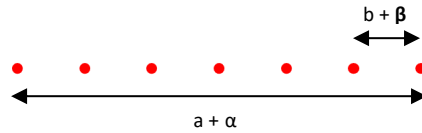


DE 802 Diffractive Optical Element

- **Element Number:** DE 802
- **Current Product Revision:** A
- Description: 1 : 7 Dot Line
- 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: 640 nm
- Recommended Wavelength Range: 630-760 nm
- Typ. Diffraction Efficiency: 76% at design wavelength
- Minimum Recommended Beam Diameter: 0.3 mm



Within the recommended wavelength range, the zeroth order has a similar power as the off-axis beams of the dot line. Spot spacing and angular separation, and the ratio between central spot and off-axis spots ('zero order intensity', see reverse page) will vary most with the wavelength.

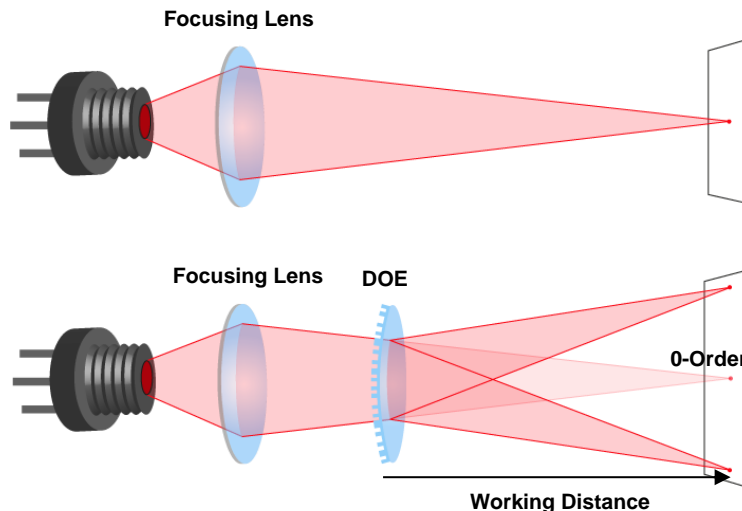
Diffraction efficiencies given on this datasheet have been measured using elements of product revision A.

Line Geometry and Diffraction Angles

Wavelength	Pattern Size @ 100 mm Distance		Pattern Angles	
λ [nm]	a [mm]	b [mm]	α [°]	β [°]
450	9.0	1.5	5.2	0.86
515	10.3	1.7	5.9	0.98
532	10.7	1.8	6.1	1.02
594	11.9	2.0	6.8	1.14
640	12.8	2.1	7.3	1.22
650	13.0	2.2	7.5	1.24
730	15.0	2.5	8.6	1.43
808	16.2	2.7	9.3	1.54

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

Setup



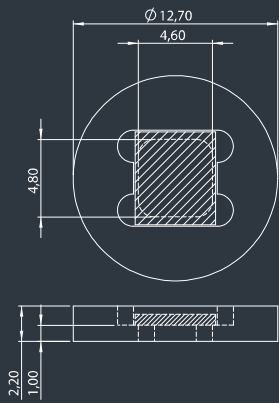
Laser diodes are the most common light source to be used with diffractive optical elements, but other laser light sources may also be used.

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.

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.

Diffraction Zero Order Intensity:

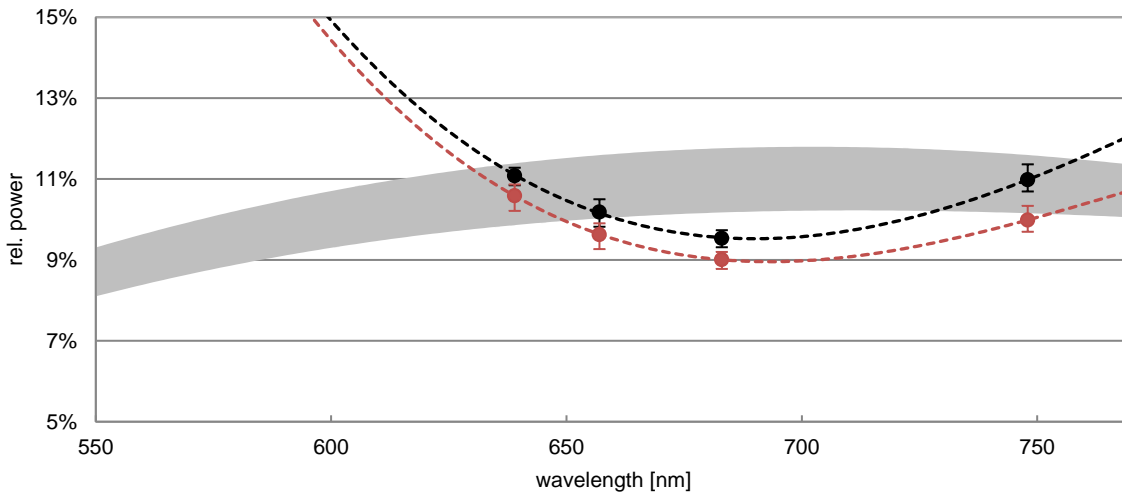
Wavelength	Min 0-Order Intensity	Typ. 0-Order Intensity	Max 0-Order Intensity	Min OA Intensity	Typ. OA Intensity	Max OA Intensity
515	32.3%	33.0%	33.6%	6.7%	7.3%	7.9%
532	28.1%	28.8%	29.8%	7.5%	8.1%	8.6%
639	10.8%	11.1%	11.3%	10.1%	10.8%	11.4%
657	9.8%	10.2%	10.5%	10.0%	10.8%	11.5%
683	9.3%	9.5%	9.7%	10.1%	11.1%	12.1%
748	10.7%	11.0%	11.4%	10.1%	10.8%	11.3%

Table 2: At the recommended polarization state, the electric field is parallel to the grid lines and the generated (dot) line. OA – desired Off-Axis orders

Wavelength	Min 0-Order Intensity	Typ. 0-Order Intensity	Max 0-Order Intensity	Min OA Intensity	Typ. OA Intensity	Max OA Intensity
515	32.8%	33.3%	34.0%	6.9%	7.4%	7.9%
532	27.8%	28.8%	30.1%	7.5%	8.0%	8.6%
639	10.2%	10.6%	10.9%	10.3%	10.8%	11.2%
657	9.3%	9.6%	9.9%	10.4%	11.0%	11.4%
683	8.8%	9.0%	9.2%	10.5%	11.0%	11.7%
748	9.7%	10.0%	10.3%	10.4%	10.9%	11.3%

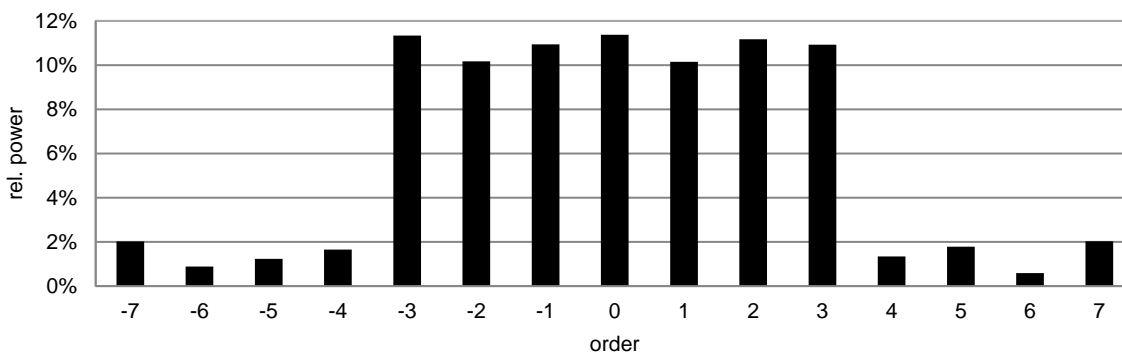
Table 2: At the opposite polarization state, the electric field is perpendicular to the grid lines and the generated (dot) line. OA – desired Off-Axis orders

■ typ. Off-axis range ● 0th order recommended polarization state ● 0th order opposite polarization stage



Line Power Profile

off-axis orders at 639nm (recommended polarization state)



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