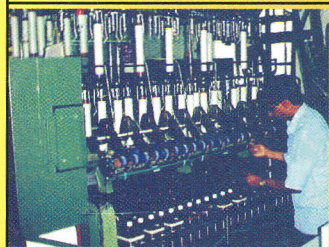


Spinning Tests at CIRCOT for Small Cotton Samples



Microspinning Test



Full Spinning Test



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Introduction

The commercial value of cotton lint is assessed on the basis of its spinning performance, which in turn is decided by the count to which a yarn is spun from the cotton by meeting the required processing performance and yarn quality. The yarn quality standard may be in terms of count strength product (CSP), single strand strength as RKM value, breaking elongation, unevenness and the number of imperfections and faults. The processing performance can be observed in terms of cleanability (ease with which lint can be cleaned), cardability, roller lapping tendency and end-breakage rates at various stages of processing, etc.

With raw material contributing to about 60% of the production cost and fibre properties decisively influencing the yarn quality, selection of cotton has become the most crucial factor for economical operation and the resultant viability of a spinning mill. As the most reliable method of assessing the spinning performance of a cotton is to subject it to actual test, CIRCOT has developed test methods and techniques for conducting spinning trials on small cotton samples. The primary objective of such an evaluation is to ascertain the spinning performance of a cotton and to postulate its behaviour when spun in bulk under mill conditions. These tests are regularly employed at CIRCOT for screening breeders' samples as well as for assessment of spinnability of commercial samples received from trade and textile industry.

Types of Spinning Tests

Two types of spinning test are carried out at CIRCOT. The type of test to be performed depends upon the quantity of cotton available for test. A microspinning technique has been evolved at this Institute whereby test could be carried out on cotton sample as small in quantity as 65 to 150 g. The second type of test known as full spinning is undertaken when cotton available is in bulk quantity of at least 5 kg.

Improved Microspinning Test at CIRCOT

The microspinning test has been developed by CIRCOT way back in 1950s. This technique has been improved and the procedure modified a few years back so as to produce yarns at a much faster rate. The modified technique is now known as "Improved Microspinning Test". In this, samples belonging to a particular trial are all spun to one count and the performance of cottons compared. The yarn samples are tested for count and lea strength and the corrected CSP calculated is used as an index of spinnability of the given cotton variety. The actual value is compared with CIRCOT CSP standards developed for various counts to determine the suitability of the cotton for manufacturing yarn of a particular count.

Details of Machines Employed

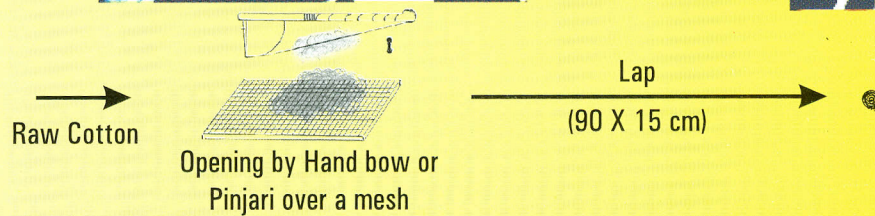
- (i) Modified SHP card with metallic clothing
- (ii) 4/4 roller drawframe with pneumatic loading and inverter speed control system
- (iii) Flyframe with SKF-PK-1600-40 four roller drafting system and inverter speed control system
- (iv) Ring frame with SKF-PK-225 top arm drafting, along with inverter speed control systems
- (v) Rotor frame (i) Rieter MO/5 unit (ii) CIRCOT-TRYTEX two head Spin Trainer
- (vi) Computerised lea tester

User Specified Tests

The Improved Microspinning Technique of CIRCOT is quite flexible to carry out testing as per user needs. An user can specify the following requirements for testing his cotton samples:

- (i) Blending with other cotton/s or other natural and manmade fibres
- (ii) Spinning of more than one count
- (iii) Yarn count and twist desired in the yarn

Microspinning



- (iv) Spinning speed
- (v) Process variables such as, drawing speed, roller settings and all parameters related to rotor spinning
- (vi) Quality evaluation in terms of single yarn breaking tenacity and elongation as well as yarn unevenness.

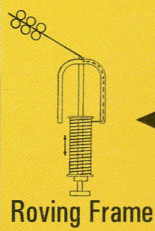
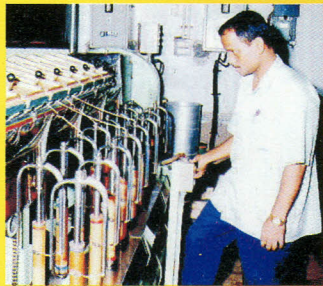
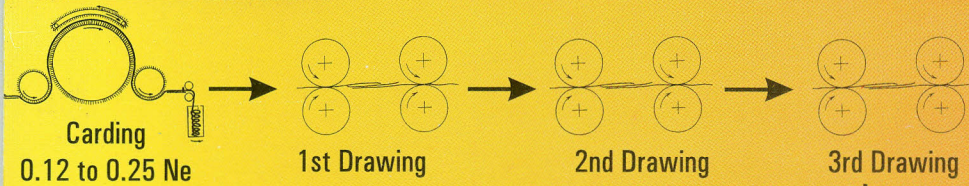
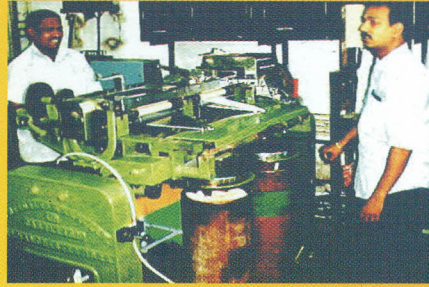
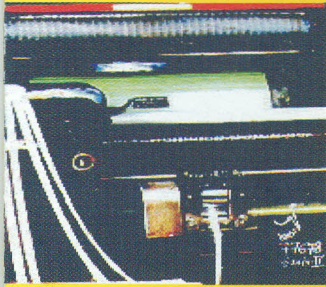
Full Spinning Test at CIRCOT

The full spinning test is carried out using normal processing methods as adopted in mills. The spinning machines used are of commercial type with less number of production heads. Two samples prepared from a given cotton are subjected to spinning to counts one above and another below than what is decided by the CIRCOT CSP norms. The full spinning results are precise and defines a spinning range for the cotton.

Details of Machines Employed

- (i) Platt's blowroom with 3 bladed beater opener, SRRL opener, Shirley opener, Air stream cleaner, scutcher lap unit with Krischner beater
- (ii) Upgraded SHP card with metallic wire clothing and web doffing system

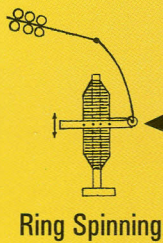
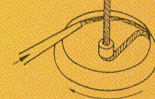
g Process



Final Drawn Sliver 0.15 to 0.45 Ne
 Doubling - 6X6X6 (upto 50s)
 Doubling - 6X6X4 (above 50s)

Roving
1.1 to 3.5 Ne

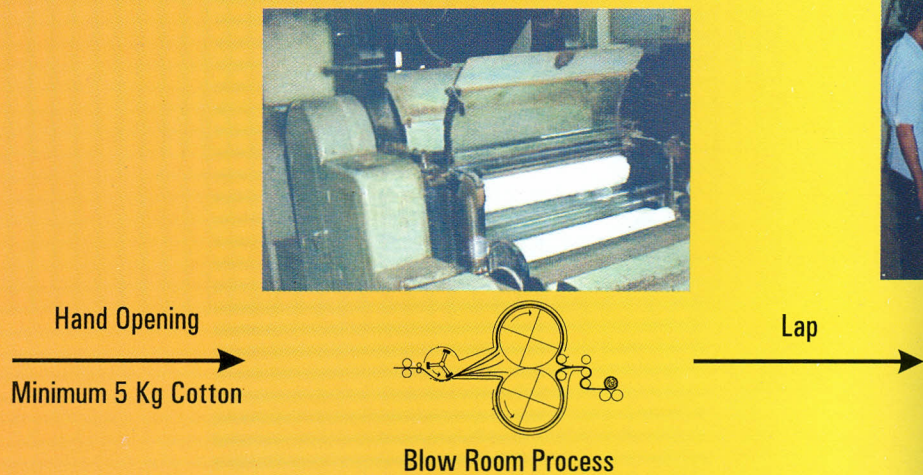
Rotor Spinning



Yarn 16s to 150s Ne

Yarn 2s to 30s Ne

Full Spinn



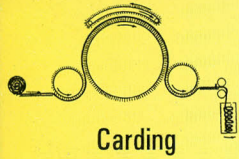
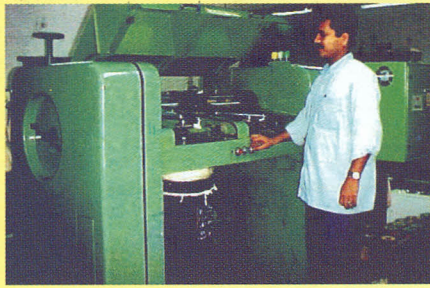
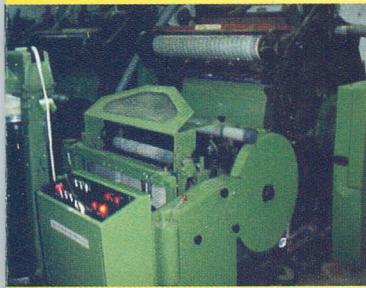
- (iii) Lakshmi-Rieter DO/2 high speed drawframe
- (iv) Lakshmi-Rieter type GS and Textool type TS 15 speed frame
- (v) Lakshmi-Rieter type DJ5 and Textool type DJ50 high speed ring frame
- (vi) Rieter MO/5 rotor frame
- (vii) Computerised lea tester

User Specified Tests

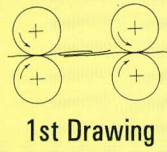
An user can specify the following additions/alterations for a full spinning test

- (i) End break rate at ring and rotor frames
- (ii) Determination of yarn appearance and hairiness
- (iii) Production of combed yarn (subject to supply of 50 kg of cotton lint or sliver)
- (iv) Determination of trash content in raw cotton

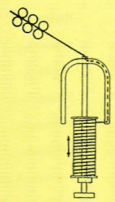
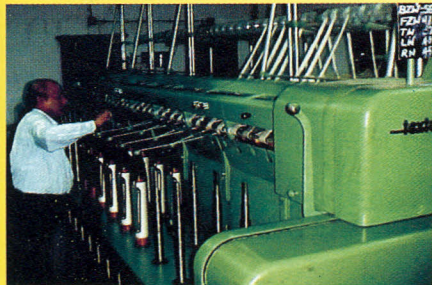
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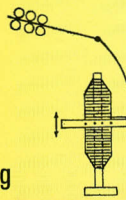
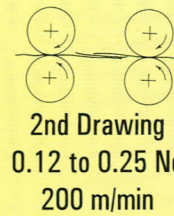
Sliver 0.12 to 0.22 Ne
34 m/min



Sliver 0.12 to 0.25 Ne
200 m/min

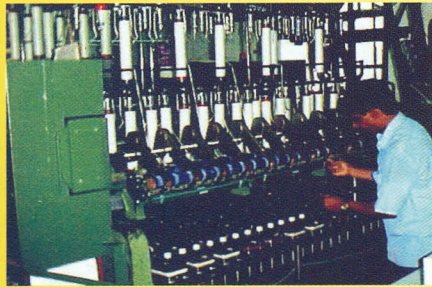


Speed Frame
0.75 to 3.5 Ne
10 to 30 m/min



Ring Spinning

Rotor Spinning



Yarn 16s to 150s Ne
7 to 15 m/min

Yarn 2s to 30s Ne
40 to 130 m/min

**Yarn Twist Multiplier and Lea CSP Standards for CIRCOT
Spinning Test (Ring Yarn)**

Count (Ne)	Twist Multiplier	Lea CSP
Below 16s	4.80	1800
16s	4.60	1987
20s	4.60	2024
30s	4.50	2116
40s	4.50	2208
50s	4.50	2300
60s	4.20	2392
80s	4.00	2576
100s	3.90	2760
120s	3.80	2944



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