



Tailored light diffusers

Tailored light diffusers

Cover: Star-shape diffuser element.

Top: Tailored surface relief structure (Laser-scanning micrograph).

Features

Tailored light diffusers enable the transformation of incoming light into a desired angular distribution. This allows a realization of predefined far field distributions with very high efficiency due to the absence of limiting apertures. The outstanding characteristics of these elements originate from unique optical design methods that also allow local variation of the deflection angle.

Characteristics

- Full angle up to 120°
- High efficiency from UV to IR spectral range (dependent on applied material)
- Achromatic behavior
- Local variation of light distribution function allowed

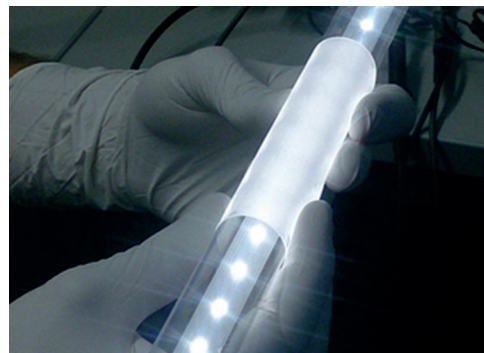
Technology

- Optical design using wave-optical methods
- Mastering by direct writing grayscale photo-lithography
- Master substrate up to Ø 300 mm
- Replication (e.g., UV molding)
- Mask for RIE proportional transfer into fused silica, borofloat glass, silicon

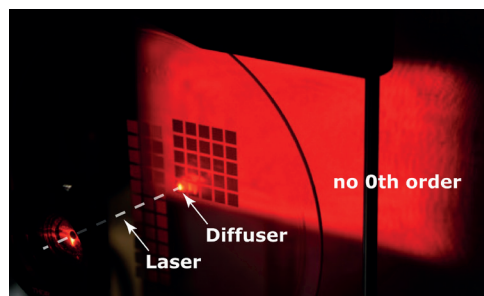
Typical applications

Tailored angular light distributions for:

- Illumination (instruments, flashlights, buildings)
- LED homogenization
- Projection screen, e.g., intermediate image plane



Diffuser with batwing profile for fluorescent tube replacement.



Characterization of a rectangular shape diffuser in a lab setup.

Contact

Department
Micro- and Nano-structured Optics

Scientific Group
Advanced Microoptical Components

Dr. Robert Leitel
Phone: +49 3641 807-375
robert.leitel@iof.fraunhofer.de

Fraunhofer IOF
Albert-Einstein-Strasse 7
07745 Jena
Germany
www.iof.fraunhofer.de



www.iof.fraunhofer.de
more info