präzisions glas & optik

Protected Aluminum Mirrors

AL-front surface mirrors for ultraviolet light

SEA-UV Series

Special Properties

- High reflection for ultraviolet wavelengths
- Broadband reflection range from about 250 nm - 10 µm
- Excellent optical characteristics
- Metallic aluminum thin-film coating
- High-quality glass substrate
- Aluminum coating protected by a thin quartz layer

Typical Applications

- Ultraviolet mirrors
- Mirrors for ultraviolet lasers
- UV-VIS-IR-broadband mirrors
- Mirrors for medical applications
- Mirror optics for UV-curing systems
- Alternative for silver or gold mirrors
- UV-sensor technology
- Broadband laser mirror optics
- UV-mirrors for disinfection systems

Related mirror types

- SEA-VIS-Series (Enhanced aluminum mirrors VIS)
- SEA-NIR-Series (Enhanced aluminum mirrors NIR-IR)
- SHP Series (Silver front surface mirrors with high reflection)

Request for Quotation

Also available in 48 h Express-Service

Protected aluminum front surface mirrors are mainly used whenever a high reflection in the ultraviolet wavelength range is required. Our SEA-UV protected aluminum mirror series features a metallic aluminum coating protected by a thin SiO2 (quartz) layer. Unprotected bare-aluminum metal coatings quickly oxidize when exposed to oxygen. Also, such optics are very sensitive to scratching. For these reasons, we deposit a thin quartz layer on top of the aluminum coating to prevent oxidization and make the mirrors more scratch resistant. Hence, compared to the soft and sensitive bare-aluminum metal mirrors, the surfaces of our protected aluminum mirrors are harder and more resistant to scratching. However, a protected aluminum mirror coating is still more sensitive to scratching than our SEA-VIS enhanced aluminum mirrors, for example, which for physical reasons can have a significantly thicker protection layer. Since metal-coated mirror optics, which are supposed to reflect UV wavelengths, can only have a thin quartz protective coating, the possible thickness of the SiO2 coating layer is limited. However, due to the great UV-transmittance and low absorption of the quartz-layer within the UV-wavelength area, the desired high ultraviolet reflection of the metallic aluminum coating is retained to a great extent. If this layer were thicker and more protective, it would absorb much more of the UV-light, which is why the scratch resistance of protected aluminum mirrors is limited. Such optics should not be used in harsh environments or when exposed to mechanical abrasion.

The reflection of our protected aluminum mirror coatings is far less angle-dependent than that of dielectric mirror coatings. Moreover, the mirrors feature a high and broadband optical reflectivity from the ultraviolet to the infrared light range. Only close to around 700-870 nm, there is a moderate reflection drop down to slightly below 80%. Above this wavelength spectrum, the reflectivity of the optics stays continuously high up to 10 µm. Therefore, the SEA-UV protected aluminum mirrors can work as laser mirrors for multiple-wavelengths at the same time. For example, they can simultaneously reflect an invisible ultraviolet laser beam and a visible or infrared laser beam. In some applications, it can even replace gold or silver mirrors.

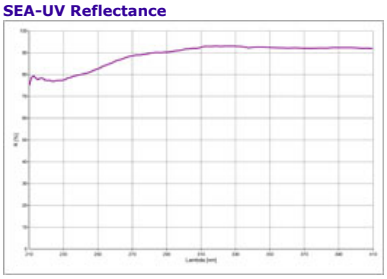
The reflectivity of the metallic mirror optics can be modified and increased for a specific wavelength or particular optical reflection ranges by adding additional thin dielectric coatings. Please use our custom coating request form to conveniently get a quotation for mirror optics based on your specific requirements. Please contact us if you need additional information or technical support.

To quickly receive a quote for our SEA-UV protected aluminum front surface mirrors with custom dimensions, please click the button below or select a thickness from the table in the specifications:

Request for Quotation

Specifications

SEA-UV Reflectance



Enlarge reflectance curve to show details

Standard Thicknesses

(Please click on a glass thickness to request a quote)

Thickness (mm)	Tolerance	48h
1,00	±0,10	✔
2,00	±0,20	✔

SEA-UV with custom thickness.

The thicknesses marked with "✔" are also available within 48–h Express Service.

Optical Reflection (45° incidence angle)

- Ravg > 85% at 280 - 700 nm
- Rabs >/= 90% at 300 - 400 nm

Coating construction

- Metallic mirror coating
- Aluminum, protected by SiO_2 (Quartz) coating layer

Substrate Material

- Selected Float Glass
- Other substrates available on request

Flatness

- Depending on substrate material and thickness
- Other on request

Surface Quality

- typ. 80-50 scratch & dig (MIL-0-13830A)
- Other on request

MIL-Standards

- Adherence according to MIL-C-675 C (tape test)
- Abrasion-resistant according to MIL-M-13508 C

In case you need mirror optics solely for the visible wavelength range, please take a look at our SEA-VIS enhanced aluminum front surface mirror, which we have optimized for higher VIS reflection by dielectric overcoatings. Also, check out our SHP-silver metal mirrors. For near-infrared wavelengths, we make the SEA-NIR mirrors, which are enhanced for this wavelength spectrum.

All given details and specifications are mean reference values and are not guaranteed. Also, please consider our "Notes on technical specification".

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