

Laser Crystals

NLO Crystals

Birefringent Crystals

AO and EO Crystals

Er:YAG
Introductions


Er: YAG is an excellent laser crystal which lasers at 2940 nm. This wavelength is the most readily absorbed into water and hydroxylapatite of all existing wavelengths and is considered a highly surface cutting laser. It has wide applications in medical applications, such as dental(hard tissues), orthopedics, etc.

Advantages of Er:YAG Crystals

- ◇ High slope efficiency
- ◇ Operate well at room temperature
- ◇ Operate in a relatively eye-safe wavelength range

Basic Properties
Material and Specifications

Items	Specifications
Dopant concentration	Er: ~50 at%
Wavefront Distortion	$\leq 0.125 \lambda$ /inch(@1064nm)
Extinction Ratio	≥ 25 dB
Rod Sizes	Diameter:3~6mm, Length:50~120 mm Upon request of customer
Dimensional Tolerances	Diameter:+0.000"/-0.002", Length: ± 0.02 "
Barrel Finish	Ground Finish: 400# Grit
Parallelism	≤ 10 "
Perpendicularity	$\leq 5'$
Flatness	$\lambda /10$
Surface Quality	Scratch and Dig 10-5
Chamfer	0.006" \pm 0.002" at 45° \pm 5°
AR Coating	R $\leq 0.25\%$ (@2940nm)

Optical and Spectral Properties of Er:YAG Crystals

Items	Specifications
Laser Transition	$4^1_{11/2}$ to $4^1_{13/2}$
Laser Wavelength	2940nm
Photon Energy	6.75×10^{-20} J(@2940nm)
Emission Cross Section	3×10^{-20} cm ²
Index of Refraction	1.79 @2940nm
Pump Bands	600~800 nm

Er:YAG

Crystal

ERYAG 01

Laser Crystals

NLO Crystals

Birefringent Crystals

AO and EO Crystals

Er:YAG

Basic Properties

Physical and Chemical Properties

Items	Specifications
Crystal Structure	Cubic
Lattice Parameters	12.01 Å
Melting Point	1970°C
Moh Hardness	8.5
Density	4.56±0.04g/cm ³
Specific Heat (0-20)	0.59J/g.cm ³
Modulus of Elasticity	310GPa
Young's Modulus	3.17×10 ⁴ Kg/mm ²
Poisson Ratio	0.3(est.)
Tensile Strength	0.13~0.26GPa
Thermal Expansion Coefficient	[100]Direction:8.2×10-6/° C(0~250° C)
	[110]Direction:7.7×10-6/° C(0~250° C)
	[111]Direction:7.8×10-6/° C(0~250° C)
Thermal Conductivity	14W/m/K(@20° C)
	10.5W/m/K(@100° C)
Thermal Optical Coefficient (dn/dT)	7.3×10-6/° C
Thermal Shock Resistance	790W/m
Solubility	Water: Insoluble; Common Acids: Slightly

Er:YAG

Crystal

ERYAG 01