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Ho:Cr:Tm:YAG - Holmium, Chromium, Thulium Co-doped Yttrium Aluminum Garnet

Introduction

Holmium, Chromium, Thulium Co-doped Yttrium Aluminum Garnet (Ho:Cr:Tm:YAG) is a high efficient laser material which lases at 2.1 μm. It has wide applications in surgery, dentistry, atmospheric testing, etc.

CASTECH's laser crystal Ho:Cr:Tm:YAG is featured by

- High slope efficiency
- Pumped by flash lamp or diode
- Operates well at room temperature
- Operates in a relatively eye-safe wavelength range

Table 1. Basic Properties

Laser Transition	$^5I_7 \rightarrow {}^5I_8$
Laser Wavelength	2.097 μm
Photon Energy	9.55×10^{-20} J
Emission Cross Section	7×10^{-21} cm^2
Fluorescence Lifetime	8.5 ms
Refractive Index	1.80 @2.08 μm
Absorption Linewidth	4 nm
Diode Pump Band	781 nm
Major Pump Bands	400~800 nm

Table 2. Specifications

Dopant Concentration	Ho:~0.35 at.%, Tm:~5.8 at.%, Cr:~1.5 at.%
Rod Sizes	Diameter: 3~6 mm, Length: 50~120 mm; Upon request of customer
Dimensional Tolerances	Diameter: ±0.1mm Length: ±0.5 mm
Surface Quality (Scratch/Dig)	10/5 to MIL-PRF-13830B
Wavefront Distortion	λ/4 @633 nm
Flatness	λ/8 @633 nm
Parallelism	≦30 arc sec
Perpendicularity	≦15 arc min
Chamfer	≦0.2 mm×45°
AR Coating	≦0.2% @2094 nm