



## Entrepreneur India

106-E, Kamla Nagar, New Delhi-110007, India.

Tel: 91-11-23843955, +91 9097075054

Mobile: +91-9097075054

Email: [npcs.ei@gmail.com](mailto:npcs.ei@gmail.com), [info@entrepreneurindia.co](mailto:info@entrepreneurindia.co)

Website: [www.entrepreneurIndia.co](http://www.entrepreneurIndia.co)



## Modern Technology Of Rubber & Allied Industries

<b>Code</b>	NI21
<b>Format</b>	paperback
<b>Indian Price</b>	₹0
<b>US Price</b>	\$0
<b>Pages</b>	709
<b>ISBN</b>	8186623248
<b>Publisher</b>	National Institute of Industrial Research

### Description

This book is compiled by NIIR board of highly experienced rubber technologists. This book covering many discipline-polymer, inorganic and physical chemistry,

manufacturing techniques, quality assurance with cost estimation. It is a comprehensive guide to rubber and allied projects. It also includes directory section i.e. plant machinery suppliers, raw material availability. This book is very beneficial to rubber technologists and consultants, new entrepreneurs and all in general.

## Content

### 1. Modified Carbon Black As Reinforcing Filler For Sbr

Abstract, Introduction, Materials, Preparation Of Modified Carbon Black, Rubber Compounding And Vulcanization Characteristics, Testing, Carbon Black Modification, Formulation Of Carbon Black (Cb) For Modification, Rubber Compounding, Mix Formulation Of Rubber Compounds, Processing Behavior, Cure Characteristics, Effect Of Modified Carbon Black On Curing Behavior In Sbr Vulcanizates, Tensile Properties, Bound Rubber, De Mattia Crack Growth And Abrasion Resistance, Effect Of Modified Carbon Black On Mechanical Properties In Sbr Vulcanizates, Goodrich Heat Build Up, Conclusion

### 2. Butyl Inner Tube Processing

Introduction, Manufacture Of Butyl Rubber, Butyl Inner Tube Processing, Mixing Of Inner Tube Compound, Open Mill Mixing, Finalization, Straining, Extrusion, Valving, Splicing, Chilling, Forming, Vulcanization, Inspection, None Buffing Type Bicycle Tube Valve Base Compound, Innertube Valve Base (No Adhesive Type), Typical Pad Cement, Pad Cement For Adhesion Of Valve Base To Tube, Key Statements

### 3. Advances In Mixing Line Equipment

Tsr Development And Description, Hopper Section, Smooth Material Flow, Tsr Operation And Control, Continuous, Start/Stop, Common Problems Associated With Conventional Mill Line Equipment, Stock Temperature Reduction Through Tsr, Effective Cooling, Fixed Clearance Screw, Low Power And Heat Generation, No Pusher Required, Reduced Labor/Compact Design, Summary, Multiple Program Controller - Mp - 100/A, Summary Of Advanced Functions, Mp 100 Control Scheme, Benefit To Users, Mp 100 Function, Setting Of Mix Procedure Sequences, Set Timing Of Material Charge And Discharge, Setting Of Various Alarms, Announce Finish Of Mix Step, Possible Combinations, Set Mixing Data, Set Daily Production Schedule, Actual Mix Data Record, Actual Mix Data Storage, Display Of Real Time Operating Data-Running Screen, Test Mixing, Mixing Results Report, Compound List, Utility, Battery Back-Up, Input/Output Of Analog Signals, Control For Weighing And Conveying Equipment, Data Input By Separate Personal Computer, Communication With Host Computer, Summary, Hardware Requirements

4. Continuous Production Of Rubber Profiles - State Of Extrusion Line Technology Systems For Continuous Extrusion Of Profiles, Systems For Vulcanization, Applications, Conclusion

5. Semi-Permanent Mould Release Agents

Introduction, Conventional Mould Releasants, Semi-Permanent Mould Releasants (Mono-Coats), How To Use Semi-Permanent Releasants, Precaution, Experiences With Indian Rubber Moulders, Summary

6. Vulcanization And Vulcanizing Agents (Part-I)

Introduction, Vulcanization, The Effect Of Vulcanization On Vulcanizate Properties, Vulcanizing Chemicals, Sulphur And Sulphur Containing Cross-Linking Agents, Sulphur, Sulphur Donor, Non-Sulphur Vulcanization, Peroxide Vulcanization, Vulcanization By Phenolic Resin, Vulcanization By Metal Oxide, Vulcanization Using Quinone Dioxine, Radiation Vulcanization

7. Vulcanization And Vulcanizing Agents (Part-II)

Introduction, Requirement Of An Accelerator, Classification Of Accelerators

8. Rubber Injection Moulding & Product Evaluation

Injection Moulding, Types Of Injection Units, Variations In Injection Moulding Techniques, Injection Compression Moulding (Icm), Injection-Transfer Moulding (Itm), Advantages, Dis-Advantages, Machine Controls And Process Variables, Optimum Utilisation For Maximising Production, Selection Of Machine, Space Available In The Mould, Shot Volume, Internal Cavity Pressure, Production Per Hour, Calculation Of Cycle Time, Production Evaluation, Conclusions, Approximate Output Figures Based On Estimated Cure Times For The Production Of Engine Mountings On A 250 Tonne Machine

9. An Introduction To Physical Testing Of Rubber And The Equipment Used For Evaluation Of These Characteristics

Hardness, Resistance To Abrasion, Resistance To Repeated Flexing, Resistance To Permanent Set, Resilience, Resistance To Ageing, Specific Gravity

10. Calenders And Calendering Process/Technology For Rubber Industry

Introduction, Calendering Concept, Calendering Equipments, Comparison Of Roll Dimensions Of Double Poured And Chilled Cast Iron Material, Calender Accessories, Feeding Systems, Comparison Of Mill Feeding And Extruder Feeding System, Alternate Methods Of Calendering, Calender Roll Temperature For Processing Of Different Elastomers, Developments, Conclusion

11. Improved Bonding Strength Of Selected Fibre With Chloroprene Compound  
Introduction, Experimental, Results, Discussion, Conclusion, Dipping Conditions Used For Different Natural And Man-Made Fibres, Formulation (Parts By Weight) Or Compounds Used In The Present Study, Physico-Mechanical Properties Of Non-Rhs, Rhs & Rhs+Compounds, Relative Evaluation Of Non-Rhs, Rhs And Rhs+Silane Bonding Systems On Adhesion For Cords With Cr-Compound, Unaged, Heat-Aged And Water-Aged T-Pullout Adhesion Test Results On Undipped/Dipped Cords With Different Type Of Bonding Systems

#### 12. Low Pressure Hydraulic Rubber Hose

Introduction, Applications, Product Uses & Applications, Market Survey, Present Status Of The Industry, Present Manufacture Of Rubber Hoses In Small Scale Sectors, Process Of Manufacture, Machinery Requirement For Hose Manufacture, Miscellaneous Equipment, Processing, Reinforcing Fabrics & Nettings, Plies, Process Flow Diagram For Manufacturing Rubber Hose, Addresses Of Machinery Suppliers, Addresses Of Raw Material Suppliers, Plant & Machinery Suppliers (Rubber Glazing), Suppliers Of Raw Materials (Rubber Glazing), Plant Economics, Land & Building, Plant & Machinery, Other Fixed Assets, Fixed Capital, Working Capital Requirement/Month, Salary & Wages/Month, Utilities & Overheads, Total Working Capital/Month, Cost Of Project, T.C.I., Cost Of Production/Annum, Turn Over/Annum, Rate Of Return, B.E.P.

#### 13. Rubber Rollers

Introduction, Market Survey, Production Of Rubbers, Import Of New Rubbers, Bis Specification, Dimensions Of Key Type Rubber Rolls, Dimension On Slip-On Type Rubber Rolls, Physical Properties, Method Of Manufacture, Process Flow Sheet For Rubber Roller, Suppliers Of Plant & Machineries, Suppliers Of Raw Material, Plant Economics, Land & Building, Plant & Machinery, Other Fixed Assets, Fixed Capital, Working Capital Requirement/Month, Salary & Wages/Month, Utilities And Overheads, Total Working Capital/Month, Cost Of Project, Total Capital Investment, Cost Of Production/Annum, Turn Over/Annum, Rate Of Return, B.E.P.

#### 14. Latex Rubber Condoms

Requirements (Properties), Packing & Marking, B.I.S. Specification, Market Survey, Present Manufacturers, Process Of Manufacture, Packaging Machine Manufacturers, Manufacturers & Supplier Of Raw Materials, Suppliers Of Rubber Condoms Plant (Latex), Plant Economics, Land And Building, Plant & Machinery, Other Fixed Assets, Fixed Capital, Working Capital Requirement/Month, Salary & Wages/Month, Utilities And Overheads, Total Working Capital/Month, Cost Of Project, Total Capital Investment, Cost Of Production/Annum, Turn Over/Annum, Rate Of Return, B.E.P.

#### 15. Cycles Tyres And Tubes

Introduction, Market Survey, Present Manufacturers Of Cycle Tyres & Tubes, Selection Of Rubbers For Specific Applications, Manufacturing Process Of Tyres & Tubes, Flow Diagram For The Manufacture Of Cycle Tyres & Tubes, Suppliers Of Machinery, Suppliers Of Raw Materials, Suppliers Of Accessories For Rubber Goods Cotton Tyre Cord, Plant Economics, Land & Building, Plant & Machinery, Other Fixed Assets, Fixed Capital, Working Capital Requirement/Month, Salary & Wages/Month, Utilities And Overheads, Total Working Capital/Month, Cost Of Project, Total Capital Investment, Cost Of Production/Annum, Turn Over/Annum, Rate Of Return, B.E.P.

#### 16. Coir Foam (Rubberised Coir)

Introduction, Characteristic Properties And Uses, Bis Specification, Market Survey, Manufacturing Process, Embedding Of Coir Fibers, Combing, Levelling, Present Manufacturers, Process Flow Sheet, Plant Machinery & Equipment, Suppliers Of Rubber Chemicals, Plant & Machinery Suppliers, Plant Economics, Land & Building, Plant & Machinery, Other Fixed Assets, Fixed Capital, Working Capital Requirement/Month, Salary & Wages/Month, Utilities And Overheads, Total Working Capital/Month, Cost Of Project, Total Capital Investment, Cost Of Production/Annum, Turn Over/Annum, Rate Of Return, B.E.P.

#### 17. Rubber Band

Introduction, Properties, Uses And Applications, Formulations And Compounds Of Rubber, Market Position With Future Demand, Present Manufacturer Of Rubber Bands, Process Of Manufacture, Process Details, Manufacturing Process, Process Flow Diagram, Storage Vessels, Raw Material Suppliers, Machinery Suppliers, Plant Economics, Land & Building, Plant & Machinery, Other Fixed Assets, Fixed Capital, Working Capital Requirement/Month, Salary & Wages/Month, Utilities And Overheads, Total Working Capital/Month, Cost Of Project, Total Capital Investment, Cost Of Production/Annum, Turn Over/Annum, Rate Of Return, B.E.P.

#### 18. Rubber Reclamation Unit

Introduction, Tread Tyre Building Rubber, Tread Width And Curvature, Uses, Application And Advantages, Market Survey, Demand Position, Supply Position, Bis Specification, Process Of Manufacture, Flow Diagram Of Rubber (Tyre) Reclamation, Tread Tyre Building, Process Flow Chart Tread Rubber Making, Present Manufactures Of Rubber Reclaim Unit, Suppliers Of Plant And Machinery, Suppliers Of Raw Materials, Plant Economics, Land & Building, Plant & Machinery, Other Fixed Assets, Fixed Capital, Working Capital Requirement/Month, Salary & Wages/Month, Utilities And Overheads, Total Working Capital/Month, Cost Of Project, Total Capital Investment, Cost Of Production/Annum, Turn Over/Annum, Rate Of Return, B.E.P.

#### 19. Auto Tyres, Tubes & Flaps

Introduction, Classification Of Tyres, Bis Specification, Market Survey, Increasing Exports Of Tyre Industry, Estimated Demand For Auto Tyres And Tubes, Present Manufacturers, Selection Of Rubbers For Specific Applications, Composition Of Rubber, Manufacturing Process, Flow Chart For Tyre Manufacturing, Addresses Of Plant & Machinery Suppliers, Addresses Of Raw Material Suppliers, Suppliers Of Accessories For Rubber Goods & Others, Plant Economics, Land & Building, Plant & Machinery, Other Fixed Assets, Fixed Capital, Working Capital Requirement/Month, Salary & Wages/Month, Utilities And Overheads, Total Working Capital/Month, Cost Of Project, Total Capital Investment, Cost Of Production/Annum, Turn Over/Annum, Rate Of Return, B.E.P.

## 20. Synthetic Rubber

Introduction, Properties Of E.P.D.M., Uses And Application, Bis Specification, Market Survey, Synthetic Rubber - Yearwise Production And Consumption (Metric Tonnes), Price, Present Manufacturer, Manufacturing Process, Process Flow Sheet, Suppliers Of Plant & Machinery, Storage Tank, Pressure Vessels & Reaction Vessels, Raw Material Suppliers, Plant Economics, Land & Building, Plant & Machinery, Other Fixed Assets, Fixed Capital, Working Capital Requirement/Month, Salary & Wages/Month, Utilities And Overheads, Total Working Capital/Month, Cost Of Project, Total Capital Investment, Cost Of Production/Annum, Turn Over/Annum, Rate Of Return, B.E.P.

## 21. Hawaii Chappals

Introduction, Raw Materials And Their Uses, Bis Specification, Market Position, Production Figures Of Rubber Footwear, Export Statistics Of Rubber Footwear, Manufacturers Of Hawaii Rubber Chappals, Manufacturing Process, Manufacture Of Sole Surface, Manufacture Of Sole, Conditions, Formulation, Two Roll Rubber Mixing Mill, Suppliers Of Raw Material, Suppliers Of Other Rubber Chemicals Including Rubber, Suppliers Of Rubber Chemicals Dyes & Pigments, Suppliers Of Plant And Machinery, Plant Economics, Land & Building, Plant & Machinery, Other Fixed Assets, Fixed Capital, Working Capital Requirement/Month, Salary & Wages/Month, Utilities And Overheads, Total Working Capital/Month, Cost Of Project, Total Capital Investment, Cost Of Production/Annum, Turn Over/Annum, Rate Of Return, B.E.P.

## 22. Rubber Auto Parts

Introduction, Engine Mounting, Types Of Suspension, Component Mountings, Product Uses, Market Survey, Formulations, Shock Absorbers-Nr, Rubber Compounding, Mastication & Mixing, Moulding, Testing & Inspection, Packing, Process Flow Sheet For The Manufacture Of Rubber Auto Parts

## 23. Rubber Gaskets

Introduction, Uses Of Gaskets, Properties Of Gaskets, B.I.S. Specification,

Manufacturing Process Of Rubber Gaskets, Preparation Of Compound, Flow Diagram Of Manufacturing Process, Market Survey Report

#### 24. Rubber Powder From Waste Tyres

Introduction, Properties, Uses, B.I.S. Specification, Market Position, Manufacturing Process, Process Flow Sheet

#### 25. Rubber Belting

Introduction, Uses & Applications, Process Of Manufacture, V-Belts Construction, Finishing, Industrial V-Belts, Future Scope, Bis Specifications, Process Flow Sheet For The Manufacture Of V-Belts

#### 26. Hard Rubber Battery Containers

Introduction, Properties, Uses And Application, B.I.S. Specification, Market Survey, Automotive Batteries, Miscellaneous And Industrial Type Batteries, Process Of Manufacture, Process Flow Sheet Diagram For Manufacture Of Battery Containers

#### 27. Rubber Floor Mat For Automobiles

Introduction, Uses And Applications, Properties, Market Survey, Moulding Technique, Types Of Moulding Techniques, Manufacturing Process, Production Of Rubber Floor Mat For Automobiles

#### 28. Rubber Plantation - A General Survey

Early History, Rubber Plantation In The East, Guayule Plantation, Nr Production & Estimate, Rubber Plantation On A Commercial Scale, Rubber Plantation & Kerala, Rubber Plantation In The Non-Traditional Areas, Rubber Plantation Exceeds Target, World Bank Assisted Project, Anticipated Rubber Consumption, Overall Demand Position By 2000-2001 A.D., Rubber For Earthquake Safety, Rubber - A Multipurpose Material

#### 29. The Rubber Goods Manufacturing Industry

Tyre Industry, Cycle Tyres And Tubes, Footwear, Belt And Beltings, Latex Products, Miscellaneous Rubber Products

#### 30. The Automatic Tyre Industry

Introduction, Production And Demand, Tyre Technology, Exports, Raw Materials, Is Marks And Retail Price, Leaders In The Industry, Research And Development, Demand Projections Of Tyre Domestic And Export, Tyre Companies At A Glance

#### 31. Raw Materials & Machinery For The Rubber Industry

Styrene Butadiene Rubber, Polybutadiene Rubber (Pbr), Nitrile Rubber (Nbr), Butyl

Rubber (Iir), Ethylene Propylene Rubber (Epdm), Silicone Rubber, V.P. Latex, Reclaim Rubber, Carbon Black, Rubber Chemicals, Blowing Agents, Insoluble Sulphur, Precipitated Silica, Zinc Oxide, Process Oil, Solvents, Stearic Acid, Sulphur, Plasticizers, Pigments, Titanium Dioxide, Mineral Fillers, Tyre Cord And Industrial Fabrics, Rubber Machinery

### 32. India's Foreign Trade

Chemicals And Allied Products Export Promotion Council (Capexil), Rubber Goods Exports, Export Promotion Councils

### 33. The Rubber Board

Functions Of The Board, Publications, Other Publications, Rubber Control (Main Features), Registration, Licensing Of Transactions In Rubber, Bench Mark Price, Inter-State Transport Of Rubber, Excise Duty, Submission Of Returns

### 34. Bureau Of Indian Standards (Bis)

Councils, Isi Certificate Marks Scheme, Iso 9000/Is 14000 Series Standards, Publications, Offices, Origin Of Technical Specifications For Rubber, Standards Published By Bis (Rubber Products And Related Products)

### 35. Natural Rubber

Latex Preservation, Sheet Rubber, Crepe Rubber, Scrap Rubber, Technically Specified Natural Rubber (Tsnr), Advantages Of Tsnr, Speciality Rubbers, Epoxidized Natural Rubber (Enr), Superior Processing Rubber (Sp), Tyre Rubber, Constant Viscosity & Low Viscosity Nr, Oil Extended Natural Rubber (Oenr), Thermoplastic Natural Rubber (Tpnr), General Purpose Rubber, International Grades For Natural Rubber,

### 36. Synthetic Rubber

Styrene Butadiene Rubber (Sbr), Polybutadiene (Br), Polyisoprene (Ir), Special Purpose Rubbers, Butyl Rubber (Iir), Bromobutyl (Biir), Chlorobutyl (Ciir), Chloroprene Rubber (Cr), Butadiene Acrylonitrile Copolymers (Nbr), Hydrogenated Nitrile Rubber, Ethylene Propylene Rubber (Epdm) (Epr), Polycrylic Rubber (Acm), Silicone Rubber (Mq), Fluorocarbon Rubber (Epm), Chloro Sulphonated Polyethylene (Csm), Polysulphide Rubber (T), Ethylene/Acrylic Elastomer, Poly-Urethane Rubber (Au), Epichlorohydrin (Eco), Thermoplastic Elastomer (Tp), Propylene Oxide Polymers, Ethylene-Vinyl Acetate (Eva)

### 37. Reclaim Rubber

Carbon Black

38. Directory Section

39. Cost Calculation

## **About Niir**

NIIR Project Consultancy Services (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. Its various services are: Pre-feasibility study, New Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Preparation of Project Profiles and Pre-Investment and Pre-Feasibility Studies, Market Surveys and Studies, Preparation of Techno-Economic Feasibility Reports, Identification and Selection of Plant and Machinery, Manufacturing Process and/or Equipment required, General Guidance, Technical and Commercial Counseling for setting up new industrial projects and industry. NPCS also publishes various technology books, directories, databases, detailed project reports, market survey reports on various industries and profit making business. Besides being used by manufacturers, industrialists, and entrepreneurs, our publications are also used by Indian and overseas professionals including project engineers, information services bureaus, consultants and consultancy firms as one of the inputs in their research.