

LiTaO₃ Crystal

Introduction

LiTaO₃ is an E-O crystal widely used for E-O devices, due to its good optical NLO and E-O properties, as well as high damage threshold. CASTECH supplies high quality LiTaO₃ boules and wafers with the following specifications for standard applications. We can also offer other specifications upon request:

Basic Properties of LiTaO₃

Crystal Structure	Trigonal, Space group R3c, Point group 3m
Cell Parameters	a=5.154 Å, c=13.781 Å
Melting Point	1650°C
Curie Temperature	607°C
Mohs Hardness	5.5
Density	7.46g/cm ³
Dielectric Constants	ϵ_{11}/ϵ_0 : 51.7 ϵ_{33}/ϵ_0 : 44.5
Elastic Stiffness Coefficients	C_{11}^E : 2.33 (x 10 ¹¹ N/m ²) C_{33}^E : 2.77 (x 10 ¹¹ N/m ²)
Piezoelectric Strain Constants	d_{22} : 2.4 (x 10 ⁻¹¹ C/N) d_{33} : 0.8 (x 10 ⁻¹¹ C/N)
Transmission range	400 - 4500nm
Electro-optical coefficients	r_{33} =30.4pm/V
Refractive index at 632.8nm	n_o =2.176, n_e =2.180

Typical Specifications

Type Specifications	Boule		Wafer	
	Diameter	φ3"	φ4"	φ3"
Length or Thickness	≤100mm	≤50mm	0.35-0.5 mm	
Orientation	127.86°Y, 64°Y, 135°Y, X, Y, Z, and other cut			
Ref. Flat Orientation	X, Y			
Ref. Flat Length	22±2mm	32±2mm	22±2mm	32±2mm
Front Side Polishing			Mirror polished 5-15 Å	
Back Side Lapping			0.3-1.0 μm	
Flatness (μm)			≤ 15	
Bow (μm)			≤ 25	