

Single Mode Beam Shapers for Ultra Fast Lasers

Overview:

Save costs by improving the efficiency and effectiveness of ultra laser material processing applications. Use a PowerPhotonic component to optimise the spot on the workpiece.

Flat Top Beam Shapers from PowerPhotonic are thin glass windows with a precision freeform surface that are designed to be mounted in a collimated laser beam. They are a perfect solution to the problem of creating a uniform intensity profile at focus AND keeping the spot size small.

In our product range of beam shapers there are optics that change just the beam profile, optics that change the just shape of the spot, and optics that change BOTH the profile and shape of the spot.

We have standard products compatible with single mode fiber lasers operating at 1070nm and for frequency doubled single mode lasers operating at 535nm. Our design and manufacturing process makes it easy for variations of standard products to be created.

The PowerPhotonic effect:

>90%

Shaping Efficiency

>20kW

CW Power Handling

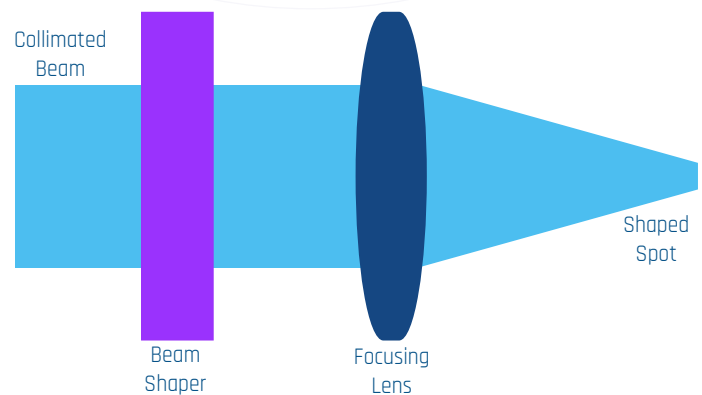
>100J

Pulsed Energy Handling

How it works:

The PowerPhotonic beam shaper is designed to work when it is located in a collimated beam (variants for operation in diverging or converging beams are also possible).

The input beam (Gaussian & Single Mode) diameter needs to be matched to the design input beam diameter. The beam shaper then re-distributes energy within the beam, such that when the beam is focused, it has the required size, shape and profile.



Key Features:

- Efficient beam conversion
- High power handling
- Cost effective
- Customisable for wavelength
- Customisable for beam size

Target Applications:

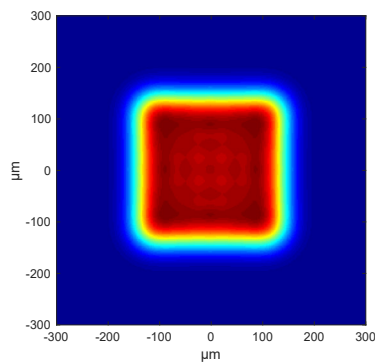
- LIPS Processing
- Micro-cutting
- Micro-engraving
- Micro-scribing
- Drilling

Standard Product: Single Mode Beam Shaper For Scanners

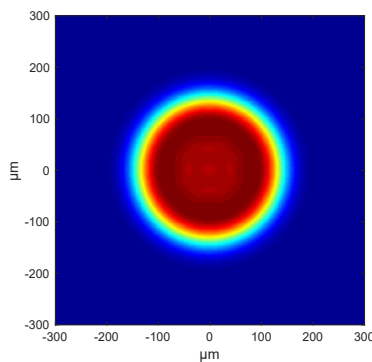
Part Number	Flat Top Shape	Design Wavelength (mm)	Input Beam Diameter, $1/e^2$ (mm)	Output Spot Size* (Full Width μm)
PP-SMSQFT-1070-FS1	Square	1070	2.0	336
PP-SMSQFT-1070-FS2	Square	1070	1.6	420
PP-SMSQFT-535-FS1	Square	535	2.0	168
PP-SMSQFT-535-FS2	Square	535	1.6	210

Circle and Line Variants also available. Use SMCFT or SMLFT to order.

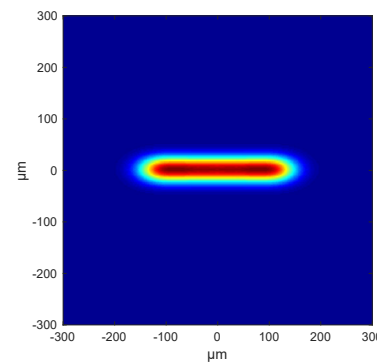
*100mm Focusing Lens



PP-SMSQFT-1070-FS1



PP-SMCFT-1070-FS1



PP-SMLFT-1070-FS1

General Specifications:

Parameter	Value
Part Diameter (mm)	25.4+0/-0.1
Part Thickness (mm)	1.01±0.05
Part Clear Aperture Diameter (mm)	12-13.5
Coating Reflectance (%)	<0.4

Functional Performance:

Parameter	Value
Power in the Bucket (%) ⁺	>90
Flatness Factor, F_F^*	>0.9
Plateau Uniformity, U_p^*	<0.1

* As defined in ISO 13694:2018

+ Defined as the fraction of power within the primary spot

Custom Options:

Standard product designs can be readily modified for specific applications. Custom options include: different input beam diameter, different wavelength (in the window between 350nm and 2 μm), larger flat top spot, different spot shape, different optic diameter & thickness.

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