

## Lithium Iodate (LiIO<sub>3</sub>)

### Introduction

LiIO<sub>3</sub> crystal is one of the oldest commercial NLO crystals. For the high NLO coefficient, LiIO<sub>3</sub> is used for frequency-doubling, tripling and mixing of low and medium power lasers.

CASTECH provides large size of LiIO<sub>3</sub> 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: ( $\lambda$ in $\mu\text{m}$ )	
$n_o^2 = 3415716 + 0047031 / (\lambda^2 - 0035306) - 0008801\lambda^2$ $n_e^2 = 2918692 + 0035145 / (\lambda^2 - 0028224) - 0003641\lambda^2$	

### Notes to the user of LiIO<sub>3</sub>

- LiIO<sub>3</sub> is highly hygroscopic. Please keep it in a dry environment, and sealed housing is recommended. CASTECH provide both polishing and sealed housing for LiIO<sub>3</sub> crystal.
- LiIO<sub>3</sub> 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.