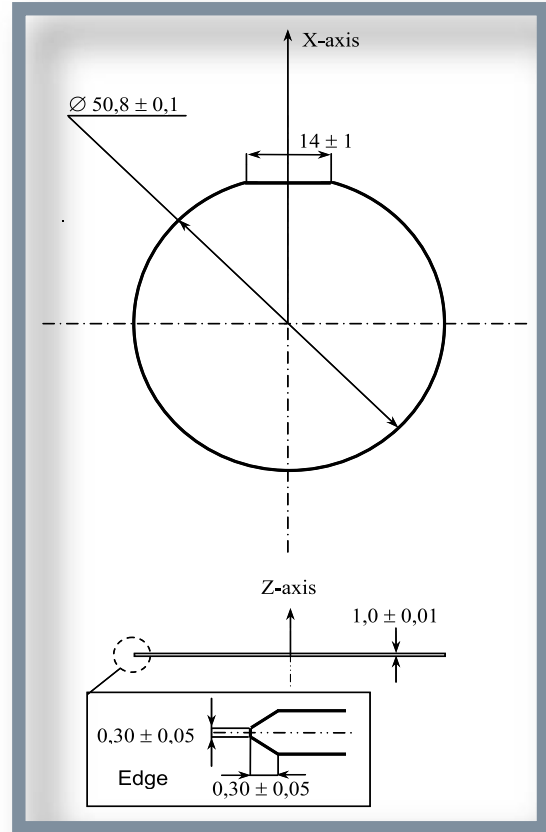
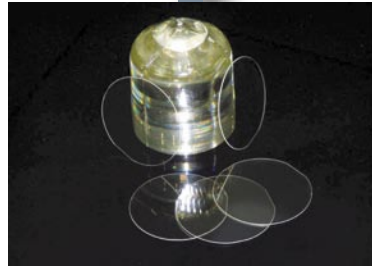


# Lithium Niobate

High quality nonlinear optical substrate



## Wafer parameters

Orientation	
Wafer surface is normal to the Z-axis within $\pm 10'$ .	
Flat is normal to the X-axis within $\pm 10'$ (Secondary flat if any for using)	
Size	
Diameter	50,8 mm $\pm$ 0,1 mm
Thickness	1000 $\mu$ m $\pm$ 10 $\mu$ m
Reference Flat	14 $\pm$ 1 mm
Bow	Equal to or less then 20 $\mu$ m
Edge	Is rounded
Surfaces	
Surfaces finish	Mirror polished. Free of visible cracks and scratches

## Material quality

Crystal Structure	Hexagonal (a=5,148 Å, c=13,863 Å)
Space Group	R3c
Density	4,64 g/cm <sup>3</sup>
Composition	Congruent $\pm$ 0,05 mol-% Li <sub>2</sub> O
Growth Method	CZ
Melting Point	1252 °C
Curie Temperature	$\sim$ 1142 °C
Hardness	5 Mohs
Thermal expansion (x10 <sup>-6</sup> / °C)	$\alpha_{11}$ : 15.4 $\alpha_{33}$ : 7.5
Index of Refraction	$\eta_o=2.286$ $\eta_e=2.203$ at 632.8 nm
Transmission wavelength	0.4 ~ 2.90 $\mu$
Nonlinear coefficient. Electro-optical coefficient	$d_{33}=34.45$ , $d_{31}=d_{15}=5.95$ , $d_{22}=13.07$ (pmV <sup>-1</sup> ) $\gamma_{13}=8.6$ , $\gamma_{22}=3.4$ , $\gamma_{33}=30.8$ , $\gamma_{51}=28.0$ , $\gamma_{22}=6.00$ (pmV <sup>-1</sup> )
Transparency Range Transmissivity	370 ~ 5000 nm > 68 % @ 632.8 nm

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