

# Beam Shaper for UltraFast Lasers

## Overview:

The PowerPhotonic Beam Shaper for UltraFast Lasers is designed to convert single mode, ultrashort pulsed beams from Gaussian to a precisely controlled, uniform flat top at the focus of a lens.

Our Beam Shapers for UltraFast Lasers are thin glass windows with a precision freeform surface, designed to be mounted in the collimated laser beam path. They are a perfect solution to the problem of creating a uniform intensity profile at focus AND keeping the spot size small.

Improve the efficiency and effectiveness of micro material processing with ultrashort pulsed beams by introducing a beam shaping element. These elements are easy to integrate into existing systems, reducing costs and complexity.

Our beam shapers come in various shapes and sizes and are designed for both 1064nm and 535nm single mode sources.

## The PowerPhotonic Effect:

**>90%**

Shaping Efficiency

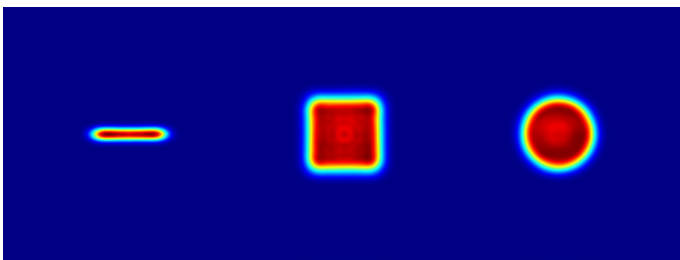
**>100J**

Pulsed Energy Handling

**>100kW**

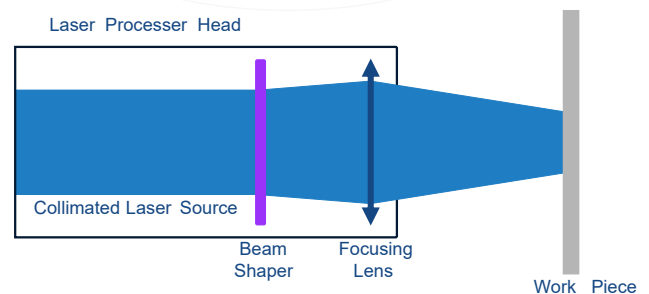
CW Power Handling Capability

## Output Profiles:



Square, Circle and Line variants of the Beam Shaper for UltraFast Lasers

## Optical Layout:



## Key Features:

- High Pulsed Power Handling Capabilities
- Efficient Beam Conversion
- Accurate Control of Beam Profile

## Target Applications:

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



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## Standard Products: Beam Shaper for UltraFast Lasers

Part Number	Flat Top Shape	Design Wavelength (nm)	Input Beam Diameter, $1/e^2$ (mm)	Output Spot Size* (Full Width $\mu\text{m}$ )
PP-SM-SQFT-1070-V1-AR	Square	1070	2.0	336
PP-SM-SQFT-1070-V2-AR	Square	1070	1.6	420
PP-SM-SQFT-535-V1-AR	Square	535	2.0	168
PP-SM-SQFT-535-V2-AR	Square	535	1.6	210

\* with a 100mm focal length lens

Circle and Line Variants also available. Use PP-SM-CFT or PP-SM-LFT to order.

## General Specification:

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 <sup>1</sup> (%)	<0.4

## Performance:

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

<sup>+</sup> Fraction of Power within the primary spot

<sup>\*</sup> As defined in ISO 13694:2018

<sup>1</sup> Reflectance per side

## Custom Options:

PowerPhotonic Beam Shapers for UltraFast Lasers can be readily modified for specific laser systems and applications upon request.

Custom options include:

Different input beam diameter, different wavelength (in the window between 350nm and 2 $\mu\text{m}$ ), different sized flat top spot, different spot shape and profile and different optic diameter & thickness.

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