

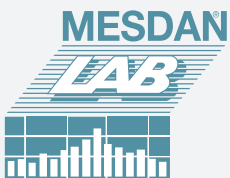
MATURITY AND CONTAMINATION TESTER

# CONTEST-S



## CONTEST:

- complete cotton bale contamination profile in one instrument
- easy preparation of **raw cotton** sample
- fully automatic **high speed and large mass** testing system
- capable to simultaneously detect, measure and classify cotton **contamination and stickiness**, as well as **maturity and fineness**
- highly flexible: each single test can also be run independently
- a valuable tool **to define cotton bale quality** and assist spinners in taking **processing decisions** in order to achieve consistent yarn quality standards



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MANAGEMENT SYSTEM  
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= ISO 9001 =  
= ISO 14001 =

# CONTEST code 3304

Cotton maturity and contamination tester



## Description

CONTEST makes the difference in the working principle: it simulates the carding process like in real spinning conditions.

Simple to use, the operator feeds a 3,5 g sample which is processed into a 10 m fine fibre web.

First, the web goes to the **Fragment Tester** for HD image analysis of Seed Coat Neps, and Trash. Then the same web is delivered to the **Stickiness Tester**, where it is pressed in between two heated drums, the sticky deposits adhering on the drum surface are optically inspected and drums automatically cleaned. Afterwards, the cotton web is recollected, blended and sent to the **Fineness and Maturity Tester**, where **Micronaire** is measured by the airflow principle, and Maturity by double compression.

The whole process is automatically achieved in about 1 minute.

### 1. FRAGMENT Tester

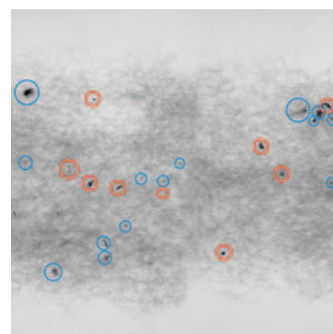
The Fragment Tester detects, measures and classifies all the impurities contained in the 10 m back LED-lighted web.

During each test over one hundred HD images are captured and analysed. Detected impurities in the web are optically inspected and classified, based on the following definitions:

**Seed Coat Neps** are pieces of broken cotton seed with fibres attached, optically looking like dark cores surrounded by irregular entanglement of fibres.

**Trash** consists of any extraneous solid matter (can be dry leaf, grass, bark fragment, dust, etc.), and optically looks like a dark piece of any shape, where light does not pass through.

All impurities are detected, measured and each of them is classified into 5 classes, then clearly brought to evidence, as shown in the picture: **Seed Coat Neps**, **Trash**.



## 2. STICKINESS Tester

Cotton stickiness phenomenon (also called “sugar” - honeydew) changes from season to season. It is caused by a large and variable source of contaminations. The most common originates from insect secretion (mainly from white-fly and aphid), or from vegetals (like oils, seed glue, crushed seeds, etc.), or from other foreign matters that stick on mechanical parts.

Besides, immature fibres have a higher content of sucrose, which tends to be stickier than other vegetal sugars. Therefore it is possible to find sticky cotton crops even from origins that never had previous stickiness problems.

“Sticky cotton” bales may seriously compromise the spinning process and create lots of troubles.

If “sticky cotton” is not detected and properly handled, it can contaminate the spinning machines, increasing the production costs for excessive wear of machinery parts, for additional cleaning and maintenance operations, causing even the machinery clogging. Finally, the presence of stickiness in cotton can reduce the quality of the yarn (decreasing evenness and increasing neps content and hairiness).

CONTEST can **detect stickiness** affecting the spinning process, thus providing real feedbacks of stickiness and its **risk grade**, enabling spinners to decide how to process and blend different cotton bales. Simultaneous measurement of stickiness deposits, seed coat fragments and fibre maturity index on the same sample provides comprehensive information on cotton stickiness profile.

### Measuring principles and testing method:

- Thermodetection of sticky deposits in the fibre web.
- 3.5 g / 10 m sample pressed through two 37°C heated drums revolving in opposite directions.
- Whilst no sticky fibres are sucked away, the sticky deposits adhere on the drums’ surface, and are optically examined by means of a laser beam.
- Sticky points are analysed (amount and size) by the software. Subsequently sticky points are eliminated by means of two rotative brushes and a blade-mechanism, to ensure automatic cleaning of the drums’ surface, in order to avoid double counting and contamination of subsequent measurements.
- Detection sensor of fibrous material at the end of the test allows to monitor and warn about unproper cleaning of the roller surface.
- The heating of the drums is achieved by a special (patented) friction system of two moveable and adjustable brushes, which permit to rapidly reach the correct starting temperature, and maintain it stable during the test, thus ensuring measurement reliability and accuracy.

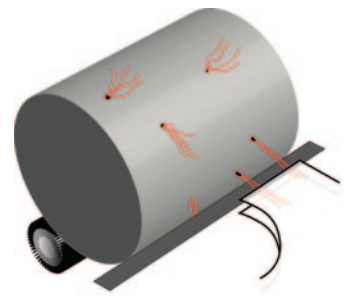
The sticky deposits are counted, classified and graded by the Stickiness Tester software as follows:

- **Sticky points classes:** all deposits are divided in 5 classes by size, from 1 (small) to 5 (large), based on the voltage peak analysis.
- **Sticky points/g:** the total amount of sticky points, in total and per class, is then converted into unit / g.
- **Sticky grade:** stickiness is graded by the software giving more importance to larger than smaller deposits. Sticky grade is an important real value, which enables to immediately identify cotton stickiness, for an easier bales management.
- **Sticky points average size.**

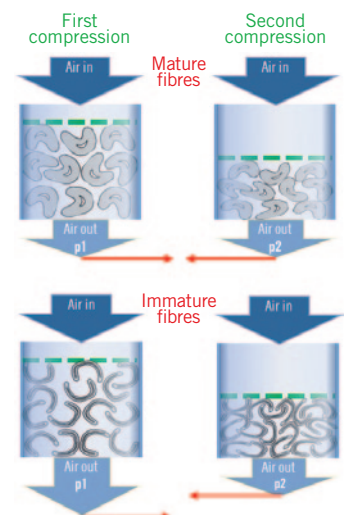
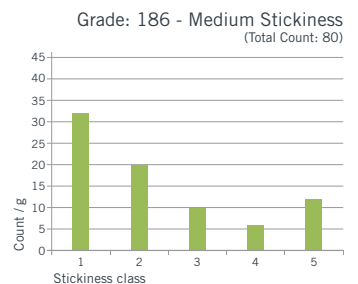
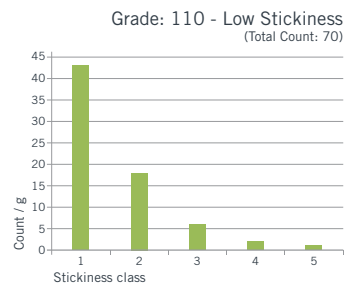
## 3. FINENESS and MATURITY Tester

- **Micronaire** is measured by the air flow through a cotton sample of a specific weight and registering the pressure drop. A sample made of coarse fibres will have low air resistance (high Mic value), whereas a sample made of fine fibres will have high air resistance (low Mic value). The result is expressed in Micronaire index, ranging from 2 to 8.
- **Fineness** is defined in terms of “mass per unit of length”, and is expressed in millitex. Its calculation is based on the Micronaire value.
- **Maturity** indicates the degree of fibre wall thickening: the thinner the cell wall is, the less mature the fibres are. To measure Maturity, CONTEST uses a standardised testing procedure known as the “double compression method”, performed after the Micronaire testing. Maturity index ranges from 0 to 1 (1 means perfectly mature fibres).

The relationship between maturity index and neps formation is well known, as neps are mainly made by immature and dead fibres. All neps with immature fibres inside create undyed spots in the finished fabrics known as “white specks” (WS), that downgrade fabric quality.



Stickiness Count and Grade.  
Graphic representation



# CONTEST

## TECHNICAL FEATURES

<b>Seed Coat Neps</b>	total count / g
Seed Coat Neps average size	mm
Seed Coat Neps classes	5 classes: less than 0.5; between 0.5-0.8; between 0.8-1.4; between 1.4-2.5; bigger than 2.5 mm
<b>Trash</b>	total count / g
Trash average size	mm
Trash classes	5 classes: less than 0.5; between 0.5-0.8; between 0.8-1.4; between 1.4-2.5; bigger than 2.5 mm
<b>Stickiness</b>	total count / g
Stickiness average size	mm
Stickiness classes	5 classes (from 1 to 5)
Stickiness grade	based on stickiness counting and classification
<b>Micronaire Index</b>	from 2 to 8 (MIC)
<b>Maturity Index</b>	from 0 to 1
<b>Fineness</b>	expressed in millitex

**Software languages:** English

**Screen size:** wide touch screen monitor

**USB:** Easy access to 4 USB ports

**Network capability:** Provided via Ethernet port

**Backup:** Storage of test results

**Testing speed:** About 70 seconds / sample

## INCLUDED COMPONENTS

- **2 Sensors** to measure the ambient conditions (temperature and relative humidity)
- **Balance:** Sartorius, Entris 8221S (820 g x 0.01 g) or similar model available
- **Barcode Reader** (for bale ID identification)

## OPTIONAL ACCESSORIES

<b>USDA calibration cotton</b> (micronaire) 5.5	code	199.2
<b>USDA calibration cotton</b> (micronaire) 2.6	code	199.14
<b>Printer</b>	code	250.4
<b>Power Supply Transformer</b> (from 115 Vac to 230 Vac)	code	3304.110

## COMPRESSED AIR CONDITIONS

Air pressure	6 bar
Dirt particles air filter (size)	5 microns
Air flow (average)	40 litres/min
Inlet air quality class	3.7.4 (according to ISO 8573)

## REFERENCE STANDARDS

- **Micronaire:** ISO 2403
- **Stickiness:** UNI EN 14278-3 (Method using an automatic thermodetection rotating drum device).

## DIMENSIONS / POWER SUPPLY

Weight: 350 kg  
Dimensions: (L) 1510 x (W) 960 x (H) 1430 mm  
Power supply: 230 Vac, 50/60 Hz, single-phase, 3 kW

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