

Although Nd:YAG was invented in the Sixties last century, it has been and is still the most commonly used solid-state crystal material. Nd:YAG crystals are widely used in all types of solid-state lasers systems-frequency-doubled continuous wave, high-energy Q-switched, and so forth.

Its good fluorescent lifetime thermal conductivity and physical strengths makes it suitable for high power lamp pumped laser.



Physical and Optical Properties	
Chemical Formula	Nd:Y ₃ Al ₅ O ₁₂
Crystal Structure	Cubic
Lattice Constants	12.01?
Concentration	~ 1.2 x 10 ²⁰ cm ⁻³
Melting Point	1970 °C
Density	4.56 g/cm ³
Mohs Hardness	8.5
Refractive Index	1.82
Thermal Expansion Coefficient	7.8 x 10 ⁻⁶ /K [111], 0 - 250 °C
Thermal Conductivity	14 W/m /K @20 °C, 10.5 W /m /K @100 °C.
Lasing Wavelength	1064 nm
Stimulated Emission Cross Section	2.8x10 ⁻¹⁹ cm ⁻²
Relaxation Time of Terminal Lasing Level	30 ns
Radiative Lifetime	550 ms
Spontaneous Fluorescence	230 ms
Loss Coefficient	0.003 cm ⁻¹ @ 1064 nm
Effective Emission Cross Section	2.8 x 10 ⁻¹⁹ cm ²
Pump Wavelength	807.5 nm
Absorption band at pump wavelength	1 nm
Linewidth	0.6 nm
Polarized Emission	Unpolarized
Thermal Birefringence	High
Capabilities Include:	
Nd dopant concentration	0.5---1.2 atm% tolerance within 10% of concentration.
Diameter	3 ~ 14mm
Length	1 ~ 160mm
Typical Specification and Tolerance:	
Orientation	<111> crystalline direction (+/-0.5°C)
Wavefront Distortion	<λ/10 at 632.8nm for 3 ~7mm <λ/8 per inch at 632.8nm for >=7mm
Surface quality	better than 20/10 Scratch/Dig per MIL-O-1380A
Parallelism	< 10 arc seconds
Perpendicularity	< 5 arc minutes
Surface flatness	< λ/10 at 632.8nm
Clear aperture	Central 95%
Chamfer	0.15x45°
Damage threshold	over 15J/cm ² (rods without coating) over 700 MW/cm ² (coating)
Coatings	AR@1064nm,R < 0.1%; AR@1064nm,R < 0.1%; HT@808nm,T > 95%; HR@1064nm,R < 99.8%; HT@808nm,T > 95%; HR@1064nm,R < 99.8%; HT@808nm,T > 95%;HR@532nm,R > 99%;

Notes:

To inquiry or order a finished Nd:YAG laser rod, please specify the specification listed above, for common application, we only need to know the main specification: Nd-dopant concentration, size, and coating. For special request, please specify specification in details for evaluation and fabrication.