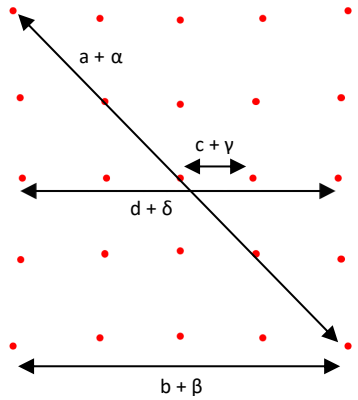
DE 804 Diffractive Optical Element



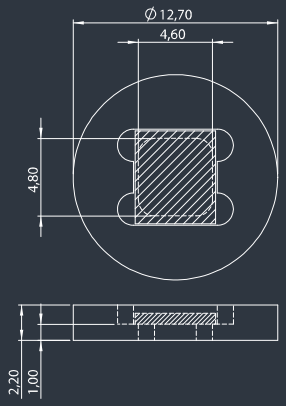
- **Element Number: DE 804**
- **Current Product Revision: A**
- Description: Matrix 5 x 5 Dots
- Number of Dots: 25 Dots
- Substrate Material: Fused Silica
- AR coating on rear side of the substrate: R < 0.5% in the range 600-700 nm
- Substrate Size : 5 mm x 5.75 mm
- Thickness: 0.67 mm
- Design Wavelength: 650 nm
- Recommended Wavelength Range: 630-700 nm
- Typ. Diffraction Efficiency: 75% at design wavelength
- Minimum Recommended Beam Diameter: 0.1 mm

Pattern size and pattern angles and the intensity in the undiffracted central spot ('zero order intensity', see reverse page) will vary most with the wavelength. Within the recommended wavelength range, the zeroth order has a similar power as the off-axis beams of the dot matrix.

Diffraction efficiencies given on this datasheet have been measured using elements of product revision A.

MOUNTED VERSION

For testing or setups under laboratory conditions, we offer a version mounted in a black anodized 12.7 mm aluminum frame for use with standard laboratory holders. For other frame sizes (e.g. 8mm) please contact us at the given contact address.



12.7 mm anodized aluminum lens adapter

COLLIMATED / CONVERGING LASER

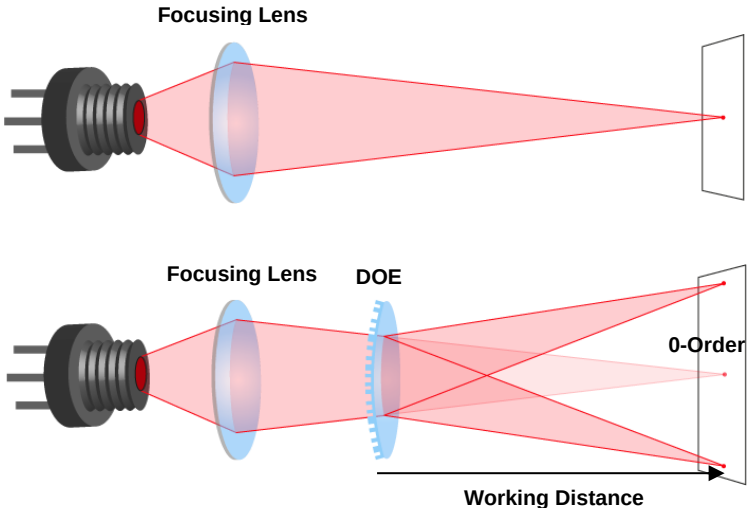
The laser can be collimated for long-range use or converging for a fixed working distance. Please note that the size/thickness of each spot or line depends on the focusing of the laser.

Geometry and Diffraction Angles

Wavelength	Pattern Size @ 100 mm Distance				Pattern Angles			
λ [nm]	a [mm]	b [mm]	c [mm]	d [mm]	α [°]	β [°]	γ [°]	δ [°]
450	52.6	37.2	9.0	36.6	29.5	21.1	5.2	20.7
515	60.9	43.1	10.4	42.1	33.9	24.3	5.9	23.8
532	63.1	44.6	10.7	43.6	35.0	25.2	6.1	24.6
594	71.4	50.5	12.0	48.9	39.3	28.3	6.8	27.5
640	77.7	54.9	12.9	53.0	42.5	30.7	7.4	29.7
650	79.1	55.9	13.1	53.9	43.1	31.2	7.5	30.1
684	83.9	59.3	13.8	56.9	45.5	33.1	7.9	31.8
750	93.7	66.3	15.2	62.9	50.2	36.7	8.6	34.9
808	102.8	72.7	16.4	68.3	54.4	39.9	9.3	37.7

Table 1: Pattern size and pattern angle depending on the wavelength

Setup



Laser diodes are the most common light source to be used with diffractive optical elements, but other laser light sources may also be used.

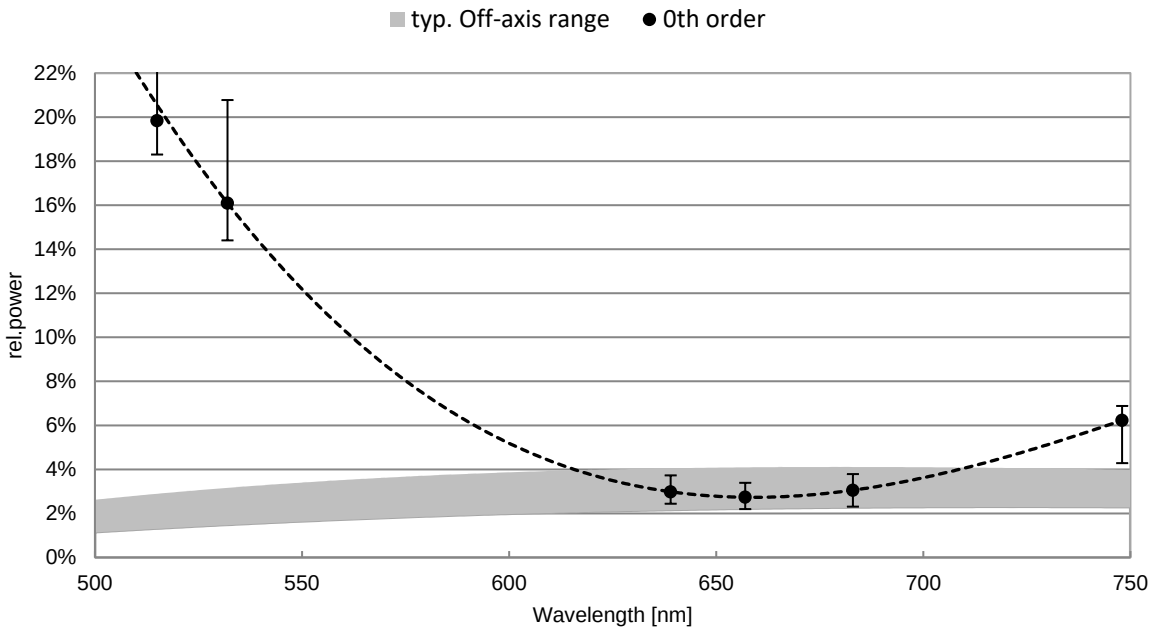
The DOEs are best used with collimated or convergent laser sources. The microstructure surface should be oriented towards the laser.

The 0-order spot is equivalent in size and shape to the original beam, but its power is attenuated.

Diffraction Zero Order Intensity:

Wavelength	Min 0-Order Intensity	Typ. 0-Order Intensity	Max 0-Order Intensity	Min OA Intensity	Typ. OA Intensity	Max OA Intensity
515	18.3%	19.8%	24.7%	1.3%	2.0%	2.8%
532	14.4%	16.1%	20.8%	1.5%	2.2%	3.1%
639	2.4%	3.0%	3.7%	2.2%	2.9%	4.0%
657	2.2%	2.7%	3.4%	2.3%	3.0%	4.0%
683	2.3%	3.1%	3.8%	2.3%	3.0%	4.0%
748	4.3%	6.2%	6.9%	2.3%	3.0%	3.9%

Table 2: Due to the symmetry of the pattern, there is no preferred direction for polarization. OA – desired Off-Axis orders



HOLOEYE Photonics AG
Volmerstr. 1
12489 Berlin, Germany
doe@holoeye.com
www.holoeye.com