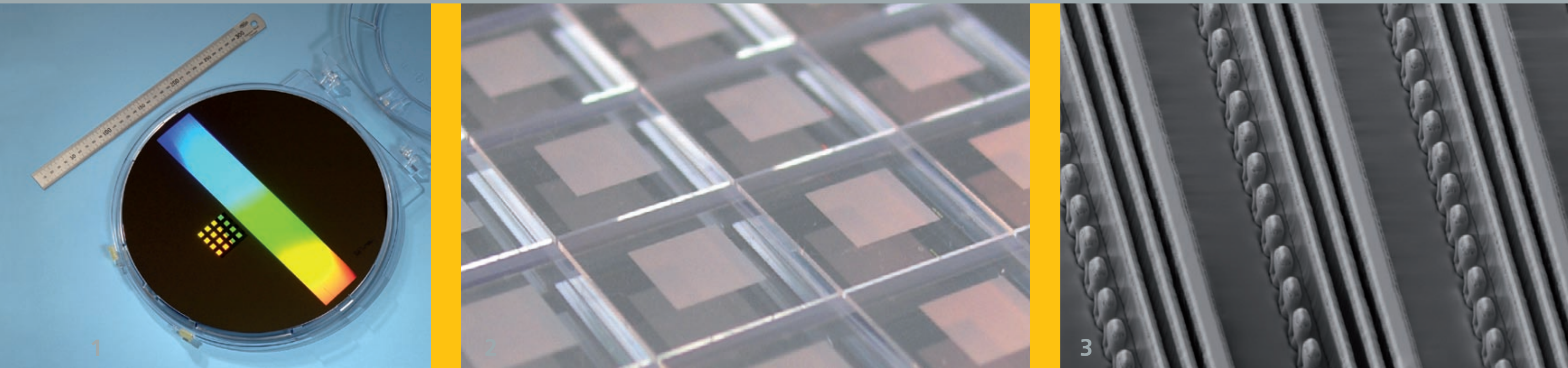
Fraunhofer

IOF

FRAUNHOFER INSTITUTE FOR APPLIED OPTICS AND PRECISION ENGINEERING IOF



1 *Large scale pulse compression grating on a 12 inch wafer.*
2 *Diffractive elements after dicing process.*
3 *Blazed grating according to the effective media approach in fused silica.*

DIFFRACTIVE OPTICAL ELEMENTS

Customized micro and nano optics

CMN offers the design, manufacturing optimized data preparation, the manufacturing and the characterization of diffractive optical elements for EUV to FIR applications inclusively processing and assembly in whole systems.

Manufacturing

- (Chemically Amplified) Resist technology
- Multilevel lithographic structuring on the electron beam writer VISTEC SB350 OS
- Reactive ion beam etching

Technological environment

- Ion beam figuring of substrates up to 9″
- Coating technology (HRC,ARC)
- UV Replication, nano imprint
- Wafer dicing & Ultra precision machining
- Wafer scale integration
- Micro assembly

Technical parameters: Electron beam lithography / Ion beam etching

- Standard substrates up to 12″ *
- Critical dimension < 65 nm
- CD tolerance ± 10 nm
- Writing grid 1 nm
- Overlay accuracy ± 20 nm
- Etching aspect ratio ≤ 1:10
- Etching depth tolerance ± 10 nm

Characterization

- Microscopy (UV, SEM, FIB, AFM)
- Diffraction efficiency
- Stray light analysis
- Wave front detection up to 11″

Selected applications

- Beam splitting, shaping, deflection
- Computer generated holograms
- Photonic crystals, effective media
- fs – pulse compression gratings

TÜV CERT

* Special substrates and materials on request

Fraunhofer Institute for Applied Optics and Precision Engineering IOF

Albert-Einstein-Straße 7
07745 Jena

Director
Prof. Dr. Andreas Tünnermann

Head of Business Unit Optical Components and Systems
Prof. Dr. Uwe Zeitner

Contact
Prof. Dr. Uwe Zeitner
Phone +49 3641 807-403
uwe.zeitner@iof.fraunhofer.de

www.iof.fraunhofer.de

Center for Advanced Micro- and Nano-Optics

CMN OPTICS