

## Nd:YAG – NEODYMIUM DOPED YTTRIUM ALUMINIUM GARNET



Nd:YAG crystal is the most popular lasing media for solid-state lasers. EKSMA OPTICS offers standard specifications high optical quality Nd:YAG rods with high damage threshold AR @ 1064 nm coatings.

### Properties of 1.0% Nd:YAG at 25 °C

Formula	$Y_{2.97}Nd_{0.03}Al_5O_{12}$
Crystal structure	Cubic
Density	4.55 g/cm <sup>3</sup>
Melting point	1970 °C
Mohs hardness	8.5
Transition	$^4F_{3/2} \rightarrow ^4I_{11/2}$ @ 1064 nm
Fluorescence lifetime	230 μs for 1064 nm
Thermal conductivity	0.14 Wcm <sup>-1</sup> K <sup>-1</sup>
Specific heat	0.59 Jg <sup>-1</sup> K <sup>-1</sup>
Thermal expansion	$6.9 \times 10^{-6}$ °C <sup>-1</sup>
$\partial n / \partial t$	$7.3 \times 10^{-6}$ °C <sup>-1</sup>
Young's modulus	$3.17 \times 10^4$ Kg/mm <sup>2</sup>
Poisson ratio	0.25
Thermal shock resistance	790 Wm <sup>-1</sup>
Refractive index	1.818 @ 1064 nm

### Standard Rods Sizes

Diameter, mm	Length, mm	Doping, %	Wedge of the ends, deg	Catalogue number
3	53	0.9	0/0	E-Y-3-0.9-A/A
3	65	0.8	0/0	E-Y-3-0.8-A/A
3	65	1.1	0/0	E-Y-3-1.1-A/A
4	65	0.8	3/3 parallel	E-Y-4-0.8-A/A
4	65	1.1	3/3 parallel	E-Y-4-1.1-A/A
6.35	85*	1.1	3/3 parallel	E-Y-6.35-1.1-A/A
8	85*	1.1	3/3 parallel	E-Y-8-1.1-A/A
10	85*	1.1	3/3 parallel	E-Y-10-1.1-A/A
12	100*	0.8	3/3 parallel	E-Y-12-0.8-A/A
12	100*	1.1	3/3 parallel	E-Y-12-1.1-A/A

\* rods with barrel grooving, except 10 mm at both ends of the rod without grooving.

### Related Products

#### Laser Safety Eyewear

See page 1.17



#### Visualizator 990-0840

See page 1.17



### Specifications of Standard Nd:YAG Laser Rods

Nd Doping Level	0.8% or 1.1%
Orientation	<111> crystalline direction
Surface Quality	10 – 5 scratch & dig (MIL-PRF-13830B)
Surface Flatness	$\lambda/10$ at 633 nm
Parallelism	< 10 arcsec
Perpendicularity	< 5 arcmin for plano/plano ends
Diameter Tolerance	+0 / -0.05 mm
Length Tolerance	+1 / -0.5 mm
Clear Aperture	> 90 % of full aperture
Chamfers	0.1 mm at 45 deg
Coating	both sides coated AR @ 1064 nm, R < 0.2%, AOI = 0 deg
Barrel grooving	all dia 6.35, 8, 10, 12 mm rods with barrel grooving