

Calcium Fluoride (CaF₂)

UV-to-IR breadth with a negative dn/dT — the classic athermalization tool.

PHYSICAL PROPERTIES	
Crystal structure	Cubic fluorite (single crystal)
Density	3.18 g/cm ³
Bulk resistivity	Insulator
OPTICAL PROPERTIES	
Useful transmission range	0.13 – 10 μm
Refractive index	1.434 (n _d)
dn/dT	–10.6 × 10 ^{–6} /K (negative)
THERMAL PROPERTIES	
Thermal conductivity	9.7 W/m·K
Specific heat	0.854 J/g·K
Thermal expansion (CTE)	18.85 × 10 ^{–6} /K
MECHANICAL PROPERTIES	
Young's modulus	75.8 GPa
Knoop hardness	158 kgf/mm ²
Poisson's ratio	0.26

Typical Applications

UV/excimer optics; MWIR windows and lenses; negative-dn/dT elements in passively athermalized IR systems.

Fabrication & Specification Notes

High CTE makes CaF₂ vulnerable to thermal shock — avoid rapid temperature swings and rigid clamped mounts without compliance.

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