

Lithium Iodate (LiIO₃)

Introduction

LiIO₃ crystal is one of the oldest commercial NLO crystals. For the high NLO coefficient. LiIO₃ is used for frequency-doubling, tripling and mixing of low and medium power lasers.

CASTECH provides large size of LiIO₃ crystals with high optical homogeneity. They may be as-cut and polished. And sealed housing with AR-coated windows is also available.

Basic Properties

Point Group	6
Transparency Range	300-5000nm
Nonlinear Coefficient	$d_{15} = -5.5 \times 10^{-12} \text{m/V}$
Refractive Index	negative uniaxial $n_o = 1.8571, n_e = 1.7165 (\lambda = 1064 \text{nm})$
Sellmeier Equations: (λ in μm)	
$n_o^2 = 3415716 + 0047031 / (\lambda^2 - 0.035306) - 0008801 \lambda^2$ $n_e^2 = 2918692 + 0035145 / (\lambda^2 - 0.028224) - 0003641 \lambda^2$	

Notes to the user of LiIO₃

- LiIO₃ is highly hygroscopic. Please keep it in a dry environment, and sealed housing is recommended. CASTECH provide both polishing and sealed housing for LiIO₃ crystal.
- LiIO₃ is not recommended for high power applications, because of the low damage threshold.

Crystal Specifications

- Transmitting wavefront distortion: less than $\lambda/4$ @ 633 nm
- Dimension tolerance: (W \pm 0.2 mm) x (H \pm 0.2 mm) x (L + 0.5 /-0.2mm)
- Clear aperture: > 90% central area
- Flatness: $\lambda/4$ @ 633 nm
- Scratch/Dig code: 20/10 to MIL-PRF-13830B
- Parallelism: better than 20 arc seconds
- Perpendicularity: 5 arc minutes
- Angle tolerance: < $\pm 0.5^\circ$
- Quality Warranty Period: one year under proper use.