



Cylindrical Optics.

Precise Beam Shaping and Expansion.

Cylindrical Optics.

Berliner Glas produces cylindrical optics in high precision for a wide range of applications for beam guidance and homogenization of laser radiation, for example for laser annealing and lift-off processes in material processing. Other applications range from data communication in space to anamorphic image correction in movie images and reproductions.

Products

- Cylindrical lenses and mirrors – concave and convex
- Cylindrical cemented groups (double and triple) in the highest centering
- Array lenses for beam homogenization
- Combined lenses (spherical radii and cylindrical radii)

Specifications*

| | |
|---------------|--|
| Material | Quartz glass, optical glass and glass ceramics |
| Length | ≤ 2,000 mm, larger on request |
| Radii | 2 mm–∞ |
| Fitting error | < $\lambda/10$ PV (@ 633 nm) |
| Centering | Rotation: ≤ 10" Offset: ≤ 4 μm Wedge: ≤ 3 μm |
| Surface error | From 5/1 x 0.016 |
| Roughness | ≤ 0.2 nm rms |

Fine Correcting Procedures

- Ion beam figuring
- Portal-/robot polishing
- Magnetorheological finishing (MRF)

Notes

All products can be coated. A customer-specific mounting to array fields or tip-tilt units is possible. Furthermore, the design of the outer lens contours can be carried out according to customer specifications.

Metrology

| | |
|------------------------------------|---|
| Wavefront | Interferometer (4–24"), Shack-Hartmann-wavefront sensor (UV, DUV, VIS, NIR), radii metrology, multiple area metrology, stitching-interferometer |
| Form deviation | 3D coordinate measuring devices, caliper, CCD micrometers, interferometers |
| Surface defects | Various microscopic methods |
| Roughness | White light interferometer, atomic force microscopes |
| Centering | Lens test control unit, laser centering station |
| Additional functional measurements | Environmental/climatic tests acc. to ISO and MIL standards, abrasion and adhesion tests, various chemical and resistance testings, autoclaving, surface measurements, resistance measurements |

* The following error and tolerance data indicates possible limit values. Specified and assessed according to ISO/MIL/DIN. Limit values cannot be combined freely.