

# Laser Optics & Coatings

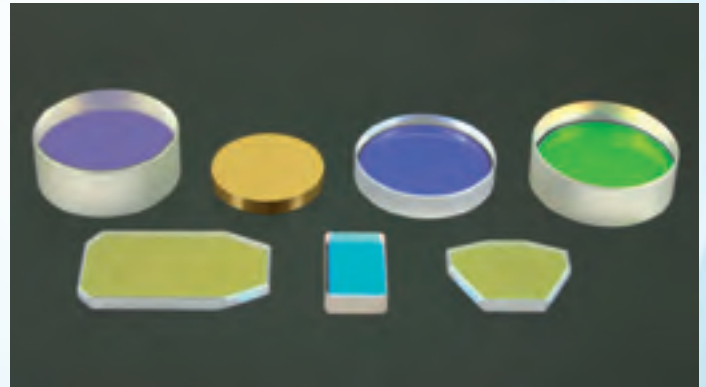


**Crytur** company produces a wide range of laser optics and coated optics made on various kinds of substrates as well as on customer furnished substrates.

## 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,  
 $\phi 19 \times 9.5$  mm,  $\phi 12.7 \times 6.35$  mm

Other sizes, shapes, substrate materials, spherical (convex, concave) substrates, 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/cm<sup>2</sup> at 1.06  $\mu$ m, 10 ns high reflectivity mirrors  
15 J/cm<sup>2</sup> at 1.06  $\mu$ m, 10 ns AR coatings, partial reflectivity mirrors, beam splitters

Coatings are designed to be used at normal or 45 degree incidence. Other angle 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 4500 nm

## Anti reflection coatings

Working wavelengths: from region 190 nm to 4500 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 from interval 250 nm to 4500 nm.  
Second side: appropriate AR-coating



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## Dichroic mirrors

Mirrors with reflection/transmission levels specified at two different wavelengths from interval 250 nm to 4500 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 from interval 250 nm to 4500 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 angle of incidence on request.

Second side: appropriate AR-coating

Dichroic beam splitters available upon request.

## Graded reflectivity laser mirrors

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

Working wavelength: 1064 nm

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

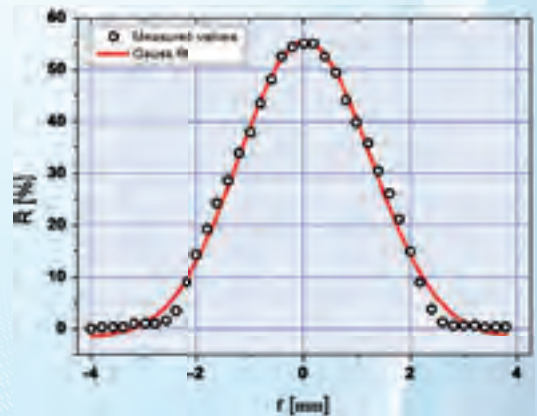
Size of reflecting area:  $w_0 = 0.5$  to 5 mm (at  $R_0/e^2$ ) typically

Central reflectivity: from interval 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 working wavelengths and reflectivity levels on request.



## Optical filters and mirrors

- cut-off filters
- bandpass filters
- filters for light sources
- interference colour filters
- metal and metal-dielectric mirrors



## Coated infrared optics

Ge, Si, CaF<sub>2</sub>, sapphire and other infrared materials based optics, AR coated (working wavelengths from interval 2.5 to 15 μm).  
Other coatings upon request..

## Coating of customer furnished substrates upon request