



We are committed to the supply of all types of substrate wafers to the microelectronics industry

Optical Grade Lithium Niobate Wafers (SLN,CLN)

Our abundance experience at growing and mass production for Optical grade Lithium Niobate on both boule and wafers. We are equipped with advanced facilities at Crystal growing, slicing, wafer lapping, polishing and checking, all finished products are passed at Testing of curie Temp and QC inspection.

All the wafers are under strict quality control and inspected. And also under the strict surface cleaning and flatness control as well.



General Specifications list:

| Material | Optical Grade LiNbO3 wafes (White or Black) | |
|------------------------|---|---|
| Curie Temp | 1142±0.7°C | |
| Cutting Angle | X/Y/Z etc | |
| Diameter/size | 2" /3" /4" ±0.03mm | |
| Tol(±) | <0.20 mm ±0.005mm | |
| Thickness | 0.18 ~ 0.5mm or more | |
| Primary Flat | 16mm/22mm /32mm | |
| TTV | <3µm | |
| Bow | -30<bow<30 | |
| Warp | <40µm | |
| Orientation Flat | All available | |
| Surface Type | Single Side Polished(SSP) /Double Sides Polished(DSP) | |
| Polished side Ra | <0.5nm | |
| S/D | 20/10 | |
| Edge Criteria | R=0.2mm C-type or Bullnose | |
| Quality | Free of crack (bubbles and inclusions) | |
| Optical doped | Mg/Fe/Zn/MgO etc for optical grade LN< wafers per requested | |
| Wafer Surface Criteria | Refractive index | No=2.2878/Ne=2.2033 @632nm wavelength/prism coupler method. |
| | Contamination, | None |
| | Particles $\phi > 0.3 \mu m$ | ≤ 30 |
| | Scratch , Chipping | None |
| | Defect | No edge cracks, scratches, saw marks, stains |
| Packaging | Qty/Wafer box | 25pcs per box |

Application list:

Integrated waveguide photonics; Wave Guide Lasers; Quasi-phase Matching for SHG&OPO; EO waveguide Phase & Amplitude Modulators

HANGZHOU FREQCONTROL ELECTRONIC TECHNOLOGY LTD.

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Optical Grade Lithium Niobate Wafers (SLN,CLN)



光学级铌酸锂晶体、晶片

Optical Grade Lithium Niobate boule and wafer

铌酸锂晶体是一种重要的多功能晶体，具有良好的非线性光学性质，其非线性光学系数较大；而且能够实现非临界相位匹配。作为电光晶体，已经作为重要的光波导材料；作为压电晶体，可以应用于制作中低频 SAW 滤波器，大功率耐高温的超声换能器等。掺杂铌酸锂材料应用也相当广泛。Mg:LN，可以大大提高抗激光损伤阈值，促进了铌酸锂晶体在非线性光学领域的应用；Nd:Mg:LN 晶体，可实现自倍频效应；Fe:LN 晶体可用在光学体全息存储。

LiNbO₃ Crystals is widely used as frequency doublers for wavelength > 1um and optical parametric oscillators (OPOs) pumped at 1064 nm as well as quasi-phase-matched (QPM) devices. Due to its large Electro-Optic (E-O) and Acousto-Optic (A-O) coefficients, LiNbO₃ crystal is the most commonly used material for Pockel Cells, Q-switches and phase modulators, waveguide substrate, and surface acoustic wave (SAW) wafers, etc.

应用领域

Applications:

集成光学波导

Integrated Waveguide Photonics

波导型激光器

Wave Guide Lasers

光隔离器用楔角片

Polarizer for Optic Isolator

电光波导相位调制器

EO Waveguide Phase Modulators

电光波导强度调制器

EO Waveguide Amplitude Modulators

准相位匹配激光倍频器件和光参量振荡器

Quasi-phase Matching for SHG and OPO

LiNbO₃ (LN) 基本性能

晶体结构 Crystal Structure Trigonal: point group 3m

负轴晶体 Negative axis crystal: $n_o > n_e$

密度 Density: 4.648g/cm³(CLN @25°C), 4.635g/cm³(SLN @25°C)

莫氏硬度 Moh's hardness: 5~5.5

熔点 Melting point: 1530K

点群 Crystal point group: 3m

介电常数 Dielectric Constant: $\epsilon_{11}/\epsilon_0=85$; $\epsilon_{33}/\epsilon_0=29.5$

电阻系数 Thermal Conductivity: 38W/m°C at 25°C

热膨胀系数 Thermal Expansion Coefficient: $a_1=a_2=2 \times 10^{-6}/\text{C}$, $a_3=2.2 \times 10^{-6}/\text{C}$ at 25°C

压电常数 Piezoelectric Strain Constant: $d_{22}=2.04 \times 10^{-11}\text{C/N}$, $d_{33}=0.6 \times 10^{-11}\text{C/N}$,

$d_{15}=7 \times 10^{-11}\text{C/N}$, $d_{31}=-0.1 \times 10^{-11}\text{C/N}$

弹性刚度 Elastic Stiffness Constant: $C_{11E}=2.04 \times 10^{11}\text{N/m}^2$, $C_{33E}=2.46 \times 10^{11}\text{N/m}^2$

晶格常数 The lattice of crystal: $a=5.1489\text{\AA}$, $c=13.8631\text{\AA}$ (CLN)

$a=5.1483\text{\AA}$, $c=13.8573\text{\AA}$ (SLN)

居里温度 TC: 1142 °C (CLN), 1205 °C (SLN)

比热容: $CP=619\text{J} \cdot \text{kg}^{-1} \cdot \text{K}^{-1}$ @25 °C

热导率 Thermal conductivity: ($\text{W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$ @27 °C): 4.4 | c, 4.5 \perp c

自由线性电光系数: ($\text{pm} \cdot \text{V}^{-1}$ @632.8um): $\gamma_{T13}=9.7$, $\gamma_{T33}=31.9$ (CLN)

$\gamma_{T13}=10.4$, $\gamma_{T33}=38.3$ (SLN)

二阶非线性电光系数: ($\text{pm} \cdot \text{V}^{-1}$ @1.064um): $d_{31}=-4.35$, $d_{33}=-27.2$ (CLN)

($\text{pm} \cdot \text{V}^{-1}$ @1.058um): $d_{31}=-4.64$, $d_{33}=-41.7$ (SLN)

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