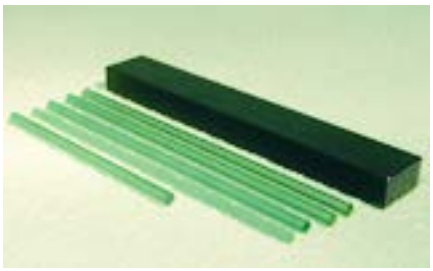
New Source Technology, LLC 6678 Owens Drive, Suite 105, Pleasanton, CA 94588 USA
Contact Us: Ph (+1) 925(462)-6888 Fx (+1) 925(462)-8388
www.newsourcetechnology.com sales@newsourcetechnology.com

CTH:YAG Rods (2080 nm)



- High-efficiency 2 µm source
- Operate well at room temperature [1]
- Flashlamp or diode pumped
- Laser diode sources can pump the strong 780 nm Tm3+ ion absorption line
- Chromium doping not necessary for diode-pumped applications
- Pump line width of 4 nm; 4 times wider than the corresponding Nd:YAG diode-pump line width
- Operate in a relatively eye-safe wavelength range

- Rod Lengths: 3 mm – 152.4 mm
- Rod Diameters: 2 mm – 12.7 mm

Standard Specifications

Material Parameters	
Host:	Yttrium Aluminum Garnet ($Y_3Al_5O_{12}$)
Standard Melt Concentration:	Chromium (Cr^{3+}): 0.85 at % Thulium (Tm^{3+}): 5.90 at % Holmium (Ho^{3+}): 0.36 at % (Other Compositions Available)
Orientation:	[111] crystallographic directions ± 5°
Wavefront Distortion:	less than 1/2 wave per inch of length @ 1064 nm
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:	less than 5 minutes of arc
Surface Quality:	scratch-dig 10 - 5 per MIL-O-13830A
Anti-Reflection End Coatings	
Reflectivity:	less than 0.25% at 2080 nm
Adhesion and Durability:	meets MIL-C-48497A standards
Pulsed Damage Threshold:	greater than 10 J / cm^2
Major Pump Bands:	400 - 800 nm

References
1. G. Huber, E. W. Duczynski and K. Petermann,"Laser Pumping of Ho-,Tm-,Er-Doped Garnet Lasers at Room Temperature," J. Quantum Electronics, 24, (1988), 920.
2. T.Y. Fan, G. Huber, R.L. Byer and P. Mitzscherlich, "Spectroscopy and Diode Laser-Pumped Operation of Tm,Ho:YAG," J. Quantum Electronics, 24 (1988), 924.

Properties Cr, Tm, Ho:YAG	
Lasing Properties	
Lasing Transition:	$^5I_7$ - $^5I_8$
Lasing Wavelength	2080 nm
Fluorescence Lifetime	8.5 ms
Stimulated Emission Cross-Section:	7×10^{-21} cm^2
Spectral Properties	
Index of Refraction:	1.80 (at 2080 nm)
Diode Pump Band:	781 nm
Absorption Linewidth:	4 nm
Major Pump Bands:	400 - 800 nm

CTH:YAG Absorption Coefficient

0.25nm SBW, corrected for Fresnel loss