

KTF – Potassium Terbium Fluoride

KTF ($\text{KTb}_3\text{F}_{10}$) provides lower absorption and lower thermo-optic coefficients than TGG, making it the crystal of choice for high-power Faraday rotators and optical isolators.

Comparison of Properties ⁽¹⁾

Composition	TGG $\text{Tb}_3\text{Ga}_5\text{O}_{12}$	KTF $\text{KTb}_3\text{F}_{10}$
Crystal structure	cubic	cubic
Transparency range (rad / T m)	400-1500nm	400-1500nm
Verdet constant, 1064nm (rad / T • m)	39	36
Refractive index at 1064nm	1.944	~1.5 (in process)
Density (g/cc)	7.2	5.86
Absorption at 1064nm	~0.16 % / cm	~0.02 % / cm
Thermo-optic coefficient (dn / dT)	$17.9 \times 10^{-6} \text{ K}^{-1}$	$\sim 1 \times 10^{-6} / \text{K}$
Nonlinear refractive index	$\sim 2 \times 10^{-19} \text{ m}^2 / \text{W}$	$\sim 1 \times 10^{-20} \text{ m}^2 / \text{W}$
Thermal conductivity (W / m • K) ⁽²⁾	7.4	1.67
Thermal expansion $\times 10^{-6} \text{ }^\circ\text{C}^{-1}$ ⁽³⁾	7.3	13.7

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KTF-- General Specifications

Crystal axis orientation:	<100> standard <111> available
Diameter Tolerance:	+0.000" / -0.002"
Chamfer:	0.005" ± 0.003" @ 45°
Barrel Finish:	55 μinches
Perpendicularity:	within 10 arc minutes
Parallelism:	60 arc-seconds or less
Rod End Face Flatness:	within λ/10 wave at 633 nm wavelength
Surface Quality:	10-5
Wave Front Distortion:	less than 1/4 wave per inch of length (measured at 633nm)
Standard Coating:	Anti-Reflection with R < 0.25%

¹ KT Stevens, W Schlichting, G Foundos, A Payne, E Rogers, Laser Technik Journal, 18-21, (3/2016)

² KTF measurement contracted by SYNOPTICS

³ KTF measurement contracted by SYNOPTICS

Specifications and information are subject to change without prior notice.
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