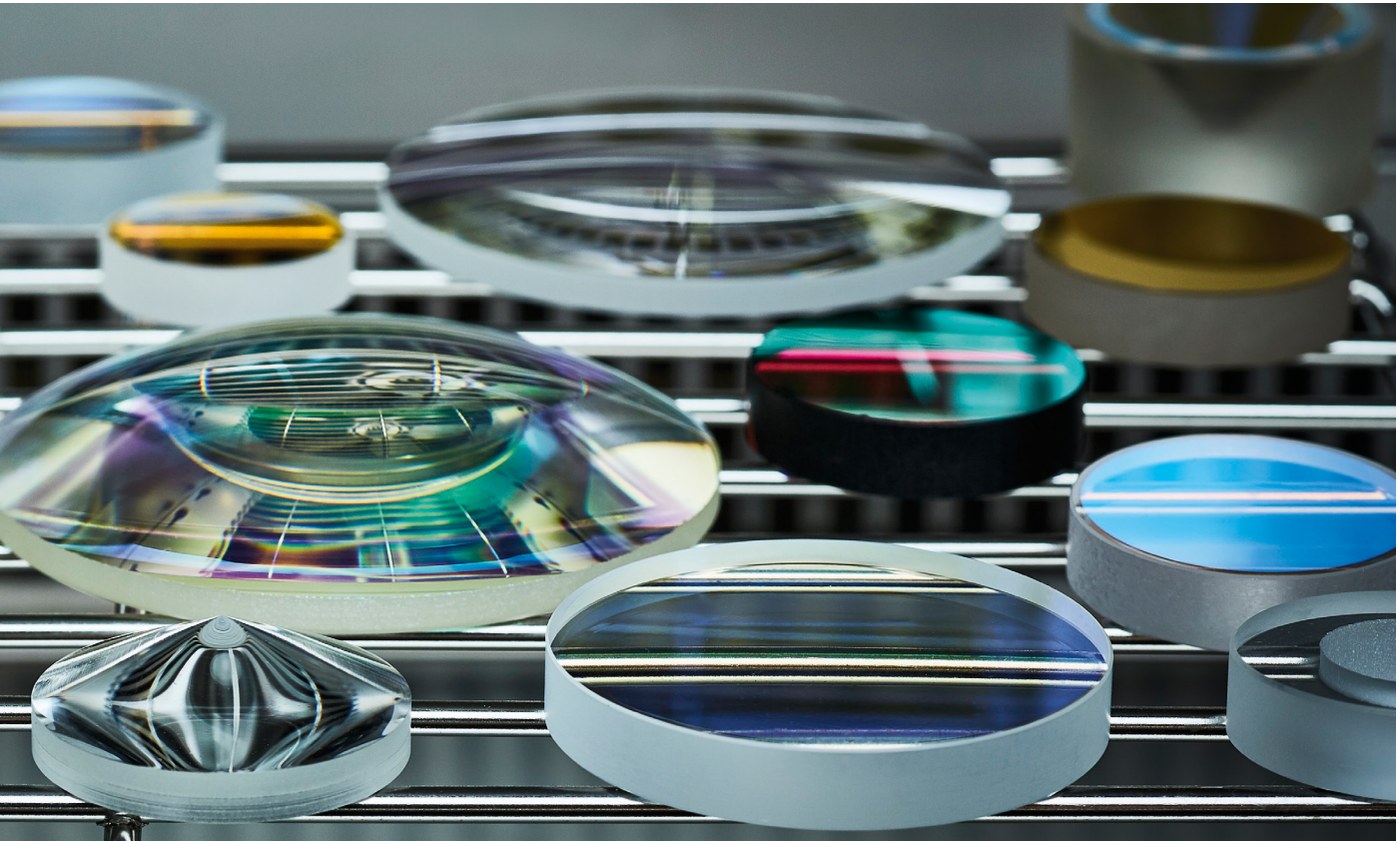
COMPONENTS FOR LASER BEAM DELIVERY



Altechna

A company you can rely on

Altechna is a Lithuania-based OEM manufacturer of high LIDT optical equipment – from optical coatings to motorized optomechanical assemblies. We have spent more than 20 years creating and developing complex technological solutions and custom designs for laser optics and related accessories.

Coating specialty is high laser damage threshold (e.g. >30 J/cm^2) and compatibility with femtosecond (e.g. <25 fs) regimes. To support industrial and scientific needs we developed motorized laser accessories, such as variable beam expanders and attenuators using our standardized components. Together with high precision characteristics, each product's quality is assured at our metrology laboratory. With innovative solutions, Altechna is a reliable supplier offering highest repeatability rates, continuous support and service meeting European standards.

Vision

We seek to become the go to source for custom made thin-film coatings, optical components and solutions for leading industrial and R&D institutions in selected photonics industries across the globe.

Mission

We adopt a fabless business strategy across global supply chain. We build and preserve key light technology knowledge and in-house expertise to serve our partner's needs best.

SPIE Corporate Member

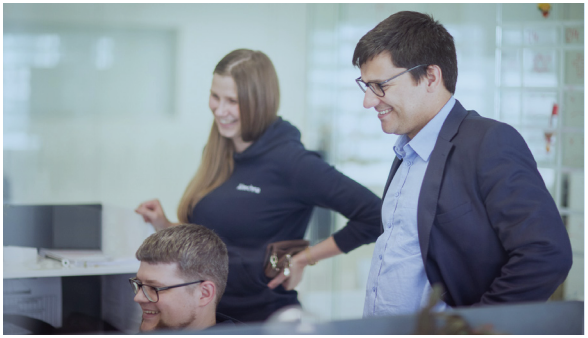
EPIC European Photonics Industry Consortium

OSA Corporate Associate Member

ISO 9001 BUREAU VERITAS Certification

RoHS Compliant

Why Altechna?

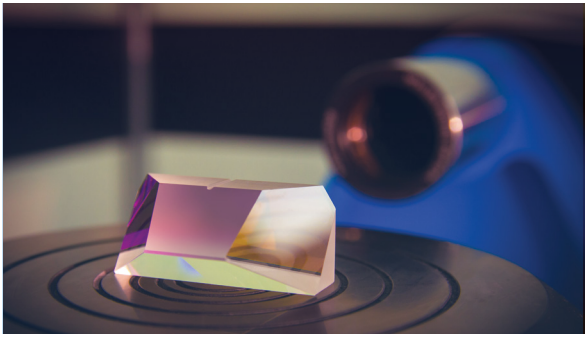


Professional Team

- Finest solutions to complex problems
- Technical consultations
- Fast reaction time
- High performance culture
- Validated supplier

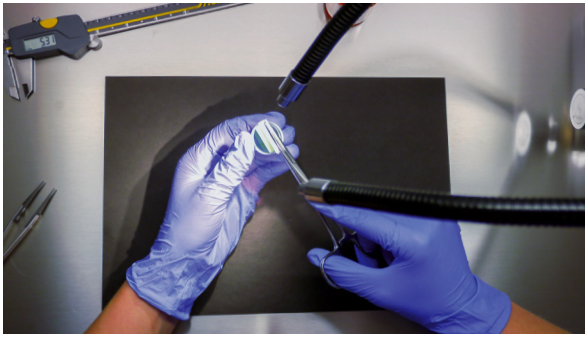
Technological Capabilities

- In-house coating technologies
- Optomechanical engineering
- Custom optical designs
- Customer-defined optomechanical assemblies



Custom Laser Optics Solutions

- Laser optics
- Polarization optics
- Laser crystals
- Laser accessories



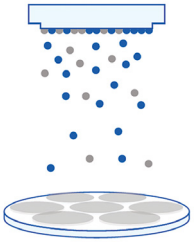
Quality Assurance

- LEAN manufacturing
- Copy-exactly!
- On time delivery
- Metrology laboratory

Technological Capabilities

Coating Technologies

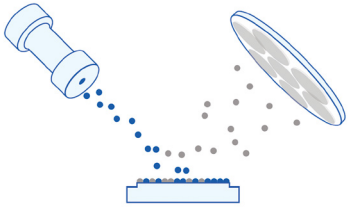
MAGNETRON SPUTTERING



Key features

- The best solution for mass production (~500 pcs of 1“ substrates)
- Plasma etching for higher LIDT
- Very low scattering and absorption losses
- Excellent solution for custom shape and size substrates
- Exceptional LIDT
- High contrast polarization coatings

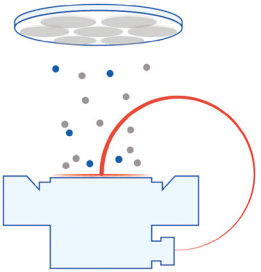
ION BEAM SPUTTERING



Key features

- Complex & long lifetime coatings
- Low absorption coatings
- Very high spectral coating accuracy
- Stress-controlled by complementary processes
- Excellent stability and performance in harsh environments

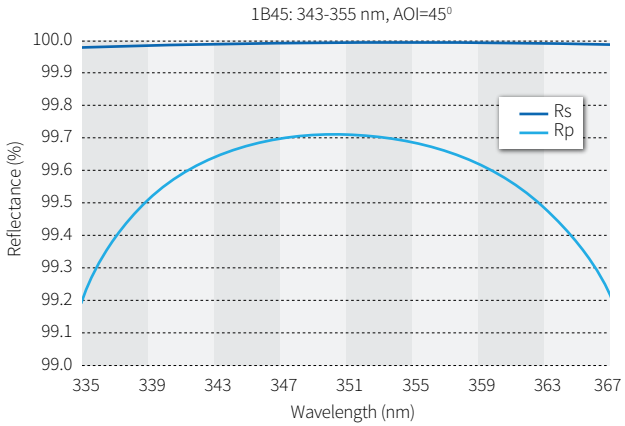
ELECTRON BEAM EVAPORATION + IAD



Key features

- Custom coatings design
- Low stress coatings
- Wide spectral range - from UV to IR
- High deposition rates
- Best cost - performance ratio

HR Laser Line Mirrors

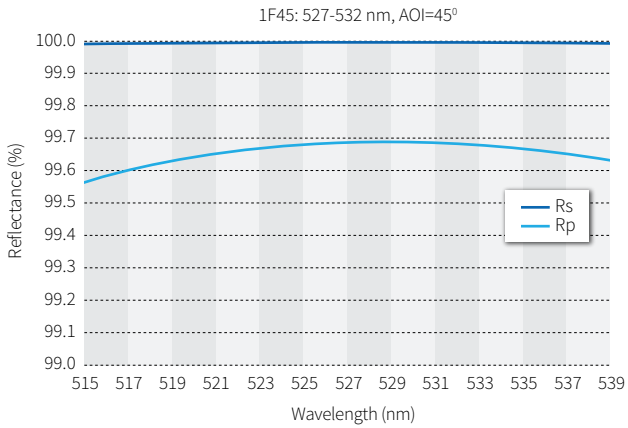


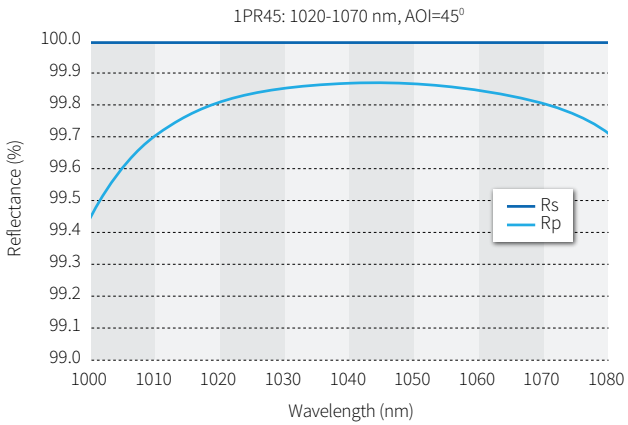
Description

Dielectric HR Laser Line Mirrors provide higher reflectivity values than metallic mirrors, making them a perfect choice for high-performance laser systems. HR mirrors can be optimized for certain wavelength, angle of incidence and polarization. We design mirrors in-house to meet your desired specifications and provide high-performance optics. Every coating batch is tested to confirm reflectivity values. Mirrors can also be optimized for high LIDT and LIDT measurements can be conducted upon request.

Features

- HR laser line coatings (HR) highly reflect at wavelength range of <10% of the central wavelength (CWL)
- Custom coatings are available for any wavelength in the range 0.19 - 5 µm
- Surface flatness, P-V: <λ/8 @ 632.8 nm
- Laser damage threshold up to 35.2 J/cm^2 @ 532 nm, 6.2 ns, 50 Hz



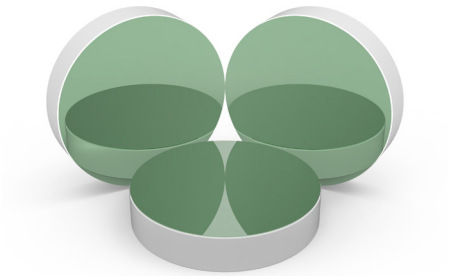


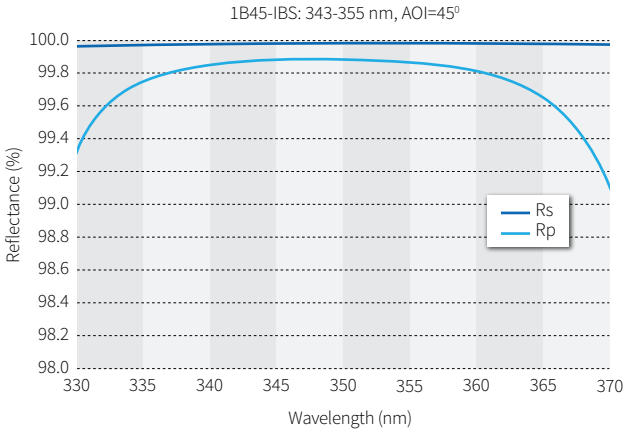
Typical Items*

Wavelength, nm	Reflectance s/p,%**	Substrate material	Product ID for AOI=45°, Ø25.4 mm
250-266	>99.0/>98.0	UVFS	1-OS-2-0254-5-[2AA45]
343-355	>99.5/>99.0	UVFS	1-OS-2-0254-5-[1B45]
380-420	>99.5/>99.0	UVFS	1-OS-2-0254-5-[1C45-GDD]
515	>99.5/>99.0	UVFS	1-OS-2-0254-5-[1E45]
527-532	>99.8/>99.3	BK7	1-OS-1-0254-6-[1F45]
760-840	>99.5/>99.0	UVFS	1-OS-2-0254-5-[1K45-GDD]
1030	>99.5/>99.0	UVFS	1-OS-2-0254-5-[1P45]
1020-1070	>99.8/>99.6	UVFS	1-OS-2-0254-5-[1PR45]
1047-1064	>99.5/>99.0	BK7	1-OS-1-0254-6-[1R45]
	Reflectance, %		**Product ID for AOI=0°, Ø25.4 mm**
343-355	>99.5	UVFS	1-OS-2-0254-5-[1B00]
760-840	>99.5	UVFS	1-OS-2-0254-5-[1K00-GDD]
1000-1060	>99.5	UVFS	1-OS-2-0254-5-[1P00]
1047-1064	>99.5	BK7	1-OS-1-0254-6-[1R00]

* Customized HR Laser Line Mirrors are available on request.
** “p” stands for value of reflected p polarization at 45°, “s” stands for value of reflected s polarization beam at 45°.

Low Loss HR Mirrors



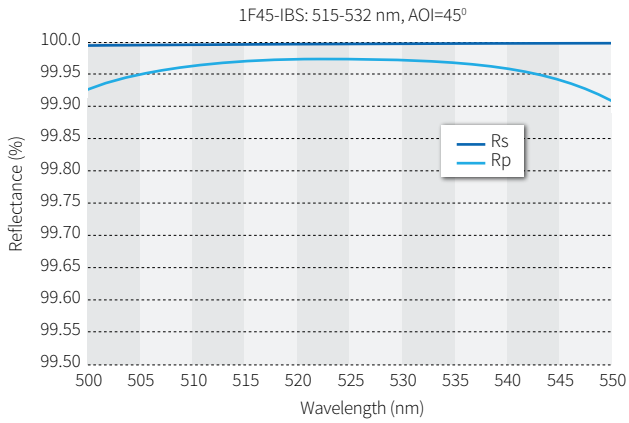


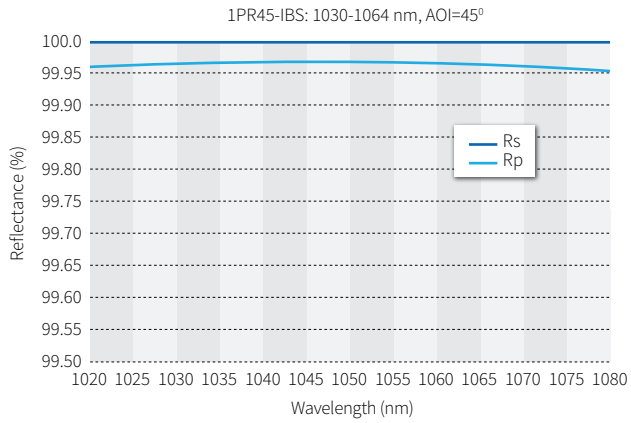
Description

Low Loss HR mirrors are essential in laser systems where the lowest possible losses are required. Mirrors are manufactured with advanced sputtering technology reach extremely high-quality specifications. Such thin films feature higher density and durability than e-beam coatings, making them resistant to environmental conditions such as heat, humidity and pressure. Mirrors reach highest reflectance (>99.9%) in a certain wavelength range and angles of incidence (AOI). Furthermore, scattering is minimized which is usually a limiting factor for high reflectivity.

Features

- Resistant to environmental conditions
- Wide-angle (AOI: 0-50°) mirrors are available
- Mass production capabilities: >500 pcs of Ø25.4 mm substrates per single batch
- Reflectance higher than 99.9%
- Typical surface flatness, P-V: <λ/8 @ 632.8 nm
- Laser damage threshold up to 17 J/cm^2 @ 1064 nm, 10 ns, 10 Hz



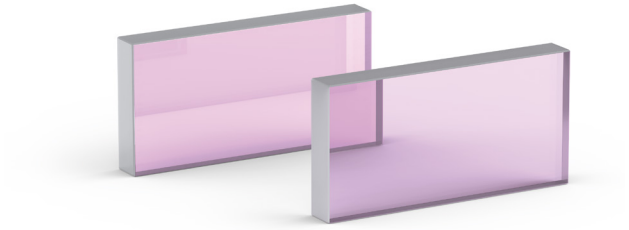


Typical Items*

Wavelength, nm	**Reflectance, %**	**Substrate material**	**Dimensions, mm**	**Product ID for AOI=0°**
515-532	>99.94	UVFS	Ø25.4x5	1-OS-2-0254-5-[1F00-IBS]
1030-1064	>99.95	UVFS	Ø25.4x5	1-OS-2-0254-5-[1PR00-IBS]
	Reflectance s/p, %			**Product ID for AOI=45°**
343-355	>99.9/>99.7	UVFS	Ø25.4x5	1-OS-2-0254-5-[1B45-IBS]
515-532	>99.97/>99.93	UVFS	Ø25.4x5	1-OS-2-0254-5-[1F45-IBS]
800	>99.97/>99.93	UVFS	Ø25.4x5	1-OS-2-0254-5-[1K45-IBS]
1030-1064	>99.97/>99.93	UVFS	Ø25.4x5	1-OS-2-0254-5-[1PR45-IBS]
1030-1064	>99.98/>99.93	UVFS	Ø30x5	1-OS-2-0300-5-[1PR45-IBS]
1550	>99.98/>99.93	BK7	Ø25.4x6	1-OS-1-0254-6-[1V45-IBS]
				Product ID for AOI=0°-45°
355	>99.9/>99.6	UVFS	Ø12.7x6	1-OS-2-0127-6-[1B45-IBS]-0-45
1027-1033	>99.9/>99.8	UVFS	Ø25.4x6	1-OS-2-0254-6-[1P45-IBS]-0-45

* Customized Low Loss HR Mirrors are available on request.
** “p” stands for value of reflected p polarization at 45°, “s” stands for value of reflected s polarization beam at 45°.

High Contrast Thin Film Polarizers



Description

High Contrast Thin Film Polarizers (TFP) are made using advanced Ion Beam Sputtering (IBS) coating technology. These thin film polarizers separate s- and p-polarization components of high energy laser beams. Due to very low losses they are perfect for intra and extra cavity usage. Because of their high damage threshold and extinction ratio (>1000:1), thin film polarizers are a good replacement for Glan laser polarizing prisms or polarizing cube beam splitters. For optimal performance, polarizers should be mounted in an appropriate holder allowing angular adjustment. We offer two types of high contrast polarizers: with higher LIDT or higher contrast values.

Features

- High Tp, low absorption & scattering
- No aging effects due to negligible porosity of the coatings
- Transmitted wavefront distortion (TWD), P-V: <λ/10 @ 632.8 nm
- Laser damage threshold up to 20 J/cm² @ 532 nm, 10 ns, 10 Hz (s-pol)

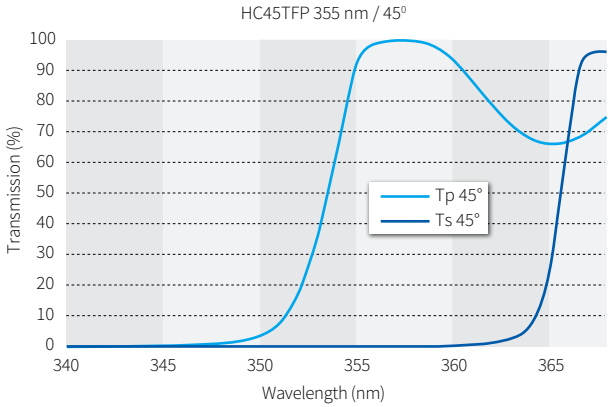
Typical Items*

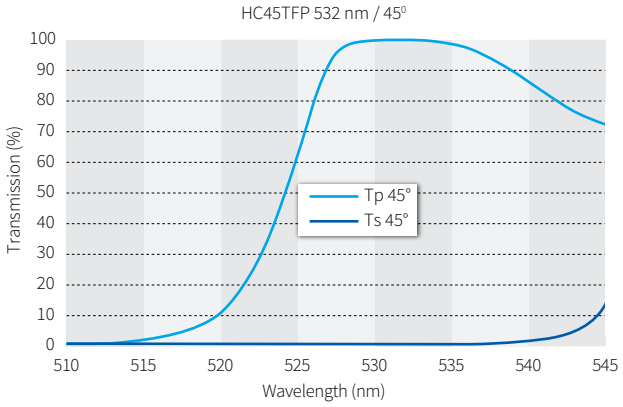
Wavelength, nm	Transmission, p-pol, %	Reflection, s-pol, %	Contrast, (Tp/Ts)	Typical LIDT @ 10 ns, 10 Hz for s-pol, J/cm²	Typical LIDT @ 10 ns, 10 Hz for p-pol, J/cm²	Product ID for AOI=Brewster
343	>97	>99.7	>300:1	>4	>1	2-HCBTFP-0343-0254
355	>97	>99.7	>300:1	>4	>1	2-HCBTFP-0355-0254
515	>99	>99.9	>1000:1	>5	>2	2-HCBTFP-0515-0254
532	>98	>99.8	>500:1	>7	>3	2-HCPBTFP-0532-0254
532	>99	>99.9	>1000:1	>5	>2	2-HCBTFP-0532-0254
800	>99	>99.9	>1000:1	>7	>3	2-HCBTFP-0800-0254
1030	>99	>99.8	>500:1	>20	>10	2-HCPBTFP-1030-1020
1030	>99	>99.9	>1000:1	>7	>3	2-HCBTFP-1030-0254
1064	>99	>99.8	>500:1	>20	>10	2-HCPBTFP-1064-1020
1064	>99	>99.9	>1000:1	>7	>3	2-HCBTFP-1064-0254

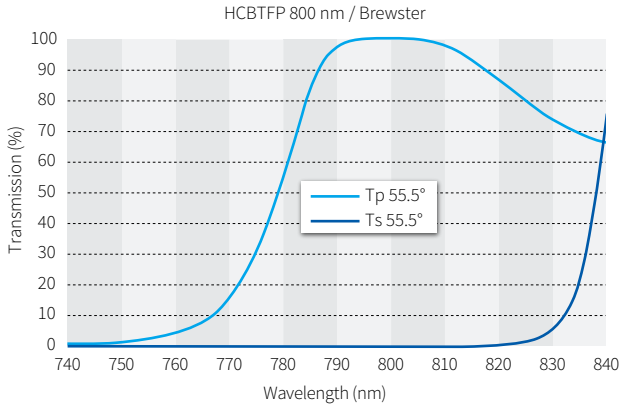
Typical Items*

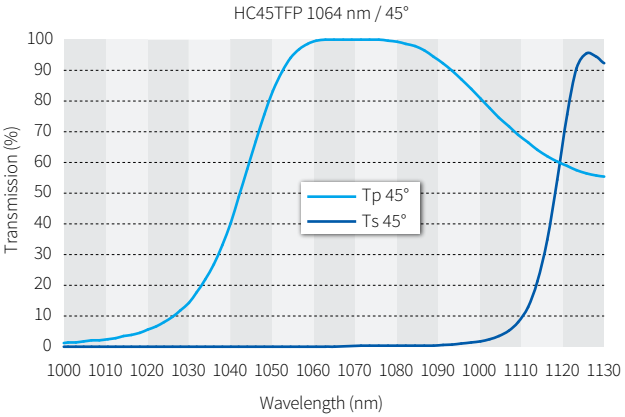
Wavelength, nm	Transmission, p-pol, %	Reflection, s-pol, %	Contrast, (Tp/Ts)	Typical LIDT @ 10 ns, 10 Hz for s-pol, J/cm²	Typical LIDT @ 10 ns, 10 Hz for p-pol, J/cm²	Product ID for AOI=45°
355	>95	>99.8	>500:1	>4	>1	2-HC45TFP-0355-0254
532	>98	>99.8	>500:1	>7	>3	2-HCP45TFP-0532-0254
532	>97	>99.9	>1000:1	>5	>2	2-HC45TFP-0532-0254
1030	>97	>99.8	>500:1	>20	>10	2-HCP45TFP-1030-0254
1030	>97	>99.8	>1000:1	>7	>3	2-HC45TFP-1030-0254
1064	>97	>99.8	>500:1	>20	>10	2-HCP45TFP-1064-0254
1064	>97	>99.9	>1000:1	>7	>3	2-HC45TFP-1064-0254

* Customized solutions are available on request. Typical dimensions are Ø25.4 x 5 mm, 20 x 40 x 5 mm and 10 x 20 x 5 mm.

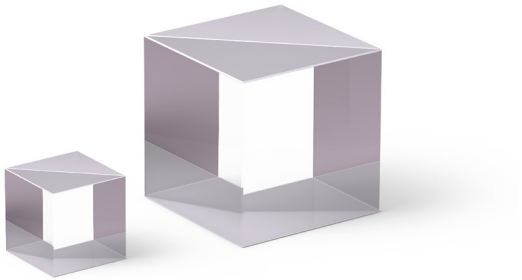








Polarizing Cubes for High Energy Applications



Description

Polarizing beamsplitter cubes offer several advantages over plate beamsplitters. They are easy to handle, high contrast and high extinction ratio polarizers that split a randomly polarized beam into two orthogonal linearly polarized components. These products are typically used in laser-beam separation, combination and optical-isolation applications. The epoxy-free construction of the cubes enables a superior performance at high energy levels.

Features

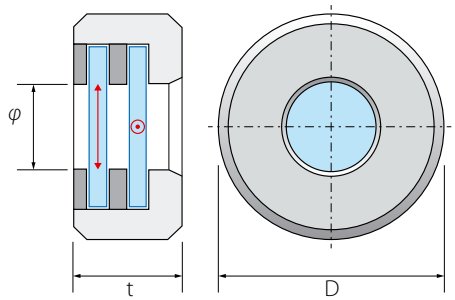
- Easy, deformation-free mounting
- High extinction ratio in transmission: Tp/Ts >1000:1
- Low reflected and transmitted wavefront distortion, P-V: <λ/10 @ 632.8 nm
- No ghost reflections
- Minimal beam displacement
- Negligible absorption of reflected and transmitted beams
- High transmission of p-polarization: Tp > 97%
- No material fluorescence in UV region
- Laser damage threshold up to 20 J/cm^2 @ 1064 nm, 10 ns, 100 Hz

Typical Items*

Wavelength, nm	Dimensions, mm	Reflection s-pol, %	Transmission p-pol, %	Product ID
345-365 (centered @ 355)	12.7x12.7x12.7	>99.5	>96	2-HPCB-A-0125
	25.4x25.4x25.4	>99.5	>96	2-HPCB-A-0254
510-550 (centered @ 532)	12.7x12.7x12.7	>99.5	>97	2-HPCB-B-0125
	25.4x25.4x25.4	>99.5	>97	2-HPCB-B-0254
1020-1090 (centered @ 1064)	12.7x12.7x12.7	>99.5	>97	2-HPCB-C-0125
	25.4x25.4x25.4	>99.5	>97	2-HPCB-C-0254
1510-1580 (centered @ 1550)	12.7x12.7x12.7	>99.5	>97	2-HPCB-D-0125

* Customized solutions are available on request.

Crystalline Quartz Waveplates



Features

- High extinction ratio
- Wide wavelength range
- Low transmitted wavefront distortion
- High LIDT

Description

Crystalline quartz waveplates are made from materials that have a birefringence property. Most common types are designed so that an ordinary ray will exhibit a half (λ/2) or quarter (λ/4) wave retardation with respect to an extraordinary ray. Such waveplates are used to rotate the plane of polarization, converting a linear polarization to a circular one and vice versa. Such elements are used for electro-optic modulations and as a variable ratio beamsplitter when used in conjunction with a polarization cube. Although the latter two types of waveplates are the most common, Altechna also offers custom retardation values on request.

One of the most common arrangements of the waveplates is the zero order (ZO) air-spaced version. These waveplates are built of two crystalline quartz plates with specific thicknesses and crossed axes, which results in a zero order performance. This arrangement allows us to reach a better performance for a wider wavelength range and is less sensitive to temperature changes when compared with low order (LO) waveplates. High purity crystalline quartz materials and precise parallelism between the two air-spaced plates allows the transmitted wavefront distortion to be better than λ/10 at 632.8 nm.

Typical Items Ø12.7 x 6 mm

ZO Crystalline Quartz Waveplates (air-spaced)		
Wavelength, nm	**Product ID**	
	λ/2 retardation, clear aperture >8 mm	**λ/4 retardation, clear aperture >8 mm**
343	2-CPW-ZO-L2-0343-S	2-CPW-ZO-L4-0343-S
355	2-CPW-ZO-L2-0355-S	2-CPW-ZO-L4-0355-S
400	2-CPW-ZO-L2-0400-S	2-CPW-ZO-L4-0400-S
515	2-CPW-ZO-L2-0515-S	2-CPW-ZO-L4-0515-S
532	2-CPW-ZO-L2-0532-S	2-CPW-ZO-L4-0532-S
800	2-CPW-ZO-L2-0800-S	2-CPW-ZO-L4-0800-S
1030	2-CPW-ZO-L2-1030-S	2-CPW-ZO-L4-1030-S
1064	2-CPW-ZO-L2-1064-S	2-CPW-ZO-L4-1064-S

Typical Items Ø25.4 x 6 mm

ZO Crystalline Quartz Waveplates (air-spaced)		
Wavelength, nm	**Product ID**	
	λ/2 retardation, clear aperture >18 mm	**λ/4 retardation, clear aperture >18 mm**
266	2-CPW-ZO-L2-0266	2-CPW-ZO-L4-0266
343	2-CPW-ZO-L2-0343	2-CPW-ZO-L4-0343
355	2-CPW-ZO-L2-0355	2-CPW-ZO-L4-0355
400	2-CPW-ZO-L2-0400	2-CPW-ZO-L4-0400
515	2-CPW-ZO-L2-0515	2-CPW-ZO-L4-0515
532	2-CPW-ZO-L2-0532	2-CPW-ZO-L4-0532
633	2-CPW-ZO-L2-0633	2-CPW-ZO-L4-0633
780	2-CPW-ZO-L2-0780	2-CPW-ZO-L4-0780
800	2-CPW-ZO-L2-0800	2-CPW-ZO-L4-0800
852	2-CPW-ZO-L2-0852	2-CPW-ZO-L4-0852
1030	2-CPW-ZO-L2-1030	2-CPW-ZO-L4-1030
1064	2-CPW-ZO-L2-1064	2-CPW-ZO-L4-1064
1550	2-CPW-ZO-L2-1550	2-CPW-ZO-L4-1550

* Customized solutions are available on request.

High Energy Waveplates

Description

Altechna provides standard (air-spaced) and high power (optically bonded) waveplates. They are made from materials that has a birefringence property. Most common types are designed so ordinary ray would exhibit half (λ/2) or quarter (λ/4) wave retardation with respect to an extraordinary one. Such waveplates are used to rotate the plane of polarization, convert linear polarization to circular and vice versa. Such elements are used for electro-optic modulation and as a variable ratio beamsplitter, when used in conjunction with a polarization cube. Although latter two types of waveplates are the most common, Altechna offers custom retardation values on request.

Features

- High extinction ratio
- Wide acceptance angle
- Wide temperature bandwidth
- Exceptional durability in UV applications
- Wide wavelength range available

Typical Items*

Wavelength, nm	Product ID		
	Mount size Ø12.7 x 6 mm	**Mount size Ø25.4 x 6 mm**	**Mount size Ø25.4 x 6 mm**
	λ/2 retardation, clear aperture >8 mm	**λ/2 retardation, clear aperture >18 mm**	**λ/4 retardation, clear aperture >18 mm**
266		2-CPW-TSO-L2-0266	2-CPW-T4O-L4-0266-W
343	2-CPW-TFO-L2-0343-S	2-CPW-TFO-L2-0343-W	2-CPW-TTO-L4-0343-W
355	2-CPW-TFO-L2-0355-S	2-CPW-TFO-L2-0355-W	2-CPW-TSO-L4-0355-W
400	2-CPW-TFO-L2-0400-S	2-CPW-TFO-L2-0400	2-CPW-TSO-L4-0400
515	2-CPW-TZO-L2-0515-S	2-CPW-TFO-L2-0515	2-CPW-TSO-L4-0515
532	2-CPW-TZO-L2-0532-S	2-CPW-TFO-L2-0532	2-CPW-TFO-L4-0532
780			2-CPW-TFO-L4-0780
800	2-CPW-TZO-L2-0800-S	2-CPW-TZO-L2-0800	2-CPW-TFO-L4-0800
1030	2-CPW-TZO-L2-1030-S	2-CPW-TZO-L2-1030	2-CPW-TFO-L4-1030
1064	2-CPW-TZO-L2-1064-S	2-CPW-TZO-L2-1064	2-CPW-TFO-L4-1064
1550	2-CPW-TZO-L2-1550-S	2-CPW-TZO-L2-1550	2-CPW-TZO-L4-1550

* Customized solutions are available on request.

PowerXP Motorized Attenuators

Description

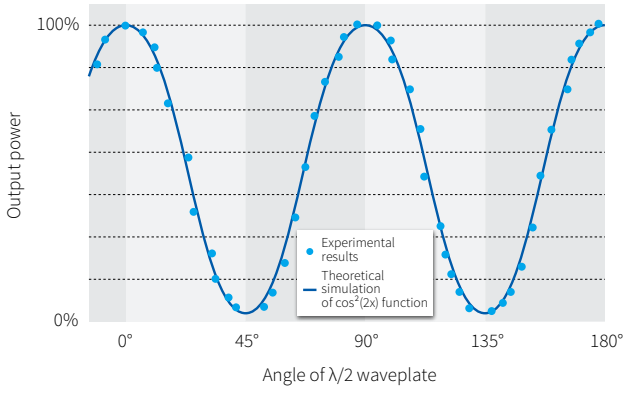
Altechna offers three types of laser beam intensity attenuators for high energy applications - Compact (CA 8 mm), Maxi (CA 18 mm) and Maxi Cube (CA 18 mm) versions. PowerXP attenuators are evolution of well known time-tested and industry-adopted Altechna Watt Pilot attenuators – new generation PXP units have upgraded belt-driven rotator mechanism for quick and precise laser beam intensity control and also brand new electronics and control driver for more connectivity options and reliable long distance communication.

PowerXP motorized attenuators are reliable solution for industrial applications. Each attenuator includes motorized rotating quartz λ/2 phase waveplate, optically aligned to a single/dual thin film polarizers or polarizing beamsplitting cube which separates the input beam into individual s-polarized and p-polarized parallel or perpendicular output beams. The intensity ratio of separated beams is continuously tuned by rotating the waveplate. S-polarized beam output can be used for high purity s-polarized beam requiring applications and P-polarized beam output for power control and attenuation applications. High energy applications compatible optics, fast rotation speed of PowerXP Maxi and Cube versions and small footprint of Compact version makes PowerXP motorized attenuators a go-to solution for power control, attenuation and beam-splitting in demanding laser processing applications.

Features

- User-friendly software interface, USB, RS232, Ethernet connection
- Divides laser beam into two s-pol and p-pol beams of adjustable intensity ratio
- Low dispersion for ultrashort and high energy laser pulses
- Ideal for integration in other systems
- Time between min and max attenuation less than 0.2 sec

Example of performance provided by attenuator comprising a waveplate and a polarizer.

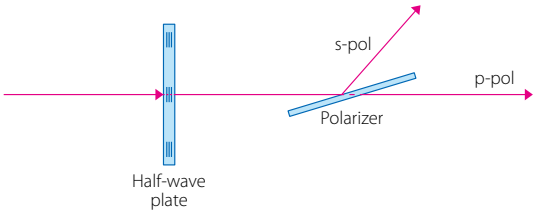


Compact version

Standard specifications

Clear aperture	Ø8 mm
Recommended maximum input beam diameter at $1/e^2$	Ø5 mm
Bandwidth	±5 nm, up to ±10 on request
Optimization	Transmission type
Configuration	λ/2 Optically bonded waveplate + IBS technology High Contrast Thin Film polarizer
Attenuation range @ CWL	From <0.1% to >99%
Typical applications	High power pulsed and CW lasers
Damage threshold	Up to >20 J/cm^2 @ 1064 nm, 10 ns, 10 Hz
Dimensions H x L x W	35 x 55 x 60 mm
Time between min and max attenuation	<0.2 sec
Steps between min and max attenuation	14400
Resolution	<11.25 arcsec/step
Maximum power transmission	T_{max} >99% at p-pol output
Maximum power blocking	T_{min} <0.1% at p-pol output
*Optional attenuation range	T_{max} >99.7%, T_{min}<4% at s-pol beam dump output

Transmission Type



Typical Items

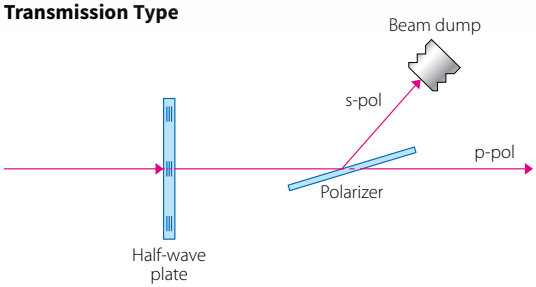
Wavelength, nm	Bandwidth, nm	Configuration	Optimization	Attenuation range at p-pol output (T_{min}-T_{max}) @ CWL	Product ID
343	±5	λ/2 Optically bonded waveplate + High Contrast TFP	Transmission	0.3-96%	PXP-08-0343
355	±5	λ/2 Optically bonded waveplate + High Contrast TFP	Transmission	0.3-96%	PXP-08-0355
515	±5	λ/2 Optically bonded waveplate + High Contrast TFP	Transmission	0.1-99%	PXP-08-0515
532	±5	λ/2 Optically bonded waveplate + High Contrast TFP	Transmission	0.1-99%	PXP-08-0532
1030	±5	λ/2 Optically bonded waveplate + High Contrast TFP	Transmission	0.1-99%	PXP-08-1030
1064	±5	λ/2 Optically bonded waveplate + High Contrast TFP	Transmission	0.1-99%	PXP-08-1064

Maxi Transmission version

Standard specifications

Clear aperture	Ø18 mm
Recommended maximum input beam diameter at $1/e^2$	Ø12 mm
Bandwidth	±5 nm, up to ±10 on request
Optimization	Transmission (T) model
Configuration	λ/2 Air-spaced or Optically Bonded waveplate + Thin Film polarizer
Attenuation range @ CWL	From <0.5% to >95%
Typical applications	High power pulsed and CW lasers
Damage threshold	Up to >10 J/cm² @ 1064 nm, 10 ns, 10 Hz
Dimensions H x L x W	56 x 99 x 90 mm
Time between min and max attenuation	<0.2 sec
Steps between min and max attenuation	24000
Resolution	<7 arcsec/step
Maximum power transmission	T_{max} >95% at p-pol output
Maximum power blocking	T_{min} <0.5% at p-pol output
*Optional attenuation range	T_{max} >99.5%, T_{min}<5% at s-pol beam dump output

Transmission Type



Typical Items

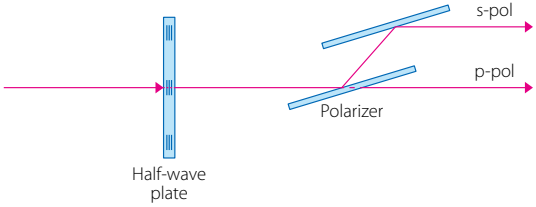
Wavelength, nm	Bandwidth, nm	Configuration	Optimization	Attenuation range at p-pol output (T_{min}-T_{max}) @ CWL	Product ID
266	±5	λ/2 Optically bonded waveplate + TFP	Transmission	0.5-95%	PXP-18-T-0266
343	±5	λ/2 Optically bonded waveplate + TFP	Transmission	0.5-95%	PXP-18-T-0343
355	±5	λ/2 Optically bonded waveplate + TFP	Transmission	0.5-95%	PXP-18-T-0355
515	±5	λ/2 Air-spaced waveplate + TFP	Transmission	0.5-95%	PXP-18-T-0515
532	±5	λ/2 Air-spaced waveplate + TFP	Transmission	0.5-95%	PXP-18-T-0532
1030	±10	λ/2 Air-spaced waveplate + TFP	Broadband Transmission	0.5-95%	PXP-18-T-1030
1064	±5	λ/2 Air-spaced waveplate + TFP	Transmission	0.5-95%	PXP-18-T-1064

Maxi Reflection version

Standard specifications

Clear aperture	Ø18 mm
Recommended maximum input beam diameter at $1/e^2$	Ø12 mm
Bandwidth	±5 nm, up to ±10 on request
Optimization	Reflection (R) model
Configuration	λ/2 Air-spaced or Optically Bonded waveplate + 2x Thin Film polarizers
Attenuation range @ CWL	From <0.3% to >99%
Typical applications	High power pulsed and CW lasers
Damage threshold	Up to >10 J/cm^2 @ 1064 nm, 10 ns, 10 Hz
Dimensions H x L x W	56 x 99 x 90 mm
Time between min and max attenuation	<0.2 sec
Steps between min and max attenuation	24000
Resolution	<7 arcsec/step
Maximum power transmission	T_{max} >99% at s-pol output
Maximum power blocking	T_{min} <0.3% at s-pol output
*Optional attenuation range	T_{max} >95%, T_{min}<0.5% at p-pol output

Reflection Type



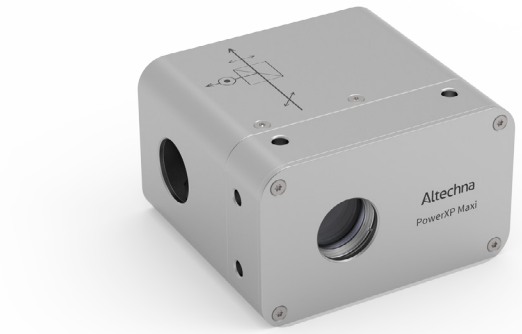
Typical Items

Wavelength, nm	Bandwidth, nm	Configuration	Optimization	Attenuation range at s-pol output (T_{min}-T_{max}) @ CWL	Product ID
266	±5	λ/2 Optically bonded waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-0266
343	±5	λ/2 Optically bonded waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-0343
355	±5	λ/2 Optically bonded waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-0355
515	±5	λ/2 Air-spaced waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-0515
532	±5	λ/2 Air-spaced waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-0532
1030	±10	λ/2 Air-spaced waveplate + 2x TFP	Broadband reflection	0.3-99%	PXP-18-R-1030
1064	±5	λ/2 Air-spaced waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-1064

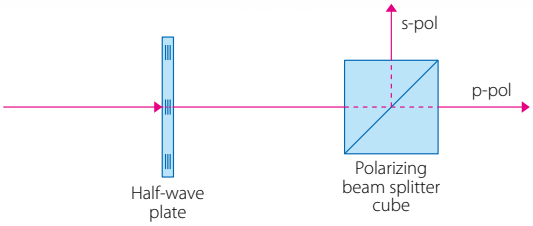
Maxi Cube version

Standard specifications

Clear aperture	Ø18 mm
Recommended maximum input beam diameter at $1/e^2$	Ø12 mm
Bandwidth	±5 nm, up to ±10 on request
Optimization	Transmission and Reflection
Configuration	λ/2 Air-spaced or Optically Bonded waveplate + Optically bonded PBS cube
Attenuation range @ CWL	From <0.3% to 97% in transmission mode
	From <3% to 99% in reflection mode
Typical applications	High power pulsed and CW lasers
Damage threshold	Up to >10 J/cm^2 @ 1064 nm, 10 ns, 10 Hz
Dimensions H x L x W	56 x 82 x 90 mm
Time between min and max attenuation	<0.2 sec
Steps between min and max attenuation	24000
Resolution	<7 arcsec/step
Transmission mode:	
Maximum power transmission	T_{max} >97% at p-pol output
Maximum power blocking	T_{min}<0.3% at p-pol output
Reflection mode:	
Maximum power transmission	T_{max} >99% at s-pol output
Maximum power blocking	T_{min}<3% at s-pol output



Cube Type



Typical Items

Wavelength, nm	Bandwidth, nm	Configuration	Attenuation range at p-pol output (T_{min}-T_{max}) @ CWL	Attenuation range at s-pol output (T_{min}-T_{max}) @ CWL	Product ID
355	±5	λ/2 Optically bonded waveplate + Optically bonded PBS cube	0.3-96%	4-99%	PXP-18-C-0355
515	±5	λ/2 Air-spaced waveplate + Optically bonded PBS cube	0.3-97%	3-99%	PXP-18-C-0515
532	±5	λ/2 Air-spaced waveplate + Optically bonded PBS cube	0.3-97%	3-99%	PXP-18-C-0532
1030	±5	λ/2 Air-spaced waveplate + Optically bonded PBS cube	0.3-97%	3-99%	PXP-18-C-1030
1064	±5	λ/2 Air-spaced waveplate + Optically bonded PBS cube	0.3-97%	3-99%	PXP-18-C-1064

Fixed Ratio Beam Expanders

Description

Altechna's beam expanders are assembled using one diverging and one converging lenses. As there is no focal point inside of the beam expander, it can be used with high power laser sources. Special treatment of lenses and mechanics is performed for UV application to improve lifetime and LIDT of the expander. Standard magnifications are from 1.1x to 10x. Beam expanders for any wavelengths between 266 - 3000 nm are available upon request.

Features

- Custom magnification and design on request
- Extended lifetime and LIDT for UV applications
- Individual reports of beam ellipticity, M^2 and pointing stability parameters
- Custom wavelengths are available in the range of 250-3000 nm

Standard specifications

Lens material	UVFS
Transmitted wavefront distortion	λ/4 p-v @ 632 nm
Overall transmission	99%
LIDT	>10 J/cm^2 @ 1064 nm, 10 ns, 10 Hz
Housing material	Black anodized aluminium
Mounting thread	SM1

Typical Items

Wavelength, nm	Expansion	Input aperture*, mm	Exit aperture*, mm	Housing dimensions, mm	Product ID
343-355	1.2X	10	12	Ø30 x 56.6	FBE-1.2x-0343-0355
	1.5X	8.5	12.75	Ø30 x 55.7	FBE-1.5x-0343-0355
	2X	5	10	Ø30 x 58.1	FBE-2x-0343-0355
	2.5X	5	12.5	Ø30 x 79.4	FBE-2.5x-0343-0355
	3X	5	15	Ø30 x 56.6	FBE-3x-0343-0355
	4X	4	16	Ø30 x 80.1	FBE-4x-0343-0355
	5X	3	15	Ø30 x 85.1	FBE-5x-0343-0355
515-532	1.2X	10	12	Ø30 x 58.2	FBE-1.2x-0515-0532
	1.5X	9	13.5	Ø30 x 57.3	FBE-1.5x-0515-0532
	2X	6	12	Ø30 x 59.6	FBE-2x-0515-0532
	2.5X	6	15	Ø30 x 78.8	FBE-2.5x-0515-0532
	3X	4.5	15	Ø30 x 58.2	FBE-3x-0515-0532
	4X	4	16	Ø30 x 81.7	FBE-4x-0515-0532
	5X	3	15	Ø30 x 87.6	FBE-5x-0515-0532
1020-1070	1.2X	10	12	Ø30 x 59.4	FBE-1.2x-1030-1064
	1.5X	10	15	Ø30 x 58.4	FBE-1.5x-1030-1064
	2X	6	12	Ø30 x 60.8	FBE-2x-1030-1064
	2.5X	6	15	Ø30 x 80.6	FBE-2.5x-1030-1064
	3X	5	15	Ø30 x 59.4	FBE-3x-1030-1064
	4X	4.5	18	Ø30 x 82.9	FBE-4x-1030-1064
	5X	3.5	17.5	Ø30 x 87.5	FBE-5x-1030-1064

* Max input beam diameter at $1/e^2$ ensuring diffraction limited performance.

Variable Beam Expanders

Description

Variable beam expanders are ideal for systems in which different magnifications and precise control of laser beam divergence are required. Altechna offers Galilean type variable beam expanders with high LIDT AR coatings that minimize ghost reflections. Our variable beam expanders allows to separately adjust magnification and divergence. Two main standard products change magnification in the range of 1x-4x and 2x-8x.

Features

- High pointing stability (<1 mrad)
- Individual reports of beam ellipticity, M^2 and pointing stability parameters
- Mounting adapters at the input, output and middle are available on request
- Extended lifetime and LIDT for UV applications
- Transmission: >97% (>99% on request)
- High overall system LIDT: >6.5 J/cm^2 @ 1064 nm, 10 ns, 100 Hz for 1x-4x model

Typical Items

Wavelength, nm	Expansion range	Max input beam diameter*, mm		Product ID
343-355	1x-4x	1X	4.0	VBE-1X-4X-0343-0355-B
		2X	5.5	
		3X	3.0	
		4X	3.0	
	2x-8x	2X	5.0	VBE-2X-8X-0343-0355-B-2M
		3X	5.0	
		4X	4.0	
		5X	3.0	
		6X	2.5	
		7X	2.25	
		8X	2.0	
515-532	1x-4x	1X	4.5	VBE-1X-4X-0515-0532-B
		2X	6.5	
		3X	4.0	
		4X	4.0	
	2x-8x	2X	5.0	VBE-2X-8X-0515-0532-B-2M
		3X	5.0	
		4X	4.0	
		5X	3.0	
		6X	2.5	
		7X	2.25	
		8X	2.0	

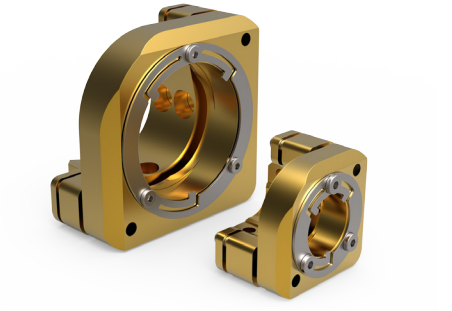
* Max input beam diameter at $1/e^2$ ensuring diffraction limited performance.

Typical Items

Wavelength, nm	Expansion range	Max input beam diameter*, mm		Product ID
1030-1064	1x-4x	1X	4.5	VBE-1X-4X-1030-1064-B
		2X	7.0	
		3X	5.0	
		4X	4.0	
	2x-8x	2X	5.0	VBE-2X-8X-1030-1064-B-2M
		3X	5.0	
		4X	5.0	
		5X	4.0	
		6X	3.0	
		7X	2.5	
		8X	2.5	

* Max input beam diameter at $1/e^2$ ensuring diffraction limited performance.

Type SD Industrial Mirror Mounts



Standard specifications

Mechanical angular range*	± 3.5°
Resolution*	10 mrad/rev
Pointing stability	<2 µrad deviation after extensive temperature cycling on Type SD mount size

* Depends on Type SD mount size.

Description

Type SD industrial precisely adjustable mirror mount provides excellent performance for demanding applications. Design ensures stress free low distortion mounting for optics, excellent holding force and pointing stability. Type SD mount allows precise mirror adjustment in both X and Y directions. 100TPI micro screws provide accurate adjustment and easily accessible fully integrated locking mechanism ensuring excellent angle stability. Depending on the application, optics can be held either by specially designed ZeroDef flexure ring or by semi-permanent optical adhesives. Type SD mount is precisely machined from special alloys to provide optimum beam pointing stability over changing environmental conditions such as temperature and transportation shock as well as vibrations and humidity.

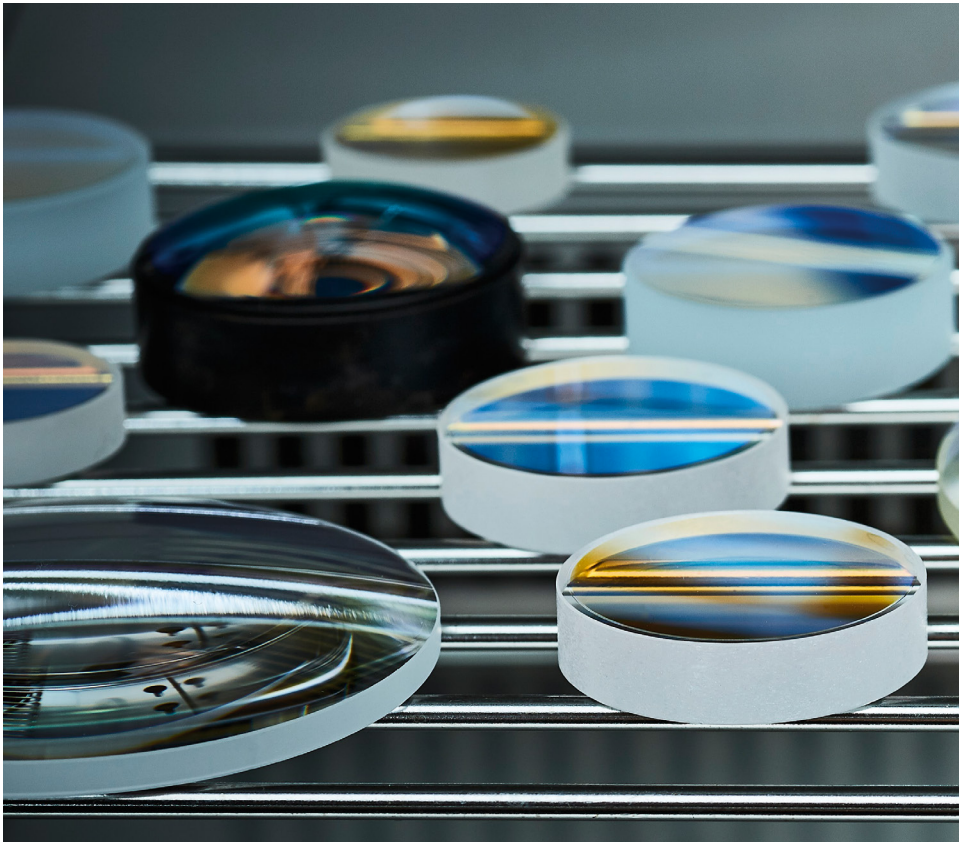
Features

- Vacuum compatible, no outgassing
- High temperature and vibrational stability
- Reliable and easy to use lock mechanism
- Fast & easy replacement of optics using ZeroDef flexure ring (RS)
- Stable and distortion free mounting of optics
- Special metallic alloys used for smooth operation and optimal performance

Typical items**

Optics diameter, mm	Physical dimensions (H x W x L), mm	ZeroDef flexure ring (RS) included***	Product ID
12.7	25.4 x 25.4 x 20.0	No	SD-127-01-VC-M
		Yes	SD-127-01-VC-RS-M
25.4	40.0 x 40.0 x 25.0	No	SD-254-01-VC-M
		Yes	SD-254-01-VC-RS-M
30.0	45.0 x 45.0 x 25.0	No	SD-300-01-VC-M
		Yes	SD-300-01-VC-RS-M
38.1	55.0 x 55.0 x 28.0	No	SD-381-01-VC-M
		Yes	SD-381-01-VC-RS-M
50.8	65.0 x 65.0 x 30.0	No	SD-508-01-VC-M
		Yes	SD-508-01-VC-RS-M

** Custom mount configurations are available on request.
*** Mounts containing ZeroDef retaining ring (RS) can accept elements with 6 - 6.35 mm thickness.



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