CASTECH®

福晶科技

CRYSTAL CATALOG

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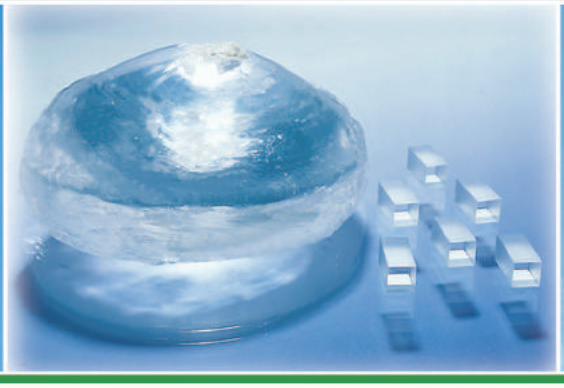

GWU-Lasertechnik

福建福晶科技股份有限公司

CASTECH INC.

Neodymium Doped Yttrium Aluminum Garnet (Nd:YAG) Crystal

Introduction

Nd:YAG is the earliest and most famous laser host crystal. Since it combines great advantages in many basic properties, Nd:YAG is the ubiquitous presence for near-infrared solid-state lasers and their frequency-doubler, tripler, and higher order multiplier.

Advantages Of Nd:YAG

- High gain
- Low threshold
- High efficiency
- Low loss at 1.06 μm
- Good thermal conductivity and thermal shock characteristics
- Mechanical strength
- High optical quality
- Material characteristics that allow for various modes of operation (CW, pulsed, Q-switched, mode locked)

Basic Properties

Crystal Structure:	Cubic
Lattice Constant:	12.01 Å
Melting Point:	1970°C
Density:	4.5g/cm^3
Reflective Index:	1.82
Thermal Expansion Coefficient:	7.8x10^{-6} /K <111>, 0-250 °C
Thermal Conductivity (W/m/K):	14, 20°C 10.5, 100°C
Mohs Hardness:	8.5
Stimulated Emission Cross Section:	2.8x10^{-19} cm^{-2}
Relaxation Time of Terminal Lasing Level:	30 ns
Radiative Lifetime:	550 μs
Spontaneous Fluorescence:	230 μs
Linewidth:	0.6 nm
Loss Coefficient:	0.003 cm^{-1} @1064nm

Specifications of Nd:YAG crystal from CASTECH

- Dimention: size up to dia.15x180mm and maximum diameter of dia.40mmx2mm
- Nd Dopant Level: 0.3~2.0(±0.1)atm%
- Diameter tolerance: ±0.05mm
- Length tolerance: ±0.5mm
- Perpendicularity: < 5 arc minutes
- Parallelism: <10 arc seconds
- Wavefront distortion: λ/8
- Flatness: λ/10
- Scratch/Dig: 10/5 @MIL-PRF-13830B
- Chamfer: 0.1mmx45°
- HR-Coating: R>99.8%@1064nm and R<5%@808nm
- AR-Coating (Single layer MgF2): R<0.25%@1064nm
- Other HR coatings, such as HR@1064/532 nm, HR@946 nm, HR@1319 nm and other wavelengths are also available.
- Damage Threshold: >500MW/cm^2

Optical Parameter of Nd:YAG crystal			
Diameter (mm)	Standard grade	Excellence grade	Superexcellence grade
φ3-6.35	≤0.5 fringes/inch	≤0.25 fringes/inch	≤0.1 fringes/inch
	≥25dB	≥28dB	≥30dB
φ7-10	≤0.7 fringes/inch	≤0.4 fringes/inch	≤0.16 fringes/inch
	≥22dB	≥25dB	≥28dB
φ11-13	≤1 fringes/inch	≤0.6 fringes/inch	≤0.2 fringes/inch
	≥20dB	≥23dB	≥26dB
φ14-16	≤1.2 fringes/inch	≤0.8 fringes/inch	≤0.25 fringes/inch
	≥18dB	≥20dB	≥23dB

Higher grade or specific Nd:YAG rods or slabs, and Nd:YAG rods for 946 nm and 1319 nm lasers can be provided. Er:YAG, Yb:YAG and other ion doped YAG crystals are also available upon request.

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