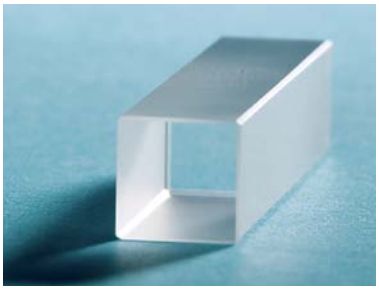
Nd:KGW — Nd-DOPED POTASSIUM GADOLINIUM TUNGSTATE



The efficiency of Nd:KGW lasers is 3–5 times higher than the one of Nd:YAG lasers. Nd:KGW laser medium is one of the best choices ensuring effective laser generation at low pump energies (0.5 – 1 J). These crystals supplied by EKSMA OPTICS feature high optical quality and great value of bulk resistans for laser radiation.

Nd:KGW crystals are low lasing threshold, highly efficient laser material exceptionally suitable for laser rangefinding applications.

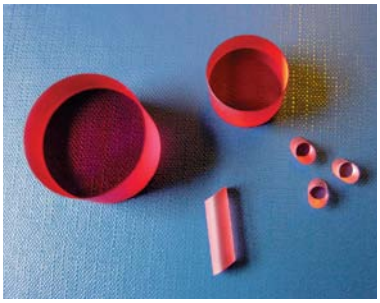
STANDARD SPECIFICATIONS

Orientation	[010] ±30 min
Dopant concentration	2-10 at %
Diameter tolerance	+0.0/-0.1 mm
Length tolerance	+1.0/-0.0 mm
Chamfer	45(±10) deg × 0.2(±0.1) mm
Flatness	λ/10 @ 633 nm
Parallelism	better than 30 arcsec
Perpendicularity	better than 15 arcmin
Surface Quality	10-5 scratch & dig (MIL-PRF-13830B)
Absorption losses	< 0.005 cm^{-1}

PHYSICAL AND LASER PROPERTIES

Chemical formula	$KGd(WO_4)$:Nd
Lattice constants	a = 8.095 Å, b = 10 Å, c = 7.588 Å
Optical orientation	n_g = b, n_pc = 20 deg
Angle between optical axis	86.5 angular grad
Density	7.27 g/cm^3
Mohs hardness	5
Thermal conductivity	2.8 W/(m×grad) [100] 2.2 W/(m×grad) [010] 3.5 W/(m×grad) [001]
Thermal expansion	$4×10^{-6}$ $grad^{-1}$ [100] $3.6×10^{-6}$ $grad^{-1}$ [010] $8.5×10^{-6}$ $grad^{-1}$ [001]
Phase transition	1005 °C
Melting point	1075 °C
Transmission range	0.35–5.5 µm
Refractive index	n_g = 2.033 @ 1.067 µm n_p = 1.937 @ 1.067 µm n_m = 1.986 @ 1.067 µm
Transition	$^4F_{3/2} \rightarrow {}^4I_{11/2}$
Laser wavelength	1.0672 µm
Fluorescence lifetime	120 µs
Fluorescent width	24 cm^{-1}
Emission cross-section	$4.3×10^{-19}$ cm^{-2}
Emission temperature drift	$8.5×10^{-4}$ nm, K^{-1}

Ti:Sapphire — TITANIUM DOPED SAPPHIRE



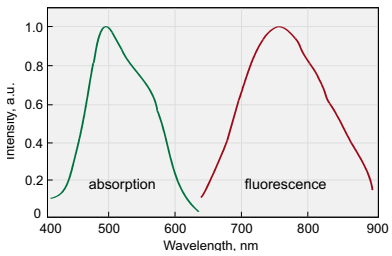
Al_2O_3:Ti^{3+} – titanium-doped sapphire crystals combine outstanding physical and optical properties with broadest lasing range.

Al_2O_3:Ti^{3+} indefinitely long stability and useful lifetime added to the lasing over entire band of 660 – 1050 nm challenge "dirty" dyes in variety of applications. Medical laser systems, lidars, laser spectroscopy, direct femtosecond pulse generation by Kerr-type mode-locking – there are few of existing and potential applications.

Ti_2O_3 wt %	**a,** cm^{-1} @ 490 nm	**a,** cm^{-1} @ 514 nm	**a,** cm^{-1} @ 532 nm
0.03	0.7*	0.6	0.5
0.05	1.1	0.9	0.8
0.07	1.5	1.3	1.2
0.10	2.2	1.9	1.7
0.12	2.6	2.2	2.0
0.15	3.3	2.8	2.5
0.20	4.3	3.7	3.4
0.25	5.4	4.6	4.1

** Presented values are given with ±0.05 cm^{-1} accuracy.*

The absorption band of Ti:Sapphire centered at 490 nm makes it suitable for variety of laser pump sources – argon ion, frequency doubled Nd:YAG and YLF, copper vapour lasers. Because of 3.2 µs fluorescence lifetime Ti:Sapphire crystals can be effectively pumped by short pulse flashlamps in powerful laser systems.



STANDARD SPECIFICATIONS

Orientation	optical axis C normal to rod axis
Ti_2O_3 concentration	0.03–0.25 wt %
Figure Of Merit	>150 (>300 available on special requests)
Size	up to 20 mm dia and up to 130 mm length
End configurations	flat/flat or Brewster/Brewster ends
Flatness	λ/10 @ 633 nm
Parallelism	10 arcsec
Surface Quality	10-5 scratch & dig (MIL-PRF-13830B)
Wavefront distortion	λ/4 inch

PHYSICAL AND LASER PROPERTIES

Chemical formula	Ti^{3+}:Al_2O_3
Crystal structure	Hexagonal
Lattice constants	a=4.748, c=12.957
Density	3.98 g/cm^3
Mohs hardness	9
Thermal conductivity	0.11 cal/(°C×sec×cm)
Specific heat	0.10 cal/g
Melting point	2050 °C
Laser action	4-Level Vibronic
Fluorescence lifetime	3.2 µsec (T=300K)
Tuning range	660–1050 nm
Absorbtion range	400–600 nm
Emission peak	795 nm
Absorption peak	488 nm
Refractive index	1.76 @ 800 nm