



## **Coating.**

**Wide Range of Specific Solutions.**

# Coating.

The coatings listed show a part of our coating capabilities. We also develop customized solutions and advise you. Environmental- and stress tests of the coatings for the qualification are carried out in-house.

## Substrates

Typical substrates are:

- Wide variety of optical glasses
- Flat glass, lenses and prisms
- Sapphire, quartz and quartz glass as well as glass ceramic and ceramic
- Substrate size up to 400 x 800 mm, Ø 450 mm
- Contract coating on customer substrates on request

## Specifications

### General

- Wavelength ranges for:
  - Metallic mirrors 120 nm–12 µm
  - Dielectric mirrors 190 nm–3 µm
  - Filters, beam splitters, black chrome 250 nm–3 µm
  - Antireflection coatings 190 nm–5 µm
  - Conductive layers 400 nm–1.6 µm
- All polarization types are specifiable (p, s and average value)

### Mirrors

- Metallic and dielectric mirrors
- Narrowband and broadband mirrors
- Front and back surface mirrors

### Antireflection coatings

- Narrow, multi- and wide-band spectral ranges
- Residual reflection  $\leq 0.05\%$

### Filters

- Edge filters: Long- (LWP) and short pass (SWP)
- Edge position tolerance from 0.5 % of the nominal wavelength
- Narrowband filters (T-band) and notch filters (R-band)
  - Center position tolerance from 0.2 % of the nominal wavelength
- Laser protection filters
- Single and multi-band filters with freely definable widths and positions

### Beam splitters

- Available on a plano-parallel plate or prism cube:
  - Cemented
  - Optically contacted
  - With defined airspace
- Polarizing beam splitters (PBS)
- Non-polarizing beam splitters (NPBS)
- Neutral beam splitters
- Narrow, wide or multiple spectral regions with freely definable splitting ratios

### Absorbing layers

- Chrome-free absorber layers available
- Narrow- and broadband
- Efficient from air and/or glass sides
- Structurable (etch and lift-off processes)

### Layers for non-optical applications

- Wear protection layers for glass, glass ceramic and ceramic
  - Nitridic layers, e. g. CrN
  - DLC
    - Coating thickness: 1–1.5 µm
    - Homogeneity: better 100 nm
    - Hardness/abrasiveness: 20 GPa
    - Scratch resistance: > 20 N
    - E-module: 140 GPa
    - Coefficient of friction: 0.1–0.15
    - Coating stress (1 µm): ~1.3 GPa
- Barrier layers, e. g. etch stop

### Surface imperfections

- Assessment according to ISO 10110
- Specifications depending on the layer system e. g.:
  - AR: 5/C3 x 0.025 over Ø 25 mm
  - Filters: 5/C3 x 0.040 over Ø 25 mm