



GAMDAN OPTICS

Neodymium Doped Yttrium Vanadate (Nd:YVO₄)



Gamdan grows boules (ingots of crystals) using specialized processes that have been refined over the past 30 years. Even the crystal synthesizing equipment is custom-engineered by Gamdan scientists.

Shown excellent in efficiency, physical, optical and mechanical properties, Nd:YVO₄ crystal is widely applied as laser material to diode-pumped solid-state (DPSS) lasers to yield stable and powerful red, green and infrared laser. In comparison with Nd:YAG material for diode-pumping applications Nd:YVO₄ lasers have the following features:

- Lower lasing threshold and higher slope efficiency;
- Large stimulated emission cross-section at lasing wavelength;
- High absorption over a wide pumping wavelength bandwidth;
- Low dependency on pumping wavelength and easier to yield single mode output.

Gamdan manufactures and provides customers with different kinds of dopants and different doping levels of Nd:YVO₄ crystals on a competitive pricing basis.

About GAMDAN

GAMDAN Optics synthesizes, custom designs and precision manufactures NLO crystals. Our exclusive **CrystalExpress**SM delivers California-grown crystals with exceptional quality in only 10 business days—the fastest in the industry.*

Gamdan also supplies custom nonlinear, acousto-optic, electro-optic and laser crystals:

- A-O: Tellurium dioxide
- E-O: Rubidium titanyl phosphate (RTP)
- Laser: Neodymium-doped (Nd:YAG, Nd:YVO₄), ytterbium-doped (Yb:YAG), chromium-doped (Cr:YAG) and titanium-doped (Ti³⁺:Sapphire)

*As of January 2008 per GAMDAN market survey. Precision cut and polish BBO and KTP crystals; coating times will vary.

Neodymium Doped Yttrium Vanadate

Basic Properties

Atomic Density	1.26x10 ²⁰ atoms/cm ³ (Nd 1.0%)
Crystal Structure	zircon tetragonal, space group D _{4h} -I4/amd a=b=7.1193
Density	4.22g/cm ³
Mohs Hardness	4-5 (Glass-like)
Thermal Expansion Coefficient (300K)	$\alpha_a=4.43 \times 10^{-6}/K$ $\alpha_c=11.37 \times 10^{-6}/K$
Thermal Conductivity Coefficient (300K)	// C: 0.0523W/cm/K ⊥ C: 0.0510W/cm/K

Sellmeier Equations, pure YVO₄ crystals (λ in μm)

$$n_o^2 = 3.77834 + 0.069736/(\lambda^2 - 0.04724) - 0.0108133 \lambda^2$$

$$n_e^2 = 4.59905 + 0.110534/(\lambda^2 - 0.04813) - 0.0122676 \lambda^2$$



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