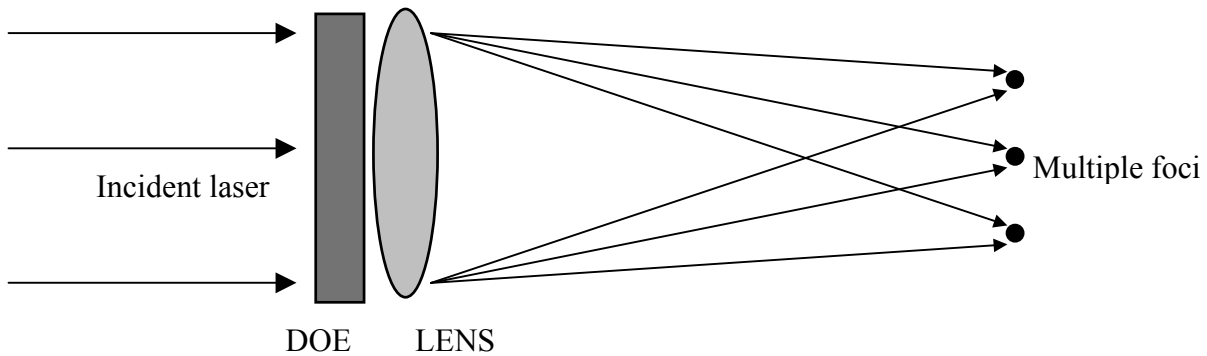


## Beam Splitter

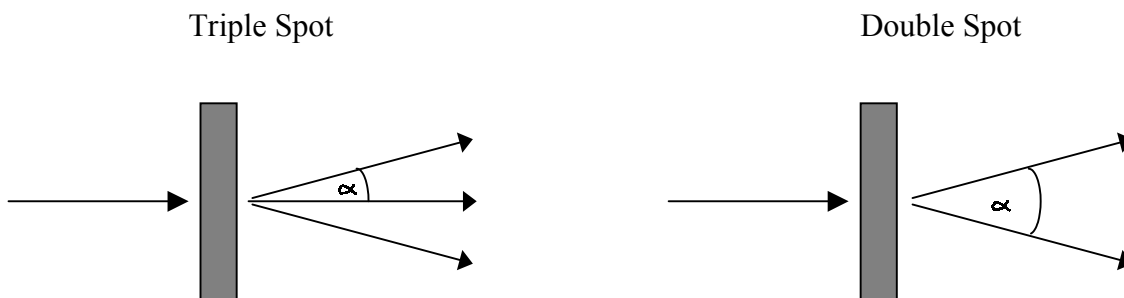
Turning a Master Beam into the requested number of Spots/Beams

Positioned in a 1 or 2 dimensional array organized to the customer's request



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. We have standard components available for 2 and 3 spots, both for ZnSe and Fused Silica, and customize for different angles and wavelengths and number of spots.

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



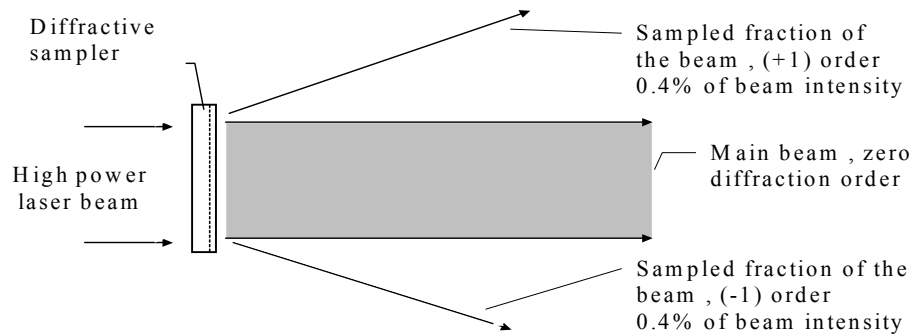
$\alpha$  = Separation Angle.

## Specifications for Beam Splitters:

Identification of DOE		Refractive substrate			Incident beam parameters		Angle separation			Coating
Part No.	Function	Material	Dia.	Clear Aperture	Wave-length	Collimation	Nominal	Accuracy	Angle of Incidence	
DS-001 [SE]	Double-spot	ZnSe	1.1"	25.4mm	10.6 µm	Collimated	1.35 deg	0.001 deg	0	Ar/Ar
DS-002 [SE]	Double-spot	ZnSe	1.1"	25.4mm	10.6 µm	Collimated	2.70 deg	0.001 deg	0	Ar/Ar
TS-003 [SE]	Triple-spot	ZnSe	1.1"	25.4mm	10.6 µm	Collimated	0.68 deg	0.001 deg	0	Ar/Ar
TS-004 [SE]	Triple-spot	ZnSe	1.1"	25.4mm	10.6 µm	Collimated	1.35 deg	0.001 deg	0	Ar/Ar
TS-014 [HE]	Triple-spot	ZnSe	16mm	14.6mm	10.6 µm	Collimated	1.215deg	0.001 deg	0	Ar/Ar
DS-006	Double-spot	FS	1.0"	24mm	1.06 µm	Collimated	2.53 deg	0.001 deg	0	Per request
DS-007	Double-spot	FS	1.0"	24mm	0.63 µm	Collimated	1.51 deg	0.001 deg	0	Per request
TS-008	Triple-spot	FS	1.0"	24mm	1.06 µm	Collimated	1.27 deg	0.001 deg	0	Per request
TS-009	Triple-spot	FS	1.0"	24mm	0.63 µm	Collimated	0.76 deg	0.001 deg	0	Per request
DS-015	Double-spot	FS	1.0"	24mm	0.532 µm	Collimated	1.27 deg	0.001 deg	0	Per request
DS-016	Double-spot	FS	1.0"	24mm	0.355 µm	Collimated	0.85 deg	0.001 deg	0	Per request
DS-017	Double-spot	FS	1.0"	24mm	0.266 µm	Collimated	0.64 deg	0.001 deg	0	Per request
TS-018	Triple-spot	FS	1.0"	24mm	0.532 µm	Collimated	0.64 deg	0.001 deg	0	Per request
TS-019	Triple-spot	FS	1.0"	24mm	0.355 µm	Collimated	0.42 deg	0.001 deg	0	Per request
TS-020	Triple-spot	FS	1.0"	24mm	0.266 µm	Collimated	0.32 deg	0.001 deg	0	Per request

## BEAM SAMPLER

The Beam sampler enables measurements for a high power laser beam in line. It samples 2 exact copies of the input beam with only a small fraction of the total power. The main part of the master beam keeps traveling and can be used during the measurement of the sampled part. We have a large range of standards design and also offer our high quality beam samplers at custom angles, wavelengths and power fractions of sampled beam.



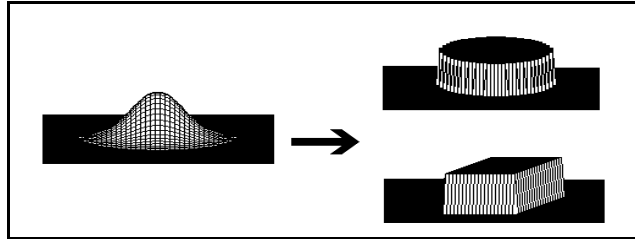
Identification of DOE		Refractive substrate			Incident beam parameters		Angle separation			Sampled
Part No.	Function	Material	Dia.	Clear Aperture	Wave-length	Collimation	Nominal	Accuracy	Thickness	Ratio/ Angle
SA-010	Sampler	FS	12x12mm	10x10mm	1.06 μm	Collimated	15.2 deg	0.001 deg	1.524mm	0.40%
SA-011	Sampler	FS	12x12mm	10x10mm	0.532 μm	Collimated	7.6 deg	0.001 deg	1.524mm	1.64%
SA-012	Sampler	FS	12x12mm	10x10mm	0.355 μm	Collimated	5.1 deg	0.001 deg	1.524mm	3.87%
SA-013	Sampler	FS	12x12mm	10x10mm	0.266 μm	Collimated	3.8 deg	0.001 deg	1.524mm	7.35%
SA-014	Sampler	FS	1.0"	24 mm	1.06 μm	Collimated	15.2 deg	0.001 deg	2.286mm	0.40%
SA-014	Sampler	FS	1.0"	24 mm	0.532 μm	Collimated	7.6 deg	0.001 deg	2.286mm	1.64%
SA-015	Sampler	FS	1.0"	24 mm	0.355 μm	Collimated	5.1 deg	0.001 deg	2.286mm	3.87%
SA-016	Sampler	FS	1.0"	24 mm	0.266 μm	Collimated	3.8 deg	0.001 deg	2.286mm	7.35%
SA-020	Sampler	ZnSe	1.1"	25.4 mm	10.6 μm	Collimated	12.8 deg	0.001 deg	3.0mm	0.40%
SA-021	Sampler	ZnSe	1.0"	24 mm	10.6 μm	Collimated	10.0 deg	0.001 deg	3.0mm	0.40%

### *Applications*

Diffractive beam samplers are used to monitor high-power CO<sub>2</sub>, Nd:YAG and other lasers in material processing and medical applications, for on-line laser-beam profile measurement and in laser radar.

## Top Hat

A Uniform Spot, Enabling Sharper and Cleaner Drill, Cut and other Laser Processing functions



Experienced Material Processing Teams know that most laser processing jobs will perform better with a Top-Hat Shape. This shape applies a UNIFORM INTENSITY well-defined spot to the material, and enables sharp and accurate transitions in the material under process. This offers considerable advantages in laser heat treatment and annealing of surfaces.

Specification for Top-Hat beam shapers:

Identification of DOE		Refractive substrate			Incident beam parameters				Output optical parameters		
Part No.	Function	Material	Dia.	Clear Aperture	Wave-length	Type	Collimation	Diameter 1/e <sup>2</sup>	Working Distance	Spot size	Shape
TH-001	Top-Hat	ZnSe	1.5"	35.6 mm	10.6 μm	Gaussian	Collimated	25 mm	250 mm	3 mm	Round
TH-002	Top-Hat	ZnSe	1.1"	25.4 mm	10.6 μm	Gaussian	Converging	12 mm	250 mm	6 mm	Square
TH-031	Top-Hat	FS UV	1"	14.0 mm	0.532 μm	Gaussian	Collimated	5 mm	52.4 mm	0.1 mm	Round
TH-032	Top-Hat	FS UV	1"	22.0mm	0.532 μm	Gaussian	Collimated	10.9 mm	200 mm	2 mm (FWHM)	Round
TH-041	Top-Hat	FS UV	1"	10.0 mm	0.355 μm	Gaussian	Converging	2 mm	100 mm	0.1 mm	Square
TH-042	Top-Hat	FS UV	1"	10.0 mm	0.355 μm	Gaussian	Collimated	2.5 mm	50 mm	0.05mm	Round
TH-051	Top-Hat	FS UV	1"	10.0 mm	0.266 μm	Gaussian	Collimated	5 mm	42 mm	0.015mm	Round

Other products that our Industrial Laser Customers purchase include:

- In-Line Laser Detector
- Spot Pattern / Circular Pattern generator
- Rectangular or other Shape spots
- Dual Wavelength Lens (HeNe/ CO<sub>2</sub>)
- Diffractive Correcting Focusing Lens
- Long Depth of focus lens
- Diffractive Focuser into a focal line contour