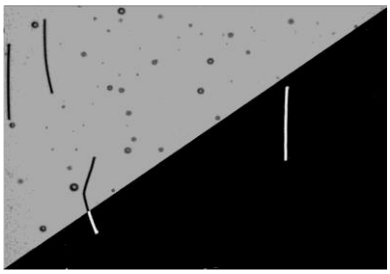
OpTest Equipment Inc.

Fiber Quality Analyzer

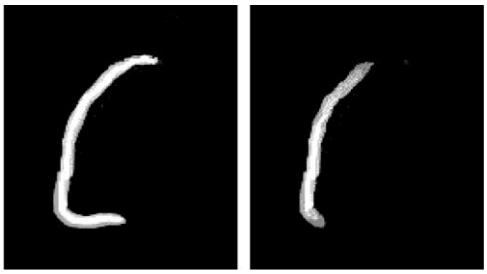
FQA - 360

The FQA-360 features a flow cell that stays clean and does not plug. It easily measures difficult pulps without special pre-treatment or screening. These pulps include:

- High Shive Content Pulps
- Mechanical Pulps
- Linerboard Pulps
- Diaper Fluff and Pulps with High Flocculation Propensity
- Recycled Fibers
- Non-wood (plant) Fibers and Long Synthetic (birefringent) Fibers

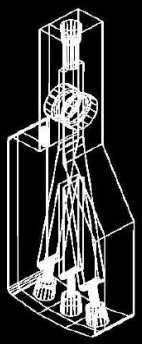


The 3mm rayon fibers above have no fines. However, air bubbles in the non-polarized part appear as fines.



The same cellulose fiber viewed with circular polarized light (left) and linear polarized light (right). The ends of the curled fiber disappear in linear polarized light.

- *Rapid & accurate measurement of length, width, curl & kink on fibers up to **15 mm***
- *All fiber values are measured simultaneously with a single camera*
- *Combined fiber length and width data provides a useful tool for pulp blending*
- *Circular polarized light provides the most accurate measurement of fiber length and shape*
- *Sample cleaning and de-airing are unnecessary, unlike many non-polarized light methods*



- *More precise than non-polarized light methods*
- *The patented cytometric flow cell stays clean and prevents plugging*
- *Characterize pulps with contaminants such as ink, fillers, extractives and pitch*
- *Exceeds the Standard Specifications of Tappi T271, PAPTAC B.4, and ISO 16065-1*
- *Minimal maintenance*
- *Optional software available for (code LDA17):*
  - *Coarseness according to ISO 23713*
  - *Hardwood/Softwood Blending Ratio*
  - *Shive and Vessels Elements*
  - *Degree of External Fiber Fibrillation (%)*

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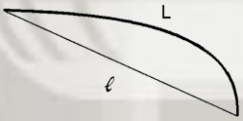
FIBER ANALYSIS MEASUREMENTS

Fiber length is reported either as the fiber contour length, L, or the end-to-end (projected) length, ℓ.



Fiber Curl is the gradual and continuous curvature of a fiber and is defined by:
Curl Index = (L/ℓ)-1

Kink is an abrupt change in the curvature of a fiber and is defined by the modified Kibblewhite's Kink Index. It is the weighted sum of the number N_x, of kinks within a range of "x" kink angles:

$$\text{Kink Index}=[2N_{(21\text{-}45)}+ 3N_{(46\text{-}90)}+4N_{(91\text{-}180)}] / L_{TOTAL}$$

The test results include means, variances and distribution histograms for:

- Fiber lengths (Ln, Lw, Lww) at ranges up to **15 mm** and at a sensitivity of 0.001mm/test.
- Fiber widths and fiber width as a function of length graphs. Measurement sensitivity is < 1 µm/fiber and < 0.1 µm/test
- Curl Index (numeric & length weighted)
- Kink Angle, Kink Index and kinks/mm
- Numeric %-fines and length-weighted with user selected size limits and ranges

A dedicated built-in LCD screen displays results, status and starts test. Individual fiber images are sent to the PC Workstation for analysis and can be stored while performing all the test measurements.

OPTIONS AND ACCESSORIES

Options:

- **Coarseness, Fiber Wall Thickness & Hwd/Swd Ratio** Software
- **Shive** Analysis Software
- **Vessel Element** Analysis Software
- **Degree of External Fiber Fibrillation (%)** Software
- **Calibration Check Fiber** Kits
- **Water Filter Replacement** Kits
- **Non-polarizing Optics**: Used for opaque fibers and some fibers that do not depolarize light. Also, may be used for fiber length measurement according to ISO 16065-2.

Accessories:

- **OpTiBlend**: Stand-alone software that uses the data files from the HiRes FQA and FQA-360 to estimate the %-weight content of up to 5 species
- **Beaker Carousel** (BC) to automatically test up to 6 specimens
- **PC Workstation & Excel™**

DIMENSIONS *(including Beaker Carousel accessory)*

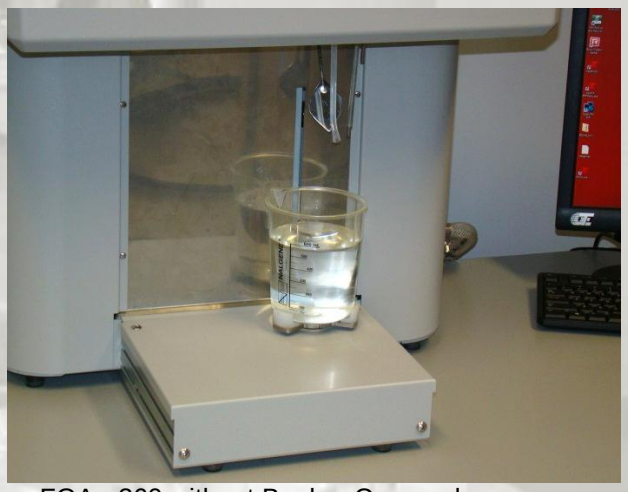
- 610 mm L x 560 mm W x 760 mm H
  (24" L x 22" W x 30" H)

WEIGHT *(including Beaker Carousel accessory)*

- 45 kg (98 lbs)

CONNECTIONS

- PC Workstation:
  Operating with Windows™ 7 or higher and containing:
  - At least 8 GB of RAM, 2 ea. Gigabit Ethernet connections, and a USB port, Microsoft Excel™ (2007, 2010 or higher)
  - Minimum 20" display is recommended
- Power:
  200W stable within 2% and transient free within 10%
- Water:
  Pressure = 275 kPa (40 PSI)
  - mineral free (less than 50 mg/L residue after evaporation)
  - filtered (external at 5 µm)
  - air-free (less than 0.05% free and bound air by volume)



FQA - 360 without Beaker Carousel accessory

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