Erbium: Yttrium Aluminum Garnet - Er:YAG

Er:YAG is a crystal with a wide pump band of 600 - 800 nm. It has numerous applications in a wide range of medical and dental applications.

Advantages Of Er:YAG Include:

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

Standard Specifications

Material Parameters

Host:	Yttrium Aluminum Garnet ($Y_3Al_5O_{12}$)
Dopant:	Erbium (Er^{3+})
Dopant Concentration:	50 Atomic % (~ 7×10^{21} cm^{-3})
Orientation:	[111] crystallographic directions (± 5°)
Wavefront Distortion:	1/2 wave per inch of length, as measured in a double pass interferometer operating @ 1 micron

Dimensional Tolerances

Diameter:	+0.000" / -0.002"
Length:	+0.040" / -0.000"
Barrel Finish:	55 ± 5 micro-inch
Chamfer:	0.005" ± 0.003" at 45° ± 5°

End Configuration

Flatness:	within λ / 10 wave at 633 nm wavelength
Parallelism:	within 30 seconds of arc
Perpendicularity:	within 5 minutes of arc
Surface Quality:	scratch-dig 10 - 5 per MIL-O-13830A

Anti-Reflection End Coatings

Reflectivity:	less than 0.25% at 2.94 microns
Adhesion and Durability:	meets MIL-C-48497A standards
Pulsed Damage Threshold:	greater than 10 J / cm^2

Laser Properties of Er:YAG

Lasing Transition:	$^4I_{11/2}$ to $^4I_{13/2}$
Stimulated Emission Cross-Section:	3×10^{-20} cm^2
Pump Bands:	600 - 800 nm

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