

Terbium Gallium Garnet(TGG)

The magneto-optical crystal TGG is an optimum material for Faraday devices (Rotator and Isolator) in the range from 400nm-1100nm, excluding 470-500nm. The Faraday rotator consists of a TGG rod contained inside a special designed magnet. The



rotation sense of the polarization of a light beam passing through the rotator only depends on the direction of the magnetic field and not on the direction of propagation of the light beam. The optical isolator is a Faraday rotator set between two suitably aligned polarizers which allows a light beam to pass through in one direction only. TGG has a combination of excellent properties such as large Verdet constant, low light loss, high thermal conductance and high light damage threshold which makes it a unique material for Faraday devices particularly suitable for YAG lasers and Ti: sapphire tunable lasers, ring lasers and seed injected lasers.

Lasertec crystal Parameters:

Chemical Formula	Tb 3 Ga 5 O 12
Lattice Parameter	a=12.355Å
Growth Method	Czocralski
Density	7.13g/cm 3
Mohs Hardness	8.0

Melting Point	1725 °C
Refractive Index	1.954 at 1064nm
Thermal Conductivity	$9.4 \times 10^{-6} \text{ W/m}\cdot\text{K}$
Verdet Constant	0.12min/Oe.cm at 1064nm

Standard TGG rod specification:

Crystal rod parameters:	
Orientation	[111] within 5 degrees
Wave front Distortion	< 1 /8 wave
Extinction Ratio	> 30dB
Dimensional Tolerances:	
Diameter	+0.00mm/-0.05mm
Length	+0.2mm/-0.2mm
Chamfer	0.13mm (+0.00mm, -0.08mm) at 45° +/- 5°
End Configuration:	
Flatness	< 1 /10 wave at 633nm
Parallelism	< 1 minutes of arc
Perpendicularity	< 30'
Scratch-dig	10/5 per MIL-013830A