



## DESCRIPTION

Lithium calcium hexafluoroaluminate(LiCAF) crystals are widely used as vacuum ultraviolet(VUV) and ultraviolet(UV) laser host media. It has excellent transmission characteristics down to the vacuum ultraviolet (VUV) region. The transmission edge of LiCAF was measured experimentally to be 112nm. In particular, LiCAF has a transmittance of over 95% at 157nm, which corresponds to the wavelength of an F2 laser. It was also shown that LiCAF becomes virtually non-birefringent around 152nm, thereby making it an attractive optical window material for VUV laser sources LiCAF(LiCaAlF<sub>6</sub>) are excellent laser materials with high energy storage and high slope efficiency, also ideal working material under conditions of ultra short pulse and ultra high power.

## APPLICATIONS

- Scintillator,IR optics
- Inorganic scintillator for subnanosecond timing
- Window and focusing mirror for deep uv and excimer lasers

## FEATURES

- Large band gaps and low phonon energies
- Absorption edge is 112nm
- Small non-linear refractive indices
- Optical transmission and low thermal lensing distortion
- Transparency, tolerance to laser-induced damage



# LiCAF

## PARAMETERS

### Material and Specifications

Orientation Tolerance	5'
Parallelism	<10"
Perpendicularity	5'
Chamfer	0.1mm@45°
Surface Quality	10/5 or better
Wavefront Distortion	$\lambda/8$ @632.8 nm
Surface Flatness	$\lambda/10$ @632.8 nm
Clear Aperture	>95%
Diameter Tolerance	+0/-0.05mm
Length Tolerance	$\pm 0.1$ mm
Coatings	As per requirement
Damage Threshold	over 15J/cm <sup>2</sup> TEM00, 10ns, 10Hz
Dopant Concentration Tolerance	0.001

### Physical and Chemical Properties

Lattice	HexagonalL
Space Group	P31C
Lattice Constants	a=5.006, c=9.636Å
Density (g/cm <sup>3</sup> )	2.94
Melting Point	825°C
Thermal Conductivity (W·m <sup>-1</sup> ·K <sup>-1</sup> )	5.14(// a), 4.58(// c)
Thermal Expansion(10 <sup>-6</sup> ·K <sup>-1</sup> )	3.6(// a), 22(// c)
Specific Heat(J·g <sup>-1</sup> ·K <sup>-1</sup> )	0.935
Fracture Toughness (MPa·m <sup>1/2</sup> )	0.18~0.37
Band Gap(eV)@LDA	8.02(indirect)
Young's Modulus(GPa)	105.32(// a), 94.89(// c)
Bulk Modulus(GPa)	108.01
Dielectric Constant	1.27

### Optical characteristics

Absorption Edge	112nm
Refractive Index	no=1.3826, ne=1.3826@632,8nm
Thermal-optical Coefficient(10 <sup>-6</sup> /°C)	-7.3(no), -4.9(ne)

### Index of Refraction

Wavelength(nm)	no	ne
632.8	1.3826	1.3826
546.1	1.384	1.384
435.8	1.3862	1.3862
253.7	1.4061	1.4073

### Spectrum

