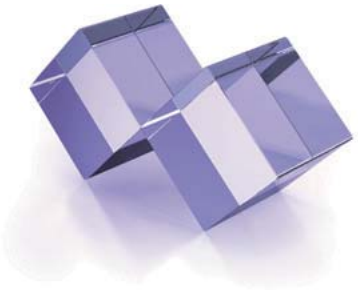
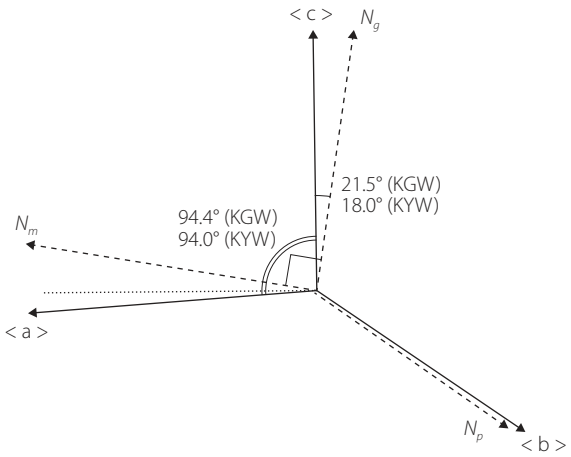
Yb:KGW and Yb:KYW Crystals





Standard specifications

Material	Yb:KGW/Yb:KYW
Orientation: N_g or b-cut	N_m axis is parallel to input/output faces
	Other orientations available
Doping concentration	0.5-5.0 atm.% for Yb:KGW
	0.5-100 atm.% for Yb:KYW
Dimensions tolerance	+0/-0.1 mm
Length tolerance	±0.1 mm
Surface quality	10-5 S-D
Surface flatness	<λ/10 @ 632.8 nm
Parallelism error	<10 arcsec
Perpendicularity	<10 arcmin
Protective chamfers	<0.1 mm x 45°

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Description

Yb^{3+} doped $KY(WO_4)_2$ (KYW) and $KGd(WO_4)_2$ (KGW) single crystals are well known laser crystals for diode and laser pumped solid-state laser applications.

Yb:KGW and Yb:KYW crystals are used as a lasing materials to generate ultrashort high power pulses. Yb:KGW can be used as ultrashort pulses amplifiers and these crystals are one of the best materials for high power thin disk lasers.

The broad spectral emission band of Yb:KYW allows the tuning of the laser radiation over 1020-1060 nm range and the generation of femtosecond pulses shorter than 70 fs, enhanced storage capacity, wide absorption spectrum at 980 nm and high absorption of pump radiation in a small crystal region allows an efficient use of diode laser pump.

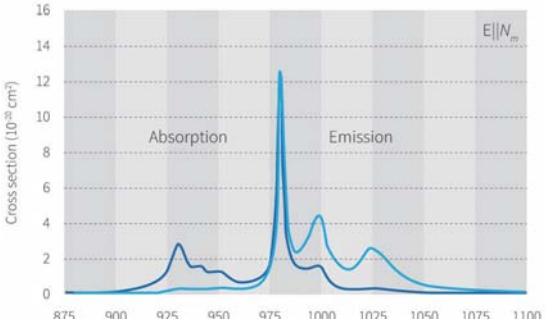
As compared to YAG or glasses used as hosts for Yb^{3+}, KYW and KGdW have the advantage of a larger absorption cross section than YAG, which decreases minimum pump intensity necessary to achieve transparency in the quasi-two-level system of ytterbium.

Features

- High absorption coefficient @ 980 nm
- High stimulated emission cross section
- Low lasing threshold
- Extremely low quantum defect
- Broad output at 1020-1060 nm
- High slope efficiency with diode pumping (>55%)
- High Yb-doping concentration

Miscellaneous

- Custom design production is available
- Different doping levels available
- Various end cuts available (plano/plano, wedge/wedge, brewster cut, etc.)
- Various dielectric coatings are available.



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Ti:Sapphire Crystals

Description

Titanium doped sapphire (Al_2O_3:Ti^{3+}) is widely used for generating ultra short femtosecond pulses and wavelength tunable lasers. It has remarkably high gain. Ti:Sapphire crystals can be effectively pumped by short pulse flash lamps in powerful laser systems.

Also these crystals combine supreme physical and optical properties with the broadest lasing range. Its indefinitely long stability and useful lifetime are an additional advantage. Medical laser systems, LIDARs, laser spectroscopy, direct femtosecond pulse generation by Kerr-type mode-locking - these are a few of the existing and potential applications.

Features

- Broad lasing range: 660-1050 nm band
- Perfect for ultrashort pulse generation
- Ti_2O_3 concentration 0.03-0.25 wt.%
- Figure of merit (FOM) up to 300 available
- Sizes up 50x50x30 mm or larger are available upon request

Standard specifications

Orientation	Optical axis C normal to rod axis
Absorption @ 532 nm on crystal length	>90%
Dimensions tolerance	+0/-0.1 mm
Length tolerance	±0.1 mm
Surface quality	10-5 S-D
Surface flatness	<λ/10 @ 632.8 nm
Transmitted wavefront distortion (TWD)	<λ/4 @ 632.8 nm
Parallelism error	<30 arcsec
Protective chamfers	<0.1 mm x 45°

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Nd:YAG Crystals

Description

The Nd:YAG crystal is the most widely used solid-state laser material today. Good fluorescence lifetime, thermal conductivity and robust nature make Nd:YAG crystals suitable for high power continuous wave, high intensity Q-switched and single mode operation.

Now, we are able to supply consistently Nd:YAG rods with high optical homogeneity, high damage threshold, consistent performance and high processing accuracy.

Features

- Wide absorption bandwidth
- Low lasing threshold
- High slope efficiency
- Large luminescence cross-section
- Linearly polarized emission and single-mode output

Standard specifications

Orientation	[111]
Doping concentration	0.5-1.1 atm.%
Extinction ratio	>28 dB
Dimensions tolerance	+0/-0.1 mm
Length tolerance	±0.1 mm
Surface quality	10-5 S-D
Surface flatness	<λ/10 @ 632.8 nm
Parallelism error	<10 arcsec
Perpendicularity	<10 arcmin
Protective chamfers	<0.1 mm x 45°

Miscellaneous

- Custom design production is available
- Different doping levels available
- Rods with barrel grooving are available for better performance
- Mass production at 2000 pcs/month available
- Various end cuts available (plano/plano, wedge/wedge, brewster cut, etc.)
- Various dielectric coatings are available. Complex coatings are realized with IBS technique

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Yb:YAG Crystals

Description

Ytterbium doped Yttrium Aluminum Garnet (Yb:YAG) crystal is one of the most promising laser-active materials.

It is more suitable for diode-pumping than the traditional Nd-doped systems. It can be pumped at 0.94 μm laser output. Compared with the commonly used Nd:YAG crystal, Yb:YAG crystal has a much larger absorption bandwidth to reduce thermal management requirements for diode lasers, a longer upper-state lifetime, three to four times lower thermal loading per unit pump power. Yb:YAG crystal is expected to replace Nd:YAG crystal for high power diode-pumped lasers and other potential applications.

Features

- Ideal for diode pumping
- Very low fractional heating, less than <11%
- Very high slope efficiency, more than 56%
- Broad absorption band, about 18 nm @ 940 nm
- High thermal conductivity and strength

Standard specifications

Orientation	[111]
Doping concentration	0.2-25 atm.%
Extinction ratio	>28 dB
Dimensions tolerance	+0/-0.1 mm
Length tolerance	±0.1 mm
Surface quality	10-5 S-D
Surface flatness	<λ/10 @ 632.8 nm
Parallelism error	<10 arcsec
Perpendicularity	<10 arcmin
Protective chamfers	<0.1 mm x 45°

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Co:Spinel (Co^{2+}:$MgAl_2O_4$) Crystals

Standard specifications

Absorption cross section	3.5×10^{-19} cm^2 @ 1540 nm
Dimensions tolerance	+0/-0.1mm
Surface quality	10-5 S-D
Surface flatness	<λ/10 @ 632.8 nm
Parallelism error	<10 arcsec
Perpendicularity	<10 arcmin
Protective chamfers	<0.1 mm x 45°
AR coatings reflectivity	<0.2% @ 1540 nm

Description

Co^{2+}:$MgAl_2O_4$ (or Co:Spinel) is a relatively new material for saturable absorber passive Q-switching in lasers emitting from 1.2 to 1.6 μm, in particular, for eye-safe 1.54 μm Er:glass laser.

High absorption cross section of 3.5 x 10-19 cm^2 permits Q-switching of Er:glass laser without intracavity focusing both with flash lamp and diode-laser pumping. Negligible excited-state absorption results in high contrast of Q-switch, i.e. the ratio of initial (small signal) to saturated absorption is higher than 10. Finally, excellent optical, mechanical, and thermal properties of the crystal give an opportunity to design compact and reliable laser sources with this passive Q-switch.

Miscellaneous

- Custom design production is also available
- Different doping levels available
- Various dielectric coatings are available
- Complex coatings are realized with IBS technique

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