

CIRCOT's Eco-friendly Process for Scouring of Cotton Textiles : Bio-scouring



Central Institute for Research on Cotton Technology
Adenwala Road, Matunga, Mumbai-400019

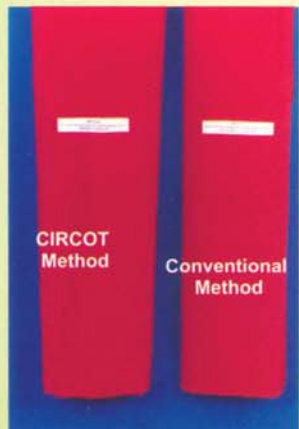
Introduction

Scouring is an important pre-treatment operation in the processing of cotton and cotton blended materials. The main objective of the above process is to remove the non-cellulosic constituents in cotton, which make the fibre non-absorbent posing serious technical problems during the subsequent stages in wet processing. In fact, the extent of scouring has a strong bearing on the ultimate quality of the finished product.

The conventional scouring operation consists of treating the cotton goods with 1-2% of NaOH solution at high pressure (15 lbs/in²) and temperature (121° C) for 4-5 hours. The above treatment is not only energy intensive but also leads to environmental pollution. It is estimated that scouring operation alone consumes about 1% of the total water used, contributes about 54% to the total BOD and is responsible for 10-25% of the total pollution load generated during the entire textile processing operation.

CIRCOT Process

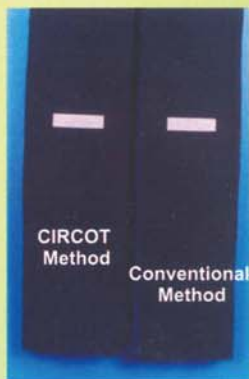
The grey cotton goods are immersed in water containing a small amount of the microbial consortium, developed and maintained at CIRCOT. The above material is kept in a closed airtight container and the microbial process is carried out under anaerobic conditions at ambient temperature (25°C - 35°C) for 6-10 hours depending upon the nature of the material. The treated fabric is removed and washed with water followed by boiling with a very dilute sodium hydroxide solution (0.5% owf) for 15 minutes. The fabric is



*Fabrics processed
in Mill*

subsequently washed with water and dried.

The Bio-scoured samples in general showed similar water absorption properties as that of conventionally scoured. The strength retention, the whiteness as well as the uniformity of whiteness and the colour strength of the dyed materials were better in comparison to the conventional samples. CIRCOT'S bio-scouring technology was successfully demonstrated in two textile processing units employing their regular production lines.



Fabrics processed in Mill

Conventional Vs Bio-scouring

Conventional Scouring	Bio-scouring (CIRCOTProcess)
Process carried out at high temperature and pressure for 4-6 hours	Process carried out at ambient temperature and pressure
Process is energy intensive	Low energy process
Residual alkali in effluent is high	Residual alkali is negligible
Water consumption in the process is high	Water consumption in the process is low



Towels processed in Mill

Fabric Quality Attributes

Parameters	Conventional Scouring	Bio-scouring (CIRCOT process)
Fabric Weight loss (%)	13	12
Water absorbency (Seconds)	Instantaneous	3
Whiteness Index	70	67
Fluidity	2.2 6.8*	2.3 2.9*
Colour Strength (K/S)	10	11
Strength Retention (%)	77.4	82.5

*Scoured and bleached

Benefits of CIRCOT Process

- Low cost infrastructure
- Low energy process
- Lesser degradation in fabric
- Less polluting operation



All enquiries should be addressed to :

The Director

Central Institute for Research on Cotton Technology
Adenwala Road, Matunga, Mumbai-400 019

Telephone : 2412 7273, 2412 7276, 2415 7238
2418 4274, 2418 4275

Fax : 022-2413 0835, 2415 7239

E-mail : circot@vsnl.com or circot@bom.nic.in