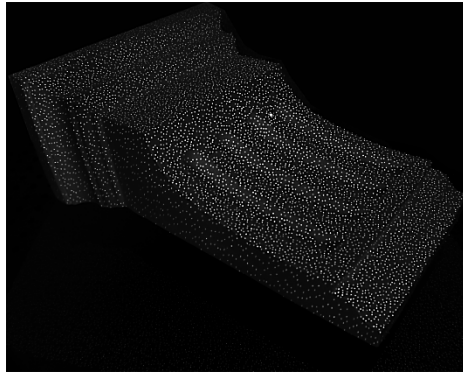


DE-R 375 Diffractive Optical Element

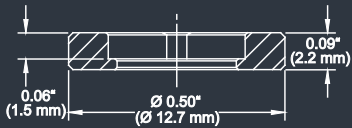


Pattern on wall ornament

- **Element Number: DE-R 375**
- **Current Product Revision: A**
- Description: Pseudo-Random Pattern
- Number of Dots: 29594 Dots
- Substrate Material: Polycarbonate (PC)
- Size (Ø x Thickness): 8 x 1.2 mm
- Minimum Recommended Beam Diameter: 2-3 mm
- Design Wavelength: 830 nm
- Recommended Wavelength Range: 810-850 nm

MOUNTED VERSION

For testing or setups under laboratory conditions we offer a version mounted in 12.7 mm stainless steel frame for use with standard laboratory holders.



COLLIMATED / CONVERGING LASER

The laser can be collimated for long range use or converging for a fixed working distance.

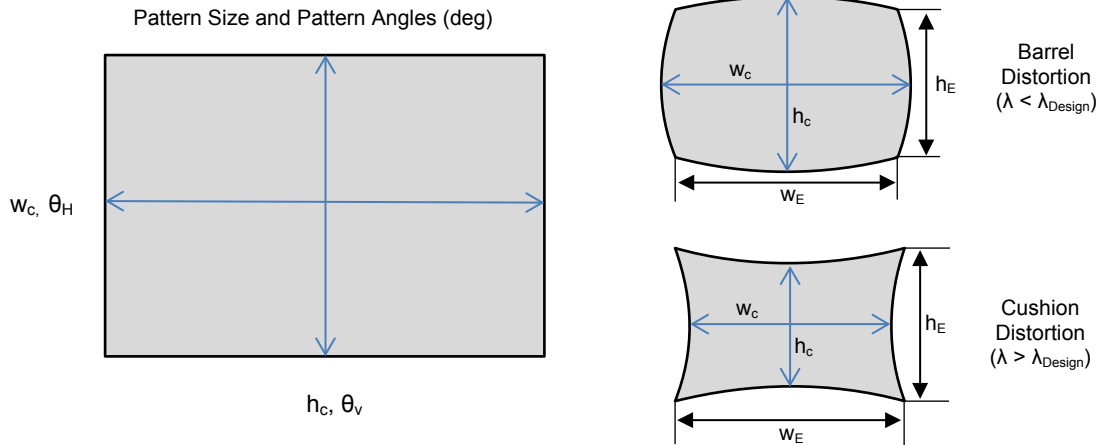
Please note that the size/thickness of each spot or line depends on the focusing of the laser.

When the DOE is used at a wavelength different from the design wavelength, the pattern will scale in size and geometrical distortions may occur (see section 'Geometry and Diffraction Angles ▼'). When the DOE is used at a wavelength within the recommended wavelength range, the element shows the lowest intensity in the central spot (see section 'Zero Order Diffraction Intensity ▼' on reverse page).

Pattern licensed from ixellence GmbH, Author: Ralf Vandenhouten (www.ixellence.com).

For further details about the pattern, see section 'Pattern properties ▼' on reverse page, or please contact doe@holoeye.com.

Geometry and Diffraction Angles



θ_H = horizontal angle, θ_V = vertical angle, h_c = center height, w_c = center width, h_E = edge height, w_E = edge width

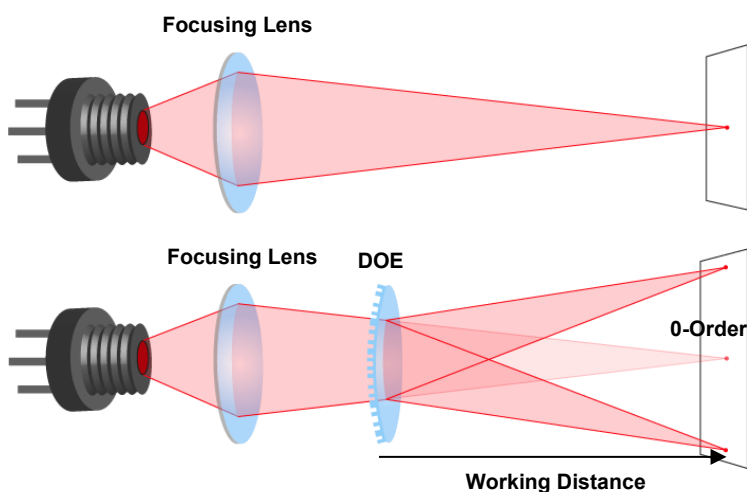
If the DOE is used at laser wavelengths close to the design wavelength ($\Delta\lambda < 50\text{nm}$) the geometrical distortion is usually tolerable (see table below).

Wavelength	Pattern Size @ 100 mm Distance				Ratio corner-to-center		Pattern Angles	
	w_c	h_c	w_E	h_E	Width	Height	θ_H	θ_V
652 nm	87.4 mm	65.9 mm	84.7 mm	62.1 mm	97.0 %	94.3 %	57.2°	36.5°
687 nm	93.1 mm	69.9 mm	90.7 mm	66.5 mm	97.4 %	95.2 %	49.9°	38.5°
752 nm	104 mm	77.4 mm	103 mm	75.2 mm	98.4 %	97.1 %	55.0°	42.3°
801 nm	113 mm	83.3 mm	112 mm	82.4 mm	99.4 %	98.8 %	58.9°	45.2°
825 nm	118 mm	86.3 mm	117 mm	86.1 mm	99.9 %	99.8 %	60.9°	46.7°
846 nm	122 mm	88.9 mm	122 mm	89.5 mm	100.4 %	100.7 %	62.6°	47.9°
893 nm	131 mm	94.9 mm	133 mm	97.7 mm	101.6 %	103.0 %	66.5°	50.8°
923 nm	138 mm	98.9 mm	141 mm	104 mm	102.5 %	104.7 %	69.1°	52.6°
980 nm	151 mm	107 mm	158 mm	116 mm	104.6 %	108.4 %	74.0°	56.1°

Pattern properties

Ixellence Pseudo-Random base tile (PSM)	'Van4'
Tile Grid Size (X * Y)	211 x 97
Spot number in base tile	2282
Corresponding spot density	11.1%
Uniqueness window size (X * Y)	7 x 7
Total Pattern (with repetitions)	
Base Tile Repetitions (X * Y)	2.85 x 4.55
Total Pattern Grid Size (X * Y)	601 x 441
Aspect Ratio	1.36 (4:3)
Total spot number	29594

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.

Zero Order Diffraction Intensity

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

Wavelength	0-Order Intensity
652 nm	10.0%
687 nm	6.2%
752 nm	1.6%
801 nm	0.2%
825 nm	0.1%
846 nm	0.3%
893 nm	1.3%
923 nm	2.3%
980 nm	4.6%

