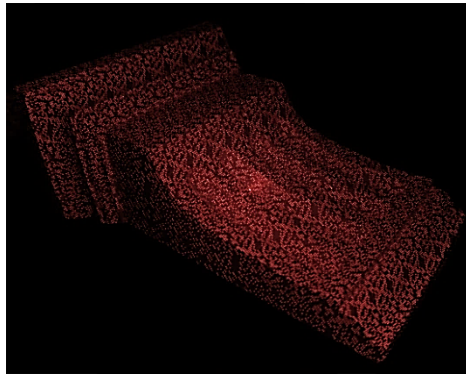


DE-R 335 Diffractive Optical Element

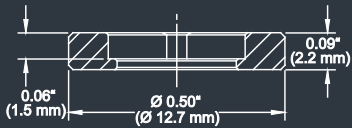


Pattern on wall ornament

- **Element Number: DE-R 335**
- **Current Product Revision: A**
- Description: Pseudo-Random Pattern
- Number of Dots: 33000 Dots
- Substrate Material: Polycarbonate (PC)
- Size (Ø x Thickness): 8 x 1.2 mm
- Minimum Recommended Beam Diameter: 2-3 mm
- Design Wavelength: 645 nm
- Recommended Wavelength Range: 630-660 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.

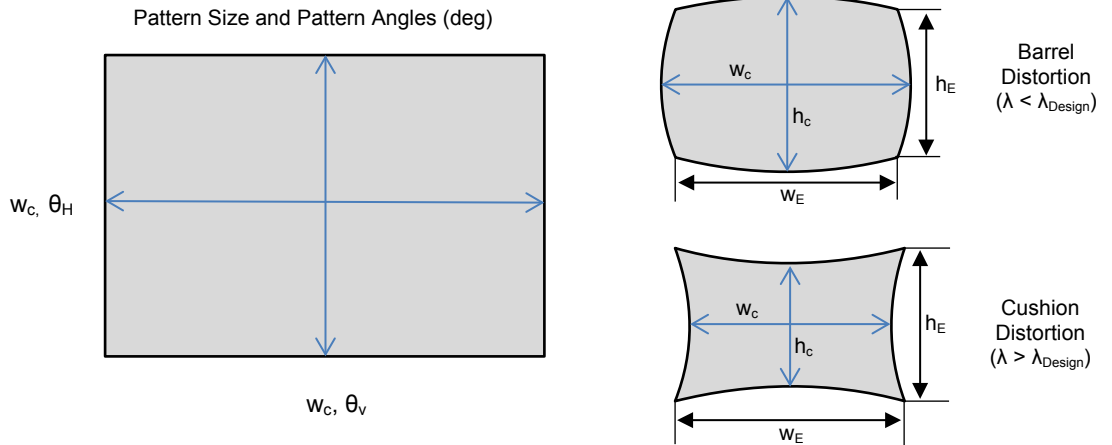
Please note that the size/thickness of each spot or line depends on the focusing of the laser.

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

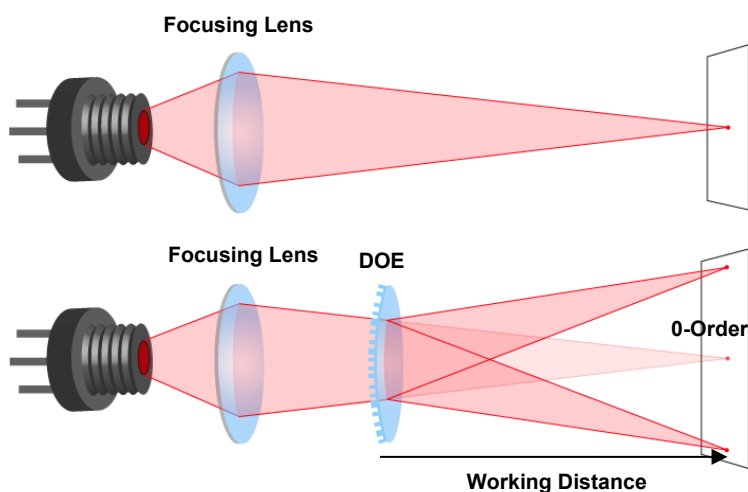
If the DOE is used at laser wavelengths close to the design wavelength ($\Delta\lambda < 50\text{nm}$) the geometrical distortion is usually tolerable (see table below).

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
516 nm	66.7 mm	44.5 mm	64.9 mm	43.2 mm	98.7 %	97.0 %	36.4°	25.1°
594 nm	77.0 mm	51.7 mm	76.6 mm	51.0 mm	99.4 %	98.7 %	42.1°	29.0°
638 nm	83.7 mm	55.8 mm	83.6 mm	55.7 mm	99.9 %	99.8 %	45.4°	31.2°
654 nm	86.2 mm	57.3 mm	86.6 mm	57.4 mm	100.1 %	100.3 %	46.6°	32.0°
687 nm	91.4 mm	60.4 mm	91.9 mm	61.2 mm	100.6 %	101.2 %	49.1°	33.6°
751 nm	102 mm	66.7 mm	104 mm	69.0 mm	101.5 %	103.5 %	54.1°	36.9°
800 nm	111 mm	71.5 mm	113 mm	75.5 mm	102.5 %	105.5 %	57.9°	39.4°
826 nm	115 mm	74.2 mm	119 mm	79.1 mm	103.0 %	106.7 %	60.0°	40.7°
847 nm	119 mm	76.3 mm	124 mm	82.2 mm	103.5 %	107.7 %	61.7°	41.8°

Pattern properties

Ixellence Pseudo-Random base tile (PSM)	'Van2'
Tile Grid Size (X * Y)	126 x 28
Spot number in base tile	440
Corresponding spot density	12.5%
Uniqueness window size (X * Y)	8 x 8
Total Pattern (with repetitions)	
Base Tile Repetitions (X * Y)	5 x 15
Total Pattern Grid Size (X * Y)	629 x 419
Aspect Ratio	1.5 (3:2)
Total spot number	33000

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
516 nm	12.2%
594 nm	1.3%
638 nm	0.1%
654 nm	0.3%
687 nm	1.4%
751 nm	5.3%
800 nm	9.0%
826 nm	11.5%
847 nm	13.2%

