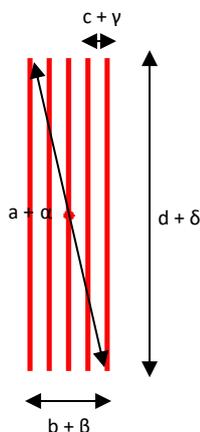


DE-R 250 Diffractive Optical Element



- **Element number: DE-R 250**
- **Current product revision: C**
- Description: 5 lines (rectangular)
- Substrate material: Polycarbonate (PC)
- Size (Ø x thickness): 8 mm x 1.2 mm
- Design wavelength: 660 nm
- Recommended wavelength range: 610-680 nm *
- Minimum recommended beam diameter: 2.5-3 mm

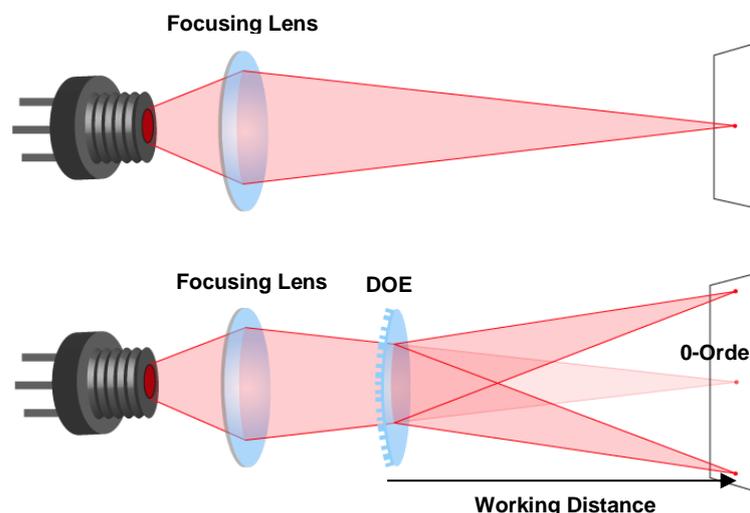
Within the recommended wavelength range, the element shows the lowest intensity in the zeroth order Z0 / central spot. This large-angle pattern is subject to geometrical distortion due to its symmetry properties, if the DOE is used at laser wavelengths significantly different ($\Delta\lambda > 50\text{nm}$) from the design wavelength. Pattern size and pattern angles as well as the ratio between central spot / zeroth order ('zero order intensity', see reverse page) and the spots on the lines will vary most with the wavelength.

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

Pattern geometry and diffraction angles

Wavelength λ [nm]	Pattern size @ 100 mm distance				Pattern angles			
	a [mm]	b [mm]	c [mm]	d [mm]	α [°]	β [°]	γ [°]	δ [°]
450	36.8	7.4	1.9	36.1	20.8	4.2	1.1	20.5
515	42.3	8.5	2.1	41.5	23.9	4.9	1.2	23.4
532	43.8	8.8	2.2	42.9	24.7	5.0	1.3	24.2
640	53.2	10.6	2.6	52.2	29.8	6.0	1.5	29.3
660	55.0	10.9	2.7	53.9	30.8	6.2	1.6	30.2
750	63.2	12.4	3.1	62.0	35.1	7.1	1.8	34.4
808	68.7	13.3	3.3	67.3	37.9	7.6	1.9	37.2

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.

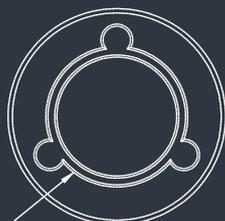
The DOEs are best used with collimated or convergent laser sources. The microstructure surface should be oriented towards the laser.

The 0-order spot is equivalent in size and shape to the original beam, but its power is attenuated.

*the recommended wavelength range is defined with $Z0 \leq 1.5\%$

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

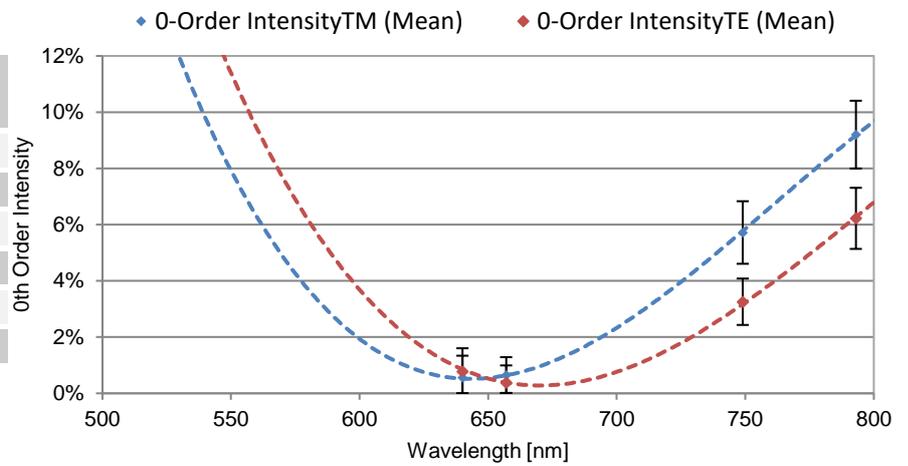
The laser can be collimated for long range use or converging for a fixed working distance.

Please note that the size/thickness of each spot or line depends on the focusing of the laser.

Zero order intensity:

Wavelength [nm]	Mean 0-Order Intensity TM [%]	Mean 0-Order Intensity TE [%]
447	40.9%	46.5%
515	15.6%	20.2%
640	0.6%	0.8%
657	0.7%	0.4%
749	5.7%	3.3%
793	9.2%	6.2%

TM – E-field parallel to longer pattern side
TE – E-field perpendicular to longer pattern side



The interval of deviation for the mean values corresponds to 2σ .