TECHNICAL BULLETIN

COTTON INCORPORATED

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TRI 1010

RECOMMENDATIONS FOR PRODUCING LINEN-LOOK YARN ON CONVENTIONAL EQUIPMENT

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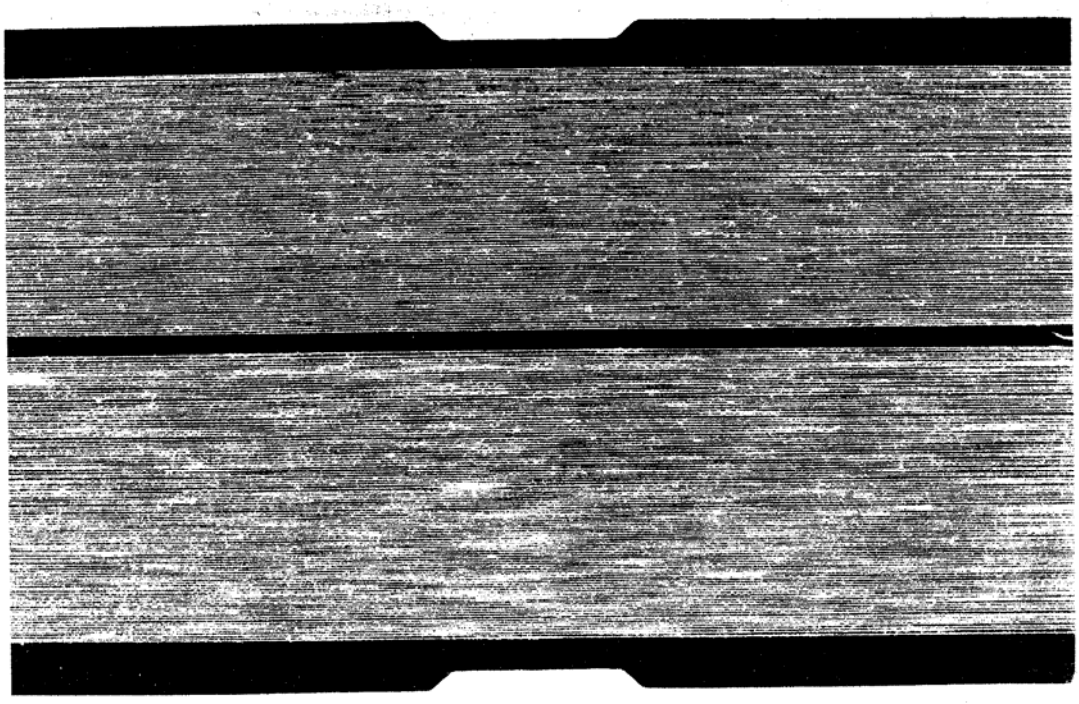
CONCEPT

To produce a 100% cotton novelty yarn with long linen-like slubs using standard mill machinery without special attachments.

INTRODUCTION

Cotton Incorporated developed a totally new novelty yarn with a linen look which can be produced on conventional mill machinery without special attachments. It is called "linen look" because it simulates long slubs common to linen yarn but is made using 100% cotton. The slubs are formed by using small amounts of comber noils (short fibers) in the final drawing operation. One of the main targets for this yarn is women's wear fabrics for blouses and skirts. In the current work, counts of 18/1 Ne were spun. The effective count range of this type yarn is projected to be from 8/1 Ne to 28/1 Ne.



Example: Linen-Look vs. Regular Yarn
(Ne 18/1 Ring TM 3.8)

FIBER ANALYSES

1. **Characteristics of fiber used in this project**

Type	-	U.S. upland cotton
Grade	-	SLM
Length (inches)	-	1.12
Mic	-	3.8 - 4.6
Strength (grams/tex)	-	24 and up

2. **Comber Noil** - any upland cotton noil

LINEN-LOOK YARN PREPARATORY PROCEDURE

1. Process 100% upland comber noils into card sliver--a sliver weighing 30-55 grains per yarn (.28 Ne-.15 Ne) was produced.

2. Process carded upland cotton through the first drawing to produce a sliver weighing approximately 44 grains per yard (.19 Ne).

3. Second Process Drawing--At the second process of drawing, blend one comber noil card sliver with six upland cotton slivers from the first drawing process. The comber noil sliver should be creeled in the middle of the six regular slivers. A 30-40 grains-per-yard sliver should be produced using a high front draft of at least 5.0.

4. Roving--Roving should be produced using the blended second process drawing sliver. The draft at roving should be as low as possible (2.5-4.0). It will be necessary to change the roving tension gear in order to build successfully a full package due to the heavy noil slubs in the roving.

Note: Slub size and frequency can be altered by the following procedures:

* The weight of the noil sliver fed to the drawing process can be raised (larger slub) or lowered (smaller slub) depending on the desired effect.
* The draft distribution on the drawing process can be weighted more on the front draft zone (larger slub) or weighted more on the back draft zone (smaller slub) depending on the desired effect.
* Roll settings or nip distances (ratch settings) can be increased (larger slub) or decreased (smaller slub) depending on the desired effect.
* Drawing speed can have a significant effect on slub size and frequency and will depend largely on the type and configuration of drawing used.
* Draft levels on processes after drawing (roving and spinning), if set high, will produce smaller and less frequent slubs as compared to larger and more frequent slubs if set low.

SPINNING SET-UP PROCEDURE

1. Creel in 4 to 6 bobbins of linen-look roving.
2. Start these ends spinning.
3. Adjust spindle speed until these ends stay up.
4. Select a traveler which winds a tight package without excessive breaks.
5. Adjust twist as necessary to achieve desired yarn strength and spinning efficiency.

PROCESSING SET-UP USED BY COTTON INCORPORATED

1. Opening and Cleaning

   Opening - Fiber Controls Hoppers
   Cleaning - Whitin Axi-Flo - Model A*
   Cleaning - Centrif Air XL Step Cleaner*
   Flock Feeder - Fiber Controls 310 Fine Opener

   *Bypassed for noil processing

2. Cards

   Card Chute Feed System - Fiber Controls - Snoflaker
   Saco Lowell Cards Rebuilt by Hollingsworth

	Regular Cotton	Noils
Production Rate (pounds/hour)	40	15
Sliver Weight (grains/yard)	57	55
Sliver Count (Ne)	0.146	0.151
Revolving Flats	yes	yes

3. Drawing - First Process*

   Saco Lowell - Model DE8C
   Production Rate (feet/minute) - 600
   Sliver Weight - 44 grams/yard - (.19 Ne)
   Number of Slivers Fed - 6

   Draft Distribution

Lifter roll to back roll	0.99
Back roll to 4th roll	1.18
4th roll to 3rd roll	1.25
3rd roll to front roll	5.07
Front roll to calender roll	1.01

   Roll Settings (center to center - inches)

Back roll to 4th roll	$1\ ^{22}/_{32}$
4th roll to 3rd roll	$1\ ^{5}/_{8}$
3rd roll to front roll	$2\ ^{17}/_{32}$

*Card sliver made of noil is not introduced into first process drawing.

4. Drawing - Second Process
   Saco Lowell - Model DE8C
   Production Rate (feet/minute) - 400
   Sliver Weight - 30 grains/yard - (.27 Ne)
   Number of Slivers Fed - 7
   - 6 First process
   - 1 Noil card sliver

Draft Distribution

Lifter roll to back roll	0.99
Back roll to 4th roll	1.18
4th roll to 3rd roll	1.25
3rd roll to front roll	7.3
Front roll to calendar roll	1.01

Roll Settings (center to center - inches)

Back roll to 4th roll	$1\ ^{27}/_{32}$
4th roll to 3rd roll	$1\ ^{5}/_{8}$
3rd roll to front roll	$2\ ^{17}/_{32}$

5. Roving
   Saco Lowell - Rovematic (14x7)
   Hank roving - 0.75
   Twist multiple - 1.48
   Tension gear (number of teeth) - 55*

Draft Distribution

Back roll to middle roll	1.34
Middle roll to front roll	2.01
Total draft	2.70

Roll Settings (center to center - inches)

Back roll to middle roll	$1\ ^{23}/_{32}$
Middle roll to front roll	$2\ ^{1}/_{4}$

Note: Tension will have to be adjusted to build a proper package.

6. Spinning
   Spinning frame - Zinser model 317 Spinomat
   Ring size (inches) - $2\ ^{1}/_{4}$
   Flange # - 1
   Spindle speed (RPM) - 5000
   Creeling - Single

   Yarn Quality Data (see following report)

TEST RESULTS - 18/1 Ne		
Sample ID.	85-434	85-434
Lab. Ref.	1186	1186
Date of Sample	11/11/85	11/11/85
Yarn Number	18/1	18/1
Yarn Type	100% Cotton	100% Cotton
Processing System	carded	carded
Spinning System	ring	ring
Twist Multiple	3.80	4.20
Bobbins tested,	10	10
Cotton count	18.11	17.87
Percent C.V.	2.11	1.67
Tex	32.61	33.05
Twist,	Z	Z
Twist per inch	16.71	18.43
Percent C.V.	.93	1.36
Twist multiple	3.93	4.36
Skein Strength,		
Lbs.	102.57	133.60
Percent C.V.	4.77	2.83
Actual Break Factor	1858	2387
Adjusted Break Factor	1860	2385
Single End Breaking Strength		
Grams	403	492
Percent Vo	11.90	9.80
Percent Vw	10.25	9.30
Percent Vb	6.04	3.08
G./Tex (RKM)	12.36	14.88
Single End Elongation,		
Percent	7.34	8.20
Percent C.V.	6.86	1.93
Uster Evenness,		
Percent C.V.	29.27	27.31
Percent Vo	2.86	2.03
Uster Imperfection Counts,		
Thin Places	2482	20
Thick Places	6112	2806
Neps	891	445
Total	9485	3971
Spectrograph,		
Percent of bobbins		
with periodicities	0	0

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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