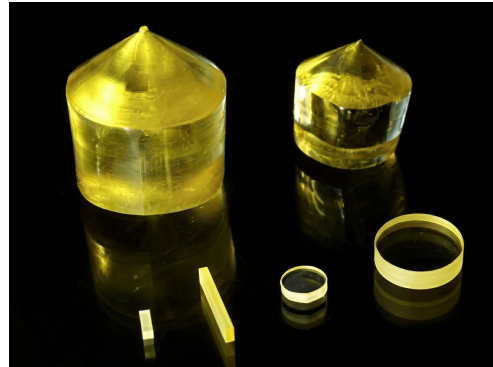


## BIREFRINGENT OPTICAL CRYSTALS

# YVO4 Birefringent Crystal

## Product Brochure &amp; Technical Reference

Undoped YVO4 is a birefringent optical material for polarizing components. Specify the optical-axis direction, operating wavelength, finished geometry and surface or coating requirements.



Reference product image. Shown geometry is illustrative.

## Material reference properties / options

| Property                         | Typical Value                                                                          |
|----------------------------------|----------------------------------------------------------------------------------------|
| Transparency range               | High transmission from 0.4 to 5 $\mu\text{m}$                                          |
| Crystal symmetry                 | Zircon tetragonal, space group D4h                                                     |
| Crystal cell                     | $a = b = 7.12 \text{ \AA}$ , $c = 6.29 \text{ \AA}$                                    |
| Density                          | $4.22 \text{ g/cm}^3$                                                                  |
| Mohs hardness                    | 5                                                                                      |
| Hygroscopic susceptibility       | Non-hygroscopic                                                                        |
| Thermal expansion coefficient    | $\alpha_a = 4.43 \times 10^{-6}/\text{K}$ ; $\alpha_c = 11.37 \times 10^{-6}/\text{K}$ |
| Thermal conductivity coefficient | //C: $5.23 \text{ W/(m K)}$ ; perpendicular C: $5.10 \text{ W/(m K)}$                  |

Reference values and options for selection. Confirm the material grade, geometry, test conditions and acceptance criteria for the quoted configuration.

## BIREFRINGENT OPTICAL CRYSTALS

# Configuration & quotation

Define the component around your application

Application examples: Fiber-optic isolators and circulators; Beam displacers and polarization beam separation optics; Optical interleavers and polarization-control components

## Specifications of YVO4 Birefringent Crystal

| Parameter               | Typical Value / Option                                                                                        |
|-------------------------|---------------------------------------------------------------------------------------------------------------|
| Material                | Undoped YVO4 / yttrium orthovanadate                                                                          |
| Dimension tolerance     | +/-0.1 mm                                                                                                     |
| Flatness                | $\lambda/10$ at 632.8 nm                                                                                      |
| Wavefront distortion    | $\lambda/4$ at 632.8 nm                                                                                       |
| Surface quality         | 10/5 per MIL-O-13830B                                                                                         |
| Parallelism             | $\leq 10$ arcsec                                                                                              |
| Perpendicularity        | $\leq 10$ arcmin                                                                                              |
| Bevel / chamfer         | <0.1 mm at 45 degrees                                                                                         |
| Chips                   | <0.1 mm                                                                                                       |
| Clear aperture          | >95%                                                                                                          |
| Coating                 | AR or HR coating; IAD, EB, or IBS coating upon customer request                                               |
| Damage threshold        | About 750 MW/cm <sup>2</sup> at 1064 nm, TEM00, 10 ns, 10 Hz; confirm test conditions for final specification |
| Quality warranty period | One year under proper use, subject to final sales terms                                                       |

## Basic Properties of YVO4 Crystal

| Property                    | Typical Value                                                       |
|-----------------------------|---------------------------------------------------------------------|
| Thermal optical coefficient | $dn_a/dT = 8.5 \times 10^{-6}/K$ ; $dn_c/dT = 3.0 \times 10^{-6}/K$ |
| Crystal class               | Positive uniaxial, with $n_o = n_a = n_b$ and $n_e = n_c$           |

## Refractive Indices, Birefringence and Walk-Off Angle

| Wavelength | no     | ne     | Birefringence, ne - no | Walk-Off Angle at 45 degrees |
|------------|--------|--------|------------------------|------------------------------|
| 630 nm     | 1.9929 | 2.2154 | 0.2225                 | 6.04 degrees                 |
| 1300 nm    | 1.9500 | 2.1554 | 0.2054                 | 5.72 degrees                 |
| 1550 nm    | 1.9447 | 2.1486 | 0.2039                 | 5.69 degrees                 |

## Prepare your quotation

| RFQ Item            | Information to Provide                                                                                       |
|---------------------|--------------------------------------------------------------------------------------------------------------|
| Application         | Beam displacer, isolator, circulator, interleaver, polarizer, or custom birefringent optic.                  |
| Wavelength range    | Operating wavelength, bandwidth, laser power, and transmission requirement.                                  |
| Geometry            | Length, width, thickness, aperture, bevel, wedge, prism or slab shape, and drawing if available.             |
| Optical axis        | Cut direction, optical axis orientation, beam path, polarization direction, and required walk-off behavior.  |
| Surface and coating | Surface quality, flatness, wavefront distortion, AR/HR coating, coating wavelength, and reflectivity target. |
| Order information   | Prototype quantity, batch quantity, inspection criteria, packaging requirement, and delivery schedule.       |

Reference values and options for selection. Confirm the material grade, geometry, test conditions and acceptance criteria for the quoted configuration.

### Send drawings for engineering review

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