TECHNICAL BULLETIN

COTTON INCORPORATED

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FQR 1002

ENGINEERED FIBER AND FABRIC SYSTEM

What is it?

A scientific approach to the selection and utilization of the proper growth area of U.S. cotton based on the textile mills' manufacturing equipment and the ultimate fabric to be produced.

What Does It Encompass?

Instrument measurement of fiber, yarn, and fabric properties that provide reliable and competitive data aimed at providing optimum mill efficiency. The measurement and use of cotton fiber is enhanced by a sophisticated cotton fiber management system known as Engineered Fiber Selection™ (EFS).

What Will EFS™ Do For a Mill?

A program known as Millnet provides a mill with a system to acquire, warehouse, and select uniform cotton mixes using HVI (High Volume Instrument) data. These mixes can then be optimized to produce a desired end product by taking into account such factors as mill production machinery and related cost factors.

Why Is It Important?

It's a key to productivity, quality, and profit. Being able to assess properties and then relate these to manufacturing processes is fundamental.

What Fiber Tools Are Available and What is Measured?

High Volume Tester --	Micronaire, length, length uniformity, strength, elongation, color, trash.
Nep Count --	AFIS (Advanced Fiber Information System).
Maturity --	Shirley Tester, FMT.
Non-Lint Content --	Microdust and Trash Monitor.
Digital Fibrograph --	Length. 2.5% span, length uniformity.
Fiber Length Array Method --	Upper quartile length.
Spin Limit Analysis --	Maximum yarn count that can be spun in 15 minutes on 30 spindles with zero ends down.
Computer --	For data analysis.

What Yarn Tools Are Available And What Is Measured?

Fiber to yarn processing laboratory - Cotton Incorporated has complete laboratory facilities for producing ring, open-end, and air jet yarns.

Yarn testing laboratory (Textile Services Laboratory) - for complete testing of yarn uniformity, strength and quality.

What Fabric And End Product Tools Are Available and What Is Measured?

Fabric and product testing laboratory (Textile Services Laboratory) – For complete testing of woven and knitted fabrics and products for color, for construction, and for performance.

Weft knitting laboratory - For manufacturing sample yardage to see visually the effect of fibers and yarns in fabric and to provide fabric for physical and chemical evaluation.

Dyeing and finishing laboratory - For producing colored fabrics with chemical finishes to evaluate response to fibers with specific characteristics through yarn and finished product.

What Tools Are Used to Predict Fiber Requirements?

End product specifications - With knowledge of industry requirements, fiber with specific characteristics can be selected to produce a profitable product with acceptable quality.

Computer analysis - With a data bank containing a wide variety of fiber, yarn, and fabric tests and how they respond on manufacturing equipment to produce a given result, accurate mathematical predictions can be made on what to expect from fiber tests only. This scientific predicting procedure is sometimes called "Regression Analysis". It's simply having enough background data to predict what a given fiber might produce in a composite structure (e.g., fabric).

What Other Uses Do We Find For Engineered Fiber And Fabric Data?

Developing new yarns in fabrics.
Solving mill production problems.
Solving mill quality problems.

Who Benefits From This Approach?

The mills by having on-site assistance through initial phases of such a program with the opportunity for continuing service and increased productivity and profits.

U.S. cotton suppliers by a well-defined cotton fiber market opportunity.

U.S. cotton producers by having an expanded market for their product.

How Does An Organization Or Person Undertake To Use This System?

Contact Cotton Incorporated marketing or research personnel. Backed by the necessary laboratory facilities, they can provide assistance as required.

In Summary, What Is The Engineered Fiber and Fabric System?

A system whereby cotton fiber with known test values is selected and followed closely throughout the textile manufacturing process to produce a product economically and of a quality satisfactory to the customer. This may include observation and control of equipment and processing routes along with chemical and mechanical treatments.

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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