

Laser Research Institute of Qufu Normal University



CRYSTAL POLARIZATION DEVICES — BACKBONE OF POLARIZATION TECHNOLOGY

Laser Research Institute of Qufu Normal University

Crystal Polarization Devices is a special device that adjusts and changes various polarizations of light. It is an irreplaceable key device in laser applications and modulation technologies. It is a basic passive device in the development and industrialization of optical communication and modern optical information technology. Situated at Confucius' hometown, Qufu Normal University is among provincial key universities. The Laser Research Institute of Qufu Normal University is the unique national scientific R&D and production base of polarization technology and devices, and the Key Lab of Laser Polarization and Optical Information Technology in Shandong Province. In 1995, the Research Center of Laser Polarization Technology and Engineering was founded in Shandong Province. The institute has solid strength in teaching, scientific R&D, and experienced management and administration. Excellent R&D conditions, advanced optical processing equipment, and skilled crystal processing techniques guarantee the international level of products.

Since 1979, the institute has undertaken many projects in the field of laser polarization technology and devices, such as National Key Science and Technology Program, National Torch Plan Project, National 863 Project, and etc. Among them, 38 achievements in science and technology were appraised, 28 achievements filled the gaps in China, and 18 achievements were originated all over the world. The institute has obtained various prizes for 51 times, including National Invention Prize, National Science and Technology Progress Prize, Science and Technology Progress Prize of **HLHL** Fund, and etc.

Polarization technology is an important branch of optical technology. It has been widely applied in a variety of fields related to optical science and technology. Polarization devices, as the basic application of polarization technology, spring up like bamboo shoots after a spring rain. There are many types of polarization devices, such as polarization plates, polarizing prisms, polarized beam splitting prisms, retardation waveplates and depolarizers. The most frequently used devices are polarizing prisms and retardation waveplates.

According to the different methods of creating polarized light, polarization devices can be classified into three types: reflection model, absorption model and prism model. Prism polarizers are widely utilized in laser and other modern polarization techniques. This kind of polarizer has developed fast in recent years, because it has the advantages of high extinction ratio, high transmittance, high optical damage threshold and wide spectrum in use. It is made of natural crystal calcite with special cut and polish. Calcite has such advantages as large maximum birefringence ($n_o - n_e$), no deliquescence and steady chemical composition. Therefore, it is an ideal material for making polarization devices.

The polarizing prism can be simply divided into two categories. According to our products, one is laser-polarizing prism whose type is LGP-Series. The other is polarization beam splitting prism whose type is LSP-Series. In the latter form, the birefringent polarization beam splitting prism, RSP-Series is newly designed and developed by us. Not only can it split the beam, but also it can revolve the two split beams near 90° . In this way, a revolving prism can be omitted in a design of light path.

Our institute took charge of drafting out one of the National Standards of P. R. China: Measurement Specification for Birefringent Crystal and Polarizer GB/T 14077-93. On February 6th 1993, the national standard issued by the National Technology Supervise Bureau, and it was executed on August 1st 1993.

According to our national standard, our institute can serve customers at home and abroad with a variety of laser polarization devices to satisfy their different needs on polarization technology, including 35 series and more than 700 types. All series of polarization devices have been appraised by the State. The main technical properties and performances of all the products have reached or surpassed those of foreign equals. According to domestic conditions of service, overseas advanced indices and the quality of crystal, our polarizing devices of different series can be divided into three grades to satisfy customers' different requirements with different performances and prices:

Grade A: High-precision devices. The prisms are made of materials with highest quality. They are designed and manufactured according to the advanced technical level of overseas equals. They are widely utilized in scientific researches, high precise instruments and the field of high-precision polarization technology.

Grade B: Common devices. The prisms are made of materials with high quality. Because of the quality of crystal and other reasons, some indices of them may be not as good as that of Grade A. However, the main technical indices are good enough to be utilized in common scientific researches and instruments.

Grade C: Manufactured with the same design of Grade A and Grade B, the prisms are made of crystals with some defects inside. They are mainly used in teaching, training and demonstrating experiments to obtain good results yet.

In addition, among the category of retardation, there are all kinds of wave-plates made by mica or quartz, which thickness is between 0.02-1.7 mm, such as $\lambda/8$, $\lambda/4$, $\lambda/2$, and arbitrary retardation. All of the wave plates are processed without any stress, they are perfect in workmanship with special technology. All of the technical indices are in accordance with the National Standard.

Moreover, all those in the Group of Special Teaching Polarization Devices can totally meet the needs of teaching and training in universities and colleges.

Our institute can provide customers with depolarizers, rotatory devices, and other special laser polarization devices based on their requirements. It is our honor and pleasure to supply you with optical processing and crystal processing. Welcome to visit and contact us. We'll serve you with all our hearts. Hope your scientific achievements well known in the world accompanied by our polarization devices!



Laser Research Institute, Qufu Normal University <http://laser.qfnu.edu.cn>
Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
Phone: +86-537-4458293, 4456492, Fax: +86-537-4458293
Contact persons: WU Fuquan, SONG Lianke
Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
Bank: Qufu Branch of Industrial and Commercial Bank of China
Account No.: 1608002609020111691

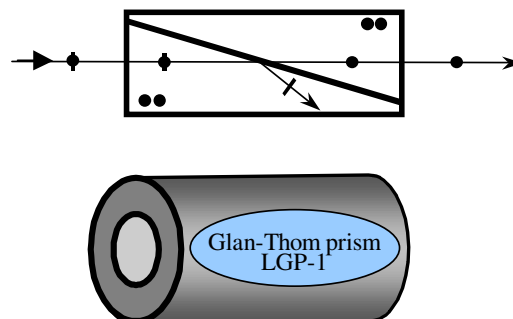
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CATEGORY I. POLARIZING PRISMS

LGP-1 SERIES: GLAN-THOMPSON PRISM

CHARACTERISTICS:

Glan-Thompson prism is made of natural calcite, which length-aperture-ratio (LAR) is equal to three and resin is adopted in its adhesive layer, it has advantages of firm structure, large field angle, and better polarizing performance. Its extinction ratio is better than 5×10^{-7} by special producing. This type of prism especially suits for polarizing and polarization analyzing in optical instrumentation with high precision and the other researches.



The usual transmission range is from 350nm to 2500nm. Anti-reflective films can be coated on both windows of the prism by special order.

USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in metal or cylindrical PMMA tube with two end windows. The mounts can be collocated with a 360° rotating-and-adjusting stand served by our institute. While using, adjusting the incident light to be perpendicular to an arbitrary window of the prism, no incident direction is required. The reflected beam from incident window of the prism should be caution.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Field Angle (632.8 nm)	Deviation Angle	Wave Front Distortion (632.8nm)	Anti-Optical Damage Threshold		Diameter of Mount (mm)
								CW W/cm ²	Pulse MW/cm ²	
LGP-1A3	3	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	20
LGP-1A5	5	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	20
LGP-1A8	8	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	27
LGP-1A10	10	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	27
LGP-1A12	12	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	29
LGP-1A14	14	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	32
LGP-1A15	15	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	36
LGP-1B5	5	B	1×10^{-4}	>90%	12°	6'	$\lambda / 4$	5	50	20
LGP-1B8	8	B	1×10^{-4}	>90%	12°	6'	$\lambda / 4$	5	50	27
LGP-1B10	10	B	1×10^{-4}	>90%	12°	6'	$\lambda / 4$	5	50	27
LGP-1B12	12	B	1×10^{-4}	>90%	12°	6'	$\lambda / 4$	5	50	29



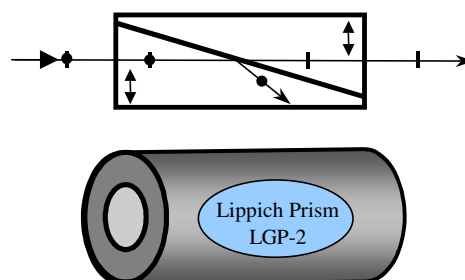
Laser Research Institute, Qufu Normal University <http://laser.qfnu.edu.cn>
 Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
 Phone: +86-537-4458293, 4456492, Fax: +86-537-4458293
 Contact persons: Wu Fuquan, Song Lianke
 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
 Bank: Qufu Branch of Industrial and Commercial Bank of China
 Account No.: 1608002609020111691

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LGP-2 SERIES: LIPPICH PRISM

CHARACTERISTICS:

Lippich prism is made of natural calcite, which LAR is equal to three and resin is adopted in its adhesive layer, it has advantages of firm structure, large field angle, and better polarizing performance. Its extinction ratio is better than 5×10^{-7} by special producing. Its transmittance in IR and UV spectral ranges is better than Glan-Thompson prism. This type of prism especially suits for polarizing and polarization analyzing in optical instrumentation with high precision and the other researches.



The usual transmission range is from 350nm to 2500nm. Anti-reflective films can be coated on both windows of the prism by special order.

USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in metal or cylindrical PMMA tube with two end windows. The mounts can be collocated with a 360° rotating-and-adjusting stand served by our institute. In order to guarantee the quality of output light, please adjust the incident light to be perpendicular to an arbitrary window of the prism while using. The reflected beam from incident window of the prism should be caution.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Field Angle (632.8nm)	Deviation Angle	Wave Front Distortion (632.8 nm)	Anti-Optical Damage Threshold		Diameter of Mount (mm)
								CW W/cm ²	Pulse MW/cm ²	
LGP-2A3	3	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	20
LGP-2A5	5	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	20
LGP-2A8	8	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	27
LGP-2A10	10	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	27
LGP-2A12	12	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	29
LGP-2A14	14	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	32
LGP-2A15	15	A	1×10^{-5}	>90%	12°	3'	$\lambda / 8$	8	100	36
LGP-2B5	5	B	1×10^{-4}	>90%	12°	6'	$\lambda / 4$	5	50	20
LGP-2B8	8	B	1×10^{-4}	>90%	12°	6'	$\lambda / 4$	5	50	27
LGP-2B10	10	B	1×10^{-4}	>90%	12°	6'	$\lambda / 4$	5	50	27
LGP-2B12	12	B	1×10^{-4}	>90%	12°	6'	$\lambda / 4$	5	50	29



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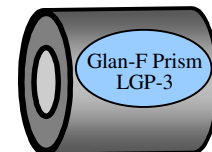
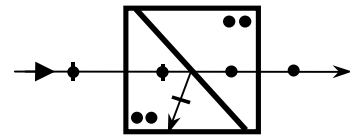
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LGP-3 SERIES: GLAN-FOUCAULT PRISM

CHARACTERISTICS:

Glan-Foucault prism with an air-gap structure inside is made of natural calcite. Its LAR is equal to 0.8. This kind of prism has extremely high optical damage threshold and good performance in polarization. Its extinction ratio is better than 1×10^{-5} , although its transmittivity is comparatively low because of material. This prism suits for polarizing and polarization analyzing in high-power laser.

The usual transmission range is from 350nm to 2500nm. Anti-reflective films can be coated on both windows of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in metal or cylindrical PMMA tube with two end windows. The mounts can be collocated with a 360° rotating-and-adjusting stand served by our institute. In order to guarantee the quality of output light, please adjust the incident light to be perpendicular to the incident window of the prism while using. The reflected beam from incident window of the prism should be caution.

This prism can be mounted with an extra side window for the ordinary light escaping, or with extra optical absorption materials. With the extra side window, the incident window of the prism should be fixed with a dot mark on it. No direction requirement for the prism mounted with extra optical absorption materials.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Field Angle (632.8 nm)	Deviation Angle	Wave front Distortion (632.8 nm)	Optical Damage Threshold		Diameter of Mount (mm)
								CW W/cm ²	Pulse MW/cm ²	
LGP-3A5	5	A	1×10^{-5}	60%	6°	3'	$\lambda / 8$	30	300	20
LGP-3A8	8	A	1×10^{-5}	60%	6°	3'	$\lambda / 8$	30	300	30
LGP-3A10	10	A	1×10^{-5}	60%	6°	3'	$\lambda / 8$	30	300	30
LGP-3A12	12	A	1×10^{-5}	60%	6°	3'	$\lambda / 8$	30	300	30
LGP-3A15	15	A	1×10^{-5}	60%	6°	3'	$\lambda / 8$	30	300	36
LGP-3B5	5	B	1×10^{-4}	60%	6°	6'	$\lambda / 4$	20	200	20
LGP-3B8	8	B	1×10^{-4}	60%	6°	6'	$\lambda / 4$	20	200	30
LGP-3B10	10	B	1×10^{-4}	60%	6°	6'	$\lambda / 4$	20	200	30
LGP-3B12	12	B	1×10^{-4}	60%	6°	6'	$\lambda / 4$	20	200	30

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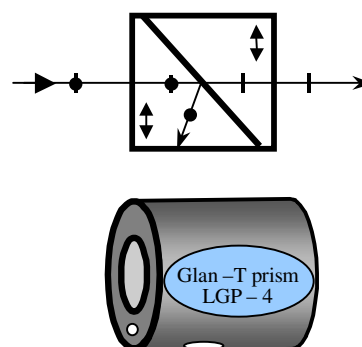
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LGP-4 SERIES GLAN-TAYLOR PRISM

CHARACTERISTICS:

Glan-Taylor prism belongs to the Glan-typed prism, which is made of natural calcite with an air-gap structure. Its LAR is equal to 0.8. This type of prism has extremely high optical damage threshold and good performance in polarization. Its extinction ratio is better than 1×10^{-5} . It is one of the most useful polarized prisms applied in the field of laser polarization technology because of its good transmittance. This type of prism especially suits for polarization creating and analyzing in high-power laser.

The usual transmission range is from 300nm to 2800nm. By special order, UV limit can be extended to 230nm. Anti-reflective films can be coated on both windows of the prism also.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in metal or cylindrical PMMA tube with two end windows. The mounts can be collocated with a 360° rotating-and-adjusting stand served by our institute. In order to guarantee the quality of output light, please adjust the incident light to be perpendicular to the incident window of the prism while using. The reflected beam from incident window of the prism should be caution.

This prism can be mounted with an extra side window for the ordinary light escaping, or with extra optical absorption materials. With the extra side window, the incident window of the prism should be fixed with a dot mark on it. No direction requirement for the prism mounted with extra optical absorption materials.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Field Angle (632.8nm)	Deviation Angle	Wave front Distortion (632.8 nm)	Optical Damage Threshold		Diameter of Mount (mm)
								CW W/cm ²	Pulse MW/cm ²	
LGP-4A3	3	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	20
LGP-4A5	5	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	20
LGP-4A8	8	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	30
LGP-4A10	10	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	30
LGP-4A12	12	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	30
LGP-4A15	15	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	36
LGP-4A18	18	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	36
LGP-4A20	20	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	
LGP-4A22	22	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	
LGP-4A25	25	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	
LGP-4A28	28	A	1×10^{-5}	85%	6°	3'	$\lambda / 8$	30	500	
LGP-4B5	5	B	1×10^{-4}	85%	6°	6'	$\lambda / 4$	20	300	20
LGP-4B8	8	B	1×10^{-4}	85%	6°	6'	$\lambda / 4$	20	300	30
LGP-4B10	10	B	1×10^{-4}	85%	6°	6'	$\lambda / 4$	20	300	30
LGP-4B12	12	B	1×10^{-4}	85%	6°	6'	$\lambda / 4$	20	300	30
LGP-4B15	15	B	1×10^{-4}	85%	6°	6'	$\lambda / 4$	20	300	36



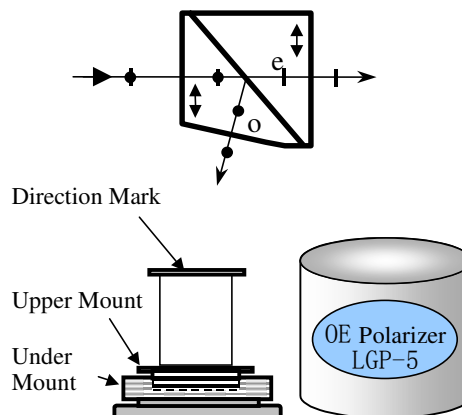
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 Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
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 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
 Bank: Qufu Branch of Industrial and Commercial Bank of China
 Account No.: 1608002609020111691

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LGP-5① SERIES OE DOUBLE ESCAPE PRISM (SINGLE WINDOW)

CHARACTERISTICS:

The basic configuration of this prism is similar to that of Glan-Taylor prism. It is made of natural calcite with an air-gap structure. The ordinary (o) and extraordinary (e) lights escape vertically to their exit windows respectively. So the wavefront distortion can be reduced. The beam-splitting angle between o and e light is 102° . This prism has extremely high optical damage threshold and good performance in polarization. Its extinction ratio is better than 1×10^{-5} . It is one of the most useful beam splitting polarizers applied in the field of laser polarization technology. Especially, it suits for polarization creating and analyzing in high-power laser.



The usual transmission range is from 300nm to 2800nm. By special order, UV limit can be to 230nm. Anti-reflective films can be coated on both windows of the prism also.

USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. In order to guarantee the two escaping beams in high-quality polarization, please adjust the incident light to be perpendicular to the incident plane according to the direction mark.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Field Angle (632.8nm)	Angle between O, E Light	Wavefront Distortion (632.8 nm)	Optical Damage Threshold		Size of Upper Mount Thread (mm)
								CW W/cm ²	Pulse MW/cm ²	
LGP-5①A5	5	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	M20 × 1
LGP-5①A8	8	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5①A10	10	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5①A12	12	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5①A15	15	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5①A18	18	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5①A20	20	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5①B5	5	B	1×10^{-4}	85%	6°	102°	$\lambda / 4$	20	200	
LGP-5①B8	8	B	1×10^{-4}	85%	6°	102°	$\lambda / 4$	20	200	
LGP-5①B10	10	B	1×10^{-4}	85%	6°	102°	$\lambda / 4$	20	200	
LGP-5①B12	12	B	1×10^{-4}	85%	6°	102°	$\lambda / 4$	20	200	
LGP-5①B15	15	B	1×10^{-4}	85%	6°	102°	$\lambda / 4$	20	200	

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 Contact persons: Wu Fuquan, Song Lianke
 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
 Bank: Qufu Branch of Industrial and Commercial Bank of China
 Account No.: 1608002609020111691



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LGP-5② SERIES OE DOUBLE ESCAPE PRISM (DOUBLE WINDOWS)

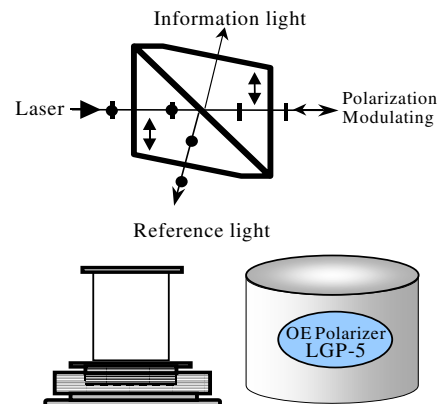
CHARACTERISTICS:

OE Double Escape Prism with double windows is made of natural calcite with an air-gap structure. It belongs to the Glan-typed prism, which is an improvement design from the single window typed prism. The incident light in reverse direction is allowed. The ordinary (o) and extraordinary (e) lights escape vertically to their exit windows respectively. This prism has extremely high optical damage threshold, good performance in polarization and good transmittance in IR and UV spectral ranges. Its extinction ratio is better than 1×10^{-5} . Moreover, it can be applied as a selector to obtain modulating polarization information.

The usual transmission range is from 300nm to 2800nm. By special order, UV limit can be to 230nm. Anti-reflective films can be coated on both windows of the prism also.

USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. The incident light in reverse direction is allowed. The reflected beam from incident window of the prism should be caution. According to the figure, the information of the backtracked vertical polarized vector is exited through another window.



SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Field Angle (632.8nm)	Angle Between O, E Light	Wavefront Distortion (632.8 nm)	Optical Damage Threshold		Size of Upper Mount Thread (mm)
								CW W/cm ²	Pulse MW/cm ²	
LGP-5②A5	5	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	M20×1
LGP-5②A8	8	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5②A10	10	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5②A12	12	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5②A15	15	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5②A18	18	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5②A20	20	A	1×10^{-5}	85%	6°	102°	$\lambda / 8$	30	300	
LGP-5②B5	5	B	1×10^{-4}	85%	6°	102°	$\lambda / 4$	20	200	
LGP-5②B8	8	B	1×10^{-4}	85%	6°	102°	$\lambda / 4$	20	200	
LGP-5②B10	10	B	1×10^{-4}	85%	6°	102°	$\lambda / 4$	20	200	
LGP-5②B12	12	B	1×10^{-4}	85%	6°	102°	$\lambda / 4$	20	200	
LGP-5②B15	15	B	1×10^{-4}	85%	6°	102°	$\lambda / 4$	20	200	



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 Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
 Telephone: +86-537-4458293, 4456492, Fax: +86-537-4458293
 Contact persons: Wu Fuquan, Song Lianke
 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
 Bank: Qufu Branch of Industrial and Commercial Bank of China
 Account No.: 1608002609020111691

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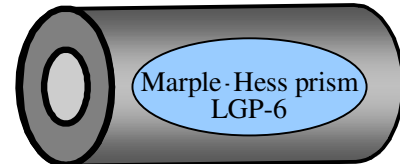
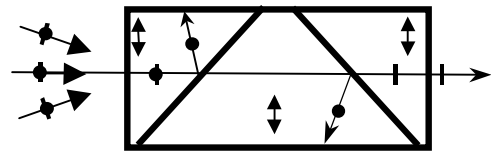
LGP-6 SERIES MARPLE-HESS PRISM

CHARACTERISTICS:

Marple-Hess prism is of a double Glan-Taylor structure. The shortcoming of Glan's small view-field angle of polarization is overcome, and the angle is enlarged one time. Its LAR is equal to 1.8. This prism has extremely high optical damage threshold and good performance in polarization. Its extinction ratio is better than 1×10^{-5} . Especially, it suits for being applied as a polarizer and analyzer with a large-field-angle.

The usual transmission range is from 300nm to 2800nm.

Anti-reflective films can be coated on both windows of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in metal or cylindrical PMMA tube with two windows. The mounts can be collocated with the 360° rotating-and-adjusting stand served by our institute. No direction is required while using.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Field Angle (632.8 nm)	Deviation Angle	Wavefront Distortion (632.8 nm)	Optical Damage Threshold		Diameter of Mount (mm)
								CW W/cm ²	Pulse MW/cm ²	
LGP-6A8	8	A	1×10^{-5}	80%	12°	6'	$\lambda / 8$	20	200	Made by Special Order
LGP-6A10	10	A	1×10^{-5}	80%	12°	6'	$\lambda / 8$	20	200	
LGP-6A12	12	A	1×10^{-5}	80%	12°	6'	$\lambda / 8$	20	200	
LGP-6A15	15	A	1×10^{-5}	80%	12°	6'	$\lambda / 8$	20	200	
LGP-6B8	8	B	1×10^{-4}	75%	12°	10'	$\lambda / 4$	10	100	
LGP-6B10	10	B	1×10^{-4}	75%	12°	10'	$\lambda / 4$	10	100	
LGP-6B12	12	B	1×10^{-4}	75%	12°	10'	$\lambda / 4$	10	100	

Please contact us if other apertures of prisms are needed.



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 Account No.: 1608002609020111691

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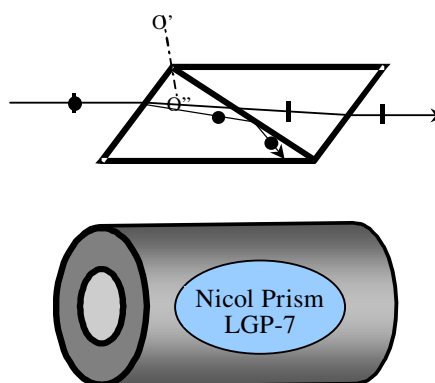
LGP-7 SERIES NICOL PRISM

CHARACTERISTICS:

As a prism-typed polarizer, Nicol prism is one of the most academically valuable crystal prisms with the longest history of invention. This prism is made of calcite. There are two types of this prism. One adhered two parts with Canadian resin has a high transmittance, but a lower optical damage threshold. The other kind is air-gap prism, which size is shorter. But its optical damage threshold is higher.

There is a bigger shift between incident light and exit one because the special structure caused the incident beam is not normal to the window of Nicol prism. Therefore, this prism is seldom used in engineering. It is generally used in education.

The usual transmission range is from 400nm to 2500nm.



USAGE:

So far, the Nicol prism is still adopted as one of the main pedagogic polarized devices in college educations in China. It's mainly used in demonstrative polarized optical experiments. According to the requirement of education, three special sets of polarized devices are designed to select by universities and colleges. It's so-called the group of *crystal polarizer for education*. Please find more information in the fifth category behind.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Optical Damage Threshold		Diameter of Mount (mm)
					CW W/cm ²	Pulse MW/cm ²	
LGP-7A8	8	A	1×10^{-4}	85%	5	50	27
LGP-7A10	10	A	1×10^{-4}	85%	5	50	29
LGP-7A12	12	A	1×10^{-4}	85%	5	50	32
LGP-7A15	15	A	1×10^{-4}	85%	5	50	38
LGP-7B8	8	B	1×10^{-3}	80%	5	50	27
LGP-7B10	10	B	1×10^{-3}	80%	5	50	29
LGP-7B12	12	B	1×10^{-3}	80%	5	50	32

Please contact us if prisms with other apertures are needed.



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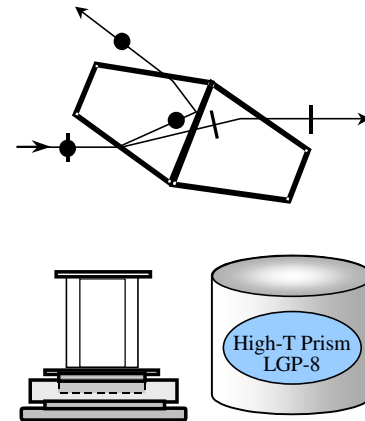
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LGP-8 SERIES HIGH TRANSMITTANCE PRISM

CHARACTERISTICS:

The high transmittance prism is made of natural calcite. This prism is one of our inventive polarized devices especially for laser polarization application, which is designed based on the Brewster Law. A very high transmittance (~99%) and high optical damage threshold are the special characteristics of this prism. A small displacement of transmitted beam compared to incident will be induced because the incident beam is not normal to the incident window.

The usual transmission range is from 300nm to 2800nm.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. When using, the incident light should be adjusted to the Brewster angle.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Incident Angle (632.8 nm)	Wave front Distortion (632.8 nm)	Optical Damage Threshold		Size of Upper Mount Thread (mm)
							CW W/cm ²	Pulse MW/cm ²	
LGP-8A5	5	A	1×10 ⁻⁵	99%	about 56°	λ / 4	40	400	M20×1
LGP-8A8	8	A	1×10 ⁻⁵	99%	about 56°	λ / 4	40	400	
LGP-8A10	10	A	1×10 ⁻⁵	99%	about 56°	λ / 4	40	400	
LGP-8A12	12	A	1×10 ⁻⁵	99%	about 56°	λ / 4	40	400	
LGP-8B5	5	B	1×10 ⁻⁴	97%	about 56°	λ / 4	30	300	
LGP-8B8	8	B	1×10 ⁻⁴	97%	about 56°	λ / 4	30	300	
LGP-8B10	10	B	1×10 ⁻⁴	97%	about 56°	λ / 4	30	300	
LGP-8B12	12	B	1×10 ⁻⁴	97%	about 56°	λ / 4	30	300	

Please contact us if prisms with other apertures are needed.



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 Telephone: +86-537-4458293, 4456492, Fax: +86-537-4458293
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CATEGORY II. BEAMSPLITTING POLARIZER

LSP-1 SERIES SEMARMONT PRISM

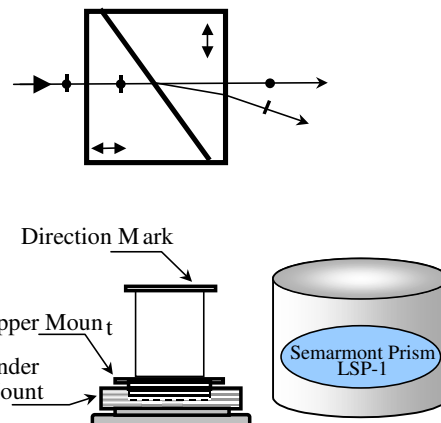
CHARACTERISTICS:

One ray of the two output plane polarized lights passing through a Semarmont prism is undeviating. This prism is made of calcite. Resin is adopted in its adhesive layer. According to design, the beamsplitting angle of this prism is generally within 10° . The prism has advantages of firm structure and good polarization performance. Its extinction ratio is better than 1×10^{-5} . This type of prism especially suits for beamsplitting polarization in optical instrumentation with high precision and other researches.

The usual transmission range is from 350nm to 2500nm.

The beamsplitting angle is generally divided into three kinds. It can be specially made according to customers' requirements.

Anti-reflective films can be coated on both sides of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. While using, please adjust the incident light to be perpendicular to the incident plane according to the direction mark. It cannot be used in reverse direction. The reflected beam from incident window of the prism should be caution.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Beamsplitting Angle (632.8nm)			Optical Damage Threshold		Size of Upper Mount Thread (mm)
								CW W/cm ²	Pulse MW/cm ²	
LSP-1A10	10×10	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	M20×1
LSP-1A12	12×12	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	
LSP-1A14	14×14	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	
LSP-1A16	16×16	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	
LSP-1A18	18×18	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	
LSP-1A20	20×20	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	
LSP-1B10	10×10	B	1×10^{-4}	>85%	2.5°	5°	7.5°	5	50	
LSP-1B12	12×12	B	1×10^{-4}	>85%	2.5°	5°	7.5°	5	50	
LSP-1B14	14×14	B	1×10^{-4}	>85%	2.5°	5°	7.5°	5	50	
LSP-1B16	16×16	B	1×10^{-4}	>85%	2.5°	5°	7.5°	5	50	
LSP-1B18	18×18	B	1×10^{-4}	>85%	2.5°	5°	7.5°	5	50	

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 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
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LSP-2 SERIES ROCHON PRISM

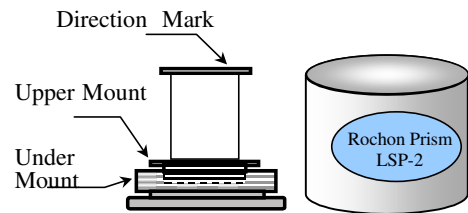
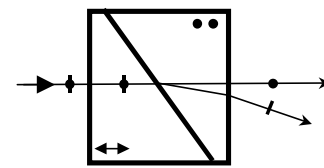
CHARACTERISTICS:

One ray of the two output plane polarized lights passing through a Rochon prism is undeviating. This prism is made of calcite. Resin is adopted in its adhesive layer. According to design, the beamsplitting angle of this prism is generally within 10° . The prism has advantages of firm structure and good polarization performance. Its extinction ratio is better than 1×10^{-5} . This type of prism especially suits for beamsplitting polarization in optical instrumentation with high precision and other researches.

The usual transmission range is from 350nm to 2500nm.

The beamsplitting angle is generally divided into three kinds. It can be specially made according to customers' requirements.

Anti-reflective films can be coated on both sides of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. While using, please adjust the incident light to be perpendicular to the incident plane according to the direction mark. It cannot be used in reverse direction. The reflected beam from incident window of the prism should be caution.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Beamsplitting Angle (632.8nm)			Optical Damage Threshold		Size of Upper Mount Thread (mm)
								CW W/cm ²	Pulse MW/cm ²	
LSP-2A10	10×10	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	M20×1
LSP-2A12	12×12	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	
LSP-2A14	14×14	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	
LSP-2A16	16×16	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	
LSP-2A18	18×18	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	
LSP-2A20	20×20	A	1×10^{-5}	>90%	2.5°	5°	7.5°	10	100	
LSP-2B10	10×10	B	1×10^{-4}	>85%	2.5°	5°	7.5°	5	50	
LSP-2B12	12×12	B	1×10^{-4}	>85%	2.5°	5°	7.5°	5	50	
LSP-2B14	14×14	B	1×10^{-4}	>85%	2.5°	5°	7.5°	5	50	
LSP-2B16	16×16	B	1×10^{-4}	>85%	2.5°	5°	7.5°	5	50	
LSP-2B18	18×18	B	1×10^{-4}	>85%	2.5°	5°	7.5°	5	50	



Laser Research Institute, Qufu Normal University <http://laser.qfnu.edu.cn>
 Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
 Telephone: +86-537-4458293, 4456492, Fax: +86-537-4458293
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 Bank: Qufu Branch of Industrial and Commercial Bank of China
 Account No.: 1608002609020111691

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LSP-3 SERIES WOLLASTON PRISM

CHARACTERISTICS:

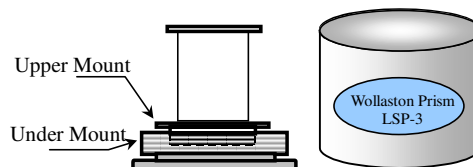
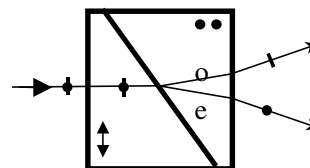
Wollaston prism is made of calcite with a large beamsplitting angle. According to design, the beamsplitting angle of this prism is generally within 15° . The prism has advantages of firm structure and good polarization performance. Its extinction ratio is better than 1×10^{-5} . This type of prism especially suits for beamsplitting polarization in optical instrumentation with high precision and other researches.

The usual transmission range is from 300nm to 2500nm.

The beamsplitting angle is generally divided into three kinds.

It can be specially made according to customers' requirements.

Anti-reflective films can be coated on both sides of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. While using, please adjust the incident light to be perpendicular to the plane of incidence. It can be used in reverse direction.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Beamsplitting Angle (632.8nm)			Optical Damage Threshold		Size of Upper Mount Thread (mm)
								CW W/cm ²	Pulse MW/cm ²	
LSP-3A10	10×10	A	1×10^{-5}	>90%	5°	10°	15°	10	100	M20×1
LSP-3A12	12×12	A	1×10^{-5}	>90%	5°	10°	15°	10	100	
LSP-3A14	14×14	A	1×10^{-5}	>90%	5°	10°	15°	10	100	
LSP-3A16	16×16	A	1×10^{-5}	>90%	5°	10°	15°	10	100	
LSP-3A18	18×18	A	1×10^{-5}	>90%	5°	10°	15°	10	100	
LSP-3A20	20×20	A	1×10^{-5}	>90%	5°	10°	15°	10	100	
LSP-3B10	10×10	B	1×10^{-4}	>85%	5°	10°	15°	5	50	
LSP-3B12	12×12	B	1×10^{-4}	>85%	5°	10°	15°	5	50	
LSP-3B14	14×14	B	1×10^{-4}	>85%	5°	10°	15°	5	50	
LSP-3B16	16×16	B	1×10^{-4}	>85%	5°	10°	15°	5	50	
LSP-3B18	18×18	B	1×10^{-4}	>85%	5°	10°	15°	5	50	
LSP-3B20	20×20	B	1×10^{-4}	>85%	5°	10°	15°	5	50	



Laser Research Institute, Qufu Normal University <http://laser.qfnu.edu.cn>
 Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
 Telephone: +86-537-4458293, 4456492, Fax: +86-537-4458293
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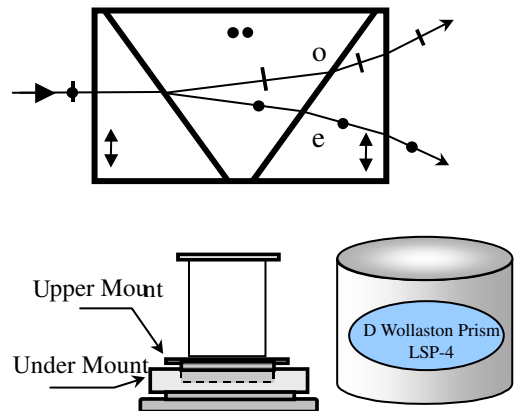
LSP-4 SERIES DOUBLE WOLLASTON PRISM

CHARACTERISTICS:

Double Wollaston prism is a three-element structured design, which is equal to a combination of two Wollaston prisms. It has a large beamsplitting angle. According to design, the beamsplitting angle is generally larger than 20° . The prism has advantages of firm structure and good polarization performance. Its extinction ratio is better than 1×10^{-5} . This type of prism especially suits for application where a large beamsplitting angle is required.

The usual transmission range is from 300nm to 2500nm.

Anti-reflective films can be coated on both sides of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. While using, please adjust the incident light to be perpendicular to the plane of incidence. It can be used in reverse direction. The reflected beam from incident window of the prism should be caution.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Beamsplitting Angle (632.8nm)	Optical Damage Threshold		Size of Upper Mount Thread (mm)
						CW W/cm ²	Pulse MW/cm ²	
LSP-4A10	10×10	A	1×10^{-5}	>85%	>20°	10	100	M20×1
LSP-4A12	12×12	A	1×10^{-5}	>85%	>20°	10	100	
LSP-4A14	14×14	A	1×10^{-5}	>85%	>20°	10	100	
LSP-4A16	16×16	A	1×10^{-5}	>85%	>20°	10	100	
LSP-4A18	18×18	A	1×10^{-5}	>85%	>20°	10	100	
LSP-4B10	10×10	B	1×10^{-4}	>80%	>20°	5	50	
LSP-4B12	12×12	B	1×10^{-4}	>80%	>20°	5	50	
LSP-4B14	14×14	B	1×10^{-4}	>80%	>20°	5	50	
LSP-4B16	16×16	B	1×10^{-4}	>80%	>20°	5	50	



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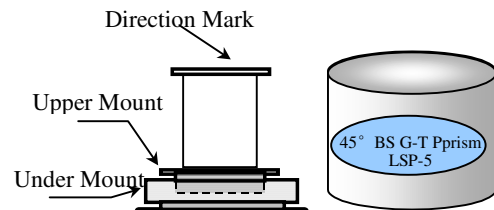
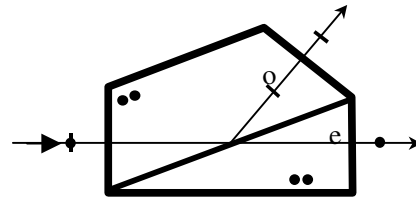
LSP-5 SERIES 45° BEAMSPLITTING GLAN-THOMPSON PRISM

CHARACTERISTICS:

The 45° beamsplitting prism belongs to Glan-Thompson design with two-element structure. This prism is made of natural calcite. Resin is adopted in its adhesive layer. It has advantages of firm structure, high transmittance and low wave-front distortion. The split angle between the two output polarized lights is 45°. Its extinction ratio is better than 1×10^{-5} . The prism is widely adopted in application and research of 45° beamsplitting polarization.

The usual transmission range is from 350nm to 2500nm.

Anti-reflective films can be coated on both sides of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. While using, please adjust the incident light to be perpendicular to the incident plane according to the direction mark. It cannot be used in reverse direction. The reflected beam from incident window of the prism should be caution.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Beamsplitting Angle (632.8nm)	Optical Damage Threshold		Size of Upper Mount Thread (mm)
						CW W/cm ²	Pulse MW/cm ²	
LSP-5A5	5×5	A	1×10^{-5}	>90%	45°	10	100	M20×1
LSP-5A8	8×8	A	1×10^{-5}	>90%	45°	10	100	
LSP-5A10	10×10	A	1×10^{-5}	>90%	45°	10	100	
LSP-5A12	12×12	A	1×10^{-5}	>90%	45°	10	100	
LSP-5B5	5×5	B	1×10^{-4}	>85%	45°	5	50	
LSP-5B8	8×8	B	1×10^{-4}	>85%	45°	5	50	
LSP-5B10	10×10	B	1×10^{-4}	>85%	45°	5	50	
LSP-5B12	12×12	B	1×10^{-4}	>85%	45°	5	50	

Please contact us if prisms with other apertures are needed.



Laser Research Institute, Qufu Normal University <http://laser.qfnu.edu.cn>
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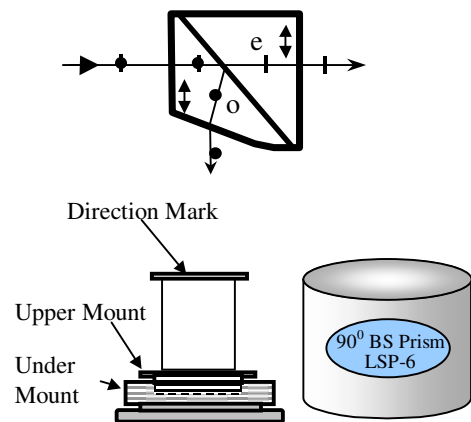
LSP-6① SERIES 90° BEAMSPLITTING PRISM (SINGLE WINDOW)

CHARACTERISTICS:

The 90° beamsplitting prism is made of natural calcite, which belongs to Glan-typed design with an air-gap structure. The output polarized lights escape vertically. Its extinction ratio is better than 1×10^{-5} . This prism has extremely high optical damage threshold and high transmittance. Its transmissivity in IR and UV spectral ranges are good. As a beamsplitting polarizer with high quality, it is very suitable for laser beam modulation.

The usual transmission range is from 350nm to 2800nm. The UV limit can be extended to 230nm by special order.

Anti-reflective films can be coated on both sides of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. While using, please adjust the incident light to be perpendicular to the incident plane according to the direction mark. It cannot be used in reverse direction. The reflected beam from incident window of the prism should be caution.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Beamsplitting Angle (632.8nm)	Wavefront Distortion (632.8 nm)	Optical Damage Threshold		Size of Upper Mount Thread (mm)
							CW W/cm ²	Pulse MW/cm ²	
LSP-6①A5	5	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	M20×1
LSP-6①A8	8	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6①A10	10	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6①A12	12	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6①A15	15	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6①A18	18	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6①A20	20	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6①B5	5	B	1×10^{-4}	80%	90°	$\lambda / 4$	20	200	
LSP-6①B8	8	B	1×10^{-4}	80%	90°	$\lambda / 4$	20	200	
LSP-6①B10	10	B	1×10^{-4}	80%	90°	$\lambda / 4$	20	200	
LSP-6①B12	12	B	1×10^{-4}	80%	90°	$\lambda / 4$	20	200	
LSP-6①B15	15	B	1×10^{-4}	80%	90°	$\lambda / 4$	20	200	



Laser Research Institute, Qufu Normal University <http://laser.qfnu.edu.cn>
 Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
 Telephone: +86-537-4458293, 4456492, Fax: +86-537-4458293
 Contact persons: Wu Fuquan, Song Lianke
 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
 Bank: Qufu Branch of Industrial and Commercial Bank of China
 Account No.: 1608002609020111691

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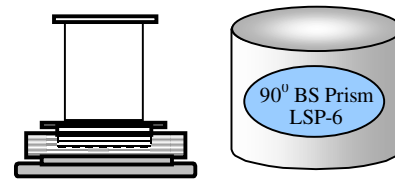
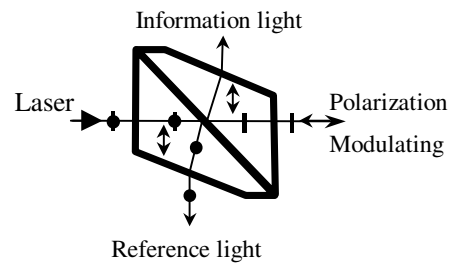
LSP-6② SERIES 90° BEAMSPLITTING PRISM (DOUBLE WINDOWS)

CHARACTERISTICS:

The 90° beamsplitting prism with double windows is made of calcite, which is designed based on Glan-Taylor type with an air-gap structure. The output polarized lights escape vertically. Its extinction ratio is better than 1×10^{-5} . This prism has extremely high optical damage threshold and high transmittance. Its transmissivity in IR and UV spectral ranges are good. As a beamsplitting polarizer with high quality, it is very suitable for laser beam modulation. It can be used in reverse direction.

The usual transmission range is from 300nm to 2800nm. The UV limit can be extended to 230nm by special order.

Anti-reflective films can be coated on both sides of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. While using, please adjust the incident light to be perpendicular to the incident plane according to the direction mark. It cannot be used in reverse direction. The reflected beam from incident window of the prism should be caution. According to the figure, the backtracked vertical polarized vector is escaped through another window.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Beamsplitting Angle (632.8nm)	Wave front Distortion (632.8 nm)	Optical Damage Threshold		Size of Upper Mount Thread (mm)
							CW W/cm ²	Pulse MW/cm ²	
LSP-6②A5	5	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	M20×1
LSP-6②A8	8	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6②A10	10	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6②A12	12	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6②A15	15	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6②A18	18	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6②A20	20	A	1×10^{-5}	85%	90°	$\lambda / 8$	30	400	
LSP-6②B5	5	B	1×10^{-4}	80%	90°	$\lambda / 4$	20	200	
LSP-6②B8	5	B	1×10^{-4}	80%	90°	$\lambda / 4$	20	200	
LSP-6②B10	10	B	1×10^{-4}	80%	90°	$\lambda / 4$	20	200	
LSP-6②B12	12	B	1×10^{-4}	80%	90°	$\lambda / 4$	20	200	
LSP-6②B15	15	B	1×10^{-4}	80%	90°	$\lambda / 4$	20	200	

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 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
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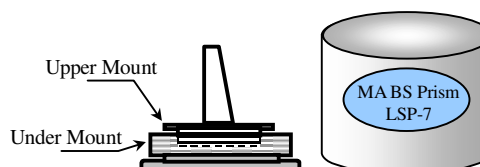
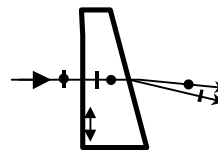
LSP-7 SERIES MICRO-ANGLE BEAMSPLITTING PRISM

CHARACTERISTICS:

Micro-angle beamsplitting prism is a single-element device with a much small beamsplitting angle that is smaller than 1.5° . Its extinction ratio is better than 1×10^{-5} . Its polarization performance is good, and it is especially suit for micro-angle beam splitting light path.

The usual transmission range is from 300nm to 2800nm. The UV limit can be extended to 230nm by special order.

This prism is made of natural calcite or other single-axis crystals. Anti-reflective films can be coated on both sides of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. While using, please adjust the incident light to be perpendicular to the incident plane according to the direction mark. The reflected beam from incident window of the prism should be caution. The prism can be used in reverse direction, although it used in right way performs better than that of in reverse direction.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Beamsplitting Angle (632.8nm)	Optical Damage Threshold		Size of Upper Mount Thread (mm)
						CW W/cm ²	Pulse MW/cm ²	
LSP-7A10	10×10	A	1×10^{-5}	>90%	within 2° can be made by special order	30	500	M20×1
LSP-7A12	12×12	A	1×10^{-5}	>90%		30	500	
LSP-7A14	14×14	A	1×10^{-5}	>90%		30	500	
LSP-7A16	16×16	A	1×10^{-5}	>90%		30	500	
LSP-7A18	18×18	A	1×10^{-5}	>90%		30	500	
LSP-7A20	20×20	A	1×10^{-5}	>90%		30	500	
LSP-7B10	10×10	B	1×10^{-4}	>85%		20	300	
LSP-7B12	12×12	B	1×10^{-4}	>85%		20	300	
LSP-7B14	14×14	B	1×10^{-4}	>85%		20	300	
LSP-7B16	16×16	B	1×10^{-4}	>85%		20	300	
LSP-7B18	18×18	B	1×10^{-4}	>85%		20	300	



Laser Research Institute, Qufu Normal University <http://laser.qfnu.edu.cn>
 Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
 Telephone: +86-537-4458293, 4456492, Fax: +86-537-4458293
 Contact persons: Wu Fuquan, Song Lianke
 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
 Bank: Qufu Branch of Industrial and Commercial Bank of China
 Account No.: 1608002609020111691

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LSP-8 SERIES ADJUSTABLE BEAMSPLITTING PRISM

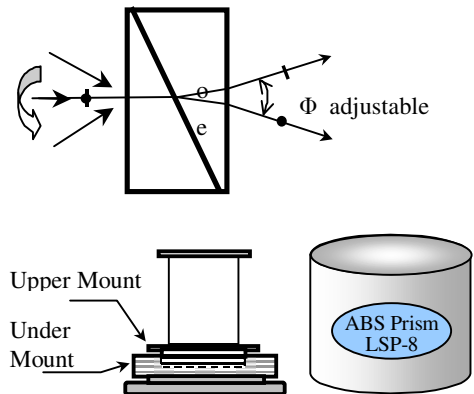
CHARACTERISTICS:

The adjustable beamsplitting prism won the silver medal in 14th International Invention and New Technology Exhibition at Geneva and National Prize of Invention.

This prism is made of natural calcite, belongs to a three-element adhesive structured device, which makes the beamsplitting angle adjusted continuously more than 35°. With this design, it is overcome that the defect of a beamsplitting angle must be corresponding to the prism angle. This prism has advantages of firm structure, high optical damage threshold and better polarization performance. Its extinction ratio is better than 1×10^{-5} . The intensities of two output beams are almost the same.

This prism especially suits for application of beamsplitting polarization in research and optical instruments with high precision. The usual transmission range is from 350nm to 2500nm.

Anti-reflective films can be coated on both sides of the prism by special order.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. While using, the maximum output beamsplitting angle can be adjusted up to 40° by adjusting the azimuth angle of the incident light. The same result can be obtained in reverse direction.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Beamsplitting Angle (632.8nm)			Optical Damage Threshold		Size of Upper Mount Thread (mm)
								CW W/cm ²	Pulse MW/cm ²	
LSP-8A10	10×10	A	1×10^{-5}	>90%	5°	10°	15°	10	100	M20×1
LSP-8A12	12×12	A	1×10^{-5}	>90%	5°	10°	15°	10	100	
LSP-8A14	14×14	A	1×10^{-5}	>90%	5°	10°	15°	10	100	
LSP-8A16	16×16	A	1×10^{-5}	>90%	5°	10°	15°	10	100	
LSP-8A18	18×18	A	1×10^{-5}	>90%	5°	10°	15°	10	100	
LSP-8A20	20×20	A	1×10^{-5}	>90%	5°	10°	15°	10	100	
LSP-8B10	10×10	B	1×10^{-4}	>85%	5°	10°	15°	5	50	
LSP-8B12	12×12	B	1×10^{-4}	>85%	5°	10°	15°	5	50	
LSP-8B14	14×14	B	1×10^{-4}	>85%	5°	10°	15°	5	50	
LSP-8B16	16×16	B	1×10^{-4}	>85%	5°	10°	15°	5	50	

Please contact us if you have any special requirements.



Laser Research Institute, Qufu Normal University <http://laser.qfnu.edu.cn>
 Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
 Telephone: +86-537-4458293, 4456492, Fax: +86-537-4458293
 Contact persons: Wu Fuquan, Song Lianke
 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
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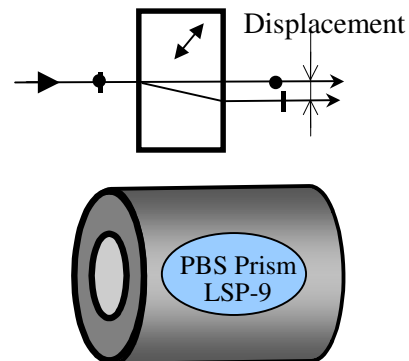
LSP-9 SERIES PARALLEL BEAMSPLITTING PRISM

CHARACTERISTICS:

The parallel beamsplitting prism is made of calcite. Two parallel output plane-polarized lights with a certain displacement can be obtained by using this prism. One beam continues straight through while the other parallel shifts from its original direction. These two beams escape in parallel. This prism has advantages of extremely high optical damage threshold and better polarization performance. Its extinction ratio is better than 1×10^{-5} .

The usual transmission range is from 300nm to 2800nm. The UV limit can be to 230nm by special order.

The parallel shift of prism is token by displacement. Usually, the displacement of this prism supplied is 1 ± 0.2 mm. Special displacements less than 3mm are supplied as well to meet customers' requirements. Anti-reflective films can be coated on both sides of the prism.



USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in metal or cylindrical PMMA tube with two end windows. The mounts can be collocated with a 360° rotating-and-adjusting stand served by our institute. In order to guarantee the quality of output light, please adjust the incident light to be perpendicular to an arbitrary window of the prism while using. The reflected beam from incident window of the prism should be caution.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Displacement (mm)	Optical Damage Threshold		Diameter of Mount (mm)
						CW W/cm ²	Pulse MW/cm ²	
LSP-9A10	10×10	A	1×10^{-5}	90%	1 ± 0.2	30	500	according to requirements
LSP-9A12	12×12	A	1×10^{-5}	90%	1 ± 0.2	30	500	
LSP-9A14	14×14	A	1×10^{-5}	90%	1 ± 0.2	30	500	
LSP-9A16	16×16	A	1×10^{-5}	90%	1 ± 0.2	30	500	
LSP-9A18	18×18	A	1×10^{-5}	90%	1 ± 0.2	30	500	
LSP-9A20	20×20	A	1×10^{-5}	90%	1 ± 0.2	30	500	
LSP-9A22	22×22	A	1×10^{-5}	90%	1 ± 0.2	30	500	
LSP-9A24	24×24	A	1×10^{-5}	90%	1 ± 0.2	30	500	
LSP-9B10	10×10	B	1×10^{-4}	85%	1 ± 0.2	20	300	
LSP-9B12	12×12	B	1×10^{-4}	85%	1 ± 0.2	20	300	
LSP-9B14	14×14	B	1×10^{-4}	85%	1 ± 0.2	20	300	
LSP-9B16	16×16	B	1×10^{-4}	85%	1 ± 0.2	20	300	
LSP-9B18	18×18	B	1×10^{-4}	85%	1 ± 0.2	20	300	
LSP-9B20	20×20	B	1×10^{-4}	85%	1 ± 0.2	20	300	

Please contact us if the prisms with bigger parallel displacements are needed.



Laser Research Institute, Qufu Normal University <http://laser.qfnu.edu.cn>
 Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
 Telephone: +86-537-4458293, 4456492, Fax: +86-537-4458293
 Contact persons: Wu Fuquan, Song Lianke
 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
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RSP SERIES DOUBLE-REFLECTED POLARIZATION BEAMSPLITTING PRISM

CHARACTERISTICS:

This is a new type of polarization beamsplitting prism we devised based on double-reflection principle of double-refraction crystals. The prism can make light path turn around 90°, and lights escape with beamsplitting polarization in the meantime. Therefore, one direction-changing prism can be saved and the polarization qualities of lights are kept. As Figure a, b and c have shown, there are three kinds of prisms. Figure a of RSP-1-84 series is single-element structured design. Figure b of RSP-2-110 series and Figure c of RSP-3-60 series are double-element structured devices.

These prisms can split an incident unpolarized light into two plane-polarized lights whose polarized planes are vertical to each other. These prisms have advantages of high optical damage threshold and better polarization performance. The extinction ratio is better than 1×10^{-5} .

The usual transmission range is from 350nm to 2500nm.

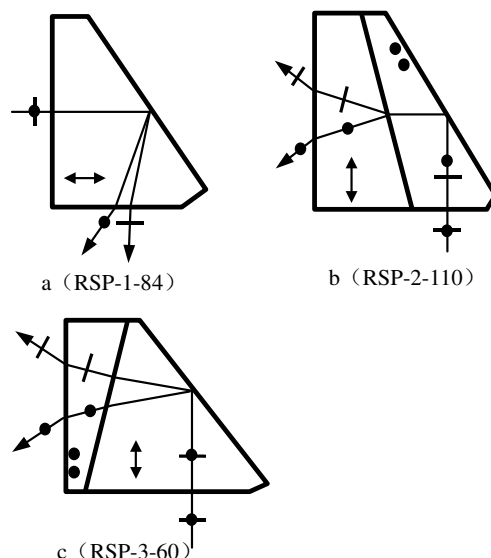
These prisms are made of calcite. Anti-reflective films can be coated on both sides of a prism by special order.

USAGE:

According to customers' requirements, this prism can be unmounted, or mounted in cylindrical PMMA tube. The prism is fixed to an upper mount. In order to protect the prism, it is mounted onto an under mount. The mount is unloaded while used, and then screwed onto a customer's device. While using, please adjust the incident light to be perpendicular to the incident plane according to the direction mark. It cannot be used in reverse direction. The reflected beam from incident window of the prism should be caution.

SPECIFICATION:

Model	Aperture (mm)	Grade	Extinction Ratio	Natural Transmittance (632.8 nm)	Beamsplitting Angle (°)	Optical Damage Threshold		Diameter of Mount (mm)
						CW W/cm ²	Pulse MW/cm ²	
RSP-1	According to requirement	A	1×10^{-5}	85%	Splitting with small angle	8	100	according to size of device
RSP-2	According to requirement	A	1×10^{-5}	85%	according to requirement (<15°)	8	100	
RSP-3	According to requirement	A	1×10^{-5}	85%	according to requirement (<15°)	8	100	



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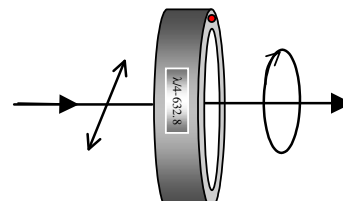
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CATEGORY III. RETARDATION DEVICE

MICA WAVEPLATE SERIES

CHARACTERISTICS:

Mica waveplate is made of natural slice-shaped white mica with optical standards by manual peeling and measuring. It has no impurity, air bubble, crystal belt and other defects. It has advantages of high transmittance and high optical damage threshold. In teaching and scientific research, it is used to change the polarization state of light and to test polarization information. Because of the reason of mica material, it is difficult to make large aperture waveplate with a symmetrical thickness.



Optional wavelength range: 400nm to 1500nm, each waveplate with single wavelength

Design method: zero order, two kinds of surface protection and no protection

Retardation: $\lambda/8$, $\lambda/4$, $\lambda/2$ or an arbitrary retardation whose thickness is from 0.02mm to 0.20mm.

Optical aperture: rounded or quadrate, sizes from $\Phi 5\text{mm}$ to $\Phi 50\text{mm}$

Processing of windows: anti-reflective films can be coated on both sides by special order

Requirement of half-wave width: According to customers' requirements of the central wavelength and retardation error, based on the 5% retardation error in usual, the half-wave width of a $\lambda/4$ waveplate is from 5nm to 10nm used in the visible range.

USAGE:

Please confirm if the wavelength needed is the same as that of the waveplate marked or not while using. In general, a mica waveplate is mounted in a metal or an engineering plastic ring with the direction of fast axis and retardation. In order to improve the optical damage threshold, there are no window-glass clips on both sides of the waveplate. Thus, please be careful to clean the faces of the waveplate with a blowing ball.

No extra charge for other shell ring made by special order. Welcome to choose the 360° rotating-and-adjusting stand served by our institute. If a waveplate is used in instrument, it is suggested that the windows should be adopted on the faces to protect it. Window material depends on different wavelengths.

SPECIFICATION:

Aperture (mm)	Grade	Wavelength Range (nm)	Retardation	Retardation Error	Natural Transmittance (632.8nm)	Optical Damage Threshold		Diameter of Mount (mm)
						CW W/cm ²	Pulse MW/cm ²	
$\Phi 8$	A	400~1500	over $\lambda/8$	<3%, <5%	90%	30	300	$\Phi 12.7 \times 4$
$\Phi 10$	A	400~1500	over $\lambda/8$	<3%, <5%	90%	30	300	$\Phi 15 \times 4$
$\Phi 15$	A	400~1500	over $\lambda/8$	<3%, <5%	90%	30	300	$\Phi 20 \times 4$
$\Phi 20$	A	400~1500	over $\lambda/8$	<3%, <5%	90%	30	300	$\Phi 25.4 \times 4$
$\Phi 25$	A	400~1500	over $\lambda/8$	<3%, <5%	90%	30	300	$\Phi 30 \times 4$
$\Phi 30$	A	400~1500	over $\lambda/8$	<3%, <5%	90%	30	300	$\Phi 36 \times 5$
$\Phi 35$	A	400~1500	over $\lambda/8$	<3%, <5%	90%	30	300	$\Phi 40 \times 5$

Please contact us if you have other requirements.



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QUARTZ WAVEPLATE SERIES

CHARACTERISTICS:

Quartz waveplate is made of artificial quartz with optical standards through special polishing process. It has good mechanical performance, high transmittance and high optical damage threshold. The waveplate retardation can be adjusted a little in a light path to revise the retardation error by using quartz waveplate. In teaching and scientific research, it is used to change the polarization state of light and to test polarization information.

Optional wavelength range: 400nm to 2500nm, each waveplate with single wavelength

Design method: multi-order, no protection on surface

Retardation: $\lambda/8$, $\lambda/4$, $\lambda/2$ or arbitrary retardation

Optical aperture: rounded, sizes from $\Phi 5\text{mm}$ to $\Phi 50\text{mm}$

Processing of windows: anti-reflective films can be coated on both sides by special order.

Requirement of half-wave width: According to customers' requirements of the central wavelength and retardation error, based on the 5% retardation error in usual, the half-wave width of a $\lambda/4$ waveplate is less than 1nm used in the visible range.

USAGE:

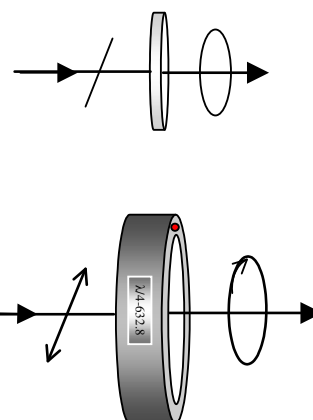
Please confirm if the wavelength needed is the same as that of the waveplate marked or not while using. In general, a quartz waveplate is mounted in a metal or an engineering plastic ring with the direction of fast axis and retardation. Quartz waveplate is multi-order plate, which thickness is about 1.5mm. The temperature effect should be considered. In general, as for a 632.8nm quartz waveplate, the retardation will be reduced about 1° if the temperature increases 1°C .

The retardation error of quartz waveplate can be revised while using. By rotating the waveplate around its slow or fast axis, the retardation will be adjusted a little. No extra charge for other shell ring made by special order. Welcome to choose the 360° rotating-and-adjusting stand served by our institute.

SPECIFICATION:

Aperture (mm)	Grade	Wavelength Range (nm)	Retardation	Retardation Error (Uniformity)	Natural Transmittance (632.8nm)	Surface Tolerance		P	Optical Damage Threshold		Diameter of Mount (mm)
						N	ΔN		CW W/cm ²	Puls MW/cm ²	
$\Phi 10$	A	400~1500	over $\lambda/8$	<5%	90%	1/2	1/8	III	30	300	$\Phi 15 \times 5$
$\Phi 15$	A	400~1500	over $\lambda/8$	<5%	90%	1/4	1/8	III	30	300	$\Phi 20 \times 5$
$\Phi 20$	A	400~1500	over $\lambda/8$	<5%	90%	1/4	1/8	III	30	300	$\Phi 25.4 \times 5$
$\Phi 25$	A	400~1500	over $\lambda/8$	<5%	90%	1/4	1/8	III	30	300	$\Phi 30 \times 5$
$\Phi 30$	A	400~1500	over $\lambda/8$	<5%	90%	1/4	1/8	III	30	300	$\Phi 36 \times 5$

Please contact us if you have other requirements.



Laser Research Institute, Qufu Normal University <http://laser.qfnu.edu.cn>
 Address: 57 Jingxuan West Road, Qufu 273165, Shandong Province, P. R. China
 Telephone: +86-537-4458293, 4456492, Fax: +86-537-4458293
 Contact persons: Song Lianke, Wu Fuquan
 Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn
 Bank: Qufu Branch of Industrial and Commercial Bank of China
 Account No.: 1608002609020111691

CATEGORY IV DEPOLARIZER

INTRODUCTION:

It is more difficult to obtain depolarization from a polarized light than to have a polarized light, especially to obtain totally depolarized effect. In general, it hardly depolarizes a plane polarized light to a natural light. According to the application of photoelectric measurement technology, it is so good enough to get depolarization over 95% in order to eliminate the effect caused by the polarization sensitivity of optical devices.

Scattering, diffuse reflection, coherent superposition and opticity are helpful to get depolarization. The following depolarizers are supplied:

1. Fake depolarizer: A 1/4 waveplate can be as a fake depolarizer. As for a monochromatic quasi-plane polarized light, a good effect can be obtained by using this kind of depolarizer if only the light intensity is measured. The measuring error caused by the polarization sensitivity of receiver can be revised well enough within an allowed error range.

2. Cuneal crystal depolarizer (shown as Fig. a): A wedge-shaped device. The incident light is paralleled with the crystal optical axis, and it is 45° angle between the polarized plane of incident light and the direction of optical axis. With the variable thickness, the depolarization effect can be obtained because the transmitting light includes all kinds of polarization states superposition. The better depolarization effect can be gotten for multi-wavelength light. It should be not so far from receiver while using. Otherwise, the depolarization effect will be influenced by the beam shift and micro-beamsplitting.

3. Quartz gyrotropic depolarizer (shown as Fig. b): This is a compound depolarizer designed based on the opticity of quartz crystal. It is made of two parts A and B, which are left-handed (A) and right-handed (B) quartz crystal separately. The sizes and structure angles of A and B cuneal prism are equal. A polarized light passes through this depolarizer along the optical axis, the output light will be a complex depolarized beam because of the different rotating angles of the incident polarized plane caused by the different thickness of A and B.

4. Crystal multiple retardation depolarizer: This is an optical crystal depolarizer designed according to the coherent superposition principle. It is made of two birefringent crystals with different thickness. The plane of incident light is paralleled with both directions of the optical axes of two crystals, and the angle between two crystals' axes is 45° . The better depolarization effect can be obtained for multi-wavelength light instead of monochromatic light.

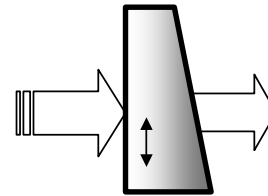


Fig. a Cuneal Depolarizer

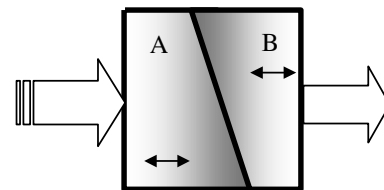


Fig. b Gyrotropic Depolarizer



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Laser Research Institute of Qufu Normal University

CATEGORY V CRYSTAL POLARIZER FOR EDUCATION

TEACHING GROUP A POLARIZED DEVICES

CHARACTERISTICS:

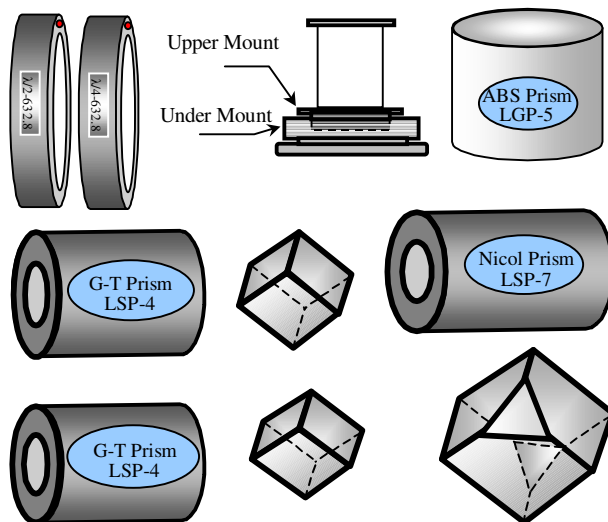
In order to meet the demands of polarization teaching and scientific practices for students in colleges and universities, this group of devices is designed based on a long-term statistics of customers' information. With these devices, the phenomena of birefringent and light extinction, the optical axis direction of anisotropic crystal, and the structure of Nicole prism can be observed. In addition, a polarized light path can be designed and all kinds of polarization states can be experimented.

METHODS OF CHOICE:

Grade A is recommended for scientific research. For education, especially demonstrative teaching, Grade B is recommended.

All prisms and waveplates can be collocated with the 360° rotating-and-adjusting stand served by our institute with extra charges. The diagram does not show the actual number of devices.

COLLOCATION OF DEVICES:



Name	Grades (A: Research B: Teaching)	Specification (mm)	Wavelength Range (um)	Number	Diameter of Mount (mm)
Calcite	A, B	>20×20×10	0.3~2.5	4	No
Optical axis-settled calcite	A, B	>20×20×20	0.3~2.5	2	No
Glan-Taylor prism	A, B	LGP-4, Φ5	0.3~2.5	2	Φ20
Nicol prism	A, B	LGP-7, Φ8	0.4~2.0	1	Φ27
Adjustable beamsplitting prism	A, B	LSP-8, 10×10	0.4~2.0	1	Screw thread of upper base: M20×1
λ/2 mica waveplate	A, B	Φ15	0.6328	1	Φ20×4, Φ25.4×4
λ/4 mica waveplate	A, B	Φ15	0.6328	1	Φ20×4, Φ25.4×4

The wavelength of waveplate will be supplied according to customers' requirements.



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Contact persons: Wu Fuquan, Song Lianke

Email: fqwu@qfnu.edu.cn, lksong@qfnu.edu.cn Website: http://qfnu.edu.cn

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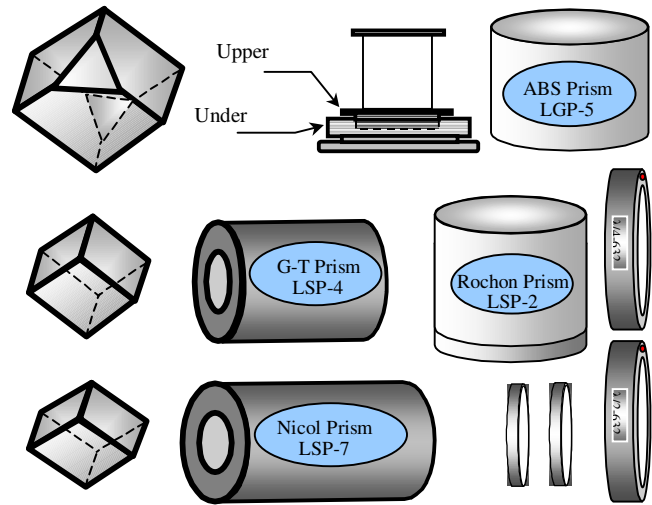
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Laser Research Institute of Qufu Normal University

TEACHING GROUP B POLARIZED DEVICES

CHARACTERISTICS:

In order to meet the demands of polarization teaching and scientific practices for students in colleges and universities, this group of devices is designed based on a long-term statistics of customers' information. With these devices, the phenomena of birefringent and light extinction, the optical axis direction of anisotropic crystal, and the structure of Nicole prism can be observed. In addition, a polarized light path can be designed and all kinds of polarization states can be experimented.



METHODS OF CHOICE:

Grade A is recommended for scientific research. For education, especially demonstrative teaching, Grade B is recommended.

All prisms and waveplates can be collocated with the 360° rotating-and-adjusting stand served by our institute with extra charges. The diagram does not show the actual number of devices.

COLLOCATION OF DEVICES:

Name	Grades (A: Research B: Teaching)	Specification (mm)	Wavelength Range (um)	Number	Diameter of Mount (mm)
Calcite (big size)	A, B	>20×20×10	0.3~2.5	4	No
Calcite (small size)	A, B	>22×22×12	0.3~2.5	2	No
Optical axis-settled calcite	A, B	>20×20×20	0.3~2.5	4	No
Glan-Taylor prism	A, B	LGP-4, Φ5	0.3~2.5	2	Φ20
Nicol prism	A, B	LGP-7, Φ8	0.4~2.0	1	Φ27
Adjustable beamsplitting prism	A, B	LSP-8, 12×12	0.4~2.0	2	Screw thread of lower base: M20×1
Rochon prism	A, B	LSP-2, 12×12	0.4~2.0	1	Screw thread of upper base: M20×1
λ/2 mica waveplate	A, B	Φ15	0.6328	1	Φ20×4, Φ25.4×4
λ/2 mica waveplate	A, B	Φ15	0.6328	1	Φ20×4, Φ25.4×4
λ/2 quartz waveplate	A, B	Φ15	0.6328	1	Φ20×5
λ/4 quartz waveplate	A, B	Φ15	0.6328	1	Φ20×5

The wavelength of waveplate will be supplied according to customers' requirements.



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TEACHING GROUP OF NICOL POLARIZED DEVICES

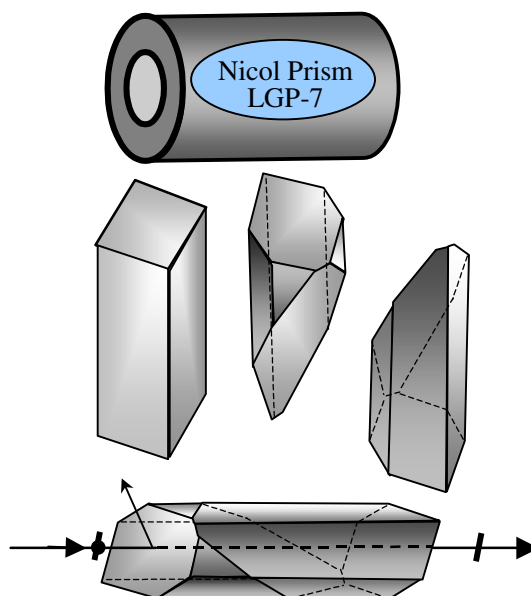
INTRODUCTION:

With the development of science and technology, the application in optical system of Nicol prism is replaced by other polarized devices with high performances. However, there is no doubt about the historical role that Nicol prism plays in the development of polarized optics. Such an important role can be seen from a lot of domestic and overseas optical textbooks. Crystal polarizers are almost demonstrated with Nicol prism as an example, although it is a little bit difficult to express the structure and polarized principle of this prism exactly without any models. On this point, this group of devices is designed to meet the demand of polarization teaching in colleges and universities.

METHODS OF CHOICE:

Grade A is recommended for scientific research. For education, especially demonstrative teaching, Grade B is recommended.

Nicol prism can be collocated with the 360° rotating-and-adjusting stand served by our institute with extra charge. The diagram does not show the actual number of devices.



COLLOCATION OF DEVICES:

Name	Grades (A: Research B: Teaching)	Specification (mm)	Wavelength Range (μm)	Number	Diameter of Mount (mm)
Nicol-typed crystal	A, B	$>10 \times 10 \times 34$	0.3~2.5	2	No
Parts of Nicol prism	A, B	Effective aperture $\Phi 8$	visible	1	No
Nicol prism	A, B	LGP-7, $\Phi 8$	0.4~2.0	1	$\Phi 27$



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