

Terbium Gallium Garnet (TGG) is the right crystal material for Farady devices (Rotator and Isolator). The Farady rotator is made up of a TGG rod contained in a special designed magnet. The polarization of a light beam passing through the rotator makes rotation. The direction of rotation is only dependent on the direction of the magnetic field and not on the direction of propagation of the light beam. The optical isolator consists of a 45 degree rotator set between two suitably arrayed polarizers which allow a light beam to pass through in one direction only. With a combination of excellent properties, such as large verdet constant, low light loss, high thermal conductance and high light damage threshold, TGG is the unique material for Farady devices. It is widely used for YAG lasers and Ti:sapphire tunable lasers, ring lasers, etc.

Specification	
Crystal	Terbium Gallium Garnet (Tb ₃ Ga ₅ O ₁₂)
Orientation	[111] within 5 degrees
Wavefront Distortion (per inch of rod length)	$\lambda/8$
Extinction Ratio	30 dB over 2/3 clear aperture
Diameter	+0.000" / -0.002"
Length	+0.010 / -0.010"
Chamfer	0.005" \pm 0.003" at 45° \pm 5°
Flatness	$\lambda / 10$ wave at 633 nm wavelength
Parallelism	< 1 minutes of arc
Perpendicularity	< 10 minutes of arc
Surface Quality	10 - 5 scratch-dig per MIL-0-13830A
Reflectivity	< 0.25% at 1064 nm
Thermal Conductivity	7.4 W cm ⁻¹ K ⁻¹
Refractive Index	1.95@ 1064nm