



- 1 *Star-shape diffuser element.*
- 2 *Characterization of a rectangular shape diffuser in a lab setup.*
- 3 *Tailored surface relief structure (Laser-scanning micrograph).*

TAILORED LIGHT DIFFUSERS

Fraunhofer Institute for Applied Optics and Precision Engineering IOF

Albert-Einstein-Straße 7
07745 Jena, Germany

Director
Prof. Dr. Andreas Tünnermann

Contact
Dr. Robert Leitel
+49 (0) 3641 / 807 375
robert.leitel@iof.fraunhofer.de

www.iof.fraunhofer.de

Description

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 allow local variation of deflection angle, too.

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, flash light, buildings)
- LED homogenization
- Projection screen, e.g. Intermediate image plane