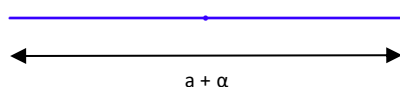


DE-R 199 Diffractive Optical Element

- **Element Number: DE-R 199**
- **Current Product Revision: B**
- Description: Quasi Continuous Line - 45
- Number of Spots on Line: 1375
- Substrate Material: Polycarbonate (PC)
- Size (\varnothing x Thickness): 8 x 0.60 mm
- Design Wavelengths: 450 nm
- Recommended Wavelength Range: 420-480 nm
- Minimum Recommended Beam Diameter: 2 mm



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.

At the design wavelength, the zeroth order (Z0) is not brighter than the rest of the line. Within the recommended wavelength range, the zeroth order is defined with $Z0 \leq 2\%$. Line width and line angle and the intensity in the undiffracted central spot ('zero order intensity', see reverse page) will vary most with the wavelength.

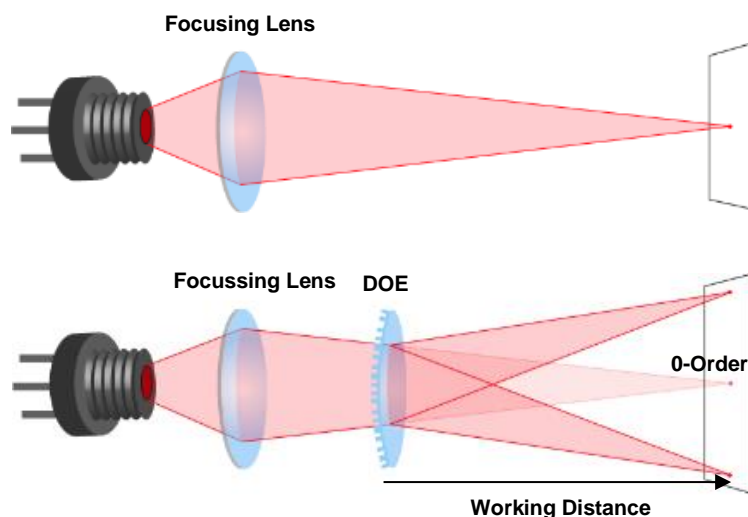
Diffraction efficiencies given on this datasheet have been measured using elements of product revision B.

Pattern Geometry and Diffraction Angles

Wavelength	Line Width @ 100 mm Distance	Spot spacing next to center @ 100 mm Distance	Spot spacing next to line end @ 100 mm Distance	Pattern Angle
λ [nm]	a [mm]	[μ m]	[μ m]	α [°]
405	74	51	61	41
450	84	56	72	45
520	100	65	91	53
532	103	67	94	54
594	119	74	117	61
640	132	80	137	67
660	138	83	147	69

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.

Zero Order Diffraction Intensity

Wavelength [nm]	Typ. 0-Order Intensity ¹	Typ. 0-Order Intensity ²
403	4.0%	10.1%
447	0.5%	1.6%
515	6.0%	2.0%
638	23.7%	16.1%

Table 2: ¹ Recommended polarization state (electric field parallel to the generated line)
² Opposite polarization state (electric field perpendicular to the generated line)

● 0th order recommended polarization state ● 0th order opposite polarization state

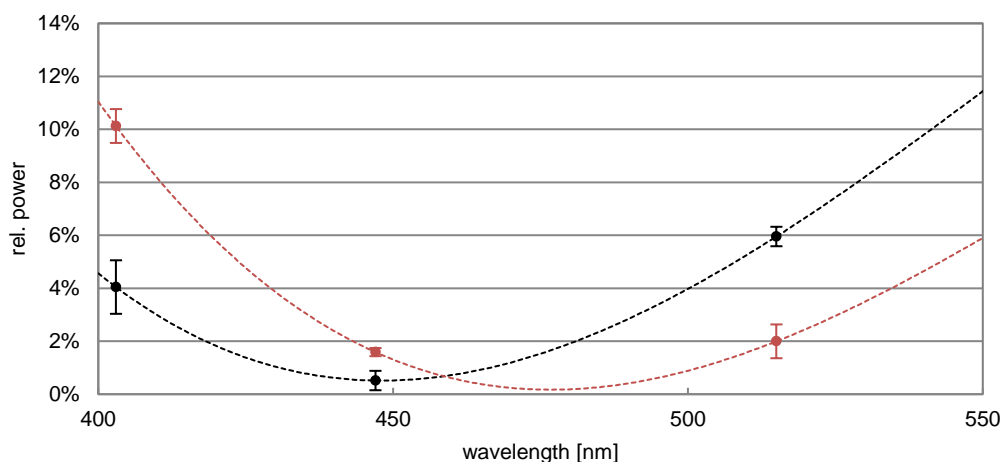


Figure 1: The error indicators represent the interval of $\pm 2\sigma$.

Power Profile

DE-R 199 Rev. B @450nm

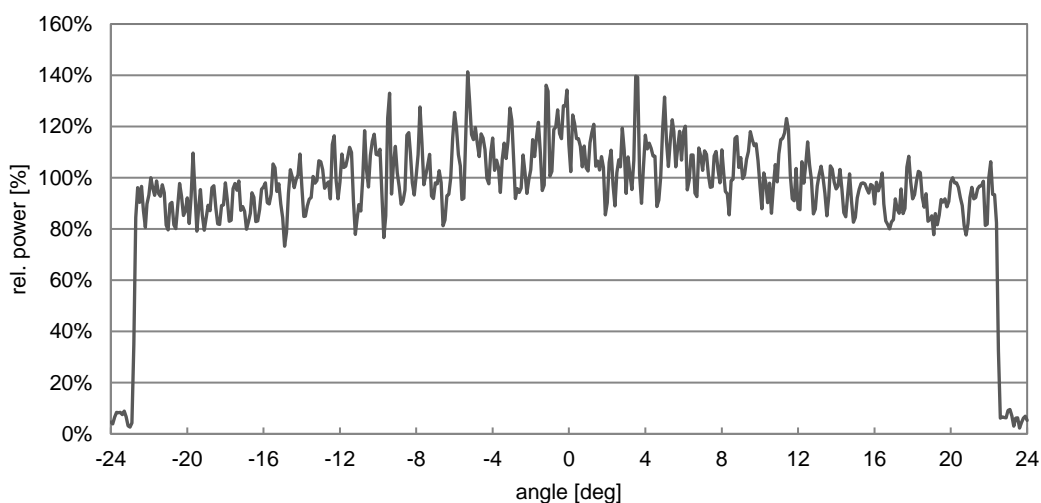


Figure 2: Line scan performed at recommended polarization state with a working distance of 1m, an angular increment of 0.1deg and a 4mm aperture in front of the detector.