

Diffractive Beam Splitters

Features

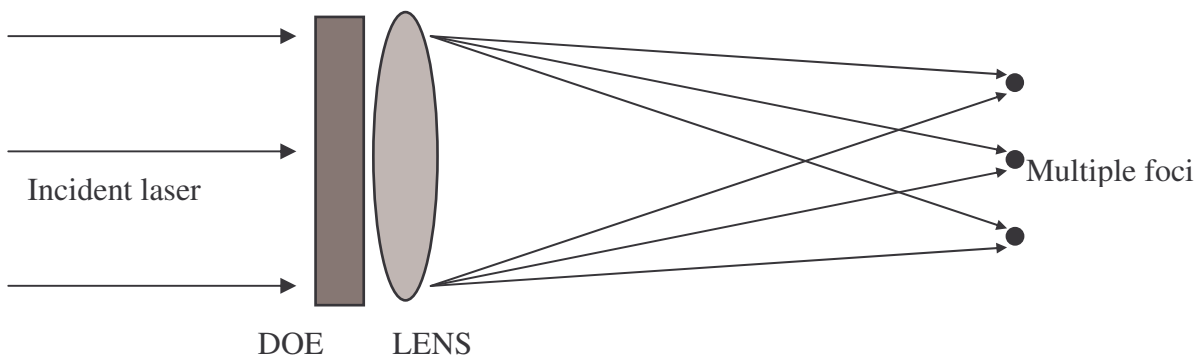
- Accurate Angle separation
- Intrinsic aligned
- High Power Threshold
- Uniform power in symmetric orders
- Optional Ar/Ar Coated
- Robust (insensitive for X-Y-Z displacement)

Applications

- Laser-Perforation
- Medical Surface Treatment
- Parallel Processing
- Parallel Laser Scanning

Operation principal:

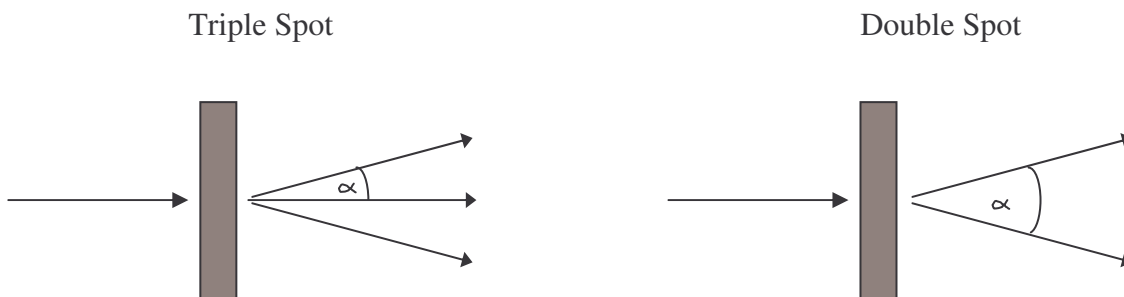
The diffractive beam splitters duplicate a Master Beam into the requested number of Beams. These beams are positioned in a 1 or 2 dimensional at well-specified angles. The input diameter equals the output diameter for each duplicated beam.



The Beam Splitter Component enables to drill / process simultaneously at a number of positions on the same part. The locations of these positions are aligned in respect to each other and therefore this price-effective element gives you a greater throughput, speed and a better alignment, and also often removes the need of a moving X-Y table. Holo-Or offers components for 1 X 2 and 1X3 arrays as well as other arrays like 2X2, 1X9, 1X15, 1X20, 9 X 9 and 1 X 27, 27 X27, Etc. These are available in ZnSe and Fused Silica, and other materials. They are easy to customize for different angles and wavelengths and number of spots.

The element accepts as input a collimate beam at nominal incidence angle and produces at various angles a number of collimated beams. These can be transformed to spots by a focusing lens. If this lens will be placed close to the element it can focus all beams.

The separation angle for double and triple spot beam splitters is described in the following drawings.



α = Separation Angle.

Typical Performance

In addition to the energy directed to the main beams, a small part of the energy will be directed towards well-defined angles. The uniformity and efficiency depend on the design. For selected designs the performances are given in the table below.

Typical Performance

Element Type	Energy in desired beams (Ar/Ar)	Angle Accuracy in mRad	Uniformity between beams	Energy in the original beam	Energy in strongest single unwanted angle
2 Spot	79%	0.02	+/-0.5%	<1%	4.5%
2X2=4 Spot	60%	0.02	+/-0.5%	< 1%	2.3%
3 Spot	84%	0.02	+/-5%	28% (desired)	3.2%
9 Spots	75%	0.02	~+/-50%	11% (desired)	4%
15 Spots	85%	0.02	~+/-25%	6% (desired)	1%
9X9=81 Spots	50%	0.02	~+/-50%	1% (desired)	0.3%

Standard Beam Splitters:

		Refractive substrate		Incident beam parameters		Spot Separation if used with	
Part No.	Type	Material	Dia.	Wavelength	Angle Separation	f=50mm	f=100mm
			Inch	in μm	In degrees	in mm	
DS-001	Double-spot	ZnSe	1.1"	10.6	1.35	1.18	2.36
DS-002	Double-spot	ZnSe	1.1"	10.6	2.7	2.36	4.72
DS-025	Double-spot	ZnSe	1.1"	10.6	1.52	1.33	2.65
DS-026	Double-spot	ZnSe	1.1"	10.6	1	0.87	1.75
TS-003	Triple-spot	ZnSe	1.1"	10.6	0.68	0.59	1.19
TS-004	Triple-spot	ZnSe	1.1"	10.6	1.35	1.18	2.36
TS-027	Triple-spot	ZnSe	1.1"	10.6	0.76	0.66	1.33
TS-028	Triple-spot	ZnSe	1.1"	10.6	0.5	0.44	0.87
DS-006	Double-spot	Fused Silica	1.0"	1.064	2.53	2.21	4.42
TS-008	Triple-spot	Fused Silica	1.0"	1.064	1.27	1.11	2.22
DS-015	Double-spot	Fused Silica	1.0"	0.532	1.27	1.11	2.22
DS-016	Double-spot	Fused Silica	1.0"	0.355	0.85	0.74	1.48
DS-017	Double-spot	Fused Silica	1.0"	0.266	0.64	0.56	1.12
TS-018	Triple-spot	Fused Silica	1.0"	0.532	0.64	0.56	1.12
TS-019	Triple-spot	Fused Silica	1.0"	0.355	0.42	0.37	0.73
TS-020	Triple-spot	Fused Silica	1.0"	0.266	0.32	0.28	0.56
DS-2106	Double-spot	Fused Silica	1.0"	1.064	10	8.82	17.63
TS-3106	Triple-spot	Fused Silica	1.0"	1.064	5	4.37	8.75
DS-2053	Double-spot	Fused Silica	1.0"	0.532	5	4.37	8.75
TS-3053	Triple-spot	Fused Silica	1.0"	0.532	2.5	2.18	4.37
MS-022	Splitter 15	Fused Silica	1.0"	1.55	0.041	0.04	0.07

Specification for 2D Beam Splitters

MB-1065	Splitter 9*9	Fused Silica	1.0"	1.064	0.5	0.44	0.87
MB-10625	Splitter 9*9	Fused Silica	1.0"	1.064	0.25	0.22	0.44
MB-05325	Splitter 9*9	Fused Silica	1.0"	0.532	0.25	0.22	0.44
MB-053125	Splitter 9*9	Fused Silica	1.0"	0.532	0.125	0.11	0.22

Notes:

The element is insensitive for X-Y-Z displacement.

The spots will rotate when the element rotates.

The standard tooling can be used for custom wavelengths. This does require special manufacture, and changes the parameters. Please contact our office or distributors for such an inquiry.

We do also have the ability to increase the energy to specific angles and reduce it for others. Please feel free to contact us for such an inquiry.



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