

# The Complete Technology Book on Textile Processing with Effluent Treatment

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**Format:** paperback

**Code:** NI108

**Pages:** 584

**Price:** Rs.1000US\$ 100

**Publisher:** NIIR PROJECT CONSULTANCY SERVICES

Usually ships within 5 days

Textile manufacturing is a major industry, it is based in the conversion of three types of fibre into yarn, then fabric, then textiles. These are then fabricated into clothes or other artefacts. Cotton remains the most important natural fibre, so is treated in depth. There are many variable processes available at the weaving and fabric forming stages coupled with the complexities of the finishing and colouration processes to the production of wide ranges of products. Certain other fiber properties increase its value and desirability in its intended end use but are not necessary properties essential to make a textile fiber. Such secondary properties include moisture absorption characteristics, fiber resiliency, abrasion resistance, density, luster, chemical resistance, thermal characteristics, and flammability. Some primary properties of textile fibers are: fiber length to width ratio, fiber uniformity, fiber strength and flexibility, fiber extensibility and elasticity, and fiber cohesiveness. Some, mostly larger, firms operate in the organized sector where firms must comply with numerous government labour and tax regulations. Most firms, however, operate in the small scale unorganized sector where regulations are less stringent and more easily evaded. The textile industry occupies a unique place in our country. One of the earliest to come into existence in India, it accounts for 14% of the total Industrial production, contributes to nearly 20% of the total exports. Being the largest foreign exchange earner, it accounts for more than 5 per cent of GDP.

This book majorly deals with characteristics of cotton textile processing, characteristics of effluents, characteristics and treatment of synthetic, textiles processing effluents, processes, volume and characteristics of effluents, treatment, the properties of textile fibres, important properties of fibres, basic aspects of textile fibres etc.

The book covers complete details of textile processing with the standard parameters of effluents treatment which is the burning problem for the textile processors. Needless to say that this book will be of immense use to textile processors, consultants and chemists engaged in water and waste water treatment, research institutions etc.

## 1. Characteristics of Cotton Textile Processing

### Characteristics of Effluents

#### Sizing (Slashing)

#### Desizing

#### Scouring

#### Bleaching

#### Mercerizing

#### Dyeing

Printing  
Final Finishing  
Combined Effluent  
Treatment  
Desizing  
Scouring  
Bleaching  
Mercerizing

Dyeing  
Printing  
Combined Effluent  
Primary Treatment  
Secondary Treatment  
Tertiary Treatment

2. Characteristics and Treatment of Synthetic  
Textiles Processing Effluents  
Processes, Volume and Characteristics of Effluents  
Treatment

3. Characteristics and Treatment of Woollen Textile  
Processing Effluents  
Processes, Sources and Characteristics of Effluents  
Raw Wool Scouring

Weaving & Finishing Operations  
Characteristics of Scouring Effluents  
Characteristics of Effluents from Weaving &  
Finishing Operations  
Effects of Effluents  
Treatment of Wool Processing Effluents  
Primary Treatment  
Secondary Treatment  
Tertiary Treatment

Recovery of Valuable Materials from Woollen  
Processing Effluent

4. Color Removal

5. Recovery and Reuse of waste Water

6. Conservation and Reuse of Water

7. Melt Spinning

Associated Apparatus

Spinneret Assembly producing Plug Flow

Multifilamentary Yarns of Uniform Quality

Filament Manufacturing Device of Small Height

Filaments and Fibers Having Discontinuous Cavities

Spinning Pack Filter

Polyesters

Highly Oriented Undrawn Yarn

Multifunctional Chain Branches

Transfer System Between Melt Source and Spinning Position

Enhanced Dyeability and Thermal Stability by

High Speed Spinning

Deep-Dyeing Textured Yarn Spun at High Speed

High Speed Production of Preoriented Yarn

Vinyl Copolymer to Reduce Pilling

Anti-Pilling Filaments with High Tenacity and

low Knot Tenacity  
Low carboxyl Polyester Fibers Using Alkali  
Metal salt as catalyst  
Antistatic Polyether-Polyester Block Copolymer  
Process for Textured Yarn  
C-Shaped Filaments  
Nylons  
Polycaproamide Reacted with Cyclic Tetracarboxylic  
Acid Dianhydride  
Polypyrrolidone with Alkylamines for Improved  
Extrudability  
Nylon 66 Spinning Process  
Magnesium Oxide Incorporated into Polycaprolactam  
Trilobal Filaments  
High Speed Spinning of Polyamides  
Acrylics  
Acrylonitrile/Styrene/Isobutylene Copolymer Needing  
No After-Stretch  
Extrusion of a Single Phase Melt of Polyacrylonitrile  
and Water  
Other Polymers  
Polyethylene Oxide Monofilament  
Nylon Modified Phenolic Resin Fiber  
Nonwoven Webs  
Reinforced Matting  
Webs of Continuous Thermoplastic Filaments  
Continuous Production of Tubular Modular Filter Elements  
Bonded, Low Density Matting  
Wet Lay Process  
Coatings and Finishes  
Fiber Finishes  
Stabilized Silicone Oil Coating for Melt Spinning Nozzles

8. Dry Spinning  
Acrylics and Modacrylics  
Bifilar Acrylic Fibers  
Modacrylics with Improved Coloristic Properties  
Removal or Residual Solvent  
Cellulosics  
Manufacture of Viscose Filaments  
Cellulose spun into Ammonia Atmosphere  
Other Polymers  
Polypyrrolidone  
Halogenated Aromatic Polyesters  
Flame Retardant Melamine  
Protein Fibers  
Associated Apparatus  
Dry Spinning Pack Assembly  
Static Mixing Apparatus

9. Wet Spinning  
Acrylics and Modacrylics  
Reduction of Voids in Wet-Spun Acrylic Fibers  
Acrylic Fibers Free from Delustering  
Improved Hot/Wet Properties

Flame-Retardant Acrylics  
Modacryl Filaments with Permanent Brilliance and  
Transparence  
Cellulose and Starch  
Rayon Fibers Containing Starch  
Continuous Process for Viscose Yarn  
Water-Insensitive Starch Fibers  
Polyamides and Other Nitrogen-containing Polymers  
Production Arylamides with Recovery of Amide Solvent  
Air Gage Arylamide Spinning Process  
Reduced Salt Content in Arylamide Fibers  
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Copolymer Fibers  
Aromatic Oxadizole Polymers and Copolymers  
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Recovery and Recycle of Salt Solution in Vinyl Polymer  
Spinning  
Lithium Halides as Solvents for Polyhydroxymethylene

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Computer - aided design  
Computer - aided process planning  
Mechatronics and information engineering  
Computer - Aided Logistic Support (CALS)  
Development of LAN system  
Network controller

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Important properties of fibres  
Fibre shape and strength of yarns  
Fibre extensibility  
Softness  
Plasticity and thermoplasticity  
Lustre  
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Solubility in various solvents  
Affinity for dyes  
Fibre structure  
The special properties of synthetic fibres

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Filament and staple  
Yarn  
Fabrics  
Woven fabrics  
Knitted fabrics  
Lace and net fabrics  
Braided fabrics  
Felt fabrics  
Bonded fibre fabrics  
Textile mills  
Woven textile fabrics

Cotton  
Wool  
Silk  
Rayon  
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Vinyon  
Mohair  
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Bulk density

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Value loss

Types of Fabrics Defects

Common Fabric Defects and their causes

Bar

Box Mark

Broken Pattern

Broken Pick

Cracks  
Cut weft  
Defective selvages  
Floats Stiches  
Fuzzy  
Hang Pick  
Harness skip or warp skip  
Lashing in or weft trail or jark in weft  
Loose warp ends  
Hanging threads  
Missing Ends/Ends Out (chira)  
Reed Marks  
Shuttle Marks  
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Sticker  
Tear Drop  
Temple Mark  
Uneven cloth  
Wrong Denting  
Wrong Drawing  
Control of Fabric Quality at Loom State  
Design Specifications  
First Piece Inspection  
Weaving Defects  
Grey Inspection  
Recording of Loomwise and Weaverwise Fabrics Faults  
Point Rate System  
Directory Section

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Sat, 17 May 2025 07:39:17 +0000