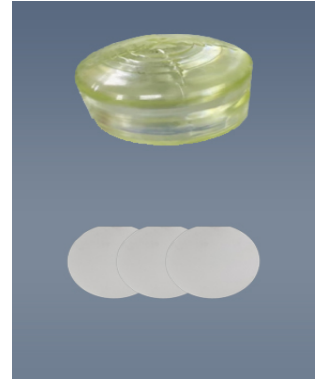


## Lithium Niobate (LiNbO<sub>3</sub>)

### Introduction:

Lithium Niobate is an inorganic material, chemical formula LiNbO<sub>3</sub>, is a negative crystal, ferro-electric crystal, polarization of lithium niobate crystal with piezoelectric, ferro-electric, photoelectric, nonlinear optical, thermo-electric materials, and has optical refractive effect.

Lithium niobate crystal is a good piezoelectric conversion material, ferro-electric materials, electric and optical materials. As electro-optical materials in optical communication, it is widely used in parametric oscillator, double frequency, acoustic and optical devices, and optical modulator. The doping of Mgo can effectively improve the damage resistance value of the crystal.



### Main Advantages:

- ✧ Very small chirp effect
- ✧ High modulation bandwidth
- ✧ High extinction ratio
- ✧ Stable chemical and physical properties

### Typical applications:

- ✧ Acoustic surface wave filter
- ✧ Separator
- ✧ Narrow band filter
- ✧ Sensors
- ✧ Photon tunable filter
- ✧ Acoustic and optical devices
- ✧ Optical gyroscope
- ✧ Optical waveguide
- ✧ Optical switches
- ✧ Optical modulation direction coupler
- ✧ Optical communication modulator
- ✧ Interferometer converter
- ✧ High-speed long-distance communication

## Material Properties:

Crystal Structure	Trigonal
Lattice constant	$a=0.515\text{\AA}$ , $c=13.863\text{\AA}$ , $Z=6\text{\AA}$
Melting Point	$1250\pm 5^{\circ}\text{C}$
Curie Point	$1140\pm 5^{\circ}\text{C}$
Mohs Hardness	5
Density	$4.64\text{ g/cm}^3$
Deliquescence	No
Dielectric Constant	$\epsilon_{11}/\epsilon_0=85$ ; $\epsilon_{33}/\epsilon_0=29.5$
Thermal Expansion Coefficient	$\alpha_1=\alpha_2=2\times 10^{-6}/^{\circ}\text{C}$ , $\alpha_3=2.2\times 10^{-6}/^{\circ}\text{C}$ at $25^{\circ}\text{C}$
Thermal Conductivity	$38\text{ W/m/K @ }25^{\circ}\text{C}$
Transmission Range	370-5000nm
Piezoelectric Constant	$d_{22}=2.04\times 10^{-11}\text{C/N}$ , $d_{33}=0.6\times 10^{-11}\text{C/N}$ , $d_{15}=7\times 10^{-11}\text{C/N}$ , $d_{31}=-0.1\times 10^{-11}\text{C/N}$
E-O Coefficient	$g_{T33}=32\text{pm/V}$ , $g_{S33}=31\text{pm/V}$ ; $g_{T31}=10\text{pm/V}$ , $g_{S31}=8.6\text{pm/V}$ $g_{T22}=6.8\text{pm/V}$ , $g_{S22}=3.4\text{pm/V}$
Refractive Indices	$n_o=2.2827 \pm 0.0003$ $n_e=2.1928 \pm 0.0003$

## Crystro offers:

Size	4", 6" Boule or wafer, Acoustic or Optical grade
Doping	No Doping or With Mg
Boule Length	$\geq 50\text{mm}$
Wafer Thickness	0.25, 0.35, 0.50(mm) or upon request
Orientation	$Y42^{\circ}/Y36^{\circ}/Y128^{\circ}/X/Y/Z$ or Upon Request
Surface Process	Single/Double Sides Polishing
TTV	$< 10\mu\text{m}$
BOW	$\pm (25\mu\text{m} \sim 40\mu\text{m})$
Warp	$\leq 35\mu\text{m}$
Flat Width	$32.0\pm 2.0$ (mm) or Upon Request
Roughness	$R_a \leq 10\text{\AA}$
Chamfer	$0.1\text{mm}@45^{\circ}$ or round edge

**Note: Above parameters for reference only, please contact our sales Rep. for your specific requirement.**