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



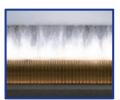
Micronaire Maturity Fineness



Easy and intuitive user interface

MESDAN CONTEST-F2

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	Testin	g time	Num. tests to per sa	b be averaged ample	Num. tests sh	per 8-hour ift
Wodale	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: $21^{\circ}\text{C} \pm 1^{\circ}\text{C} / 70^{\circ}\text{F} \pm 2^{\circ}\text{F}$ - Relative Humidity: 65% r.H. \pm 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 [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

- \cdot Pc with wide touch screen monitor \cdot 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)
 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)
 Lot of standard tiles for the select adilibration
- · 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 ASTM D1447 - Length and Length Uniformity of Cotton Fibers by Photoelectric Measurement Length ASTM D1445 - Breaking Strength and Elongation of Cotton Fibers (Flat Bundle Method) Strength ASTM D5867 - Measurement of Physical Properties of Raw Cotton by Cotton Classification Instruments High Volume Instruments and testing

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

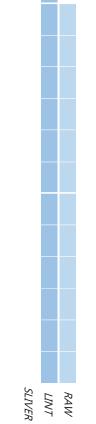


10 TESTS

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

Japanpic			1	2	ω	4	ъ	6	7	∞	9	10	Mean	CV%	StdDev	Min	Max	Q99
	SCI		135	141	137	141	136	136	136	135	137	138	137.2	1.63	2.2	134.7	141.1	2.0
141101	Mic	μg/inch	4.75	4.75	4.71	4.75	4.76	4.74	4.76	4.82	4.73	4.83	4.76	0.79	0.04	4.71	4.83	0.03
אווכן סוומוור פל ואומימו ולא	Mat	index	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.08	0.00	0.87	0.87	0.00
i a cai icy	Mike	µg/inch	4.66	4.71	4.67	4.68	4.72	4.71	4.66	4.68	4.70	4.66	4.69	0.50	0.02	4.66	4.72	0.02
	MR		0.944	0.967	0.989	0.951	0.954	0.973	0.967	0.966	0.941	0.998	0.965	1.90	0.018	0.941	0.998	0.016
	PM	*	83.4	85.1	86.7	83.9	84.2	85.6	85.1	85.1	83.2	87.4	85.0	1.61	1.37	83.2	87.4	1.21
	н	mtex	192	191	185	192	194	190	188	189	195	183	189.9	1.92	3.6	183	195	3.2
	Hs	mtex	204	197	187	202	203	195	195	196	207	184	196.9	3.74	7.4	184	207	6.5
10,191	UHML	mm	29.93	29.64	29.48	29.80	29.15	28.78	29.71	29.36	29.83	29.68	29.54	1.20	0.36	28.78	29.93	0.31
-crigin & occording	ML	mm	25.11	24.92	24.70	24.97	24.42	24.21	24.89	24.55	24.91	24.82	24.75	1.13	0.28	24.21	25.11	0.25
907	Ľ	*	83.9	84.1	83.8	83.8	83.8	84.1	83.8	83.6	83.5	83.6	83.8	0.24	0.2	83.5	84.1	0.2
	SFI	%	7.2	7.2	7.4	7.3	7.5	7.4	7.4	7.5	7.5	7.5	7.4	1.63	0.1	7.2	7.5	0.1
	Str	g / tex	29.8	31.9	30.9	32.4	31.0	30.5	30.8	31.1	31.3	32.0	31.2	2.44	0.8	29.8	32.4	0.7
	Elo	%	7.1	7.5	7.2	7.0	7.8	7.4	7.4	7.5	6.9	7.2	7.3	3.75	0.3	6.9	7.8	0.2
000	Rd		73.8	73.8	73.7	73.7	74.5	73.7	74.0	74.2	74.3	73.5	73.9	0.43	0.3	73.5	74.5	0.3
	+b		9.6	9.7	9.5	9.4	9.6	9.7	9.4	9.4	9.7	9.5	9.55	1.33	0.13	9.40	9.70	0.11
	C-Grade		32-2	32-1	32-2	32-2	32-1	32-1	32-2	32-2	32-1	32-2	32-2					
77 0077	Tr Cnt		50	47	40	50	40	42	46	47	46	56	46	10.7	ъ	40	56	4
	Tr Area		0.42	0.54	0.36	0.32	0.28	0.28	0.27	0.37	0.25	0.68	0.38	36.5	0.14	0.25	0.68	0.12
	Leaf		5	5	4	ر ت	4	4	4	5	4	6	4.6	15.2	0.7	4	6	0.6

NATI A	dvanced	NATI Advanced (optional))		
Neps	SC Neps	Tot Neps	Trash	Dust	Tot Trash
Cnt/g	Cnt/g	Cnt/g	Cnt/g	Cnt/g	Cnt/g
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	200	700 7





AMBIENT CONDITIONS

CONTEST-F2

Ambient conditions must be maintained in order to get reproducible test results, according to ISO 139 (temperature: $20^\circ\text{C} \pm 2^\circ\text{C} / \text{R.H}$: $65^\circ\text{M} \pm 4^\circ\text{M}$) and/or according to ASMT D176 (temperature: $21^\circ\text{C} \pm 1^\circ\text{C} / 70^\circ\text{F} \pm 2^\circ\text{F} / \text{R.H}$: $65^\circ\text{M} \pm 2^\circ\text{M}$). 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, as well as to obtain essential processing data from slivers as well, the CONTEST-F2 can be linked to the latest version of the well known third generation of NATI – Advanced version. The NATI ADVANCED (code 3280C) 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:

 \cdot Neps count/g [>0.5 mm] \cdot Seed Coat Neps count/g [>1.0 mm] \cdot Total Neps count/g [>0.5 mm] \cdot Trash count/g [>0.25 mm] \cdot Dust count/g [>0.15 mm] \cdot Total Trash count/g [>0.15 mm]

Photographs and descriptions of the present leaflet have to be considered as purely indicative and not binding





