

Laser Crystals

NLO Crystals

Birefringent Crystals

AO and EO Crystals

Yttrium Orthovanadate (YVO4)

Introductions



The yttrium orthovanadate (YVO4) is a positive uniaxial crystal grown with Czochralski method. It has good mechanical and physical properties and is ideal for optical polarizing components because of its wide transparency range and large birefringence. It also has good physical and favorable mechanical properties than other birefringent

Basic Properties

Items	Specification
Transparency Range	high transmittance from 0.4 to 5mm
Crystal Symmetry	Zircon Tetragonal, space group D_{4h}
Crystal Cell	$a=b=7.12 \text{ \AA}$, $c=6.29 \text{ \AA}$
Density	4.22 g/cm^3
Hygroscopic Susceptibility	Non-hygroscopic
Thermal Expansion Coefficient	$a_a = 4.43 \times 10^{-6}/K$; $a_c = 11.37 \times 10^{-6}/K$
Thermal Conductivity Coefficient	// C: 5.23 W/m/K ; \perp C: 5.10 W/m/K
Crystal Class	Positive uniaxial with $n_o=n_a=n_b$, $n_e=n_c$
Refractive Indices, Birefringence ($Dn = n_e - n_o$) and Walk-off Angle at 45° (r)	$n_o = 1.9929$, $n_e = 2.2154$, $Dn = 0.2225$, $r = 6.04$ at 0.63 mm $n_o = 1.9500$, $n_e = 2.1554$, $Dn = 0.2054$, $r = 5.72$ at 1.30 mm $n_o = 1.9447$, $n_e = 2.1486$, $Dn = 0.2039$, $r = 5.69$ at 1.55 mm
Sellmeier Equation (l in mm)	$n_o^2 = 3.77834 + \frac{0.069736}{l^2} - 0.04724 - 0.0108133l^2$ $n_e^2 = 4.59905 + \frac{0.110534}{l^2} - 0.04813 - 0.0122676l^2$
Thermal Optical Coefficient	$dn_a/dT = 8.5 \times 10^{-6}/K$; $dn_c/dT = 3.0 \times 10^{-6}/K$

Standard Specification

Items	Specification
Dimension Tolerance	$\pm 0.05 \text{ mm}$
Flatness	$\leq \lambda / 4$ @ 633 nm
Wavefront distortion	$\leq \lambda / 4$ @ 633 nm
Surface Quality	Scratch and Dig 20-10
Beam Deviation	< 3 arc minutes
Clear Aperture	$> 80\%$
Coating	Upon the customers' request

YVO4

Crystal

YVO4 02