

### Nd:YAG Nd- doped yttrium aluminum garnet

Nd:YAG Nd -doped yttrium aluminum garnet is the solid-state laser material with the best comprehensive performance. It has the characteristics of high gain, low laser threshold, good thermal conductivity and thermal shock, and is suitable for various working modes ( continuous , pulse , Q-switch, Mode-locked ), often used in near-far infrared solid-state lasers and double frequency, triple frequency applications, and widely used in scientific research, medical, industrial , military and other fields.

#### Main features:

High gain , low threshold , high efficiency , high optical quality , low loss , high mechanical strength , excellent thermal conductivity and thermal shock resistance are suitable for various laser working modes (continuous, pulsed, Q-switched, mode-locked, frequency multiplied, etc. ) high average power solid-state lasers .

#### Material properties:

Crystal structure	Cubic system
Lattice constant	12.01 Å
Melting point	1970°C
Moh's hardness	8.5
Density	4.56±0.04g/ cm <sup>3</sup>
Specific heat	0.59J/g.cm <sup>3</sup> @0-20°C
Elastic Modulus	310GPa
Young's modulus	3.17×10 <sup>4</sup> Kg/ mm <sup>2</sup>
Poisson's ratio	0.3
Tensile strength	0.13~0.26GPa
Coefficient of thermal expansion	[100] 8.2×10 <sup>-6</sup> /K @ 0~250°C;[110] 7.7×10 <sup>-6</sup> /K @0~250°C [111] 7.8×10 <sup>-6</sup> /K @0~250°C
Thermal conductivity	14W/m/K @20°C; 10.5W/m/ K@100°C
Thermo-optic coefficient (dn/dT)	7.3×10 <sup>-6</sup> /K
Thermal shock resistance	790W/m

#### Product parameters:

Doping concentration	Nd: 0.1~ 2.5at %
Orientation	[111] or [100], ±5°
Wavefront distortion	≤λ/10/inch@632.8nm _ _
Extinction Ratio	≥ 25dB _
Crystal rod size	Diameter: < 50 mm, Length: < 220 mm ; can be customized
Dimensional tolerance	Diameter: +0.00/-0.05mm, Length: ±0.5mm
Cylindrical processing	Grinding , polishing , threading, etc.
Parallelism of end faces	≤10"
Perpendicularity between end face	≤5'
Flatness of end face	λ/10 @632.8nm
Surface Quality	10-5 (MIL-O-13830A)
Chamfer	0.15±0.05mm
Coating	Anti-reflection coating: R<0.15% @1064nm, R<0.5% @808nm, R<0.15% @532nm, Partial reflection film: R=(10~90)%±2% @1064nm
Damage threshold	≥1GW/ cm <sup>2</sup> @1064nm, 10ns, 10Hz