

TECHNICAL BULLETIN



COTTON INCORPORATED

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COTTON INCORPORATED

**PRODUCT EVALUATION
LABORATORY**

WHAT IS IT?

Cotton Incorporated's Product Evaluation Laboratory (PEL) provides a wide range of standard fiber, yarn, fabric, and product tests. The PEL has two testing and evaluation labs: (1) a conditioning and testing lab, and (2) a product care lab. The standard tests performed are those developed by the American Association of Textile Chemists and Colorists (AATCC) and the American Society for Textile Materials (ASTM), many of which are similar to or comparable to the International Standardization Organization (ISO) standard test methods. The PEL participates in testing proficiency programs sponsored by both AATCC and ASTM.

WHO DOES THE TESTING?

The PEL staff includes personnel qualified to perform standard textile test methods. PEL personnel have earned certificates from AATCC after successful completion of training workshops. Other certificates of training from equipment manufacturers have been earned at specialized training workshops. PEL staff are active members of either ASTM, AATCC, or both standard organizations.

WHO CAN OBTAIN SERVICES?

Yarn spinners, knitters, weavers, dyers/finishers, converters, and retailers with specific interests in producing or marketing all-cotton or NATURAL BLEND[®] textile products made of U.S. cotton are eligible for services provided by the Product Evaluation Laboratory. Importers of cotton textile products into the U.S. are also eligible for these services. Cotton Incorporated's Agricultural, Global Product Supply Chain, Fiber Competition, and Consumer Marketing divisions are also beneficiaries of the Product Evaluation Laboratory's services.

NOTE: NATURAL BLEND[®] is a registered trademark of Cotton Incorporated to identify products containing a minimum of 60% Upland cotton, which meet the objective criteria established by Cotton Incorporated.

WHAT ARE SOME OF THE TESTS OFFERED?

Fiber Tests

- Micronaire, Length, Length Uniformity Index, Strength, Elongation, Color, Leaf Content, ASTM D5867 (Uster 900 and 1000 HVI)
- Micronaire, ASTM D1448
- Neps, ASTM D5866 (AFIS)
- Length Distribution (AFIS)
- Trash Content (AFIS and MDTA3))

Yarn Tests

- Breaking Strength, single strand, ASTM D2256 (Uster Tensorapid 4)
- Breaking Strength, skein, ASTM D1578 (Scott Tester)
- Unevenness, ASTM D1425 (Uster System III)
- Twist, ASTM D1422 (direct) and D1423 (indirect) (Zweigle 304)
- Yarn Abrasion and Lint Generation, (Lawson-Hemphill CTT)
- Yarn Hairiness, (Uster UT3 and Zweigle G567)
- Yarn Number, ASTM D1907 (skein)

Fabric Construction Analyses

- Barré, (SDL Atlas Streak Analyzer)
- Bow and Skewness, ASTM D3882
- Fabric Count, ASTM D3775 (woven), ASTM D3887 (knit)
- Fiber Identification, AATCC 20
- Knit and Weave Construction Analysis
- Melting Point
- Stitch Length
- Thickness, ASTM D1777
- Twist, ASTM D1422 (direct) and D1423 (indirect) (Zweigle 314)
- Width, ASTM D3774
- Yarn Number, ASTM 1059
- Yield, ASTM D3776

Fabric Performance Tests

- Burst, ASTM D3786 (inflated diaphragm –James H. Heal TruBurst) and D3787 (ball – MTS Q Test™ 5 Tester)
- Crease Retention, AATCC TM88C
- Dimensional Changes, AATCC 135 (fabric), 150 (textile items), and 187 (accelerated) (SDL Atlas Quickview™ measurement)
- Needle Cutting, (L&M Sewability Tester)
- Oil Repellency, AATCC TM118
- Seam and Yarn Slippage, ASTM D1683 and D434
- Seam Appearance, AATCC TM88B
- Skewness Change, AATCC TM179
- Smoothness Appearance, AATCC TM124 (fabric-Roaches Ltd SAS) and TM143 (garment)
- Soil Release, AATCC TM130
- Stiffness, ASTM D1388 and D4032
- Stretch and Growth, ASTM D3107 (woven) and D2594 (knit)
- Tear, ASTM D1424 (falling pendulum – TexTest FX3750), D2261 (tongue- MTS Q Test™ 5 Tester) and D5733 (trapezoid – MTS Q Test™ 5 Tester)
- Tensile, ASTM D5034 (grab) and D5035 (ravel strip/cut strip) (MTS Q Test™ 5 Tester)
- Water Absorbency, AATCC TM79 (drop)
- Water Repellency, AATCC TM22 (spray)
- Wrinkle Recovery Appearance, AATCC TM128
- Water/Alcohol Resistance, AATCC TM193

- Moisture Management - vertical wicking, horizontal wicking, and cling tests*
- Water/Alcohol Resistance, AATCC 193

* These tests are in process for being approved as AATCC test methods.

Fabric Abrasion Tests

- Flex, ASTM D3885 (TexTest FX3450)
- Martindale, ASTM D4966 (abrasion), D4970 (pilling) (Nu-Martindale)
- Oscillatory Cylinder, ASTM D4157 (Wyzenbeek)
- Pile Retention, ASTM D4685, (Taber 5130 Abrasion Tester)
- Random Tumble Pilling, ASTM D3512 (SDL Atlas Pilling Tester) (PillGrade® Automatic Pilling Grading System)
- Rotary Platform, ASTM D3884 (Taber 5130 Abrasion Tester)

Colorfastness Tests

- Crocking, AATCC TM8 (AATCC Crockmeter)
- Light AATCC TM16E (SDL Atlas 4000 -Xenon)
- Perspiration, AATCC TM15
- Washing, AATCC TM61 (accelerated) (AATCC Launderometer)
- Water, AATCC 107

Evaluation Procedures

- AATCC EP 1 Gray Scale for Color Change
- AATCC EP 2 Gray Scale for Staining
- AATCC EP 5 Fabric Hand Subjective Evaluation
- AATCC EP 7 Instrumental Assessment of the Change in Color of a Test Specimen
- AATCC EP 8 AATCC 9-Step Chromatic Transference Scale
- AATCC EP 9 Visual Assessment of Color Difference of Textiles

Microscopy

- Contaminant Identification
- Fiber Identification
- Spinning System Verification
- Videoprints

ARE OTHER TESTS AVAILABLE?

Yes. The tests available are not limited to those in the preceding list. Inquiries about other common and special textile tests are welcomed.

"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 improve 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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