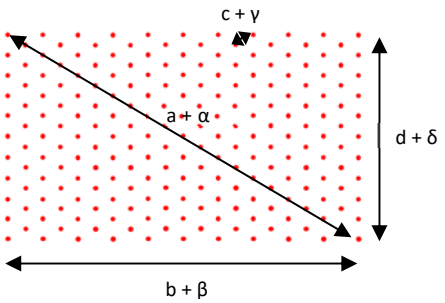
DE-R 396 Diffractive Optical Element



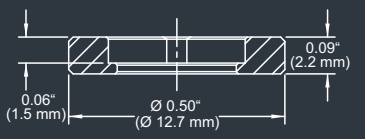
- **Element Number: DE-R 396**
- **Current Product Revision: A**
- Description: 21 x 11 Hexagonal Array
- Number of Dots: 221 Dots
- Substrate Material: Polycarbonate (PC)
- Size (Ø x Thickness): 8 x 0.63 mm
- Design Wavelengths: 660 nm
- Recommended Wavelength Range: 600-730 nm
- Minimum Recommended Beam Diameter: 2-3 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 than 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 12.7 mm stainless steel frame for use with standard laboratory holders.



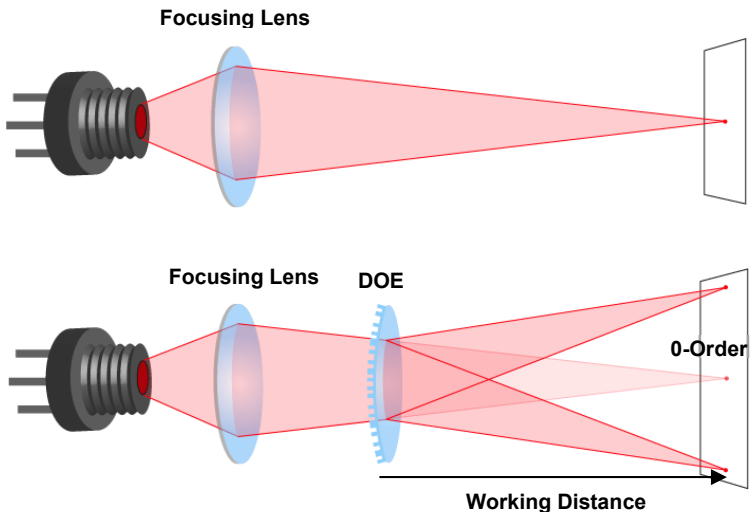
COLLIMATED / CONVERGING LASER

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

Wavelength	Pattern Size @ 100 mm Distance				Pattern Angles			
	a	b	c	d	α	β	γ	δ
450 nm	46.6 mm	40.3 mm	2.3 mm	23.3 mm	26.2°	22.8°	1.3°	13.3°
520 nm	54.3 mm	47.0 mm	2.7 mm	27.1 mm	30.4°	26.5°	1.5°	15.5°
594 nm	62.7 mm	54.3 mm	3.1 mm	31.4 mm	34.8°	30.4°	1.8°	17.8°
640 nm	68.1 mm	59.0 mm	3.4 mm	34.1 mm	37.6°	32.9°	1.9°	19.3°
660 nm	**70.5 mm**	**61.1 mm**	**3.5 mm**	**35.3 mm**	**38.8°**	**34.0°**	**2.0°**	**20.0°**
684 nm	73.4 mm	63.6 mm	3.7 mm	36.7 mm	40.3°	35.3°	2.1°	20.8°
750 nm	81.6 mm	70.7 mm	4.1 mm	40.8 mm	44.4°	38.9°	2.3°	23.1°
800 nm	88.1 mm	76.3 mm	4.4 mm	44.0 mm	47.5°	41.8°	2.5°	24.8°

Setup



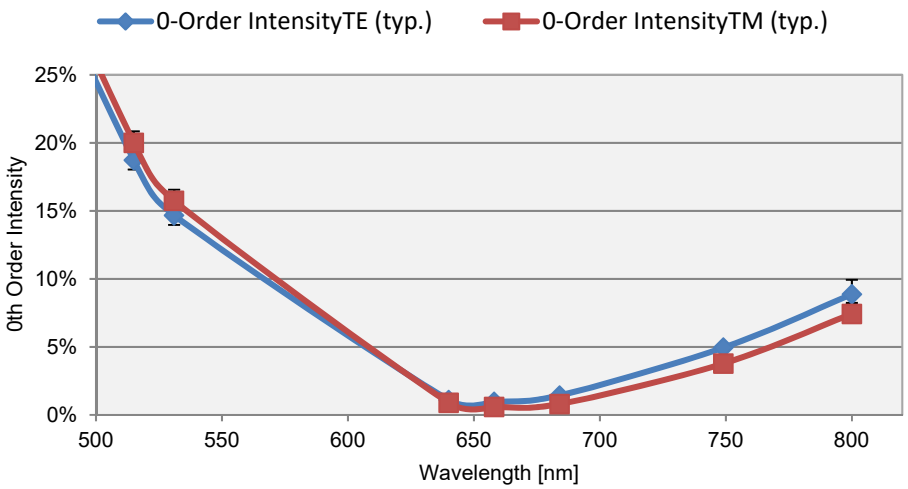
Laser diodes are the most common light source to be used with diffractive optical elements, but other laser light sources may also be used.

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	0-Order Intensity TM (min)	0-Order Intensity TM (typ.)	0-Order Intensity TM (max)	0-Order IntensityTE (min)	0-Order IntensityTE (typ.)	0-Order IntensityTE (max)
447 nm	46.8%	47.5%	48.3%	45.0%	45.7%	46.4%
515 nm	19.3%	20.0%	20.9%	18.0%	18.7%	19.6%
531 nm	15.1%	15.8%	16.6%	14.0%	14.7%	15.6%
640 nm	0.7%	0.9%	1.1%	0.9%	1.1%	1.3%
658 nm	0.5%	0.6%	0.7%	0.8%	1.0%	1.1%
684 nm	0.7%	0.8%	0.8%	1.4%	1.4%	1.5%
749 nm	3.7%	3.8%	3.9%	4.8%	5.0%	5.1%
800 nm	7.3%	7.4%	7.9%	8.2%	8.9%	9.9%



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