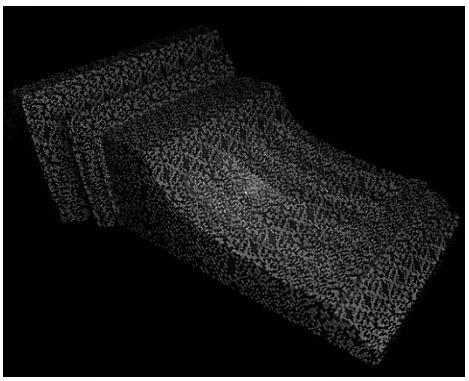
DE-R 332 Diffractive Optical Element



Pattern on wall ornament

- **Element Number: DE-R 332**
- **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: 830 nm
- Recommended Wavelength Range: 820-850 nm

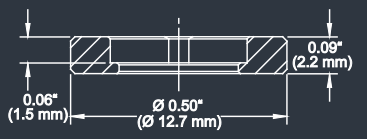
When the DOE is used at a wavelength different from the design wavelength, the pattern will scale in size and geometrical distortions may occur (see section 'Geometry and Diffraction Angles▼'). When the DOE is used at a wavelength within the recommended wavelength range, the element shows the lowest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

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.

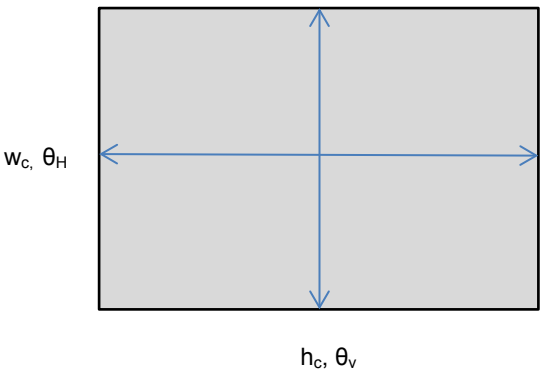


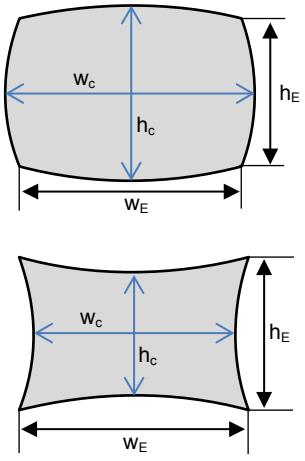
COLLIMATED / CONVERGING LASER

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.

Geometry and Diffraction Angles

Pattern Size and Pattern Angles (deg)





θ_H= horizontal angle, θ_V= vertical angle, h_C= center height, w_C= center width, h_E= edge height, w_E= edge width

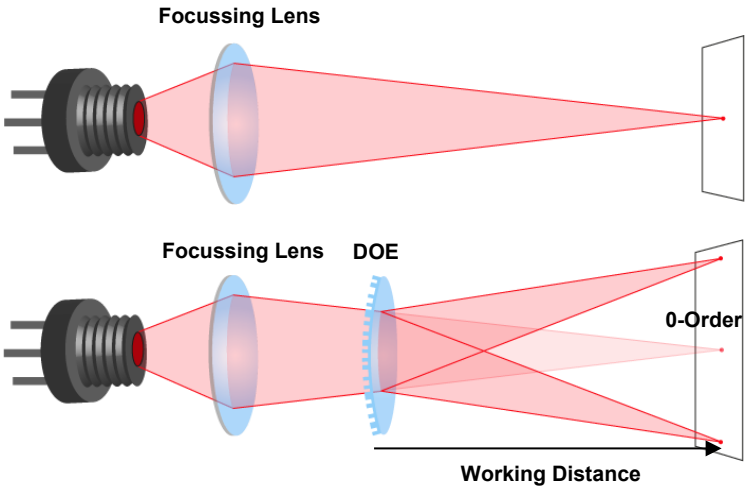
If the DOE is used at laser wavelengths close to the design wavelength ($\Delta\lambda$ < 50nm) the geometrical distortion is usually tolerable (see table below).

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
654 nm	85.2 mm	58.5 mm	83.1 mm	55.3 mm	97.6 %	94.6 %	46.1°	32.6°
687 nm	90.3 mm	61.7 mm	88.5 mm	58.9 mm	98.0 %	95.4 %	48.6°	34.3°
751 nm	101 mm	68.1 mm	99.5 mm	66.2 mm	98.8 %	97.2 %	53.5°	37.6°
826 nm	114 mm	75.9 mm	114 mm	75.7 mm	99.9 %	99.8 %	59.3°	41.5°
847 nm	118 mm	78.1 mm	118 mm	78.6 mm	100.3 %	100.7 %	61.0°	42.7°
893 nm	127 mm	83.0 mm	128 mm	85.3 mm	101.2 %	102.8 %	64.7°	45.1°
923 nm	133 mm	86.3 mm	135 mm	90.0 mm	101.9 %	104.3 %	67.1°	46.7°
980 nm	145 mm	92.8 mm	150 mm	99.9 mm	103.5 %	107.7 %	71.9°	49.8°

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.

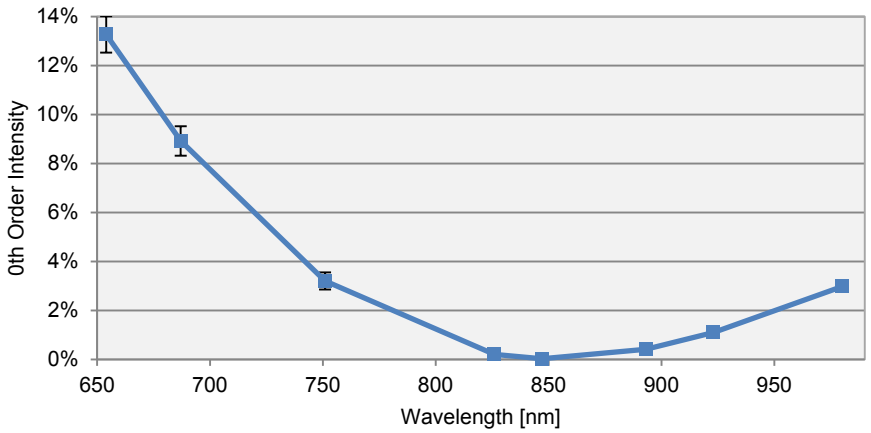
The DOEs are best with collimated or convergent laser sources. The microstructure surface should be oriented towards the laser.

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
654 nm	13.3%
687 nm	8.9%
751 nm	3.2%
826 nm	0.2%
847 nm	0.03%
893 nm	0.4%
923 nm	1.1%
980 nm	3.0%



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

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