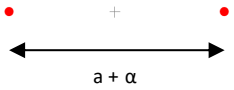
DE 801 Diffractive Optical Element

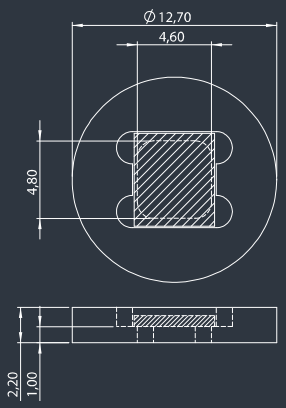


- **Element Number: DE 801**
- **Current Product Revision: A**
- Description: 1 : 2 Beam Splitter
- Substrate Material: Fused Silica
- AR coating on rear side of the substrate: R < 0.5% at recommended wavelength range
- Substrate Size: 5 mm x 5.75 mm
- Thickness: 0.67 mm
- Design Wavelength: 660 nm
- Recommended Wavelength Range: 630-700 nm
- Typ. Diffraction Efficiency: 79% at design wavelength
- Minimum Recommended Beam Diameter: 0.1 mm

Within the recommended wavelength range, the zeroth order has a significant lower power than 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. *In the wavelength range from 490nm to 515nm the element can theoretically be used as a 1:3 beam splitter with a reduced efficiency of about 73%.* 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 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

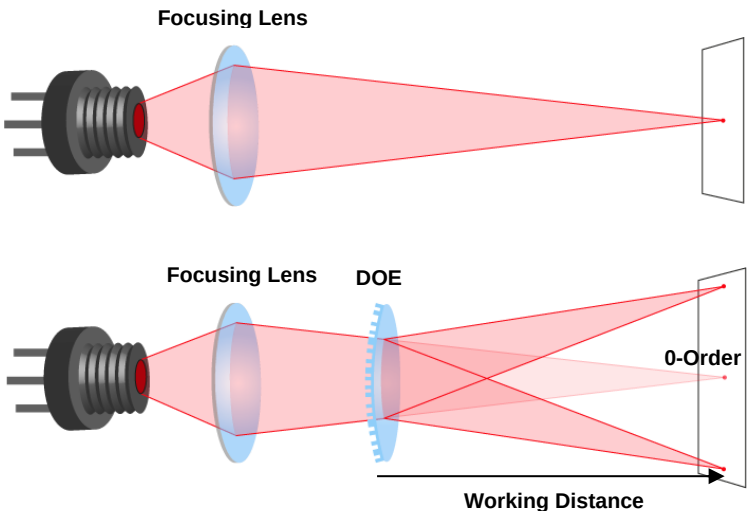
The laser can be collimated for long-range use or converging for a fixed working distance. Please note that the size/thickness of each spot or line depends on the focusing of the laser.

Line Geometry and Diffraction Angles

Wavelength	Pattern Size @ 100 mm Distance	Pattern Angles
λ [nm]	**a [mm]**	**α [°]**
515	34.9	19.8
532	36.0	20.4
635	43.3	24.4
650	44.4	25.0
660	**45.1**	**25.4**
750	51.6	29.0
808	55.9	31.2

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.

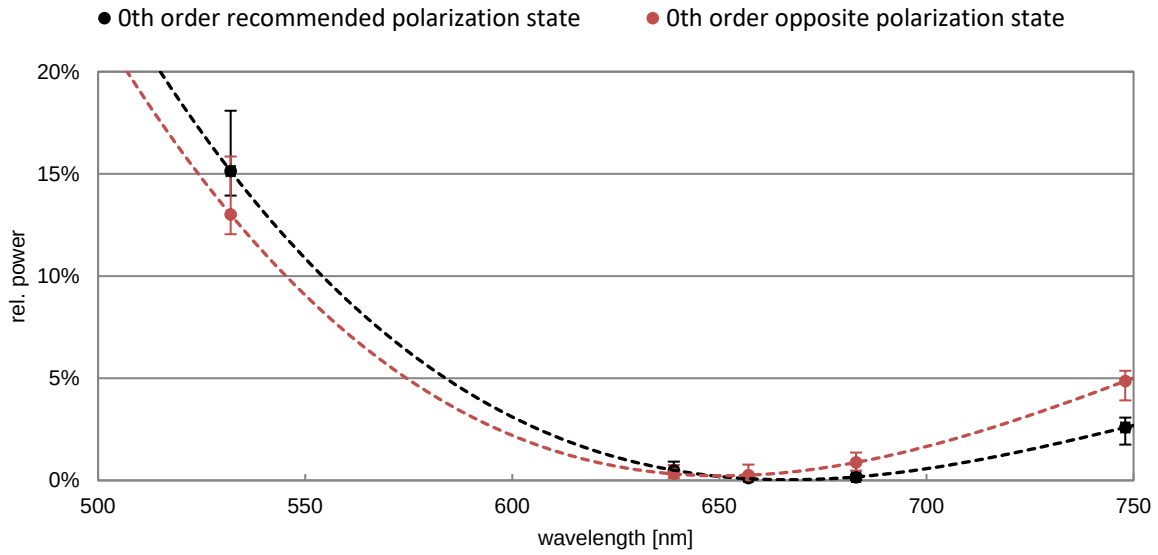
Diffraction Zero Order Intensity:

Wavelength	Min 0-Order Intensity	Typ. 0-Order Intensity	Max 0-Order Intensity	Min OA Intensity	Typ. OA Intensity	Max OA Intensity
515	18.2%	19.3%	22.2%	25.3%	26.4%	27.2%
532	13.9%	15.1%	18.1%	27.9%	29.3%	30.2%
639	0.3%	0.5%	0.9%	38.1%	38.3%	38.6%
657	0.04%	0.1%	0.3%	38.3%	39.2%	40.0%
683	0.01%	0.2%	0.3%	38.5%	39.1%	39.9%
748	1.8%	2.6%	3.1%	38.5%	38.9%	39.2%

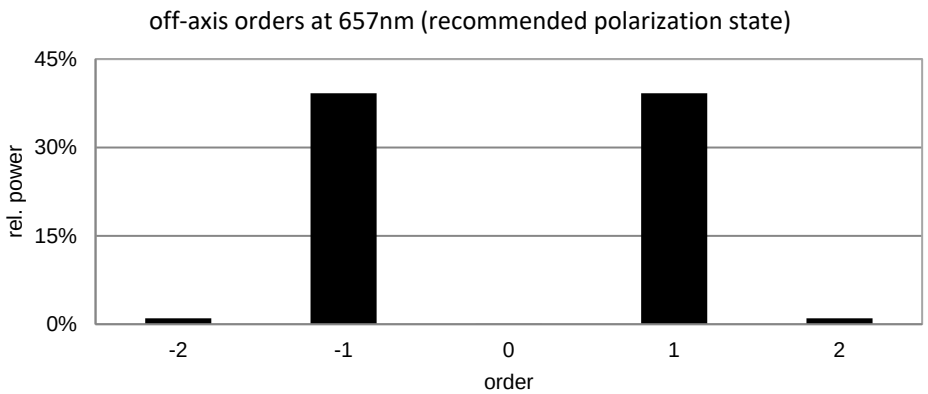
Table 2: At the recommended polarization state, the electric field is perpendicular to the grid lines and the generated (dot) line. OA – Off-Axis order (±1)

Wavelength	Min 0-Order Intensity	Typ. 0-Order Intensity	Max 0-Order Intensity	Min OA Intensity	Typ. OA Intensity	Max OA Intensity
515	16.4%	17.5%	20.1%	25.9%	27.0%	27.9%
532	12.0%	13.0%	15.9%	28.6%	29.6%	30.2%
639	0.1%	0.3%	0.8%	38.2%	38.6%	39.1%
657	0.1%	0.3%	0.8%	38.6%	39.0%	39.3%
683	0.5%	0.9%	1.4%	38.2%	38.7%	39.1%
748	3.9%	4.9%	5.4%	37.3%	37.7%	38.1%

Table 3: At the opposite polarization state, the electric field is parallel to the grid lines and the generated (dot) line. OA – Off-Axis order (±1)



Line Power Profile



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