

# TECHNICAL BULLETIN



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**TRI 1013**

## **STICKY COTTON**

### **RECOMMENDATIONS FOR MILL PROCESSING**

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## **INTRODUCTION**

Textile mills have used the term "sticky cotton" to describe cotton lint which sticks to moving machinery parts and causes problems in yarn manufacturing.

## **CAUSES**

Stickiness on cotton lint can be caused by secretions from insects (honeydew) or natural plant sugars resulting from nectaries on the cotton plant or cellulose precursors in the cotton boll. It has been estimated that most sticky cotton problems are related to insect honeydew contamination on cotton lint. However, problems do occasionally arise because of natural sugars on cotton lint.

**Natural Sugars:** These natural sugars are produced by leaf and floral nectaries on the cotton plant as well as sugars present on fiber from newly opened bolls. Stickiness due to natural sugars usually disappears on storage. This stickiness is uniformly deposited on the lint and is often less of a problem in high rainfall production areas of the cotton belt.

**Insect Honeydew:** Insect honeydew is most often caused by aphids, whiteflies and mealy bugs, all members of the insect order Homoptera. Of these, the whitefly most often causes stickiness. These insects ingest plant juices, extract proteins and other nutrients from these plant juices, and then expel excess sugars in the form of honeydew. These sticky liquid droplets subsequently fall on leaves or lint after boll opening.

In view of these manufacturing problems, mill trials were run and industry contacts were made to determine recommendations for control. The results of this work follow.

## **PROCESSING RECOMMENDATIONS**

The processing of sticky cotton during yarn manufacturing may be improved by introducing or adjusting some conditions in cotton bale storage and/or the yarn preparation stages. The following list of items is presented to assist the manufacturer in processing. These items can be evaluated individually or in combination with each other.

### **FIBER STORAGE:**

- Store suspect or identified bales with the sticky condition for an aging period.

### **OPENING/BLENDING:**

- Incorporate a minimum number of suspect bales in each laydown blend.
- Distribute contaminated bales throughout the mix.
- Optimize blending conditions to assure an even distribution through the blend mix.
- Introduce a lubricant in fog form at the end of the hopper conveyer to minimize sticking

problems.<sup>1</sup>

- Reduce relative humidity below 50%, or a workable level, in opening, picking, and carding.

NOTE: Reduced humidity conditions may be required and could be beneficial in drawing, combing, and spinning.

#### **CARDING:**

- Reduce or adjust rate of production of card to optimize processing of fiber.
- Reduce pressure on crush rolls of card, while continuing to maintain sufficient crushing action for dried trash.
- Replace and adjust card crush roll blade as necessary. NOTE: Roll blade may require more frequent cleaning during processing.
- Improvements may be experienced by sparingly spraying the card crush rolls with a lubricant<sup>2</sup> twice each shift.

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<sup>1</sup>Henry Perkins, "Identification and Processing of Honeydew Containing Cottons," Textile Research Journal, Volume 53 #8, August, 1983.

<sup>2</sup>"Pam" has been used by some U.S. mills to improve processing conditions during carding. "Pam" is a spray product used in the home to prevent fry pan sticking and is made by Boyle-Midway Household Products, Inc., New York, NY 10017.

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- 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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