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Manufacturer:
Arden Photonics

Product Name:
Arden Photonics FGC-GH Fiber Geometry Measurement System

Manufacturer Part Number:
FGC-GH

Click here for more details on the Arden Photonics FGC-GH Fiber Geometry Measurement System

Arden PHOTONICS
Optical Fiber Measurement Specialists

FGC-GH

Fiber Glass Geometry Measurement System

Specifically designed to measure the fiber geometric parameters of Hollow Core Fiber (HCF), Multi-Core Fiber (MCF), Polarising-Maintaining Fiber (PMF) and other specialty fiber designs, encompassing a range of fiber cladding diameters from 80 µm* to 250 µm. Its increased performance also enables high precision characterisation of standard singlemode fibers.

Optimised for characterising specialty fibers from 80 µm* to 250 µm.

Core Diameter
Repeatability : 40 nm**

Core-to-Cladding Concentricity
Repeatability : 40 nm**

Capillary Diameter
Repeatability : 20 nm

* Capability to operate with smaller cladding diameter available on request.
** Repeatability is measured on the FGC-GH using a single 240 µm fiber without removing it from the unit. Measuring performance of other fibers is not guaranteed.
*** The above diagram is intended for illustrative purpose only.

Contact the professionals at Fiber Optic Center for a quote or to get more details.

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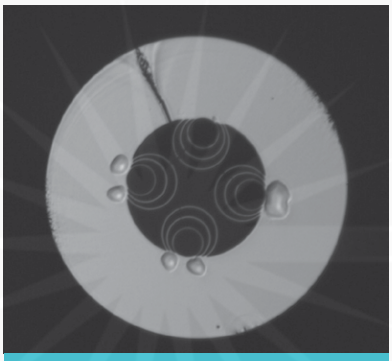
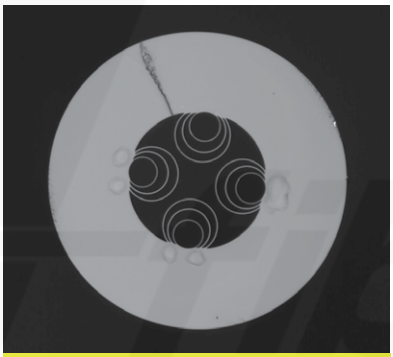
Extreme Precision, Resolution and Repeatability

Equipped with a high-magnification objective lens and Arden's proprietary measurement algorithms, the FGC-GH delivers superb precision, resolution and repeatability, when comparing the imaging results of the same fiber and the same cleave.

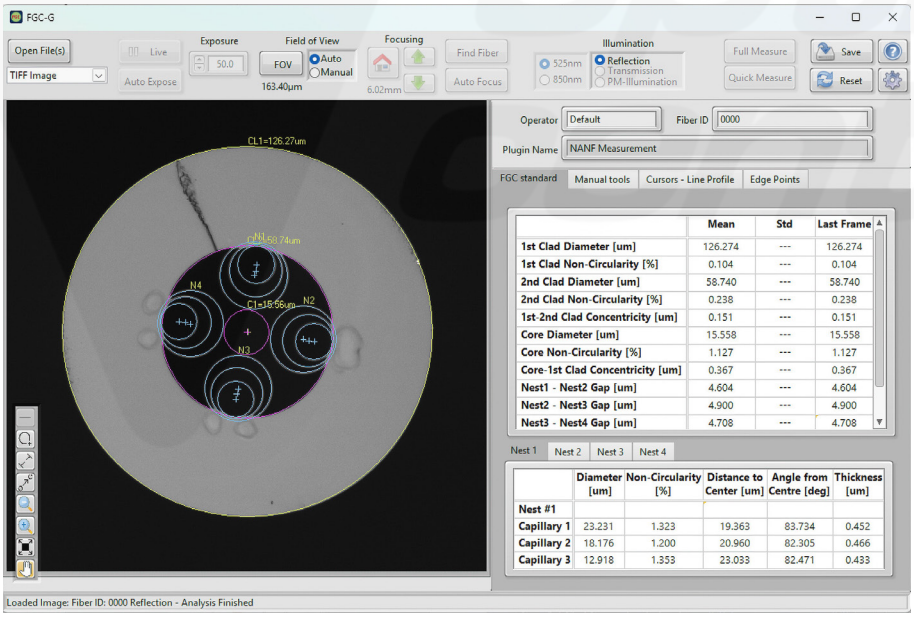


FGC-GS
125 µm NANF fiber***



FGC-GH
125 µm NANF fiber***

Optimised for Measuring Complex Fibers - from 250 µm down to 80 µm*



* Capability to operate with smaller cladding diameter available on request.
** The above images are intended for illustrative purpose only.
*** The hollow-core fiber sample was kindly supplied by the Optoelectronics Research Centre at the University of Southampton.

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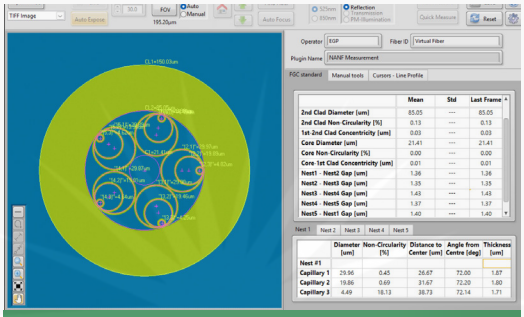
Key Features and Technologies

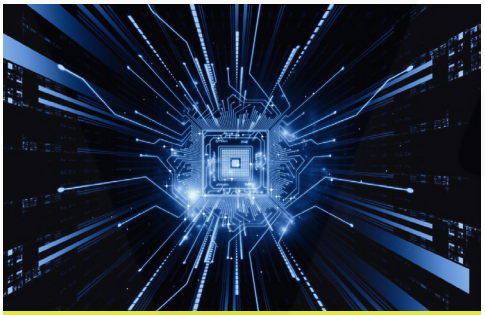


Optimised for the Latest Optical Fibers

Precise and automatic geometric measurement and characterisation of the latest generation of HCF and DNANF is now possible with the FGC-GH's built-in, ultra-high numerical aperture optical system. Other specialty fibers, such as MCF, are equally well addressed, ensuring the instrument remains the definitive solution for the most demanding fiber geometry characterisation.

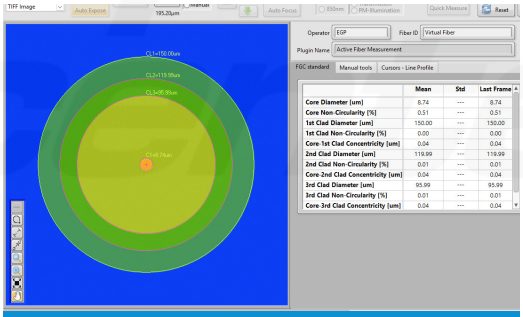
Traceable In-Field Calibration

To maintain confidence and eliminate production downtime, there is no need to return the FGC-GH to Arden Photonics for recalibration. Users can simply utilise our traceable calibration artifact alongside built-in software algorithms for effortless and fast re-calibration in the field.



Fast Validation of Manufactured Fibers

Manufacturers can validate HCF with high-precision measurements of each double-nested set of tubes within the DNANF structure, obtaining critical data that relates directly to the loss per km of the manufactured fiber. The FGC-GH is equally adept at providing critical measuring data to verify the location of cores, cladding, and core-to-cladding concentricity in MCF.



R&D and Production Compatibility

Specialty fiber geometry characterisation in a production environment is automatic, de-skilled and streamlined, and made highly repeatable and user-independent through the use of software plugins tailored to each specific fiber type. In an R&D environment, an extensive set of manual tools allows engineers to measure novel or unique features of any innovative or proprietary specialty fiber design.

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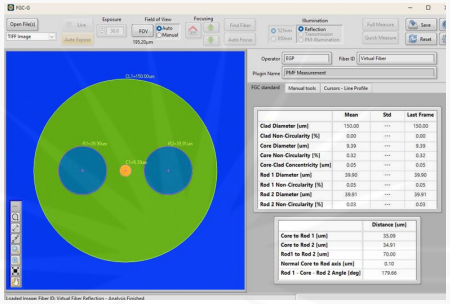
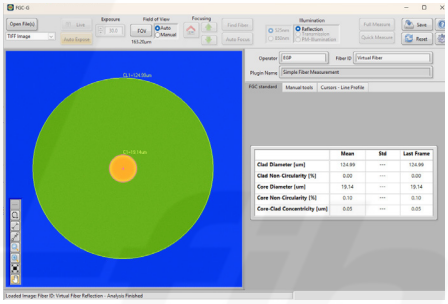
Optional Software Plug-ins

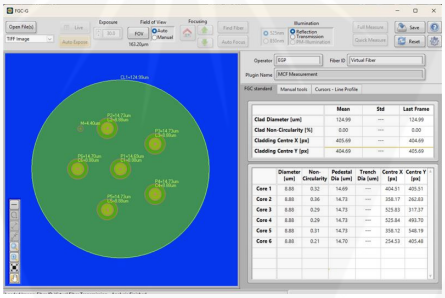
The optional plug-ins enable automatic measurement. Five optional plug-ins are currently available for measuring the geometry of key features of specialty fibers with cladding diameter 80 µm** - 250 µm.



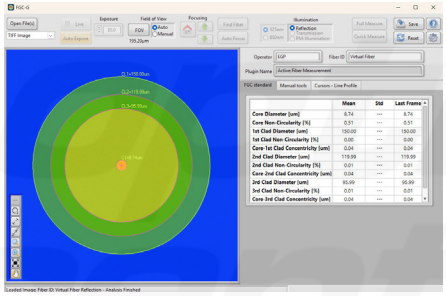
FGC-SPI01: Software plug-in for Panda-style PM Fibers (measuring stress rods, the diameters and non-circularity of cladding and core, core to rod distance)



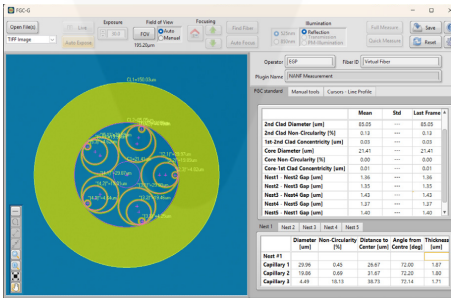
FGC-SPI02: Software plug-in for Single Mode Fibers and Multimode Fibers (measuring cladding and core diameters, non-circularity and core-to-cladding concentricity)



FGC-SPI03: Software plug-in for Multi Core Fibers (measuring the diameter and non-circularity of cladding, core, pedestal and trench)



FGC-SPI04: Software plug-in for Active Fibers (measuring cladding diameters, non-circularity and core-to-cladding concentricity)



FGC-SPI05: Software plug-in for Nested Antiresonant Nodeless Fiber (NANF) (measuring the inner and outer cladding diameter and non-circularity, tube diameter and non-circularity, distance between lobes, and central core diameters)

* The above screenshots are computer-generated, and are intended for illustrative purpose only.
** Capability to operate with smaller cladding diameter available on request.

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Technical Specification

Optical	
Field of View	~ 330 µm
Fiber Illumination – Reflection	Darkfield illumination, 525 nm LED
Fiber Illumination – Transmission	High NA LED source, 525 nm

Repeatability*	Singlemode*	Multimode*	NANF Plug-in**
Core Diameter / Hollow Core Diameter	< 0.03 µm	< 0.04 µm	< 0.04 µm
Cladding Diameter	< 0.02 µm	< 0.02 µm	< 0.02 µm
Core Non-Circularity	< 0.5%	< 0.25%	< 0.5%
Cladding Non-Circularity	< 0.02%	< 0.02%	< 0.02%
Core-to-Cladding Concentricity	< 0.03 µm	< 0.02 µm	< 0.03 µm

Measurement Capability	
Measurement Time (Standard)	< 25 seconds (excluding fiber preparation)
Measurement time (Enhanced performance)	< 150 seconds (excluding fiber preparation)
Fiber Diameter (Cladding)	Single fibers up to 250 µm
Specialty Fibers	Dual clad, Non-circular, Octagonal, PM, Multicore, NANF / DNANF etc.

Physical	
Weight	9 kg (with carry case 33kg)
Size of FGC unit	0.3 x 0.45 x 0.15 m
Total Footprint (incl. fiber handling bench)	0.3 x 0.7 x 0.15 m
Operating Temp	10 – 30°C
Computer Requirements	All FGC systems are supplied with a computer running up-to-date Windows OS
Data Interface	1 x USB 3.0 (USB B to USB A: 1m cable supplied)

* Repeatability is measured on the FGC-GH using a single 125 µm fiber without removing it from the unit at 22°C, the repeatability specifications are only applicable to OM1, OM2 and singlemode fibers.
** Repeatability is measured on the FGC-GH using a single 240 µm fiber without removing it from the unit. Measuring performance of other fibers is not guaranteed.

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Ordering Information

Main Unit	Description
FGC-GH	FGC-GH Fiber Glass Geometry System for measurement of optical fibers with diameters up to 250 µm. Including single wavelength optical unit and the following accessories: FGC-FHB - Fiber handling bench, FG-H-250 - Pair of Arden holders with 250 µm V-groove, FG-C-125 - Clamped holder mount, 125 µm V-groove, FG-FTK-125 - Fiber samples, FGC-CK - cable kit, FGC-SFT - software package, APL-PC - desktop computer, FGC-CC - shipping case, and FGC-ILL-525 - 525 nm illumination system

Holders	Description
FGC-FCD125	Fiber cladding diameter measurement artefact placed in a retractable holder. Fiber diameter and circularity is measured by NPL and supplied with a measurement certificate. Requires an FGC-HA adapter tray for use on the FGC-GH.
FG-FTK-125	FGC fiber samples, 125 µm diameter, for checking FGC alignment and calibration.
FGC-HA	Holder adapter tray for standard holders / calibration artefacts
FG-H-400	Pair of Arden FGC fiber holders with 400 µm V-groove
FG-H-250	Pair of Arden FGC fiber holders with 250 µm V-groove
FG-H-200	Pair of Arden FGC fiber holders with 200 µm V-groove
FG-H-125	Pair of Arden FGC fiber holders with 125 µm V-groove
FG-H-080	Pair of Arden FGC fiber holders with 80 µm V-groove
FG-C-250	Clamped holder mount with 250 µm V-groove
FG-C-200	Clamped holder mount with 200 µm V-groove
FG-C-125	Clamped holder mount with 125 µm V-groove
FG-C-080	Clamped holder mount with 80 µm V-groove

Illuminator	Description
FGC-PMI-525	PM illuminator, 525 nm, for measuring dimensions of 125 and 80 µm diameter PANDA fibers.

Software Plug-ins	Description
FGC-SPI01	FGC Software Plugin for measurement of geometry of Panda-style PM Fibers
FGC-SPI02	FGC Software Plugin for measurement of geometry of Single Mode Fibers and Multimode FIbers
FGC-SPI03	FGC Software Plugin for measurement of geometry of Multi Core Fibers
FGC-SPI04	FGC Software Plugin for measurement of geometry of Active Fibers
FGC-SPI05	FGC Software Plugin for measurement of geometry of Nested Antiresonant Nodeless Fiber (NANF)

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Services	Description
FGC-UCS1	FGC on-site service visit. Includes calibration of FGC and issue of calibration certificate. Travel and subsistence will be charged separately
FGC-UCS2	FGC on-site commissioning and training. Travel and subsistence will be charged separately
FGC-H-GUEW3	FGC-GH extended warranty covering parts and labour for 3 years from purchase
FGC-H-GUEW5	FGC-GH extended warranty covering parts and labour for 5 years from purchase