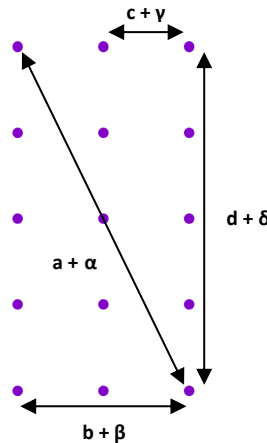


# DE 870 Diffractive Optical Element



- **Element number: DE 870**
- **Product revision: A**
- Description: matrix 3 x 5 dots
- Substrate material: fused silica
- AR coating on both sides of the substrate: R < 0.5% within recommended wavelength range
- Substrate size: 9.95 mm x 9.35 mm
- Thickness: 0.725 mm
- Design wavelength: 405 nm
- Recommended wavelength range: 400 - 410 nm \*
- Typ. diffraction efficiency: 78% at design wavelength

Within the recommended wavelength range, the central spot / zeroth order (Z0) is of the same order of magnitude as the desired off-axis 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 zeroth order spot is equivalent in size and shape to the original beam, but its power is attenuated.

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

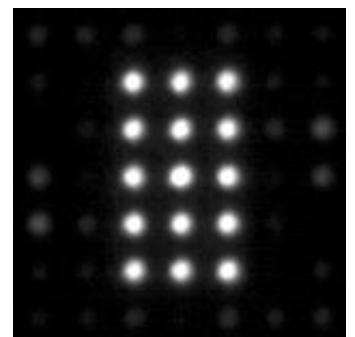
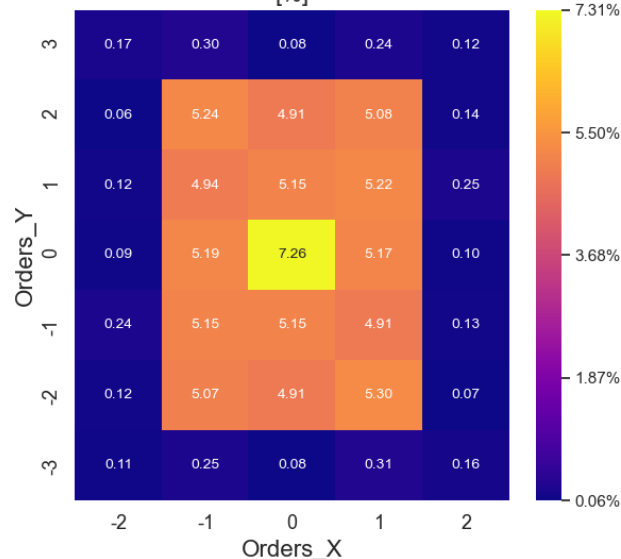
## Diffraction angles & efficiencies

Wavelength	Pattern Size @ 100 mm Distance				Pattern Angles			
$\lambda$ [nm]	a [mm]	b [mm]	c [mm]	d [mm]	$\alpha$ [°]	$\beta$ [°]	$\gamma$ [°]	$\delta$ [°]
375	4.2	1.9	0.93	3.7	2.4	1.1	0.53	2.1
<b>405</b>	<b>4.5</b>	<b>2.0</b>	<b>1.00</b>	<b>4.0</b>	<b>2.6</b>	<b>1.1</b>	<b>0.57</b>	<b>2.3</b>
450	5.0	2.2	1.11	4.5	2.9	1.3	0.64	2.6

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

Orders at 405nm

Measured polarization-averaged diffraction efficiency [%]



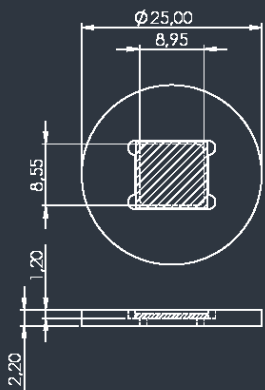
Upper image: pattern recorded by camera

Left image: Efficiencies measured by sensor

\*within the recommended wavelength range the zeroth order is  $7.0\% \leq Z0 \leq 7.5\%$

### MOUNTED VERSION

For testing or setups under laboratory conditions, we offer a version mounted in a black anodized 25 mm aluminum frame for use with standard laboratory holders.



25 mm anodized aluminum mount with 8.95 x 8.55 mm clear aperture

### 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.