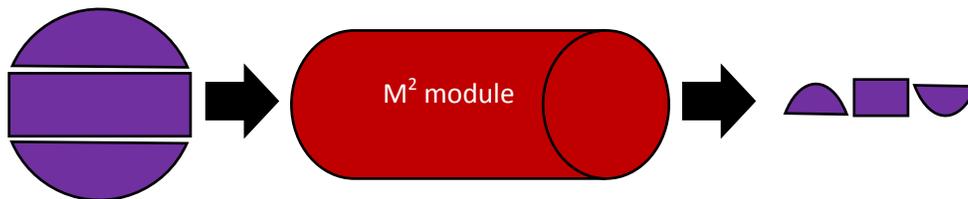




M² transformation module for high power laser material processing of flat panels/ wafers

The operating principle of the M² transformation module is to recombine an input beam with a large and symmetrical M² into a highly asymmetrical M² output beam. This output beam will have a much smaller M² (~2) in the first (fast) axis and a very large M² in the second orthogonal (slow) axis. The transformation occurs continuously along the module length to achieve a very high transformation precision.



How it works:

The incident multimode laser beam with beam quality factor M_x^2, M_y^2 for axes X, Y is divided into N discrete sections. The module modifies the beam quality factor so that the output M² of each axis becomes $M_x^2 \cdot N, M_y^2/N$ of the original values.

Why choose an M² transformation module for your system:

- The module has a low sensitivity to positioning tolerances and is very easy and fast to align
- The module has a low sensitivity to the dimensions of the incident beam size and can work with both round and elliptical beams.
- Extremely high precision of transformation, achieved by a lithographical production process.
- The module has an extremely small thermal lensing effect. This is because the Fused Silica DOE has a much smaller thermal coefficient than a refractive element.
- The Laser damage threshold of the M² module is high due to the large incident beam diameter, the high efficiency DOE and low NA of the optics.
- Holo/Or also has a solution to use several input lasers simultaneously\ with very few alignment procedures, or supply it as pre-aligned modules.

Specifications of the M² Module M2-002-1:

Wavelength:	343 nm
Input M ²	<25
Output M ² for fast axis	2-3
Input beam size	5-5.5
Output beam size	~0.8x12 mm
Overall Efficiency	~95%
Dimensions	~505 x 40.6 x 40.6 mm
Optical elements material	UV grade Fused Silica

Special features:

- Adjustment of output beam orientation by adjusting 2 rotator rings
- Opto-mechanical cage compatibility
- Assembled in clean room environment

Applications

Laser annealing to improve process quality in a variety of industries:

- Lift off process for manufacturing flexible displays
- OLED displays
- Semiconductor devices
- Thin-film solar cell production
- Sensor production

Materials

Processing of a broad range of materials including:

- Silicon
- Silicon on glass
- Polymers

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