en.dayoptics.com

HO

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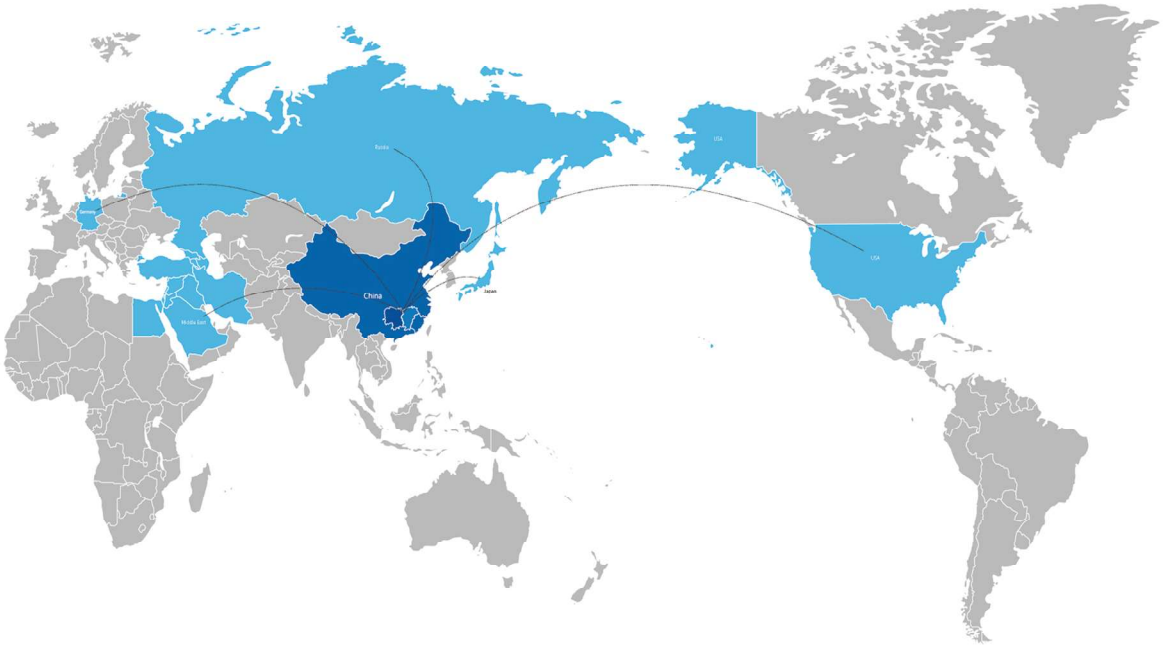
DayOptics

PRODUCT CATALOG

About Us



Founded in 2005, our company has consistently focused on research and manufacturing in the optoelectronics field. Our core products include optical systems, components, devices, and precision elements, widely used in industrial lasers, optical communications, biomedical applications, artificial intelligence, semiconductors, and defense. Our network of partners extends across the United States, Japan, Russia, the European Union, ASEAN, and the Middle East.

Guided by the spirit of "Pursue Excellence and Innovation," we have achieved significant breakthroughs in critical technologies, established a precision optical manufacturing platform, and integrated a comprehensive technological system encompassing optical components to assemblies. We provide one-stop optical solutions to customers both domestically and internationally.

International Organization for Standardization ISO 45001

International Organization for Standardization ISO 14001

International Organization for Standardization ISO 9001

International Organization for Standardization ISO 56005

CERTIFIED IATF 16949

50+ countries and regions served

70+ million optical components annually

10,000+ partner companies

Company Capability

Production Capability

Wide range of products with comprehensive category

- Materials
  Optical glass, Fused Silica, Crystals, and special materials
- Wavelength
  deep ultraviolet (DUV) to far infrared (FIR).
- Coating
  AR, HR,Bandpass filters, Dichroic splitters, Polarizing beamsplitter, Infrared Optics, IR Cut Filter, SWPF, LWPF, Metallic, etc.

R&D

- R&D Centers in Changsha
  R&D personnel make up **20%**
- Comprehensive Development of Laser Application Fields

QC Capability

Quality Control System

- Incoming Quality Control (IQC) + In-Process Quality Control (IPQC) + Final Quality Control (FQC) + Outgoing Quality Control (OQC).

Systematic Testing Platform

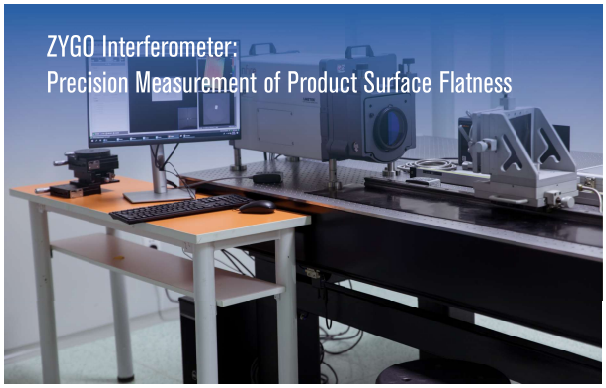
- LIDT Test
- UV-Vis-NIR Measurement Spectrophotometer
- ZYGO Interferometer
- Acousto-Optic Modulation Performance Test Platform
- QCS Spot Testing Platform
- Optical Power Testing PlatformControl (OQC).

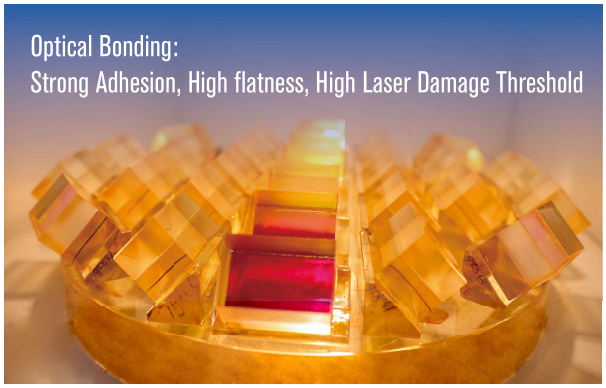
Company Capability


Weak Absorption Measurement:
Ensuring Stability and Reliability of Performance


Laser Damage Threshold Test:
Improving Coating Layer Damage Threshold


IBS Coating:
High Damage Laser Coating


ZYGO Interferometer:
Precision Measurement of Product Surface Flatness


Optical Bonding:
Strong Adhesion, High flatness, High Laser Damage Threshold


Ion Beam Processing :
High Surface Quality, No Sub-Damage Layer


Ultrasonic Cleaning:
Efficient Cleaning and More Reliable


Production Workshop:
Ensuring Clean Air During the Assembly Process

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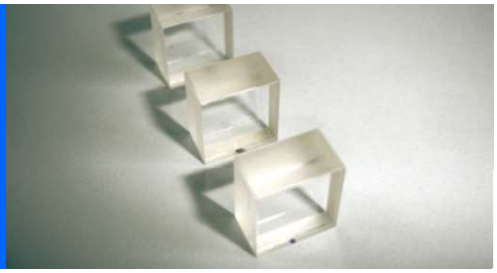

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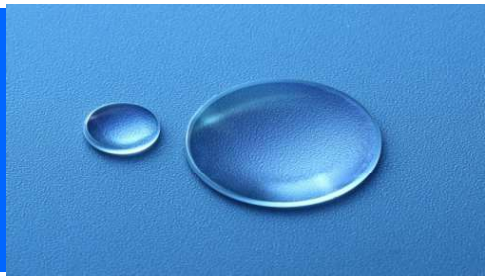

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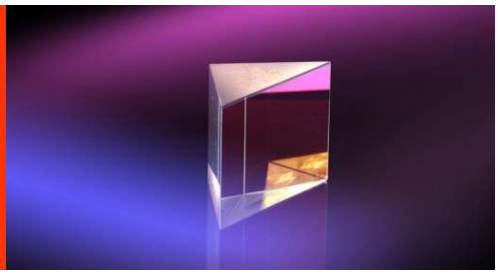

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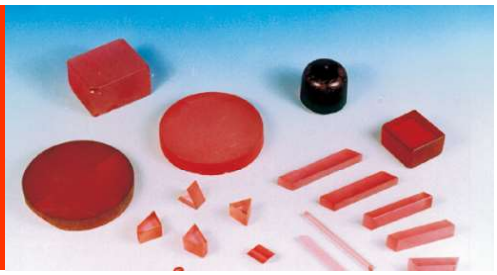

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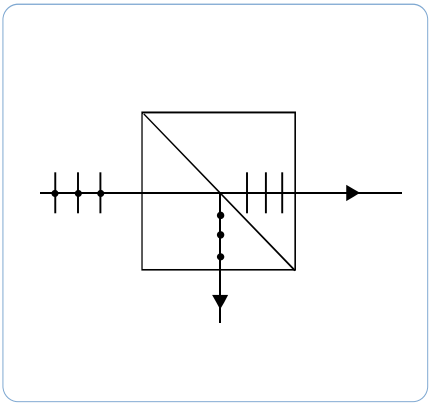
01

POLARIZING BEAM SPLITTER

Polarizing Cube Beamsplitters split randomly polarized beams into two orthogonal, linearly, polarized components-S-polarized light is reflected at a 90deg. Angle while P-polarized light is transmitted. Each beamsplitter consists of a pair of precision high tolerance right angle prisms cemented together with a dielectric coating on the hypotenuse of one of prisms.

Currently. as coating technologies and assembly techniques have improved, so there are many types of polarizing beamsplitter cubes can be provided in the market. Dayoptics has own technology in providing two types of high precision polarizing beamsplitter cube. One is by using cemented method for PBS (as standard PBS), the other one is using optical bonding method for the interface of PBS (as high power PBS). The comparison specification of two PBS as following for your reference.

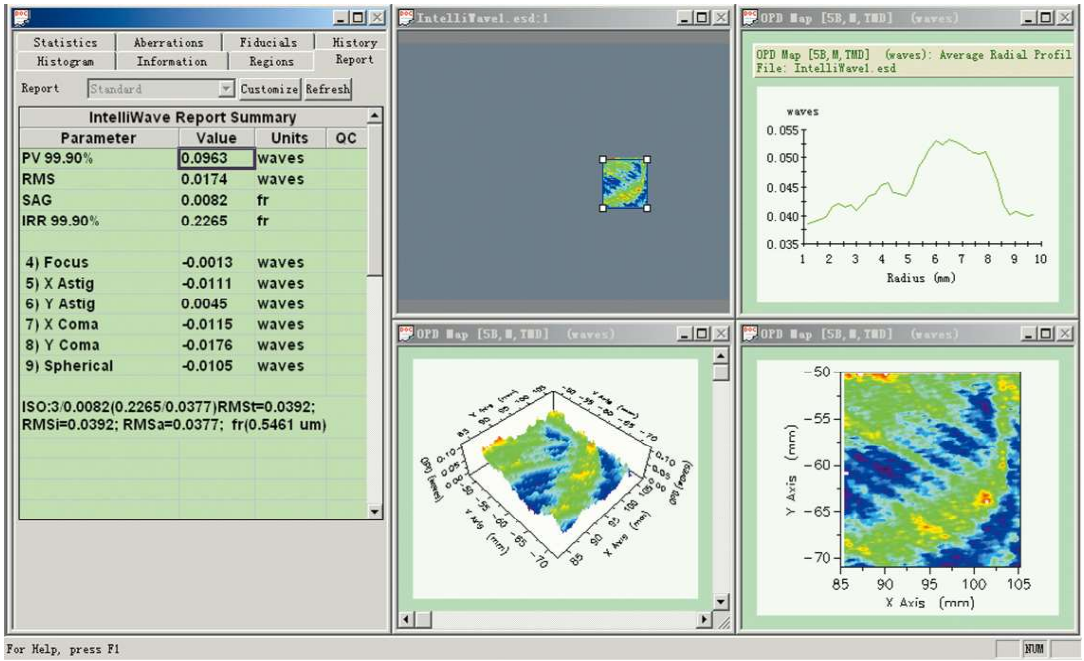
Dayoptics	Polarizing Beam Splitter (PBS)	
	Standard PBS	High Power PBS
Interface Surface	Cemented	Optically Bonded
Damaged Threshold @ 1064 nm,10ns	0.3J/cm2	>15 J/cm2
Beam Deviation	<3′	<3′
Flatness	L/4	L/8
Transmission @ 1064nm	Tp>95%	Tp>97%;Tp>96%@355nm
Surface Quality	60/40 Scratch/Dig	40/20 (20/10) Scratch/Dig
Extinction Ratio	>500:1	>1000:1



A primary advantage of a direct-bonding technique over optical contacting is that the increased strength of the bond allows processing after assembly, meaning that the bonded parts can be cut, shaped, polished or coated to create highly toleranced or multicomponent assemble without the temperature constraints or threat of delamination exhibited by other assembly techniques. Because there is no epoxy, the finished units are compact and thermally stable, exhibiting insignificant levels of absorption or scattering loss at the optical interface.

PBS

Flatness of PBS inspected by Interferometer

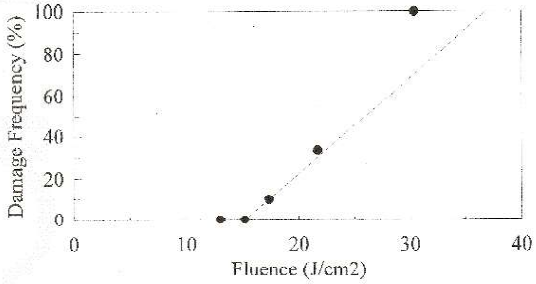


HIGH POWER POLARIZATION BEAMSPLITTER

High Power Damage Threshold Report from Quantel

LASER DAMAGE THRESHOLD

Customer:	Dayoptics, Inc.	Certificate No.:	13866 #1
Purchase Order Number:	P338	Issued:	Dec. 1, 2008
Substrate Material:	BK-7 Glass	Coating Type:	B/S@1064 nmm
Part No.:	PBS206-HP PBS cube	Lot No.:	136
Special Requirements:	Per P.O.		
Wavelength (nm):	1064	Spot Diam. (FW/e2, mm):	.5
Repetition Freq. (Hz):	20	Incidence Angle (deg.):	Normal
Pulse Width (FWHM, ns):	20	Polarization State:	Circular
Axial Modes:	Multiple	Transverse Modes:	TEMoo
No. Sites Tested:	26	No. Shots/Site:	200
Damage Definition:	Permanent surface change	Inspection Method:	Nomarski/Darkfield 150X
Preparation:	N2 Dustoff		



J/cm2	MW/cm2	%Fail
30.4	1214	100
21.7	867	33.3
17.3	694	10
15.2	607	0
13	520	0

Test Results: Damage Threshold: **15.2** J/cm2 or **607** MW/cm2
Damage Type: Propagating pit(s) on the hypotenuse

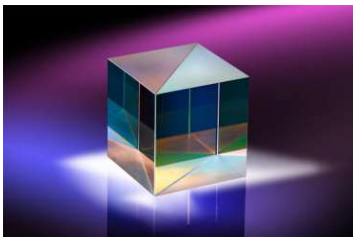
Notes:

"Big Sky Laser Technologies, Inc., certifies that the Laser Damage Threshold of this sample was tested as shown hereon. Fluence measurement precision was plus or minus 10%, traceable to NIST. The test method was substantially in agreement with ISO 11254. Specific calibration data are maintained in this office and are available on request. We certify that this test report conforms to all applicable provisions of the purchase order."

Jeff Runkel

HIGH POWER POLARIZATION BEAMSPLITTER

Dayoptics is dedicated to producing various High Power PBS. Compare to traditional PBS, it adopts special optical contacted technology which makes it has higher laser damage threshold.

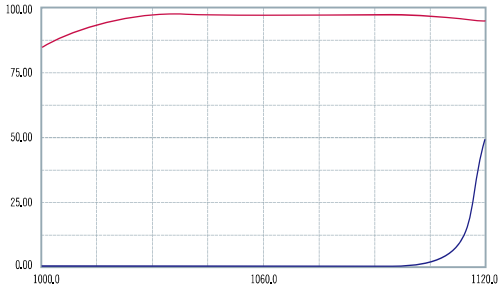


Features

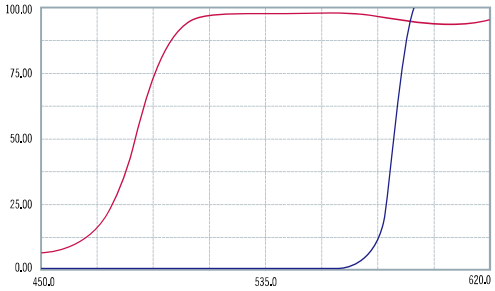
- High Power High Damage Threshold: ~15J/cm^2 @ 1064nm 20ns, 20Hz （Certificate No. 13866#1）
- Green Optics. Epoxy-free! Optical Contacted.
- Transmission: >97%@Central Wavelength (Tp >96%@355nm)
- Extinction Ratio: Better than 30dB for 1064nm
- High Coating Performance
- Surface quality: 20/10 Scratch/Dig
- Wavelength Range (Other Material & Wavelength Available)

  1064nm+/-20nm (Material: BK7) 1550nm+/-25nm (Material: BK7)

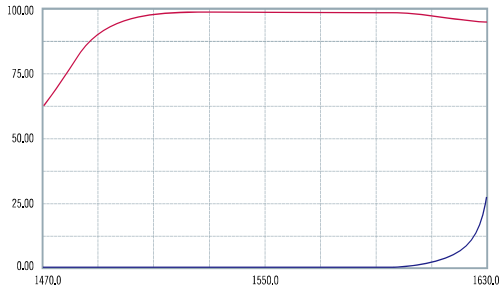
  532nm+/-20nm (Material: BK7) 355nm+/-7nm (Material: Fused Silica)
- Design & Technical Support Services and Volume Production.



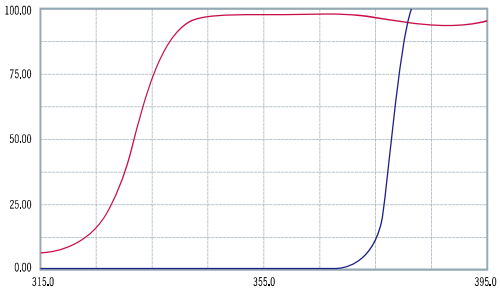
PBS@1064nm



PBS@532nm



PBS@1550nm



PBS@355nm

Single Wavelength

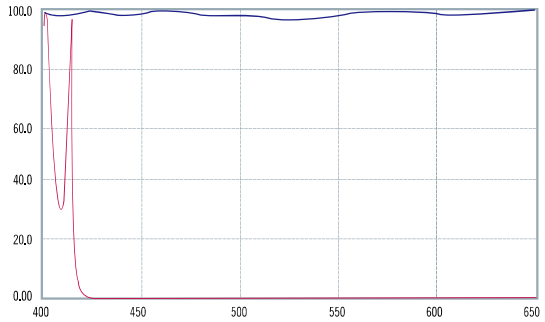
Part No.	Size Tolerance
PBS206-HP	6.35x6.35mm +/-0.1
PBS212-HP	12.7x12.7mm +/-0.2
PBS225-HP	25.4x25.4 mm +/-0.2

Order information: 1064nm PBS206-HP-1064nm

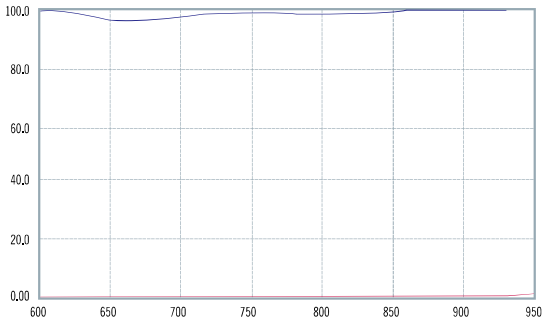
HIGH POWER POLARIZATION BEAMSPLITTER

Specifications

High Power High Damage Threshold	> 3-5J/cm2 @ 1064nm 20ns, 20Hz
Green Optics	Epoxy-free! Optical Contacted
Extinction Ratio	>30dB
Avarage	Tavg>92%
Wavelength Range	450-650nm、650-900nm 、900-1200nm、1200-1600nm
Surface Quality	40/20 Scratch/Dig
Surface Figure	< 1/4 wave @633nm



PBS@450-650nm



PBS@650-900nm

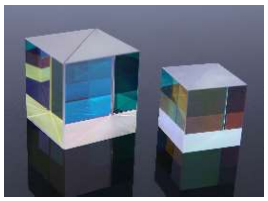
Broadband Wavelength

Part No.	Size Tolerance
PBS506-HP	6.35x6.35 mm +/-0.1
PBS512-HP	12.7x12.7 mm+/-0.2
PBS525-HP	25.4x25.4 mm +/-0.2

Order information: 450-650nm PBS506-HP-450-650nm

POLARIZATION CUBE BEAMSPLITTER

Polarizing Cube Beamsplitters split randomly polarized beams into two orthogonal, linearly, polarized components-S-polarized light is reflected at a 90deg. Angle while P-polarized light is transmitted. Each beamsplitter consists of a pair of precision high tolerance right angle prisms cemented by epoxy together with a dielectric coating on the hypotenuse of one of prisms.



Single Wavelength PBS

Dimension Tolerance	±0.2mm
Interface	By epoxy
Flatness	λ /4 @ 632.8 nm per 25mm
Surface Quality	40/20 Scratch/Dig
Extinction Ratio	Tp:Ts>500:1
Beam Deviation	<3 arc minutes
Transmittance of P-Polarized Light	Tp>95%
Clear Aperture	>85%
Coatings	Polarization beamsplitter coating on hypotenuse face, AR-coatings (R< 0.25%) on all input and output face.
Standard Coating Wavelength	488, 532, 632.8, 808,980, 1064, 1310, 1550 nm

Part No.	Size Tolerance
PBS206	6.35x6.35 mm +/-0.1
PBS212	12.7x12.7 mm +/-0.2
PBS225	25.4x25.4 mm +/-0.2

Order information: 1064nm PBS206-1064nm

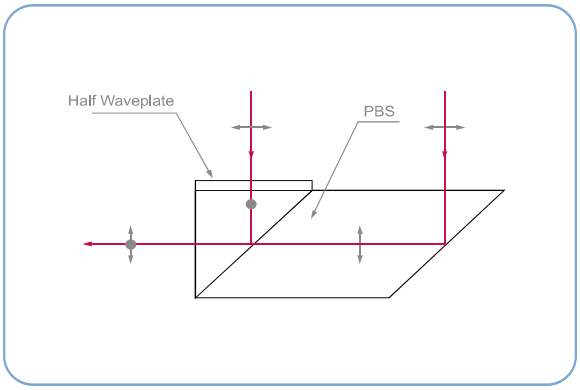
Broadband PBS

Dimension Tolerance	±0.2mm
Interface	By epoxy
Flatness	λ /4 @ 632.8 nm per 25mm
Surface Quality	40/20 scratch/dig
Extinction Ratio	>500:1
Beam Deviation	<3 arc minutes
Transmittance of P-Polarized Light	>92%
Clear Aperture	>85%
Coatings	Polarization beamsplitter coating on hypotenuse face, AR-coatings (Ravg< 1%) on all input and output face.
Standard Coating Wavelength	450-650,650-900,900-1200,1200-1600nm

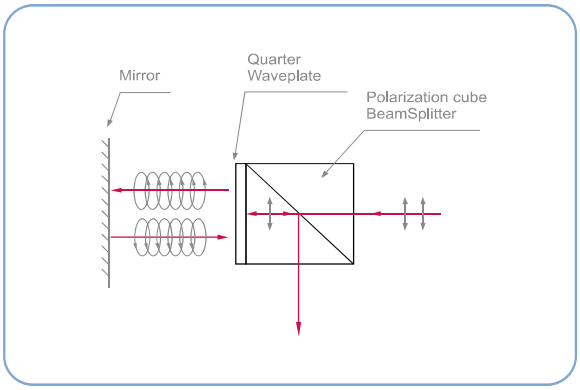
Part No.	Size Tolerance
PBS506	6.35x6.35mm +/-0.1
PBS512	12.7x12.7mm +/-0.2
PBS525	25.4x25.4 mm +/-0.2

Order information: 450-650nm PBS506-450-650nm

MICRO-OPTICS ASSEMBLY



PBS +Waveplate



Isolators

Specifications

Material	BK7+Quartz
Wavelength	1064 nm
Surface Flantness	< λ /4@633nm (or better)
Surface Quality	20/10 Scratch/Dig
Clear Aperture	>85%
Beam Deviation	<3'
Coating	PBS Coating,Tp>96%,Ts<0.1@AOI=45° ; AR Coating,R<0.2%@1064nm
Damaged Threshold@1064nm,10ns	>15J/cm^2

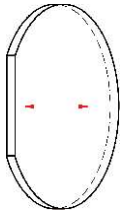
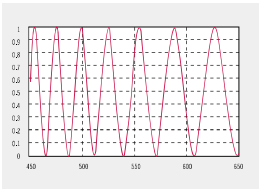
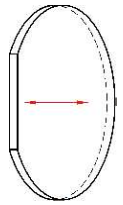
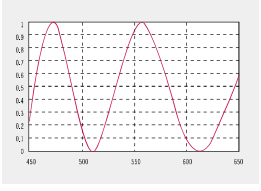
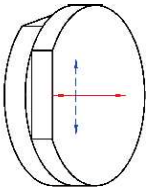
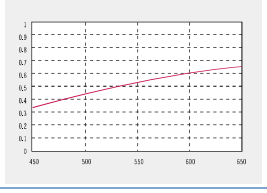
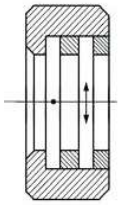
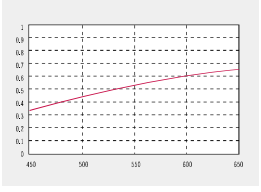
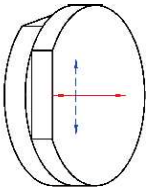
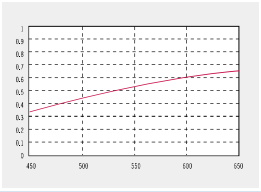
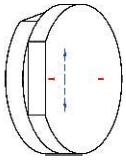
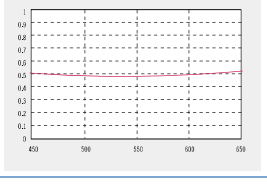
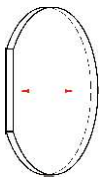
Standard Products

PBS+Waveplate		
Part No.	**Dimension(mm)**	**Dimension Tolerance(mm)**
OAPW635	6.35x6.35	+/-0.1mm
OAPW1000	10x10	+/-0.2mm
Isolators		
Part No.	**Dimension(mm)**	**Dimension Tolerance(mm)**
OAPW-I635	6.35x6.35	+/-0.1mm
OAPW-I1000	10x10	+/-0.2mm

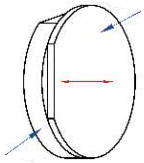
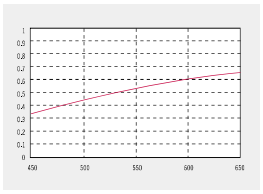
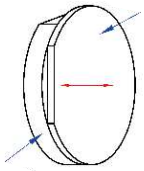
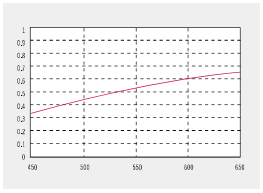
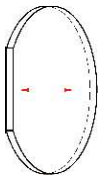
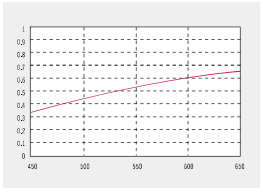
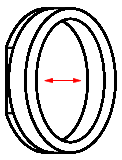
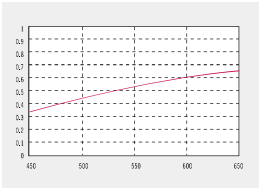
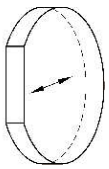
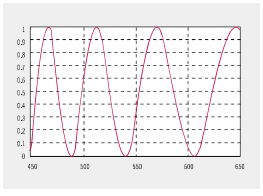
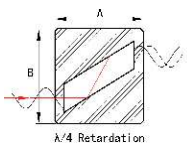
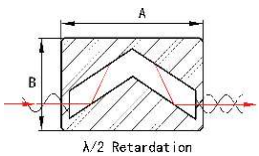
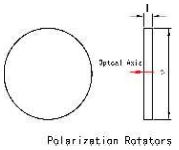
Minimum Order Quantity: 5 pcs

Note: We can make the Micro-Optics Assembly according to your requirements

WAVEPLATE OVERVIEW

Waveplate		Part #	Illustration	Wavelength Bandwidth (λ /4@532nm)	(λ /100 Bandwidth) λ /2 @532nm	Plates	Acceptance Angle	Typical Length	Damage Threshold	Page
Multi-order Waveplate(Quartz) (Can be Replaced by Low-order)		WPMxxxx			0.29nm (T=0.9686mm)	Single	Low	1~2mm	1GW/cm2	
Low-order Waveplate(Quartz)		WPLxxxx			0.92nm (T=0.3036mm)	Single	Medium	0.2~0.5mm	1GW/cm2	9
Zero-order Waveplate (Quartz)	Optically Contracted	WPOxxxx			19.22nm (Δ T=0.0145mm)	Double (Optical Contacted)	Low	~1mm	~200 MW/cm2	10
	Air-spaced	WPAxxxx			19.22nm (Δ T=0.0145mm)	Double (Air Spaced)	Low	~1mm	~500 MW/cm2	11
	Cemented	WPCxxxx			19.22nm (Δ T=0.0145mm)	Double Cemented (Epoxy)	Low	~1mm	~ 10MW/cm2	11
Achromatic Waveplate (Quartz)		WPBxxxx			200 nm	Double (Optical Contacted or Air Spaced)	Low	~2mm	~ 10MW/cm2	12-13
IR Waveplate		WPSXXX-M			19.22nm (T=0.022mm)	Single	High	<0.2mm	>1GW/cm2	14

WAVEPLATE OVERVIEW

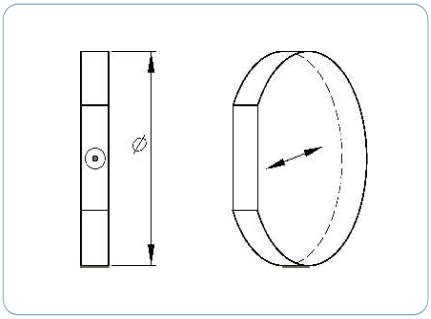
Waveplate		Part #	Illustration	Wavelength Bandwidth (λ /4@532nm)	(λ /100 Bandwidth) λ /2 @532nm	Plates	Acceptance Angle	Typical Length	Damage Threshold	Page
True Zero-order Waveplate	High Power Waveplate（Quartz, BK7, Fused Silica）	WPH xxxx			19.22nm (T=0.0145 mm)	Doulbe (Optical Bonding)	High	~1mm	>1GW/cm2	15
	Cemented (Quartz, BK7,Fused Silica)	WPF xxxx			19.22nm (T=0.0145 mm)	Double (Cemented by Epoxy	High	~1mm	~ 10MW/cm2	16
	Single Plate (Quartz)	WPS xxxx			19.22nm (T=0.0145 mm)	Single	High	<0.2mm	> 1GW/cm2	16
	Single Plate (Quartz) with BK7 Holder	WPQ xxxx			19.22nm (T=0.0145 mm)	Single (BK7 Ring as Holder)	High	<0.2mm	> 1GW/cm2	17
Double Wavelength Waveplate (Quartz)		WPDxxxx			Very Small	Single	Low	0.2~2mm	1GW/cm2	17
Fresnal Rhomb Retarder (Fused Silica, BK7, CaF_2)		FRRxxxx			Broadband	Single or Double (Optical Contact or Cemented)	Medium		500 MW/cm2	18
Polarization Rotators (Quartz)		WPRxxxx			20 nm	Single	High	3.33mm (90。@ 532nm)	1GW/cm2	19

LOW ORDER WAVEPLATE

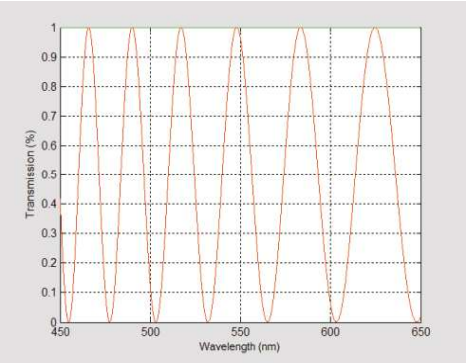
The low order waveplate which can be replaced by multi-order waveplate is designed to give a retardance of several full waves, plus the desired fraction. This results in a single, physically robust component with desired performance. However, even small variation in wavelength or temperature will result in significant changes in the desired fractional retardance.

Specifications

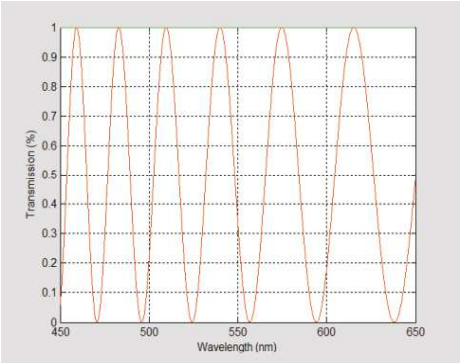
Material	Quartz
Dimension Tolerance	+0.0, -0.1
Wavefront Distortion	λ /8@633nm
Retardation Tolerance	λ /60- λ /150(λ <400nm); λ /150- λ /360 (400< λ <700nm); λ /350- λ /600 (λ >700nm);
Parallelism	<1 arc second
Surface Quality	20/10 Scratch/Dig
Clear Aperture	Central 90%
AR Coating	<0.2% @wavelength
Holder	Refer to 《Holders for waveplates》



Standard Wavelength:266nm,355nm,532nm,632.8nm,780nm,808nm,980nm,1064nm,1310nm,1550nm



λ /2@532nm



λ /4@532nm

Dayoptics Standard Products (Without Holder)

Quarter Waveplates P/N#	Half Waveplates P/N#	Diameter(mm)
WPL210Q	WPL210H	10.0
WPL212Q	WPL212H	12.7
WPL215Q	WPL215H	15.0
WPL220Q	WPL220H	20.0
WPL225Q	WPL225H	25.4
WPL230Q	WPL230H	30.0

ZERO ORDER WAVEPLATE

The zero order waveplate is designed to give a retardance of zero full waves, plus the desired fraction. Zero order waveplate shows better performance than multiple order waveplates. It has broad bandwidth and a lower sensitivity to temperature and wavelength changes. It should be considered for more critical applications.

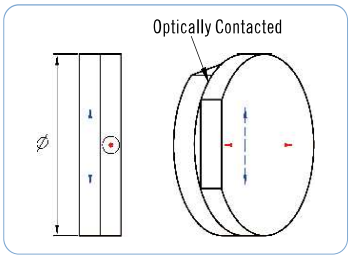
Specifications

Material	Quartz
Dimension Tolerance	+0.0, -0.1
Wavefront Distortion	< λ /8@633nm
Retardation Tolerance	λ /500
Parallelism	<1 arc second
Surface Quality	20/10 Scratch/Dig
Clear Aperture	Central 90%
AR Coating	<0.2% @Wavelength
Holder	Refer to 《Holder for Waveplate》

Standard Wavelength: 266nm,355nm,532nm,632.8nm,780nm,808nm,980nm,1064nm,1310nm,1550nm
Note: wavelengths within the range of 240-2300nm are also available upon request.

Zero Order Waveplate Optically Contacted

- Optically Contacted
- AR Coated, R<0.2%
- High Damage Threshold
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth



Standard Wavelength: 266nm,355nm,532nm,632.8nm,780nm,808nm,
850nm,980nm,1064nm,1310nm,1480nm,1550nm

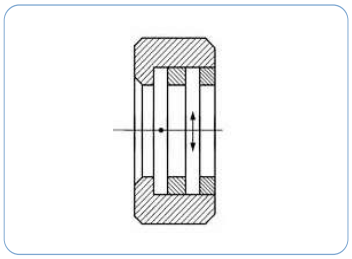
Dayoptics Standard Products (Without Holder)

Quarter Waveplates P/N#	Half Waveplates P/N#	Diameter(mm)
WP0210Q	WP0210H	10.0
WP0212Q	WP0212H	12.7
WP0215Q	WP0215H	15.0
WP0220Q	WP0220H	20.0
WP0225Q	WP0225H	25.4
WP0230Q	WP0230H	30.0

ZERO ORDER WAVEPLATE

Zero Order Waveplates Air-spaced

- Double Retardation Plates
- AR Coated, R<0.2% and Mounted
- High Damage Threshold
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth



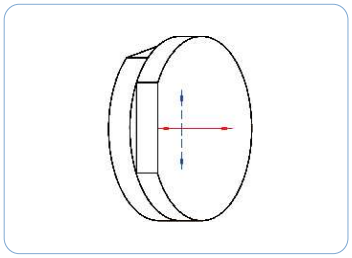
Dayoptics Standard Products

Quarter Waveplates P/N#	Half Waveplates P/N#	Waveplate Aperture(mm)	Mount Diameter(mm)	Mount Thickness (mm)
WPA210Q	WPA210H	10.0	25.4	6.0
WPA212Q	WPA212H	12.7	25.4	6.0
WPA215Q	WPA215H	15.0	25.4	6.0
WPA220Q	WPA220H	20.0	30.0	6.0
WPA225Q	WPA225H	25.4	30.0	6.0
WPA230Q	WPA230H	30.0	38.1	6.0

Zero Order Waveplates Cemented by Epoxy

This type of zero order waveplate is constructed of two multiple order waveplate with their axes crossed. Thus,the effect of the first plate is canceled by the second, except for the residual difference between them.

- Cemented by Epoxy
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- AR Coated, R<0.2%



Dayoptics Standard Products (Without Holder)

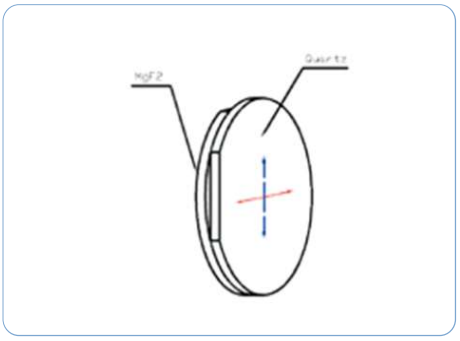
Quarter Waveplates P/N#	Half Waveplates P/N#	Diameter(mm)
WPC210Q	WPC210H	10.0
WPC212Q	WPC212H	12.7
WPC215Q	WPC215H	15.0
WPC220Q	WPC220H	20.0
WPC225Q	WPC225H	25.4
WPC230Q	WPC230H	30.0

ACHROMATIC WAVEPLATE

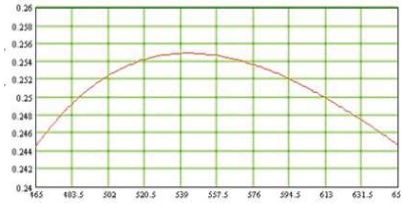
Dayoptics has special designed achromatic waveplates by using two pieces of plate. It is similar to Zero-order waveplate except that the two plates are made from different materials, such as crystal quartz and magnesium fluoride. Since the dispersion of the birefringence can be different for the two materials, it is possible to specify the retardation values at a wavelength range. From the curve, you can see that the bandwidth of such achromatic waveplate is very wide, while the achromatic waveplates remain a nearly constant retardance over a range of wavelength.

Specifications

Material	Quartz and MgF_2
Wavefront Distortion	λ /8@633nm
Dimension Tolerance	+0.0,-0.1
Retardation Tolerance	λ /100
Parallelism	<1 arc second
Surface Quality	40/20 Scratch/Dig
Clear Aperture	Central 90%
AR Coating	Ravg<0.8% at Central Wavelength
Standard Wavelength	VIS 465-650nm,NIR 650-1100nm,IR 1000-1750nm



WPBXXXH 465-650nm



WPBXXXQ 465-650nm

Achromatic Waveplate Optical Cemented

Quarter Waveplates P/N#	Half Waveplates P/N#	Diameter(mm)
WPB210Q	WPB210H	10.0
WPB212Q	WPB212H	12.7
WPB215Q	WPB215H	15.0
WPB220Q	WPB220H	20.0
WPB225Q	WPB225H	25.4
WPB230Q	WPB230H	30.0

Achromatic Waveplate Air-Spaced (Mounted)

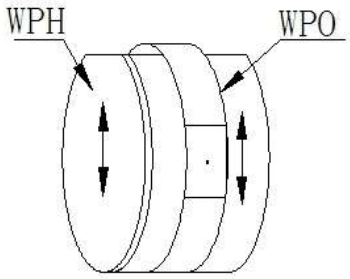
Quarter Waveplates P/N#	Half Waveplates P/N#	Waveplate Aperture(mm)	Mount Diameter(mm)
WPB510Q	WPB510H	10.0	12.7
WPB512Q	WPB512H	12.7	25.4
WPB515Q	WPB515H	15.0	25.4
WPB520Q	WPB520H	20.0	25.4
WPB525Q	WPB525H	25.4	30.0
WPB530Q	WPB530H	30.0	38.1

UV ACHROMATIC WAVEPLATE

Dayoptics has special designed UV achromatic waveplates by using four pieces of plates.It consist of our product WPO and WPH. It has a small bandwidth and you can ues that in the range of UV wavelength .

Specification

Material	Quartz and MgF_2
Wavefront Distortion	λ /4@633nm
Dimension Tolerance	+0.0,-0.2
Retardation Tolerance	λ /90
Parallelism	<1 arc second
Surface Quality	40/20 Scratch/Dig
Clear Aperture	Central 85%
AR Coating	Ravg<2.5% at Central Wavelength
Standard Wavelength	UV230-280nm ; UV280-350nm;UV350-450nm



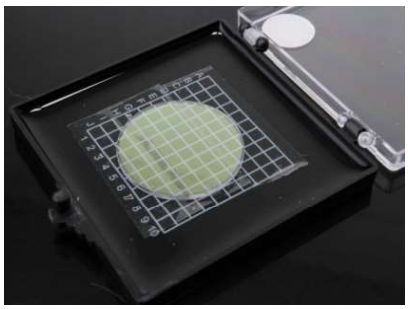
Achromatic Waveplate Optical Cemented

Quarter Waveplate P/N#	Half Waveplate P/N#	Diameter(mm)
WPB110Q	WPB110H	10.0
WPB112Q	WPB112H	12.7
WPB115Q	WPB115H	15.0
WPB120Q	WPB120H	20.0

IR WAVEPLATE

Specifications

Dimension	+0.0,-0.2mm
Clear Aperture	>90%
Wavefront Distortion	λ/8@633nm
Surface Quality	40/20 Scratch/Dig
Retardation Tolerance	λ/300
Parallelism	< 1″
Coating	R<0.5% @ central wavelength



Standard Wavelength:

λ/2 : 3500nm, 4000nm, 4500nm, 5000nm, 5500nm, 6000nm, 6500nm, 7000nm

λ/4 : 3500nm, 4000nm, 4500nm, 5000nm, 5500nm, 6000nm, 6500nm, 7000nm

Dayoptics Standard Products(Without Holder)

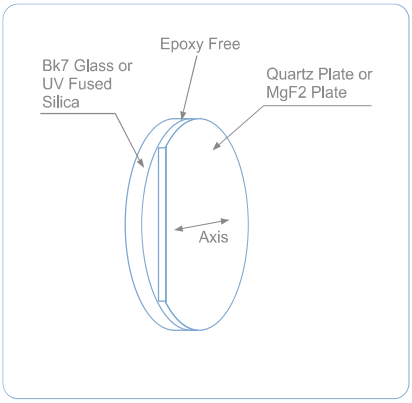
Quarter Waveplates P/N#	Half Waveplates P/N#	Diameter (mm)
WPS212Q-M	WPS212H-M	12.7
WPS220Q-M	WPS220H-M	20.0
WPS225Q-M	WPS225H-M	25.4

PS: as regards the true zero order quarter waveplate,if the thickness is too thin,we will do the one-order waveplate.
More detail information,please send the mail to us:sales@dayoptics.com

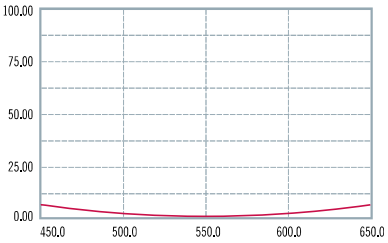
HIGH POWER WAVEPLATE

Features

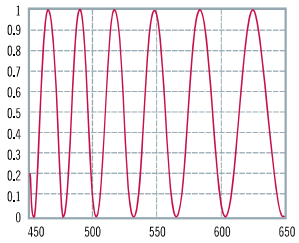
- True Zero Order Waveplate
- Epoxy Free
- High Power:＞10J/cm²@1064nm,20ns,20Hz
- Used Wavelength:400～3000nm
- Good for UV Application
- Easy Handling



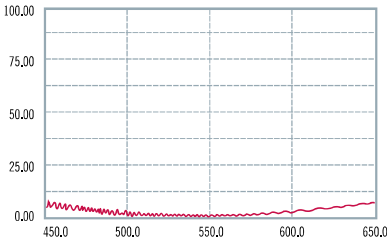
Waveplate Comparison	High Power Waveplate	Low-order Waveplate	Zero-order Waveplate (Cemented/Optical Contacted)
For Short	WPH	WPL	WPC / WPO
λ / 100 Spectra Bandwidth@532nm	9.16nm	0.51nm	9.16nm
λ / 100 Temperature Bandwidth△T	230.56K	12.13K	230.56K
Acceptance Angle	11.37°	2.63°	11.37°
Damage Threshold@1064nm, 10ns,20HZ	＞10J/cm²	＞10J/cm²	～0.1J/cm²(WPC) ～2J/cm²(WPO)
Extinction Ratio	High	High	Low



High Power Waveplate



Low-order Waveplate



Zero-order Waveplate

Quarter Wavepalte Part No.	Half waveplate Part No.	Diameter
WPH210Q	WPH210H	10.0
WPH212Q	WPH212H	12.7
WPH215Q	WPH215H	15.0
WPH220Q	WPH220H	20.0
WPH225Q	WPH225H	25.4
WPH230Q	WPH230H	30.0

Advantages of High Power Waveplate

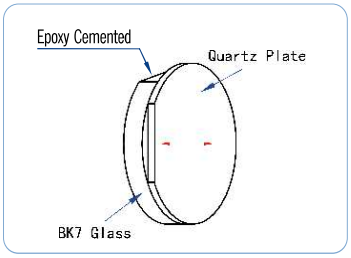
a. Compare with WPL, WPH has wider spectra & temperature bandwidth and wider angular field.

b. Based on our unique optical bonding technology, WPH has higher damage threshold and better extinction ratio which compared with WPO or WPC.

c. The thickness of WPH is more suitable for handling compare with single plate true zero order waveplate, which is easy to be damaged.

TRUE ZERO ORDER WAVEPLATE

This type of waveplate is constructed of a true zero order waveplate and a BK7 substrate. As the waveplate is very thin and easy to be damaged, the BK7 plates function is to strengthen the waveplate.



- Cemented by Epoxy
- Wide Angle Acceptance
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- AR Coated, R<0.2%

Standard Wavelength:

λ /4: 532nm, 632.8nm, 780nm, 808nm, 980nm, 1064nm, 1310nm, 1480nm, 1550nm

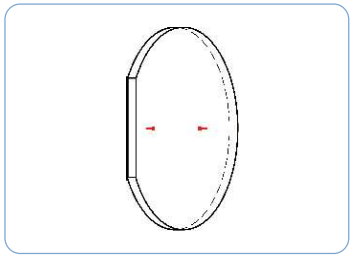
λ /2: 532nm, 632.8nm, 780nm, 808nm, 980nm, 1064nm, 1310nm, 1480nm, 1550nm

Dayoptics Stardand Products

Quarter Waveplates P/N#	Half Waveplates P/N#	Diameter(mm)
WPF210Q	WPF210H	10.0
WPF212Q	WPF212H	12.7
WPF215Q	WPF215H	15.0
WPF220Q	WPF220H	20.0
WPF225Q	WPF225H	25.4
WPF230Q	WPF230H	30.0

True Zero Order waveplate Single Waveplate

This type of waveplate is made of a very thin quartz waveplate which function as true zeor order. In some cases, the thickness required for single ture zero order waveplates is too thin, they have to be provided as first order waveplate.



Standard Wavelength:

λ /4: 1310nm, 1480nm, 1550nm

λ /2: 980nm, 1064nm, 1310nm, 1480nm, 1550nm

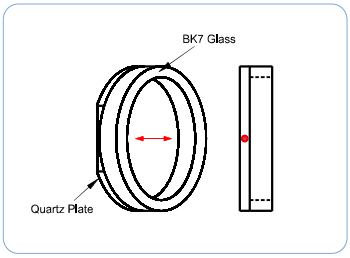
Minimal Thickness: 0.038mm

Dayoptics Standard Products

Quarter Waveplates P/N#	Half Waveplates P/N#	Diameter(mm)
WPS210Q	WPS210H	10.0
WPS212Q	WPS212H	12.7
WPS215Q	WPS215H	15.0
WPS220Q	WPS220H	20.0
WPS225Q	WPS225H	25.4
WPS230Q	WPS230H	30.0

TRUE ZERO ORDER WAVEPLATE

WPQ is our new product, true zero order waveplate single waveplate on annual glass frames, the ray only through the quartz, epoxy free. It can meet high damage threshold and better parallelism. The frames can be designed by different requirement .



Standard Wavelength:

λ /4: 1310nm, 1480nm, 1550nm

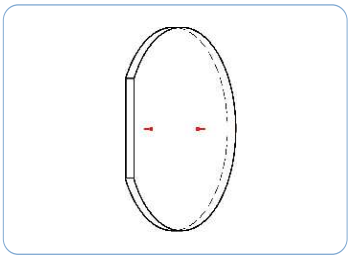
λ /2: 980nm, 1064nm, 1310nm, 1480nm, 1550nm

Dayoptics Standard Products

Quarter Waveplates P/N#	Half Waveplates P/N#	Diameter(mm)
WPQ210Q	WPQ210H	10.0
WPQ212Q	WPQ212H	12.7
WPQ215Q	WPQ215H	15.0
WPQ220Q	WPQ220H	20.0
WPQ225Q	WPQ225H	25.4
WPQ230Q	WPQ230H	30.0

Double Wavelength Waveplate

Double Wavelength Waveplate is a special kind of multi-order waveplate, it can meet the required retardation at two wavelength at the same time. It widely used to improve the conversion efficiency in solid double frequency laser device.



- Better Parallelism
- Wide Angle Acceptance
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- AR Coated, R<0.2%

Standard Wavelength:

λ @1064nm+ λ /2@532nm, λ /2@1064nm+ λ @532nm

λ @532nm+ λ /2@355nm, λ /2@532nm+ λ @355nm

λ @800nm+ λ /2@400nm, λ /2@800nm+ λ @400nm

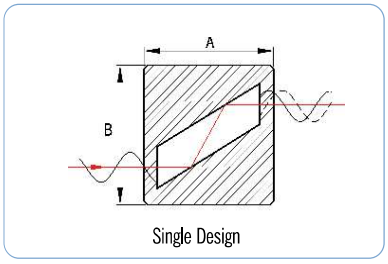
Dayoptics Standard Products

P/N#	Diameter(mm)
WPD210	10.0
WPD212	12.7
WPD215	15.0
WPD220	20.0
WPD225	25.4
WPD230	30.0

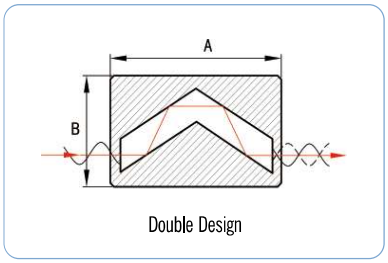
FRESNAL RHOMB RETARDER

BK7 Fresnal Rhomb Retarder Specifications

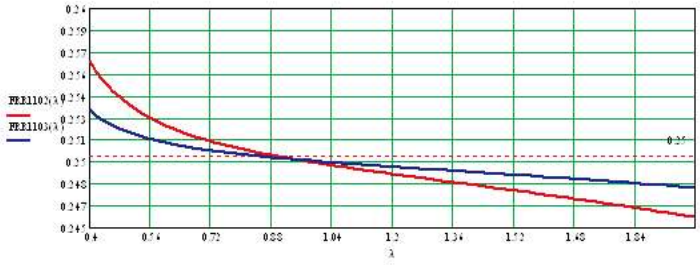
Material	BK7 Grade A Optical Glass
Dimension Tolerance	+0.0,-0.2mm
Clear Aperture	>80%
Flatness	λ /10@ 632.8nm
Surface Quality	20/10 Scratch/Dig
Bevel	0.2mm to 0.5mm
Aperature	10x10 mm



Single Design



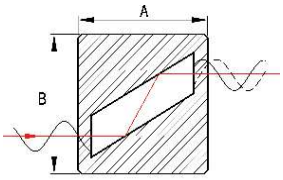
Double Design


FRR1102,FRR1103 retardation curve

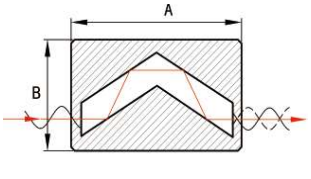
Part No.	Ratardation	Design	Using Wavelength	Mounter Dimension		
				A(mm)	B(mm)	H(mm)
FRR1101	λ /4	Single	400-2000nm	35	40	37
FRR1102	λ /2	Double	400-2000nm	64	40	37
FRR1103	λ /4	Double	400-2000nm	140	40	37

Fused Silica Fresnel Rhomb Retarder Specifications

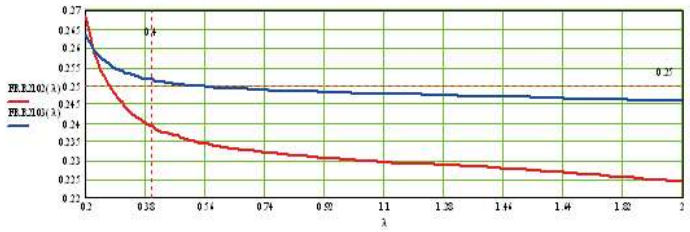
Material	UV Grade Fused Silica
Dimension Tolerance	+0.0,-0.2mm
Clear Aperture	>80%
Flatness	λ /10@ 632.8nm
Surface Quality	20/10 scratch/dig
Bevel	0.2mm to 0.5mm
Aperature	10x10 mm



Single



Double


FRR2102, FRR2103 retardation curve

Part No.	Ratardation	Design	Using Wavelength	Mounter Dimension		
				A(mm)	B(mm)	H(mm)
FRR2101	λ /4	Single	200-2000nm	35	40	37
FRR2102	λ /2	Double	200-2000nm	64	40	37
FRR2103	λ /4	Double	200-2000nm	140	40	37

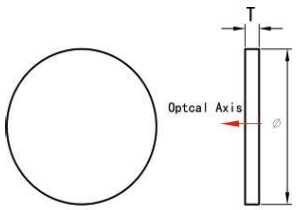
POLARIZATION ROTATOR

Polarization roators offer 45° or 90° rotation at a number of common laser wavelengths. The optical axis in a polarization rotator is perpendicular to the polished face. The result is that the orientation of in put linearly polarized light is rotated as it propagates through the device.

Specifications

- Wide Angle Acceptance
- Better Temperature Bandwidth
- Wide Wavelength Bandwidth
- AR Coated, R<0.2%

Standard Wavelength: 532nm, 632.8nm, 1064nm



Polarization Rotators

Dayoptics Standard Products

Part No.	Diameter(mm)	Rotation
WPR4512	12.7	45°
WPR4515	15.0	45°
WPR4520	20.0	45°
WPR4525	25.4	45°
WPR9012	12.7	90°
WPR9015	15.0	90°
WPR9020	20.0	90°
WPR9025	25.4	90°

Order information: 1064nm

HOLDER

Holder for Waveplate

Specifications:

- Material:Black anodized aluminum
- Diameter tolerance:+0 /-0.2mm
- Thickness tolerance:+/-0.1mm

P/N#	Diameter(mm)	Thickness(mm)	Aperture(mm)	CA(mm)
WH2510	25.4	6.0	10.0	9.0
WH2512	25.4	6.0	12.7	11.5
WH2515	25.4	6.0	15.0	13.5
WH3020	30.0	6.0	20.0	18.0
WH3025	30.0	6.0	25.4	22.8
WH3830	38.1	6.0	30.0	27.0

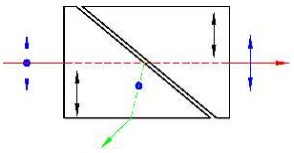
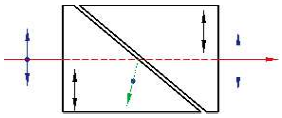
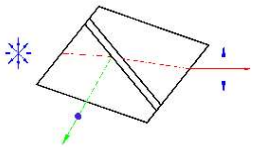
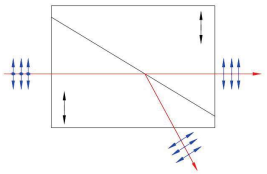
Holders for Waveplates

Specifications:

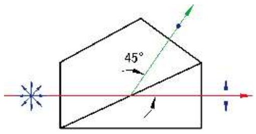
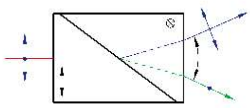
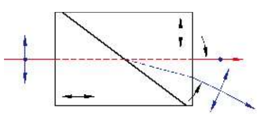
- Material:Black anodized aluminum
- Rotation tolerance:<5°
- Diameter tolerance:+/-0.1mm

P/N#	Width	Height	Length	Diameter(ring holder)	Thickness(ring holder)
WRH25	40	60	10	25.4	6.0
WRH30	45	63	10	30.0	6.0

POLARIZERS OVERVIEW

Polarizer	Illustration	Damaged Threshold	Interface	Transmission	Part#	Material	Wavelength(nm)	Extinction Ratio	Angular Field(°)	Page
Glan-Laser Polarizer (PGL)	 α-BBO Glan-Laser Polarizer	High Power 500MW/cm^2 (with escape windows)	Air-space	Medium	PGL7xxx	Calcite	350-2300	<5x10^{-5}	>7.7	23-24
					PGL6xxx	α -BBO	190-3500	<5x10^{-5}	>6.0	
					PGL8xxx	YVO_4	500-4000	<5x10^{-6}	>6.5	
Glan-Taylor Polarizer (PGT)	 α-BBO Glan-Taylor Polarizer	Low to Medium 200MW/cm^2 (without escape windows)	Air-space	Medium	PGT7xxx	Calcite	350-2300	<5x10^{-5}	>7.7	25-26
					PGT6xxx	α - BBO	190-3500	<5x10^{-5}	>6.0	
					PGT8xxx	YVO_4	500-4000	<5x10^{-6}	>6.5	
High Transmission Glan-Laser Polarizer (PGH)	 Calcite High Transmission Glan-Laser Polarizer	High Power 500MW/cm^2 (with escape windows)	Air-space	High	PGH7xxx	Calcite	350-2300	<5x10^{-5}	>7.7	27-28
					PGH8xxx	YVO_4	500-4000	<5x10^{-6}	>6.5	
Glan-Thompson Polarizer (PGM)	 α-BBO Glan-Thompson Polarizer	Low Power 100MW/cm^2	Cemented	Medium	PGM71xx	Calcite	350-2300	<5x10^{-5}	14-16	29-30
					PGM72xx	Calcite	350-2300	<5x10^{-5}	25-28	
					PGM6xxx	α -BBO	220-900	<5x10^{-5}	>15	

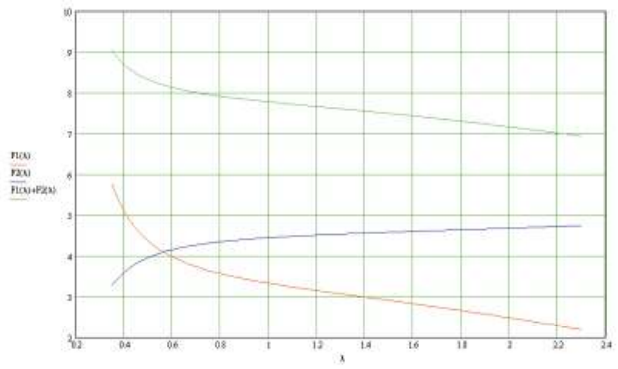
POLARIZERS OVERVIEW

Polarizer	Illustration	Damaged Threshold	Interface	Transmission	Part#	Material	Wavelength(nm)	Extinction Ratio	Angular Field(°)	Page
Glan-Thompson Polarizer Beamsplitter Cube (PGB)	 Calcite Glan-Thompson Polarizer Beamsplitter Cube	Low to Medium 150MW/cm^2	Cemented	Medium	PGB7xxx	Calcite	350-2300	$<5x10^{-5}$	14-16	35
Wollaston Polarizer (PWS)	 α-BBO Wollaston Polarizer	Medium Power 200MW/cm^2	Optical Contact	High	PWS6xxx	α - BBO	190-3500	$<5x10^{-6}$	15-27	31-32
					PWS9xxx	Quartz	200-2300	$<5x10^{-5}$	2-3	
		Low Power 100MW/cm^2	Cemented	High	PWS7xxx	Calcite	350-2300	$<5x10^{-5}$	16.7-22.5	
					PWS8xxx	YVO_4	500-4000	$<5x10^{-6}$	19.6-23.3	
Rochon Polarizer (PRH)	 α-BBO Rochon Polarizer	Low Power 100MW/cm^2	Cemented	High	PRH8xxx	YVO_4	500-4000	$<5x10^{-6}$	1-2	33-34
		Medium Power 200MW/cm^2	Optical Contact	High	PRH6xxx	α -BBO	190-3500	$<5x10^{-6}$	8-14	
					PRH9xxx	Quartz	200-2300	$<5x10^{-5}$	1-2	
					PRH5xxx	MgF_2	120-8500	$<1x10^{-4}$	1-2	

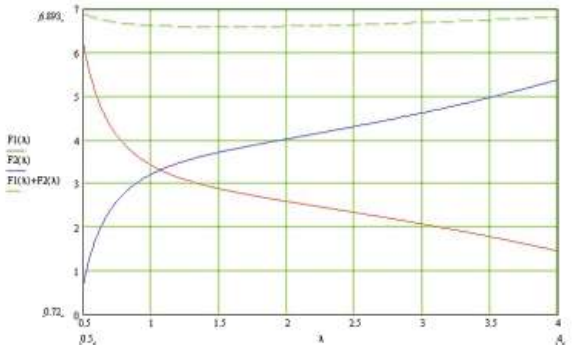
HIGH POWER GLAN LASER POLARIZER

Glan Laser polarizer is made of two same birefringent material prisms that are assembled with an air space. The polarizer is a modification of the Glan Taylor type and is designed to have less reflection loss at the prism junction. The polarizer with two escape windows allows the rejected beam to escape out of the polarizer, which makes it more desirable for high energy lasers. The surface quality of these faces is relatively poor compare to that of entrance and exit faces. No scratch and dig surface quality specifications are assigned to these faces. The polarized field F1 and F2 of these is shown in the plot below.

Angular Field vs Wavelength



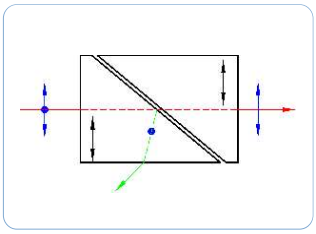
Calcite, 350-2300nm



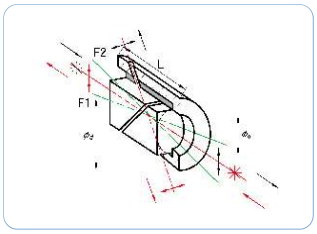
YVO , 500-4000nm
4

Features

- Air-spaced
- Close to Brewster's Angle Cutting
- High Polarization Purity
- Short Length
- Suitable for low to medium power application where the rejected beam is not required



α-BBO
Glan-Laser Polarizer



Glan-Laser Prism

Specifications

Material	a-BBO, Calcite or YVO_4
Wavelength Range	a-BBO: 190-3500 nm, Calcite: 350-2300 nm, YVO_4: 500-4000 nm
Extinction Ratio	Calcite: $<5x10^{-5}$; a-BBO: $<5x10^{-6}$; YVO_4: $<5x10^{-6}$
Surface Quality	20/10 Scratch/Dig
Beam Deviation	$<$ 3 arc minutes
Wavefront Distortion	$< \lambda/4$@633nm
Damage Threshold	$>$500 MW/cm^2
Coating	Single MgF_2
Mount	Black Anodized Aluminium

HIGH POWER GLAN LASER POLARIZER

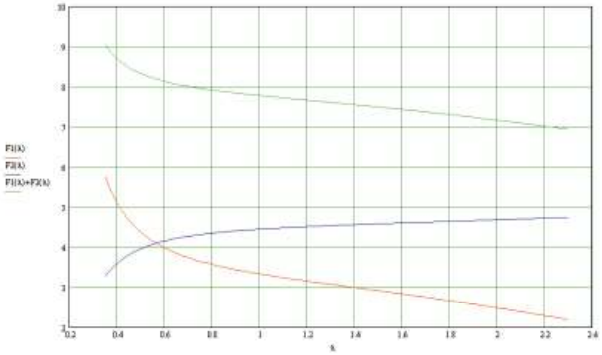
Standard Products

a -BBO High Power Glan Laser Polarizer						
Part No.	Wavelength Rang(nm)	Extinction Ratio	Angular Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PGL6206	200-300	$<5x10^{-6}$	>6.0	6.0	15.0	29.0
PGL6208	200-300	$<5x10^{-6}$	>6.0	8.0	25.4	31.0
PGL6210	200-300	$<5x10^{-6}$	>6.0	10.0	25.4	31.0
PGL6215	200-300	$<5x10^{-6}$	>6.0	15.0	30.0	38.6
PGL6220	200-300	$<5x10^{-6}$	>6.0	20.0	38.0	48.9
PGL6306	300-700	$<5x10^{-6}$	>6.0	6.0	15.0	25.0
PGL6308	300-700	$<5x10^{-6}$	>6.0	8.0	25.4	25.0
PGL6310	300-700	$<5x10^{-6}$	>6.0	10.0	25.4	26.0
PGL6315	300-700	$<5x10^{-6}$	>6.0	15.0	30.0	33.4
PGL6320	300-700	$<5x10^{-6}$	>6.0	20.0	38.0	43.6
PGL6706	700-3000	$<5x10^{-6}$	>6.0	6.0	15.0	23.0
PGL6708	700-3000	$<5x10^{-6}$	>6.0	8.0	25.4	24.7
PGL6710	700-3000	$<5x10^{-6}$	>6.0	10.0	25.4	25.9
PGL6715	700-3000	$<5x10^{-6}$	>6.0	15.0	30.0	33.0
PGL6720	700-3000	$<5x10^{-6}$	>6.0	20.0	38.0	43.6
Calcite High Power Glan Laser Polarizer						
Part No.	Wavelength Rang(nm)	Extinction Ratio	Angular Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PGL7006	350-2300	$<5x10^{-5}$	>7.7	6.0	15.0	21.0
PGL7008	350-2300	$<5x10^{-5}$	>7.7	8.0	25.4	24.5
PGL7010	350-2300	$<5x10^{-5}$	>7.7	10.0	25.4	26.2
PGL7015	350-2300	$<5x10^{-5}$	>7.7	15.0	30.0	33.3
PGL7020	350-2300	$<5x10^{-5}$	>7.7	20.0	38.0	42.3
YVO4 High Power Glan Laser Polarizer						
Part No.	Wavelength Rang(nm)	Extinction Ratio	Angular Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PGL8006	500-4000	$<5x10^{-6}$	>6.5	6.0	15.0	15.5
PGL8008	500-4000	$<5x10^{-6}$	>6.5	8.0	25.4	19.0
PGL8010	500-4000	$<5x10^{-6}$	>6.5	10.0	25.4	22.5
PGL8015	500-4000	$<5x10^{-6}$	>6.5	15.0	38.0	31.0

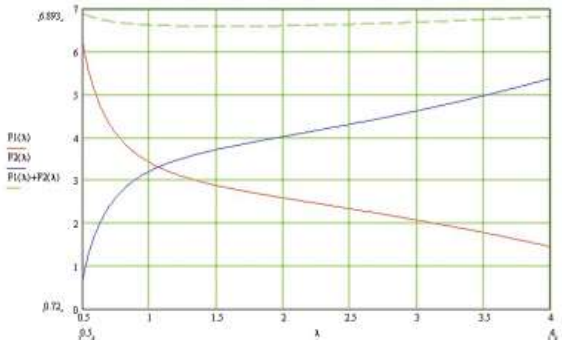
GLAN TAYLOR POLARIZER

Glan Taylor polarizer is made of two same birefringent material prisms that are assembled with an air space. Its length to aperture ratio which is less than 1.0 makes it a relatively thin polarizer. The polarizer with no side escape windows is suitable for low to medium power application where the side rejected beams are not required. The angular field of different materials of polarizers is listed below for comparison.

Angular Field vs Wavelength



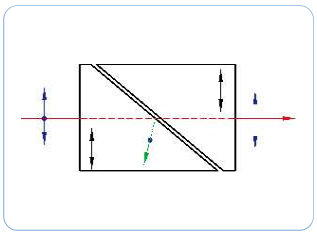
Calcite, 350-2300nm



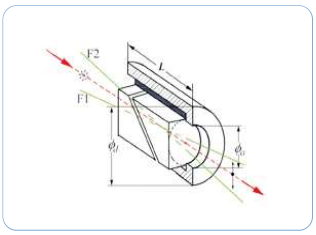
YVO , 500-4000nm
4

Features

- Air-spaced
- Close to Brewster's Angle Cutting
- High Polarization Purity
- Short Length
- Suitable for low to medium power application where the rejected beam is not required



α-BBO
Glan-Taylor Polarizer



Glan Taylor Prism

Specifications

Material	a-BBO, Calcite or YVO_4
Wavelength Range	a-BBO: 190-3500 nm, Calcite: 350-2300 nm, YVO_4: 500-4000 nm
Extinction Ratio	Calcite:$<5x10^{-5}$; a-BBO:$<5x10^{-6}$; YVO_4:$<5x10^{-6}$
Surface Quality	20/10 Scratch/Dig
Beam Deviation	$<$ 3 arc minutes
Wavefront Distortion	$< \lambda$ /4@633nm
Damage Threshold	$>$200 MW/cm^2
Coating	Single MgF_2
Mount	Black Anodized Aluminium

GLAN TAYLOR POLARIZER

Standard Products

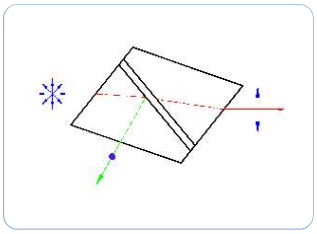
α -BBO Glan Taylor Polarizer						
Part No.	Wavelength Rang(nm)	Extinction Ratio	Angular Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PGT6206	200-300	<5x10^{-6}	>6.0	6.0	15.0	15.0
PGT6208	200-300	<5x10^{-6}	>6.0	8.0	25.4	17.0
PGT6210	200-300	<5x10^{-6}	>6.0	10.0	25.4	19.0
PGT6215	200-300	<5x10^{-6}	>6.0	15.0	30.0	23.0
PGT6220	200-300	<5x10^{-6}	>6.0	20.0	38.0	29.0
PGT6306	300-700	<5x10^{-6}	>6.0	6.0	15.0	15.0
PGT6308	300-700	<5x10^{-6}	>6.0	8.0	25.4	17.0
PGT6310	300-700	<5x10^{-6}	>6.0	10.0	25.4	19.0
PGT6315	300-700	<5x10^{-6}	>6.0	15.0	30.0	23.0
PGT6320	300-700	<5x10^{-6}	>6.0	20.0	38.0	29.0
PGT6706	700-3000	<5x10^{-6}	>6.0	6.0	15.0	15.0
PGT6708	700-3000	<5x10^{-6}	>6.0	8.0	25.4	17.0
PGT6710	700-3000	<5x10^{-6}	>6.0	10.0	25.4	19.0
PGT6715	700-3000	<5x10^{-6}	>6.0	15.0	30.0	23.0
PGT6720	700-3000	<5x10^{-6}	>6.0	20.0	38.0	29.0
Calcite Glan Taylor Polarizer						
Part No.	Wavelength Rang(nm)	Extinction Ratio	Angular Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PGT7006	350-2300	<5x10^{-5}	>7.7	6.0	15.0	15.0
PGT7008	350-2300	<5x10^{-5}	>7.7	8.0	25.4	17.0
PGT7010	350-2300	<5x10^{-5}	>7.7	10.0	25.4	19.0
PGT7015	350-2300	<5x10^{-5}	>7.7	15.0	30.0	23.0
PGT7020	350-2300	<5x10^{-5}	>7.7	20.0	38.0	29.0
YVO4 Glan Taylor Polarizer						
Part No.	Wavelength Rang(nm)	Extinction Ratio	Angular Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PGT8006	500-4000	<5x10^{-6}	>6.5	6.0	15.0	12.0
PGT8008	500-4000	<5x10^{-6}	>6.5	8.0	25.4	15.0
PGT8010	500-4000	<5x10^{-6}	>6.5	10.0	25.4	17.0
PGT8015	500-4000	<5x10^{-5}	>6.5	15.0	30.0	20.0
PGT8020	500-4000	<5x10^{-6}	>6.5	20.0	38.0	25.0

HIGH TRANSMSSION POLARIZER

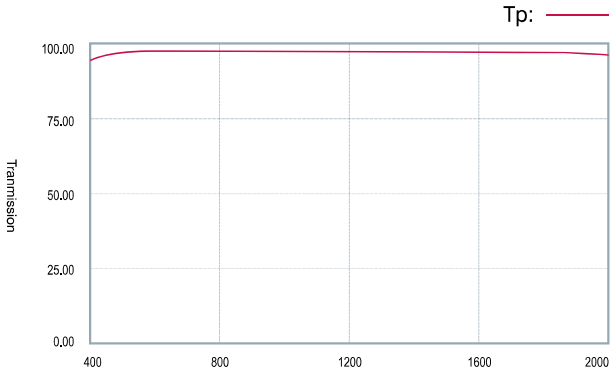
High Transmission Glan Laser Polarizers (PGH) is a special type of Glan Laser Polarizers. The incidence angle of the PGH is brewster angle cut which can great improve the transmission ray up to 98% in a wide range of wavelength without coating. The polarizer can be made from Calcite and YVO_4 crystals. In order to get high transmission of wide range of wavelength, the polarizers are not recommended to use for large acceptance angle. Typically used is within +/-5°.

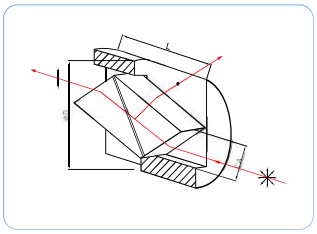
Features

- UV High Power Application， >20J/cm²@1064nm,10ns, 20Hz
- High Transmission: T>95%
- High Extinction Ratio, Wide Acceptance Angle
- Material: Calcite, YVO_4
- Dimension: 3×3mm ~ 20×20mm



Calcite
High Transmission
Glan-Laser Polarizer





Glan Laser Polarizer High Transmission
Curve Brewster Angle

Specifications

Material	Calcite, YVO_4
Wavelength Range	Calcite:350-2300nm,YVO_4:500-4000nm
Extinction Ratio	Calcite:<$5x10^{-5}$, YVO_4:<$5x10^{-6}$
Transmission	>98%(typical)
Surface Quality	20/10 Scratch/Dig
Beam Deviation	< 3 arc minutes
Wavefornt Distortion	λ/4@633nm
Damage Threshold	>500 MW/cm²
Coating	Uncoated
Mount	Black Anodized Aluminium

HIGH TRANSMSSION POLARIZER

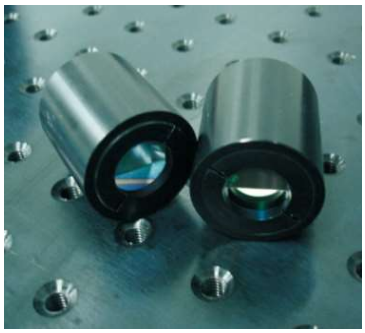
Standard Products

Calcite High Transmission Glan Laser Polarizer							
Part No.	Wavelength Rang	Extinction Ratio	Angular Field	C.A.f a (mm)	O.D.f d (mm)	L±0.1 (mm)	Beam offset
PGH7006	350-2300	$<5X10^{-5}$	~5°(typical)	6.0	25.4	25.0	5.5mm
PGH7008	350-2300	$<5X10^{-5}$	~5°(typical)	8.0	25.4	32.0	7.8mm
PGH7010	350-2300	$<5X10^{-5}$	~5°(typical)	10.0	30.0	38.0	9.3mm
PGH7015	350-2300	$<5X10^{-5}$	~5°(typical)	15.0	38.0	54.0	14.0mm
YVO4 High Transmission Glan Laser Polarizer							
Part No.	Wavelength Rang	Extinction Ratio	Angular Field	C.A.f a (mm)	O.D.f d (mm)	L±0.1 (mm)	Beam offset
PGH8006	500-4000	$<5X10^{-6}$	~5°(typical)	6.0	25.4	28.0	5.5mm
PGH8008	500-4000	$<5X10^{-6}$	~5°(typical)	8.0	30.0	38.0	13.3mm
PGH8010	500-4000	$<5X10^{-6}$	~5°(typical)	10.0	38.0	45.0	16.0mm

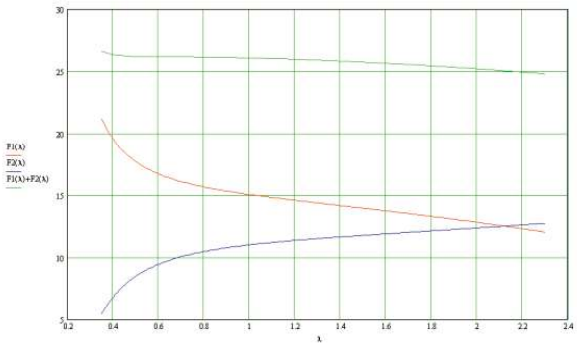
GLAN THOMPSON POLARIZER

Glan Thompson polarizer is made of two calcite prisms or two α -BBO prisms cemented together. Two types of Glan Thompsons are available. One is the standard form and the other is the long form. Their length to aperture ratios are 2.5 : 1 and 3.0 : 1 respectively. Glan Thompson polaizers tend to have higher extinction ratio than air spaced polarizers. In the ultra violet spectrum, their transmission is limited by absorption in birefriengent materials as well as the cement layer. α -BBO polarizers and Calcite polarizers can be used from about 220 to 900nm and 350 to 2300 nm respectively.

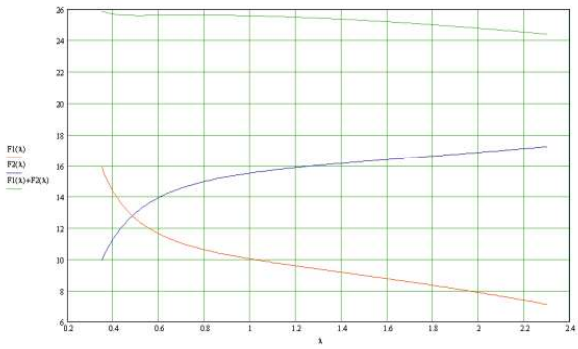
The polarizers have the widest field angle of any design. The standard form of this polarizer with 2.5:1 length to aperture ratio has a full acceptance cone angle of more than 15 ° @ 589nm, symmetric about the input axis, while the long form with 3:1 ratio has a field angle >26 °.The polarized field F1 and F2 of all these is shown in the plot below.



Angular Field vs Wavelength



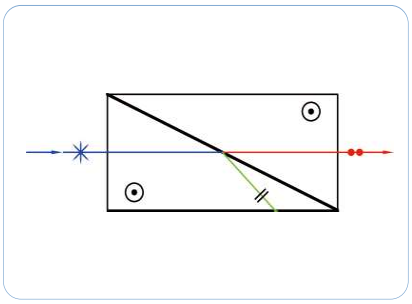
Calcite:L/A=3 (350-2300nm)



Calcite:L/A=2.5 (350-2300nm)

Specifications

Material	a-BBO, Calcite
Wavelength Range	a-BBO: 200-900 nm, Calcite: 350-2300 nm
Extinction Ratio	Calcite:<$5x10^{-5}$; a-BBO:<$5x10^{-6}$
Surface Quality	20/10 Scratch/Dig
Beam Deviation	< 3 arc minutes
Wavefront Distortion	< λ /4@633nm
Damage Threshold	>200 MW/cm^2
Coating	Single MgF_2
Mount	Black Anodized Aluminium



α-BBO
Glan-Thompson Polarizer

GLAN THOMPSON POLARIZER

Standard Products

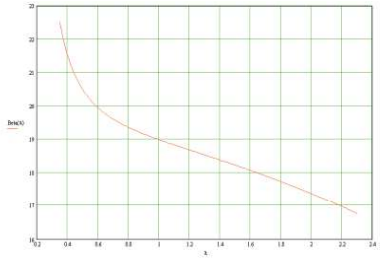
a -BBO Glan Thompson Polarizer Special for DUV, Visible and NIR(200-900nm)						
Part No.	L(Material)/CA	Extinction Ratio	Angular Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PGM6006	1.6	$<5x10^{-6}$	>15	6	15	18
PGM6008	1.6	$<5x10^{-6}$	>15	8	25.4	21
PGM6010	1.6	$<5x10^{-6}$	>15	10	25.4	24.5
PGM6012	1.6	$<5x10^{-6}$	>15	12.7	25.4	29
PGM6015	1.6	$<5x10^{-6}$	>15	15	30	33
PGM6020	1.6	$<5x10^{-6}$	>15	20	38	41.5
Calcite Glan Thompson Polarizer (350-2300nm)						
Part No.	L(Material)/CA	Extinction Ratio	Angular Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PGM7106	2.5	$<5x10^{-5}$	14-16	6	15	23
PGM7108	2.5	$<5x10^{-5}$	14-16	8	25.4	28
PGM7110	2.5	$<5x10^{-5}$	14-16	10	25.4	33
PGM7112	2.5	$<5x10^{-5}$	14-16	12.7	25.4	39
PGM7115	2.5	$<5x10^{-5}$	14-16	15	30	45.5
PGM7206	3	$<5x10^{-5}$	25-28	6	15	26
PGM7208	3	$<5x10^{-5}$	25-28	8	25.4	32
PGM7210	3	$<5x10^{-5}$	25-28	10	25.4	38
PGM7212	3	$<5x10^{-5}$	25-28	12.7	25.4	46
PGM7215	3	$<5x10^{-5}$	25-28	15	30	53

Order information: 450-650nm PBS506-450-650nm

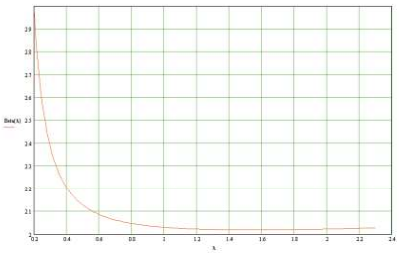
WOLLASTON POLARIZER

Wollaston polarizer is made of two birefringent material prisms that are cemented together. The deviations of the ordinary and extraordinary beams are nearly symmetrical about the input beam axis, so that the Wollaston polarizing beam splitter has approximately twice the deviation of the Rochon. The separation angle exhibits chromatic dispersion, as shown in the plot blow. Any separation angle can be designed upon requirement. The separation angle of standard products vs wavelength is shown in the plot below.

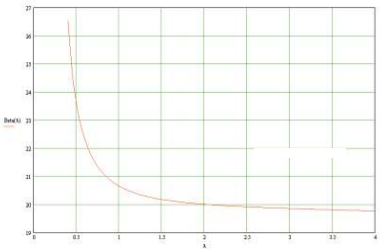
Angular Field vs Wavelength



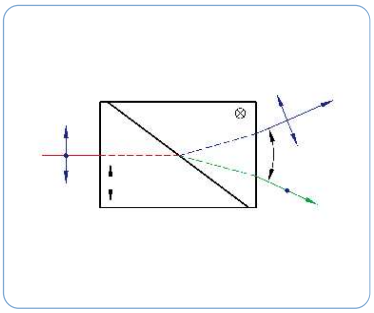
Calcite:350-2300nm



Quartz, 200-3300nm



YVO_4, 500-4000nm

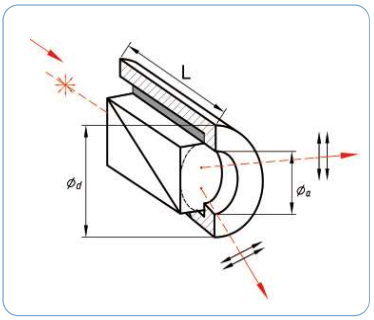


α-BBO

Wollaston Polarizer

Specifications

Material	α -BBO, Calcite, YVO_4, Quartz
Wavelength Range	α -BBO:190-3500 nm, Calcite:350-2300nm, YVO_4:500-4000nm, Quartz:200-2300nm
Extinction Ratio	Calcite, Quartz:$<5x10^{-5}$; a-BBO, YV04:$<5x10^{-6}$
Surface Quality	20/10 Scratch/Dig
Beam Deviation	< 3 arc minutes
Wavefront Distortion	< λ /4@633nm
Damage Threshold	>500 MW/cm^2
Coating	Single MgF_2
Mount	Black Anodized Aluminium



WOLLASTON POLARIZER

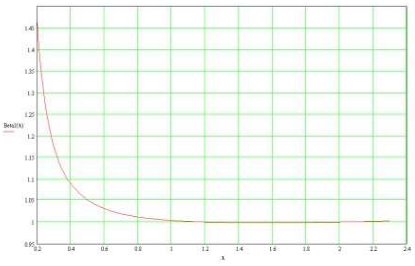
Standard Products

α -BBO Wollaston Polarizer					
Part No.	**Extinction Ratio**	**Separate Field(°)**	**C.A. Φ a(mm)**	**O.D. Φ d(mm)**	**L±0.1(mm)**
PWS6006	$<5x10^{-6}$	15-27 16@800nm	6.0	15.0	14.0
PWS6008	$<5x10^{-6}$	15-27 16@800nm	8.0	25.4	16.0
PWS6010	$<5x10^{-6}$	15-27 16@800nm	10.0	25.4	18.0
PWS6015	$<5x10^{-6}$	15-27 16@800nm	15.0	30.0	23.0
PWS6020	$<5x10^{-6}$	15-27 16@800nm	20.0	38.0	28.0
Calcite Wollaston Polarizer					
Part No.	**Extinction Ratio**	**Separate Field(°)**	**C.A. Φ a(mm)**	**O.D. Φ d(mm)**	**L±0.1(mm)**
PWS7006	$<5x10^{-5}$	16.7-22.5 19@980nm	6.0	15.0	14.0
PWS7008	$<5x10^{-5}$	16.7-22.5 19@980nm	8.0	25.4	16.0
PWS7010	$<5x10^{-5}$	16.7-22.5 19@980nm	10.0	25.4	18.0
PWS7015	$<5x10^{-5}$	16.7-22.5 19@980nm	15.0	30.0	23.0
PWS7020	$<5x10^{-5}$	16.7-22.5 19@980nm	20.0	38.0	28.0
Quartz Wollaston Polarizer					
Part No.	**Extinction Ratio**	**Separate Field(°)**	**C.A. Φ a(mm)**	**O.D. Φ d(mm)**	**L±0.1(mm)**
PWS9006	$<5x10^{-5}$	2-3 2@1064nm	6.0	15.0	20.0
PWS9008	$<5x10^{-5}$	2-3 2@1064nm	8.0	25.4	24.0
PWS9010	$<5x10^{-5}$	2-3 2@1064nm	10.0	25.4	28.0
PWS9015	$<5x10^{-5}$	2-3 2@1064nm	15.0	30.0	38.0
PWS9020	$<5x10^{-5}$	2-3 2@1064nm	20.0	38.0	48.0
YVO4 Wollaston Polarizer					
Part No.	**Extinction Ratio**	**Separate Field(°)**	**C.A. Φ a(mm)**	**O.D. Φ d(mm)**	**L±0.1(mm)**
PWS8006	$<5x10^{-6}$	19.6-23.3 20@1550nm	6.0	15.0	14.0
PWS8008	$<5x10^{-6}$	19.6-23.3 20@1550nm	8.0	25.4	16.0
PWS8010	$<5x10^{-6}$	19.6-23.3 20@1550nm	10.0	25.4	16.0
PWS8015	$<5x10^{-6}$	19.6-23.3 20@1550nm	15.0	30.0	20.0
PWS8020	$<5x10^{-6}$	19.6-23.3 20@1550nm	20.0	38.0	25.0

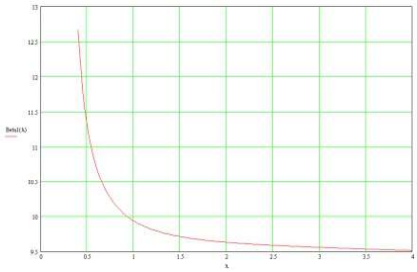
ROCHON POLARIZER

Rochon polarizer is one of the earliest designs, which is made of two birefringent material prisms cemented or optical contacted together. Both ordinary and extraordinary beams propagate collinearly down the optic axis in the first prism under the ordinary refractive index. Upon entering the second prism the ordinary beam experiences the same refractive index and continues undeviated. The extra-ordinary beam, however, now has a lower refractive index and is refracted at the interface. Any separation angle can be designed for specific wavelength upon requirement.

Angular Field vs Wavelength

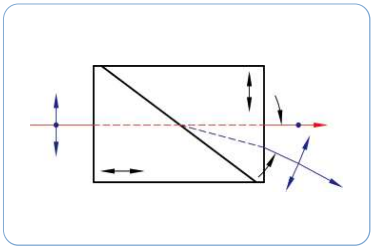


Quartz, 200-3300nm



YVO_4, 500-4000nm

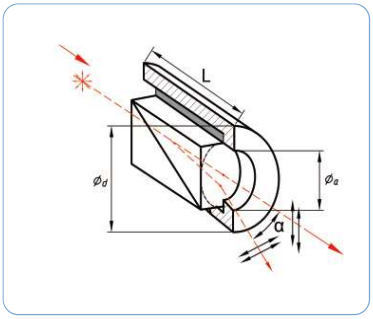
MgF_2,160-1500nm



α-BBO
Rochon Polarizer

Specifications

Material	α -BBO, Calcite, YVO_4, Quartz, MgF_2
Wavelength Range	a-BBO:190-3500nm,YVO_4:500-4000nm,Quartz:200-2300nm, MgF_2:130-7000nm
Extinction Ratio	Quartz:$<5x10^{-5}$; α -BBO, YVO_4:$<5x10^{-6}$, MgF_2: $<10^{-4}$
Parallelism	<1 arc Min
Surface Quality	20/10 Scratch/Dig
Beam Deviation	< 3 arc minutes
Wavefront Distortion	< λ /4@633nm
Damage Threshold	>500 MW/cm^2
Coating	Single MgF_2
Mount	Black Anodized Aluminium



Rochon Prism

ROCHON POLARIZER

Standard Products

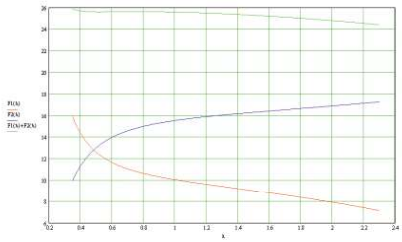
MgF_2 Rochon Polarizer					
Part No.	Extinction Ratio	Separate Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PRH5006	$<1x10^{-4}$	1.0-2 1@980nm	6.0	15.0	14.0
PRH5008	$<1x10^{-4}$	1.0-2 1@980nm	8.0	25.4	18.0
PRH5010	$<1x10^{-4}$	1.0-2 1@980nm	10.0	25.4	28.0
PRH5015	$<1x10^{-4}$	1.0-2 1@980nm	15.0	30.0	38.0
PRH5020	$<1x10^{-4}$	1.0-2 1@980nm	20.0	38.0	48.0
α -BBO Rochon Polarizer					
Part No.	Extinction Ratio	Separate Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PRH6006	$<5x10^{-5}$	8.0-14 8@800nm	6.0	15.0	14.0
PRH6008	$<5x10^{-5}$	8.0-14 8@800nm	8.0	25.4	16.0
PRH6010	$<5x10^{-5}$	8.0-14 8@800nm	10.0	25.4	18.0
PRH6015	$<5x10^{-5}$	8.0-14 8@800nm	15.0	30.0	23.0
PRH6020	$<5x10^{-5}$	8.0-14 8@800nm	20.0	38.0	28.0
Quartz Rochon Polarizer					
Part No.	Extinction Ratio	Separate Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PRH9006	$<5x10^{-5}$	1.0-1.5 1@1064nm	6.0	15.0	20.0
PRH9008	$<5x10^{-5}$	1.0-1.5 1@1064nm	8.0	25.4	24.0
PRH9010	$<5x10^{-5}$	1.0-1.5 1@1064nm	10.0	25.4	28.0
PRH9015	$<5x10^{-5}$	1.0-1.5 1@1064nm	15.0	30.0	38.0
PRH9020	$<5x10^{-5}$	1.0-1.5 1@1064nm	20.0	38.0	48.0
YVO_4 Rochon Polarizer					
Part No.	Extinction Ratio	Separate Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)
PRH8006	$<5x10^{-5}$	9.8-13.0 10@1550nm	6.0	15.0	14.0
PRH8008	$<5x10^{-5}$	9.8-13.0 10@1550nm	8.0	25.4	16.0
PRH8010	$<5x10^{-5}$	9.8-13.0 10@1550nm	10.0	25.4	16.0
PRH8015	$<5x10^{-5}$	9.8-13.0 10@1550nm	15.0	30.0	20.0
PRH8020	$<5x10^{-5}$	9.8-13.0 10@1550nm	20.0	38.0	25.0

GLAN THOMPSON POLARIZER BEAMSPLITTER CUBE

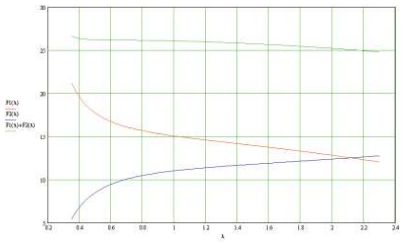
Glan Thompson polarizer Beamsplitter Cube is made of two Calcite prisms or two a-BBO prisms cemented together .It have high extinction ratio below 5×10-5 is botained. The Calcite type can be used in the range of the350-2300nm,and a-BBO crystal usable in the range of the220-900nm. It can separate the nature light for O polarized light and E polarized light,and the separate angle is 45°. Since there are two ports,the prism can also be used by replacing the input and output direction

The polarizers have the widest field angle of any design.The standard form of this polarizer with 2.5:1 length to aperture ratio has a full acceptance cone angle of more than 15 °@589nm,symmetric about the input axis,while the long form with 3:1 ratio has a field angle>26°.The polarized field F1 and F2 of all these is shown in the plot below.

Angular Field vs Wavelength



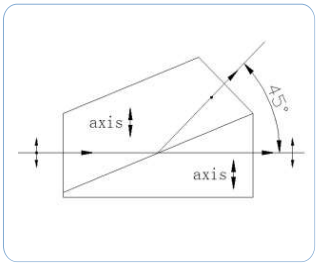
Calcite:L/A=2.5 (350-2300nm)



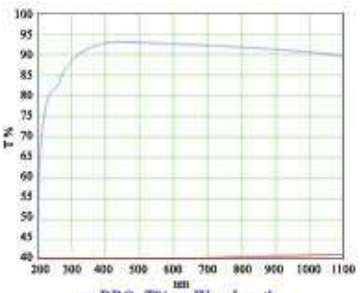
Calcite:L/A=3 (350-2300nm)

Specifications

Material	a-BBO, Calcite
Wavelength Range	a-BBO: 200-900 nm, Calcite: 350-2300 nm
Extinction Ratio	a-BBO: $<5x10^{-5}$; Calcite:$<5x10^{-6}$
Surface Quality	20-10 Scratch/Dig
Beam Deviation	< 3 arc minutes
Wavefront Distortion	< λ /4@633nm
Separate Angle	45°±0.5°
Damage Threshold	>200 MW/cm^2
Coating	Single MgF_2
Mount	Black Anodized Aluminium



α-BBO
Glan-Thompson Polarizer



α-BBO: T% vs Wavelength

GLAN THOMPSON POLARIZERS
Standard Products

a -BBO Glan Thompson Polarizer Beamsplitter Cube Special for DUV,Visible and NIR(220-900nm)

Part No.	L(Material)/CA	Extinction Ratio	Angular Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)	Unit Price
PGB6006	1.6	$<5x10^{-6}$	>15	6	25.3	15	$538
PGB6008	1.6	$<5x10^{-6}$	>15	8	30	18	$598
PGB6010	1.6	$<5x10^{-6}$	>15	10	38.1	22	$688
PGB6012	1.6	$<5x10^{-6}$	>15	12.7	50.8	26	$838
PGB6015	1.6	$<5x10^{-6}$	>15	15	50.8	30	$1068

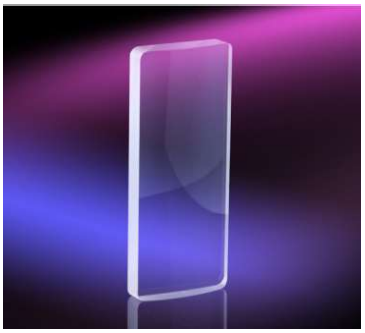
Calcite Glan Thompson Polarizer hBeamsplitter Cube (350-2300nm)

Part No.	L(Material)/CA	Extinction Ratio	Angular Field(°)	C.A. Φ a(mm)	O.D. Φ d(mm)	L±0.1(mm)	Unit Price
PGB7006	2.5	$<5x10^{-5}$	14-16	6	25.4	20	$388
PGB7008	2.5	$<5x10^{-5}$	14-16	8	30	25	$458
PGB7010	2.5	$<5x10^{-5}$	14-16	10	38.1	30	$568
PGB7012	2.5	$<5x10^{-5}$	14-16	12.7	50.8	37	$658
PGB7015	2.5	$<5x10^{-5}$	14-16	15	50.8	43	$788

THIN FILM POLARIZER

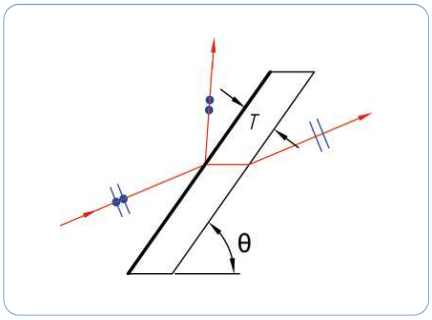
Dayoptics thin film polarizers based on a coating is made up of particular birefringent materials which has polarizing properties. The coating is designed under Brewster angle.

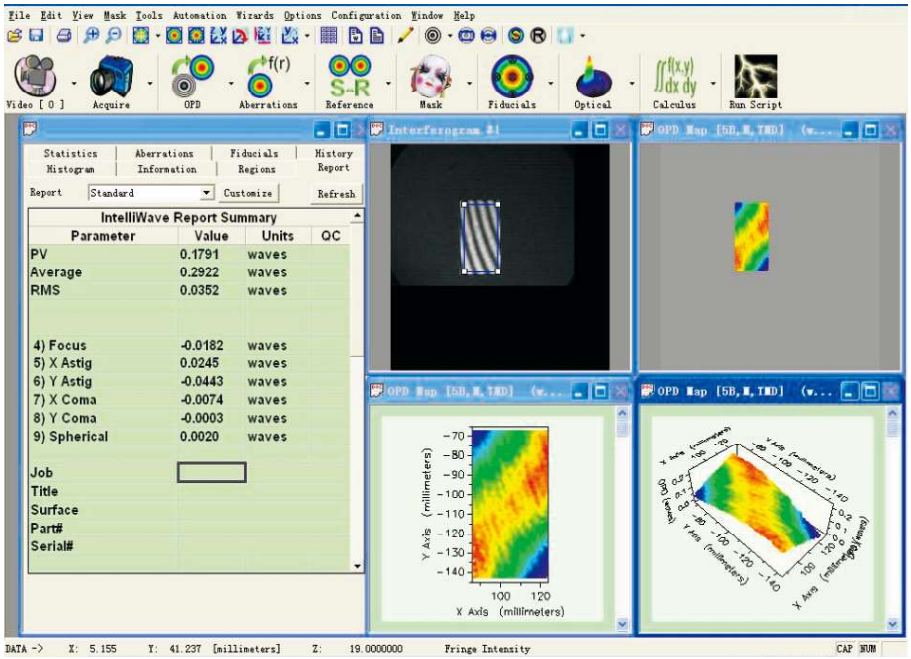
Brewster Angle: For light incident on a plane boundary between two regions having different refractive indices, the angle of incidence at which the reflectance is zero for light that has its electrical field vector in the plane defined by the direction of propagation and the normal to the surface. For propagation from medium 1 to medium 2, Brewster's angle is given as arctan (n2/n1).



Specifications

Material	BK7
Two surfaces polished	
Surface Quality	40/20 Both Sides
Flatness	λ /8 @ 633nm
Other surfaces are fine ground	
Chamfer	<0.3x45°
One Side Coating	Tp>97% and Ts<0.05% @1064nm (Brewster angle incidence 56.4deg.)
Standard Products	
Dimension	28.6x14.3 mm
Thickness	3 mm
Standard Code	PTF1001

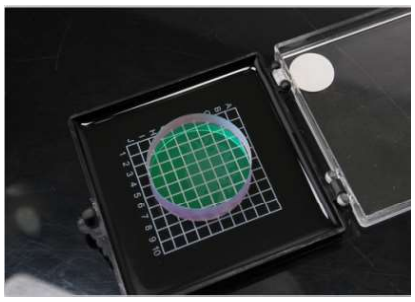


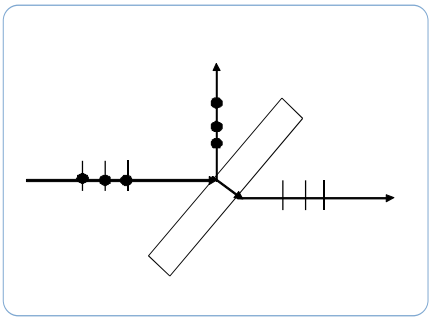


The flatness of Thin Film Polarizer is inspected by our interferometer.

Thin film Polarizer-45°

Dayoptics has newly developed thin film polarizer based on 45deg. Incidence. We can assure high transmittion >95% and high reflection >99%. Ask Dayoptics' sales for whatever you need.

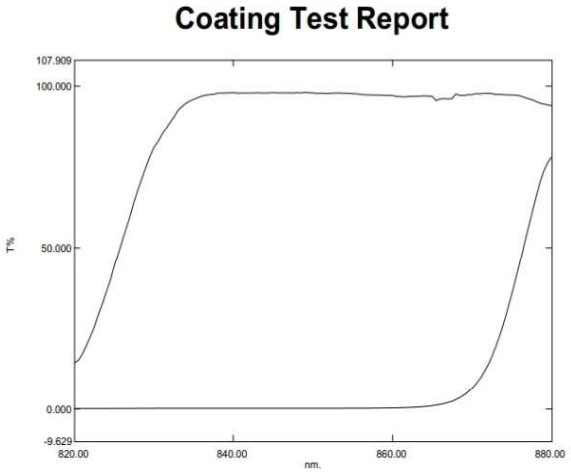




Specifications

Material	Fused Silica
Two surfaces polished	
Surface Quality	40/20 Both Sides
Flatness	λ /8 @ 633nm
Other surfaces are fine ground	
Chamfer	<0.3x45°
Coating specification	Tp>95% & Rs>99% @ 355 +/-3nm, AOI=45deg.+/-1 deg. Tp>95% & Rs>99% @ W +/-5nm, AOI=45deg.+/-1 deg. 800nm>W>400nm Tp>95% & Rs>99% @ W +/-10nm, AOI=45deg.+/-1 deg. 1100nm>W>800nm

Typical Coating Curve:



Tp>95% & Rs>99% @ 850 +/-10nm, AOI=45deg.+/-1 deg.

ETALON

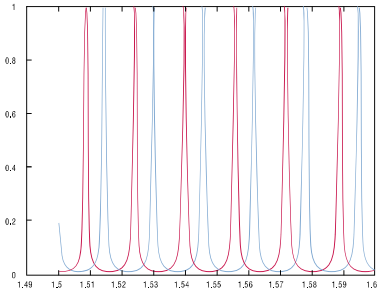
Etalon Theory

The equation for the transmission of an ideal etalon, an Airy Function, is

$$T=\left[1+\frac{4R}{(1-R)^2}\ \mathrm{Sin}^2\left(\frac{\phi}{2}\right)\right]^{-1} \qquad \phi=\frac{2\pi}{\lambda}\ 2nd\cos\theta$$

where
T = transmission
R = reflectivity of the mirrors
Φ = the roundtrip phase change of the light ray
If any phase change at the mirror surfaces is ignored then

Where
λ = the wavelength of the light
n = the index of refraction of the material between the mirrors
d = the distance between the mirrors
θ = the angle of the incoming light beam



Incidence angle—5deg. —0deg.

The above figure plots the etalon spectral transmission. The distance between adjacent peaks is the Free Spectral Range (D) and the width (FWHM) of each peak is the resolution (d). The Free Spectral Range can be written three ways:

$$\Delta_\nu(\text{frequency})=\frac{C}{2nd} \qquad \Delta_\lambda(\text{wavelength})=\frac{\lambda^2}{2nd} \qquad \Delta_k(\text{wavenmbers})=\frac{1}{2nd}$$

Another useful concept for etalons is the finesse (F). This dimensionless parameter is the ratio of the free spectral range to the peak width.

$$F=\frac{\Delta}{\delta}\ \text{or}\ \ \delta=\frac{\Delta}{F}$$

For an ideal etalon, only the mirror reflectivity determines the finesse.

$$F=F_R=\frac{\pi\sqrt{R}}{(1-R)}$$

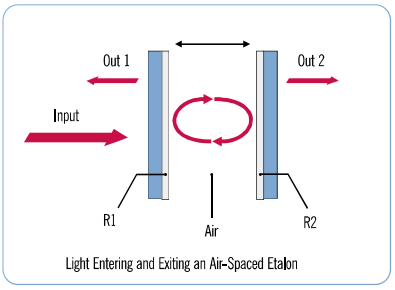
Imperfections in the etalon such as not-perfect flatness and parallelism will degrade the finesse. Dayoptics includes the various imperfections into our etalon design calculations so we guarantee all quoted specifications.

Air Space Etalon

Air-Spaced Etalons have appropriate grade fused silica (UV-visible or IR) substrates. Outside-face AR coatings and wedges on the substrates prevent extraneous interference patterns from forming. Spacers, optically contacted to the substrates, determine the parallelism of the mirrored surfaces and the etalon’ s free spectral range. Depending upon the application, the spacers can be fused silica or a low thermal expansion material such as Zerodur or ULE.

Specifications

Plate Material	Fused Silica or Silicon(Si)
Spacer Material	Fused Silica, Zerodur, or ULE
Flatness	λ /20
Parallelism	<1 arc sec
Gap	5m to 65mm
Clear Apertures	2mm to 100mm
Wavelengths	200nm to 3m
Finesse	Up to 100
Coatings	Standard and Custom



Light Entering and Exiting an Air-Spaced Etalon

Solid Etalons

Solid Etalons typically have fused silica substrates with the material grade (e.g. UV-visible or IR) dependent on the spectral region. The faces are ground, polished, and figured typically to better than λ /100 flatness with similar quality parallelism between the faces. Dielectric (or, rarely, metallic) coatings provide the reflectivity necessary for the required finesse.

Specifications

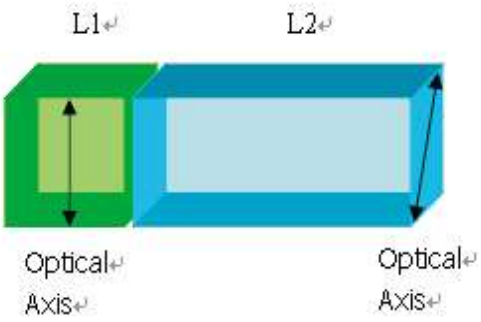
Material	Fused Silica
Flatness	< λ /20
Parallelism	<1 arc sec
Clear Aperture	2mm to 125mm
Diameters	3mm to 150mm
Thickness	50m to 20mm
Wavelengths	200nm to 3m
Finesse	Up to 50
Coatings	Standard and Custom


Etalon Testing Instrument

LYOT DEPOLARIZER

Optical depolarizer is a kind of optical passive component which can transform the input polarized or partial polarized light into non-polarization light (depolarization), it is designed according to Lyot depolarizer's principle.

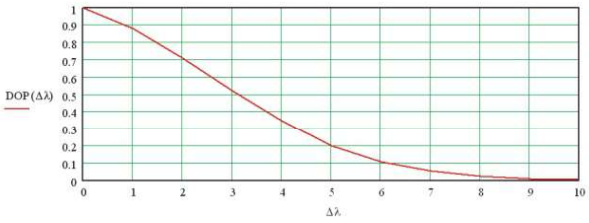
Dayoptics Lyot depolarizer consists of two crystalline plane parallel plates whose axes is 45° apart from each other with optical contacted. The thickness ratio of two plates length is typically 2:1. The depolarization is created by the superposition of the circularly, elliptically and linearly polarized light in different wavelengths. The depolarizer is not suitable for usage in monochromatic light.



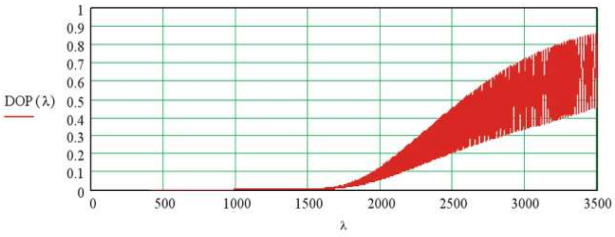
Theory Data

DOP – Degree of Polarization, DOP=1 good polarization, DOP=0 good depolarization

Material: Calcite

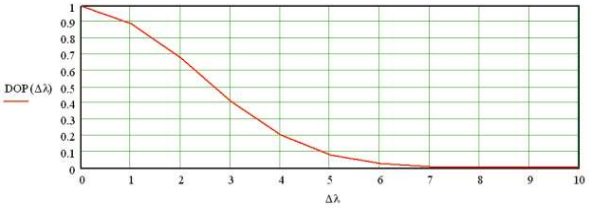


DOP Vs. wavelength bandwidth
Laser beam Wavelength is 1550nm, with total length of 6mm

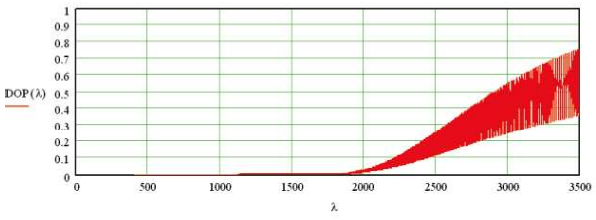


DOP Vs. input wavelength
(Input beam with 10nm bandwidth, total length 6mm)

Material: YVO4

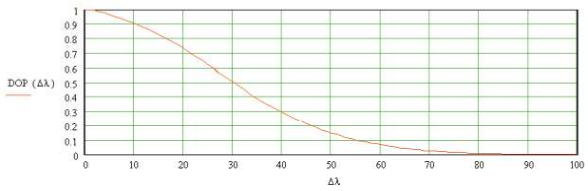


DOP vs. wavelength bandwidth
Laser beam Wavelength is 1550nm, with total length of 6mm

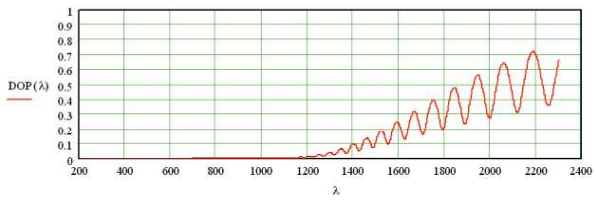


DOP Vs. input wavelength
(Input beam with 10nm bandwidth, total length 6mm)

Material: Quartz



DOP Vs. wavelength bandwidth
Laser beam Wavelength is 1064nm, with total length of 6mm



DOP Vs. input wavelength
(Input beam with 100nm bandwidth, total length 6mm)

LYOT DEPOLARIZER

Specifications

Material: Calcite, YVO_4, Quartz

Wavelength Range: Calcite: 350-2300nm, YVO_4: 500-4000nm, Quartz: 200-2300nm

Dimension: +0/-0.2mm

Parallelism: <20 arc second

Flatness: λ /4 @633nm

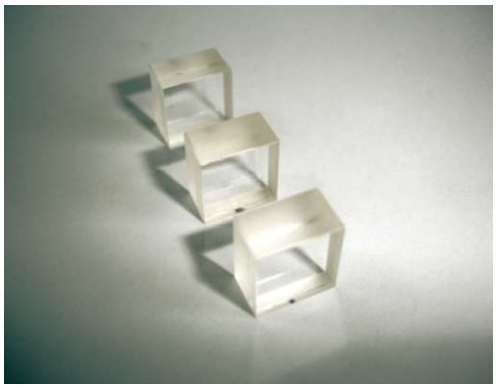
Surface Quality: 20/10 Scratch/Dig

Surface contact method: Optical contact

Coating is available upon requirement

Mount is available upon requirement

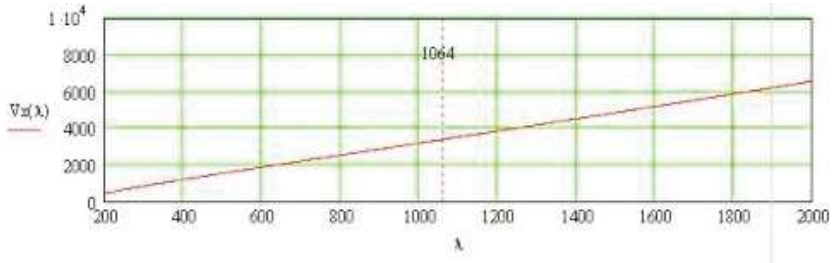
Total Length: 6mm



Part No	Material	Aperature	Total Length
DPL7005	$CaCO_3$	5X5mm	6mm
DPL7010	$CaCO_3$	10X10mm	6mm
DPL8005	YVO_4	5X5mm	6mm
DPL8010	YVO_4	10X10mm	6mm
DPL9005	Quartz	5X5mm	6mm
DPL9010	Quartz	10X10mm	6mm

E-O Q Switch BBO

BBO is one of the electro-optic material choices for high average power E-O Q Switch applications. BBO has significant advantages over other materials in terms of laser power handling abilities, temperature stability, and substantial freedom from piezoelectric ringing. Because it relies on the electro optic effect, switching time - aided by the low capacitance of the E-O Q Switch is very fast. The wide transparency range of BBO allows it to be used in diverse applications. E-O Q Switch of DEOB series are transverse field devices. Low electro-optical coefficient of BBO results in high operating voltages. The quarter-wave voltage is proportional to the ratio of electrode spacing and crystal length. As a result, a smaller aperture device has lower quarter-wave voltage. However, even for 3mm aperture devices quarter-wave voltage is as high as 3.4KV@1064nm. Double crystal design is employed in order to reduce required voltages and allowing operation in half-wave mode with fast switching times.



1/4 Wave Voltage Vs Wavelength

FEATURES:

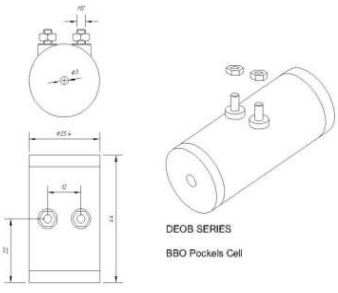
- High Repetition Rate
- High peak power damage resistance
- Low absorption
- UV Transmission
- Low Acoustic Noise

Applications:

- High repetition rate DPSS Q-Switch
- High repetition rate Regenerative Amplifier control
- Cavity Dumping
- Beam Chopper

Specifications

Description	
Model Number	DEOB-254403
Aperture Diamete	2.5
Quarter-Wave Voltage@ 1064 nm	3.4KV
Optical Transmission	>98%
Damage Threshold	> 500 MW / cm^2 @1064nm, 10ns
Wavefront Distortion@ 1064 nm	< λ /8
Typical Capacitance	< 3pf
Outline dimension, mm	Φ 25.4×44

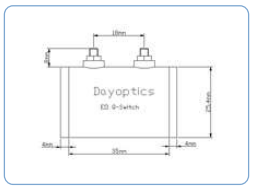


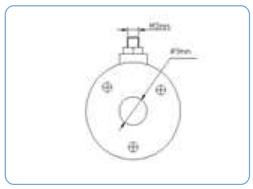
EO Q-SWITCHES-KD*P

A E-O Q Switch alters the polarization state of light passing through it when an applied voltage induces birefringence changes in an electro-optic crystal such as KD*P. When used in conjunction with polarizers, these cells can function as optical switches, or laser Q-switches. Our EO Q-switch employs the finest strain-free, highly deuterated KD*P available. Based on Dayoptics advanced crystal fabrication and coating technlogy, we can offer a variety of laser wavelengths EO Q switchs which exhibits high transmission (T>97%), high damaged threshold (>500W/cm^2)and high extinction ratio (>1000:1).

Applications

- OEM Laser Systems
- Medical/Cosmetic Lasers
- Versatile R&D Laser Platforms
- Military & Aerospace Laser Systems





Features

Benefits

Features	Benefits
CCI Quality - Economically Priced	Exceptional Value
Finest Strain-free KD*P	High Contrast Ratio
	High Damage Threshold
	Low 1/2 Wave Voltage
Space Efficient	Ideal for Compact Lasers
Ceramic Apertures	Clean and Highly Damage-resistant
High Contrast Ratio	Exceptional Hold-off
Quick Eectrical Connectors	Efficient/Reliable Installation
Ultra-flat Crystals	Excellent Beam Propagation

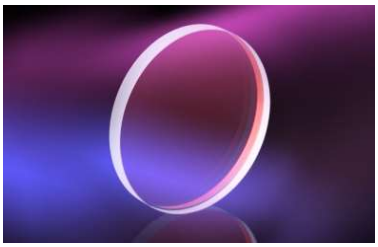
Electro-optical @ 1064nm

1/4 Wave Voltage	3.3 KV
Transmitted Wave Front Error	<1/8 Wave
ICR	>2000:1
VCR	>1500:1
Capacitance	6 pf
AR @ 1064nm, 10ns pulse	5J/cm^2

Housing Dimensions	DEOQ-253508	DEOQ-253510	DEOQ-253513
Aperture	8 mm	10 mm	13 mm
Length	39 mm	39 mm	45 mm
Diameter	25.35 mm	25.35 mm	32 mm

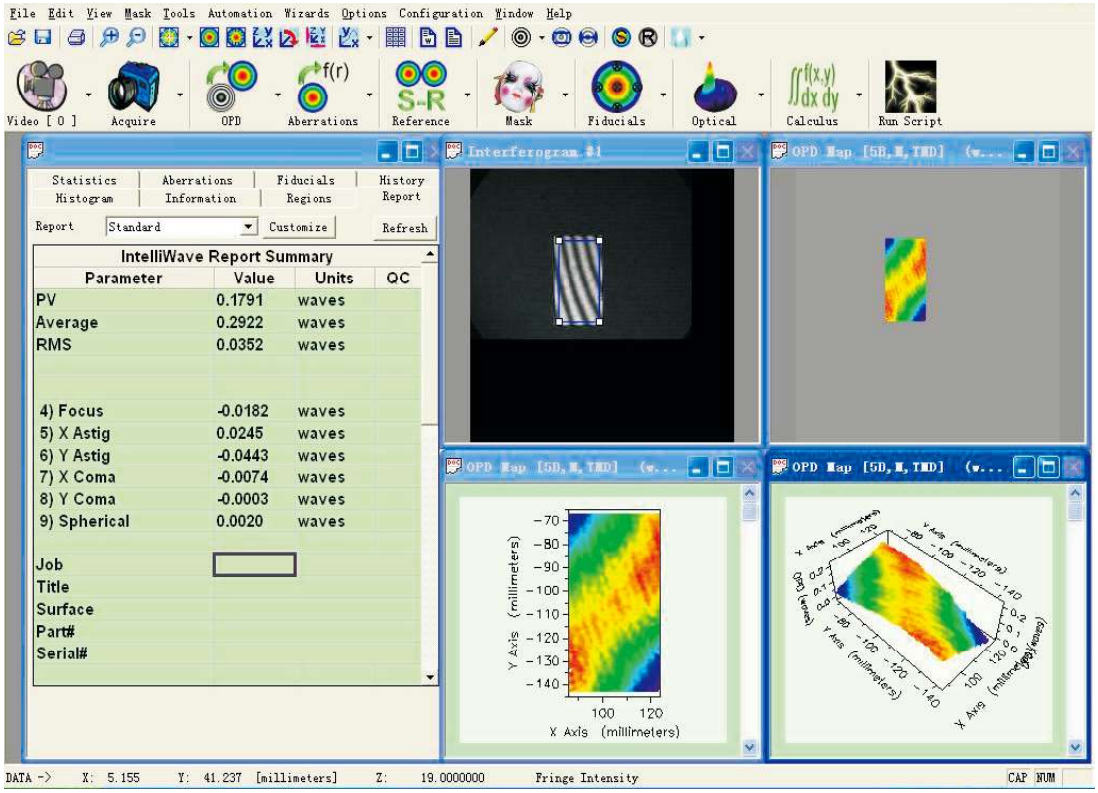
WINDOW

Windows are applied to isolate different physical environments while allowing light to pass through. When selecting windows, it's impossible to consider materials, transmission, scattering, wavefront distortion, parallelism and resistance to certain environment. Dayoptics offers all kinds of windows, which are made from different materials. Windows of special sizes and materials are available upon requirement. Single layer or multiplayer anti-reflecting or high-reflecting coatings on optical windows are available upon customer's requirement.



Specification	BK7 Windows	Fused Silica Windows	Sapphire
Diameter Tolerance	+0.0, -0.1mm	+0.0, -0.1mm	+0.0, -0.2mm
Thickness Tolerance	±0.2mm	±0.2mm	±0.2mm
Clear Aperture	>80%	>80%	>85%
Parallelism	1'(Standard), 10"(High Precision)	1'(Standard), 10"(High Precision)	1'
Surface Quality	60/40(Standard), 20/10(High Precision)	60/40	60/40(Standard)
Wavefront Distortion	λ /4 (Standard), λ /10(High Precision) per 25mm @633nm	λ /4 (Standard), λ /10(High Precision) per 25mm @633nm	λ @ 633nm
Bevel	<0.25mm x 45°	<0.25mm x 45°	<0.25mm x 45°
Coating	Uncoated	Uncoated	Uncoated

Note: We can make coatings as your requires



WINDOW

Standard Products

BK7 Windows		
Part No.	Diameter(mm)	Thickness(mm)
WIN0101	10.0	3.0
WIN0102	12.7	3.0
WIN0103	25.4	3.0
WIN0104	10.0	6.35
WIN0105	12.7	6.35
WIN0106	25.4	6.35

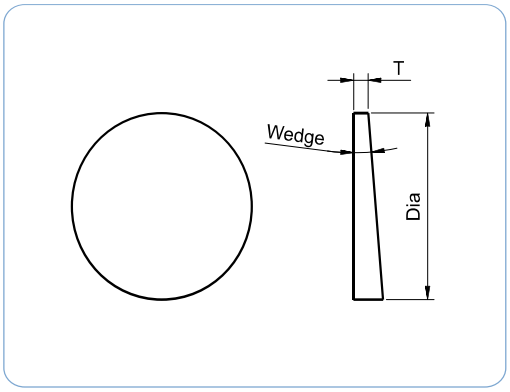
Fused Silica Windows		
Part No.	Diameter(mm)	Thickness(mm)
WIN0201	10.0	3.0
WIN0202	12.7	3.0
WIN0203	25.4	3.0
WIN0204	10.0	6.35
WIN0205	12.7	6.35
WIN0206	25.4	6.35

Sapphire Windows		
Part No.	Diameter(mm)	Thickness(mm)
WIN0301	5.5	0.5
WIN0302	8.5	0.5
WIN0303	9.5	0.5
WIN0304	10	1
WIN0305	12.7	1
WIN0306	25.4	1

WEDGE

Specifications

Material	BK7;Fused Silica
Diameter Tolerance	+0.0, -0.2mm
Thickness Tolerance	+/-0.1mm
Clear Aperture	>80%
Surface Figure	λ /4@632.8nm
Surface Quality	40/20 Scratch/Dig
Bevel	0.25 mm x 45°
Angle Tolerance	±3'



BK7 wedge

Part No.	Diameter (mm)	Thickness (mm)	Wedge (°)
WED1101	12.7	3.0	3.0
WED1201	12.7	3.0	0.5
WED1301	25.4	3.0	3.0
WED1401	25.4	3.0	0.5

Fused Silica wedge

Part No.	Diameter (mm)	Thickness (mm)	Wedge (°)
WED2101	12.7	6.35	3.0
WED2201	12.7	6.35	0.5
WED2301	25.4	6.35	3.0
WED2401	25.4	6.35	0.5

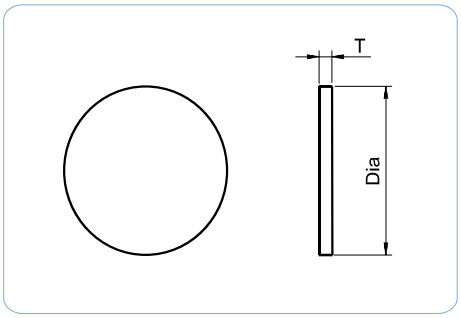
FILTER

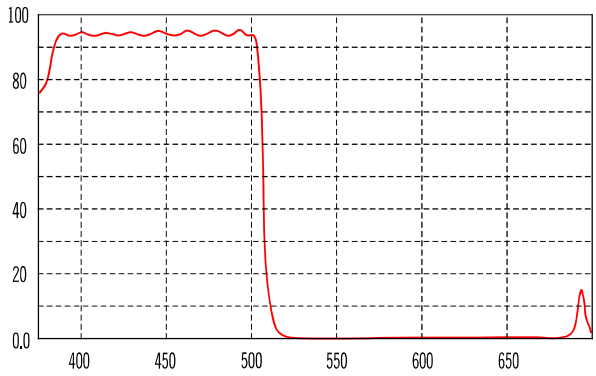
Filters are used for selecting or filtrating the specific wave band, they are widely used in optical instrument, industrial measurement, environment protection and many other applications. We can provides short pass filter, long pass filter, band pass filter, color glass filter, etc.

The dimension and coating index can be customized according to customer requirements.

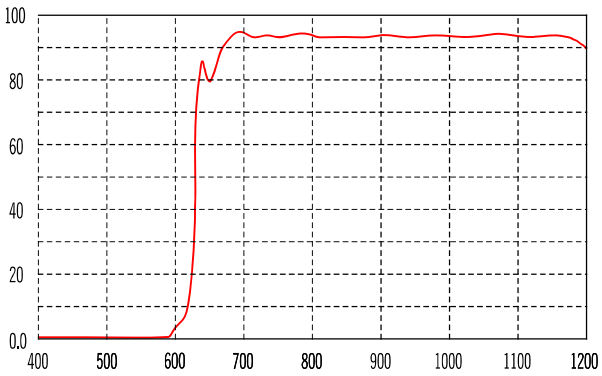
Specifications

Material	BK7, Fused Silica, Color Glass
Dimension Tolerance	+0.0/-0.2
Parallelism	<3 arc minute
Surface Quality	60/40 Scratch/Dig
Clear Aperture	Central 90%
Flatness	< λ @633nm

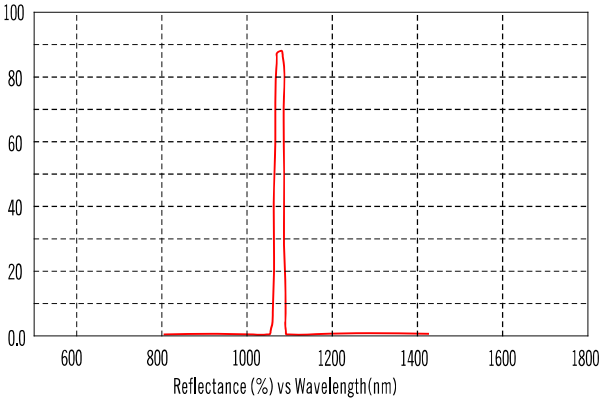




R>98%@530-650,T>90%400-500nm



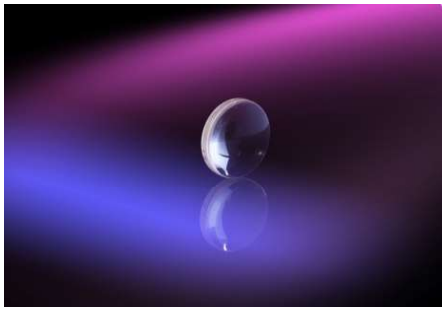
R>99%@450-560,T>92%700-1100nm

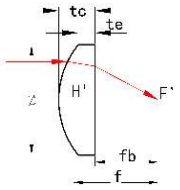
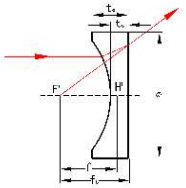
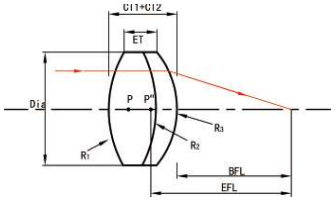
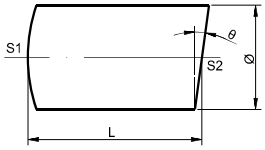
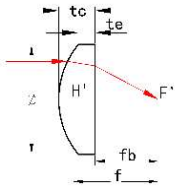


Central Wavelength @1064nm T>85%, FWHM 20nm
Wavelength Tolerance +/-2 for 20nm FWHM

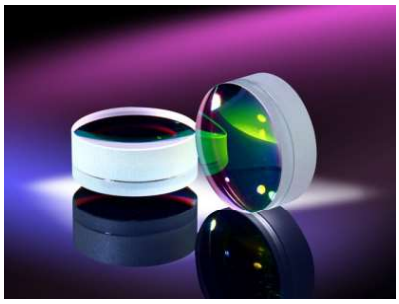
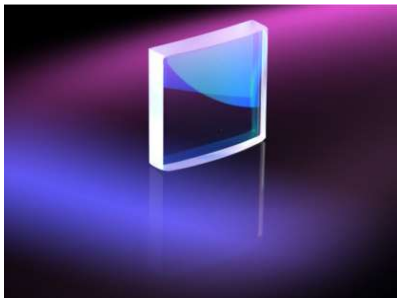
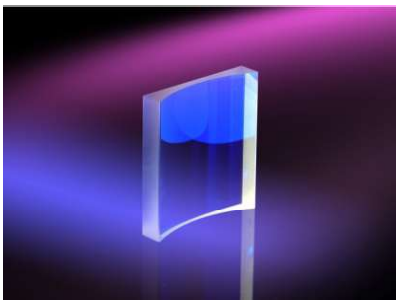
LENS OVERVIEW

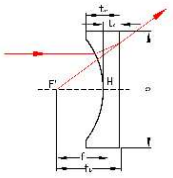
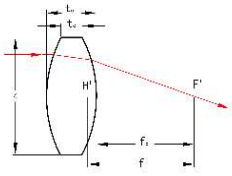
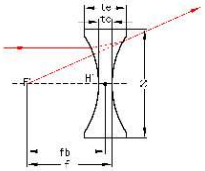
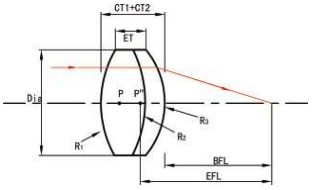
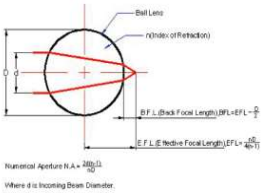
A transparent optical component consisting of one or more pieces of optical glass with curved surfaces (usually spherical) that they serve to converge or diverge the transmitted rays from an object, thus forming a real or virtual image of that object. Dayoptics provides these lenses with the material of BK7, fused silica, sapphire, CaF_2 and MgF_2 as standard. Other materials lenses are available upon requirement.



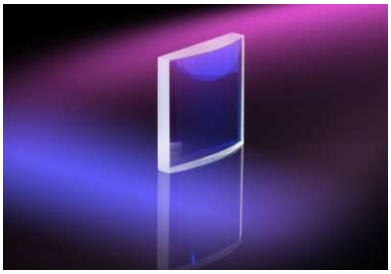
Lens	Material	Illustration	Page
Plano Convex Cylindrical Lens	BK7 Fused Silica		49
Plano Concave Cylindrical Lens	BK7 Fused Silica		50
Cylindrical Positive Achromatic Lens	Depend on the design		51
C-Lens	Depend on the design		52
Plano Convex Lens	BK7 Fused Silica		53

LENS OVERVIEW

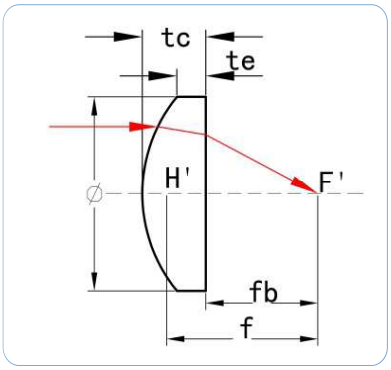
Lens	Material	Illustration	Page
Plano Concave Lens	BK7 Fused Silica		54
Double Convex Lens	BK7 Fused Silica		55
Double Concave Lens	BK7 Fused Silica		56
Achromatic Lens	Depend on the design		57
Ball Lens	BK7 Fused Silica		58

PLANO CONVEX CYLINDRICAL LENS



Specifications

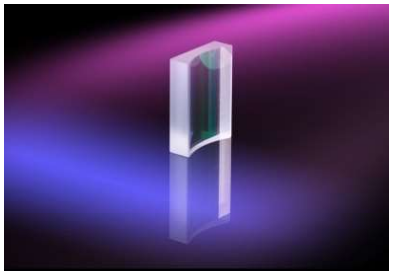
Material	BK7;Fused Silica
Design Wavelength	589.6nm
Diameter Tolerance	+0.0, -0.15mm
Thickness Tolerance	+/-0.1mm
Paraxial Focal Length Tolerance	±2%
Centration	3 arc minutes
Clear Aperture	>85%
Surface Figure	λ /4@632.8nm
Surface Quality	60/40 Scratch/Dig
Bevel	0.25 mm x 45°
Coating	Uncoated



BK7/Fused Silica Plano Convex Cylindrical Lens

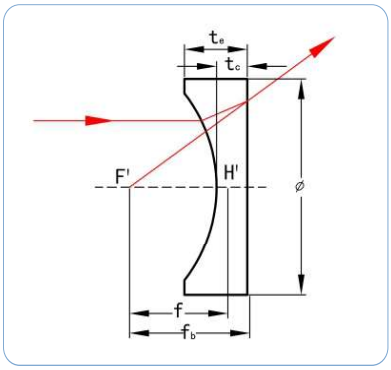
Part No	ϕ (mm)	f (mm)	R1 (mm)	t c (mm)	t e (mm)	f b (mm)	Material
PCYX1101	12.7	50	-25.8	3	2.2	48.02	BK7
PCYX1102	12.7	150	-77.4	3	2.74	148.02	BK7
PCYX1103	12.7	200	-103.2	3	2.8	198.02	BK7
PCYX2201	25.4	200	-91.6	3	2.11	197.942	Fused Silica
PCYX2202	25.4	300	-135	3	2.4	297.93	Fused Silica
PCYX2203	25.4	400	-180	3	2.55	397.93	Fused Silica
PCYX2301	10x10	25	-11.45	3	1.85	22.942	Fused Silica
PCYX2302	10x10	50	-22.9	3	2.447	47.942	Fused Silica
PCYX2401	20x20	100	-45.8	3	1.895	97.942	Fused Silica
PCYX2402	20x20	200	-91.6	3	2.453	197.942	Fused Silica

PLANO CONCAVE CYLINDRICAL LENS



Specifications

Material	BK7;Fused Silica
Design Wavelength	589.6nm
Diameter Tolerance	+0.0, -0.15mm
Thickness Tolerance	+/-0.1mm
Paraxial Focal Length Tolerance	±2%
Centration	3 arc minutes
Clear Aperture	>85%
Surface Figure	λ /4@632.8nm
Surface Quality	60/40 Scratch/Dig
Bevel	0.25 mm x 45°
Coating	Uncoated



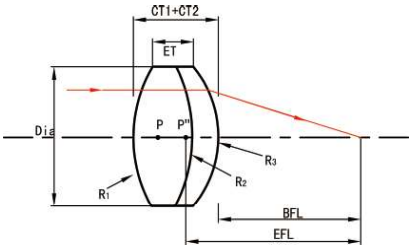
BK7/Fused Silica Plano Convex Cylindrical Lens

Part No	ϕ (mm)	f (mm)	R1 (mm)	t c (mm)	t e (mm)	f b (mm)	Material
PCYV1101	12.5	-25	-12.9	2	3.62	-26.32	BK7
PCYV1102	12.5	-40	-20.64	2	2.97	-41.32	BK7
PCYV1103	12.5	-60	-30.96	2	2.64	-61.32	BK7
PCYV2201	25.4	-100	-45.8	3	4.796	-102.058	Fused Silica
PCYV2202	25.4	-200	-91.6	3	3.88	-202.058	Fused Silica
PCYV2203	25.4	-300	-137.4	3	3.58	-302.058	Fused Silica
PCYV2301	10x10	-25	-11.45	2	3.15	-26.372	Fused Silica
PCYV2302	10x10	-40	-18.32	2	2.69	-41.372	Fused Silica
PCYV2401	25x25	-600	-274.8	2	2.284	-601.372	Fused Silica
PCYV2402	25x25	-800	-366.4	2	2.213	-801.372	Fused Silica

CYLINDRICAL POSITIVE ACHROMATIC LENSES

Specifications

Material	BK7;SF5
Design Wavelength	589.6nm
Diameter Tolerance	+0.0, -0.15mm
Thickness Tolerance	+/-0.1mm
Paraxial Focal Length Tolerance	±2%
Centration	3 arc minutes
Clear Aperture	>85%
Surface Figure	λ /4@632.8nm
Surface Quality	60/40 Scratch/Dig
Bevel	0.25 mm x 45°
Coating	Uncoated

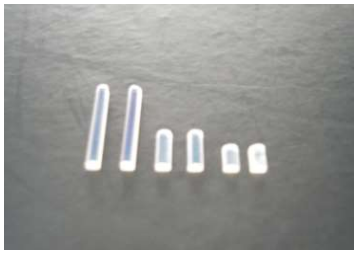


Positive Achromatic Lenses

Part No.	Φ (mm)	f (mm)	R1(mm)	R2=R3(mm)	R4(mm)	CT1(mm)	CT2(mm)	fb(mm)	Lens A	Lens B
ALYP1301	12.5	25	10.55	10.55	200.14	7	2	18.32	BK7	SF5
ALYP1302	12.5	50	24.97	24.97	119.88	4	2	46.39	BK7	SF5
ALYP1303	12.5	75	38.1	38.1	172.49	3.5	2	71.79	BK7	SF5
ALYP1304	12.5	100	51.21	51.21	225.98	2	2	97.15	BK7	SF5

Fast-axis Collimation (Aspherical Cylindrical lenses)

The most important optical component in the beam forming systems in high-power diode lasers is the fast-axis-collimation optic. The lenses are manufactured from high-quality glass and have an aspherical surface. Their high numerical aperture permits the entire diode output to be collimated with outstanding beam quality. The high transmission and excellent collimation characteristics guarantee the highest levels of beam forming efficiency for diode lasers.



Advantages

Aspheric cylindrical lens

High beam quality

High numerical aperture (NA 0.64-0.86)

Diffraction-limited collimation

High transmission

Long term stability

Standard Specifications of Fast-axis Collimation

Part No	L(mm)	W(mm)	H(mm)	EFA(mm)	NA	WD(mm)	Coating
FAC0101	12	1.5	1.5	0.89	0.64	0.085	AR@808nm
FAC0201	5	1.6	1.22	0.9	0.86	0.228	AR@808nm
FAC0301	3	1.6	1.22	0.9	0.86	0.228	AR@808nm

C-LENS

Features

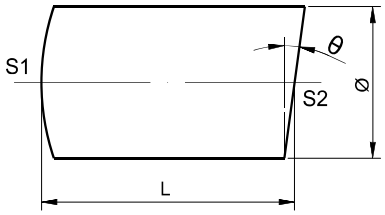
- Low Insertion Loss
- High precision

Applications

- Collimators
- Isolators
- Switches
- Collimator Array
- Laser Assembly

Specifications

Diameter tolerance	+0.005/-0.01mm
Length Toerance	+/-0.04mm
Surface Quality	20/10 Scratch/Dig
Damage Threshold	>600MW
Coating	R<0.25%@1550±40nm

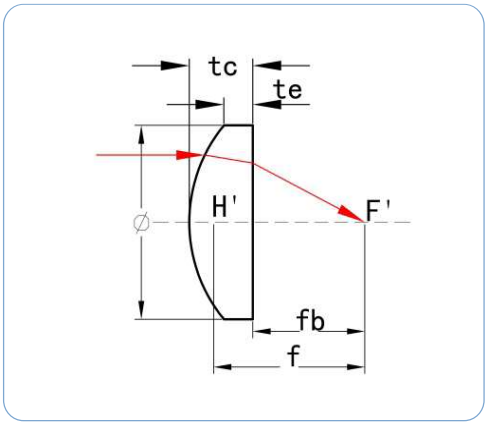


Part No	θ (Heg)	Ø (mm)	Central Wavelength(nm)	L (mm)
CLS0101	8	1.0	1550	2.62
CLS0102	8	1.8	1550	2.94
CLS0103	8	1.8	1310	3.85
CLS0104	8	1.8	1550	3.85
CLS0105	8	1.8	1550	6.61

PLANO CONVEX LENS

Specifications

Material	BK7
Design Wavelength	546.1nm
Design Index	1.5183 ±0.0005
Diameter Tolerance	+0.0, -0.15mm
Paraxial Focal Length Tolerance	±2%
Centration	3 arc minutes
Clear Aperture	>85%
Surface Figure	λ /4@632.8nm
Surface Quality	60/40 Scratch/Dig
Bevel	0.25 mm x 45°
Coating	Uncoated



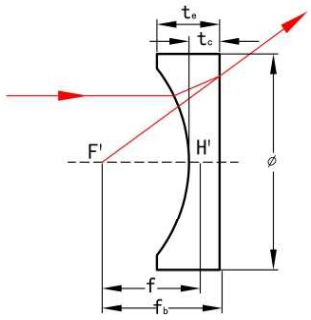
BK7 Plano Convex Lens

Part No	ϕ (mm)	f (mm)	R1 (mm)	t c (mm)	t e (mm)	f b (mm)
PCX1201	12.7	15	7.78	5.3	2	11.5
PCX1202	12.7	20	10.37	4.2	2	17.2
PCX1203	12.7	25	12.96	3.7	2	22.6
PCX1204	12.7	30	15.55	3.4	2	27.8
PCX1205	12.7	40	20.73	3	2	38
PCX1206	12.7	50	25.92	2.8	2	48.2
PCX1207	20	35	18.155	4.2	1.2	32.2
PCX1208	20	40	20.73	4.5	1.9	37
PCX1209	20	50	25.936	4	2	47.4
PCX1303	25.4	50	25.92	5.3	2	46.5
PCX1309	25.4	60	31.1	4.7	2	56.9
PCX1304	25.4	75	38.87	4.1	2	72.3
PCX1305	25.4	100	51.83	3.6	2	97.6
PCX1306	25.4	125	64.79	3.3	2	122.8
PCX1307	25.4	150	77.75	3	2	148
PCX1308	25.4	200	103.66	2.8	2	198.2

PLANO CONCAVE LENS

Specifications

Material	BK7
Design Wavelength	546.1nm
Design Index	1.5183 ±0.0005
Diameter Tolerance	+0.0, -0.15mm
Paraxial Focal Length Tolerance	±2%
Centration	3 arc minutes
Clear Aperture	>85%
Surface Figure	λ /4@632.8nm
Surface Quality	60/40 Scratch/Dig
Bevel	0.25 mm x 45°
Coating	Uncoated



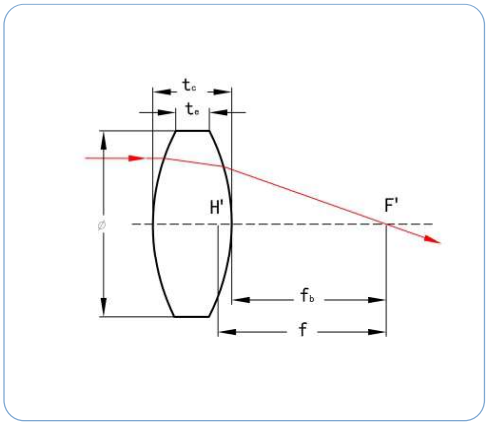
BK7 Plano Convex Lens

Part No.	Φ (mm)	f (mm)	R1 (mm)	t c (mm)	t e (mm)	f b (mm)
PCV1201	12.7	-15	-7.78	2	5.3	-16.3
PCV1202	12.7	-20	-10.37	2	4.1	-21.3
PCV1203	12.7	-25	-12.96	2	3.7	-26.3
PCV1204	12.7	-30	-15.55	2	3.4	-31.3
PCV1205	12.7	-40	-20.73	2	3	-41.3
PCV1206	12.7	-50	-25.92	2	2.8	-51.3
PCV1301	25.4	-25	-12.97	2	10.9	-26.3
PCV1302	25.4	-35	-18.14	2	7.2	-36.3
PCV1303	25.4	-50	-25.92	2	5.3	-51.3
PCV1305	25.4	-75	-38.87	2	4.1	-76.3
PCV1306	25.4	-100	-51.83	2	3.6	-101.3
PCV1307	25.4	-150	-77.75	2	3	-151.3
PCV1308	25.4	-200	-103.66	2	2.7	-201.3

DOUBLE CONVEX LENS

Specifications

Material	BK7
Design Wavelength	546.1nm
Design Index	1.5183 ±0.0005
Diameter Tolerance	+0.0, -0.15mm
Paraxial Focal Length Tolerance	±2%
Centration	3 arc minutes
Clear Aperture	>85%
Surface Figure	λ /4@632.8nm
Surface Quality	60/40 Scratch/Dig
Bevel	0.25 mm x 45°
Coating	Uncoated

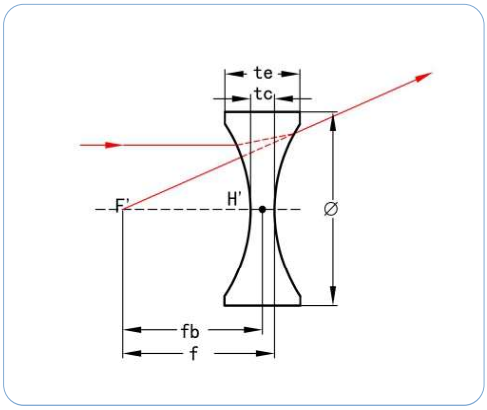


Part No.	Φ (mm)	f (mm)	R1 (mm)	t c (mm)	t e (mm)	f b (mm)
DCX1201	12.7	20	20.01	4	2	18.6
DCX1202	12.7	25	25.28	3.6	2	23.8
DCX1203	12.7	30	30.52	3.3	2	28.9
DCX1204	12.7	40	40.95	3	2	39
DCX1301	25.4	25.4	24.71	9	2	22.2
DCX1314	25.4	35	35.09	6.8	2	32.8
DCX1315	25.4	40	40.4	6.1	2	37.9
DCX1302	25.4	50	50.92	5.2	2	48.3
DCX1316	25.4	60	61.4	4.7	2	58.5
DCX1303	25.4	75	77.04	4.1	2	73.6
DCX1304	25.4	100	103.05	3.6	2	98.8
DCX1305	25.4	125	129.02	3.3	2	123.9
DCX1306	25.4	150	154.97	3	2	149
DCX1307	25.4	200	206.84	2.8	2	199
DCX1308	25.4	250	258.7	2.6	2	249.1
DCX1309	25.4	300	310.55	2.5	2	299.2
DCX1310	25.4	400	413.8	2.4	2	399
DCX1311	25.4	500	517.91	2.3	2	499.2
DCX1312	25.4	750	774.3	2.3	2	748.8
DCX1313	25.4	1000	1036.23	2.2	2	999.3

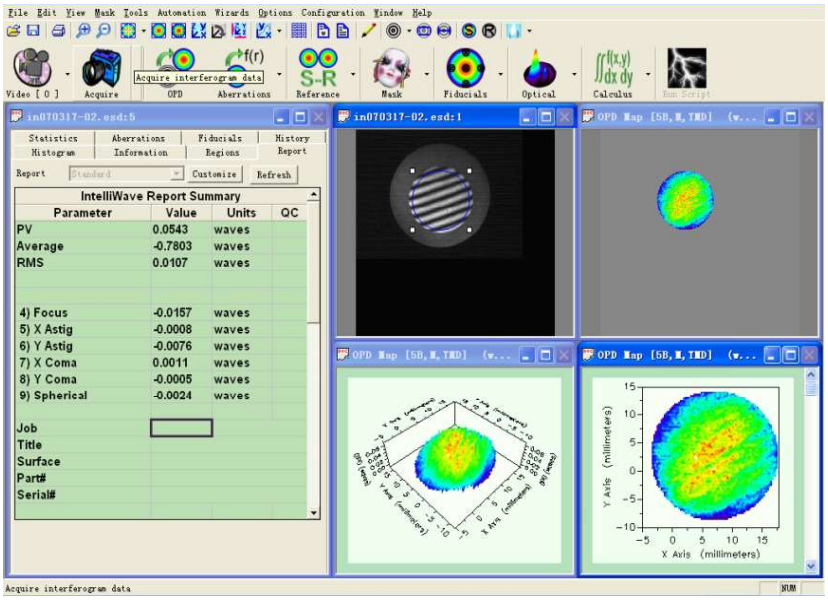
DOUBLE CONCAVE LENS

Specifications

Material	BK7
Design Wavelength	546.1nm
Design Index	1.5183 ±0.0005
Diameter Tolerance	+0.0, -0.15mm
Paraxial Focal Length Tolerance	±2%
Centration	3 arc minutes
Clear Aperture	>85%
Surface Figure	λ /4@632.8nm
Surface Quality	60/40 Scratch/Dig
Bevel	0.25 mm x 45°
Coating	Uncoated



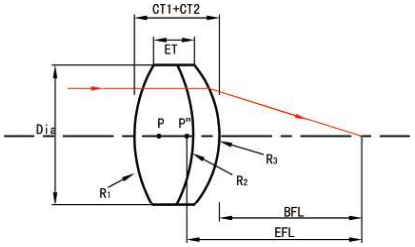
Part No.	Φ (mm)	f (mm)	R1 (mm)	t c (mm)	t e (mm)	f b (mm)
DCV1201	12.7	-25	26.25	2	3.6	-25.7
DCV1202	12.7	-30	31.44	2	3.3	-30.7
DCV1203	12.7	-40	41.8	2	3	-40.7
DCV1204	12.7	-50	52.17	2	2.8	-50.7
DCV1301	25	-25	26.25	2	8.6	-25.7
DCV1302	25.4	-35	36.62	2	6.5	-35.7
DCV1303	25.4	-50	52.17	2	5.1	-50.7
DCV1305	25.4	-75	78.09	2	4.1	-75.7
DCV1306	25.4	-100	104	2	3.6	-100.7



ACHROMATIC LENSES

Specifications

Design Wavelength	480.0, 546.1, 643.8nm
Diameter Tolerance	+0.0, -0.15mm
Paraxial Focal Length Tolerance	±2%
Centration	3 arc minutes
Clear Aperture	>85%
Surface Figure	λ /4@632.8nm
Surface Quality	60/40 Scratch/Dig
Bevel	< 0.25 mm x 45°
Coating	λ /4 Wave MgF_2@550nm



Positive Achromatic Lenses

Part No.	Φ (mm)	f (mm)	R1(mm)	R2=R3(mm)	R4(mm)	CT1(mm)	CT2(mm)	fb(mm)	Lens A	Lens B
ALP0101	6	15	8.831	-6.546	-19.77	2.71	1	13.066	BK7	SF5
ALP0102	6	20	12.356	-8.511	-24.38	2.6	1	18.288	BK7	SF5
ALP0103	6	25	15.704	-10.666	-29.99	2.3	1	23.455	BK7	SF5
ALP0104	6	30	18.88	-12.942	-36.48	1.9	1	28.695	BK7	SF5
ALP0105	8	25	15.596	-10.814	-30.48	2.9	1	23.125	BK7	SF5
ALP0106	8	30	18.88	-12.882	-36.22	2.7	1	28.277	BK7	SF5
ALP0107	10	20	12.3	-9.02	-25.23	3.6	1	17.625	BK7	SF5
ALP0201	12	25	15.346	-11.35	-31.92	4.2	1.3	22.286	BK7	SF5
ALP0202	12.7	25	15.596	-11.402	-31.05	4.3	1.3	22.251	BK7	SF5
ALP0203	12.7	30	18.535	-13.49	-37.84	4	1.3	27.36	BK7	SF5
ALP0204	12.7	40	25.23	-17.539	-48.75	3.4	1.3	37.778	BK7	SF5
ALP0205	12.7	50	31.26	-21.93	-62.37	3.1	1.3	47.992	BK7	SF5
ALP0206	12.7	60	37.33	-26.42	-75.86	2.8	1.3	58.127	BK7	SF5
ALP0207	12.7	75	46.77	-32.96	-94.62	2.6	1.3	73.227	BK7	SF5
ALP0208	20	65	40.09	-29.58	-83.59	6.3	2	60.868	BK7	SF5
ALP0301	25.4	60	37.33	-27.16	-75.86	7	2	55.565	BK7	SF5
ALP0302	25.4	120	73.28	-54.33	-159.96	4.2	2	117.103	BK7	SF5

Negative Achromatic Lenses

Part No.	Φ (mm)	f (mm)	R1(mm)	R2=R3(mm)	R4(mm)	CT1(mm)	CT2(mm)	fb(mm)	Lens A	Lens B
ALN0201	12.7	-25	-15.6	13.09	44.16	3	2.67	-27.5	BK7	F2
ALN0202	12.7	-40	-24.45	17.97	66.6	3	2.34	-42.5	BK7	F2
ALN0301	25.4	-50	-31.19	24.89	85.31	3	4.22	-53.3	BK7	F2

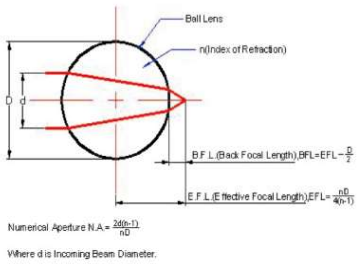
BALL LENS

Product Overview

Ball lenses are near perfect polished spheres of glass or other transparent materials used to focus light from laser sources into fibers and to couple light from fiber to fiber by matching the N.A.(numerical aperture) of the balls to the fibers. Balls can be machined into drums for higher fiber array pitch and mounting alignment accuracy.

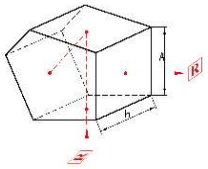
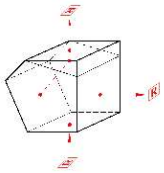
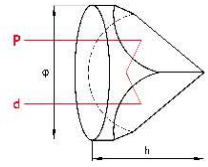
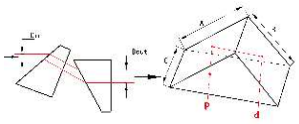
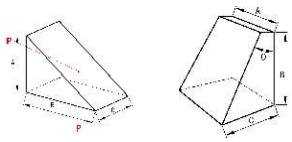
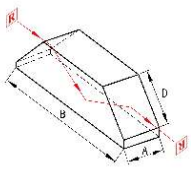
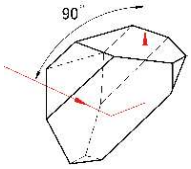
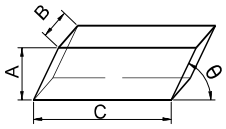
Specifications

Material	BK7 and other optical glass
Diameter tolerance	+0/-0.005mm
Sphericity	+/-0.001mm
Surface quality	40/20
Surface quality	<2.5 lambda



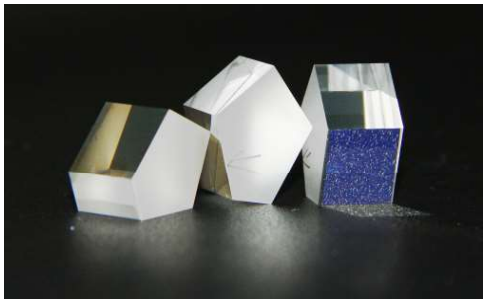
Part No	Diameter (mm)	Dia tolerance(mm)	Sphericity(mm)	Surface quality
BAL0010	1.0	+/-0.005	+/-0.002	40/20
BAL0030	3.0	+/-0.005	+/-0.002	40/20
BAL0040	4.0	+/-0.005	+/-0.002	40/20
BAL0050	5.0	+/-0.005	+/-0.002	40/20

PRISM OVERVIEW

Prism	Illustration	Material	Angle Precision	Application
Penta Prism		BK7	1 Min. Deviation 30 Sec. Deviation 10Sec. Deviation	Plumb Level, Surveying, Alignment, Range Finding and Optical Tooling
Beamsplitter Penta Prism		BK7	1 Min. Deviation 30 Sec. Deviation 10Sec. Deviation Transmission/ Reflection:20/80 ±5 or 50/50±5	Plumb Level, Surveying, Alignment, Range Finding and Optical Tooling
Corner Cube Retroreflectors		BK7	3 Sec. Deviation 5 Sec. Deviation	Plumb Level, Surveying, Alignment, Range Finding and Optical Tooling
Right Angle Prism		BK7 Fused Silica	3 Min. Deviation 1 Min. Deviation 30 Sec. Deviation 10 Sec. Deviation 5 Sec. Deviation	Plumb Level, Surveying, Alignment, Range Finding and Optical Tooling
Anamorphic Prism		SF11	30 Sec. Deviation	For Beam Expansion
Dove Prism		BK7	3 Min. Deviation	Medical Instrument, Optical Tooling and Other Optical Systems
Roof Prism		BK7	3 Sec. Deviation 5 Sec. Deviation	Medical Instrument, Optical Tooling and Other Optical Systems
Rhomboid Prism		BK7	3 Min. Deviation 1 Min. Deviation 30 Sec. Deviation 10 Sec. Deviation 5 Sec. Deviation	Plumb Level, Surveying, Alignment, Range Finding and Optical Tooling

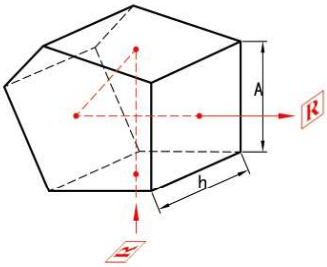
PENTA PRISM

Penta prism can deviate an incident beam without inverting or reversing 90°.The deviation angle of 90° is independent of any rotation of the prism about an axis parallel to the line of intersection of the two reflecting faces. It is commonly used in plumb level, surveying, alignment, range finding and optical tooling. The reflecting surfaces of this Prism must be coated with a metallic or dielectric coating. The standard Penta Prism reflecting surfaces are coated with aluminum or enhanced aluminum.



Specifications

Material	BK7 Grade A Optical Glass
Dimension Tolerance	±0.2mm
90° Deviation Tolerance	According to the Table
Flatness	λ /2(Standard), λ /4(High Precision)@633nm
Reflectivity	R > 95% per Face @400~700 nm
Surface Quality	60/40 Scratch/Dig
Coating on Input and Output Surface	Uncoated



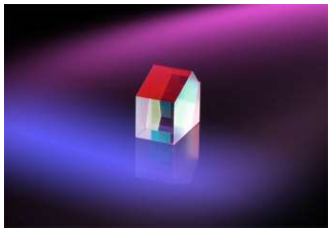
Size(mm)	1 min. Deviation	30 Sec. Deviation	10Sec. Deviation
A x h	Part No.	Part No.	Part No.
2.5 x 2.5	PTP1101	PTP1201	PTP1301
7 x 5	PTP1102	PTP1202	PTP1302
7 x 6	PTP1103	PTP1203	PTP1303
10 x 10	PTP1104	PTP1204	PTP1304
15 x 15	PTP1105	PTP1205	PTP1305
20 x 20	PTP1106	PTP1206	PTP1306

BEAMSPLITTER PENTA PRISM & CORNER CUBE RETROREFLECTOR

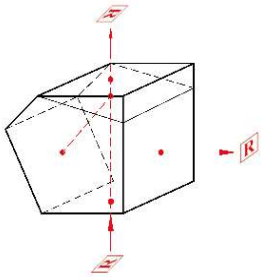
Beamsplitter Penta Prism

By adding a wedge and with partial reflective coating on first reflective surface, Penta Prism can be used as Beamsplitter. We supply Beamsplitter Penta Prism with standard Transmission/reflection (T/R) ratio of 20/80, 50/50. Other T/R ratio is available upon request.

Specifications



Material	BK7 Grade A Optical Glass
Dimension Tolerance	±0.2 mm
90° Deviation Tolerance	According to the Form
Flatness	λ /2(Standard), λ /4(High Precision)@633nm
Reflectivity	R>95% Per Face @400~700nm
Surface Quality	60/40 Scratch/Dig
Beamsplitter Ratio Transmission/Reflection	20/80±5 or 50/50±5
Coating on Input and Output Surface	Uncoated

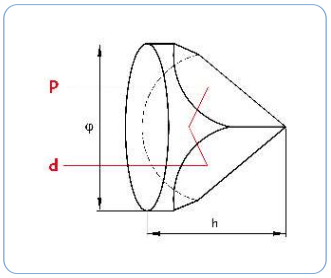


Size(mm)	1 min. Deviation	30 Sec. Deviation	10Sec. Deviation
A x h	Part No.	Part No.	Part No.
7 x 6	PPS1103	PPS1203	PPS1303
10 x 10	PPS1104	PPS1204	PPS1304
15 x 15	PPS1105	PPS1205	PPS1305
20 x 20	PPS1106	PPS1206	PPS1306

Corner Cube Retroreflectors

Specifications

Material	Bk7 Grade A Optical Glass
Dimension Tolerance	+0.0, -0.2 mm
Clear Aperture	>80%
Deviation	180° ±3"
Flatness	λ /4 on big surface, λ /10 on Other Surfaces
Surface Quality	60/40 Scratch and Dig
Wavefront Distortion	λ /2 @633nm
Bevel	0.2 mm to 0.5 mm
Coating on Input and Output Surface	Uncoated

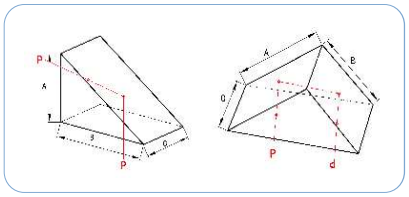


Part No.	Φ (mm)	h(mm)
CCR1101	15	11.3
CCR1102	25.4	19
CCR1103	38.1	29.2
CCR1104	50.8	38.1

RIGHT ANGLE PRISM & ANAMORPHIC

Specifications

Material	BK7 Grade A Optical Glass
Dimension Tolerance	+0.0, -0.2 mm
Clear Aperture	>80%
Angle Tolerance	See the Table
Flatness	λ /2 @633 nm
Surface Quality	60/40 Scratch/Dig
Bevel	0.2 mm to 0.5 mm
Coating	Uncoated



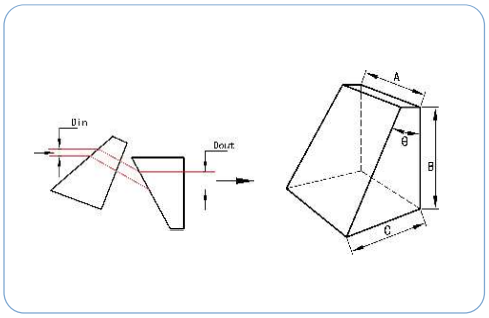
High precision RAP: high angle precision(<5 second), high flatness(<lambda/10), high angle pyramid tolerance (<5 second) are available upon requirement.

Size(mm)	3 min. Deviation	1 min. Deviation	30Sec. Deviation
A,B,C	Part No.	Part No.	Part No.
A=B=C=2.0	RAP1101	RAP1201	RAP1301
A=B=C=3.2	RAP1102	RAP1202	RAP1302
A=B=C=5.0	RAP1103	RAP1203	RAP1303
A=B=C=10.0	RAP1104	RAP1204	RAP1304
A=B=C=12.7	RAP1105	RAP1205	RAP1305
A=B=C=15.0	RAP1106	RAP1206	RAP1306
A=B=C=20.0	RAP1107	RAP1207	RAP1307
A=B=C=25.4	RAP1108	RAP1208	RAP1308
A=B=C=30.0	RAP1109	RAP1209	RAP1309

Anamorphic Prisms

Specifications

Material	SF11 Grade A Optical Glass
Dimension Tolerance	+0.0, -0.2 mm
Clear Aperture	>80%
Flatness	λ /8 @633 nm
Theta	q = 29° 27'±3"
Surface Quality	60/40 Scratch/Dig
Coating	MgF2 Single Layer on Perpendicular Surface

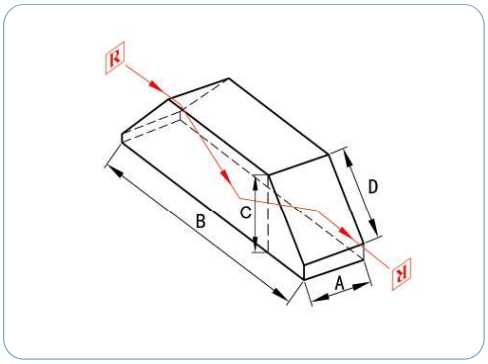


Part No.	A (mm)	B (mm)	C (mm)
ANP0101	12	12	8.5

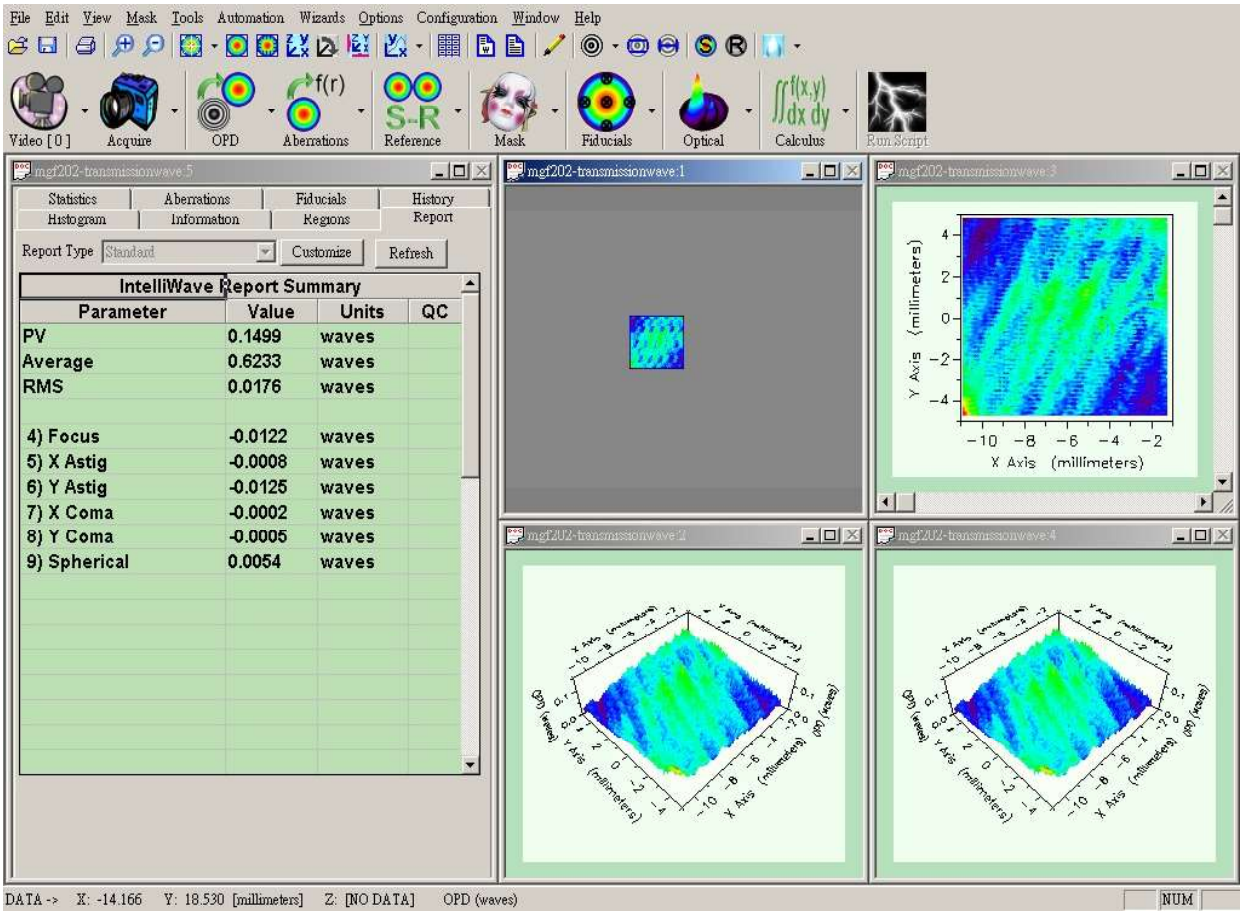
DOVE PRISM

Specifications

Material	BK7 Grade A Optical Glass
Dimension Tolerance	+0.0, -0.2 mm
Clear Aperture	>80%
Angle Tolerance	± 3 arc minutes
Flatness	λ /2 @633 nm
Surface Quality	60/40 Scratch/Dig
Bevel	0.2 mm to 0.5 mm
Coating	Uncoated



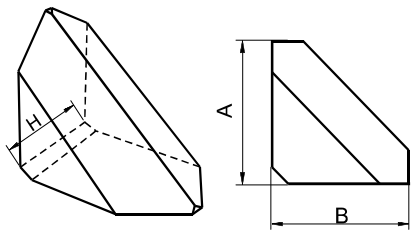
Part No.	A (mm)	B (mm)	C (mm)
DOP1101	5	21.1	5
DOP1102	10	42	10
DOP1103	15	64	15



ROOF PRISM & RHOMBOID PRISM

Specifications

Material	Bk7 or Fused Silica
Dimension Tolerance	+/-0.1 mm
Clear Aperture	>80%
Angle Tolerance	± 30 arc sec
Flatness	λ /4 @633 nm
Surface Quality	60/40 Scratch/Dig
Bevel	0.2 mm to 0.5 mm

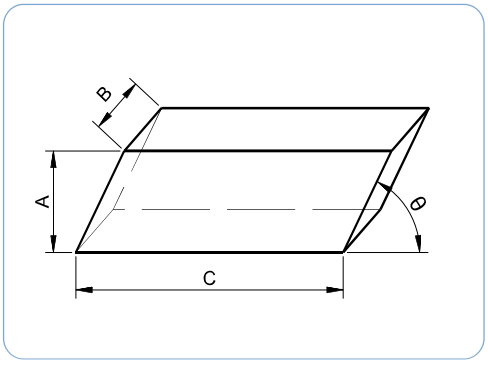


Part No.	A (mm)	B (mm)	H (mm)
RFP1101	15.0	15.0	12.0
RFP1102	23.0	23.0	18.0
RFP1103	31.5	31.5	23.0

Rhomboid Prisms

Specifications

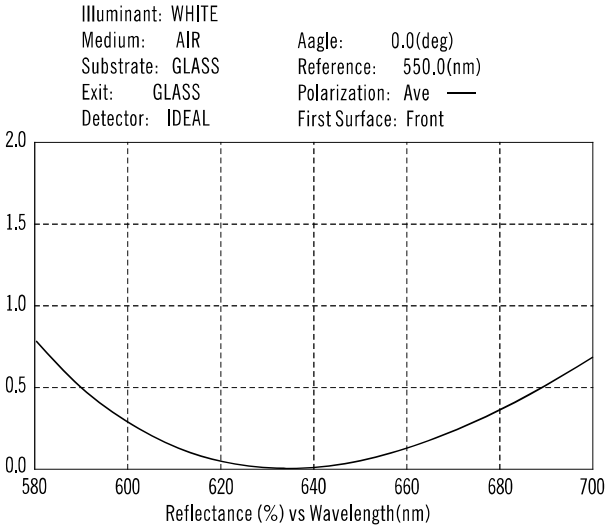
Material	BK7 Gade A Optical Glass
Dimension Tolerance	+0.0/-0.2 mm
Clear Aperture	>80%
Angle Tolerance	3' (3" can be available)
Flatness	λ /4 @633 nm
Surface Quality	60/40 Scratch/Dig (20/10 can be available)
Bevel	0.2 mm to 0.5 mm



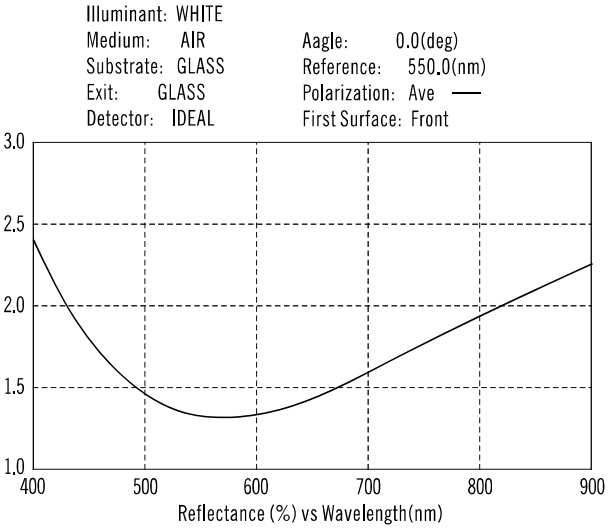
Part No.	A (mm)	B (mm)	C (mm)	θ
RHP1101	3.5	3.5	6.3	45°
RHP1102	10.0	10.0	14.2	45°
RHP1103	15.0	15.0	21.2	45°

ANTI-REFLECTIVE COATING

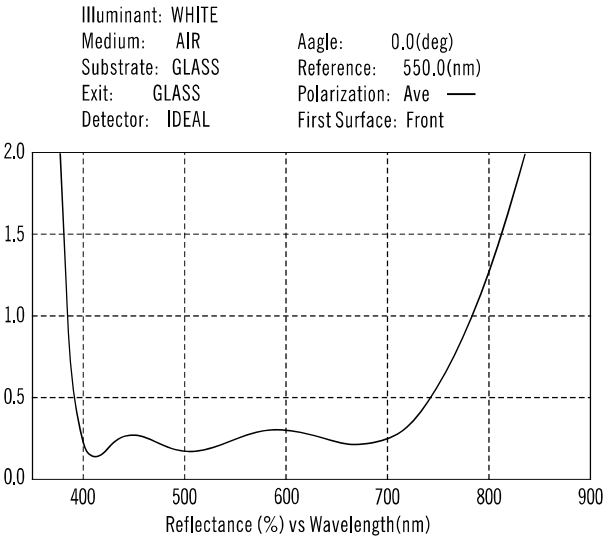
A thin layer of material applied to a surface to reduce the amount of reflected energy. Ideally the index of refraction of that material should be equal to the square root of the product of the indices of the material on either side of the coating, while the ideal thickness for a single-layer coating is one-quarter of the wavelength at which reflectance is to be minimized.



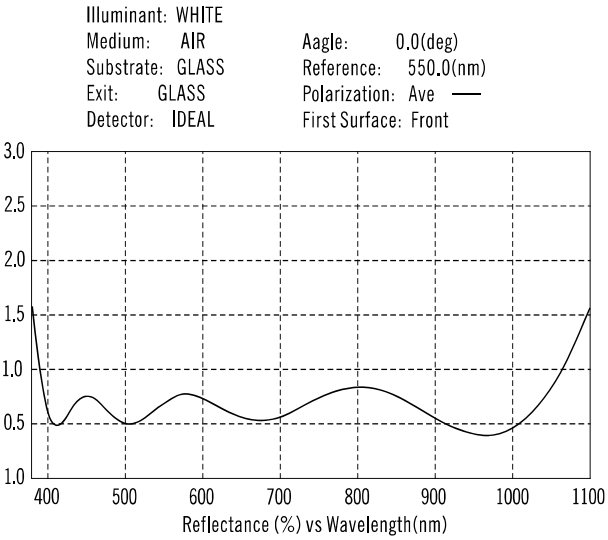
AR@633nm



MgF2@550nm



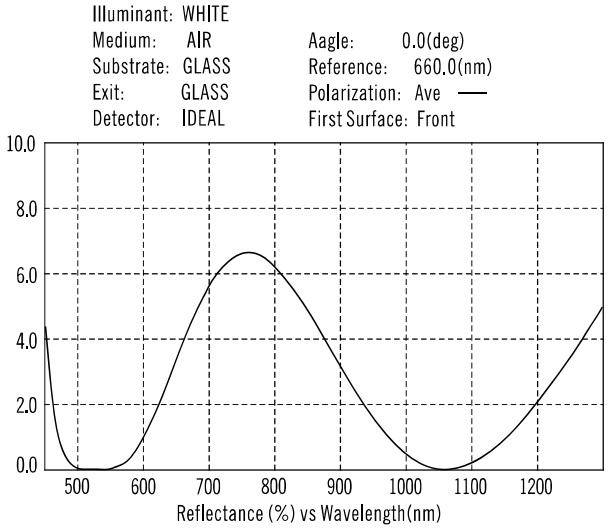
AR@400-700nm



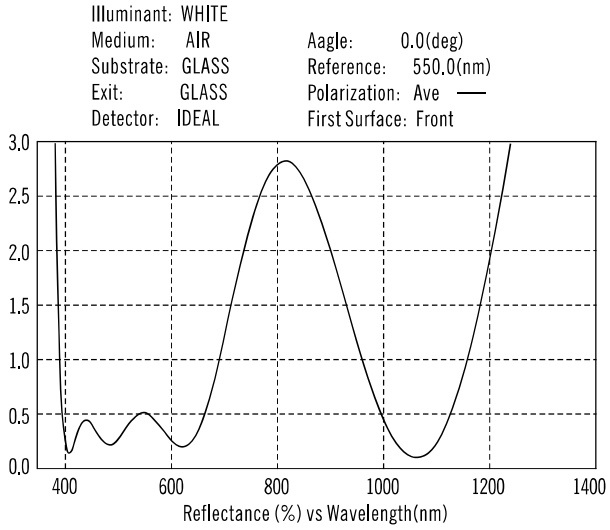
AR@400-1000nm

ANTI-REFLECTIVE COATING

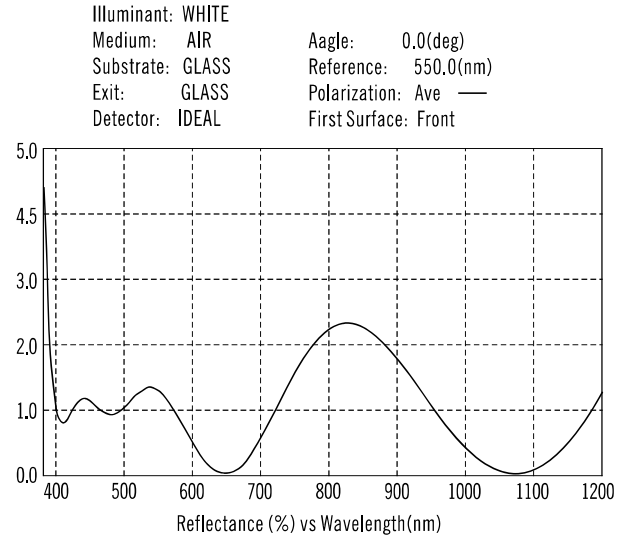
A thin layer of material applied to a surface to reduce the amount of reflected energy. Ideally the index of refraction of that material should be equal to the square root of the product of the indices of the material on either side of the coating, while the ideal thickness for a single-layer coating is one-quarter of the wavelength at which reflectance is to be minimized.



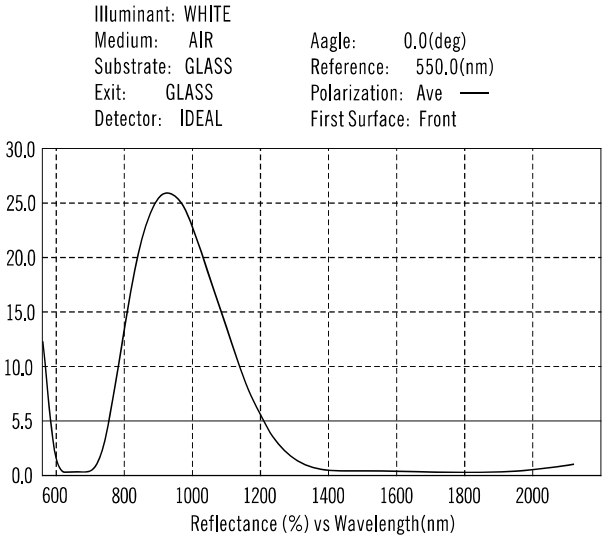
AR@532&1064nm



AR@400-600&1064nm



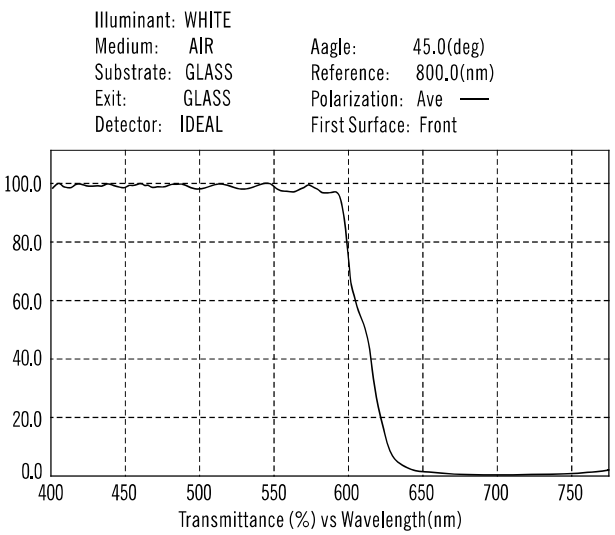
AR@400-1200nm



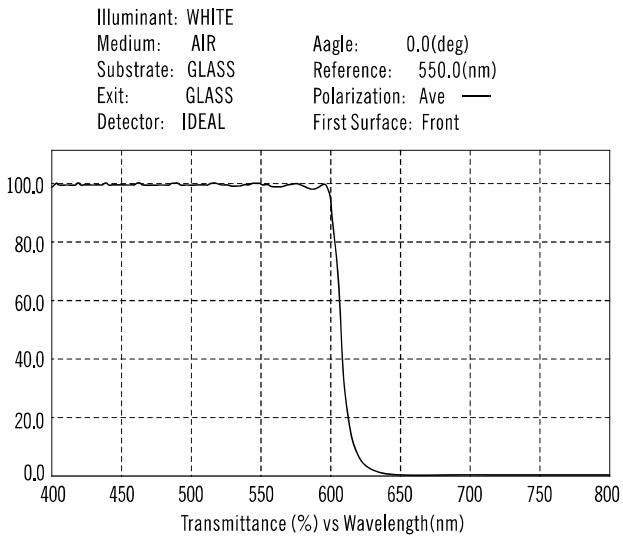
AR@650&1400-2000nm

DIELECTRIC COATING- HR COATING AND PR COATING

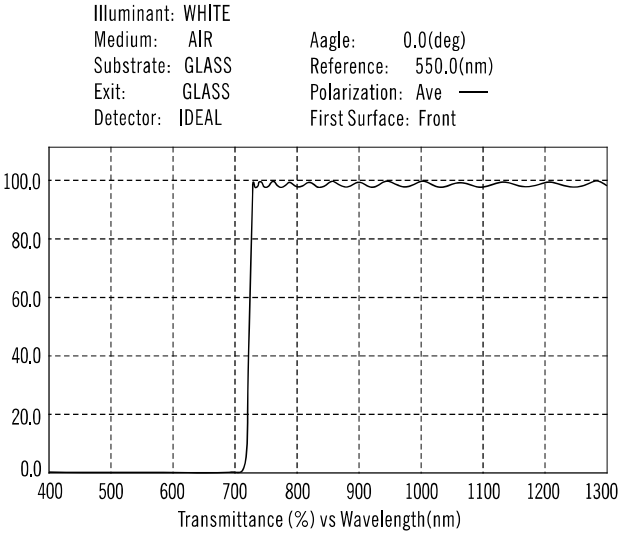
A dielectric coating consisting of alternating layers of quarter-wave film of a higher refractive index and lower refractive index than the substrate. Such coatings can be made very specific to a reflected wavelength or, by varying the layers' thicknesses or film indexes, spread over a wide wavelength interval including high reflection coating (HR) and partial reflective coating (PR).



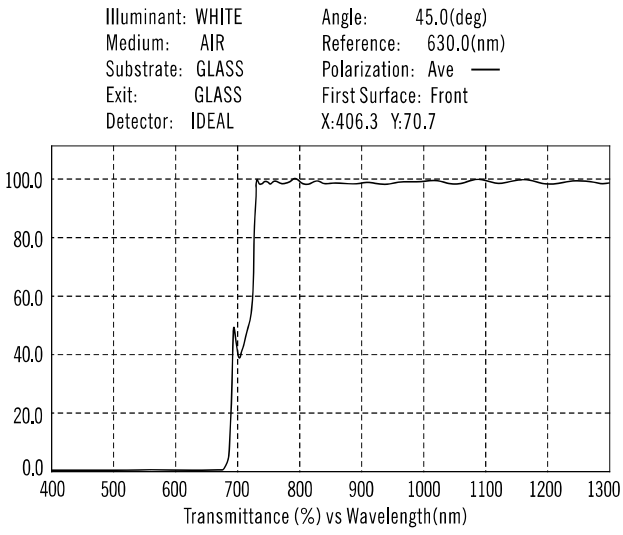
HT@400-560&HR@650-750nm AOI=45°



HT@400-560&HR@650-750nm AOI=0°



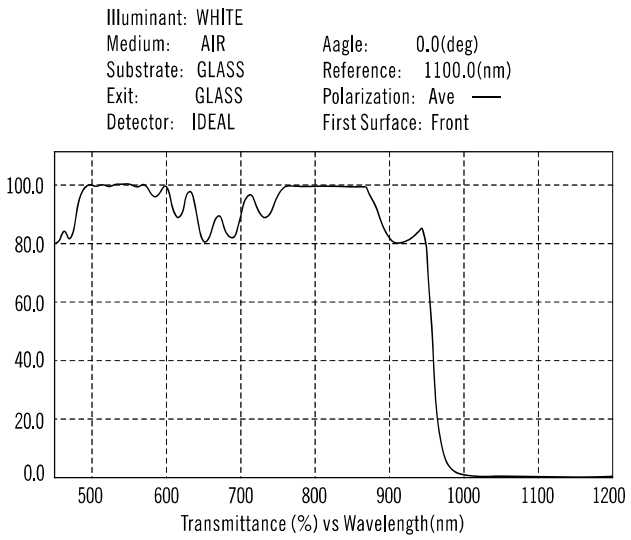
HR@400-700nm&HT@730-815nm AOI=0°



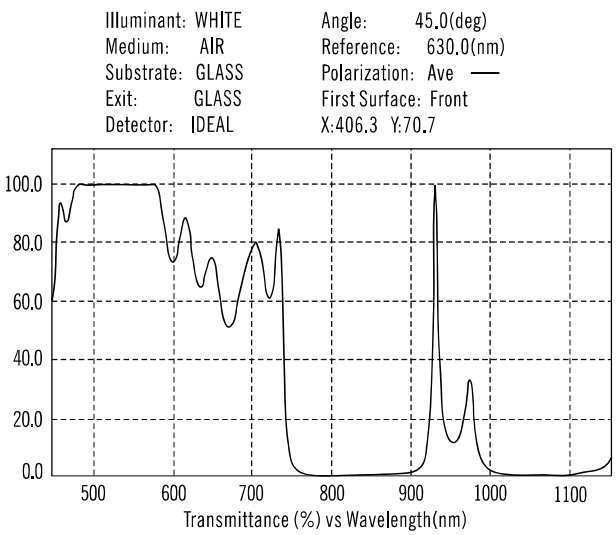
HR@400-680nm&HT@750-1300nm AOI=45°

DIELECTRIC COATING- HR COATING AND PR COATING

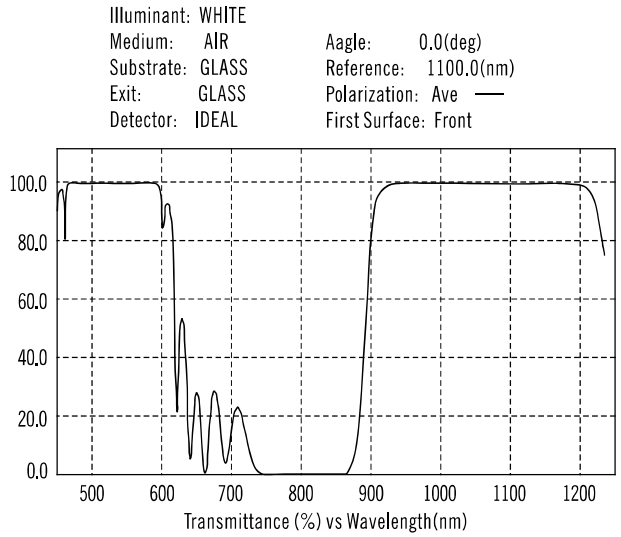
A dielectric coating consisting of alternating layers of quarter-wave film of a higher refractive index and lower refractive index than the substrate. Such coatings can be made very specific to a reflected wavelength or, by varying the layers' thicknesses or film indexes, spread over a wide wavelength interval including high reflection coating (HR) and partial reflective coating (PR).



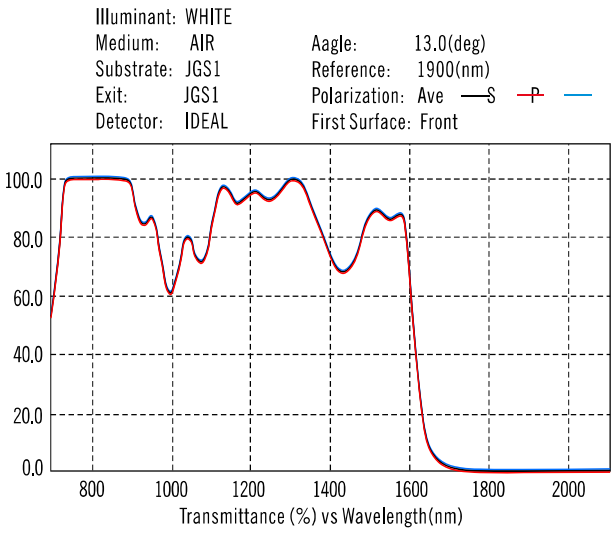
HR@1064nm&HT@532&808nm AOI=0°



HR@1064&808nm&HT@532nm AOI=45°



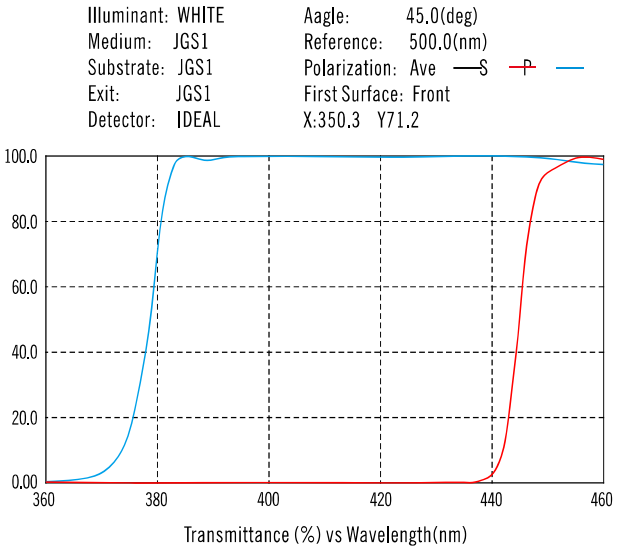
HR@1064&532nm&HT@808nm AOI=0°



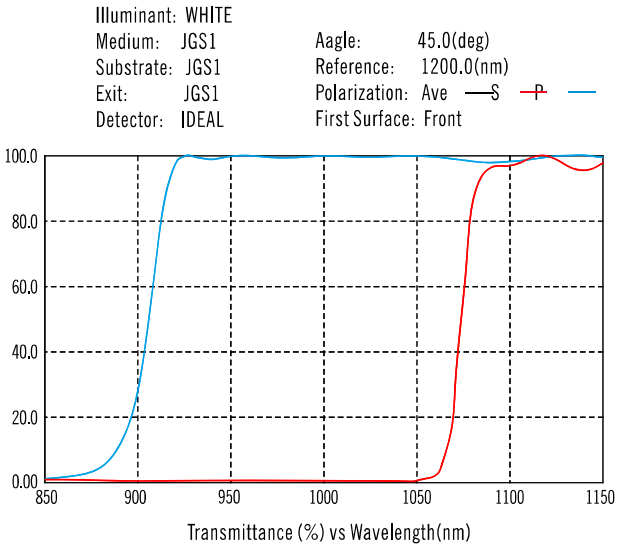
HR@1800-2000nm&HT@785-815nm

POLARIZATION BEAMSPLITTER COATING

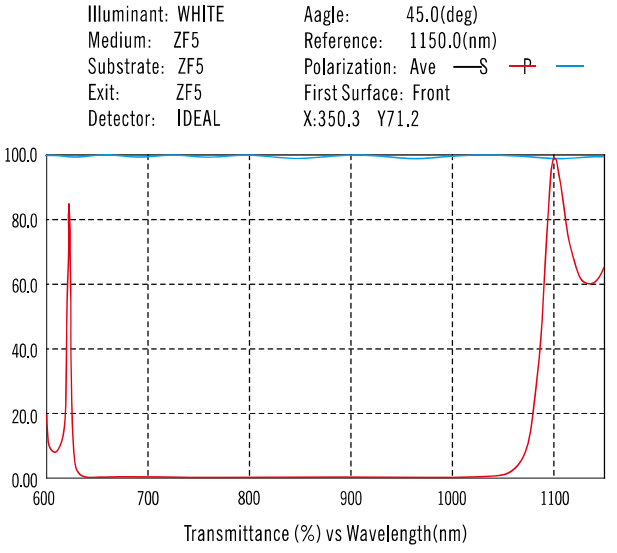
An optical device for dividing a beam into two or more separate beams. A simple beamsplitter may be a very thin sheet of glass inserted in the beam at an angle to divert a portion of the beam in a different direction. A more sophisticated type consists of two right-angle prisms cemented together at their hypotenuse faces. The cemented face of one prism is coated, before cementing, with a metallic or dielectric layer having the desired reflecting properties, both in the percentage of reflection and the desired color.



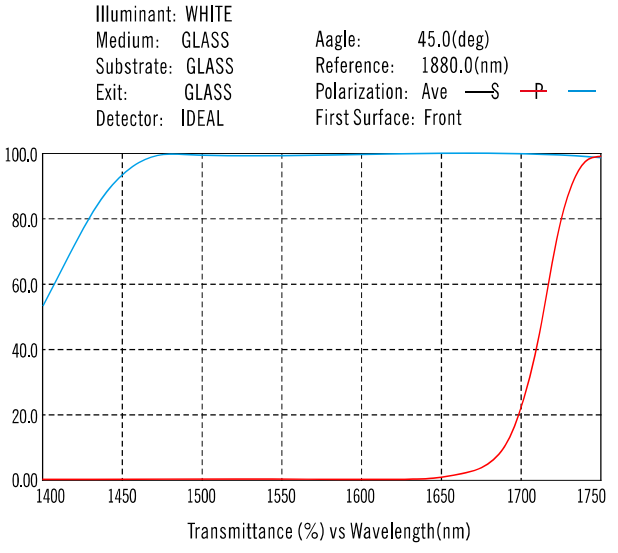
PBS@405+/-10nm



PBS@980+/-30nm



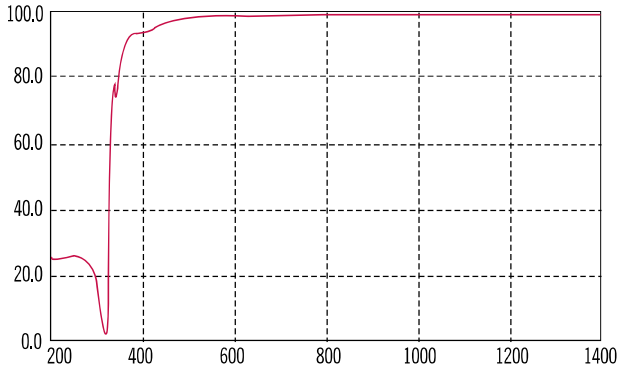
PBS@700-900nm



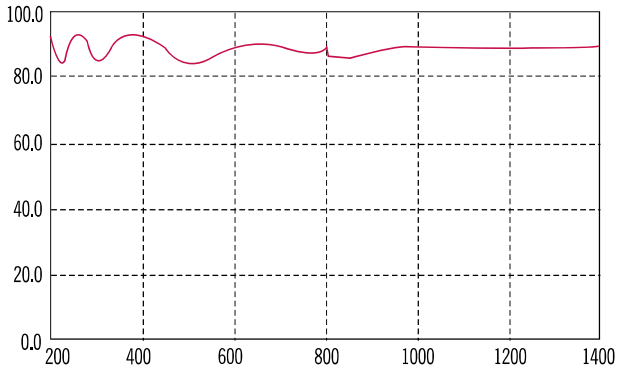
PBS@1520-1610nm

MIRROR--METAL COATING

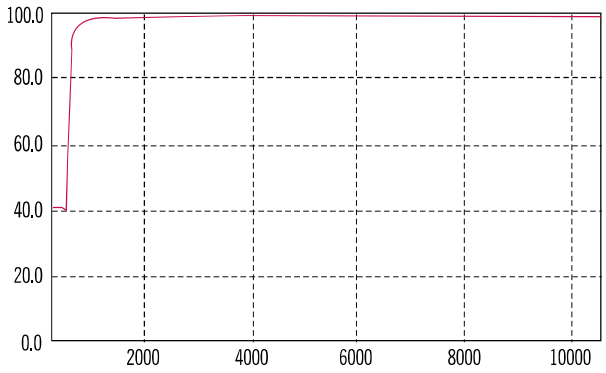
A thin layer of metal deposited on the surface of a substrate. The film may serve as a reflector, beamsplitter, neutral density filter or electromagnetic interference filter. The most common metal coating as for mirror is Al, Ag, Au, Cr, etc.



Ag coating

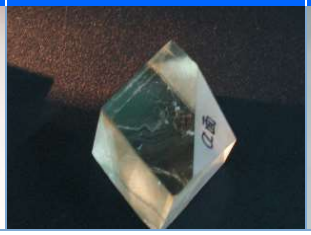


Al coating



Au coating

BIREFRIGENT CRYSTAL

Birefringent Crystals	YVO_4	Calcite	a -BBO
			

Physical and Optical Properties

Transparency Range	500~4000nm	350~2300nm	190~3500nm
Crystal Structure	Trigonal, Space Group R3c	Trigonal, Space Group R3c	Trigonal, Space Group R3c
Crystal Class	Positive Uniaxial	Positive Uniaxial	Negative Uniaxial
Crystal Cell	a=b=7.12Å, c=6.29Å	a=b=4.621Å, c=3.053Å	a=b=12.532 Å, c=12.717 Å
Density	4.22g/cm^3	2.7g/cm^3	3.85g/cm^3
Hygroscopic Susceptibility	Low	Low	Low
Mohs Hardness	5	3	4.5
Thermal Expansion Coefficients	a_a=4.43x10^{-6}/k a_c=11.37x10^{-6}/k	a_a=24.39x10^{-6}/k a_c=5.68x10^{-6}/k	a_a=4 x 10^{-6}/k a_c=36 x 10^{-6}/k
Optical Homogeneity	10^{-6}/cm	10^{-6}/cm	10^{-6}/cm
Absorption Coefficient	0.05%/cm-1 @ 1064 nm	0.07 @ 200nm 0.02 @ 500nm	0.05%/cm-1 @ 1064 nm
Refractive Index, Birefringence(Δ n=ne-no) Walk-Off Angle @ 45°(ρ)	n_e=2.2154, n_o=1.9929 Δ n=0.2251 ρ =6.042° @ 633nm	n_e=1.4852 n_o=1.6557 Δ n=0.1705 ρ =6.20° @ 633nm	n_e=1.67056, n_o=1.54831 Δ n=0.1222 ρ =4.345°@ 532nm

Capabilities

Diameter	Max. 30~40mm	Max. 150mm	Max. 40~50mm
Length	Max. 25~35mm	Max. 100mm	Max. 25~35mm
Surface Quality	Better than 20/10 Scratch/Dig Per MIL-0-13830A		
Beam Deviation	<10 arc seconds		
Optical Axis Orientation	+/-0.2°		
Flatness	< λ /8 @633nm		
Transmission Wavefront Distortion	< λ /4 @633nm		
Coating	Upon Specification		

BIREFRIGENT CRYSTAL

Birefringent Crystals	$LiNbO_3$	MgF_2	Quartz
			

Physical and Optical Properties

Transparency Range	420~5200nm	120~8500nm	200~2300nm
Crystal Structure	Trigonal, Space Group R3c	Trigonal, Space Group R3c	Trigonal, Space Group R3c
Crystal Class	Positive Uniaxial	Positive Uniaxial	Negative Uniaxial
Crystal Cell	a=b=0.515A°, c=13.863 A°	a=b=4.621 A°, c=3.053 A°	
Density	4.64g/cm^3	3.18g/cm^3	2.65g/cm^3
Hygroscopic Susceptibility	Low	Low	Low
Mohs Hardness	5	6	7
Thermal Expansion Coefficients	a_a=2.0x10^{-6}/k @ 25°c c_c=2.2x10^{-6}/k @ 25°c	a_a=6.23-9.25x10^{-6}/k a_c=10.86-14.54x10^{-6}/k	a_a=6.2x10^{-6}/k a_c=10.7x10^{-6}/k
Optical Homogeneity	5 x 10^{-5}/cm	10^{-6}/cm	10^{-6}/cm
Absorption Coefficient	0.1%/cm @ 1064 nm	0.07 at 0.2 μm;0.02 at 5.0 μm	0.1%/cm @ 1064 nm
Refractive Index, Birefringence(Δ n=ne-no) Walk-Off Angle @ 45°(ρ)	n_e=2.20263, n_o=2.28629 Δ n=0.08366 ρ =2.135° @ 633nm	N_e=1.38876, n_o=1.37698 Δ n=0.01178 ρ =0.488° @ 633nm	n_e=1.55170, n_o=1.54265 Δ n=0.00905 ρ =0.335°@ 633nm

Capabilities

Diameter	Max. 30~40mm	Max. 50mm	Max. 100mm
Length	Max. 25~35mm	Max. 100mm	Max. 100mm
Surface Quality	Better than 20/10 Scratch/Dig Per MIL-0-13830A		
Beam Deviation	<10 arc seconds		
Optical Axis Orientation	+/-0.2°		
Flatness	< λ /8 @633nm		
Transmission Wavefront Distortion	< λ /4 @633nm		
Coating	Upon Specification		

LASER CRYSTAL

Laser Crystal	Ti:Sapphire	Nd:YAG	$Nd:YVO_4$
			

Physical and Optical Properties

Chemical Formula	$Ti_3+: Al_2O_3$	Nd: $Y_3Al_5O_{12}$	$Nd:YVO_4$
Crystal Structure	Hexagonal	Cubic	Zircon Tetragonal, Space Group D4h
Melting Point	2050° C	1970° C	
Density	3.98 g/cm^3	4.56 g/cm^3	4.22 g/cm^3
Mohs Hardness	9	8.5	5
Thermal Conductivity Coefficient	0.11 cal/(°C x sec x cm)	14 W/m /K @20° C 10.5 W /m /K @100° C	||C: 5.23 W/m/K ^C: 5.10 W/m/K
Thermal Expansion Coefficient		7.8 x 10-6 /K [111],0 - 250° C	$a_a=4.43x10^{-6}$/K $a_c=11.37x10^{-6}$/K
Lasing Wavelength	660~1050 nm (795nm)	1064nm	914nm, 1064nm, 1342nm
Absorption Range	400~600 nm (488nm)	lamp pump	808nm
Lattice Constants	a=4.748, c=12.957	12.01	a=b=7.12, c=6.29
Fluorescence Lifetime	3.2 μ sec (T = 300 K)	230msec	90 msec (about 50 m s for 2 atm% Nd doped) @ 808nm
Absorption Coefficient	1.0~7.5cm^{-1} @490nm	7.1 cm^{-1}	31.4 cm^{-1} @ 808 nm
Refractive Index	1.76 @ 800nm	1.82 @1064nm	no =1.9573, ne =2.1652@1064nm
Polarized Emission	Unpolarized	Unpolarized	Parallel to Optic Axis (C-axis)

Capabilities

Concentration	0.06~0.5 wt% Ti dopant	0.5~1.2 atm% Nd dopant (10% tolerance)	0.2~3 atm% Nd dopant (10% tolerance)
Figure of Merit	100~300		
Aperature	2~50mm	3~14mm	1~20mm
Path Length	2~130mm	1~60mm	0.02~20mm
End Configuration	Flat/Flat or Brewster/Brewster Ends or Specified		

LASER CRYSTAL

Laser Crystal	Ti:Sapphire	Nd:YAG	$Nd:YVO_4$
Orientation	Optical Axis C Normal to Rod Axis	<111> Crystalline Direction (+/-0.5°C)	a-cut Crystalline Direction (+/-0.5°C)
Parallelism	<10 arc seconds		
Surface Quality	Better than 60/40 Scratch/Dig per MIL-O-13830A	Better than 20/10 Scratch/Dig per MIL-O-1380A	Better than 20/10 Scratch/Dig per MIL-O-1380A
Surface Flatness	< λ /10 @633nm	< λ /10 @ 632.8nm	< λ /10 @ 632.8nm
Wavefront Distortion	< λ /4 per inch @ 633 nm	<λ /10 @ 632.8nm for 3~7mm <λ /8 per inch @ 632.8nm for>=7mm	< λ /8 @ 633nm
Perpendicularity	< 5 arc minutes	< 5 arc minutes	< 5 arc minutes
Clear Aperture	Central 90%	Central 95%	Central 95%
Chamfer	0.15x44°	0.15x45°	0.15x45°
Damage Threshold	Over 15J/cm^2 (Rods without Coating) over 700MW/cm^2(Coating)	Over 15J/cm^2 (Rods without Coating) Over 700MW/cm^2 (Coating)	Over 15J/cm^2 (Rods without Coating) Over 700MW/cm^2 (Coating)
Coatings	AR@700~1100nm	a) AR@1064nm,R<0.1%	a) AR@1064nm,R<0.1%
		b) AR@1064nm,R<0.1%; HT@808nm,T>95%;	b) AR@1064nm,R<0.1%; HT@808nm,T>95%;
		c) HR@1064nm,R<99.8%; HT@808nm,T>95%;	c) HR@1064nm,R<99.8%; HT@808nm,T>95%;
		d) HR@1064nm,R<99.8%; HT@808nm,T>95%; HR@532nm,R>99%	d) HR@1064nm,R<99.8%; HT@808nm,T>95%; HR@532nm,R>99%

NLO CRYSTAL

NLO Crystal	BBO	KTP	LBO	$LiNbO_3$
				

Physical and Optical Properties

Crystal Structure	Trigonal, Space Group R3c	Orthorhombic, Point Group mm^2	Orthorhombic, Point Group mm^2	Trigonal, Space Group R3c
Transparency Range	189~3500 nm	350nm~4500nm	160~2600 nm	420~5200 nm
Cell Parameters	A=b=12.532Å C=12.717Å	A=6.404Å B=10.616Å C=12.814Å	A=8.44731Å B=7.3788Å C=5.1395Å	a = 0.515Å c = 13.863Å
Melting Point	1095 +/-5° C	1172° C Incongruent	834° C	1255 +/-5° C
Curie point	925 +/-5° C	936° C		1140 +/-5° C
Optical Homogeneity	$\Delta n \approx 10^{-6}$ /cm	$\Delta n \approx 10^{-5}$ /cm	$\Delta n \approx 10^{-6}$ /cm	$\Delta n \approx 5 \times 10^{-5}$ /cm
Mohs Hardness	4.5	5	6	5
Density	3.85 g/cm^3	3.01 g/cm^3	2.47g/cm^3	4.64 g/cm^3
Thermal Conductivity	^c, 0.012 W/cm/K ||c, 0.016 W/m/K	0.03 W/cm/K	0.035 W/cm/K	0.046 W/cm/K
Phase-matchable SHG Range	205nm~1750nm	1000~2000nm	800~2000nm	1100~3000nm
Absorption Coefficient	< 0.1%/cm @ 1064nm	<1%/cm @1064nm and 532 nm	<=1%/cm @ 1064nm	<0.1%/cm @ 1064 nm
NLO coefficients	d_{21} = 2.2pm/V d_{31} = 0.08pm/V d_{22} = 2.2pm/V	d_{31} =1.95pm/V d_{32} =3.90pm/V d_{33} =15.3pm/V d_{24} =3.90pm/V d_{15} =1.95pm/V	d_{21} =0.67pm/V d_{22} =0.04pm/V d_{23} =0.85pm/V d_{34} =0.85pm/V d_{16} =0.67pm/V	$d_{21}=d_{22}=d_{16}$=2.6pm/V $d_{31}=d_{32}=d_{24}$ =4.6pm/V d_{33} = 25.6pm/V
Damage Threshold @ 1064 nm	12.9J/cm^2 9.9GW/cm^2	6.0J/cm^2; 4.6GW/cm^2	24.6J/cm^2; 18.9GW/cm^2	200 MW/cm^2
Refractive Indices@ 1064nm@532nm	n_e = 1.5425 n_o = 1.6551 n_e = 1.5555 n_o = 1.6749	n_x = 1.73991 n_y = 1.74802 n_z = 1.82956 n_x = 1.77903 n_y = 1.79002 n_z = 1.88628	n_x = 1.56447 n_y = 1.59050 n_z = 1.60538 n_x = 1.57842 n_y = 1.60650 n_z = 1.62154	n_o = 2.23216 n_e = 2.15600 n_o = 2.32309 n_e = 2.23415

NLO CRYSTAL

Typical Specification and Capabilities

NLO Crystal	BBO	KTP	LBO	$LiNbO_3$
Angle Tolerance	$\Delta\theta < \pm 0.5^\circ$; $\Delta\phi < \pm 0.5^\circ$			
Dimension Tolerance	(W ± 0.1mm) x (H ± 0.1mm) x (L + 0.2mm/-0.1mm)	(W ± 0.1mm) x (H ± 0.1mm) x (L + 0.2mm/-0.1mm)	(W ± 0.1mm) x (H ± 0.2mm) x (L + 0.2mm/-0.2mm)	(W ± 0.1mm) x (H ± 0.2mm) x (L + 0.2mm/-0.2mm)
Flatness	< λ /8 @ 633nm	< λ /8 @ 633nm	< λ /4 @ 632.8nm	< λ /8 @ 633nm
Scratch/Dig Code	Better than 10/5 Scracth/Dig per MIL-O-13830A			
Parallelism	< 20 arc seconds			
Perpendicularity	<5 arc minutes	< 5 arc minutes	< 30 arc minutes	< 5 arc minutes
Wavefront Distortion	< λ /8 @ 633nm	< λ /8 @ 633nm	< λ /4 @ 632nm	< λ /8 @ 632nm
Clear Aperture	> 90% Central Area	> 90% Central Area	> 80% Central Area	> 90% Central Area
Aperture	1x1~12x12mm	1x1~10x10mm	2~10mm	1~50mm
Length	0.02~25mm	0.05~20mm	0.3~20mm	0.3~20mm
Phase Matching Type	Type I or Type II	Type II	Type I or Type II	Type I or Type II
End Configuration	Flat or Brewster or Specified	Flat or Brewster or Specified	Flat, Spherical, Parallel and Wedged	Flat, Spherical, Parallel and Wedged
Typical Coating	Antireflective coating	Antireflective coating Highreflective coating	Antireflective coating	Antireflective coating

PASSIVE CRYSTAL

Cr 4+ :YAG

Physical Properties

Chemical Formula	$Cr_4+: Y_3 A_{15} O_{12}$
Crystal Structure	Cubic Garnet
Recovery Time	8.5 μ s
Hardness Mohs	8.5
Density	$4.56g/cm^3$
Orientation	[100]+/-10°
Thermal Conductivity	12.13W/m/K
Refractive Index	1.82 @ 1064nm

Optical Properties

Base State Absorption Cross Section	$\sigma_{s1} = 4.3x10^{-18}\ cm^2$
Emission State Absorption Cross Section	$\sigma_{s2} = 8.2x10^{-19}\ cm^2$
Fluorescence Lifetime	3.4us

Capabilities

Cr_4+ Dopant Concentration	0.5 mol%~3 mol%
Aperture	2x2~14x14mm
Initial transmission	10% ~ 99%

Typical Specification and Tolerance

DimensionTolerance	(W ± 0.1mm) x (H ± 0.1mm) x (L + 0.2mm/-0.1mm)
Flatness	< λ /8 @ 633nm
Scratch/Dig	Better than 10/5 Scracth/Dig per MIL-O-13830A
Parallelism	< 20 arc seconds
Perpendicularity	<5 arc minutes
Wavefront Distortion	Less than λ /8 @ 633nm
Clear Aperture	> 90% Central Area
Coating	Anti-reflective

TERBIUM GALLIUM GARNET(TGG)

Terbium Gallium Garnet (TGG) is the right crystal material for Farady devices(Rotator and Isolator). The Farady ratator is made up of a TGG rod contained in a special designed magnet. The polarization of a light beam passing through the rotator makes rotation.The direction of rotation is only dependent on the direction of the magnetic field and not on the direction of propagation of the light beam.The optical isolator consists of a 45 degree rotator set between two suitably arrayed polarizers which allow a light beam to pass through in one direction only. With a combination of excellent properties, such as large verdet constant,low light loss, high thermal conductance and high light damage threshold,TGG is the unique material for Farady devices. It is widely used for YAG lasers and Ti:sapphire tunable lasers,ring lasers ,etc.

Physical Properties

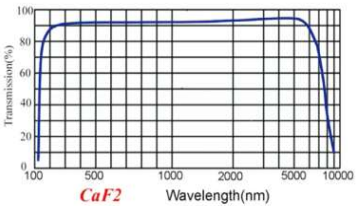
Crystal	Terbium Gallium Garnet ($Tb_3Ga_5O_{12}$)
Orientation	[111] Within 5 Degrees
Wavefront Distortion (Per Inch of Rod Length)	λ /8
Extinction Ratio	30 dB over 2/3 Clear Aperture
Diameter Tolerance	+0.000" / -0.002"
Length Tolerance	+0.010 / -0.010"
Chamfer	0.005" $\pm$ 0.003" @ 45° $\pm$ 5°
Flatness	λ / 10 wave @ 633 nm
Parallelism	< 1 minutes of arc
Perpendicularity	< 10 minutes of arc
Surface Quality	10/5 Scratch/Dig per MIL-O-13830A
Reflectivity	< 0.25% @ 1064 nm
Thermal Conductivity	7.4 W cm^{-1} K^{-1}
Refractive Index	1.95 @ 1064nm

OPTICAL CRYSTAL

CaF_2

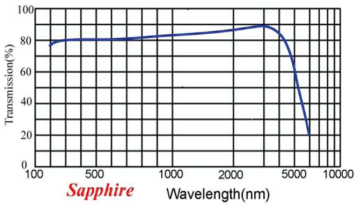
CaF_2 is a crystal, which has good transmission from 170 nm to 7800 nm. It's slightly soluble in water and susceptible to thermal shock. CaF_2 is commonly used in IR components such as windows, Lenses and prisms.

- Transmission Range: 170 nm~7800 nm
- Thermal Expansion Coefficient: 18.85X10-6/K
- Density: 3.18 g/cm^3



Sapphire

Sapphire is a single crystal aluminum oxide (Al_2O_3). It is one of the hardest materials. Sapphire has good transmission characteristics over the visible, and near IR spectrum. It exhibits high mechanical strength, chemical resistance, thermal conductivity and thermal stability. It is often used as window materials in specific field such as space technology where scratch or high temperature resistance is required.



Physical Properties

Crystal Symmetry Hexagonal	System
Lattice Constant	a =4.75 ; c =12.97
Transparence Range	0.18~4.5 μ m
Density	3.98 g/cm^3
Mohs Hardness	9
Melting Point	2030℃
Thermal Conductivity	0.04 W/m/K
Expansion Coefficient	8.4 x 10^{-6}/K
Refractive Index	1.755

Silicon(si) Crystal

Silicon(Si) is commonly used as a substrate material for infrared reflectors and windows in the 1.5 μ m-8 μ m region. The strong absorption band at 9 μ m makes it unsuitable for CO_2 laser transmission applications but it is frequently used for laser mirrors because of its high thermal conductivity and low density. Silicon is also a useful transmitter in 20 μ m range.

Physical Properties

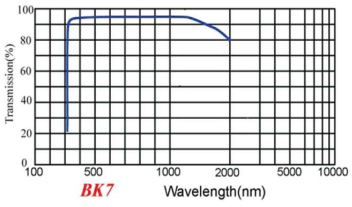
Material Type	CZ FZ; N or P
Crystal Direction	{100} {111}
Resistivity(Ohm/cm)	0.003-50
Thermal condustivity(J/K . M . S)	163.3@273K
Density(g/cm^3)	2.33g/cm^3 at 20℃
Melting point	1410℃
Boiling point	3265℃
Knoop Hardness(kg/mm^2)	1150
Transparency Range	1000nm-10000nm 30000nm-300000nm

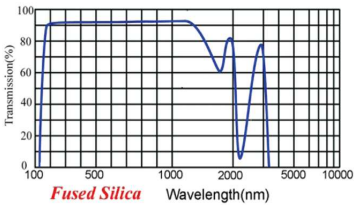
OPTICAL GLASS

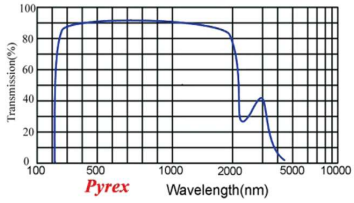
Dayoptics has capability in manufacturing various optical components with a wide variety of optical materials. Selecting a optical material is important since each material has different optical characteristics, such as transmission versus wavelength, index of refracton, thermal, mechanical and chemical characteristics.
The index of refraction and Abbe Number of a glass are typically used by designers as degrees of freedom when designing systems. Dayoptics has a program that combines the foundation data of a wide variety of optical materials. It is easy for us to find the right materials for your application.
Many glass manufacturers offer the same material characteristics under different trade names. Based on availability,we reserve the right to substitute an equivalent glass in our production runs.

Herewith, the most common materials Dayoptics used:

Materials	Refractive Index (nd)	Abbe Number (Vd)	Density (g/cm^3)	Transmission Range (um)	Thermal Expansion Coefficient (10-6/K)
BK7	1.517	64.2	2.52	0.33-2.1	7.5
SF5	1.673	32.17	4.08	0.33-2.5	8.2
SF11	1.785	25.76	4.87	0.37-2.5	6.8
Fused Silica	1.458	67.82	2.2	0.185-2.5	0.54
Prexy	1.474	65.38	2.23	0.23-2.7	3.25
CaF2	1.434	94.99	3.18	0.17-7.8	18.85
Sapphire	1.768	72.24	3.99	0.18-4.5	5.8







For the Schott material in this catalogue , we use Chinese equivalent material instead

Plano product Capability:

Attribute	Commercial	High Precision
End- faces Configuration	Flat	Flat
Dimension Tolerance	±0.1mm	±0.01mm
Surface Quality	40-20 scratch and dig	10-5 scratch and dig
Flatness	λ/4	λ/10
Parallelism	20″	2″
Perpendicularity	15′	5′

Lens Specification :

Diarmeter size	5-50mm
Shape	Plano-convex, Double-convex, Plano-concave&Double-concave
Surface Figure: Power(N) Irregularity(△N)	≤3 ≤0.5
Centration ($Z=\frac{D1}{R1}\pm\frac{D2}{R2}{4}$ Double-convex and Double-concave lens: "+", Meniscus lens "-", Plano-convex and Plano-concave: R=∞)	Z>0.15:C≤3 Z>0.1-0.15:C≤30 Z<0.1:No centration
Surface quality	40-20 scratch and dig, 5≤ Φ ≤22mm 60-40 scratch and dig, 22≤ Φ ≤50mm

OPTICAL GLASS

n_d	V_d	CDGM	SCHOTT	OHARA	HOYA	SUMITA	HIKARI
1.470	66.83	H-QK1	FK1	FSL1	FC1		
1.487	70.04	H-QK3					
1.487	70.44	H-QK3L	N-FK5	S-FSL5	FC5		E-FK5
1.500	62.07	K1	K11				
1.500	66.02	H-K2	BK4	BSL4	BSC4		
1.505	64.72	H-K3	BK5				
1.508	61.05	K4A	ZKN7	ZSL7	ZNC7		ZK7
1.510	63.36	H-K5	BK1	BSL1	BSC1		BK1
1.511	60.46	H-K6	K7	NSL7	C7		K7
1.515	60.63	H-K7					
1.516	56.79	K8		NSL2	C2		K2
1.517	64.2	H-K9L	N-BK7	S-BSL7	BSC7		E-BK7
1.517		H-UK9L	UBK7				
1.518	58.95	H-K10		S-NSL3	E-C3		E-K3
1.526	60.61	H-K11	BALK1	NSL21	BACL1		
1.534	55.47	H-K12	ZK5	ZSL5	ZNC5		ZK5
1.519	61.69	H-K16			BACL3		BALK3
1.522	59.48	H-K50	N-K5	S-NSL5	C5		E-K5
1.523	58.64	H-K51	B270	NSL51	C12		KN1
1.530	60.47	H-BaK1					
1.540	59.72	H-BaK2	N-BAK2	S-BAL12	BAC2		E-BaK2
1.547	62.78	H-BaK3		BAL21			PSK1
1.552	63.36	H-BaK4	N-PSK3	BAL23	PCD3		PSK3
1.561	58.34	BaK5					
1.564	60.76	H-BaK6	N-SK11	S-BAL41	BACD11		E-SK11
1.569	56.04	H-BaK7	N-BAK4	S-BAL14	BAC4		E-BAK4
1.573	57.49	H-BaK8	N-BAK1	S-BAL11	BAC1		E-BAK1
1.574	56.45	BaK9	BAK6	BAL16	BAC6		
1.560	61.21	BaK11	SK20	BAL50			SK20
1.569	62.93	H-ZK1	PSK2	BAL22	PCD2		PSK2
1.583	59.46	H-ZK2	SK12	S-BAL42	BACD12		SK12
1.589	61.25	H-ZK3	N-SK5	S-BAL35	BACD5		E-SK5
1.609	58.86	H-ZK4	SK3	BSM3	BACD3		BSM3
1.611	55.77	ZK5	SK8	BSM8	BACD8		
1.613	58.58	H-ZK6	N-SK4	S-BSM4	BACD4		E-SK4
1.613	60.58	H-ZK7					
1.614	55.12	ZK8	SK9	BSM9	BACD9		SK9
1.620	60.34	H-ZK9	N-SK16	S-BSM16	BACD16		E-SK16
1.623	56.71	H-ZK10	N-SK10	S-BSM10	E-BACD10		E-SK10
1.639	55.45	H-ZK11	N-SK19	S-BSM18	BACD18		E-SK18
1.603	60.6	H-ZK14	N-SK14	S-BSM14	BACD14		E-SK14
1.607	59.46	H-ZK15	SK7	BSM7	BACD7		SK7
1.614	56.4	H-ZK19	SK6	BSM6	BACD6		SK6
1.617	53.91	H-ZK20	SSK1	BSM21	BACED1		SSK1
1.623	58.12	H-ZK21	N-SK15	S-BSM15	BACD15		E-SK15
1.607	56.65	H-ZK50	SK2	BSM2	BACD2		E-SK2
1.618	55.14	ZK51	SSK4	BSM24	BACED4		SSK4

COLOR GLASS

Chinese color glass	Former USSR	SCHOTT	HOYA	Chinese color glass	Former USSR	SCHOTT	HOYA
ZJB220			UV-22	QB26		BG18	
ZJB240		WG230		QB29		BG25	B-380
ZJB260	Б С12			LB1	3С1	VG9	
ZJB280	Б С3	WG280	UV-28	LB2	3С2	VG11	
ZJB300	Б С4	WG295	UV-30	LB3	3С3		
ZJB320	Б С5	WG320	UV-32	LB4	3С6		
ZJB340	Б С10	WG345	UV-34	LB6	3С8		
ZJB360	Б С7	WG360	UV-36	LB7	Ж3С1	VB8	G-533
ZJB380	Б С8	GG375	L-38	LB8	Ж3С4		
JB400	Ж С4	GG400	L-40	LB9	Ж3С5	VB10	
JB420	Ж С11	GG420	L-42	LB10	Ж3С6		G-550
JB450	Ж С12	GG455	Y-44	LB11	Ж3С9		
JB470	Ж С16	GG475	Y-46	LB12	Ж3С10		
JB490	Ж С17	GG495	Y-48	LB13	Ж3С12		G-545
JB510	Ж С18	GG515	Y-50	LB14	Ж3С13		
CB535	ОС11	GG530	O-54	LB15	Ж3С17		
CB550	ОС12	GG550		LB16	Ж3С18		
CB565	ОС13	GG570	O-56	LB17		VG5	
CB580	ОС14	GG590	O-58	LB18		VG6	
HB600	КС10		R-60	LB19			
HB610	КС11	RG610		JB1	Ж С3	GG19	
HB630	КС13	RG630	R-62	JB9		GG10	
HB640	КС14	RG645	R-64	CB1	ОС5		
HB650	КС15		R-66	CB2	ОС6		
HB670	КС17	RG665		HB1	II С5		
HB685	КС18		R-68	HB3	II С8	RG6	
HB700	КС19	RG695	R-70	HB5	II С13		
HB720		RG715	R-72	HB6	II С2		
HWB760			IR-76	HWB1	И КС1		RM-86
HWB780		RG780		HWB3	И КС2	RG7	RM-90
HWB800			IR-80	HWB4	И КС3		
HWB830		RG830	IR-83	FB1	ТС1		
HWB850			IR-85	FB3	ТС3		
HWB900				GRB1	С3С14	KG2	HA-50
HWB930				GRB3	С3С16	KG30	HA-30
ZWB1	У Ф С2	UG11	U-340	PNB586	С7	BG20	V-10
ZWB2	У Ф С3	UG1	U-360	HOB445			HY1
ZWB3	У Ф С1	UG5	U-330	TB1			SL-1A
ZB1	Ф С1		B-390	TB2			L-1B
ZB2	Ф С6	BG3		SSB40		FG6	LB-40
ZB3	Ф С7		B-370	SSB145		BG34	LB-145
QB1	СС1			SSB165		FG3	LB-165
QB2	СС2		B-410	SSB200			LB-200
QB3	СС4			SJB20		FG18	LA-20
QB4	СС5			SJB80		FG16	LA-80
QB5	СС8		B-440	SJB100			LA-100
QB9	С3С3			SJB130		FG15	LA-120
QB10	С3С5			SJB140			LA-140
QB11	С3С7	BG14		ZAB00	НС12	NG1	ND-0
QB12	С3С8		B-460	ZAB02	НС11	NG9	ND-03
QB13	С3С9			ZAB2	НС10	NG3	
Qb16	С3С15			ZAB5	НС3		