



LiIO₃ - Lithium Iodate

Introduction

Lithium Iodate (LiIO₃) is one of oldest commercial NLO crystals. With 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 can be as-cut or polished, and sealed housing with AR-coated windows is also available.

Table 1. Basic Properties

Crystal Structure	Hexagonal, Point Group 6
Transparency Range	300-5000 nm
Nonlinear Coefficient	$d_{15} = -5.5 \times 10^{-12}$ m/V
Refractive Index	negative uniaxial $n_o = 1.8571$, $n_e = 1.7165$ ($\lambda = 1064$ nm)
Sellmeier Equations: (λ in μm)	
	$n_o^2 = 3.415716 + 0.047031 / (\lambda^2 - 0.035306) - 0.008801 \lambda^2$
	$n_e^2 = 2.918692 + 0.035145 / (\lambda^2 - 0.028224) - 0.003641 \lambda^2$

Table 2. Specifications

Dimension Tolerance	$(W \pm 0.2 \text{ mm}) \times (H \pm 0.2 \text{ mm}) \times (L + 0.5/-0.2 \text{ mm})$
Clear Aperture	central 90% of the diameter
Surface Quality (Scratch/Dig)	20/10 to MIL-PRF-13830B
Flatness	$\lambda/4$ @633 nm
Transmitted Wavefront Distortion	$\leq \lambda/4$ @633 nm
Parallelism	≤ 30 arc sec
Perpendicularity	≤ 15 arc min
Angle Tolerance	$\leq 0.5^\circ$
Quality Warranty Period	one year under proper use.

Notes

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