DE 842 Diffractive Optical Element

c + γ

a + α

d + δ

b + β
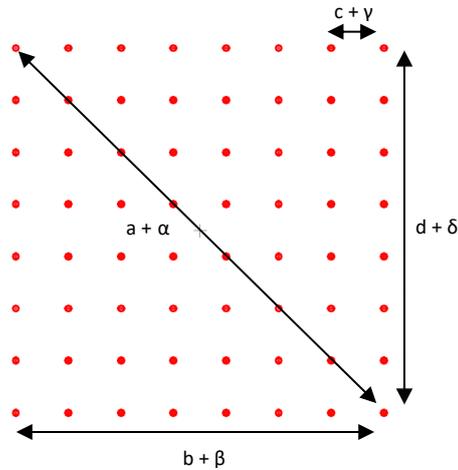
- **Element number: DE 842**
- **Product revision: A**
- Description: matrix 8 x 8 dots
- Substrate material: fused silica
- AR coating on both sides of the substrate: R < 0.5% within recommended wavelength range
- Substrate size: 15.0 mm x 14.1 mm
- Thickness: 2.3 mm
- Design wavelength: 532 nm
- Recommended wavelength range: 500 nm - 540 nm *
- Typ. diffraction efficiency: 78% at design wavelength
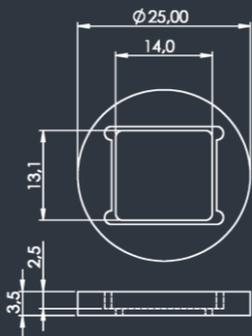
Within the recommended wavelength range, the zeroth order has a significant lower power than the desired diffraction orders of the dot matrix. Pattern size and pattern angles, and the ratio between central spot / zeroth order and desired orders will vary most with the wavelength. Diffraction efficiencies given on this datasheet have been measured using elements of product revision A.

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 angles & efficiencies

Wavelength	Pattern Size @ 100 mm Distance				Pattern Angles			
λ [nm]	a [mm]	b [mm]	c [mm]	d [mm]	α [°]	β [°]	γ [°]	δ [°]
488	6.3	4.5	0.64	4.5	3.6	2.6	0.37	2.6
515	6.7	4.7	0.67	4.7	3.8	2.7	0.39	2.7
532	6.9	4.9	0.70	4.9	4.0	2.8	0.40	2.8

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

Orders at 532nm
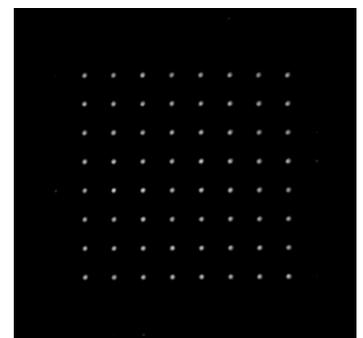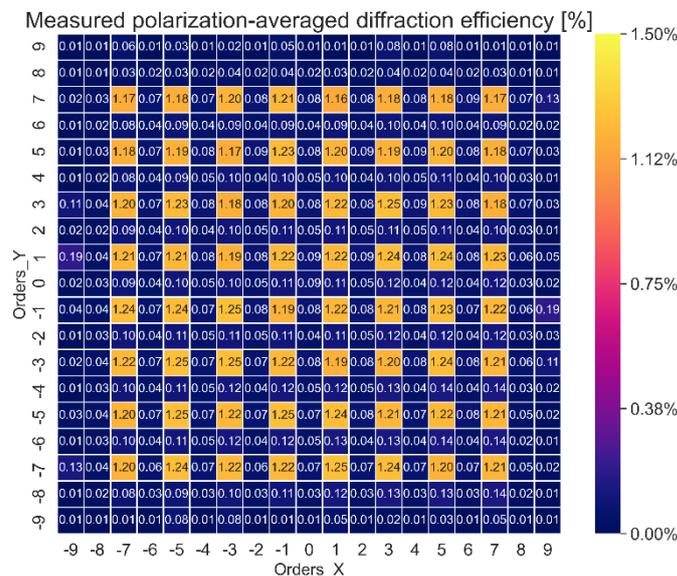
Upper image: pattern recorded by camera

Left image: Efficiencies measured by sensor

*the recommended wavelength range is defined with Z0≤0.5%

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