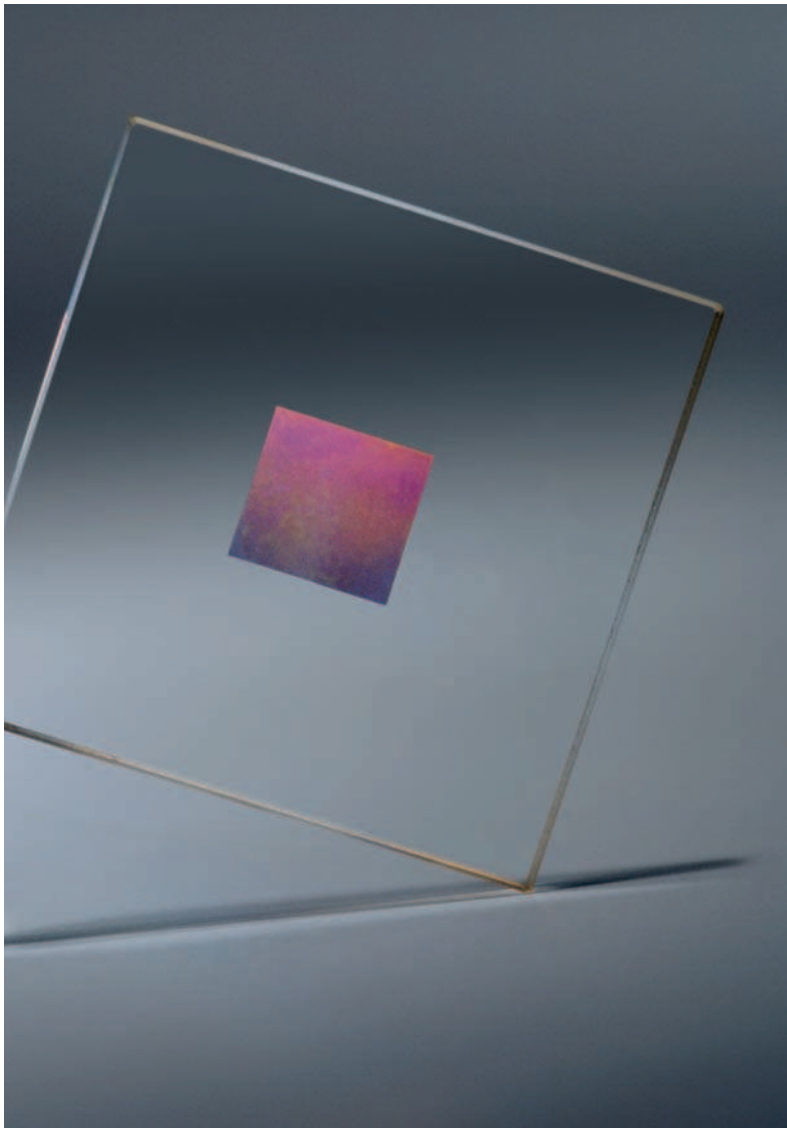
JENOPTIK

Diffractive Diffusers

Diffractive diffusers spread and homogenize laser beams over a controlled small angle. This results in a uniform far-field intensity profile with very sharp edges and a top-hat like or a custom shape. Low scattering and sharp profile edges result in higher efficiencies compared to conventional diffusers. Diffractive diffusers may be used as a single optical component to generate the desired intensity profile in a larger distance. The profile dimensions are determined by the distance and the diffuser angle.
A combination of diffractive diffuser and focusing lens generates the uniform illumination at the focus plane of the lens. The profile dimensions depend on the focal length of the lens and the diffuser angle.

Features:
- Controlled small diffuser angle
- High efficiency within specified angle
- Uniform top-hat or custom illumination profiles
- Different spot geometries
- Wavelengths from deep UV to infrared
- High damage threshold and lifetime
- Insensitive to input beam shape and misalignment

Applications:
- Laser materials processing with optimized spot geometries and intensity profiles
- Medical laser treatment, e.g. with excimer lasers
- Homogeneous illumination in mask projection systems
- Highly efficient diffuse illumination of lens array homogenizers
- Laser beam homogenizing and shaping



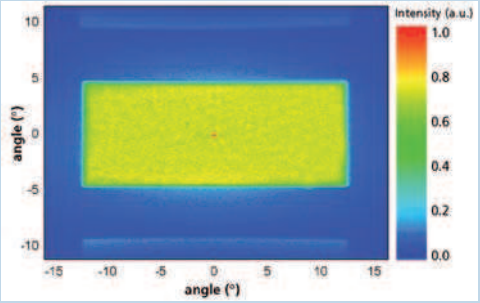
Microoptics

Diffractive Diffusers

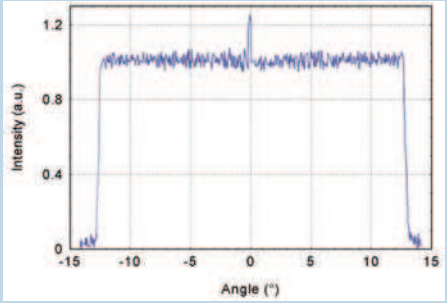
Specifications

Illumination geometries:	Lines, rectangles, circles, hexagons and many others.
Efficiency:	75 % to 90 % (for different grades, with AR-Coating)
Uniformity:	±2 % to ±5 %
Diffuser angles (FWHM):	up to ±25° @ 193 nm
Edge steepness:	Mostly limited by laser divergence
Wavelengths:	193 nm to 14 µm
Size:	5 x 5 mm² to 120 x 120 mm²
Materials:	Fused Silica, ZnSe, Ge, Si, GaP, Sapphire
AR-Coating:	Laser line or broadband
Options:	Custom intensity profiles, diffusing angles and illumination geometries, other diffuser materials
Product number:	029112

Typical intensity profile after diffractive diffuser @ 193 nm



CCD camera image



Intensity profile

Results

Efficiency:	> 70 %
Uniformity:	< ±2.5 %
Angle:	23° x 9°
Zero Order:	< 0.3 %

It is our policy to constantly improve the design and specifications. Accordingly, the details represented herein cannot be regarded as final and binding.

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