

LiNbO₃ – LITHIUM NIOBATE

Lithium Niobate (LiNbO₃) nonlinear optical crystals are well suited for a wide range of applications:

- Electro-optical modulation
- Q-switching
- Laser frequency conversion of wavelengths >1 μm

Specifications

Flatness	λ/8 at 633 nm
Parallelism	< 20 arcsec
Surface quality	10 – 5 scratch & dig (MIL-PRF-13830B)
Perpendicularity	< 5 arcmin
Angle tolerance	< 30 arcmin
Clear aperture	90% of full aperture

Standard Crystals list

Size, mm	Orientation	Coating	Catalogue number	Price, EUR
6x6x25	z-cut	AR/AR @ 1064 nm	LNO-602	550
9x9x25	z-cut	AR/AR @ 1064 nm	LNO-901	620

Physical and Optical properties

Chemical formula	LiNbO ₃
Crystal structure	trigonal
Space group	R3C
Density	4.64 g/cm ³
Mohs hardness	5
Optical homogeneity	~ 5 × 10 ⁻⁵ / cm
Transparency range	420 – 5200 nm
Absorption coefficient	~ 0.1 % / cm @ 1064 nm
Refractive indices at 1064 nm	n _e = 2.146, n _o = 2.220 @ 1300 nm n _e = 2.156, n _o = 2.232 @ 1064 nm n _e = 2.203, n _o = 2.286 @ 632.8 nm
Sellmeier equations (λ, μm)	n _o ² = 4.9048 + 0.11768 / (λ ² - 0.04750) - 0.027169 λ ² n _e ² = 4.5820 + 0.099169 / (λ ² - 0.04443) - 0.021950 λ ²
Thermal expansion coefficient @ 25 °C	//a, 2.0 × 10 ⁻⁶ / K //c, 16.7 × 10 ⁻⁶ / K
Thermal conductivity	~ 5 W/m/K @ 25 °C
Thermal optical coefficient	dn _o /dT = -0.874 × 10 ⁻⁶ / K at 1.4 μm dn _e /dT = 39.073 × 10 ⁻⁶ / K at 1.4 μm