

Nd:YAG crystal is the most widely used solid-state laser material today. It has been used in the "micro/mini" "DPSS" (Diode Pumped Solid State) laser system to get high quality Red, Green or Blue laser output in which the blue laser of Nd:YAG crystal has higher efficiency and more easy to realizes than Nd:YVO₄ crystal blue laser. Nd:YAG crystal was also widely used in the military, scientific, medical and industrial laser systems, high performance scientific laser systems, laser therapy, cosmetology systems, laser marking, laser drilling and other laser material processing systems. Especially, Nd:YAG crystal is the best laser material for the high power, high energy, and Q-switched pulse laser systems. The very wide applications of Nd:YAG crystal in various laser system is because its outstanding performance in physics and mechanics.

Advantages of Nb:YAG Crystals

- High gain and efficiency ; Low threshold and loss
- Suitable for high-average power lasers
- Good thermal conductivity and thermal shock characteristics
- Large mechanical strength

Specification:

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| Nd Dopant Level: | 0.6-1.3atm% |
| Standard Dimension: | Dia3-14mm x 1-160mm length |
| Orientation: | <111> or <100> +/-5deg |
| Dimension Tolerance: | +/-0.1mm |
| Wavefront Distortion: | < λ/8 at 632.8nm |
| Surface Quality: | better than 20/10 Scratch/Dig |
| Parallelism: | < 10 arc seconds |
| Perpendicularity: | < 5 arc minutes |
| Surface Flatness: | < λ/10 at 632.8nm |
| Clear Aperture: | > Central 95% |
| Chamfer: | < 0.15mmx45deg |
| Coating: | a) AR@1064nm, R<0.2%;b) AR@1064nm, R<0.2%; HT@808nm, T>95% c) HR@1064nm, R>99.8%; HT@808nm, T>95% |



Properties:

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| Chemical Formula | Nd:Y ₃ Al ₅ O ₁₂ |
| Crystal Structure | Cubic |
| Lattice Constants | 12.01Å |
| 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 Nd=1.1 atm% | 550 μs |
| Spontaneous Fluorescence Nd=1.1 atm% | 230 μs |
| Loss Coefficient Nd=1.1 atm% | 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 |