



Electro-Optics Technology GmbH

# Innovative High Quality Laser Solutions

## Yb:CALGO

Ytterbium-doped Calcium Aluminum  
Gadolinium Oxide



Electro-Optics Technology GmbH has been growing Yb:CALGO for over 10 years. During this time, material properties and qualities have improved to make it one of the best solutions on the market. You will find our material to have lower absorption and higher transmission than are commonly found on the market. We specialize in controlling the dopant level to optimize your pumping requirements. High quality Yb:CALGO is a highly effective laser medium for high power ultrafast lasers. It is widely used in laser processing applications.

With over 20 years of polishing and fabrication experience, Electro-Optics Technology GmbH has become a world leader in providing 2D and 3D crystal designs. We also offer low absorbing, high damage threshold optical coatings.

Speak to one of our crystal experts to learn more about Electro-Optics Technology's product offerings.

### FEATURES

- Shorter laser pulses due to broad emission spectrum
- Excellent thermal properties
- High gain
- Large tuning range

### OPTIONS

- Slabs, disks, and rods available
- a- and c-cut parts available
- Custom coatings available

### APPLICATIONS

- Ultrafast Picosecond Lasers
- Amplifiers
- Industrial Micromachining
- Medical



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## MATERIAL PARAMETERS

Host Crystal	CaGdAlO <sub>4</sub>
Structure	Tetragonal, I4/mmm
Lattice Parameters	a = 3.66 Å c = 12.01 Å
Thermal Expansion Coefficient	$\alpha_a = 10.1 \cdot 10^{-6} \text{ K}^{-1}$ $\alpha_c = 16.2 \cdot 10^{-6} \text{ K}^{-1}$
Thermal Conductivity (2% Yb)	$W_a = 6.9 \text{ Wm}^{-1} \text{ K}^{-1}$ $W_c = 6.3 \text{ Wm}^{-1} \text{ K}^{-1}$
Melting Point	Approximately 1750 °C
Density	5.94 g/cm <sup>3</sup>
Refractive Indices at 1043 nm	$n_a = 1.916$ $n_c = 1.94$

## LASER PARAMETERS

Dopant Concentrations for Yb	Up to 10%; 1% corresponds to $1.25 \times 10^{20} / \text{cm}^3$
Absorption Cross Section at 979 nm	$4.42 \cdot 10^{-20} \text{ cm}^2$ (for polarization along c-axis) $1.65 \cdot 10^{-20} \text{ cm}^2$ (for polarization along a-axis)
Absorption Bandwidth	4 nm
Fluorescence Lifetime	0.44 ms (for <5 at% Yb)
Emission Cross Section (990 nm to 1040 nm)	$0.8 \cdot 10^{-20} \text{ cm}^2$ (for polarization along a-axis)
Emission Bandwidth	60 nm

## SPECIFICATIONS

Aperture	On request (up to 20 mm <sup>2</sup> )
Length	0.1 mm to 40 mm
AR Coatings	Available upon request

### References

J. Petit, PhD Thesis, Université Pierre et Marie Curie - Paris VI (2006).  
 Y. Zaouter et al., Opt. Lett. 31 (2006) 119  
 J. Boudeille et al., Opt. Lett. 32 (2007) 1962  
 D.N. Papadopoulos et al., Opt. Lett. 34 (2009) 196  
 P.O. Petit, PhD Thesis, Université Pierre et Marie Curie - Paris VI (2010)  
 S. Boudeille, PhD Thesis, Université Paris - Sud (2010)  
 A. Jaffres, PhD Thesis, Université Pierre et Marie Curie - Paris VI (2013)