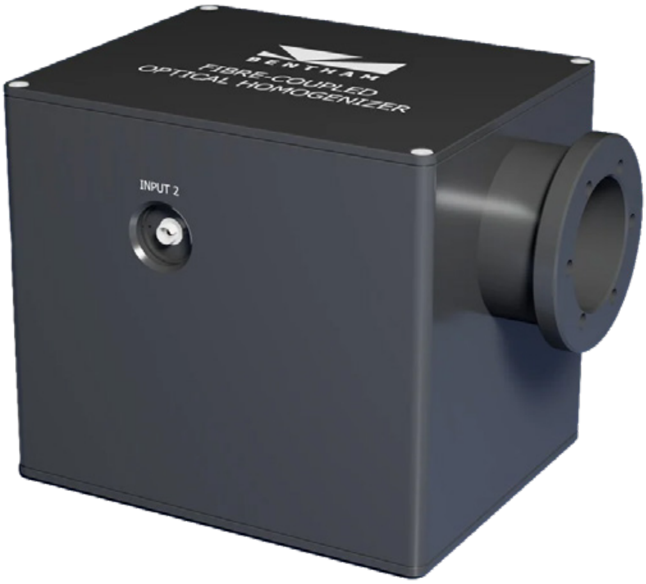
Fibre-Coupled Optical Homogeniser



The **FCH Fibre-Coupled Optical Homogeniser** is a microlens-array (MLA) based optical system designed to convert fibre-delivered light into a large, square, highly uniform illumination field at the sample plane. The system combines high irradiance with exceptional spatial uniformity, making it ideal for calibration, characterization, and testing applications requiring broadband or monochromatic illumination.

Operating over a spectral range from **200 nm to 2.5 µm**, the homogeniser provides wavelength-tunable, flat-top illumination when used with our fibre-coupled monochromators or broadband light sources.

Technical Specifications	
Parameter	Specification
Spectral Range	200 nm to 2.5 µm
Optical Principle	Microlens Array (MLA)
Output Beam Shape	Square Flat-Top
Spatial Uniformity	U2 ≥ 98%
Enhanced Uniformity Regions	U2 ≥ 99%
Available Field Sizes	60 × 60 mm, 120 × 120 mm
Typical Throughput	~50% usable patch throughput
Maximum Envelope Dimensions	<250 × 154 × 170 mm
Fibre Connectors	SMA-905, FC-PC, and others available
Input Configurations	Single Input or Motorized Dual Input
Dual Input Control	Front Panel and USB Interface

Ordering information	
B-FCH-500-1	Projected field: 60 mm × 60 mm, Working distance: 500 mm
B-FCH-1000-1	Projected field: 120 mm × 120 mm, Working distance: 1000 mm
B-FCH-500-2	Projected field: 60 mm × 60 mm, Working distance: 500 mm dual input
B-FCH-1000-2	Projected field: 120 mm × 120 mm, Working distance: 1000 mm dual input

Advantages over Integrating Spheres

The FCH achieves highly uniform illumination without the significant optical losses typically associated with integrating sphere systems. Using usable output power within the uniform field as the comparison metric, the homogeniser delivers approximately **50% throughput while maintaining U2 ≥ 98% uniformity**, substantially exceeding the performance of comparable integrating sphere arrangements under practical measurement conditions.

Applications

Detector Characterisation

- Responsivity measurements
- Linearity testing
- Saturation analysis
- Spatial uniformity assessment
- Spectral response measurements

Camera and Image Sensor Testing

- Pixel response uniformity
- Flat-field correction
- Vignetting analysis
- Color and spectral sensitivity evaluation

Solar Cell QE/EQE Measurements

- Uniform irradiation over cell and sub-cell areas
- Improved reliability of wavelength-dependent quantum efficiency measurements

Hyperspectral and Multispectral Imager Calibration

- Radiometric calibration
- Spatial response correction
- Channel-to-channel comparison across the field of view

General Sample Illumination

- Optical component testing
- Calibration targets
- Sensor evaluation
- Research and development applications

Quantum Design

Quantum Design GmbH
Breitwieserweg 9
D-64318 Pfungstadt

Michael Foos: +49 6157 80710- 34
foos@qd-europe.com
Find your local contact at www.qd-europe.com

BENTHAM