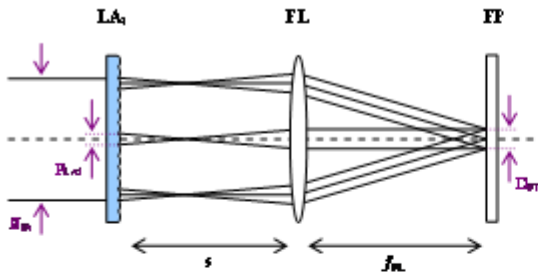


SMO TECH INFOSHEET 10bis - EXAMPLES FOR BEAM HOMOGENIZING

wavelength used for calculations:
Fused silica: 987nm Silicon: 2.15um

Please fill in all cells marked in yellow

Non-Imaging Beam Homogenizer



Choose Microlens Array:

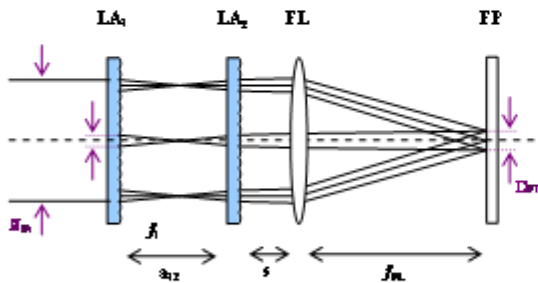
Square lens: Lens pitch 300µm, ROC 2.2mm Div. Angle: ± 2°, no AR-Coating, Mat 18-1393-100-000	SMD-Order Number
Wave length λ	248 nm
Lens Pitch P _{LA}	0.3 mm
Radius of Curvature ROC _{LA1}	2.2 mm
LA ₁ focal length f _{LA1}	4.79930192 mm
Lens FL focal length f _{FL}	100 mm

$$FN \approx \frac{P_{LA} \cdot D_{FT}}{4 \cdot \lambda \cdot f_{FL}}$$

Flat-Top Size D _{FT}	6.25 mm
Fresnel Number FN	15.90

diffraction effects

Imaging Beam Homogenizer



$$D_{FT} = P_{LA1} \frac{f_{FL}}{f_{LA1} \cdot f_{LA2}} [(f_{LA1} + f_{LA2}) - a_{12}]$$

Choose Microlens Arrays:

Square lens: Lens pitch 300µm, ROC 2.2mm Div. Angle: ± 2°, no AR-Coating, Mat 18-1393-100-000	SMD-Order Number
Wave length λ	248 nm
Lens Pitch P _{LA1}	0.3 mm
Radius of Curvature ROC _{LA1}	2.2 mm
LA ₁ focal length f _{LA1}	4.80 mm
Square lens: Lens pitch 300µm, ROC 2.2mm Div. Angle: ± 2°, no AR-Coating, Mat 18-1393-100-000	SMD-Order Number
Lens Pitch P _{LA2}	0.3 mm
Radius of Curvature ROC _{LA2}	2.2 mm
LA ₂ focal length f _{LA2}	4.80 mm
Separation LA ₁ ↔ LA ₂ a ₁₂	4.91 mm
Lens FL focal length f _{FL}	100 mm

$$f_{LA1} < a_{12} < f_{LA1} + f_{LA2}$$

Flat-Top Size D _{FT}	6.11 mm
Fresnel Number FN	15.47
Beam divergence (±) θ _{beam}	5 mrad
Beam diameter Ø _{beam}	5 mm
Spot size Ø _{spot}	0.056 mm
Focus factor	36.5
Divergence (D _{FT} > P _{LA})	3.007 °
Numerical aperture	0.052

acceptable FWHM
f₁₁₁ = 500

52.49 mrad

Beam Homogenizer for Excimer 248nm

Microlens Arrays CC-Q-300S, 12-1393, flat-top 6mm x 6mm at 100mm working distance

The Flat-Top Size D_{FT} scales with the Focal Length of the Fourier Lens f_{FL}.

Fourier Lens f _{FL}	14mm	20mm	40mm	60mm	100mm	200mm	400mm
Flat-Top Size D _{FT}	0.84mm	1.2mm	2.4mm	3.6mm	6mm	12mm	24mm

Beam Homogenizer Toolbox:

Based on Technical Datasheet #10 this Excel file allows simple calculations for Beam Homogenizing. A catalog of SUSS MicroOptics' Microlens Arrays is included. A simple tool for damage threshold evaluation is included. → [Download Excel Toolbox](#)

Beam Homogenizer Optical Design in ZEMAX:

A simple model for a Microlens Beam Homogenizer simulation in Zemax Optical Design Program is provided. → [Download Zemax Files](#)

Contact:

Please contact our experts to get a customized solution for your homogenization problem!