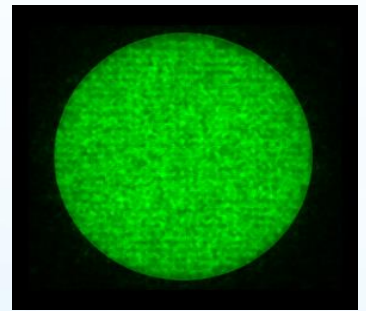


## Homogenizer / Diffuser

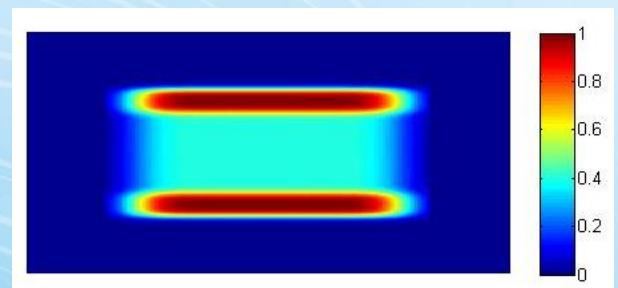
Homogenizer/Diffuser diffractive optical elements (DOE) allow conversion of a single or multi-mode input beam into a well-defined output beam, characterized with a desired shape, and uniform intensity.



<b>Features:</b>	<b>Applications:</b>
<ul style="list-style-type: none"> <li>• Works with single or multi-mode input beams</li> <li>• Glass or plastic materials</li> <li>• Low centration requirement</li> <li>• Any output shape or symmetry</li> <li>• Uniform/Tailored intensity profile</li> </ul>	<ul style="list-style-type: none"> <li>• Laser homogenizing/shaping</li> <li>• Laser material processing: perforation, ablation, derailing, marking, scribing and welding</li> <li>• Medical/aesthetic laser treatment</li> <li>• Beam shaping for Excimer lasers</li> <li>• Hot spot reducer</li> </ul>

The Homogenizer/Diffuser DOE is mainly beneficial with improved uniform exposure. When sharp shaped edges are required, while keeping small divergence, and enabling high transmission efficiency.

The most common shapes are: round, square, rectangular, elliptical and hexagonal. However, almost any shape of image can be designed. Also possible, is a tailored intensity distribution of the image, so that different areas present higher/lower energy. Holo/Or can also design a Multi-level diffuser DOE to achieve higher efficiency.



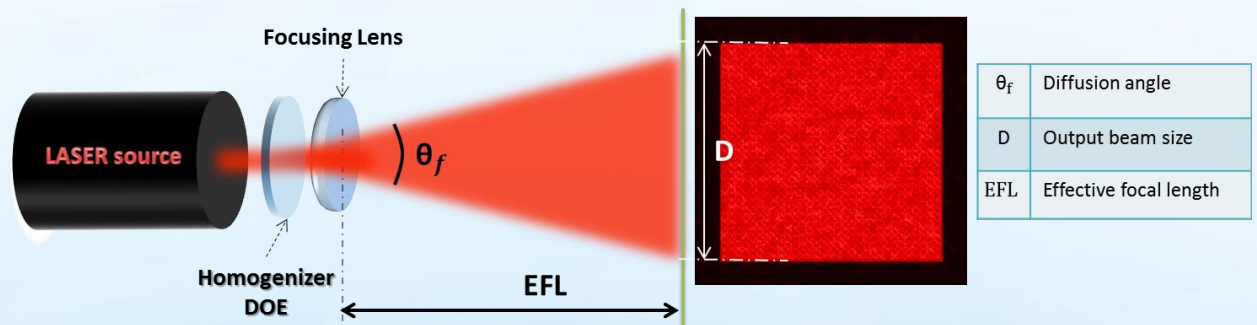
### High homogeneity series (RH/HH/XH):

Holo/Or developed a new class of homogenizers with enhanced performance referred to as the high homogeneity series. Its advantages are: higher homogeneity, lower zero order. Also, it corresponds well with input beams of lower  $M^2$ .



### Design Considerations

1. Common homogenizer/diffuser elements are manufactured on a DOE window. Since the homogenizer defines a certain diffusion angle, the customer is able to control the image size on the image plane by choosing a focusing lens with a correct EFL. Typical set up for homogenizer is presented below:



2. Holo/Or has the capability to design an integrated solution: combining the DOE window and a specific focusing lens into one single hybrid element. Here, the diffractive pattern will be etched on the Plano side of the focusing lens (plano-convex lens). The advantage of this solution includes less optical surfaces, compact dimension and low weight.
3. Additional improvement in the performance may be achieved by using a high  $M^2$  input beam.

### Specifications:

<b>Materials:</b>	Fused Silica, ZnSe, Plastics
<b>Wavelength range:</b>	193nm to 10.6um
<b>DOE design:</b>	Binary and up to 16-level
<b>Element size:</b>	2mm to 100mm
<b>Diffraction efficiency:</b>	75%-98%
<b>Coating (optional):</b>	AR/AR
<b>Custom Design:</b>	Tailored shape and intensity distribution
<b>Pattern angles@532nm:</b>	Few mRad to 160°

