

# The Complete Technology Book on Textile Spinning, Weaving, Finishing and Printing (4th Revised Edition)

**Author:-** NIIR Board of Consultants & Engineers

**Format:** paperback

**Code:** NI107

**Pages:** 528

**Price: Rs.1875US\$ 150**

**Publisher:** NIIR PROJECT CONSULTANCY SERVICES

Usually ships within **5** days

Textile industry is one of the few basic industries, which is characterised as a necessary component of human life. One may classify it as a more glamorous industry, but whatever it is, it provides with the basic requirement called clothes. Spinning is the process of converting cotton or manmade fibre into yarn to be used for weaving and knitting. Weaving is a method of textile production in which two distinct sets of yarns or threads are interlaced at right angles to form a fabric or cloth. Finishing refers to the processes that convert the woven or knitted cloth into a usable material. Printing is the process of applying colour to fabric in definite patterns or designs.

The textile industry occupies an important position in the total volume of merchandise trade across countries. Developing countries account for little over two-third of world exports in textiles and clothing. It is the second largest employer after agriculture, providing employment to over 45 million people directly and 60 million people indirectly. The future for the textile industry looks promising, buoyed by both strong domestic consumption as well as export demand.

This book is based on the latest technology involved in textile industry, which describes the processes available at the spinning and fabric forming stages coupled with the complexities of the finishing and colouration processes to the production of wide ranges of products.

The major contents of the book are dyeing of textile materials, principles of spinning, process preparatory to spinning, principles of weaving, textile chemicals, yarn preparation, weaving and woven fabrics, knitting and knit fabrics, nonconventional fabrics, cellulose, mixed fibers, printing compositions, printing processes, transfer dyes, transfer inks etc. It describes the manufacturing processes and photographs of plant & machinery with supplier's contact details.

It will be a standard reference book for professionals, entrepreneurs, textile mill owners, those studying and researching in this important area and others interested in the field of textile industry.

## 1. Textile Spinning

### 1.1 Classification of Spinning

- 1.1.1 Short Staple Spinning
  - 1.1.2 Long Staple Spinning
  - 1.1.3 Filament Spinning
- 1.2 Types of Spinning Processes
- 1.3 Spinning Process
  - 1.3.1 Blending
  - 1.3.2 Carding
  - 1.3.3 Combing
  - 1.3.4 Gilling
  - 1.3.5 Drawing
  - 1.3.6 Roving
  - 1.3.7 Spinning
  - 1.3.8 Winding
  - 1.3.9 Assembly Winding
  - 1.3.10 Twisting
  - 1.3.11 Steaming
- 2. How to Start Textile Spinning Business
- 3. The Principles of Spinning
  - 3.1 Long Fibre Spinning
  - 3.2 Short Fibre Spinning
- 4. Different Spinning Process
  - 4.1 Spinning Process Types
  - 4.2 Cotton Yarn Spinning Overview
  - 4.3 Understanding Yarn
  - 4.4 Yarn Manufacturing Process
    - 4.4.1 Step 1 – Ginning Process of Cotton
    - 4.4.2 Step 2-Blowing

- 4.4.3 Step 3-Carding
- 4.4.4 Step 4-Combing
- 4.4.5 Step 5-Drawing
- 4.4.6 Step 6-Roving
- 4.4.7 Step 7-Spinning
- 4.4.8 Step 8-Winding and Spooling
- 4.5 Machinery and Equipment used in a Cotton Mill
- 4.6 Spinning of Wool Yarn
- 4.7 Wool Yarn Spinning Process
- 4.8 Types of Wool Spinning Machines
- 4.9 Spinning of Worsted Yarn
- 4.10 Mule Spinning
- 4.11 Ring Spinning
- 4.12 Process of Worsted Yarn Spinning
- 5. Plant Layout Description of Textile Spinning Unit
- 6. Textile Weaving
  - 6.1 Different Type of Weaving
    - 6.1.1 Plain Weaving
    - 6.1.2 Satin/Sateen
    - 6.1.3 Jacquard Weave
    - 6.1.4 Leno or Gauze Weave
    - 6.1.5 Pile Fabric Weave
    - 6.1.6 Basket Weave
  - 6.2 Principles of Weaving Process
  - 6.3 Yarn Requirements
    - 6.3.1 Warp
    - 6.3.2 Weft

- 6.4 Weaving Preparations
- 6.5 Loom Timing
- 6.6 Weaving Machine
- 6.7 The Classification of the Weaving Machinery
- 6.8 Steps in the Action of the Insertion of Warp and Weft Yarns in Loom to Form a Fabric
- 6.9 Weaving Process
- 6.10 Types of Loom
- 6.11 Weave Patterns
- 6.12 What is Textile Weaving Machine?
- 7. How to Start Textile Weaving Business
- 8. Yarn Preparation
  - 8.1 Introduction
  - 8.2 Winding
  - 8.3 Warping
  - 8.4 Slashing or Warp Sizing
  - 8.5 Drawing-in and Tying-in
- 9. Plant Layout Description of Textile Weaving Industry
- 10. Textile Finishing
  - 10.1 Types of Textile Finishing
    - 10.1.1 Mechanical Finishing
    - 10.1.2 Chemical Finishing
  - 10.2 Some Requirements of Chemical Finishes Include
  - 10.3 Factors that are Commonly Considered for Proper Formulation of the Chemical Finishes Include
  - 10.4 The Finishes are Applied to
  - 10.5 Routine Fabric Finishes
    - 10.5.1 Singeing

- 10.5.2 Desizing
- 10.5.3 Scouring
- 10.5.4 Bleaching
- 10.5.5 Sizing/Stiffening
- 10.5.6 Degumming
- 10.5.7 Weighting
- 10.5.8 Tentering
- 10.5.9 Mercerization
- 10.5.10 Calendering
- 10.5.11 Carbonizing
- 10.5.12 Crabbing
- 10.5.13 Decating
- 10.5.14 Fulling/Milling
- 10.5.15 Heat Setting
- 10.5.16 Brushing
- 10.5.17 Shearing
- 10.5.18 Optical Brightening

## 11. How to Start Textile Finishing Business

## 12. The Principles of Finishing

### 12.1 Finishing Processes and Machines

- 12.1.1 Mending, Knotting and Burling
- 12.1.2 Scouring
- 12.1.3 Milling
- 12.1.4 Crabbing
- 12.1.5 Steaming
- 12.1.6 Dyeing
- 12.1.7 Washing-Off

- 12.1.8 Drying
- 12.1.9 Tentering
- 12.1.10 Brushing and Raising
- 12.1.11 Cropping or Cutting
- 12.1.12 Singeing
- 12.1.13 Pressing
- 12.1.14 Calendering
- 12.1.15 Schreincring
- 12.1.16 Filling
- 12.1.17 Conditioning
- 12.1.18 Waterproofing

## 12.2 General Notes

## 13. Plant Layout Description of Textile Finishing

## 14. Textile Printing

- 14.1 Origin of Textile Printing
- 14.2 Early Textile Printing Methods
- 14.3 Types of Textile Printing Methods
  - 14.3.1 Block Printing
  - 14.3.2 Roller Printing
  - 14.3.3 Screen Printing
  - 14.3.4 Heat Transfer Printing
  - 14.3.5 Digital Printing on Fabric
- 14.4 Comparison between Dyeing and Printing
- 14.5 Textile Printing Process
  - 14.5.1 Fabric Preparation
  - 14.5.2 Selection of Printing Method
  - 14.5.3 Preparation of Printing Paste

- 14.5.4 Printing Application
- 14.5.5 Fixation and Drying
- 14.5.6 Washing and After-Treatment
- 14.5.7 Finishing and Quality Control
- 14.5.8 Packaging and Dispatch

#### 14.6 Importance of Textile Printing in the Fashion Industry

### 15. How to Start Textile Printing Business

### 16. The Principles of Designing and Colouring

- 16.1 Materials
- 16.2 Interlacing
- 16.3 The Use of Point-Paper
- 16.4 Colour
- 16.5 Figure Designing

### 17. The Dyeing of Textile Materials

- 17.1 Mordants
- 17.2 Assistants
- 17.3 Dyestuffs
  - 17.3.1 Mordant Dyes
  - 17.3.2 Acid-Mordant Dyes
  - 17.3.3 Acid Dyes
  - 17.3.4 The Direct Cotton Dyes
  - 17.3.5 The Basic Colours
  - 17.3.6 Dyes Applied by Special Processes
- 17.4 The Ingrain Dyes
- 17.5 Water Used in Dyeing
- 17.6 Interdependence of Processes
- 17.7 Processes Preliminary to Dyeing

- 17.8 Wool Scouring
- 17.9 "Boiling-off" Silk
- 17.10 Cotton Bleaching
- 17.11 Wool Dyeing Processes
- 17.12 Dyeing of Loose Wool
- 17.13 Slubbing (Silver)
- 17.14 Yarn Dyeing
- 17.15 Piece Dyeing
- 17.16 "Woaded Colours"
- 17.17 Blacks on Wool
- 17.18 Dark Blues, Greens, and Browns on Wool
- 17.19 Cotton Dyeing Processes
- 17.20 Fast Blacks on Cotton
- 17.21 Fast Colours on Cotton
- 17.22 Basic Colours on Cotton
- 17.23 Dyeing of Mercerized Cotton
- 17.24 Union Dyeing Processes
- 17.25 Silk Dyeing Processes
- 17.26 The Dyeing of Artificial Silk
- 17.27 Colour Matching
- 17.28 Fastness Properties of Dyes

## 18. Printing Compositions

- 18.1 Printing Pastes with Developing Dyes
  - 18.1.1 Improved Base Printing Process
- 18.2 Formic Acid as Developing Medium for Azo Dyes
- 18.3 Auxiliary Agents in Print Formulations
  - 18.3.1 Fixing Prints on Synthetics without Intermediate Drying



- 18.4 Hydroxyalkyl Carboxyalkyl Cellulose Thickening Agent
- 18.5 Sodium Cellulose Sulfate as Thickening and Acid-Fixing Agent
- 18.6 Additive for Pigmentary Printing Pastes
- 18.7 Salts of Diaryl Ether Sulfonic Acids
- 18.8 Carrier for Cationic Dyes
- 18.9 Dye Carrier Comprising Phenyl Cyclohexane and Derivatives

## 19. Printing Processes

- 19.1 Fixation
  - 19.1.1 Fixation with Vapor of Organic Solvent
- 19.2 Dyestuffs for Methylene Chloride Fixation Processes
- 19.3 Improved Fixation of Reactive Dyes on Cellulose Fibers
  - 19.3.1 Continuous Dyeing and Printing of Piece Goods
- 19.4 Printing Heavy Pile Fabrics with Powder Preparations
- 19.5 Improved Alignment of Printed Patterns
- 19.6 Uniform Heat-Setting of Continuous Synthetic Filament Groups
- 19.7 Voluminous Substrate Rolled up with Formed Dye
- 19.8 Continuous Printing Process by Direct Liquid Film Transfer
- 19.9 Method for Printing and Flocking Simultaneously
- 19.10 Sprayed Carriers for Continuous Print Fixation

## 20. Textile Chemicals

- 20.1 Indian Demand
- 20.2 Demand for Bleaching Agents
- 20.3 Textile Bleach Formulation
- 20.4 Industry Trends and Success Factors
- 20.5 Outlook and Opportunities
- 20.6 Fluorescent Whitening Agent

- 20.7 Usage Pattern
- 20.8 Industry Trends and Success Factors
- 20.9 Outlook and Opportunity
- 20.10 Flame Retardants
- 20.11 Halogenated Compounds
- 20.12 Non Halogenated Compounds
- 20.13 Application
- 20.14 Sector of Applications
- 20.15 Outlook and Opportunities
- 20.16 Bleaching Agents
- 20.17 Hydrogen Peroxide
- 20.18 Sodium Hydrosulphite (Hydros)
- 20.19 Sodium Hypochlorite
  - 20.19.1 Application and Formulations
- 20.20 Bleaching Assistants
- 20.21 Chelating Agents
- 20.22 Fatty Alcohol Ethoxylate
- 20.23 Carboxy Methyl Cellulose
- 20.24 Demand
- 20.25 Acrylates
- 20.26 Industry Trends and Success Factors
- 20.27 Pattern of Use and Formulation - Starch/Modified Starch
- 20.28 The Spin Finish Compositions for Polyester and Polyamide Yarn
- 20.29 White Oil
- 20.30 Industry Trends and Success Factors
- 20.31 Warp Sizes
- 20.32 Sector of Applications for Sizing Agents

- 20.33 Filament Yarns
- 20.34 Staple or Spun Yarn
- 20.35 Starch/Modified Starch
- 20.36 Demand
- 20.37 Polyvinyl Alcohol
- 20.38 Operations Involved in the Use of the Textile Chemicals
- 20.39 Classification of Textile Chemicals
- 20.40 Classification Based on Use Pattern
- 20.41 Group Classification
- 20.42 Yarn Lubricants
- 20.43 Spin Finishing Agent

## 21. Transfer Dyes

- 21.1 Anthraquinones
  - 21.1.1 Anthraquinone Ink Formulation
- 21.2 Anthraquinone Dyes for Synthetics
- 21.3 Deep Yellow Colors on Polyesters
- 21.4 Indolenine Methines for Acid-Modified Synthetics
- 21.5 Heterocyclic Naphthalene Derivatives
- 21.6 Printing Polyacrylonitriles with Disperse Dyes
- 21.7 Disperse Dyes Containing Carboxylic Acid Groups
- 21.8 Hydrolyzable Silyl-Substituted Dyestuffs
- 21.9 Nitroacridone Dyestuffs
- 21.10 Heat Transfer Black Dyestuff A
- 21.11 Heat Transfer Black Dyestuff B
- 21.12 Dyestuff Combinations for Long-Pile Fabrics

## 22. Transfer Inks

- 22.1 Organic Base

- 22.1.1 Cationic Dyes in Organic Solvents
  - 22.2 Carbinol Base of Cationic Dyestuff as Dyestuff Intermediate
  - 22.3 Sublimable Dyestuff Base on Acid-Modified Fibers
  - 22.4 Aqueous and Oil in Water
    - 22.4.1 Oil-in-Water Transfer Printing Emulsions
  - 22.5 Aqueous Preparations of Sparingly Soluble Dyestuffs
  - 22.6 Organic-Aqueous Printing Inks
  - 22.7 Water-Dilutable Transfer Ink Compositions
  - 22.8 Dry Preparation
    - 22.8.1 Dispersing Aid for Printing Ink Preparation
  - 22.9 Hot-Melt and Hot-Stamp Inks
    - 22.9.1 Hot-Melt Ink Composition
    - 22.9.2 N-Methoxymethylated Nylon Copolymer for Hot-Stamp Ink
  - 22.10 Others
    - 22.10.1 Production of Transfer Paper by Rotary Screen Printing
  - 22.11 Group 1
  - 22.12 Group 2
  - 22.13 Transfer Inks for Household Use
  - 22.14 Inks of High Filler Content
  - 22.15 UV-Curable Inks for Offset-Printing Transfers
23. Nonconventional Fabrics
- 23.1 Introduction
  - 23.2 Nonwoven Systems and Fabrics
  - 23.3 Chemically or Adhesively Bonded Fabrics
  - 23.4 Mechanically Bonded Fabrics
  - 23.5 Tufting
  - 23.6 Flocking

23.7 Laminated and Bonded Fabrics

23.8 Wet Adhesive Bonding

23.9 Foam-Flame Bonding

## 24. Synthetic Substrates

24.1 Anthraquinones

24.1.1 Nitroanthraquinones

24.2 Thiocyanomethyl-Substituted Anthraquinones

24.2.1 Tetra-a-Substituted Anthraquinone Derivatives

24.2.2 Trichromatic Dyeing of Polyacrylonitriles

24.2.3 Diverse Synthetic Substrates

24.3 Monoazo Dyestuffs

24.3.1 Water-Insoluble Monoazo Dyestuffs

24.3.2 Yellow Monoazo Dyes

24.3.3 N-b-1,2,3-Triazolylethyl Anilino Coupling Component

24.4 Mixture of Monoazo Dyestuffs for Polyesters

24.4.1 Monoazo Dye Mixtures for Navy Shades

24.5 Azo Containing Compounds

24.5.1 Water-Soluble Disazo Dyestuffs for Polyamides

24.6 Gold and Orange Prints on Polyamides

24.6.1 Bicationic Disazo and Trisazo Dyes for Acid-Modified Synthetics

24.6.2 Bisazo Dyestuffs of the 2,6-Diaminopyridine

Series

24.6.3 Heterocyclic Basic Phenylazophenyl Dyes for Polyacrylonitriles

24.6.4 Water-Insoluble Nitrophenylazophenyl Compounds

24.6.5 Having a 2-Nitro-4-Phenylsulfamoyldiphenylamine Nucleus

24.6.6 Azocoumarinic Dyes for Hydrophobia Synthetics

24.6.7 Cyanoaryl-Thiodiazole-Azo Dyestuffs

## 24.6.8 Dyestuffs Tolerant to Temperature and pH

### Variations

#### 24.7 Printing of Nickel-Containing Polyolefins

## 25. Natural and Synthetic Substrates

### 25.1 Anthraquinones

#### 25.1.1 Sulfonic-Acid-Containing Anthraquinones for Polyamides

### 25.2 Polyfluoro Acid Anthraquinone Dyestuffs for Polyamides

### 25.3 Fiber-Reactive Anthraquinone Compounds

### 25.4 Aminoanthraquinone Reactive Disperse Dyes

### 25.5 Azo Compounds

#### 25.5.1 Disazo Dyestuffs Containing Phenylmethane Sulfonic Acid and Indole

### 25.6 Naphthylene and Tetrahydronaphthylene-Containing Azo Dyestuffs

### 25.7 Monoazo Dyestuff Containing Fiber-Reactive Group

### 25.8 Cold-Water-Soluble Acid Dye Compositions

### 25.9 Polyvalent Metal and Azo-Barbituric Acid

### 25.10 Anionic and Cationic Dyes

#### 25.10.1 Fluid and Stable Dispersions of Anionic Dyes

#### 25.10.2 Cold-Water-Soluble Solid Anionic Dye Preparations

### 25.11 Heterocyclic Cationic Dyestuffs

### 25.12 Water-Soluble Quaternary Ammonium Phenylazo Cationic Dyes

### 25.13 1,2,4-Benzotriazinium Dyestuffs

## 26. Cellulosics

### 26.1 Reactive Dyes

#### 26.1.1 Organic Dye with Phosphonic Acid Monofluoride

### 26.2 Aminonaphthyl Azobenzene Vinyl Type Reactive Dyes

### 26.3 Phthalocyanine Reactive Dyestuffs

### 26.4 Water-Soluble Fiber-Reactive Dyestuffs

- 26.5 Disperse Dyes
  - 26.5.1 Fixation with Aliphatic Alcohols, Amines, or Aminoalcohols
- 26.6 Azo Dyes Having Substituted 2,6-Diaminopyridine Coupling Component
- 26.7 Acylating Cellulose Fibers
- 27. Mixed Fibers
  - 27.1 Polyester and Wool
    - 27.1.1 Tone-in-Tone Dyeing of Polyester-Wool Blend
  - 27.2 Cellulosics and Synthetic Polyamides
    - 27.2.1 Marked Reactive Dyestuff
  - 27.3 Swellable Cellulosics And Synthetics
    - 27.3.1 Ethoxylated Condensate of Monocarboxylic Acid and Hydroxyalkylamine
  - 27.4 Water-Soluble Solvent and Swelling Agent
  - 27.5 Disazo Dyes Derived from Amino-Pyrazole
  - 27.6 Unformed Disperse Dye and Swelling Agent
  - 27.7 Cellulosics and Synthetics
    - 27.7.1 Unformed Disperse Dye with Reactive Dye
  - 27.8 Textile Treated with Epoxy-Group-Containing Compounds
  - 27.9 Impregnation with an Aqueous Composition
  - 27.10 Blends of Natural and Synthetic Fibers
    - 27.10.1 Aqueous Composition of Disperse and Reactive Dyestuffs
- 28. Plant Layout Description of Textile Printing Industry
- 29. BIS Standards
- 30. Plant Layout and Process Flow Chart & Diagram
- 31. Photographs of Plant and Machinery with Suppliers Contact Details
  - Double Roller Gin Machine
  - Carding Machine
  - Weaving Machine

- Airjet Weaving Machine
- Knitting Machine
- Circular Knitting Machine
- Rapier Loom
- Air Jet Loom
- Water Jet Loom
- Needle Loom Machine
- Textile Printer
- Textile Testing Equipment
- Dyeing Jigger
- Yarn Dyeing Machinery
- Textile Washing
- Spinning Machine
- Cone Winding Machine
- Cut and Loop Tufting Machine
- Speed Frame
- Comber
- Multi Cage Screen Stretching Machine

## About NIIR

**NIIR PROJECT CONSULTANCY SERVICES (NPCS)** is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process,



Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

---

**NIIR PROJECT CONSULTANCY SERVICES**, 106-E, Kamla Nagar, New Delhi-110007, India.  
Email: [npcs.india@gmail.com](mailto:npcs.india@gmail.com) Website: [NIIR.org](http://NIIR.org)

Sat, 17 May 2025 10:05:03 +0000