (3)
dn/d $\mu = 0$	1.7 μm
Density	3.18 g/cc
Melting Point	1360 $^\circ\text{C}$
Thermal Conductivity	9.71 W m ⁻¹ K ⁻¹ (4)
Thermal Expansion	$18.85 \times 10^{-6}/^\circ\text{C}$ (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	C11 = 164 C12 = 53 C44 = 33.7 (7)
Apparent Elastic Limit	36.54 MPa
Poisson Ratio	0.26
Solubility	0.0017g/100g water at 20 $^\circ\text{C}$
Molecular Weight	78.08
Class/Structure	Cubic (111) cleavage

