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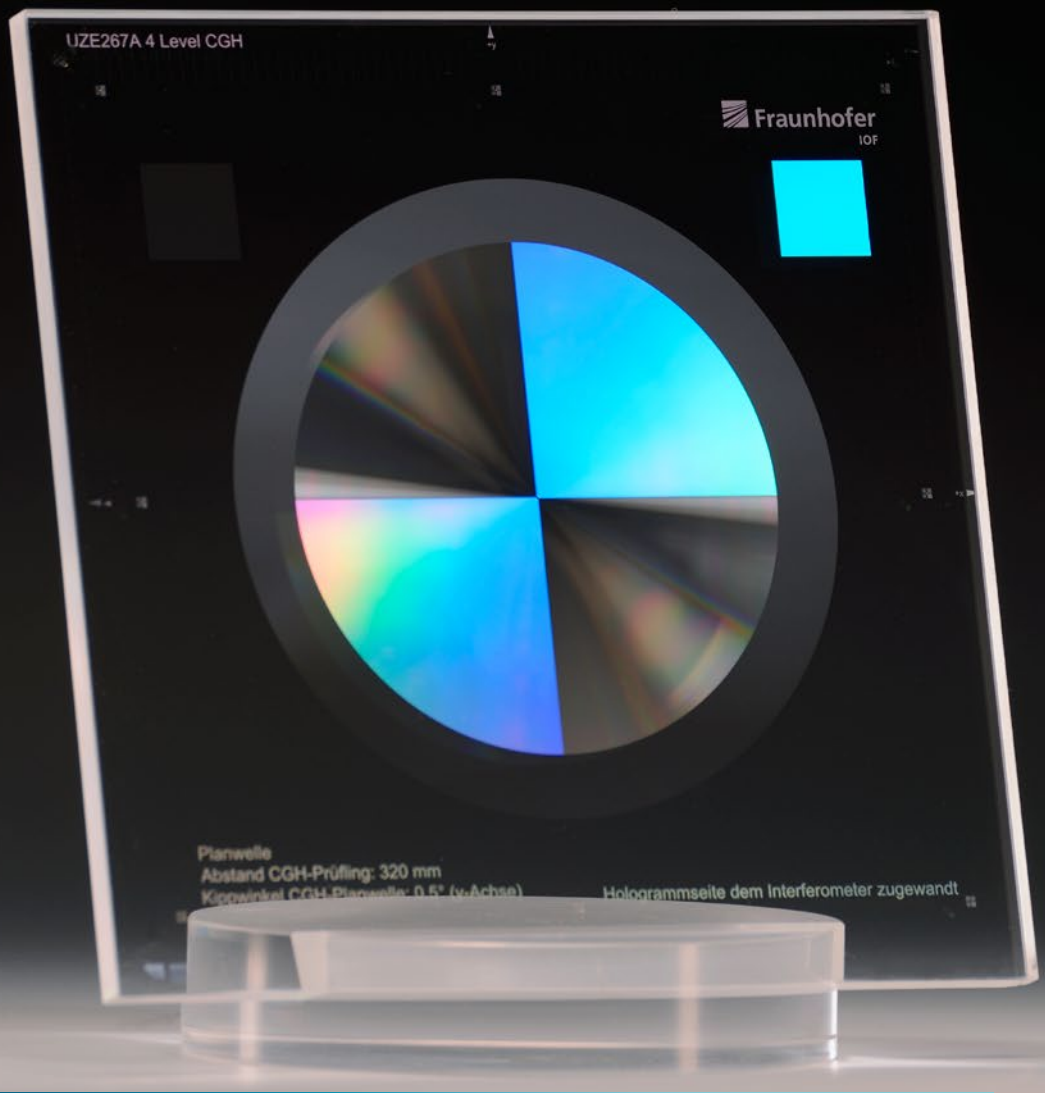


# Design and manufacturing of computer-generated holograms

## Interferometric testing of aspheres and freeforms

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# Design and manufacturing of computer-generated holograms

## Interferometric testing of aspheres and freeforms

*Cover: Computer generated hologram on 6" fused-silica substrate.*

*Top: Interferometric testing of a freeform mirror pair using a specially designed CGH.*

### Description

Computer-generated holograms (CGHs) allow for contact-free interferometric testing of demanding optical surfaces, for example aspheres or freeforms, with an accuracy < 10 nm RMS. To realize this, a high-precision lithographic fabrication technology and the use of special substrates with sub-100 nm flatness are needed.

### Lithographic process chain

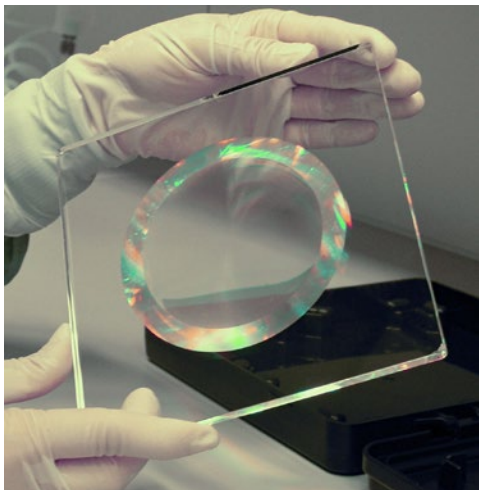
- Coating of substrate with chromium and photoresist
- Exposure by use of electron beam lithography
- Transfer of structure into chromium mask through reactive ion etching (RIE)
- Transfer of structure into substrate through RIE
- Removal of chromium mask (selective removal possible)

### Technical data

- Available substrate geometries:
  - 6-inch (152 × 152 × 6.35) mm
  - 9-inch (230 × 230 × 9) mm
  - ET (292 × 150 × 15) mm
- Placement accuracy < 20 nm (3σ)

### Our product range

- Optical design of phase functions and layout
- Provision and correction of substrates (transmitted wavefront error < 10 nm RMS)
- Lithographic fabrication of CGHs
- Measurement of placement accuracy
- Measurement of transmitted wavefront



*Structured CGH on a 6-inch mask blank (152 mm × 152 mm × 6.35 mm).*

### Contact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