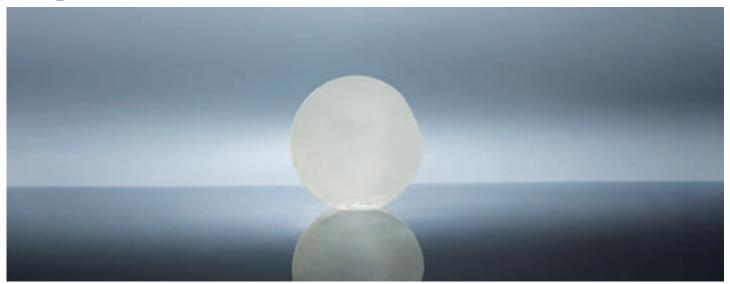# MgO:LiNbO₃

DESCRIPTION

MgO:LiNbO$_3$ crystals, also known as magnesium-doped lithium niobate crystals, are electro-optic crystals with excellent overall properties. MgO-doped LN (typical doping: 5%) was developed to reduce the optical folding effect of the intrinsic material and thus can be used for higher energy applications. MgO:LiNbO$_3$ has special advantages for NCPM SHG, hybrid SFG, and optical parametric oscillators of Nd:Laser and thus has applications in OPO, OPA, quasi-phase-matching multipliers, and integrated waveguides. MgO:LiNbO$_3$ crystals have unique advantages over LiNbO$_3$ crystals for NCPM multiplication, mixing, and optical parametric oscillation in Nd-doped lasers, where MgO:LiNbO$_3$ crystals can achieve multiplication efficiencies over 65% for pulsed Nd:YAG lasers and 45% for continuous Nd:YAG lasers. crystals are widely used in optical parametric oscillation (OPO), optical parametric amplification (OPA), quasi-phase matching, and integrated optical waveguides.

FEATURES

- High damage threshold
- Wide range of transparency
- Excellent EO and NLO performance
- Good mechanical and chemical properties
- Non-critical phase matching at room temperature

APPLICATIONS

- SHG
- Waveguide modulator
- Electro-optical modulator
- Rangefinder LIDAR cell phone
- For 1064nm laser room temperature doubling
- Q-switched:YAG lasers as Nd

CRYSTAL SPECIFICATION

Crystal Materials	MgO:LiNbO₃
Size	Customized
Dimensional Tolerance	±0.1mm
Length Tolerance	±0.2mm
Surface quality	20/10 S/D
Parallelism	<20 arc seconds
Flatness	<λ/10 @633nm
Perpendicularity	<5 arc minutes
Chamfering	0.2mm @45°
Directional Tolerance	<10 arc minutes
Wavefront distortion	<λ/4 @633nm

MgO:LiNbO₃

CRYSTAL CHARACTERISTICS

Melting point	1255±5℃
Curie Point	1140±5℃
Mohs Hardness	5
Density	$4.64 g/cm^3$
Absorption coefficient	~ 0.1%/cm@1064nm
Solubility	Insoluble in water
Relative dielectric constant	e^T_{11}/e_0:85 e^T_{33}/e_0:29.5
Thermal conductivity	38W/m/k@25℃
Transparency range	420-5000nm
Refractive index	n_e=2.146,n_o=2.220@1300nm n_e=2.156,n_o=2.322@1064nm n_e=2.203,n_o=2.286@632.8nm
Optical uniformity	$\sim 5 \times 10^{-5}$/cm
Sellmeier equation	$n_o^2(\lambda)=4.9048+0.11768/(\lambda^2-0.04750)-0.027169\lambda^2$ $n_e^2(\lambda)=4.5820+0.099169/(\lambda^2-0.04443)-0.021950\lambda^2$
Electro-optical coefficient	Y^T_{33}=32pm/V,Y^S_{33}=31pm/V Y^T_{31}=10pm/V,Y^S_{31}=8.6pm/V Y^T_{22}=6.8pm/V,Y^S_{22}=3.4pm/V
Half-wave voltage (DC)	3.03KV
Damage Threshold	$200MW/cm^2$(10ns)

SPECTRA