

FibreShape

Analysis of industrial and natural fibers

FibreShape is a measurement system for the quality control and for the characterization of industrial and natural fibers.

Our quality inspection systems try to leverage the potential inherent in image analysis while trying to keep the tedious details of using image analysis away from the end user as much as possible. The systems focus on:

- simplicity in sample preparation,
- simplicity in testing the sample
- reproducibility of the results at any time
- managing and tracking the material's quality

<p>► FibreShape M (FibreShape software package, computer and a medium format scanner.)</p> <p>► FibreShape FiVer M (FibreShape FiVer software, computer and a medium format scanner)</p>	<p>► FibreShape FA (FibreShape software package, computer and a flatbed scanner with an automatic sample feeder)</p>	<p>► FibreShape FH (FibreShape software package, computer and a flatbed scanner with a hand operated sample feeder)</p> <p>► FibreShape FiVer FH (FibreShape FiVer software, computer and a flatbed scanner with a hand operated sample feeder)</p>
 <p>3200 dpi, large contact area with high optical resolution</p>	 <p>1600 dpi real optical resolution</p>	 <p>1600 dpi real optical resolution</p>

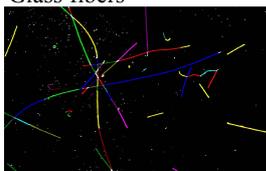
The FibreShape software is available as QC (quality control) or PRO (quality control, research and development) version. The FibreShape FiVer software measures the length and fineness (width) of **crossing** stiff fibers, especially for glass fibers or carbon fibers.

The analysis of powders is possible with the add-on PowderShape.

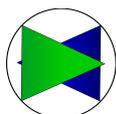
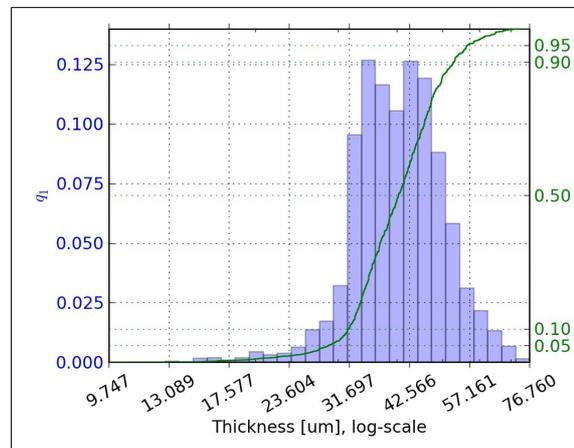
Thickness measurement of glass fibers with FibreShape M



Glass fibers



Glass fibers recognized with FibreShape M



Length and width measurement with FibreShape FA



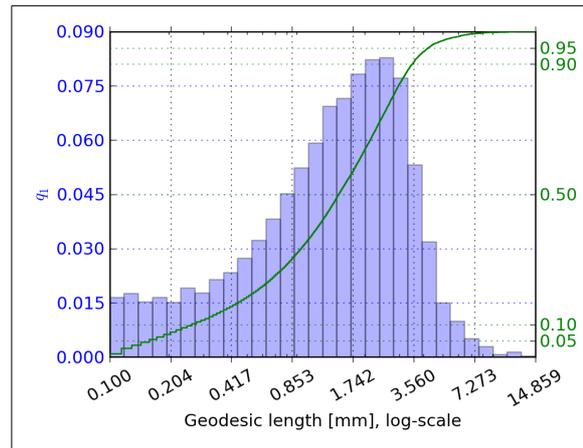
Wood chips



Pine chips measured with FibreShape FA

← 4.2 cm →

FibreShape FA is applied to the production control of chip boards, fiberboards, WPC, etc. The size distribution (fiber length and width) of wood chips is a determining factor for the properties and the quality of the final product.



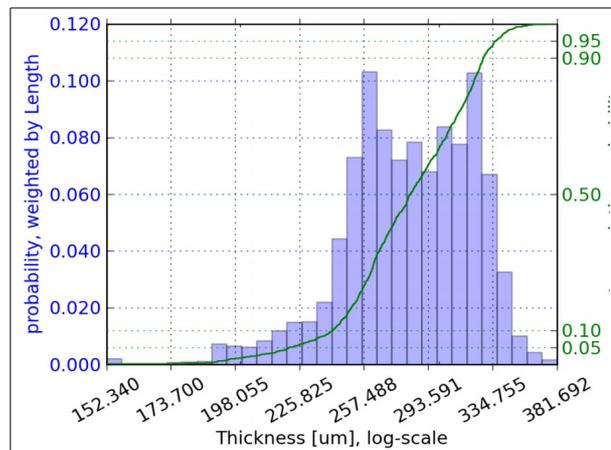
Flax blossom



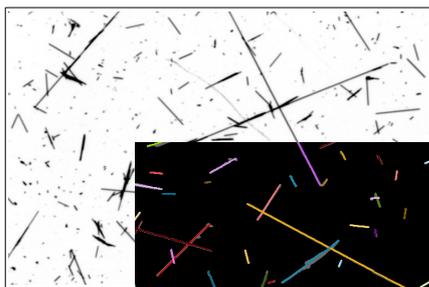
Flax fiber bundles

← 2.4 cm →

FibreShape FA is in use for the quality control of the raw material and end products (e.g. rovings and yarn). Flax fibers are nowadays typically used in technical applications as for example in the automotive industry (natural fiber reinforced plastics).

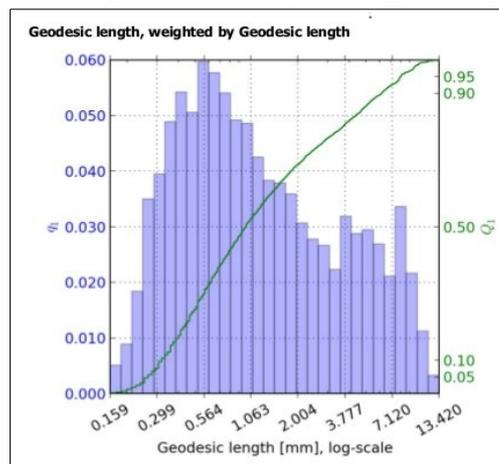


Length measurement of carbon fibers with FibreShape FiVer FH (crossing fibers)



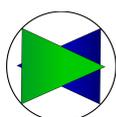
Glass fibers scanned at 2400 dpi.

Black overlay: fibers recognized by FibreShape FiVer



The length weighted histogram shows $q_1(x)$ = distribution density of the geodesic length. $Q_1(x)$ = cumulative distribution by length. The analysis are based on the ISO norms (ISO 9276-1 & ISO 13322).

The fiber length plays an important role in determining the mechanical properties like strength, modulus and fracture toughness.



Specifications

Recommended size range:	
FibreShape M:	Medium format scanner: 15µm-200µm in fiber width, 30µm-5cm in fiber length
FibreShape FA	A4 scanner with automatic sample feeder: 30µm-3mm in fiber width to 30µm-15cm in fiber length
FibreShape FH	A4 scanner with hand operated sample feeder: 30µm-3mm in fiber width to 30 µm-15cm in fiber length
FibreShape FiVer (M):	Medium format scanner: 15µm-200µm in fiber width, 30µm-5cm in fiber length
FibreShape FiVer (FH):	A4 scanner with hand operated sample feeder: 30µm-3mm in fiber width to 30 µm-15cm in fiber length
Characterization parameters:	<ul style="list-style-type: none"> • size: length and width • shape descriptors according to ISO 9276 – 6, e.g. aspect ratio, elongation, curvature and rectangularity • orientation • color (red, green, blue)
Typical application:	<ul style="list-style-type: none"> • industrial fibers: glass fibers, carbon fibers, aramid fibers • natural fibers: cotton, hemp, flax, kenaf, etc.
Statistical evaluations:	<ul style="list-style-type: none"> • size or shape parameters weighted by length, area or volume • diagrams: histogram and/or cumulative distribution logarithmic and linear scale • statistical quantities: mean, median, standard deviation, span
ISO Compliance:	ISO 9276 - 6
Voltage:	220/110 V 50/60 Hz;
Software FibreShape PRO:	<ul style="list-style-type: none"> • freely adjustable size ranges, shape and color filters • allocation of each recognized fiber to the parameter values • calibration of the scanner • creation of individual user profiles • creation of individual measure masks • interactive reporting system available in English and German

