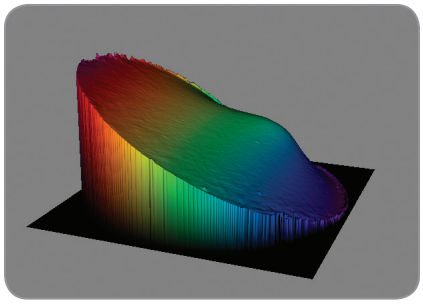
CleaveMeter 3D™

The CleaveMeter 3D is a phase-shifting Michelson interferometer for non-contact end-face inspection of cleaved and polished optical fibers with cladding diameters up to 1200 µm. Designed for both production and research applications, this comprehensive fiber optic testing system combines full resolution, three-dimensional surface topography reconstruction and mapping with automated, operator independent measurements of cleave angle and surface flatness in a small, lightweight bench-top unit.

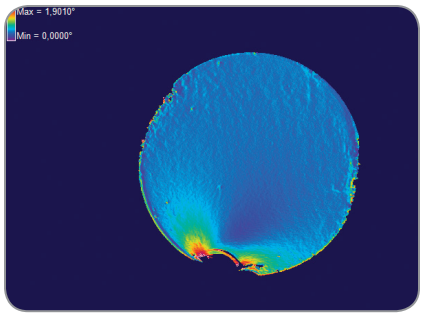
When used in the 3D-mode, the surface topography is reconstructed from the fringe pattern and presented graphically as a three-dimensional image of the fiber end. By rotating the image and adjusting the scale and contrast, the surface quality and cleave angle at different points can be analyzed in close detail, allowing for a more comprehensive understanding and accurate interpretation of the data and the cleaving process. While this capability is always important to cleave quality analysis, it can be even especially helpful when analyzing cleaving of fibers with complicated structures such as polarization maintaining fibers, or micro-structured fibers. Information on surface topography can also be saved to a file for further analysis using third party software.



Reconstructed end-face surface of a cleaved 400 µm fiber (center cleave angle about 0.16°), with height scaled three hundred times to bring out surface irregularities and facilitate easier cleave quality analysis.

Extremely accurate measurements of both cleave angle and surface flatness over arbitrary diameters can be performed on the reconstructed end-face surface. These measurements are carried out automatically, with full operator independence. This makes the system well suited not only for detailed cleave quality analysis in laboratory environments, but also for close production monitoring where software features such as optional pass/fail indication of cleave angle help ensure that consistent cleave quality is maintained over long periods of continuous cleaver operation.

In addition to cleave angle measurements, the system can also be used to measure a number of other properties such as plane angles, fiber diameters and the distance between different points. The software allows the user to view the point-wise slope across the whole fiber end-face, a very useful tool for spotting small scale irregularities and crack propagation behavior.



Detail of above image, showing a dust particle or other surface contamination with a height of about 15 nm – illustrating the level of detail and sensitivity of the measurements.

Adapter plates are available for both perpendicular and angled cleave analysis. The mechanical design is compatible with all NYFORS automatic fiber cleavers and accepts the fiber holders used with those machines as well as those of major splicer manufacturers. Custom made Adapter plates are available upon request. The CleaveMeter 3D comes in a small, ergonomic bench-top design and connects to the USB port of a PC running the host application.

Features

- Full resolution surface reconstruction
- 2D view of surface topography and pointwise slope
- 3D view of surface topography with camera and lighting control
- Extremely accurate, operator independent measurements of cleave angle and surface flatness over arbitrary diameters
- Optional pass/fail indication of cleave angle for fast operation in production environments

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Specifications

PARAMETER	VALUE
Fiber Cladding	125–1200 µm*
Fiber Coating	250–1500 µm
Camera Resolution	1280 × 1024 pixels
Image Scale	1.25 µm per pixel
Image File Format	8-bit JPEG, PNG, TIFF, BMP / 24-bit BMP for surface topography
PC Connection	USB 2.0 port
Power Supply	Through USB port
Dimensions	97 mm (W) × 179 mm (D) × 142 mm (H)
Weight	1.6 kg
Absolute accuracy**	0.01° standard deviation
Relative accuracy	5 %

*Fiber-specific adapter plates required.

** This level of accuracy requires the adapter plate angle error to be measured and compensated for on each individual CleaveMeter™ the holder is used with. For more information about system accuracy, please contact us at info@nyfors.com.

Ordering Information

DESCRIPTION	AFL NO.
CleaveMeter 3D includes: PC Software, USB Cable, Manual and Tools	30100013

Accessories

DESCRIPTION	AFL NO.
Adapter Plates	
Adapter Plate, FJK, 115-210 µm	30100001
Adapter Plate, FJK, 200-529 µm	30100002
Adapter Plate, FJK, 510-800 µm	30100003
Adapter Plate, FJK, 800-1200 µm	30100004
Adapter Plate, NYFORS, Custom	30100007
Angle Adapter Plate, 15 degrees	30100008
Angle Adapter Plate, 8 degrees	30100009
Angle Adapter Plate, Custom	30100010

Fiber specific adapter plates are required to clamp and align the fiber to the interferometer optics. They are not included in delivery and should be ordered separately.

Select Adapter Plate to match fiber cladding diameter and Angle Adapter Plate (optional) to match the fiber tilt angle.

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