

HIGH VOLUME COTTON TESTING EQUIPMENT

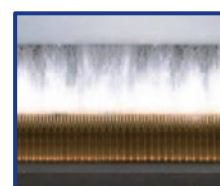
CONTEST-F2



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



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	20 sec / test	1 reading	1 reading	~225	>1000

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.

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 [µg/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 [µg/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

FIBER TESTING

example of CONTEST-F2 + NATI ADVANCED obtainable data

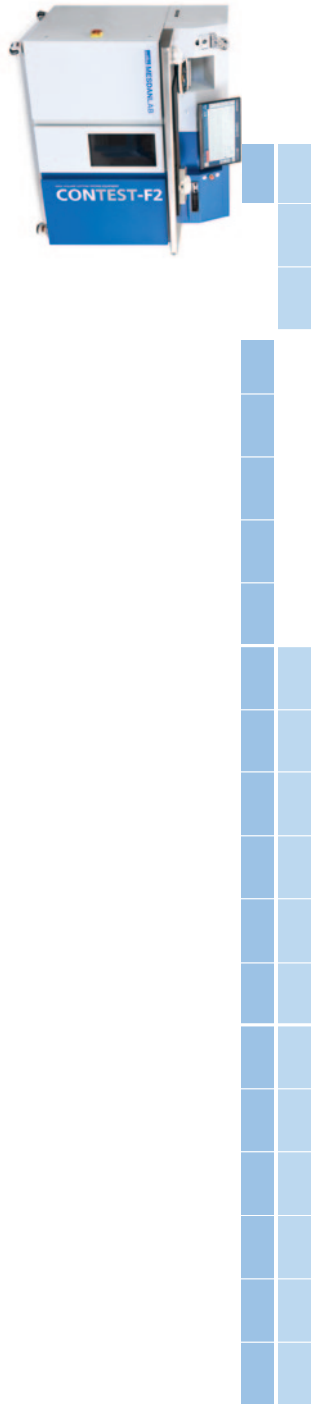


10 TESTS

Calibration Length & Strength: Universal Long Strong 34967 – Universal Short Weak 34458 - Calibration Micronaire: Universal Au46 – Gu38

Subsample	Micronaire & Maturity								Length & Strength					Color				Trash		Leaf
	SCI	Mic	Mat	Mike	MR	PM	H	Hg	UHML	ML	UI	SFI	Str	Elo	Rd	+b	C-Grade	Tr-Cnt	Tr-Area	
1	135	4.75	0.87	4.66	0.944	83.4	192	204	29.93	25.11	83.9	7.2	29.8	7.1	73.8	9.6	32.2	50	0.42	5
2	141	4.75	0.87	4.71	0.967	85.1	191	197	29.64	24.92	84.1	7.2	31.9	7.5	73.8	9.7	32.1	47	0.54	5
3	137	4.71	0.87	4.67	0.989	86.7	185	187	29.48	24.70	83.8	7.4	30.9	7.2	73.7	9.5	32.2	40	0.36	4
4	141	4.75	0.87	4.68	0.951	83.9	192	202	29.60	24.97	83.8	7.3	32.4	7.0	73.7	9.4	32.2	50	0.32	5
5	136	4.76	0.87	4.72	0.954	84.2	194	203	29.15	24.42	83.8	7.5	31.0	7.8	74.5	9.6	32.1	40	0.28	4
6	136	4.74	0.87	4.71	0.973	85.6	190	195	28.78	24.21	84.1	7.4	30.5	7.4	73.7	9.7	32.1	42	0.28	4
7	136	4.76	0.87	4.66	0.967	85.1	188	195	29.71	24.89	83.8	7.4	30.8	7.4	74.0	9.4	32.2	46	0.27	4
8	135	4.82	0.87	4.68	0.966	85.1	189	196	29.36	24.55	83.6	7.5	31.1	7.5	74.2	9.4	32.2	47	0.37	5
9	137	4.73	0.87	4.70	0.941	83.2	195	207	29.83	24.91	83.5	7.5	31.3	6.9	74.3	9.7	32.1	46	0.25	4
10	138	4.83	0.87	4.66	0.998	87.4	183	184	29.68	24.82	83.6	7.5	32.0	7.2	73.5	9.5	32.2	56	0.68	6
Mean	137.2	4.76	0.87	4.69	0.965	85.0	189.9	196.9	29.54	24.75	83.8	7.4	31.2	7.3	73.9	9.55	32.2	46	0.38	4.6
C%v	1.63	0.79	0.08	0.50	1.90	1.61	1.92	3.74	1.20	1.13	0.24	1.63	2.44	3.75	0.43	1.33		10.7	36.5	15.2
StdDev	2.2	0.04	0.00	0.02	0.018	1.37	3.6	7.4	0.36	0.28	0.2	0.1	0.8	0.3	0.3	0.13		5	0.14	0.7
Min	134.7	4.71	0.87	4.66	0.941	83.2	183	184	28.78	24.21	83.5	7.2	29.8	6.9	73.5	9.40		40	0.25	4
Max	141.1	4.83	0.87	4.72	0.998	87.4	195	207	29.93	25.11	84.1	7.5	32.4	7.8	74.5	9.70		56	0.68	6
O99	2.0	0.03	0.00	0.02	0.016	1.21	3.2	6.5	0.31	0.25	0.2	0.1	0.7	0.2	0.3	0.11		4	0.12	0.6

NATI Advanced (optional)									
Neps	SC Neps	Tot Neps	Trash	Dust	Tot Trash				
Cnt / 8	Cnt / 8	Cnt / 8	Cnt / 8	Cnt / 8	Cnt / 8				
202	18	220	76	370	446				
204	27	231	95	646	741				
209	27	236	111	588	699				
189	30	219	110	689	799				
222	34	256	124	762	886				
225	30	255	113	654	767				
210	27	237	105	606	711				
199	42	241	159	865	1024				
217	28	245	92	687	779				
167	10	177	41	136	177				
204.4	27.3	231.7	102.6	600.3	702.9				
8.3	31.4	9.9	30.0	34.5	33.5				
17.1	8.6	22.9	30.8	206.9	235.7				
167	10	177	41	136	177				
225	42	256	159	865	1024				
15.1	7.6	20.3	27.3	183.2	208.7				



AMBIENT CONDITIONS

Ambient conditions must be maintained in order to get reproducible test results, according to ISO 139 (temperature: 20°C ± 2°C / 68°F ± 2°F / R.H: 65% ± 4%) and/or according to ASMT D1776 (temperature: 21°C ± 1°C / 70°F ± 2°F / R.H: 65% ± 2%).

Due to the hygroscopic nature of cotton, the samples have to be conditioned in the laboratory for at least 24 hours before testing.

For a proper way of testing for commercial use with the aim to obtain reliable and comparable test results, it is recommended to follow the Guideline for Standardized Instrument Testing of Cotton approved by the ICAC Task Force on Commercial Standardization of Instrument Testing of Cotton (CSITC) and the ITMF Instrument Committee on Cotton Testing Methods (ICCTM), available at:

www.csitc.org - www.icac.org - itmf.org

NATI ADVANCED

In order to complete the cotton profile on raw cotton, the CONTEST-F2 can be linked to the latest version of the well known third generation of NATI - advanced version. The NATI ADVANCED (code 32800) can be simultaneously used with CONTEST-F2, sharing the same graphical user interface of CONTEST-F2, appearing together on the same screen and same printout, including:

- Neps count/g (>0.5 mm) · Seed Coat Neps count/g (>1.0 mm) · Total Neps count/g (>0.5 mm) · Trash count/g (>0.25 mm) · Dust count/g (>0.15 mm) · Total Trash count/g (>0.15 mm)



RAW
LIN7