Overview

PowerPhotonic’s single mode field mappers use a unique freeform direct-write process to fabricate customized single mode beamshaping surfaces in to a fused silica substrate.

These single mode beamshapers are carefully designed to transform a single mode beam into a variety of image shapes at the focus of a lens, providing the highest performance in shape and efficiency without adding additional speckle or diffraction artifacts.

PowerPhotonic’s fabrication technology can generate field mappers to produce a wide selection of shapes and intensity distributions including square, round, annular and more. These field mappers are offered in a 1 optic or 2 optic solution, allowing for optimal tradeoffs between cost and performance.

Key Features

- All fused silica optics
- Customizable image shapes
- Customizable image sizes
- No additional speckle or diffraction artifacts
- Long depth of focus version available
- Suitable for single-mode TEM00 lasers ($M^2 < 2$)
- Suitable for use with galvo-fθ system

Target Applications

- Materials processing: low power and pulsed
  - Laser polishing
  - Laser marking and drilling
  - Laser lift-off
  - Glass annealing and crystallisation
- Solar cell and Li-ion battery manufacturing

Benefits

- Highest system efficiency possible >98%
- Dramatic increase in beam uniformity
- High power handling, >20kW CW
- High laser damage threshold, >100J/cm²
- No focal plane shift
- Good through-focus performance
- Long depth of focus
- Nearly diffraction limited spot size

How they are Used
Standard Product Selection – Single Mode Field Mappers

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Spot Shape*</th>
<th>1/e² Input Beam Diameter (mm)</th>
<th>Spot Radius (mm)</th>
<th>Height H (mm)</th>
<th>Thickness T (mm)</th>
<th>Long DOF version**</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP-FM-T1-SQ-D5-R05</td>
<td>Square</td>
<td>5.00</td>
<td>0.50</td>
<td>25.4</td>
<td>1.00</td>
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</tr>
</tbody>
</table>

*Image shape can be specified as Circular = CI, Square = SQ, Annular – AN
For custom image shapes please contact PowerPhotonic

**T3 indicates 2 optic system within extended depth of focus and smaller available spot radii

Optical coating on request at extra cost
All custom parameters can be customer specified

Customization Program
Due to the unique nature of the PowerPhotonic manufacturing process, our standard products can be easily modified to meet specific requirements. Please contact PowerPhotonic for additional information.

Options
- Clear Aperture Width and Height
- Substrate Width, Height and Thickness
- Divergence Angle

About Us
PowerPhotonic is a global leader in precision micro-optics products. Our business was founded with the objective of providing unsurpassed excellence in all aspects of design and manufacture of micro-optics for optical and laser applications. Our world-class design skills are supported by an innovative and flexible manufacturing process that allows the company to design both a broad range of state-of-the-art standard micro-optics products and uniquely, to offer a low cost and rapid fabrication service for creating completely freeform optical surfaces.

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