

HIGH VOLUME COTTON TESTING EQUIPMENT

CONTEST-F2

**Cotton classing**

- To test all cotton classification values, such as: length, strength, elongation, micronaire, maturity, colour grade and trash
- Can test both raw cotton or lint
- Test results independent from operator influence due to highly automated operation
- Classing module is calibrated with international standard materials
- Fully automatic
- Designed, engineered and manufactured in Italy

CONTEST-F2 Code 3302F



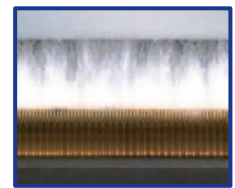
Micronaire
Maturity
Fineness



Easy and intuitive
user interface



Length
Short fibers
Strength
Elongation
Moisture
Colour grade
Leaf grade
S.C.I



Description

CONTEST-F2 has been developed to measure all relevant fiber data from cotton bales. The instrument consists of 3 modules:

- **Module 1** measures all parameters related to the length and strength classification of raw cotton, like upper half mean length, mean length, uniformity index, strength, elongation, short fiber index, moisture, as well as the spinning consistency index;
- **Module 2** evaluates the color and appearance classification of raw cotton, such as colour grade, Rd, +b, trash count, trash area, and leaf grade;
- **Module 3** provides a full characterization of the fiber fineness for raw cotton, like micronaire and maturity index, as well as all other properties which can be accessed through a fully cleaned material (lint fiber), such as the lint surface area (mike), maturity ratio, percentage content of mature fibers, fineness, and standard fineness.

The integration of various sensors provides the full fiber profile, which is important for the preparation and spinning process, as well as the yarn quality and the final product. After the sample preparation, the measurements take place automatically, therefore test results are not affected by the operator. Easy sample preparation and user-friendly interface. The three measuring modules can be operated simultaneously as well as separately; in facts, each sensor can be individually selected and used.

The overall measuring time of all modules, operating in simultaneous or separate mode, are listed in the following table:

Module	Testing time		Num. tests to be averaged per sample		Num. tests per 8-hour shift	
	All modules simultaneously	Single modules separately	All modules simultaneously	Single modules separately	All modules simultaneously	Single modules separately
1 - Length & Strength	60 sec / test	60 sec / test	2 combs	2 combs	~450	~450
2 - Colour & Trash	60 sec / test	15 sec / test	2 readings	1 reading	~450	~1800
3 - Micronaire & Maturity	120 sec / test	12 sec / test	1 reading	1 reading	~225	>2200

Required testing conditions; Temperature: 21°C ± 1°C / 70°F ± 2°F - Relative Humidity: 65% r.H. ± 2%, non-condensing according to (ASTM D1776 or ISO 139).

As prescribed by ITMF in the Guideline for Standardized Instruments Testing of Cotton, the Module 1 is set to automatically perform the average of double combs for Length & Strength for both the simultaneous and separate uses. Differently, the Module 2 is set to carry out double readings for Colour & Trash only for the simultaneous mode, whereas single readings for Colour & Trash can be performed in the separate mode. Module 3 executes only single measurements.

Sample weight: · for Module 1 and 2: 25-30 g · for Module 3: 3.00 g · for NATI Advanced: 0.50 g for raw cotton and 1.00 g for sliver.

Test Results	Description	Data / Value
MODULE 1		
Length / Short fibers	Optical measurement of the fibers which are randomly clamped in a comb (bundle fiber measurement). All length parameters derive from the fibrogram to be processed for analysis. These are UHML, ML and UI. The short fibers index (SFI) refers to the fibers which are shorter than 1/2 inch (12.7 mm).	Upper Half mean length, UHML [mm or inch] Mean Length, ML [mm or inch] Uniformity Index, UI [%] Short Fiber Index, SFI [%]
Strength / Elongation	Physical measurement of the fiber strength by clamping and breaking the fibers at a distance of 1/8 inch (bundle fiber measurement). The applied force when pulling the fibers to the point of rupture is reported as fiber strength. The distance at the point of break is reported as elongation.	Strength, Str [g/tex] Elongation, Elong [%]
Moisture content	Cotton moisture content measurement based on electrical resistance. Sensor is located at the sampling position for the length and strength measurement.	Moisture, Moist [%]
Spinning Consistency Index	Calculated value based on Length/Strength, Micronaire and Color measurements which quantifies the level of spinnability for each raw sample.	SCI [a.u.]
MODULE 2		
Colour	Optical measurement of the surface colour of a cotton sample by spectrophotometer. Results are graded according to the Nickerson-Hunter colour chart for Upland cotton (by default).	Reflectance, Rd [%] Yellowness, +b [a.u.] Color-Grade (Upland), CG Color-Grade (Custom), CG
Trash	Optical measurement of the trash particles found on the surface of a cotton sample. Results are graded according to the USDA trash grades.	Trash count, Tr C [count] Trash Area, Tr Area [%] Leaf Grade [a.u.]
MODULE 3		
Micronaire	Only from raw material: evaluation of the air permeability in single compression of the sample (fiber + contamination) of a constant weight, as an indication of the fiber fineness.	Micronaire, Mic [$\mu\text{g}/\text{inch}$]
Maturity	Only from raw material: indication of the cell-wall thickness of the fibers which is calculated on the basis of the micronaire evaluation.	Maturity, Mat [index]
Mike	Only from lint material: evaluation of the air permeability in single compression of the sample (lint fiber) of a constant weight, as an indication of the true fiber fineness.	Lint surface area, Mike [$\mu\text{g}/\text{inch}$]
Maturity Ratio	Only from lint material: evaluation of the air permeability by double compression air flow measuring maturity separately from the mike; maturity is related to the cell-wall thickness of the fiber.	Maturity ratio, MR [a.u.]
Percent content of Mature Fiber	Only from lint material: evaluation of the percent content of mature fibers based on the air permeability by double compression air flow.	Mature Fiber content, PM [%]
Fineness	Only from lint material: evaluation of the fiber count based on the air permeability by double compression air flow.	Fineness, H [mtex]
Standard Fineness	Only from lint material: calculation based on Maturity Ratio and Fineness.	Standard Fineness, Hs [mtex]

STANDARD EQUIPMENT

- Pc with wide touch screen monitor
- 2 Sensors to measure the ambient conditions: temperature and relative humidity (internal and external)
- Barcode reader
- Electronic balance: 820g / 0.01 g
- 2 cassettes for sample preparation of module 1-2
- 1 cassette for colour tiles
- Toolkit (spare parts and maintenance tools)
- 1 compressed air tool (already installed) equipped with pipe
- 2 pcs. of standard calibration cottons for micronaire testing
- 4 pcs. of standard calibration cottons for length and strength testing (n.2 for Universal, n.2 for Extra Long Staple)
- 1 set of standard tiles for the colour calibration

REFERENCE STANDARDS

Micronaire	ISO 2403 - Determination of micronaire value
Maturity	UNI EN ISO 10306 - Evaluation of cotton fibres maturity
Length	ASTM D1447 - Length and Length Uniformity of Cotton Fibers by Photoelectric Measurement
Strength	ASTM D1445 - Breaking Strength and Elongation of Cotton Fibers (Flat Bundle Method)
High Volume Instruments and testing	ASTM D5867 - Measurement of Physical Properties of Raw Cotton by Cotton Classification Instruments

DIMENSIONS / POWER SUPPLY

Weight: 311 kg
Dimensions: (L) 1510 x (W) 980 x (H) 1450 mm
Power supply: 230 Vac, 50/60 Hz, single-phase - 1,7 kW
Air supply: 6 bar

