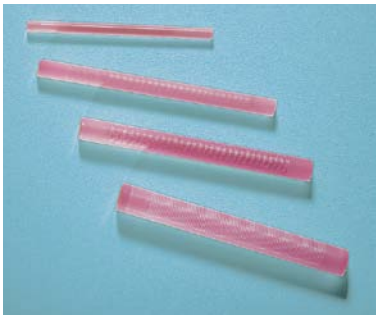
# Laser Crystals

## 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.

*Please contact EKSMA OPTICS for further information or non-standard specifications.*

### 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$^3$ |
| 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$^{-1}$K$^{-1}$ |
| Specific heat | 0.59 Jg$^{-1}$K$^{-1}$ |
| Thermal expansion | 6.9 × 10$^{-6}$ °C$^{-1}$ |
| ∂n/∂t | 7.3 × 10$^{-6}$ °C$^{-1}$ |
| Young's modulus | 3.17 × 10$^4$ Kg/mm$^{-2}$ |
| Poisson ratio | 0.25 |
| Thermal shock resistance | 790 Wm$^{-1}$ |
| Refractive index | 1.818 @ 1064 nm |

### STANDARD RODS SIZES

| Code | Diameter, mm | Length, mm | Doping, % | Wedge of the ends, deg | Price, EUR |
|---|---|---|---|---|---|
| E-Y-3-0.8-A/A | 3 | 65 | 0.8 | 0/0 | 265 |
| E-Y-3-1.1-A/A | 3 | 65 | 1.1 | 0/0 | 325 |
| E-Y-4-0.8-A/A | 4 | 65 | 0.8 | 3/3 parallel | 410 |
| E-Y-4-1.1-A/A | 4 | 65 | 1.1 | 3/3 parallel | 410 |
| E-Y-6.35-1.1-A/A | 6.35 | 85* | 1.1 | 3/3 parallel | 875 |
| E-Y-8-1.1-A/A | 8 | 85* | 1.1 | 3/3 parallel | 1065 |
| E-Y-10-1.1-A/A | 10 | 85* | 1.1 | 3/3 parallel | 1695 |
| E-Y-12-0.8-A/A | 12 | 100* | 0.8 | 3/3 parallel | 2280 |
| E-Y-12-1.1-A/A | 12 | 100* | 1.1 | 3/3 parallel | 2280 |

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

### 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 | λ/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 |

### RELATED PRODUCTS

Laser Safety Eyewear
*See page 1.16*

Visualizator 990-0840
*See page 1.16*