

Undoped YVO4 Crystals and Components

The yttrium orthovanadate (YVO4), a kind of crystal preferably grown with Czochralski method has good mechanical and physical properties. It has good temperature stability and physical and mechanical properties. It is ideal for optical polarizing components because of its wide transparency range and large birefringence. It is an excellent synthetic substitute for Calcite (CaCO3) and Rutile (TiO2) crystals in many applications including fiber optic isolators and circulators, beam displacers, Glan polarizers and other polarizing optics, etc.

It also has good physical and favorable mechanical properties than others birefringent crystals, which make YVO 4 well suited for compact fiber optical components as telecom application such as isolators, circulators and interleaver etc.

The Physical and Optical Properties of Undoped YVO4 Crystals

Properties	Values
Transparency Range	400–5000nm
Crystal Symmetry	Zircon tetragonal, space group D4h
Crystal Cell	$A=b=7.12^\circ$, $c=6.29^\circ$
Density	4.22 g/cm ²
Hygroscopic Susceptibility	Non-hygroscopic
Mohs Hardness	5 glass like
Thermal Optical Coefficient	$Dn_a/dT=8.5 \times 10^{-6}/K$; $dn_c/dT=3.0 \times 10^{-6}/K$
Thermal Conductivity Coefficient	$\parallel C: 5.23 \text{ w/m/k}$; $\perp C: 5.10 \text{ w/m/k}$
Crystal Class	Positive uniaxial with $n_o=n_a=n_b$, $n_e=n_c$
Refractive Indices, Birefringence ($D n=n_e-n_o$) and Walk-Off Angle at 45 deg(ρ)	$N_o=1.9929$, $n_e=2.2154$, $D n=0.2225$, $\rho=6.04^\circ$, at 630nm $N_o=1.9500$, $n_e=2.1554$, $D n=0.2054$, $\rho=5.72^\circ$, at 1300nm $N_o=1.9447$, $n_e=2.1486$, $D n=0.2039$, $\rho=5.69^\circ$, at 1550nm
Sellmeier Equation (l in mm)	$n_o^2 = 3.77834 + 0.069736 / (l^2 - 0.04724) - 0.0108133 / l^2$ $n_e^2 = 24.5905 + 0.110534 / (l^2 - 0.04813) - 0.0122676 / l^2$

Standard Processing Specifications of YVO4 Crystals

Specifications	Capability
Surface Flatness	up to $\lambda/8$ at 633 nm
Dimension tolerance	$(W \pm 0.1 \text{ mm}) \times (H \pm 0.1 \text{ mm}) \times (L \pm 0.2 \text{ mm})$
Clear aperture	90% of full aperture
Surface quality	20/10 scratch/dig as per MIL-O-13830A
Perpendicularity	< 5 arcmin
Angle tolerance	< 30 arcmin
Aperture tolerance	$\pm 0.1 \text{ mm}$
Chamfers	0.1 mm at 45 deg
Coating	dual wave band AR coating at 1064/532 nm on both surfaces, with $R < 0.2\%$ at 1064 nm and



R < 0.5% at 532 nm per surface. Other coatings are available upon request.

Notes

- »| Our inspection standard is comply with MIL standard and ISO9001 standard
- »| OEM Specifications are available upon requested

Standard Product List

YVO4 Beam Displacer:

Code	Dimension(mm)	θ	φ	d(mm)	coating	Price
YVB-101	2.6x2.6x7	45°	0	0.70	AR/AR@1550nm	Contact us
YVB-102	2.6x2.6x10	45°	0	1.00	AR/AR@1550nm	Contact us
YVB-103	2.6x2.6x12	45°	0	1.20	AR/AR@1550nm	Contact us
YVB-104	2.6x2.6x15	45°	0	1.50	AR/AR@1550nm	Contact us
YVB-105	2.6x2.6x7	45°	45°	0.70	AR/AR@1550nm	Contact us
YVB-106	2.6x2.6x10	45°	45°	1.00	AR/AR@1550nm	Contact us
YVB-107	2.6x2.6x12	45°	45°	1.20	AR/AR@1550nm	Contact us
YVB-108	2.6x2.6x15	45°	45°	1.50	AR/AR@1550nm	Contact us

YVO4 Wedge:

Code	X(mm)	Y(mm)	Z(mm)	θ	φ	coating	Price
YVW-101	0.5	1.4	1.4	5°	22.5°	AR/AR@1550nm	Contact us
YVW-102	0.5	1.4	1.4	9°	22.5°	AR/AR@1550nm	Contact us
YVW-103	0.5	1.4	1.4	5°	22.5°	AR/AR@1310nm	Contact us
YVW-104	0.5	1.4	1.4	9°	22.5°	AR/AR@1310nm	Contact us

Notes

»| To inquiry or order a finished Nd:YAG laser rod, please specify the specification listed above, for common application, we only need to know the main specification: Nd-dopant concentration, sizes, and coating. For special request, please specify specification in details for evaluation and fabrication.

»| Custom size is available upon requested.



