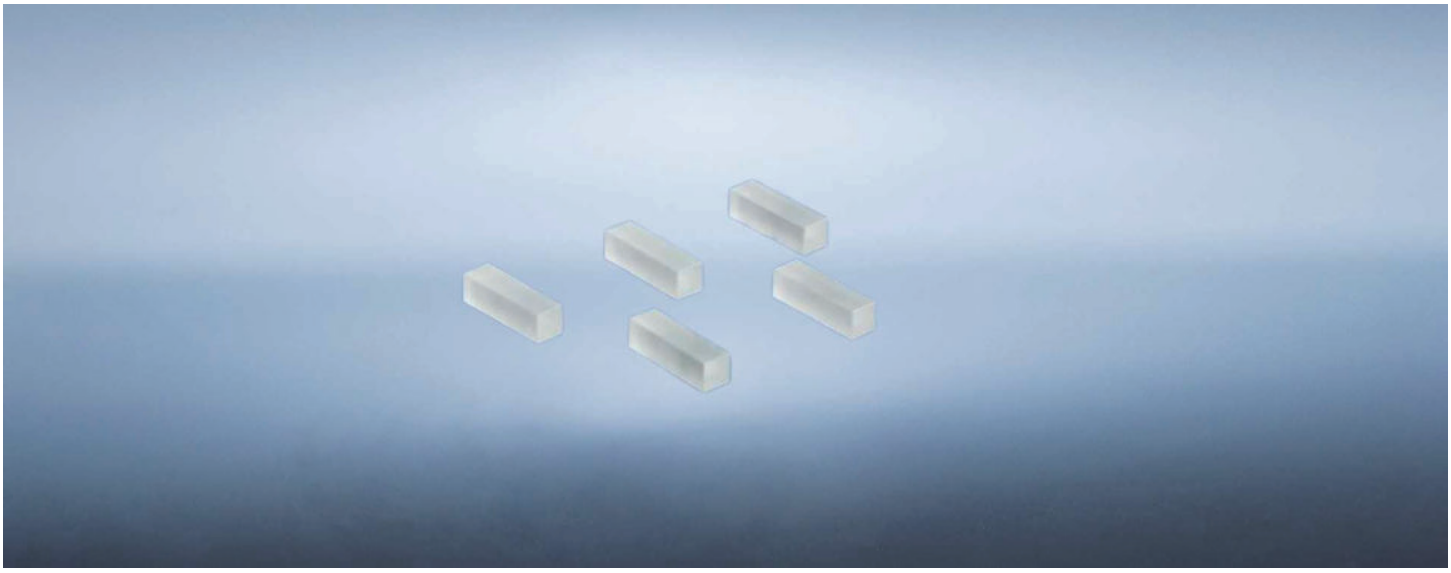
# $LiIO_3$



## DESCRIPTION

Lithium Iodate ($LiIO_3$) crystals are negative uniaxial crystals with high nonlinear optical coefficients and a wide range of transparency, resistant to radiation damage characteristics. It can be used in nonlinear acousto-optical and piezoelectric applications, in 347 nm ruby lasers, as a medium for second harmonic and parametric oscillations and as a narrow pulse, broadband ultrasonic transducer. It can also be used as a diode, triplet and mixer for low to medium power lasers.

## FEATURES

- Wide transparent range
- Low damage threshold
- High nonlinear optical coefficient
- Wide range of phase matching
- Applied to low and medium power lasers
- Good temperature stability of refractive index

## APPLICATIONS

- Autocorrelator
- Raman laser
- Harmonic generator
- Femtosecond third harmonic generator

## MATERIAL SPECIFICATIONS

| | |
|---|---|
| > 90% central area | Better than λ/4 @ 633 nm |
| Outer diameter tolerance | (W±0.2mm) x (H±0.2 mm) x (L+0.5 /-0.2mm) |
| Effective light passage aperture | > 90% central area |
| Flatness | λ/4 @ 633 nm |
| Brightness | 20/10 to MIL-PRF-13830B |
| Parallelism | > 20'' |
| Perpendicularity | 5′ |
| Angular Tolerance | <±0.5° |

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## PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| Crystal Structure | Hexagonal, uniaxial negative crystal |
| Point Group | 6 |
| Melting Point | 420℃ |
| Density | 4.487 g/cm$^3$ |
| Mohs Hardness | 3.5–4.0 |
| Transparent Range | 280–4000nm |
| Absorption Coefficient @1064 nm, | < 0.05cm$^{-1}$ |
| Refractive Index @1064 nm | $n_o$ = 1.8571, $n_e$ = 1.7165 |
| Refractive Index @800 nm | $n_o$ = 1.8676, $n_e$ = 1.7245 |
| Refractive Index@532 nm | $n_o$ = 1.8982, $n_e$ = 1.7480 |
| Type 1 SHG Phase Matching Range | 570–4000nm |
| Type 1 SHG Adoption@1064 nm | |
| Angle, mrad×cm | 0.77 |
| Spectra, cm$^{-1}$×cm | 12.74 |
| Type 1 SHG Walk-off Angle @1064 nm, mrad | 74.3 |
| Nonlinear Coefficient | $d_{31}$=4.4 pm/V(@1064 nm) |
| Effective Nonlinearity | $d_{eff} = d_{31}\sin\theta$ |
| Damage Threshold | > 100MW/cm$^2$ @ 1064 nm, 10 ns |
| Sellmeier Equation (λ – in μm) | $n_o^2$=3.415716+0.047031/(λ$^2$-0.035306)-0.008801λ$^2$<br>$n_e^2$=2.918692+0.035145/(λ$^2$-0.028224)-0.003641λ$^2$ |

## SPECTRA