

# TECHNICAL BULLETIN



COTTON INCORPORATED

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**TRI 4001**

## **COTTON INCORPORATED ANALYTICAL SERVICES LABORATORY**

## **WHAT IS IT?**

The Analytical Services Laboratory is equipped with both traditional equipment and modern instrumentation. There are three main functions within the laboratory:

1. Technical Service: The Analytical Services Laboratory uses both traditional and advanced analytical techniques to help the cotton textile industry troubleshoot special problems. The range of samples varies from cotton fiber to finished garments.
2. Research Support: Results from standard analytical and textile chemical tests provide researchers with basic information before a project begins and help to define the final results. Advanced instrumental techniques are also used to gauge the outcome of a project.
3. Methods Development: For the support of both research and production efforts, new analytical methods are often required to provide the required information. Existing analytical methods may be modified or entirely new methods may be developed to meet these needs.

## **WHERE IS IT?**

The Analytical Services Laboratory is part of the Product Development and Implementation Group at the Cotton Incorporated World Headquarters in Cary, North Carolina.

## **HOW IS IT STAFFED?**

The lab is staffed with chemists and technicians with experience in both analytical techniques and support services to the textile industry.

## **WHO CAN OBTAIN SERVICES?**

Textile manufacturers, weavers, knitters, converters, and retailers with specific interests in producing or marketing all-cotton or NATURAL BLEND<sup>®</sup> textile products of U.S. cotton are eligible for services provided by the Analytical Services Laboratory. Importers of cotton textile products into the U.S. are also eligible for these services. Requests for service should be directed to the Technology Implementation team at Cotton Incorporated in Cary.

**NOTE:** NATURAL BLEND<sup>®</sup> is a registered trademark of Cotton Incorporated for blended products containing a minimum of 60% Upland Cotton which meet approved performance characteristics.

## WHAT ARE SOME OF THE SERVICES OFFERED?

In addition to the three main functions given above, the staff is available for advice on analytical methods and/or instrumentation. The following tests are available on a routine basis:

### Test Methods

- Absorbency
- Alkalinity
- Chemical Damage
- Degree of Mercerization
- Dyestuff Classification/Identification
- Extractables (Water, Solvent, Enzyme)
- Fiber Content
- Formaldehyde
- pH
- Presence of Resin
- Spot Tests for Size, Iron
- Sugar Content

### Titrations

- Caustic (NaOH)
- Hypochlorite
- Peroxide

### Instrumental Analysis

- FT-IR
- NIR

| <b>EQUIPMENT</b>                                                                             | <b>TYPICAL USES</b>                                                                                                                      |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Metrohm Titrator (Model 716 DMS Titrino)                                                     | Automated titrations                                                                                                                     |
| Fisher Accumet pH Meter                                                                      | pH and mV measurements                                                                                                                   |
| Sartorius Analytical Balance (Model ME 254S Genius)                                          | Weighing to the nearest 0.0001 gram                                                                                                      |
| Sartorius Top Loading Balance (Model LA 5200P)                                               | Weighing to the nearest 0.01 gram                                                                                                        |
| Spectronics Unicam (UV1) Ultraviolet-Visible Spectrophotometer                               | Quantitative measurements of solution that absorb in the UV-VIS region of spectrum                                                       |
| Varian Fourier Transform Infrared Spectrophotometer (Model FTS-7000) with UMA 600 microscope | Identification of organic and some inorganic materials including microscopic samples; used extensively in technical service applications |
| FOSS/NIRSystems Near Infrared Spectrophotometer XDS and Fiber Optic Probe                    | Identification of fibers, blends, or spots on fabrics; degree of mercerization                                                           |
| Extraction Equipment (Soxhlet and Ultrasound)                                                | Extractions for identification and/or quantitative analysis                                                                              |
| Carpet Flammability Tester                                                                   | Pill test                                                                                                                                |
| Hitachi Video Microscope                                                                     | Isolation of contaminants and visual inspection of samples                                                                               |
| Büchi Rotary Evaporator (Model R-124)                                                        | Concentrating liquids and recycling of solvents                                                                                          |
| Mechanical Convection and Forced Air Ovens                                                   | Drying of samples                                                                                                                        |
| CEM Microwave (MARS 5)                                                                       | Rapid digestion of solid samples for subsequent analyses                                                                                 |
| Associated Environmental Systems Controlled Temperature and Humidity Chamber (Model HD-464)  | Condition samples for flammability testing                                                                                               |
| AnalytikJena Atomic Absorption Spectrophotometer with Flame and Graphite Furnace (vario 5)   | Determination of metals                                                                                                                  |
| Sartorius Microbalance (Model MC5)                                                           | Weighing to nearest 0.00001 gram                                                                                                         |
| Govmark 45 Degree Tester (TC-45)                                                             | General wearing apparel flammability                                                                                                     |
| Govmark Vertical Tester                                                                      | Vertical flammability and Children's sleepwear                                                                                           |

"The statements, recommendations, and suggestions contained herein are based on experiments and information believed to be reliable only with regard to the products and/or processes involved at the time. No guarantee is made of their accuracy, however, and the information is given without warranty as to its accuracy or reproducibility either express or implied, and does not authorize use of the information for purposes of advertisement or product endorsement or certification. Likewise, no statement contained herein shall be construed as a permission or recommendation for the use of any information, product, or process that may infringe any existing patents. The use of trade names does not constitute endorsement of any product mentioned, nor is permission granted to use the name Cotton Incorporated or any of its trademarks in conjunction with the products involved."

## RESEARCH AND TECHNICAL SERVICES

Cotton Incorporated is a research and promotion company representing cotton worldwide. Through research and technical services, our company has the capability to develop, evaluate, and then commercialize the latest technology to benefit cotton.

- Agricultural research leads to improved agronomic practices, pest control and fiber variants with properties required by the most modern textile processes and consumer preferences. Ginning development provides efficient and effective machines for preservation of fiber characteristics. Cottonseed value is enhanced with biotechnology research to improve nutritional qualities and expand the animal food market.
- Research in fiber quality leads to improved fiber testing methodology and seasonal fiber analyses to bring better value both to growers and then mill customers.
- Computerized fiber management techniques result from in-depth fiber processing research.
- Product Development and Implementation operates programs leading to the commercialization of new finishes and improved energy and water conserving dyeing and finishing systems. New cotton fabrics are engineered -- wovens, circular knits, warp knits, and nonwovens -- that meet today's standards for performance.
- Technology Implementation provides comprehensive and customized professional assistance to the cotton industry and its customers -- textile mills and manufacturers.
- A fiber to yarn pilot spinning center allows full exploration of alternative methods of producing yarn for various products from cotton with specific fiber profiles.
- The Company operates its own dyeing and finishing laboratory, knitting laboratory, and a laboratory for physical testing of yarn, fabric, and fiber properties including High Volume Instrument testing capable of measuring micronaire, staple length, strength, uniformity, color, and trash content.

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