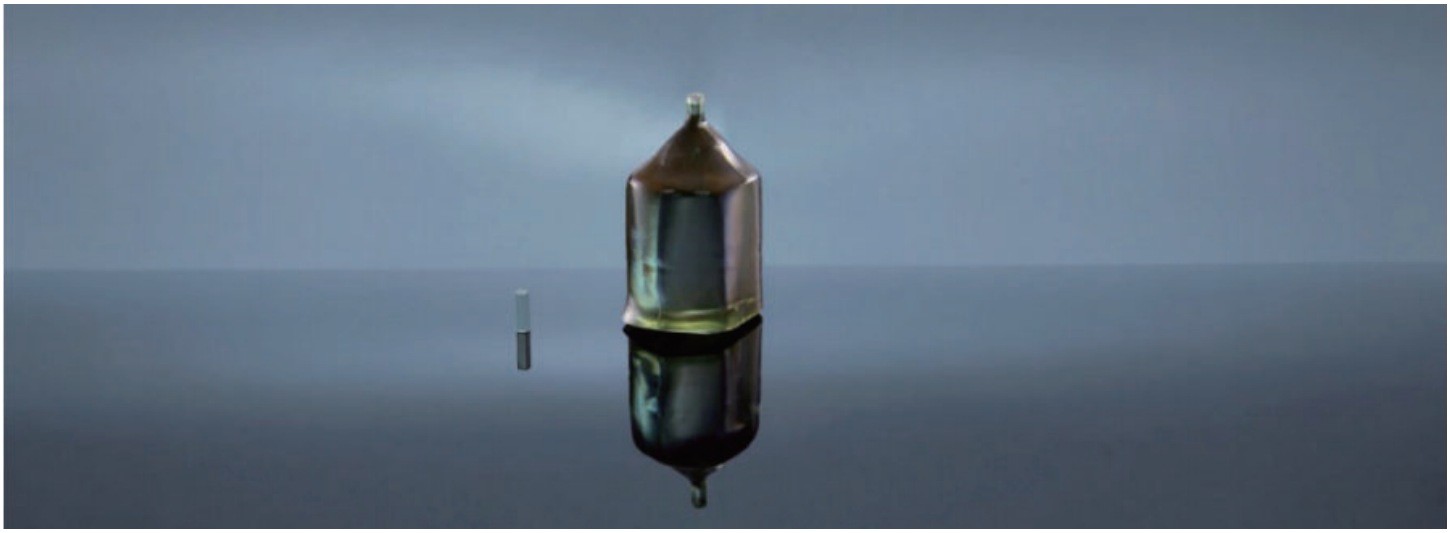
Nd:YVO4



DESCRIPTION

Nd:YVO_4 crystal product, also known as neodymium doped gadolinium vanadate crystal, is a laser crystal product with excellent comprehensive performance for making semiconductor pumped solid-state lasers.

Nd:YVO_4 crystal is widely used in many fields, such as machinery, material processing, spectroscopy, wafer testing, display, medical testing, laser printing, data storage, etc.

The product has the characteristics of good thermal conductivity, large stimulated emission cross section, high laser damage threshold, absorption bandwidth and absorption peak of about 808nm. Because of these advantages, small crystals can be used to make smaller laser devices. Another feature of Nd:YVO_4 crystal is that it is uniaxial, which makes it emit linearly polarized light. Combined with frequency doubling crystal, all solid state lasers with green, blue and red wavelengths can be realized.

Now, Nd:YVO_4 laser has been widely used in many fields, such as machinery, material processing, spectroscopy, chip inspection, display, medical testing, laser printing, data storage and so on. And Nd:YVO_4 diode pumped solid-state lasers are rapidly replacing traditional water-cooled ion lasers and lamp pumped lasers in the market, especially in miniaturization and single longitudinal analog output. It can be used in laser diode pumped all solid state (DPSS) micro lasers, lidar and remote sensing satellite products.

FEATURES

- Uniaxial crystal
- Absorb the bandwidth
- High damage threshold
- High absorption coefficient
- Stimulated radiation cross section
- Good physical and optical properties

APPLICATIONS

- 457nm laser
- Holographic
- 671nm laser
- In the military field
- Medical tests
- Material processing
- Laser printing

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Nd:YVO4

PHYSICAL AND CHEMICAL PROPERTIES OF CRYSTALS

Attribute	The numerical
The crystal structure	Zircon box, space group D4h-I4 / amd
The lattice constant	a=b=7.12, c=6.29
The density	4.22g/cm^3
Melting point	1825
Absorption coefficient	1.0cm^{-1}~7cm^{-1}
Coefficient of thermal conductivity	5.2
Thermal optical coefficient	dn$_o$ /dT = 8.5 x 10^{-6}; dn$_e$/dT=2.9×10^{-6}/K
Thermal expansion coefficient	a = 4.43, c= 11.4
Mohs hardness	4~5

MATERIAL SPECIFICATIONS

Material	Nd: YVO_4
Concentration of tolerance（atm%）	0.5%, 1.1%, 2.0%, 3.0%
Orientation	A-cut or C-cut
Parallelism	20″
Vertical	5′
The surface quality	In accordance with MIL-O-13830-B 10/5 scratches/sag
Wavefront distortion	<λ/8 @633nm
The surface roughness	<λ/10@ 633 nm
Clear aperture	>90%
Chamfering	≤0.2mm@450
Size tolerance	(W±0.1mm)x(H±0.1mm)x(L+0.2/-0.1mm) (L<2.5mm)
	(W±0.1mm)x(H±0.1mm)x(L+0.5/-0.1mm) (L≥2.5mm)
Angle tolerance	≤0.5°
Damage threshold[GW / cm^2]	> 1 for 1064 nm, TEM00, 10 ns, 10 hz (AR - coating)
Coating	HR@1064nm+532nm+HT@808nm/AR@1064nm+532nm

MATERIAL SPECIFICATIONS

The laser wavelength	1064nm, 1342nm
The polarization of laser	The polarization ofπ;Parallel to the optical axis (c axis)
Pump wavelength	808nm
Intrinsic loss	0.02cm^{-1} @1064nm
Diode pump efficiency to light	>60%
Emission cross section	25×10^{-19}cm^2@1064nm
The fluorescence lifetime	90 μs (about 50 μs s for ATM % 2 Nd doping) @ 808 nm
Gain bandwidth	0.96nm @1064nm
Refractive index	1.9573(n_o); 2.1652(n_e) @1064nm
	1.9721(n_o); 2.1858(n_e) @808nm
	2.0210(n_o); 2.2560(n_e) @532nm
Absorption coefficient	31.4 cm^{-1} @ 808 nm
Absorption length	0.32 mm @ 808 nm
Gain bandwidth	0.96 nm (257 GHz) @ 1064 nm

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SPECTRA