

# Wuxi OptonTech Ltd

Wuxi OptonTech Ltd. specializes in diffractive optical elements (DOEs) and computer generated holograms (CGHs) for beam shaping, beam splitting and beam homogenizing (diffusing). We design and provide standard and custom DOEs and CGHs for high-performance laser and LED applications at competitive prices. We address the market needs high precision (virtually *zero reconstruction error* within the signal window) and high efficiency.

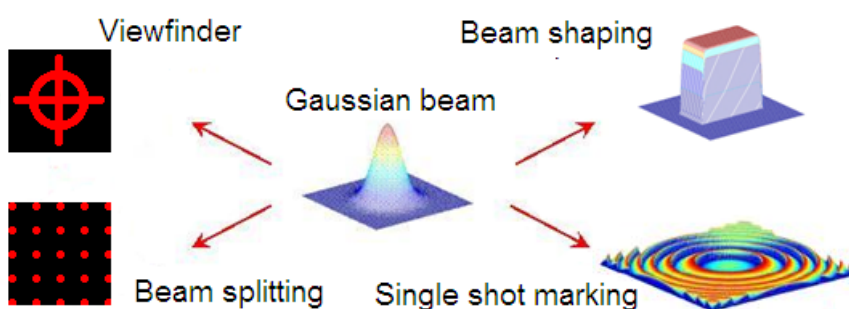
Website: <http://www.edphoton.com>

Address: Room 1109, 16 Changjiang Road, Wuxi New District (WND), Wuxi, Jiangsu Province, China

Email: [sales@edphoton.com](mailto:sales@edphoton.com), [info@edphoton.com](mailto:info@edphoton.com)

Tel: +86-510-81814590

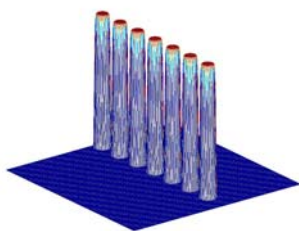
Fax: +86-510-81814590-603



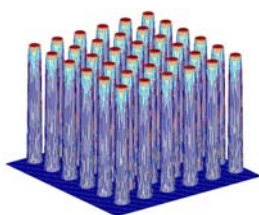
DOEs can convert a Gaussian beam to a beam with almost any intensity distribution

## Beam splitter

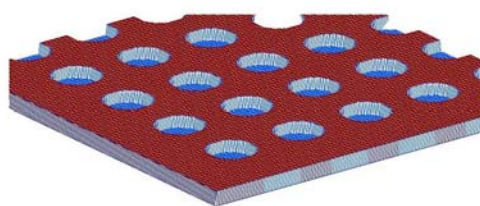
Beam splitters can be used for simultaneous laser drilling (perforating) of multi-holes, fiber coupling, etc. Specific applications of laser drilling include pre-weakening of cartons and metal-foils in packaging industry, high-speed laser texturing, cigarette filters, etc. We can split a single beam into up to a million highly uniform beams.



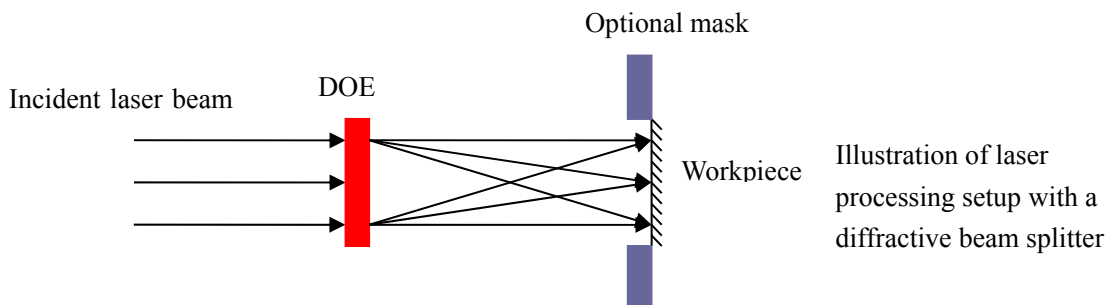
1-D Beam Splitting



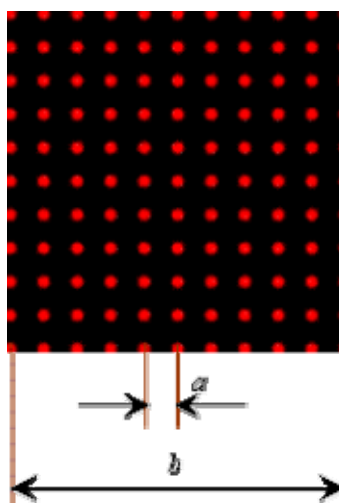
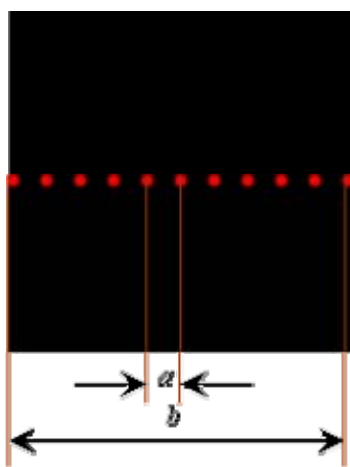
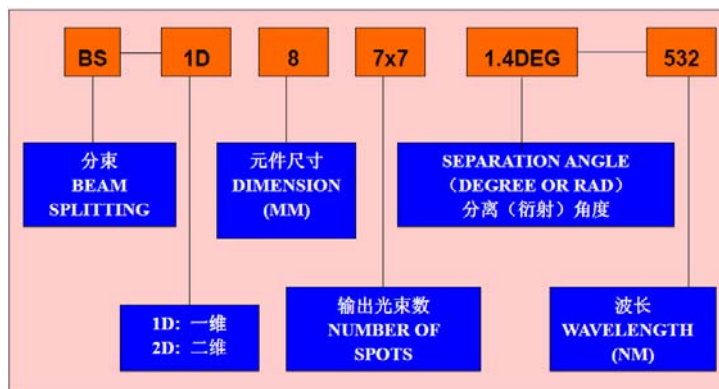
2-D Beam Splitting



Simultaneous laser drilling of multi-holes by 2-D beam splitters



Product nomination for diffractive beam splitter elements



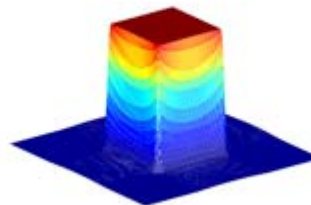
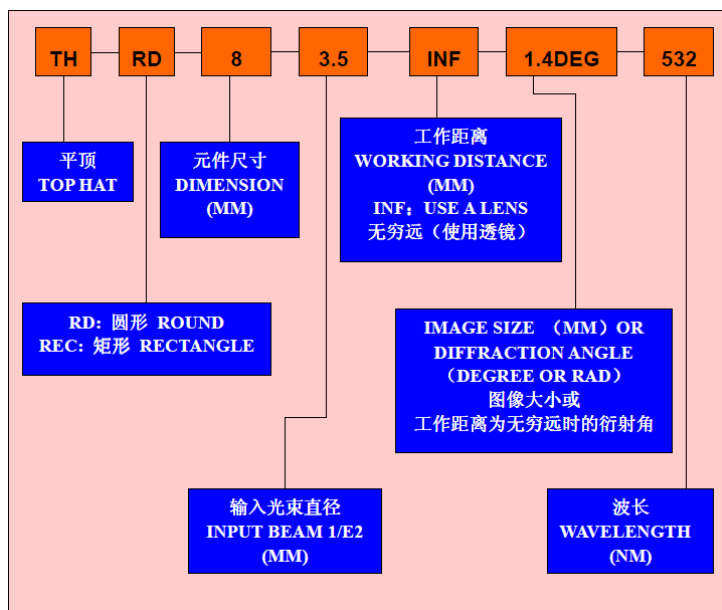
Product Item	Light Receiving area	Number of Spots	Separation angle corresponding to a and b	Wavelength	Delivery time
BS-1D-8-1x3-40DEG-808	8 x 8 mm <sup>2</sup>	1x3	A = 40 DEG B = 80 DEG	808 nm (other wavelengths available)	4-6 weeks
BS-1D-8-1x24-0.17DEG-	7.5 x 7.5 mm <sup>2</sup>	1x24	A = 0.17 DEG B = 4.0 DEG	808 nm (other wavelengths available)	4-6 weeks
BS-1D-8-1x25-0.17DEG-808	7.5 x 7.5 mm <sup>2</sup>	1x25	A = 0.17 DEG B = 4.2 DEG	808 nm (other wavelengths available)	4-6 weeks
BS-2D-8-10x10-532	8 x 8 mm <sup>2</sup>	10 x 10	A = 0.38 DEG	532 nm	In stock

**Beam shaper**

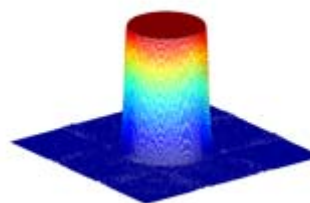
Diffractive beam shapers convert a laser beam with Gaussian intensity distribution into a beam with an accurate and almost arbitrary intensity distribution. Specific applications include precise control of treatment depth in laser heat treatment, laser hardening, cladding; turning a laser beam into a square or hexagon to increase the fill-factor in laser direct writing; and laser tweezers, etc.

## Top Hat Beam shaper

### Product nomination for diffractive top-hat beam-shaping elements



Gaussian to rectangular top-hat



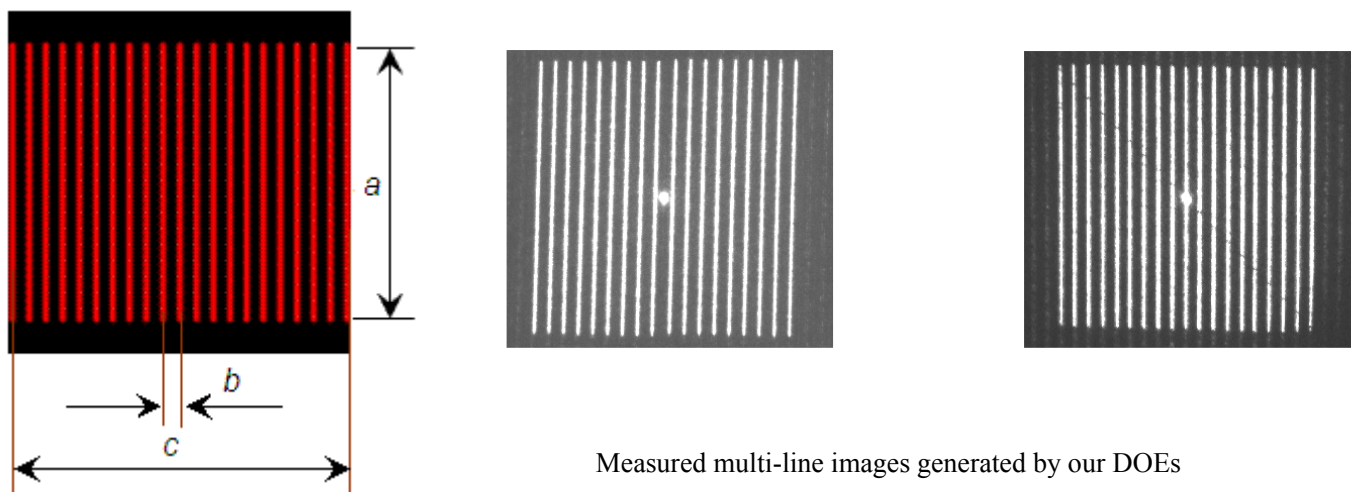
Gaussian to circular top-hat

Product Item	DOE size	Image size	wavelength	Working distance	Delivery time
TH-REC-8-2-INF-20mrad-1064	8 mm	20 mrad	1064 nm	Infinite	5days
TH-REC-8-2-200-4x4-1064	8 mm	4x4 mm	1064 nm	200 mm	5days
TH-REC-8-2.5-INF-20mrad-1064	8 mm	20 mrad	1064 nm	Infinite	5days
TH-REC-8-2.5-200-4x4-1064	8 mm	4x4 mm	1064 nm	200 mm	5days
TH-REC-8-3-INF-20mrad-1064	8 mm	20 mrad	1064 nm	Infinite	5days
TH-REC-8-3-200-4x4-1064	8 mm	4x4 mm	1064 nm	200 mm	5days
TH-REC-8-3.5-INF-20mrad-1064	8 mm	20 mrad	1064 nm	Infinite	5days
TH-REC-8-3.5-200-4x4-1064	8 mm	4x4 mm	1064 nm	200 mm	5days
TH-REC-8-4-INF-20mrad-1064	8 mm	20 mrad	1064 nm	Infinite	5days
TH-REC-8-4-200-4x4-1064	8 mm	4x4 mm	1064 nm	200 mm	5days
TH-REC-20-8-INF-2.9 mrad-1064	20 mm	2.9 mrad	1064 nm	Infinite	2weeks
TH-REC-20-8-1700-5x5-1064	20 mm	5x5 mm	1064 nm	1700 mm	2weeks
TH-RD-8-3.5-100-0.05-532	8 mm	0.05 mm	532 nm	100 mm	4 weeks
TH-RD-8-3.5-100-0.5mrad-532	8 mm	0.5 mrad	532 nm	Infinite	4 weeks
TH-RD-8-3.5-100-0.1-532	8 mm	0.1 mm	532 nm	100 mm	4 weeks
TH-RD-8-3.5-100-1mrad-532	8 mm	1 mrad	532 nm	Infinite	4 weeks
TH-RD-8-3.5-100-0.2-532	8 mm	0.2 mm	532 nm	100 mm	4 weeks
TH-RD-8-3.5-100-2mrad-532	8 mm	2 mrad	532 nm	Infinite	4 weeks



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## Multi-line



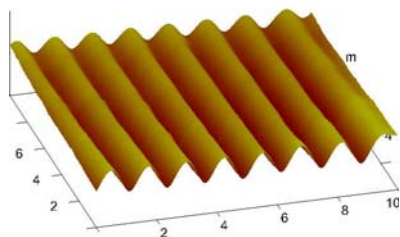
Item No	Light receiving area	Separation angle at 650nm corresponding to $a$ , $b$ and $c$	Image size at 650 nm and working distance of 1000 mm	Remarks	Delivery time
L1	6.5x 6.5 mm	$a = 4.91$ degrees $b = 0.27$ degrees $c = 4.62$ degrees	$a = 86$ mm $c = 4.7$ mm $c = 81$ mm	18 lines	in stock
L2	6.5 x 6.5 mm	$a = 4.5$ degrees $b = 0.24$ degrees $c = 4.34$ degrees	$a = 78$ mm $b = 4$ mm $c = 76$ mm	19 lines	in stock

## Intra-Cavity beam shaper

Traditional laser resonators generate laser beams with a Gaussian distribution. By using an intra-cavity DOE, the resonator can extract more energy and generate a more uniform super-Gaussian beam, thus greatly improve the electrical-optical conversion efficiency.

## Long / short focal depth DOE

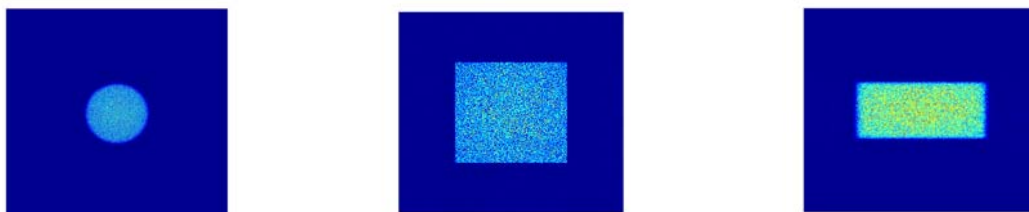
DOEs with long or short depth of focus can be achieved without changing the incident beam size or the working distance (focal length) as well as the focal spot size.



AFM image of our fabricated DOE.  
Size: 10 x 10 micron.

## Beam homogenizer(Diffuser)

One main advantage of a beam homogenizer is its insensitivity to the incident beam quality and the change of intensity. Hence it is most suitable for the less stable lasers, laser with long pulse duration or multi-pulse laser applications. Due to the lengthy exposure time, the intensity fluctuation can be averaged to some extent. For a circularly symmetric output beam, the variation in intensity can be further impressed by rotating the beam homogenizer.



Output laser beam spots by diffusers

Product Item	Light receiving area	wavelength	Diffraction angle	Delivery
DF-RD-6-2-473	6 x 6 mm	473 nm	2 degree	1 day
DF-RD-6-3-589	6 x 6 mm	589 nm	3 degree	1 day
DF-RD-6-4-785	6 x 6 mm	785 nm	4 degree	1 day
DF-RD-6-4-808	6 x 6 mm	808 nm	4 degree	1 day

## Diffractive lenslet arrays

Compared with refractive lenslet array, diffractive lenslet array has the advantage of fill factor 100%, and low F#. Lenslet arrays can be used for imaging systems to do the aberration correction.



Micro refractive and diffractive lenslet arrays

## Beam sampler

Without affecting the main laser beam, a diffractive beam sampler produces two laser beams which are exactly the same as the main beam except for having lower power. These two low-power laser beam can be used for monitoring the intensity distribution of the main beam. We offer both reflective and transmissive beam samplers.

## We need the following parameters to provide you custom DOEs

DOEs you would like to order:

Beam splitter;  Top-hat beam shaper;  Other beam shaping;  Other applications

Required diffractive efficiency: \_\_\_\_\_

Please attach your required target image (irradiance/intensity distribution) if necessary

Wavelength: \_\_\_\_\_

Material: \_\_\_\_\_

Light receiving area: \_\_\_\_\_

Dimensions and shape of DOE: \_\_\_\_\_

Incident beam diameter(radius x 2): \_\_\_\_\_

Mode (Single Mode or Multi Mode): \_\_\_\_\_

Working distance: \_\_\_\_\_

(beam splitting) Separation angle of 2 adjacent output beams: \_\_\_\_\_

Size of each output beam: \_\_\_\_\_

(Top-hat) diffraction angle of output beam: \_\_\_\_\_

Size of output beam spot: \_\_\_\_\_

AR coating (Yes or No): \_\_\_\_\_

## Specifications

Material: Fused silica, BK7 (K9) glass,  
resin, PC, GaAS etc.

Wavelength: 193-10600 nm

Dimension, : up to  $\Phi$ 150 mm

Phase levels: 16

Feature size: >300 nm

