

Laser Optics & Coatings

Crytur company produces a wide range of laser optics and coated optics made on various kinds of substrates as well as on customer furnished substrates.

Substrate specifications

Material: optical grade fused silica or BK7 glass
Surface figure: $\lambda/10$ at 633 nm
Wedge: <5 minutes of arc
Standard sizes: $\phi 25.4 \times 9.5$ mm, $\phi 25.4 \times 6.35$ mm, $\phi 12.7 \times 6.35$ mm

Other sizes, shapes, substrate materials, spherical (convex or concave) substrates with radii of curvature from 50 mm to 20 m, parallel (<10 second of arc) or wedged substrates are available upon request.



Coating specifications

Material: electron beam deposited hard dielectrics, Ion Assisted Deposition (IAD) available
Clear aperture: 80 % of diameter
Damage threshold:
30 J/cm² at 1.06 μ m, 10 ns ... high reflectivity mirrors
15 J/cm² at 1.06 μ m, 10 ns ... AR coatings, partial reflectivity mirrors, beam splitters

Coatings are designed to be used at normal or 45-degree incidence.
Other angles of incidence can be supplied upon request.

High reflectivity mirrors

Reflectivity: > 99.7 % (VIS, NIR)
> 99.5 % (UV, IR)
Central wavelengths: from region 250 nm to 3500 nm

Anti reflection coatings

Working wavelengths: interval from 250 nm to 3500 nm
Substrate materials: fused silica, optical glass, filter glass, float glass, laser crystal elements, etc.
Reflectivity: < 0.2 % (V-type coating)
< 0.5 % (W-type coating or broadband)

Partial reflectivity mirrors

For any reflection level from 1% to 99% (tolerances +/- 0.3 % to +/- 3 % depending on the reflectivity level) and at any wavelength in the interval from 250 nm to 3500 nm.
Second side: appropriate AR-coating

Dichroic mirrors

Mirrors with reflection/transmission levels specified at two different wavelengths in the interval from 250 nm to 3500 nm.

Second side: appropriate AR-coating

Beam splitters

For any reflection level from 1% to 99% (tolerances +/- 0.3 % to +/- 3 % depending on the reflectivity level) at any wavelength in the interval from 250 nm to 3500 nm and at specified polarization.

R_p/R_s ratio is about 0.5 for reflection/transmission level 50/50 % and angle of incidence 45°.

Standard angle of incidence: 45°

Other angles of incidence available on request.

Second side: appropriate AR-coating

Dichroic beam splitters available upon request.

Graded reflectivity laser mirrors

Working wavelength: 1064 nm

Reflectivity profile: nearly Gaussian or super-Gaussian with specified order N

Size of reflecting

area: $\phi 0.5$ to 10 mm (at R_0/e^2) typically

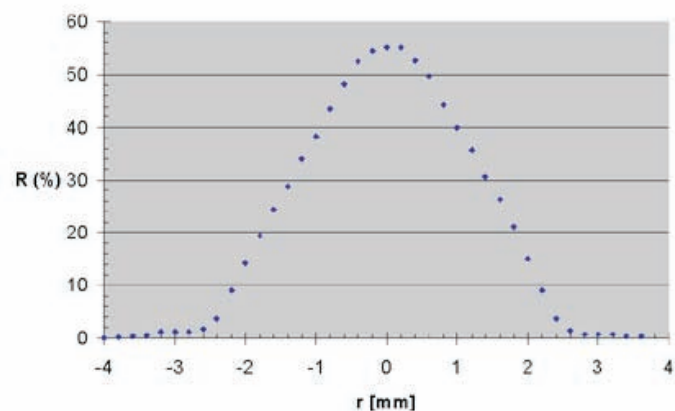
Central reflectivity: region from 5 % to 80%
(+/-1 % to +/-5 % depending on reflectivity level)

Residual reflectivity: <1/20 of R_0 or <0.5%

Second side: appropriate AR-coating

Other wavelengths and reflectivity levels available on request.

$$R(r) = R_0 \exp(-2(r/w_0)^N)$$



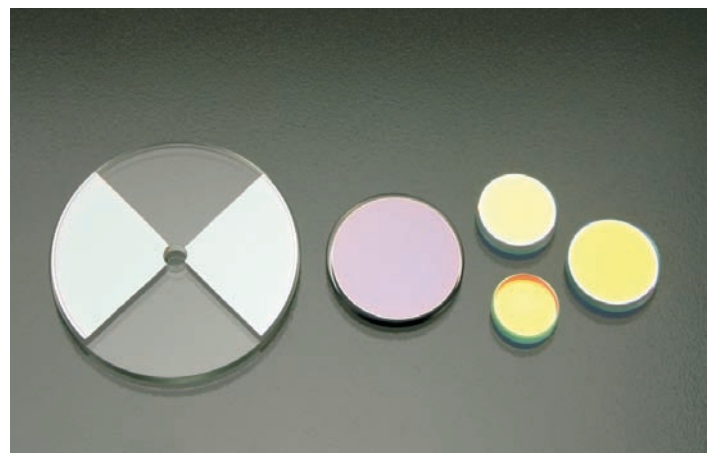
Optical filters and mirrors

Examples:

- ▶ cut-off filters
- ▶ bandpass filters
- ▶ filters for optical curing units
- ▶ filters for photodynamic therapy
- ▶ metal and metal-dielectric mirrors

Coated infrared optics

Ge, Si, CaF₂, sapphire and other crystal- and infrared material-based optics (windows, mirrors, filters, beam splitters) for wavelengths in the interval from 2.5 to 15 μm .



Coating of customer furnished substrates available upon request