

Nd:YAG & Nd,Cr:YAG

Nd:YAG crystal rod is used in Laser marking machine and other laser equipment.

It is the only solid substances that can work continuously at room temperature, and is the most excellent performance laser crystal.

Also, the YAG (yttrium aluminium garnet) laser can be doped with chromium and neodymium in order to enhance the absorption characteristics of the laser. The Nd,Cr:YAG laser is a solid state laser. Chromium ion(Cr³⁺) has a broad absorption band; it absorbs the energy and transfers it to the neodymium ions(Nd³⁺) by way of dipole-dipole interactions. Wavelength of 1064nm is emitted by this laser.

The laser action of Nd:YAG laser was first demonstrated at the Bell Laboratories in the year of 1964. The Nd,Cr:YAG laser is pumped by a solar radiation. By doping with chromium, the energy absorption capacity of the laser is enhanced and ultra short pulses are emitted.



Basic Properties of Nd:YAG

Product name	Nd:YAG
Chemical Formula	Y ₃ Al ₅ O ₁₂
Crystal structure	Cubic
Lattice constant	12.01Å
Melting point	1970°C
orientation	[111] or [100], within 5°
Density	4.5g/cm ³
Reflective Index	1.82
Thermal Expansion Coefficient	7.8x10 ⁻⁶ /K
Thermal Conductivity (W/m/K)	14, 20°C / 10.5, 100°C
Mohs hardness	8.5
Radiative Lifetime	550 us
Spontaneous Fluorescence	230 us
Linewidth	0.6 nm
Loss Coefficient	0.003 cm ⁻¹ @ 1064nm

Basic Properties of Nd,Cr:YAG

Laser type	Solid
Pump source	Solar Radiation
Operating wavelength	1.064 μm
Chemical formula	Nd ³⁺ :Cr ³⁺ :Y ₃ Al ₅ O ₁₂
Crystal structure	Cubic
Melting point	1970°C
Hardness	8-8.5
Thermal conductivity	10-14 W/mK
Young's modulus	280 GPa



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Technical Parameters

Dimension	maximum diameter of dia.40mm
Nd Dopant Level	0~2.0atm%
Diameter Tolerance	±0.05mm
Length Tolerance	±0.5mm
Perpendicularity	<5'
Parallelism	<10"
Wavefront distortion	L/8
Flatness	λ/10
Surface quality	10/ 5 @ MIL-O-13830A
Coatings	HR-Coating: R>99.8%@1064nm and R<5% @808nm AR-Coating (Single layer MgF2) : R<0.25% per surface (@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

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