

## Structured Light DOEs

Complex structured light patterns can be easily obtained by using diffractive optical elements (DOEs)

### FEATURES

- Complex structured light patterns
- High efficiency (Plastic)
- High laser damage threshold (glass)
- Coated elements
- Compact size, light-weight
- High pattern angle

### APPLICATIONS

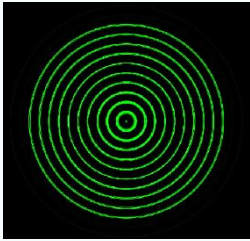
- 3D Mapping / sensing
- Machine Vision
- Volume and movement tracking
- High-End Alignment
- Life Sciences:**
- Confocal Microscopy, Bio-Detection, Flow Cytometry, Spectroscopy

Structured light is a common method in which a known pattern is projected onto an object or a scene, and by measuring the deforming pattern, a vision system can calculate: depth, movement, etc. This technology is applied in the currently widespread 3D mapping/sensing, shape measurements and machine/computer vision. The light patterns can have various: shapes, textures and periods.

### SPECIFICATION RANGE

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

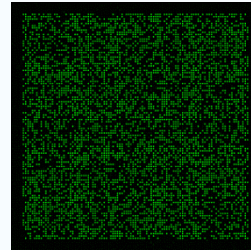
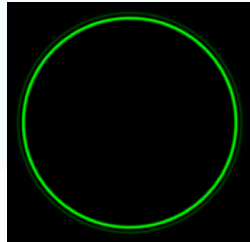
HOLO/OR has the capability to design and manufacture any complex structured light pattern according to customers' requests and applications.



### Single/Multi circle DOE

A Single/Multi circle DOE was recently proved to be the most appropriate light pattern for certain 3D mapping applications, especially with pipe/tube objects. Custom number of circles, periods and

pattern angles can be easily obtained. Center spots could be added to the single circle DOE. This kind of pattern also used for high-end alignment systems specified for round objects.



### Multi spot DOE

Multi spot DOEs are widely used in 3D mapping and volume/movement

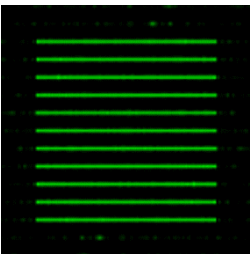
tracking applications. Here the main advantages of a DOE are:

1. Generating a large dot matrix by a very small and light-weight element (the picture on the right shows a random 101x101 MS DOE).
2. Each spot has a random yet stationary (constant with time) intensity. Other common multi spot structures are the high uniformity 15x15 matrices or hexagonal structure matrices where each spot is equally separated from its six neighboring spots.

### Single/Multi line DOE

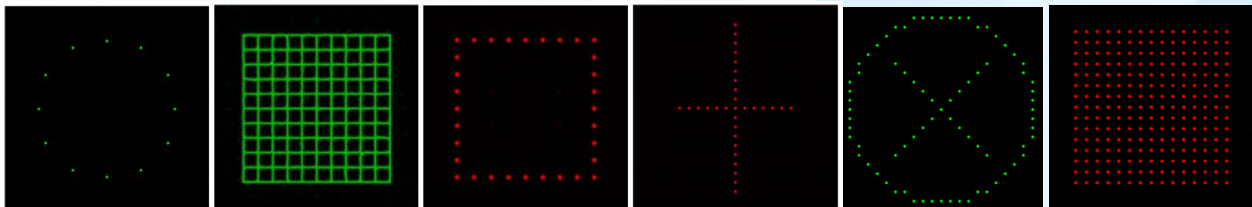
Single line DOE can be combined with a scanning system, whereas multi line DOE is commonly used for 3D

mapping and laser-induced fluorescence applications.



### More options

The pictures below present custom structured light patterns that are used in various applications.



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