

Beam Shaper for Scanners

Overview:

Improve the efficiency and effectiveness of single mode laser scanning applications with the use of the PowerPhotonic Beam Shaper for Scanners. The PowerPhotonic Beam Shaper for Scanner converts a single mode beam from a Gaussian profile into a highly accurate flat top.

Our Beam Shapers for Scanners are thin glass windows with a precision freeform surface, designed to be mounted at the entrance aperture of a scanner. The optic creates a uniform flat top profile at the focus of the scanner lens, but keeps the spot size close to the diffraction limited spot size.

These beam shapers are perfectly suited to additive manufacturing processes, where the smallest possible spot size is required for creation of fine detail. Using the PowerPhotonic Beam Shaper for Scanners allows for precise control of the spot while creating an improved heat profile.

The PowerPhotonic Effect:

>90%

Shaping Efficiency

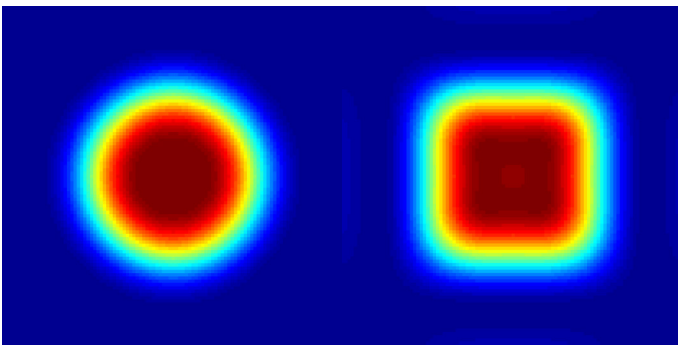
>100J

Pulsed Energy Handling

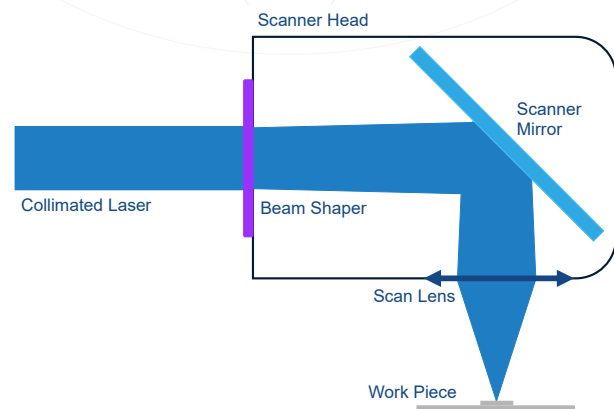
>100kW

CW Power Handling Capability

Output Profile:



Optical Layout:



Key Features:

- High Power Handling Capabilities
- Efficient Beam Conversion
- Near Diffraction Limited Shaping

Target Applications:

- Additive Manufacturing
- Remote Welding
- Remote Cutting
- Ultra-fast Material Processing



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Standard Products: Single Mode Beam Shaper For Scanners

Part Number	Flat Top Shape	Design Wavelength (nm)	Input Beam Diameter, $1/e^2$ (mm)	Output Spot Diameter
PP-SM-CFT-NDL-1070-AR	Circle	1070	5.40	1.5 x diffraction limit
PP-SM-SQFT-NDL-1070-AR	Square	1070	5.40	1.5 x diffraction limit
PP-SM-CFT-NDL-535-AR	Circle	535	4.80	1.5 x diffraction limit
PP-SM-SQFT-NDL-535-AR	Square	535	4.80	1.5 x diffraction limit

General Specification:

Parameter	Value
Part Diameter (mm)	25.4±0.1
Part Thickness (mm)	1.01±0.05
Part Clear Aperture Diameter (mm)	12-13.5
Coating Reflectance ¹ (%)	<0.4

Performance:

Parameter	Value
Power in the Bucket (%) ⁺	>90
Flatness Factor, F_F [*]	>0.9

⁺ Fraction of Power within the primary spot

^{*} As defined in ISO 13694:2018

¹ Reflectance per side

Custom Options:

PowerPhotonic Beam Shapers for Scanners 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 2µm), larger flat top spot, different spot shape and profile and different optic diameter & thickness.

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PowerPhotonic
Enhancing Beam Performance