

Er:YAG

Er:YAG is an excellent laser crystal with a wide pump band of 600 - 800 nm and lasing wavelength at 2940nm. It has numerous applications in a wide range of medical and dental applications.

Advantages of Er:YAG Crystals

- Wide pump band of 600 - 800 nm
- High slope efficiency
- High optical quality
- Operates in a long-wavelength, high water peak region
- Ideal for hard tissue removal

Basic Properties

Crystal Structure	Cubic
Lattice Parameters	12.01 Å
Mohs Hardness	8.5
Melting Point	1970°C
Density	4.56 g/cm ³
Specific Heat	0.59J/g.cm ³
Modulus of Elasticity	310GPa
Tensile Strength	0.13~0.26GPa
Thermal Conductivity	14 W/m/K at 20°C, 10.5 W/m/K at 100°C
Thermal Expansion Coefficient	8.2 x 10 ⁻⁶ °C ⁻¹ [100], 7.7 x 10 ⁻⁶ °C ⁻¹ [110], 7.8 x 10 ⁻⁶ °C ⁻¹ [111]
Thermal optical Coefficient (dn/dT)	7.3 x 10 ⁻⁶ °C ⁻¹
Thermal Shock Resistance	790W/m

Optical Properties

Er Dopant Concentration	50 at% (~ 7 x 10 ²⁴ cm ⁻³)
Laser Transition	⁴ I _{11/2} to ⁴ I _{13/2}
Laser Wavelength	2940nm
Photon Energy	6.75×10 ⁻²⁰ J at 2940nm
Emission Cross Section	3×10 ⁻²⁰ cm ²
Index of Refraction	1.79 @ 2940nm
Pump Bands	600~800 nm

Standard Specifications

Orientation	[111] within 5°
Wavefront Distortion	≤ 0.125λ/inch at 1064 nm
Extinction Ratio	≥28 dB
Rod Sizes	Diameter: 3~6mm, Length: 50~120mm
Dimensional Tolerances	Diameter: +0.00/-0.05mm, Length: +0.5/-0.2 mm
Flatness	λ/10 @633 nm
Parallelism	< 10 arc seconds
Perpendicularity	< 5 arc minutes
Surface Quality	10/5 Scratch/Dig per MIL-O-13830A
Barrel Finish	50 - 80 micro-inch (RMS)
Chamfer	0.006"±0.002" at 45° ± 5°
Clear Aperture	> Central 90%