

Nd:YAG crystals

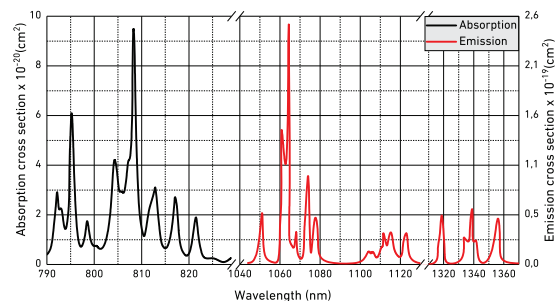
Main features

- Isotropic crystal (cubic symmetry)
- High thermal conductivity
- High optical quality and large diameter boules grown by Czochralski growth method
- Low lasing threshold and wide absorption band at near 808 nm that coincides with the emission of AlGaAs laser diodes
- Custom crystals available upon request

Application examples

- CW and pulsed operation at 1064 nm, 532 nm, 355 nm, 266 nm
- Material processing, welding, cutting
- Laser systems for medical applications

Nd:YAG crystal is the most widely used solid-state laser material. These crystals are characterized by relatively small gain bandwidth, which allows achieving a high gain efficiency and a relatively low lasing threshold. Nd:YAG crystals feature excellent thermal and mechanical properties. Nd:YAG of high optical quality and large diameter can be grown.



Standard specifications

ND:YAG CRYSTALS	
Orientation	[111]
Extinction ratio	>28 dB
Clear aperture	>90%
Face dimensions tolerance	+0,0/-0,1 mm
Length tolerance	±0,1 mm
Parallelism error	<20 arcsec
Perpendicularity error	<10 arcmin
Protective chamfers	<0,1 mm at 45°
Surface quality	10-5 5-D
Surface flatness	<λ/8@632,8 nm
Wavefront distortion	λ/4@632,8 nm
Coatings	AR(R<0,15%)@1064 nm on both sides or HT(T>95%)@808 nm + HR(R>99,5%)@1064 nm/ AR(R<0,15%)@1064 nm
Laser induced damage threshold	>10 J/cm²@1064 nm, 10 ns
Mount	Unmounted

Properties

SPECTROSCOPIC AND THERMO-MECHANICAL PROPERTIES	
Absorption peak wavelength	808 nm
Absorption cross-section at peak	$6,7 \times 10^{-20} \text{ cm}^2$
Absorption bandwidth at peak wavelength	2,5 nm
Laser wavelength	1064 nm
Lifetime of $^4F_{3/2}$ neodymium energy level	250 μs
Emission cross-section @1064	$3 \times 10^{-19} \text{ cm}^2$
Refractive index @1064 nm	1,82
Crystal structure	cubic
Density	4,56 g/cm³
Mohs hardness	8,5
Thermal conductivity	~13 Wm⁻¹K⁻¹
dn/dT	$9,86 \times 10^{-6} \text{ K}^{-1}$
Thermal expansion coefficient	$6,96 \times 10^{-6} \text{ K}^{-1}$
Typical doping level	0,6 - 1,3 at. %

Standard products

FACE DIMENSIONS	LENGTH	END FACES	DOPING	COATINGS	SKU
ø3 mm	10 mm	Right-angle cut	0,8%	AR/AR@1064 nm	7106
	50 mm	Right-angle cut	0,8%	AR/AR@1064 nm	7071
	100 mm	Right-angle cut	0,8%	AR/AR@1064 nm	7072
ø5 mm	10 mm	Right-angle cut	0,8%	AR/AR@1064 nm	7076
	50 mm	Right-angle cut	0,8%	AR/AR@1064 nm	7077
	100 mm	Right-angle cut	0,8%	AR/AR@1064 nm	7078
ø3 mm	10 mm	Right-angle cut	1,1%	AR/AR@1064 nm	7073
	50 mm	Right-angle cut	1,1%	AR/AR@1064 nm	7074
	100 mm	Right-angle cut	1,1%	AR/AR@1064 nm	7075
ø5 mm	10 mm	Right-angle cut	1,1%	AR/AR@1064 nm	7079
	50 mm	Right-angle cut	1,1%	AR/AR@1064 nm	7080
	100 mm	Right-angle cut	1,1%	AR/AR@1064 nm	7081
3 x 3 mm	2 mm	Right-angle cut	1,1%	AR/AR@1064 nm	7082
	2 mm	Right-angle cut	1,1%	HT@808 nm + HR@1064 nm/AR@1064 nm	7085
	3 mm	Right-angle cut	1,1%	AR/AR@1064 nm	7083
	3 mm	Right-angle cut	1,1%	HT@808 nm + HR@1064 nm/AR@1064 nm	7086
	5 mm	Right-angle cut	1,1%	AR/AR@1064 nm	7084
	5 mm	Right-angle cut	1,1%	HT@808 nm + HR@1064 nm/AR@1064 nm	7087


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