



YVO₄

The yttrium orthvanadate (YVO₄) is a positive uniaxial crystal grown with Czochralski method. It has good temperature stability and physical and mechanical properties, wide transparency and large birefringence, so it is also ideal for optical components such as fiber optical isolators and circulators, beam displacers and other polarizing optics, etc.

Basic Properties:

Transparency Range	high transmittance from 0.4 to 5μm		
Crystal Symmetry	Zircon Tetragonal, space group D _{4h}		
Crystal Cell	a=b=7.12Å; c=6.29 Å		
Density:	4.22 g/cm ³		
Hygroscopic Susceptibility:	Non-hygroscopic		
Thermal Expansion Coefficient	α _a = 4.43 x 10 ⁻⁶ /K; α _c = 11.37 x 10 ⁻⁶ /K		
Thermal Conductivity Coefficient	// C: 5.23 W/m/K; ⊥ C: 5.10 W/m/K		
Crystal Class:	Positive uniaxial with n _o =n _a =n _b , n _e =n _c		
Thermal Optical Coefficient:	dn _a /dT = 8.5x10 ⁻⁶ /K; dn _c /dT = 3.0x10 ⁻⁶ /K		
	0.6341 μm	1.30 μm	1.55 μm
Refractive Indices: n _o	1.9929	1.950	1.9447
n _e	2.2154	2.1554	2.1486
Birefringence (Δn = n _e - n _o)	0.2225,	0.2054	0.2039
Walk-off Angle at 45° (ρ)	6.04° at	5.72°	5.69°
Sellmeier Equation (λ in μm):	n _o ² =3.77834 + 0.069736/(λ ² - 0.04724) - 0.0108133λ ²		
	n _e ² =4.59905 + 0.110534/(λ ² - 0.04813) - 0.0122676λ ²		

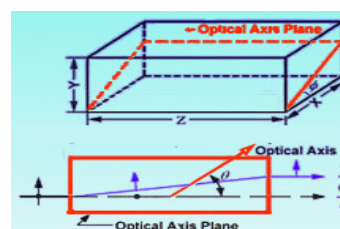
Comparison with other Birefringent crystals

		YVO ₄	TiO ₂	CaCO ₃	LiNbO ₃
Thermal Expansion (/C°)	c-axis	11.4x10 ⁻⁶	9.2x10 ⁻⁶	26.3x10 ⁻⁶	16.7x10 ⁻⁶
	a-axis	4.4x10 ⁻⁶	7.1x10 ⁻⁶	5.4x10 ⁻⁶	2x10 ⁻⁶
Refractive Index	n _o	1.9447@550nm	2.454@1530nm	1.6346@1497nm	2.2151@1440nm
	n _e	2.1486@1550nm	2.710@1530nm	1.4774@1497nm	2.1413@1440nm
Birefringence (n _e -n _o)		0.2039@1550nm	0.256@1530nm	-0.1572@1497nm	-0.0738@440nm
Mohs Hardness		5	6.5	3	5
Transparency range		0.4-5μm	0.4-5μm	0.35-2.3μm	0.4-5μm

Beam Displacer

Standard Specifications:

Dimension tolerance:	±0.05 mm
Optical axis orientation:	±0.3°
Parallelism:	<15 arc sec
Perpendicularity:	<10 arc min
Flatness:	λ/4 @ 632.8 nm
Surface Quality:	20-10
AR-coating:	R<0.2% @ 1550±40nm





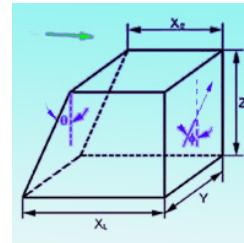
Standard Products

Part No.	Crystal	Size	θ°	ϕ°	d	AR
YBD01	YVO ₄	2x2x7mm	45	0	0.70mm	1550nm
YBD02	YVO ₄	2.6x2.6x10mm	45	0	1.00mm	1550nm
YBD03	YVO ₄	2.6x2.6x12mm	45	0	1.20mm	1550nm

Wedges

Wedges' Specification:

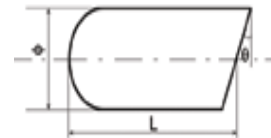
Material: Optical Grade YVO₄ or LiNbO₃
 Dimension Tolerance: $\pm 0.05\text{mm}$
 Wedge Angle Tolerance: $\pm 0.1^\circ$
 Optical Axis Orientation: $\pm 0.3^\circ$
 Flatness: $\lambda/4$ @ 632.8 nm
 Surface Quality: 20/10
 AR-Coating: $R < 0.2\%$ @ $1550 \pm 40\text{nm}$



C-Lens

C-Len's Specification:

Diameter Tolerance: $+0.005\text{mm}, -0.01\text{mm}$
 Diameter Range: $> \text{Dia. } 1.0\text{mm}$
 Length Tolerance: $\pm 0.03\text{mm}$
 Wedge Tolerance: ± 0.3 degree
 Surface Quality: 40/20 Scratch & Dig
 Coating: $R < 0.25\%$ @ (design Wavelength) $\pm 40\text{nm}$



Standard Products

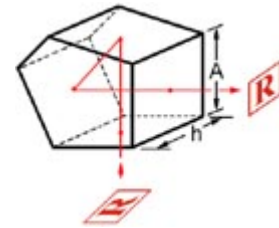
Part No.	Working Distance (mm)	Dia.(mm)	L (mm)	(Deg.)	l	Pitch
CL201	100	1.8	3.85/4.21	8°	1550	0.23/0.25
CL205	67	1.8	2.94/3.32	8°	1550	0.23/0.25
CL101	68	1.0	2.90/3.27	8°	1550	0.23/0.25
CL103	50	1.0	2.62/2.80	8°	1550	0.23/0.25
CL105	10	1.0	1.92	8°	1550	0.23
CL106	32	1.0	2.1	8°	1550	0.23
CL107	49	1.0	2.46	8°	1550	0.23
CL108	71	1.8	3.05	8°	1550	0.23



Micro Prism

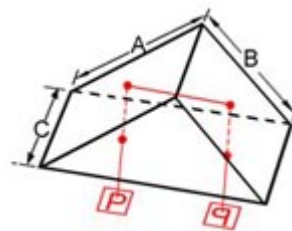
1. Micro Penta Prism

Material: BK7 Grade A optical glass
 Dimension Tolerance: $\pm 0.2\text{mm}$
 Flatness: $\lambda/4$ at 632.8 nm
 Reflectivity: $R > 95\%$ per face from @ 1550 nm
 Surface Quality: 40-20 scratch and dig
 Working Wavelength: 1310, 1550, 1590 nm
 90° Deviation Tolerance: 1 min. deviation



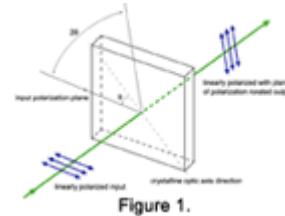
2. Micro Right-Angle Prisms

Material: BK7 glass
 Dimension Tolerance: $+0.0, -0.2$ mm
 Clear Aperture: $>80\%$
 Flatness: $\lambda/2$ @ 632.8 nm
 Surface Quality: 60-40 scratch and dig
 Angle Tolerance: 1 min. deviation
 Working Wavelength: 1310, 1550, 1590 mm
 Bevel: 0.2 mm to 0.5 mm
 Reflectivity: $R > 95\%$ per face @ center wavelength



Micro Waveplate

Material: Crystal Quartz
 Dimension: $+0.0, -0.2\text{mm}$
 Wavefront Distortion: $< \lambda/8 @ 632.8$
 Retardation tolerance: $< \lambda/500$
 Parallelism: < 1 arc second
 Surface Quality: 20/10 scratches and dig
 AR coating: $R < 0.2\%$ @ 1550nm
 Standard Wave: Quarter-wave ($\lambda/4$), half-wave ($\lambda/2$)



Micro PBS

PBS's Specifications:

Material: BK7 grade A, optical glass
 Dimension Tolerance: $\pm 0.2\text{mm}$
 Flatness: $\lambda/4$ @ 632.8 nm per 25mm
 Extinction Ratio: $>100:1$
 Beam Deviation: < 3 arc minutes
 Principal Transmittance: $T_p > 98\%$ and $T_s < 0.5\%$
 Principal Reflectance: $R_s > 99.5\%$ and $R_p < 2\%$
 Coatings: 1. Polarization beamsplitter coating on hypotenuse face,
 2. AR-coatings ($R < 0.25\%$) on all input and output face.
 Standard wavelength: $1310 \pm 20, 1550 \pm 20$ nm

