

EPIC Online Technology Meeting on Microscopy

13 July 2020, asphericon GmbH

Key figures I

ASPHERICON IN NUMBERS

165

Employees

>750

Customers
worldwide

5.600

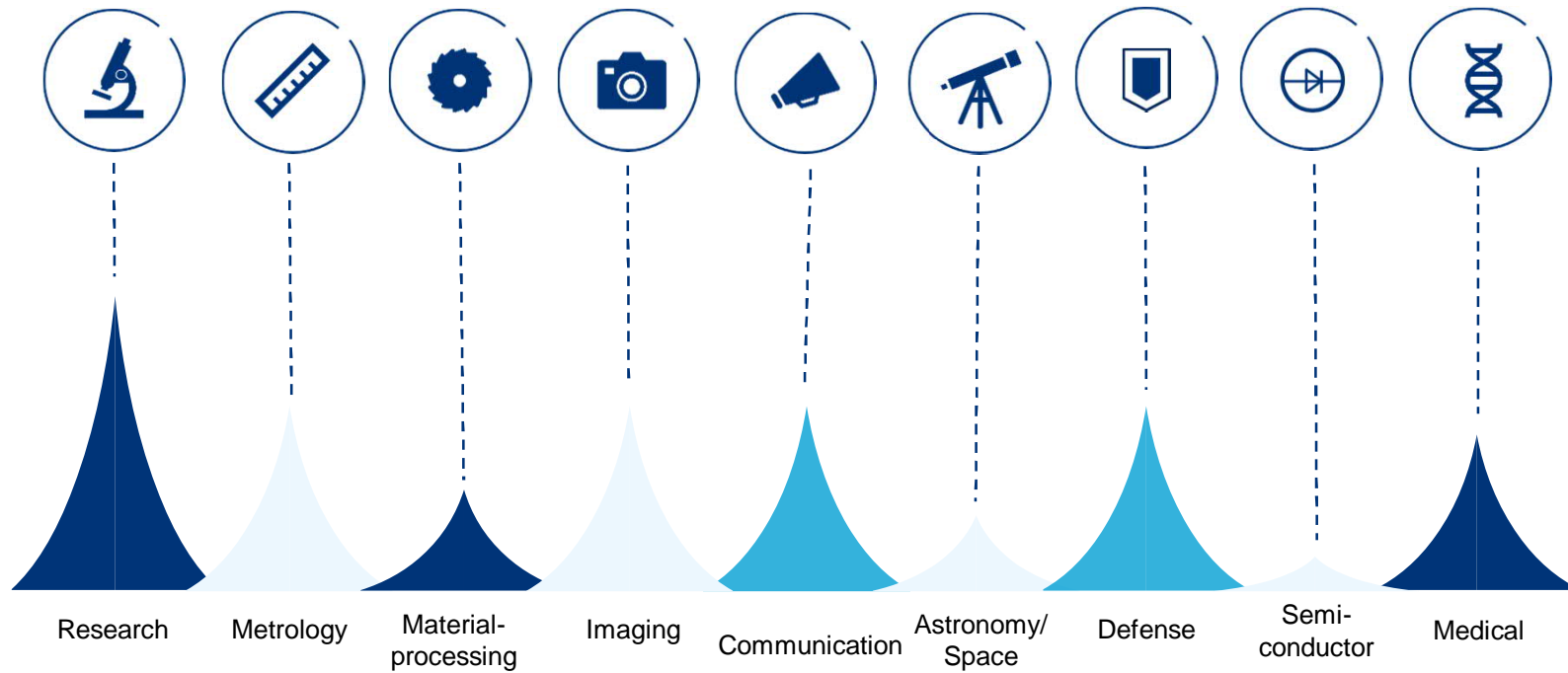
Facility area
(m²)

1.500

Manufacturing
capacity (pc/week)

Key figures II

CUSTOMERS BY INDUSTRY



Precision out of passion

ASPHERICON SETS STANDARDS IN ASPHERE MANUFACTURING



BeamTuning @asphericon



asphericon BeamTuning

THE NEXT LEVEL OF BEAM SHAPING

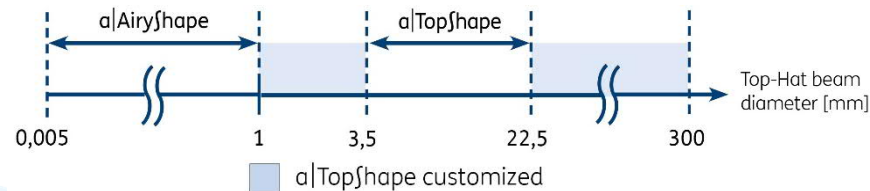


a|AiryShape

- = Generates different beam profiles (Top-Hat, Donut and Beam Waist)
- = Scalable input and output beam
- = Optimized for 300 nm – 1600 nm

a|TopShape and a|TopShapeLD

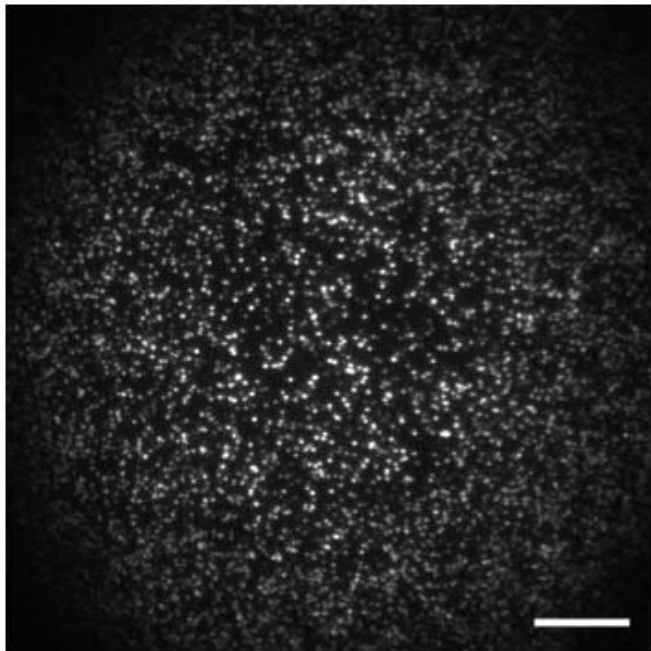
- = Transform collimated Gaussian beams into collimated Top-Hat beams
- = Scalable input and output beam
- = Optimized for 320 nm – 2500 nm
- = TopShape LD: Stable beam profiles up to 4,5m



BeamTuning Applications

LIFE SCIENCE WITH THE a|TOPSHAPE

Life science, e.g. fluorescence microscopy - High performance with uniform illumination



EMCCD (512 x 512)
Scale bar: 10 μm

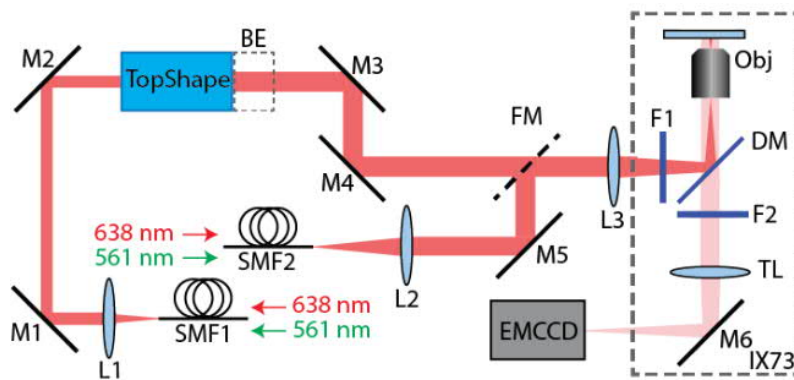
- = Distortion of intensity data
- = Analysis gets challenging
- = Loss of fluorescence signal at the edge
- = Position dependent resolution

I. Khaw, B. Croop, J. Tang, A. Möhl, U. Fuchs, and K. Han,
"Flat-field illumination for quantitative fluorescence imaging,"
Opt. Express 26, 15276-15288 (2018).

BeamTuning Applications

LIFE SCIENCE WITH THE a|TOPSHAPE

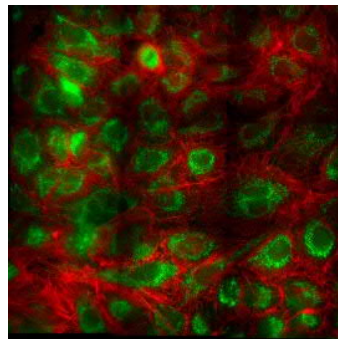
Life science, e.g. fluorescence microscopy - High performance with uniform illumination



= a|TopShape and a|BeamExpander implemented in a fluorescence microscope

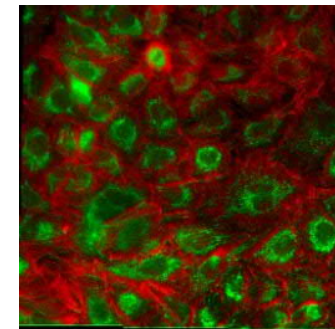
Conventional Systeme:

Image stitching under FFI with conventional system (Gaussian Beam)



BeamTuning:

Borderless image stitching under FFI with a|TopShape (Top-Hat).



I. Khaw, B. Croop, J. Tang, A. Möhl, U. Fuchs, and K. Han, "Flat-field illumination for quantitative fluorescence imaging," Opt. Express 26, 15276-15288 (2018).

asphericon BeamTuning

BEAM EXPANSION HAS NEVER BEEN SO SIMPLE



a|BeamExpander

- = Design wavelengths [nm]: 532, 632, 780, 1064
- = Optimization to all wavelengths [500-1600nm]
- = Guaranteed diffraction-limited up to 32x beam expansion



a|Waveλdapt

- = Optimized adaptation to any wavelength from 500 to 1600 nm
- = Compensation of divergent incoming beams up to 1 mrad



a|AspheriColl

- = Flexible choice of output beam diameter
- = Simple mounting via metric fine thread



a|Adapter

- = Intra-system adapters enable easy combination of BeamTuning elements
- = Cross-system adapters guarantee high level of compatibility with other optical systems

asphericon StockOptics

HIGH-PRECISION OFF-THE-SHELF OPTICS - INNOVATIVE DIVERSITY & PRECISION



a|Aspheres

- = Low-NA & High-NA
- = Diameter: 10-100 mm
- = Quality: RMS < 0.5 μm
- = UV-Aspheres
- = Diameter: 12.5 – 50 mm
- = Quality: RMS < 0.3 μm



a|Axicons

- = For high-power laser applications
- = Diameter: 25.4 and 50.8 mm
- = Quality: RMS < 0.07 μm
- = Material: Fused silica
- = Available with 4 standard coatings



a|Acylinders

- = Ideal line-focus
- = Size: 10x10 – 50x50 mm
- = Quality: RMS < 0.5 μm
- = Material: S-LAH64
- = Available with 4 standard coatings

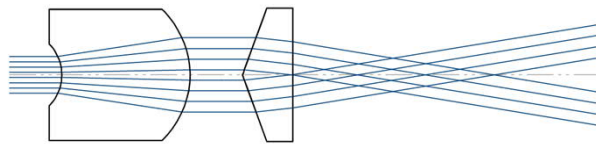


MountedOptics

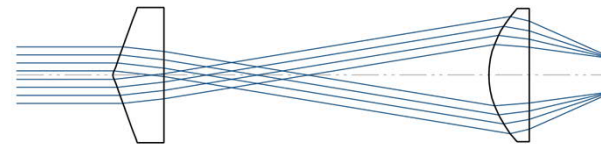
- = Pre-aligned aspheres, axicons and acylinders in high-precision mounts
- = Diameter: 12.5 - 25.4
- = Quality: < 10 μm decentration
- = Material: S-LAH64, N-BK7, Fused silica

≡ Mix & Match: a|BeamBoxes

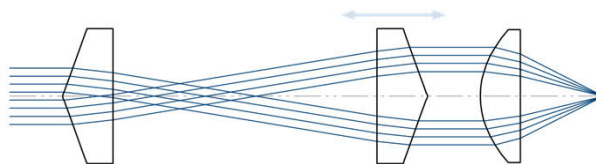
INDIVIDUAL BEAMTUNING AND STOCK ELEMENT COMBINATIONS



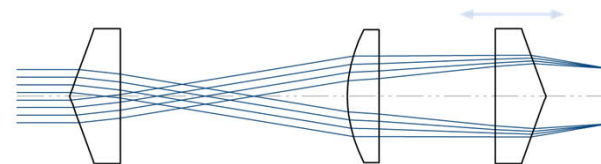
= Optimizing the illumination



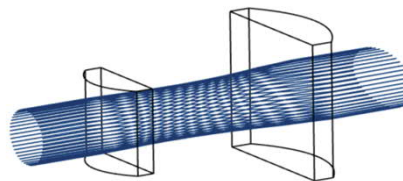
= Generating a ring focus



= Tuning your lens (focus under the diffraction limit or change the EFL)



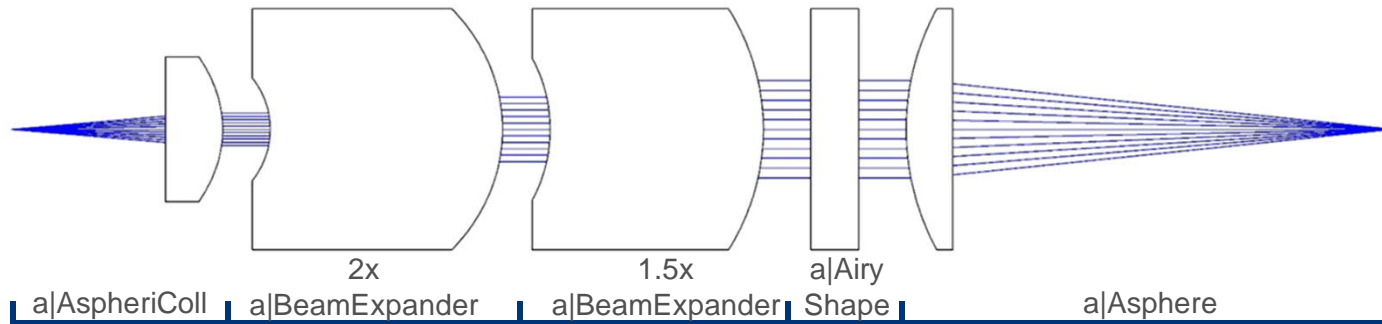
= Generating adjustable ring foci



= Create elliptical beams

Mix & Match: a|BeamBoxes

INDIVIDUAL BOXES WITH BEAMTUNING ELEMENTS



a|BeamBox Essential

= Consisting of a|BeamExpander, a|AspheriColl, a|WaveAdapt and matching a|Adapters



a|BeamBox TopShape(LD)

= Consisting a|BeamExpanders, a|TopShape, a|AspheriColl and matching a|Adapters as well as MountedOptics



a|BeamBox AiryShape

= Consisting a|BeamExpanders, a|AiryShape, a|AspheriColl and matching a|Adapters as well as a|MountedAspheres

What can we do for you?

- = Provide first class optical components and systems
- = Support you with several services to give your products an advantage

What can you do for us?

Help us develop new products for the market

- = Tell us what kind of beam profiles or optics you need for your application
- = Challenge us – We love it!

Contact



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