## The Complete Technology Book on Textile Processing with Effluent Treatment

Author:- NIIR Board 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 varn, 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 Neutralization of Polyamide Spin Dope Fibers from Anisotropic Dopes of Aromatic Polymers Arylene Oxadiazole/Arylene N-Alkylhdrazide **Copolymer Fibers** Aromatic Oxadizole Polymers and Copolymers Vinvls Recovery and Recycle of Salt Solution in Vinyl Polymer Spinning Lithium Halides as Solvents for Polyhydroxymethylene 10. Computers in Textile Manufacturing Computer - Aided Design (CAD) systems Computer - aided manufacturing Computer - aided design Computer - aided process planning Mechatronics and information engineering Computer - Aided Logistic Support (CALS) Development of LAN system Network controller 11. The Properties of Textile Fibres Important properties of fibres Fibre shape and strength of yarns Fibre extensibility Softness Plasticity and thermoplasticity Lustre Fibre density Solubility in various solvents Affinity for dyes Fibre structure The special properties of synthetic fibres 12. Basic Aspects of Textile Fibres 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 Acetate Nylon Vinyon Mohair Linen **Glass** fibres Dacron Orlon Vicara Yarns for weaving 13. Structure and Properties of Textile Fibres Fibre structure Properties of synthetic fibres 14. Textile Weaving Plain Weave **Twill Weaves** Effect and flush Satin Weaves Basket and rib weaves Weave Combinations Face and back of fibres **Knitted Fabrics** Colouring Braiding Lace Nonwoven fabrics **Bonded Fabrics** Automatic weaving machine 3-D weaving processes **15. Textile Wet Processes Cotton Textiles** Sizing (Slashing) Desizing Scouring Bleaching Mercerizing Dyeing Printing Finishing Synthetic Textiles Wool Processing Wool Scouring Wool fulling Wool Carbonizing Water Usage Data Processing Block 16. Printing Processes Fixation Fixation with Vapor of Organic Solvent

Dyestuffs for Methylene Chloride Fixation Processes Improved Fixation of Reactive Dyes on Cellulose Fibers Treatments of Cellulosics Crosspadding or Overprinting Impregnated Cellulose **Materials Basic Dyes and Simultaneous Crosslinking** Printing and Simultaneous Finishing **Other Treatments** Addition of Lactone for pH Adjustments Sodium Hydrosulfite Aftertreatment of Aromatic Polyesters Improved Pretreatment and Aftertreatment for Optimum Handle Aftertreatment with Surfactant and Reductonate Coloration of Aromatic Polyester or Cellulose Triacetate **Special effects** Continuous Process for Two-Color Effect on Blends **Double-Surface Multicolor Printed Cloth Double Face Printing of Polyester Fabrics** Well - Defined Multicolor Patterns on Porous Substrates Polymer - Printed Fabric Having Differential Dyeing Characteristic Acid Dye Mixture for Differential-Dyeing Nylons Spotted Effect on Synthetic Fiber Materials **Resist Printing Polyesters with Acid Dyes** Discharge Effects on Prints with Disperse Dyes **Reserve Effects in Multicolor Printing Relief Printing to Simulate Animal Skins** Camouflage Dyeings and Prints on Synthetics and Blends Photographic Techniques **Continuous Repetitive Patterns on Piled Fabrics** Impregnation with Leuco Ester of Vat Dyestuff **Other Processes** Continuous Process for Optical Brightening and Printing Continuous Dyeing and Printing of Piece Goods Printing Heavy Pile Fabrics with Powder Preparations Improved Alignment of Printed Patterns Uniform Heat-Setting of Continuous Synthetic Filament Groups Voluminous Substrate Rolled Up with Foamed Dye Continuous Printing Process by Direct Liquid Film Transfer Method for Printing and Flocking Simultaneously Sprayed Carriers for Continuous Print Fixation 17. Weaving of Synthetic Yarns And Blends Introduction **Polyester Blended Fabrics** Sizing **Pirn Winding** Weaving Weaving of Multifilament Yarns **Commonly Used Multifilament Fabrics** Warping

Sizing **Monofilament Fabrics** 18. Weaving of Certain Commercial Fabrics Introduction Weaving of Poplin Wrap preparation Weaving Denim **Dyeing and Sizing Processes** Tyre Cord Fabric Yarn and Fabric Particulars Production Flow for Tyre Cord Fabric Weaving Weaving of Tapes **Tubular Cloth** Weaving of Aramide (Kevlar) yarns Characteristics of Aramides Ranges of Application of Kevlar Fibres **Basic Requirements** Warping Sizing Weaving 19. Weaving and Fabric Engineering Calculations Introduction **Conversion Tables** Yarn Numbering System SI Units recommended for Textiles Folded Yarns Average Count Weight of a Piece of Cloth Heald Calculations **Reed Calculations** Take-Up Motion on a Plain Loom Loom speed Production of Looms Efficiency Shuttle Movement Accelerating force of Sley Calculation on shuttleless weaving Machines Example 33 Fractional Cover and Cover Factor Diameter Bulk density **Fractional Cover Cloth Setting Rules** 20. Fabric Defects and Value Loss Grading of fabrics Value loss **Types of Fabrics Defects** Common Fabric Defects and their causes Bar Box Mark **Broken Pattern Broken Pick** 

Cracks Cut weft **Defective selvedges 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 Slough-off Stains 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** 

## About NIIR

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Thu, 01 May 2025 08:28:31 +0000