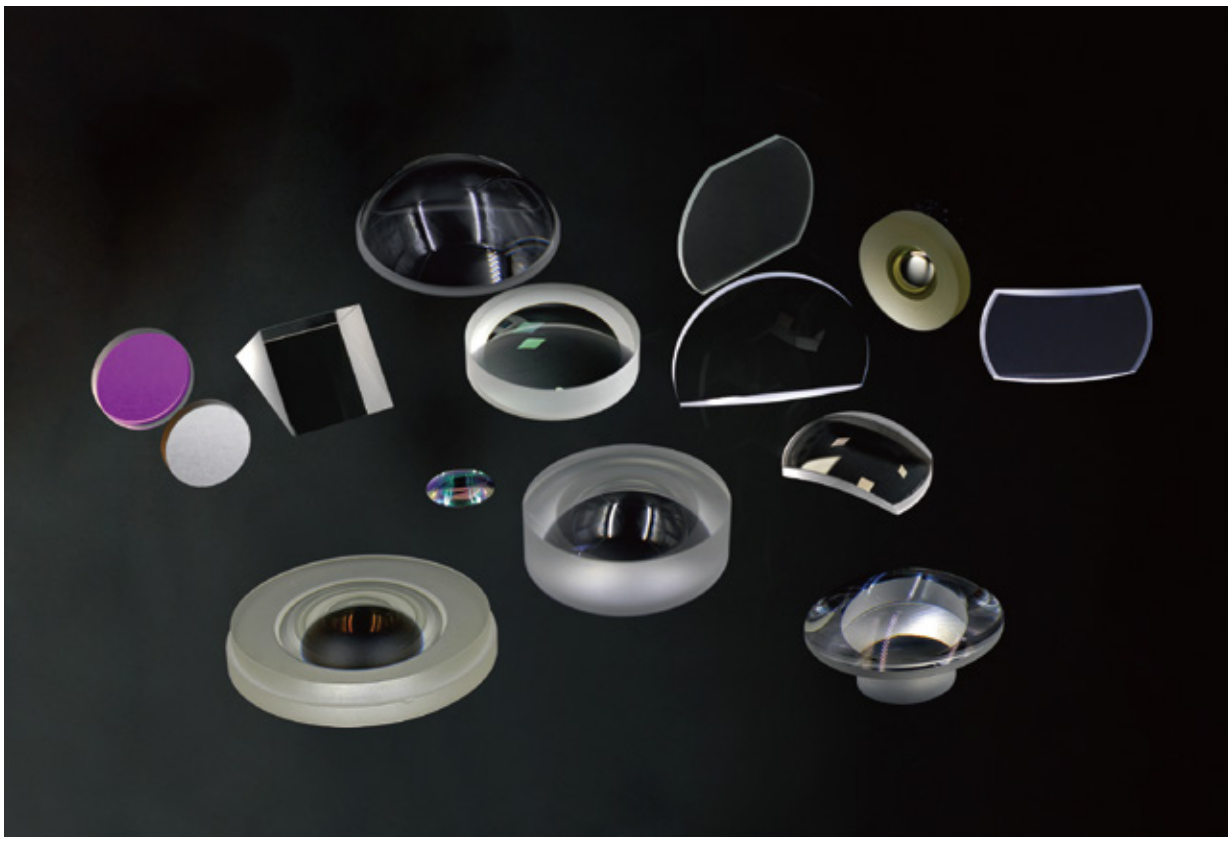
Intane OPTICS® 英田光学

Ultra-precision Optical elements



ONE WORLD CONNECTED WITH LASER

Company profile

Nanjing Intane Optics was founded in 2003 by Professor Zhou Bifang, the former director of Nanjing Astronomical Instruments Research Center, the Chinese Academy of Sciences. Nanjing Intane Optics is a national high-tech enterprise with precision optical systems solutions at its core competency. The company boasts a team of experienced engineers in precision optical engineering, with proven technological capabilities ranging from complex system design, integration, assembly, testing to the manufacturing of key optical components.

Advanced optical elements are the core components that determine the performance of precision optical instruments. As technology and requirements develop, there are increasingly higher demands for the performance of advanced optical elements.

Nanjing Intane Optics is actively engaged in research on ultra-precision optical component processing technology. With internationally advanced polishing and testing equipment, combined with self-developed CNC equipment, our experienced technicians team is constantly taking on challenges of high-performance optical component manufacturing with increasing difficulty. We have achieved full-spectrum nano-scale processing accuracy in the manufacturing of optical aspherics, spheres, planes, cylinders, and windows. Through high-performance optical coating, our products feature long life, high reliability, high strength, and diversity of optical components.

Based on high-precision optical components, Intane Optics also has developed a series of high-precision optical testing instruments and equipment. Collimators of various aperture and specifications have a good reputation among customers. Intane Opics: Your trusted supplier for precision optical system solutions.

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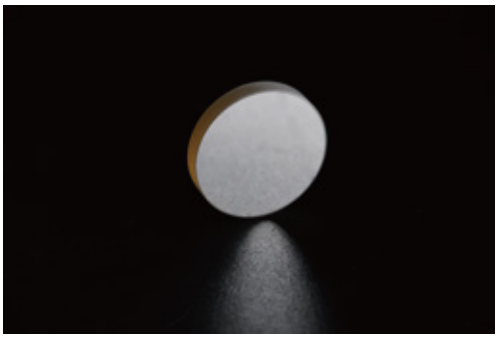
ONE WORLD CONNECT
WITH LASER

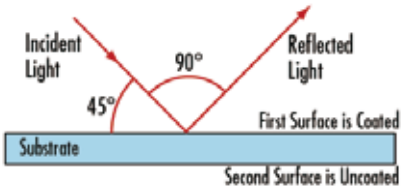
Plane mirrors

Plane mirrors are usually used for beam steering, interferometry, imaging or illumination. Glass or metals after surface polishing are used as the substrates, and beams shine on their surfaces and cause specular reflection.

Plane reflectors

Plane reflectors can be used for beam steering and interferometry and as optical elements in imaging systems. The surface flatness and reflectivity are taken as the important parameters . High surface precision can reduce the light loss due to dispersion.





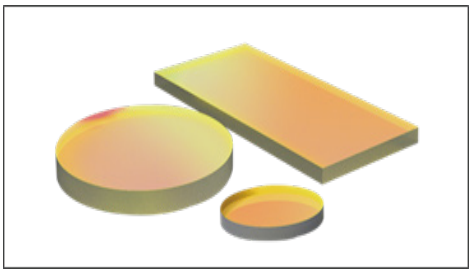
Material	Precision-annealed H-K9L optical glass/fused quartz/glass ceramics	
Surface accuracy	K9 standard precision plane reflectors	λ/20@633nm
	K9 high precision/fused quartz high precision plane reflectors	λ/20@633nm
	Fused quartz standard precision plane reflectors	λ/20@633nm
	Economical plane reflectors	4-6 λ/20@633nm
Parallel error	<3′	
Surface quality	K9 standard precision/fused quartz standard precision plane reflectors	40/20-60/40
	K9 high precision/fused quartz high precision plane reflectors	Up to 10-5
	Economical plane reflectors	80-50
Back	Fine ground/figuring	
Dimension tolerance	K9 standard (high) precision/fused quartz (high) precision plane reflectors	±0.01mm
	Economical plane reflectors	±0.01mm
Thickness tolerance	K9 standard (high) precision/fused quartz (high) precision plane reflectors	±0.01mm
	Economical plane reflectors	±0.01mm
Beveling	K9 standard (high) precision/fused quartz (high) precision plane reflectors	Any angle by manual grinding
	Economical plane reflectors	0.2-0.5mm x 45°
Coatings	As per customer's request	

* The dimensions and the coating are both customizable.

Cold/hot reflectors

With visible light and infrared light in the light source or light signals, cold/hot reflectors can separate visible light and infrared light and reflect/transmit visible light only, reducing system temperature rising problems due to infrared radiation.

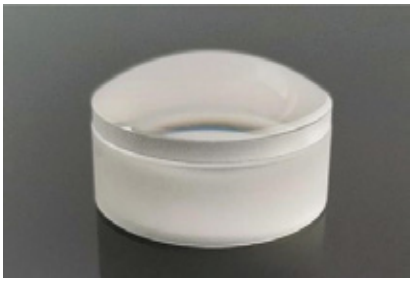
In terms of spectral characteristics, hot reflectors have high transmittance for visible light and high reflectivity for near-infrared light, and cold reflectors have high reflectivity for visible light and high transmittance for near-infrared light. Hot reflectors can reduce heat and lower the thermal impact on the overall performance of systems.

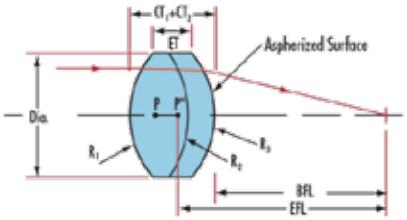


Material	Schott Borofloat borosilicate glass, quartz glass	
Surface accuracy	λ/10@633nm	
Parallel error	<1′	
Surface quality	Ho reflector	60-40
	Cold reflector	60/40-80/50
Diameter tolerance of the circular substrate	Hot reflector	±0.01mm
	Cold reflector	±0.01mm
Thickness	As per customer's request	
Focal length tolerance	±2%	
Transmittance	Tavg > 90%	
Reflectivity of visible light	Hot reflector	Ravg > 95%@750-1150nm
	Cold reflector	Ravg > 95%@425-675nm
Angle of incidence	Hot reflector	0°/45°
	Cold reflector	0°/45°

Positive achromatic lenses

Positive achromatic lenses are doublet with positive focal lengths. They are used for chromatic aberration correction and can greatly reduce or even eliminate chromatic aberrations.



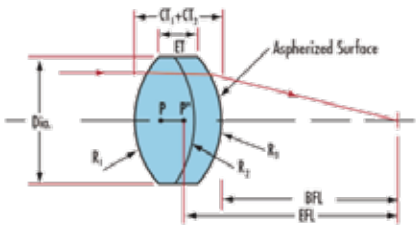


Diameter tolerance	+0.0/-0.1mm
Center thickness tolerance	±0.01
Surface accuracy	λ/10@632.8nm
Effective focal length tolerance	±2%
Centering tolerance	30″
Surface quality	40-20 ~ 60-40
Bevel	0.2mm x 45°
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Negative achromatic lenses

Negative achromatic lenses are doublet with negative focal lengths. They are used for chromatic aberration correction and can greatly reduce or even eliminate chromatic aberrations.



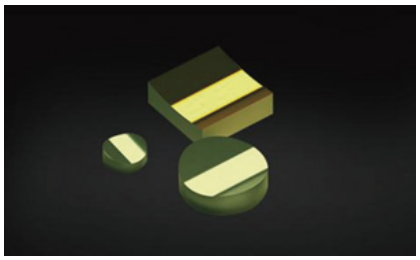
Diameter tolerance	+0.0/-0.1mm
Center thickness tolerance	±0.01
Surface accuracy	λ/10@632.8nm
Effective focal length tolerance	±2%
Centration tolerance	30″
Surface quality	40-20 ~ 60-40
Bevel	0.2mm x 45°
Coating	As per customer's request

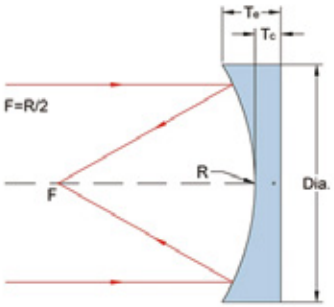
* The dimensions and the coating are both customizable.

Cylindrical mirrors

Cylindrical reflectors

A cylindrical reflector has a cylindrical surface. Through its cylindrical surface, it can converge parallel incident beam into a line, resulting in a positive focal length that is a half of the curvature radius of its cylindrical surface. It applies to light focusing and shaping.



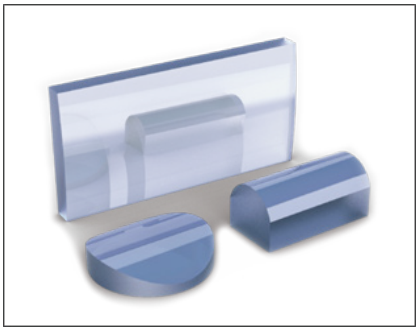


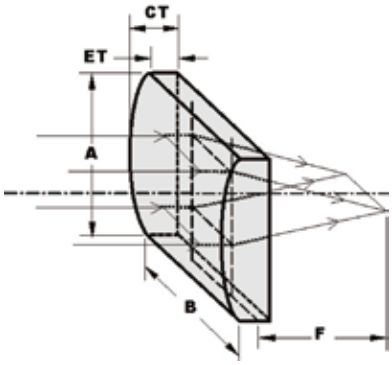
Material	Precision-annealed H-K9L , quartz glass, glass ceramics
Surface accuracy	λ/4@633nm
Parallel error	<1′
Finish	40/20 ~ 60/40
Back	Curved surface
Dimension tolerance	+0.0/-0.01mm
Thickness tolerance	±0.03mm
Focal length tolerance tolerance	±2%
Bevel	0.2mm x 45°
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Plano-convex cylindrical lenses

The Plano spherical lens acts symmetrically on the incident light in both directions, while the convex cylindrical lens acts in only one direction on the incident light. A typical application is to shape a deformed beam with a pair of plano-convex cylindrical lenses. A pair of positive plano-convex cylindrical lenses can be used to collimate and round the output of the laser diode. Another possible application is to focus the diverging beam onto the detector array with a single plano-convex cylindrical lens. In order to minimize the spherical aberration, when the collimated beams are concentrated into one line, the collimated light should be incident on the curved surface of the lens, and when the quasi-linear source is used, the line source should be incident on the plane of the lens.



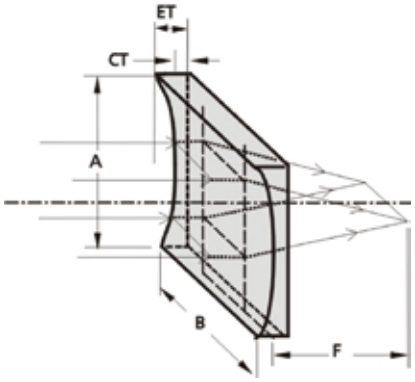


Material	Ultraviolet fused quartz/precision-annealed H-K9L /CaF_2	
Design wavelength	Fused quartz/K9	587.6nm
	CaF_2	587.6nm
Diameter tolerance	Fused quartz/CaF_2	+0.0/-0.05mm
	K9	+0.0/-0.05mm
Center thickness	±0.05mm	
Effective focal length tolerance	±2%	
Centering	3~5′	
Surface quality	Fused quartz/K9	20/10 ~ 40/20
	CaF_2	40/20 ~ 60/40
Bevel	0.2mm x 45°	
Coating	As per customer's request	

* The dimensions and the coating are both customizable.

Plano-concave cylindrical lenses

A plano-concave cylindrical lens with a plane and a concave cylinder has got a negative focal length. Plano-concave cylindrical lenses are usually used to converge parallel or divergent beams to a line or change the width-height ratio of images, in order to change point light sources into linear light sources.These lenses are used in laser scanners, spectroscopy, dye lasers, acousto-optics, optical processors and other similar applications.

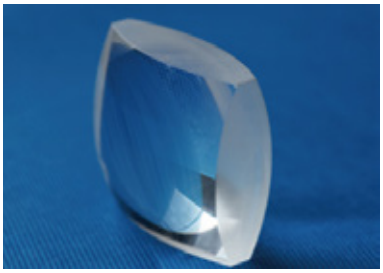


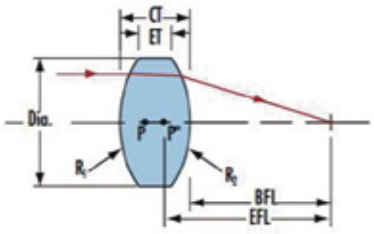
Material	Precision-annealed H-K9L optical glass/ultraviolet fused quartz	
Design wave length	587.6nm	
Diameter tolerance	K9/fused quartz	+0.0/-0.05mm
Center thickness tolerance	±0.03mm	
Effective focal length tolerance	±2%	
Surface quality	Fused quartz/K9	20/10 ~ 40/20
Bevel	0.2mm x 45°	
Coating	As per customer's request	

* The dimensions and the coating are both customizable.

Biconvex cylindrical lenses

Each biconvex cylindrical lens is made up of two convexities. Biconvex cylindrical lenses are usually used in optical display systems, imaging systems, optical instruments and laser systems to change point light sources into linear light sources.



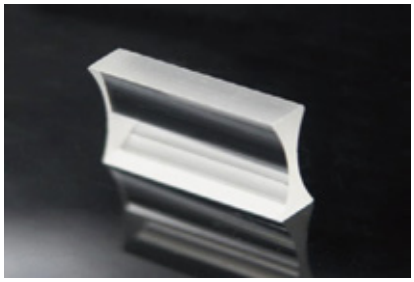


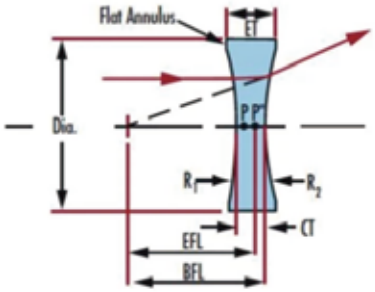
Material	K9/ultraviolet fused quartz
Design wave length	587.6nm
Outer diameter tolerance	±0.01/-0.05mm
Surface accuracy	λ/10
Center thickness tolerance	±0.03mm
Effective focal length tolerance	±2%
Surface quality	20/10
Centration	<3arcmin
Bevel	<0.2mm x 45°
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Biconcave cylindrical lenses

Biconcave cylindrical lenses are mainly used for changing image sizes as required. They are widely used in high-power laser systems and synchrotron radiation beams, too. Based on increasingly stricter requirements for their parts, they are particularly suitable for precision test instruments and devices, such as high-power laser resonant cavities and long-distance Laser interferometric measurment systems.





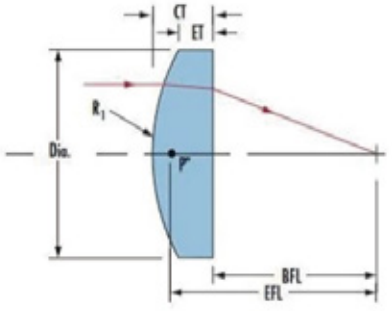
Material	K9/ultraviolet fused quartz
Design wave length	587.6nm
Outer diameter tolerance	±0.01/-0.05mm
Surface accuracy	λ/10
Center thickness tolerance	±0.03mm
Effective focal length tolerance	±2%
Surface quality	20/10
Centration	<3arcmin
Bevel	<0.2mm x 45°
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Spherical lenses

Plano-convex spherical lens

Each plano-convex spherical lens is based on the principle of light refraction and characterized by the thick center, thin rim, positive focal length, flat surface on one side and convex surface on the other side. Thick plano-convex spherical lenses can be used for telescoping, converging and so on, depending on their thicknesses. Plano-convex spherical lenses are suitable for the collimation and focusing through monochromatic lights.

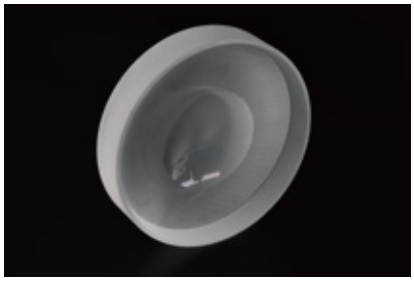


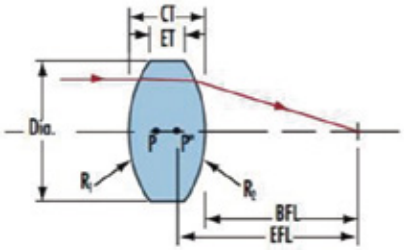
Material	K9/quartz/sapphire/Si/Ge/CaF2/LiF/BaF2/MgF2/ZnSe, etc.
Focal length tolerance	±1%
Thickness tolerance	±0.02mm
Dimension tolerance	±0.02mm
Surface accuracy	λ/10
Surface quality	20/10 or better
Centration	<3arcmin
Clear Aperture	>90%
Bevel	<0.2x 45°
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Biconvex spherical lens

A biconvex spherical lens is a convex lens characterized by the convex surface on its two sides and a positive focal length which is longer in its middle and shorter at its ends. Biconvex spherical lenses are mainly used for converging the light from point light sources or transmitting images to other optical systems.



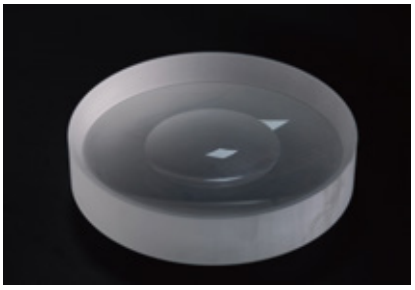


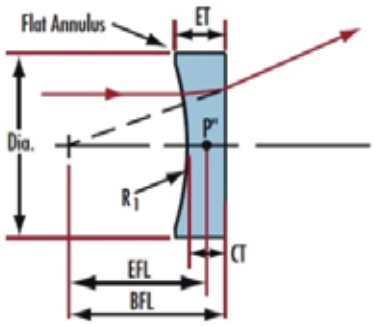
Material	K9/quartz/sapphire/Ge/CaF2/ZnSe, etc.
Focal length tolerance tolerance	±1%
Thickness tolerance	±0.02mm
Dimension tolerance	±0.02mm
Surface accuracy	λ/10
Surface quality	20/10 or better
Centration	<3arcmin
Clear Aperture	>90%
Bevel	<0.2mm x 45°
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Plano-concave spherical lenses

A plano-concave spherical lens has a negative focal length, and it has got a concave spherical on one side, flat surface the other side , thus it is,thinner in the middle than the edge . Plano-concave spherical lenses are used for expanding beams, projecting beams and increasing the focal length applications of optical systems.



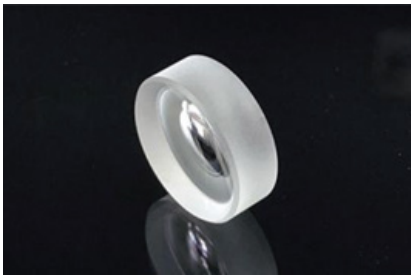


Material	K9/quartz/sapphire/ZnS/LiF/MgF_2/BaF_2/ CaF_2/ZnSe/Si/Ge, etc.
Focal length tolerance	±1%
Thickness tolerance	±0.02mm
Dimension tolerance	±0.02mm
Surface accuracy	λ/10
Surface quality	20/10 or better
Centration	<3arcmin

* The dimensions and the coating are both customizable.

Biconcave spherical lens

A biconcave spherical lens has a negative focal length, it refracts light outwards, so it is also called diverging lens. Biconcave spherical lenses are usually used for beam expansion, projection, etc.

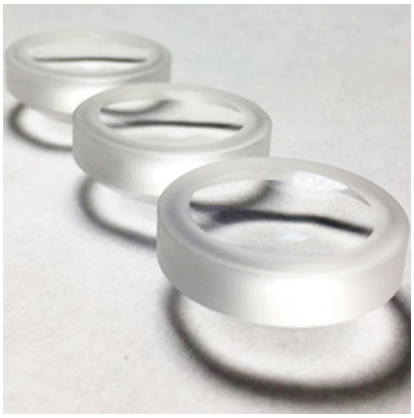


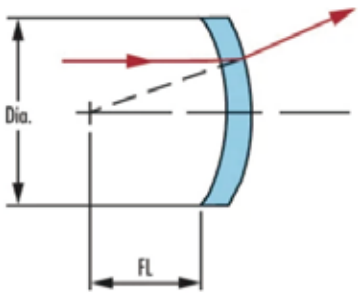
Material	K9/quartz/sapphire/Ge/CaF2/ZnSe, etc.
Focal length tolerance	±1%
Thickness tolerance	±0.02mm
Dimension tolerance	±0.02mm
Surface accuracy	λ/10
Surface quality	20/10 or better
Centration	<3arcmin
Clear Aperture	>90%
Bevel	<0.2 x 45°
Coating	As per customer's request

*The dimensions and the coating are both customizable.

Meniscus lenses

A meniscus lens may be a positive meniscus lens or a negative meniscus lens. Made of K9, ultraviolet fused quartz, CaF_2 or ZnSe, it is used for reducing focal length of the other lens and maintaining the angular resolutions of optical elements. It is usually used with another positive meniscus lens for better focusing. Negative meniscus lenses are designed to minimize spherical aberrations. A negative meniscus lens is made up of a convex surface and a concave surface with a larger curvature radius. Used with another lens, it can reduce the numerical apertures of systems. Negative meniscus lenses are common parts for beam expansion.





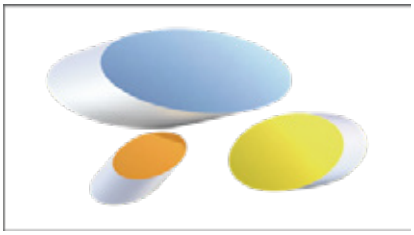
Material	K9/quartz/sapphire/Ge/CaF_2/ZnSe, etc.
Focal length tolerance	±1%
Thickness tolerance	±0.02mm
Dimension tolerance	±0.02mm
Surface accuracy	λ/20
Surface quality	20/10 or better
Centration	<3arcmin
Clear Aperture	>90%
Bevel	<0.2 x 45°
Coating	As per customer's request

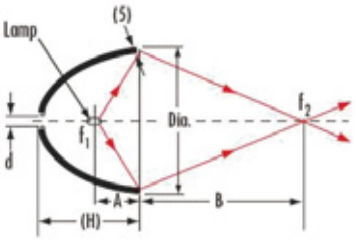
*The dimensions and the coating are both customizable.

Aspheric reflectors

Elliptical reflectors

An elliptical reflector has a planar reflecting surface and an elliptical outline or, when placed in an light path slantly at 45°, a circular outline. It can converge any light starting from or passing through a focus to another focus, being aplanatic for the two focuses.





Material	Precision-annealed H-K9L optical glass, fused quartz, glass ceramics
Surface flatness	λ/10@633nm
Parallel error	<1′
Finish of reflecting surface	Up to 10-5
Back	Fine ground
Dimension tolerance	+0.0/-0.05mm
Thickness tolerance	±0.05mm
Bevel	0.2mm x 45 °
Coating	As per customer's request

*The dimensions and the coating are both customizable.

Parabolic reflectors

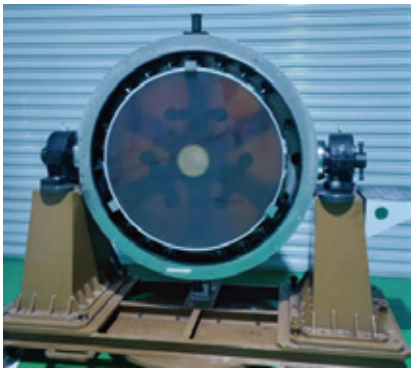
A parabolic reflector has a curved surface that is a circular paraboloid, namely that is, the surface generated by a parabola revolving around its axis. Therefore, parabolic reflectors can be used for the convergence and focusing of incoming rays.

Material	K9/fused quartz/glass ceramics
Dimension	15mm ~ 2000mm
Surface rule	RMS >1/80
Deviation angle	90 °
Finish	Up to 60 ~ 40
Surface roughness	RMS < 0.8nm
Dimension tolerance	±0.02mm
Focal length tolerance tolerance	±0.2%
Coating	Aluminum/silver/gold/medium high-flection film/ customizable for special wave bands

*The dimensions and the coating are both customizable.

Hyperboloid reflectors

A hyperboloid reflector has two curved surfaces that are symmetrical. Therefore, hyperboloid reflectors are usually used for imaging and focusing in fields such as cameras, telescopes, solar power systems, and head lights.



Material	K9/fused quartz/glass ceramics
Focal length tolerance	±0.1%
Thickness tolerance	±0.02mm
Dimension tolerance	±0.02mm
Finish	40/20
Centration	<3arcmin
Bevel	<0.2mm x 45°
Coating	Aluminum/silver/gold/medium high-flection film/ customizable for special wave bands

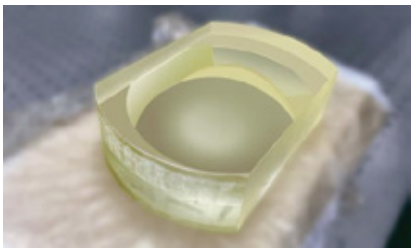
High-order aspheric reflectors

High-order aspheric reflectors have highly free surface parameters, large fluctuations of the curves on their curved surfaces, and stricter requirements for optical machining. Different surface requirements need different process routes and test methods.

Material	H-K9L/fused quartz/glass ceramics
Range of machining	15mm ~ 2000mm
Precision of machining	Rms >1/80
Bevel	0.2mm x 45°
Dimension tolerance	0/-0.2mm
Thickness tolerance	±0.05mm
Coating	Aluminum/silver/gold/medium high-flection film/ customizable for special wave bands

Free form reflectors

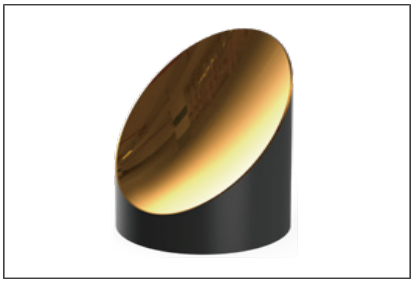
As a disruptive technology, free form reflectors overcome the limitation of rotational symmetry of conventional optical curved surfaces and can correct the asymmetrical aberrations of asymmetrical optical systems and realize high-performance large-field-of-view off-axis reflective imaging optical imaging systems. Besides, free-form surfaces guarantee a high degree of freedom in optical design and can overcome complex spatial constraints, generate flexible and diversified optical architectures and realize high-performance optical imaging systems with compact structures, small volumes and high image quality

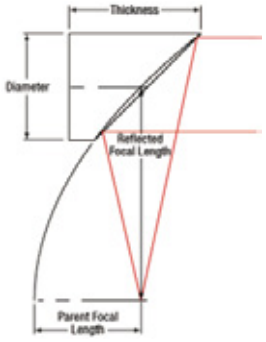


Material	K9/fused quartz/glass ceramics, etc.
Focal length tolerance	±0.1%
Thickness tolerance	±0.02mm
Dimension tolerance	±0.02mm
Finish	40/20
Centration	<3arcmin
Bevel	<0.2mm x 45°
Coating	Aluminum/silver/gold/medium high-flection film/ customizable for special wave bands

Off-axis parabolic reflectors

For an off-axis parabolic reflector, its reflecting surface is a part of its paraboloid; its focus is beyond the optical axis; the beams parallel to the central axis of its paraboloid converge on the focus after reflecting on its paraboloid. Off-axis parabolic reflectors can realize high optical performance in the visible light band, the near-infrared band and the infrared band with help of the coating technology. With a surface roughness of 50A or 100A, they can reduce light scattering. They are widely used in products or fields including reflective optical systems, laser focusing systems, terahertz, etc.





Material	6061-T6
Surface accuracy	λ/4
Deviation angle	90°
Finish of reflecting surface	80 ~ 50
Surface roughness	RMS < 100A
Dimension tolerance	0/-0.2mm
Focal length tolerance	±2%
Coating	Aluminum/silver/gold

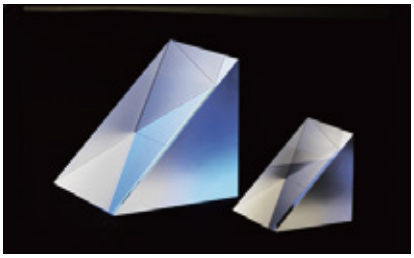
* The dimensions and the coating are both customizable.

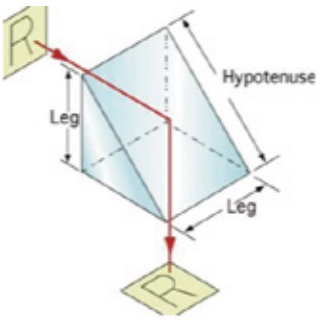
Prisms

Prisms are transparent devices usually made of glass and allowing light propagation in them. Through its ends that are not parallel, each prism realizes ray refraction (the beam directions change) usually depending on the wave lengths because of the dispersion of its material. However, total reflection is needed sometimes; the emergent beam directions do not depend on the wave lengths sometimes.

Right-angle prisms

Right-angle prism mirrors are extremely versatile optical components, commonly used as individual prisms and components of optical assemblies. A beam of light entering the leg of a right-angle prism mirror will deviate by a nominal value of 90°, while precise rotation of the prism controls beam alignment. When light enters the hypotenuse of the prism, it is commonly called a Porro prism. In this configuration, a light beam will undergo 180° deviation that is invariant in the azimuthal axis, while precise adjustment of the prism controls beam elevation.



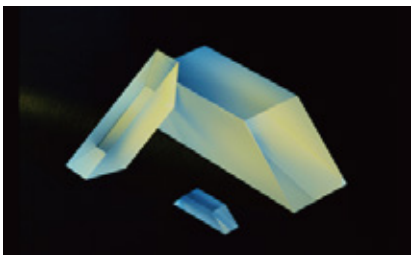


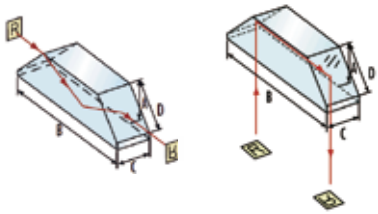
Material	K9/quartz/sapphire/Ge/CaF_2/ZnSe, etc.
Surface flatness	λ/10
Thickness tolerance	±0.02mm
Dimension tolerance	±1 Arc Seconds
Surface finish	20/10 or better
Bevel	Protection bevel
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Dove prisms

Dove prisms are actually right-angle prisms with their triangular tops removed. They can generate flipped, reversed images or rotary images, depending on the ray incidence directions. They can reverse images by 180 °, so they are also called image rotators. When an image rotates around the optical axis of a Dove prism, its rotation angle doubles that of the Dove prism. In the case of limited space or a need for easier installation, Dove prisms can replace retroreflector or right-angle prisms.
Dove prisms have an unusual and very interesting characteristic , if you look through the prism and rotate it around a longitudinal axis, the image rotates through twice the angle through which the dove prism itself rotates. For optimal peformance, use dove prisms with collimated light.

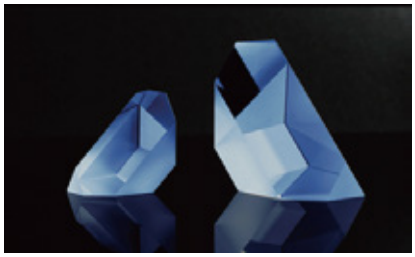




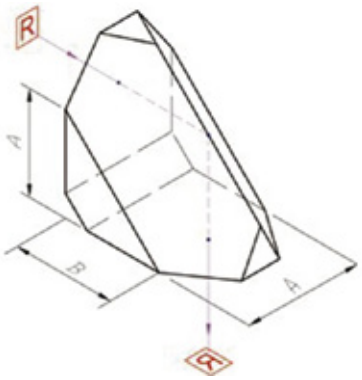
Material	K9/quartz/sapphire/Ge/CaF2/ZnSe, etc.
Surface flatness	λ/10
Thickness tolerance	±0.02mm
Dimension tolerance	±0.02mm
Surface finish	20/10 or better
Parallelism	±1 Arc Seconds
Bevel	0.2mm x 45°
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Roof prisms



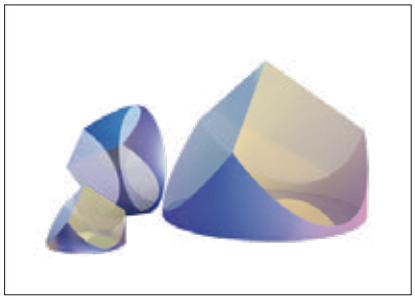
A roof prism has two reflecting surfaces looking like a roof in the optical route. The ridge of the two reflecting surfaces is in middle of the optical route. That's why there's a dividing line in middle of a roof prism sometimes. A roof prism can be regarded as a prism dividing a beam in half and then splicing it again.
The roof or Amici prism deviates or deflects the image through an angle of 90 degrees. It is a right-angle prism whose hypotenuse has been replaced by a 90-degree TIR roof. Glass that does not contribute to the clear aperture has been trimmed away to reduce size and weight.
Roof Prism is made from N-BK7, or as required, and can be used when a right angle deflection of an image or laser beam is required. In passing through the prism, the image is both deflected right-to-left and top-to-bottom. The hypotenuse of the optical prism utilizes total internal reflection (TIR) to reflect the image through the prism. Polarization states may become rotated during reflection.



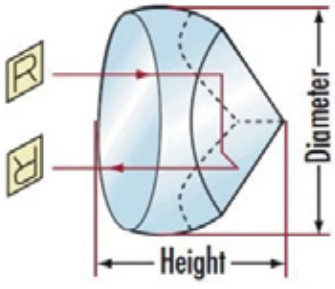
Material	K9/quartz/sapphire/Ge/CaF2/ZnSe, etc.
Surface flatness	λ/10
Effective aperture	>90%
Dimension tolerance	±0.02mm
Surface finish	20/10 or better
Angle tolerance	±1 Arc Seconds
Bevel	<0.2mm x 45°
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Pyramid prisms



A pyramid prism is a glass part for retroreflection: it realizes retroreflection of the incident beams through three 90 ° angles, and the incident beams have total reflection on the three rectangular planes and return along their original routes. Pyramid prisms are not limited by angles of incidence. They are often used on laser range finders and in other time-consuming occasions with difficult precision alignment.
Corner optical prism rear reflector/pyramid prism is designed to reflect any light or beam entering the prism surface, regardless of the direction of the prism, can be reflected back to itself. The mirror can only be used at a normal Angle of incidence. Therefore, corner prism retroreflector is an ideal choice for accurate alignment. They have three total internal reflections that work even at very large incident angles. N - BK7 Corner Cube Retroreflectors is made by the precision of N - BK7, suitable for all kinds of visible light.



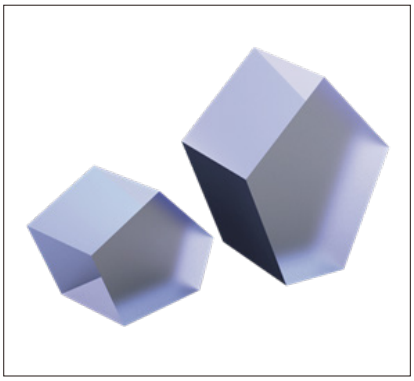
Material	K9/quartz/sapphire/Ge/CaF2/ZnSe, etc.
Surface flatness	λ/10
Effective aperture	>90%
Dimension tolerance	±0.02mm
Surface finish	20/10 or better
Angle tolerance	±1 Arc Seconds
Bevel	<0.2mm x 45°
Coating	As per customer's request

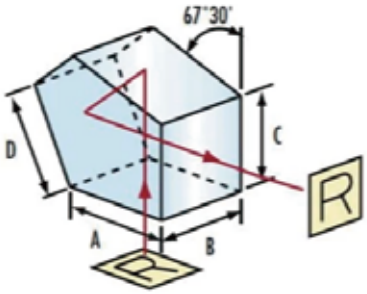
* The dimensions and the coating are both customizable.

Pentagonal prisms

Pentagonal prism is the beam Angle (90 °), one of the steering gear.It has two purposes: one is that no matter how much the first incident Angle on the side is the emergent light incident light steering Angle (90 °);The other is that, unlike a rectangular prism, the resulting image has neither rotation nor specular reflection.Pentaprism is commonly used in camera viewfinders, image observation systems or measuring instruments.

Characteristics of pentagonal prism is a 90° Angle of the light became a vertical incidence, and then after the 45 ° Angle of two surface reflection, from the Angle of 90 ° exit, on the other side of the incident light and emergent light is equal to 90 ° Angle, such application pentagonal prism can turn axis around 90 °. The pentagonal prism rotates around the horizontal axis for emergent light in the vertical plane sweep out a plane, and vice around the vertical axis rotation, can be measured in horizontal plane, when using laser as light source, because the laser range far, you can sweep out a big plane, this for housing construction, large engineering construction of planar measurement obviously is simple and convenient and of high precision, so the pentagonal prism needs more and more.





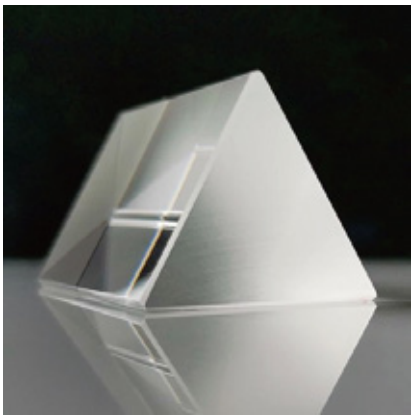
Material	K9/quartz/sapphire/Ge/CaF_2/ZnSe, etc.
Surface accuracy	λ/10
Thickness tolerance	±0.02mm
Dimension tolerance	±0.02mm
Surface quality	20/10 or better
Parallelism	±1 Arc Seconds
Bevel	<0.2mm x 45°

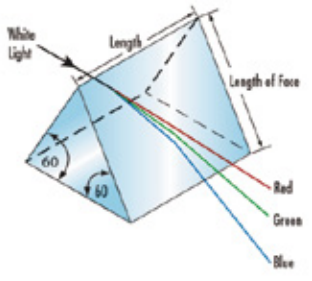
* The dimensions and the coating are both customizable.

Triple prisms

A triple prism is a transparent object surrounded by pairwise intersecting, unparallel planes.

Triple prisms are used to make beams split or get dispersion.



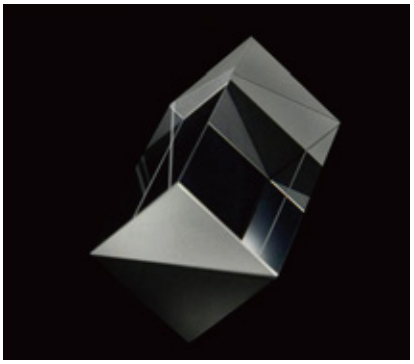


Material	K9/quartz/sapphire/Ge/CaF_2/ZnSe, etc.
Surface flatness	λ/10
Angle tolerance	±1 Arc Seconds
Dimension tolerance	±0.02mm
Surface finish	20/10 or better
Clear aperture	>90%
Bevel	As per customer's request
Coating	As per customer's request

* The dimensions and the coating are both customizable.

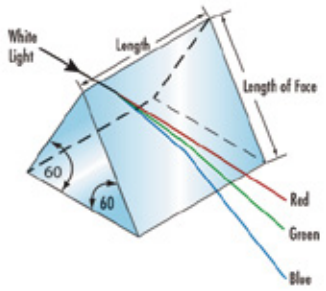
Equilateral prisms

The three angles of an equilateral prism are all 60 °,It's Also called dispersing prism, equilateral prism can split light of different wave lengths,thus it is ideal for light dispersion.



Material	K9/quartz/sapphire/Ge/CaF_2/ZnSe, etc.
Surface flatness	λ/10
Thickness tolerance	±0.02mm
Dimension tolerance	±0.02mm
Clear aperture	>90%
Surface finish	20/10 or better
Parallelism	±1 Arc Seconds
Bevel	0.2mm x 45°
Coating	As per customer's request

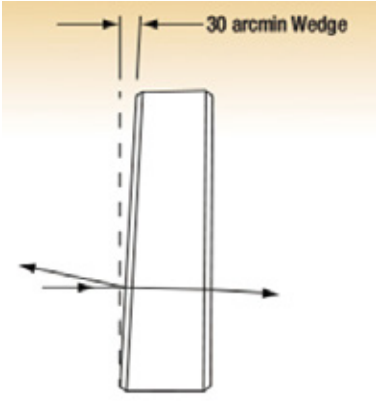
* The dimensions and the coating are both customizable.



Optical windows

Wedged windows

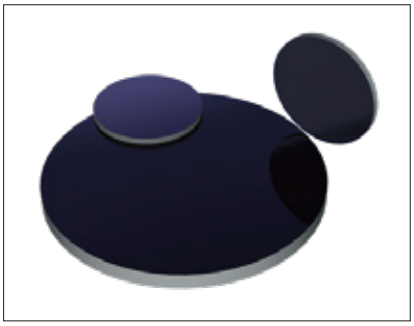
A sedged window has an angle of 30″between two unparallel planes, avoiding the interference effect due to light reflection by the front and back surfaces of a high-parallelism window, and problems such as poor stability and mode hopping of laser output due to optical interference feedback by the laser resonator. Wedged windows are usually used to make incident beam deviate by certain angles toward the designated directions. When used in a pair, relative rotation of the two optical wedges can make the emergent beam situated in any direction in a pyramid taking the incident beam as its axis.

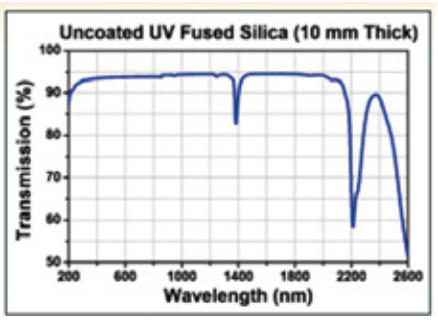


Material	K9/ultraviolet fused quartz
Surface flatness	λ/10@633nm
Wedge angle	30 arcmin±10 arcmin
Diameter tolerance	+0.0/-0.1mm
Thickness tolerance	±0.02mm
Surface finish	10/5 ~ 20/10
Bevel	0.2 ~ 0.5mm x 45°
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Quartz windows





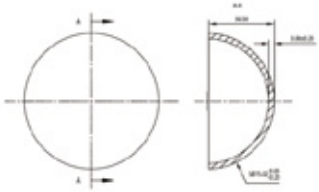
Quartz glass is a kind of special industrial glass made from SiO2. As a good base material, it has excellent physical, chemical and optical properties. It allows transmission of far ultraviolet light, visible light and near-infrared light, becoming the best choice among all the base materials allowing transmission of ultraviolet light. Thanks to its resistance to high temperature, extremely small thermal expansivity, extremely high chemical stability, and extent of bubbles, stripes, uniformity and double refraction comparable to ordinary optical glass, it is a necessary optical material with a highly stable optical coefficient when used in severe conditions.

Material	K9/ultraviolet fused quartz/sapphire/Ge/CaF2/ZnSe, etc.	
Surface flatness	K9	λ/10@633.nm
	Ultraviolet quartz	λ/10@633.nm (standard), λ/10@633.nm (high precision)
	Sapphire	λ/10@633.nm (standard), λ/10@633.nm (high precision)
	Ge	λ/10@633.nm
	CaF_2	λ/8@633.nm
	ZnSe	λ/6@633.nm
Parallel error	K9	<30″
	Ultraviolet quartz	<30″
	Sapphire	<30″
	Ge	<30″
	CaF_2	<45″
	ZnSe	<45″
Thickness tolerance	K9/ultraviolet quartz	±0.01mm
	CaF_2	±0.03mm
Diameter tolerance	+0.0/-0.1mm, +0.0/-0.2mm (CaF_2)	
Surface finish	K9	40/20 ~ 60-40
	Ultraviolet quartz	40/20 ~ 60-40 (standard), 10/5 ~ 20/10 (high precision)
	Sapphire	80-50 (standard), 40-20 (high precision)
	Ge	40/20 ~ 60/40
	CaF_2	20/10 ~40/20
	ZnSe	20/10 ~40/20
Bevel	0.2 ~ 0.5mm x 45°	

* The dimensions and the coating are both customizable.

Dome windows

Dome windows are protective windows shaped in hemispherical shells. They are usually used for articles with large-angle incident beams, such as detectors and optical sensors.

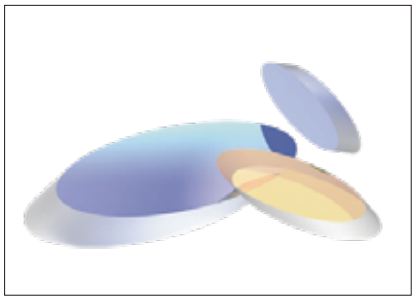


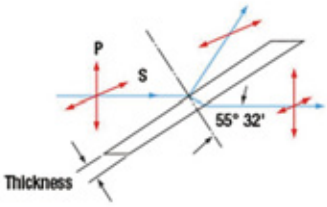
Material	K9/ultraviolet fused quartz
Surface flatness	Partial λ/4@633nm
Diameter error	+0.0/-0.2mm
Thickness tolerance	±0.02mm
Surface finish	60 ~ 40
Bevel	0.2 ~ 0.5 mm x 45°
Coating	As per customer's request

* The dimensions and the coating are both customizable.

Brewster windows

Brewster windows are uncoated substrates that can be connected in series as polaroids, or used for improving the degree of polarization of some polarized light. If a Brewster window is placed at the Brewster angle and a beam transmits through it, the P polarized component of the beam has no reflection loss and the S polarized component of the beam is partially reflective.



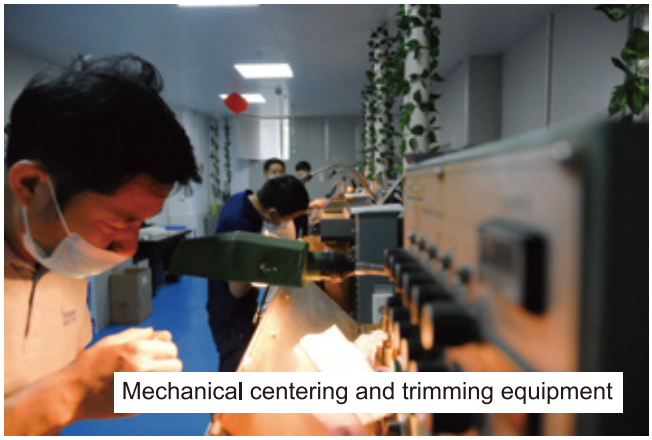


Material	Fused quartz
Transmitted wavefront distortion	λ/10@633nm
Parallel error	<5 Arc Seconds
Diameter tolerance	+0.0/-0.1mm
Thickness tolerance	±0.02mm
Surface finish	10/5 ~ 20/10
Bevel	0.2 ~ 0.5mm x 45 °
Brewster angle	55 °34′@633nm
Coating	As per customer's request

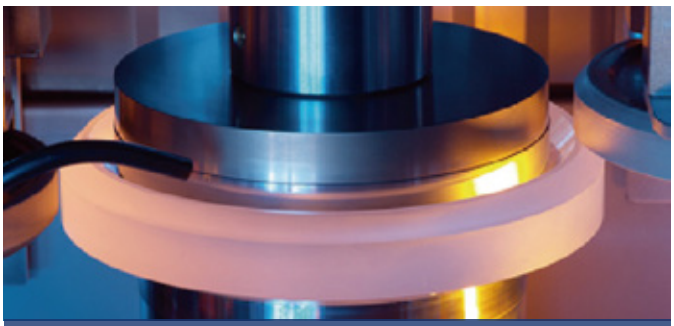
* The dimensions and the coating are both customizable.

High-precision polishing workshop

NTG IBF-300 polishing equipment imported from Germany

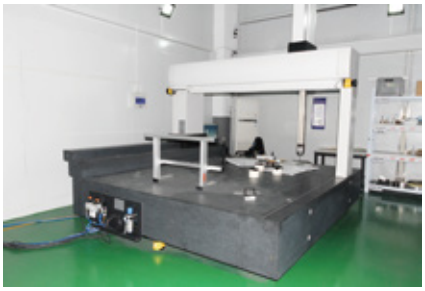


Mechanical centering and trimming equipment



Ion-beam polishing equipment imported from Germany

Ultra-clean coating line



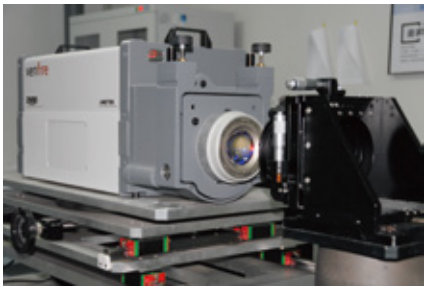
2m ZEISS PRISMO

9m precision vibration isolation optical platform

600 laser plane flat interferometer

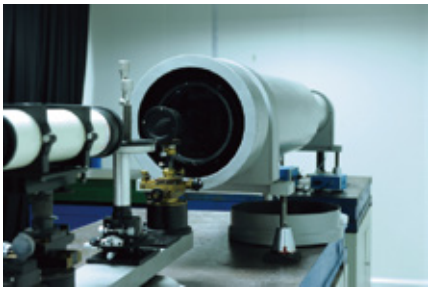
4D interferometer 6000

4D interferometer 4020



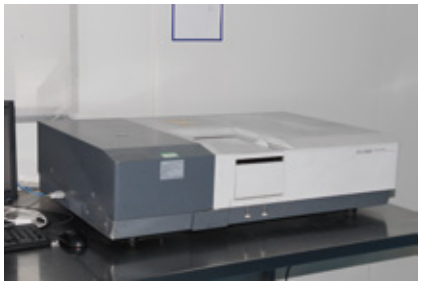
4″ZYGO digital wave flat interferometer

INTERFERO interferometer

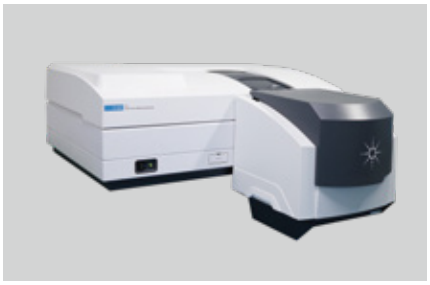


Collimator

TRIOPTICS super spherometer

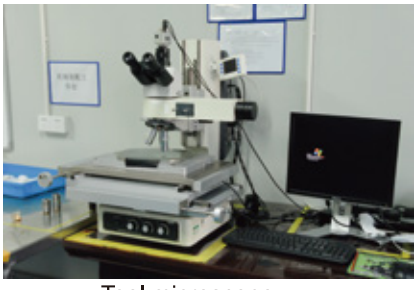


Shimadzu UV3600



Shimadzu UV3600

Profilometer LuphoScan420SD



Tool microscope

TRIOPTICS centering error gauge

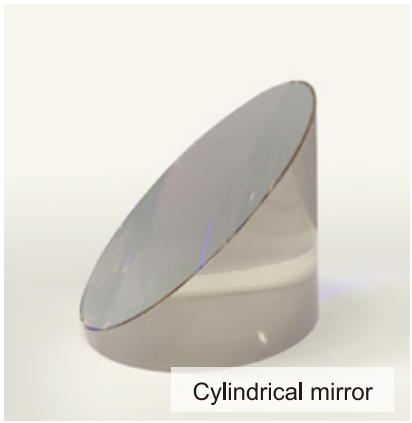

CaF$_2$ lens

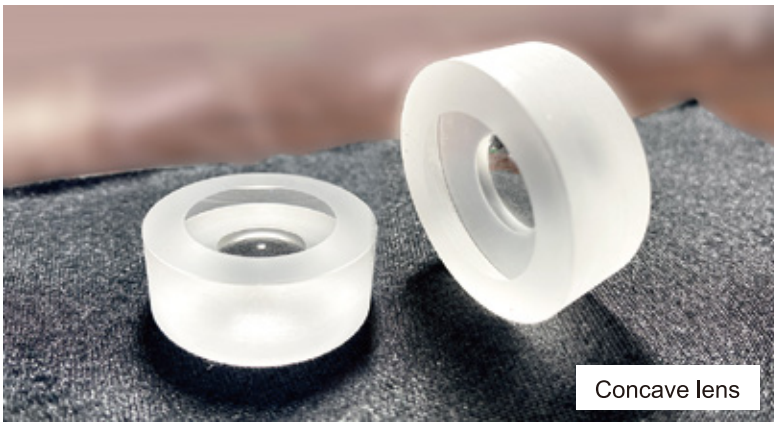

Edge-blackened lens

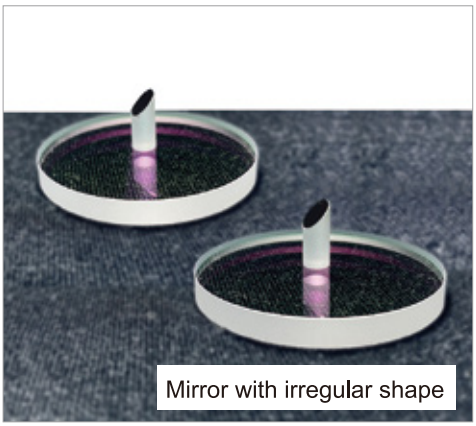

Prism


Cemented lens

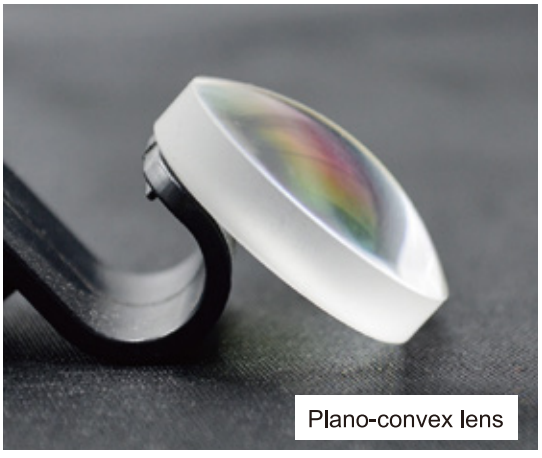

Convex lens

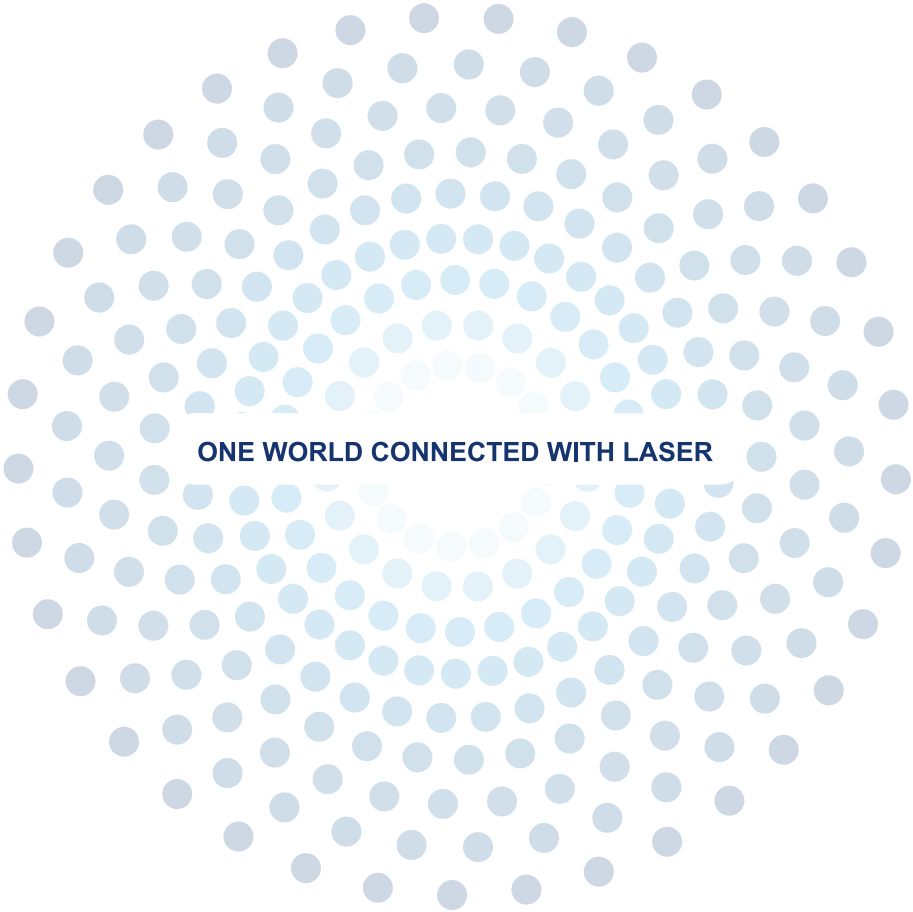

Cylindrical mirror


Concave lens


Mirror with irregular shape


Meniscus lens


Plano-convex lens



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