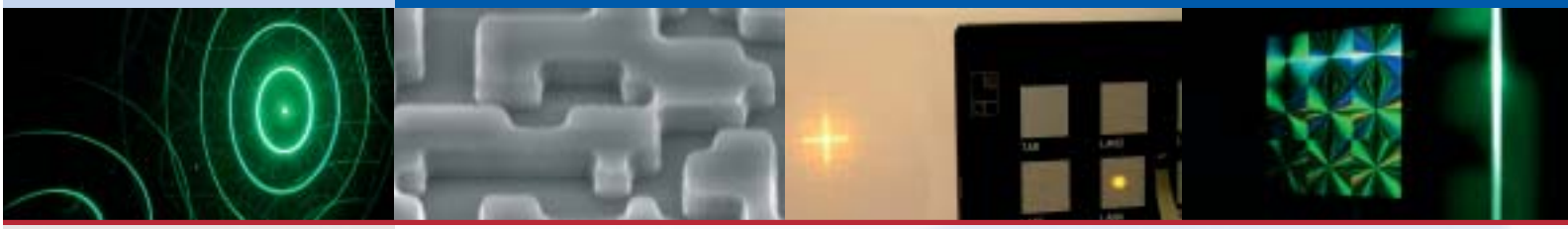
DOE

>> Diffractive Optics Services



Diffractive Optics

HOLOEYE was founded in 1999 to design, develop, and commercialize DOEs specifically for the fields of technical optics and lasers. Since inception, HOLOEYE has established a full service design and development technology cycle that provides its customers with a fully integrated closed-loop development process. HOLOEYEs array of products and services ranges from standard DOE development to large-scale complex bilateral joint DOE projects.

HOLOEYEs Service in DOE Technology:

+ Identification of applications of diffractive optics in industrial environments.
+ Shipment of test elements for evaluation of technology.
+ Feasability studies and analyses.
+ Simulation of the optical setups.
+ Rapid prototyping of systems incorporating diffractive elements
+ Experimental verification of designs.

Properties of Diffractive Optical Elements

The different types of DOEs (Beam splitters, Fourier holograms, beam shapers, diffusers and various grating structures) act like optical processors, splitting or reshaping light to almost any desired distribution. Moreover, diffractive optics can realize almost the same optical functions as refractive optics such as lenses, prisms or aspheres but they are much smaller and lighter. DOEs are not limited to lasers; partially coherent light from LEDs or other light sources can also be modulated.

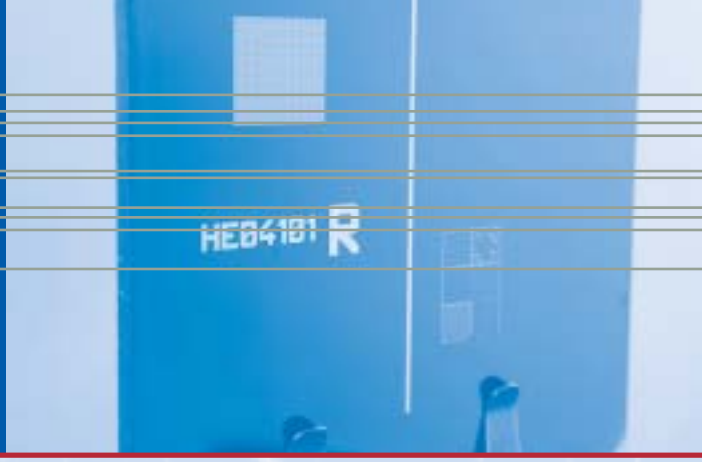
Diffractive Optical Elements Provided by HOLOEYE

+ Beam Splitting Elements: Fan-out-elements, Pattern Generators
+ Beam Shaping Elements
+ Diffractive Lenses (Fresnel Zone Lenses, Lens Arrays, Cylindrical Lenses)
+ Gratings (Amplitude, Phase, Blazed)

HOLOEYE

Pioneers in Photonic Technology

>> Design & Mastering



Diffractive Optical Elements

Diffractive Optical Element (DOE) utilizes a surface with a complex microstructure for its optical function. These micro-structured optical elements have binary or multiple phase levels, where the surface structures are either etched in fused silica or embossed in different polymer materials.

Order Processing:

+ Custom design of diffractive elements for industrial applications according to customer specification
+ Fabrication of master structures for DOE replication
+ Replication of diffractive elements
+ Optical Performance tests

Design & Simulation of Diffractive Optical Elements

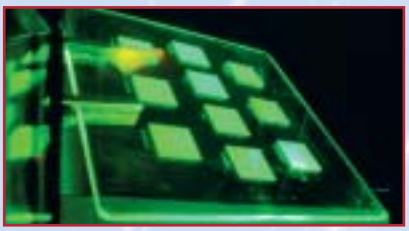
HOLOEYE offers costumized design of diffractive optical elements. During the design process, the parameters from the application are taken into account. The obtained element design will be tested in wave-optical simulation prior to fabrication. The customer will receive detailed information about parameters of concern like exact diffraction angles, diffraction efficiency, signal-to noise ratio and energy distribution uniformity.

Master Fabrication

The design data will be optimized for minimum fabrication error dependency and the data conversion for the fabrication facilities is monitored to ensure maximum performance of the master elements. The fabrication technology will be chosen to meet specifications on the one hand and to minimize cost on the other hand.

HOLOEYEs customized DOE solutions are based on its ability to communicate with the customer, evaluate their needs, analyze the problem at hand, and then manufacture a solution using an array of master fabrication and volume replication technologies at HOLOEYEs disposal.

>> DOE - Replication Technology



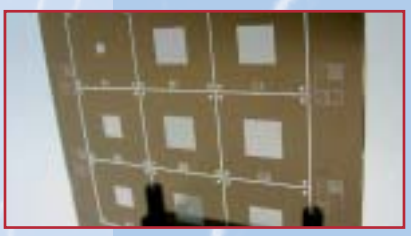
Replication significantly reduces the cost of each single optical element. Replication technologies represent a major economic success factor in diffractive optics.

The fabrication of a master component with an optical microstructure can be very cost-intensive. With a replication method the optical structure of a master component can be copied in high quantities onto different optical media, thus reducing the effective cost per element significantly.

Using accordingly manufactured master structures, HOLOEYE can add value by its own replication methods to improve the performance of diffractive elements with respect to specific merit parameters.

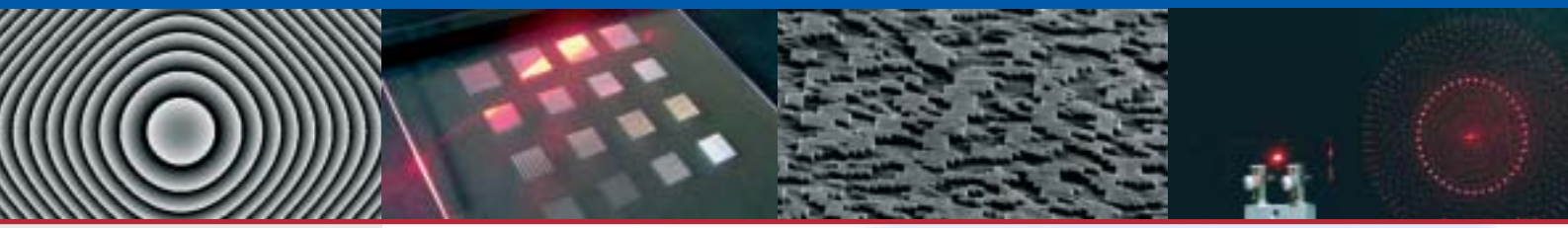
HOLOEYEs Replication Services:
High-precision replication of small quantities for applications in technical optics at reasonable cost.
Possible replication in almost 50 different materials for:
-Different material requirements
-Varying wavelengths (for optimum diffraction efficiency)
-Index of refraction (for optimum diffraction efficiency)
-Replication on surfaces of different media
-Different environmental conditions (temperature, humidity)
High precission mass replication on glass substrates.

HOLOEYE Photonics AG is commited to provide superior service in diffractive optics and incorporate this emerging technology into technical systems. Therefore our service includes the conversion of the microoptical element into a ready-to-use optical component. HOLOEYE uses appropriate separating technologies for fused silica wafers as well as for plastic material replicas. The DOE elements will be delivered with the customers' requested shape and size or integrated with an customized mechanical holder.



HOLOEYE **Pioneers in Photonic Technology**

>> DOE Customized Solutions & Systems

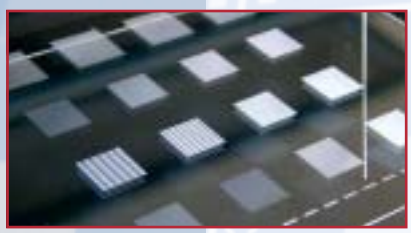


We are ready to support you, and help you move from concept to reality.

System Design & Analysis

Upon costumers request, we may review and discuss the existing or intended optical system in order to determine whether and in which way micro-optical or diffractive optical elements can be used to provide a solution and how they should be incorporated. Theoretical analysis of the systems and simulations can be accompanied by tests at HOLOEYEs optical laboratories taking advantage of the availability of aSLM technology, another main field of HOLOEYEs activities.

[x] DOE Design
[x] DOE Mastering
[x] DOE Replication



Implemenation Support

Upon customers request, we are ready to visit the customers implementation laboratories and provide assistance regarding the actual implementation of the microoptical component into the customers system. We also offer integrated solutions where the optical elements are delivered incorporated into a mount, a holder or other optomechanical component. For complex development efforts, we are able to support you through the iterative design phases that may be required to develop a solution.

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