

Calcium Fluoride (CaF₂) Windows



Features:

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

Descriptions:

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 coating could be made on the windows surface to improve its deliquescence properties.

Hangzhou Shalom EO provides the crystals optical windows and also the windows assembly with metal holders for thermal imaging inspection applications.

Specifications:

Materials	IR grade Calcium fluoride crystals	Aperture	>90%
Dimension Tolerance	+0.0/-0.2mm	Thickness Tolerance	+/-0.1mm
Surface Quality	60/40 S/D	Parallelism	1 arc minute
Chamfer	0.3-0.5mmx45degree	Coating	Optional protective coating

Physical and Optical Properties:

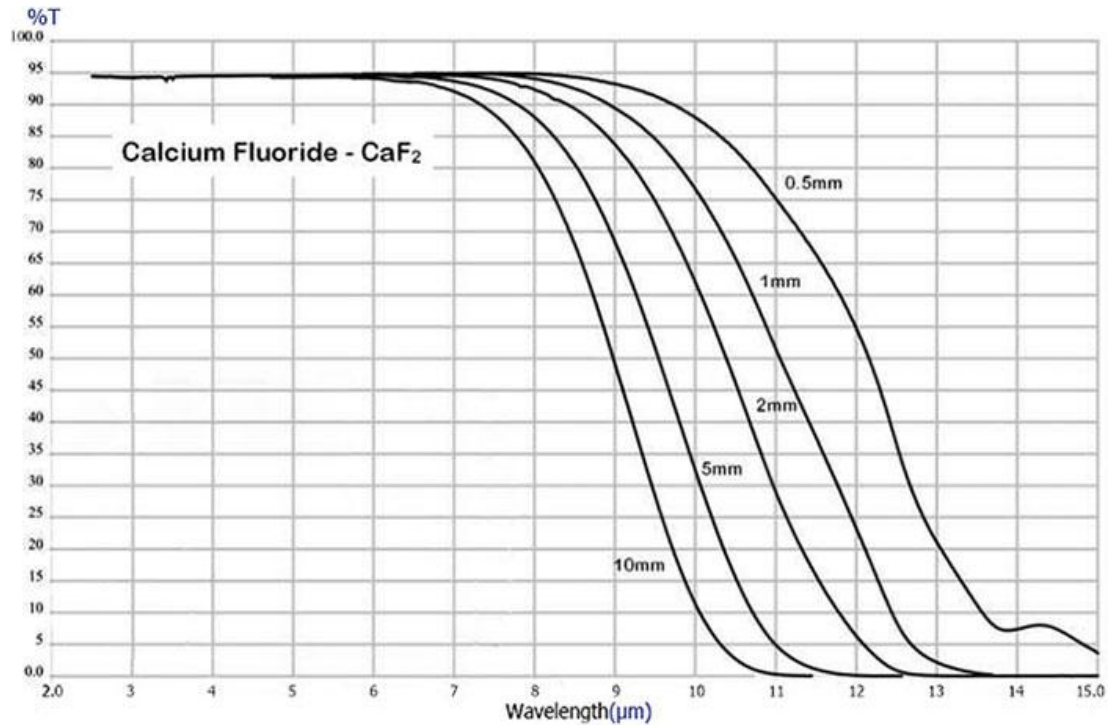
Transmission Range	0.13 to 10 μm	Refractive Index	1.39908 at 5 μm (1) (2)
Reflection Loss	5.4% at 5 μm	Absorption Coefficient	$7.8 \times 10^{-4} \text{ cm}^{-1}$ @ 2.7 μm
Reststrahlen Peak	35 μm	dn/dT	$-10.6 \times 10^{-6}/^{\circ}\text{C}$ (3)
dn/d $\mu = 0$	1.7 μm	Density	3.18 g/cc
Melting Point	1360 $^{\circ}\text{C}$	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	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		

Technical images:

Transmission curve of the CaF₂ windows of different thickness



Related products:

- 1) Infrared windows -> BaF₂ windows
- 2) Infrared windows -> Windows assembly for inspection
- 3) Infrared lenses -> CaF₂ lenses