The Complete Technology Book on Soaps (2nd Revised Edition)

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Soap is the traditional washing compound made from oil fats and caustic alkali. It is an item of daily necessity as cleaning agent. There are few specialty soaps like the washing soaps, castile soaps, sandal soap, specially flavored soaps, medicated soaps, toilet soaps and baby soaps. Population growth, especially households with children has a proportional impact on the growth of the manufacturing sector of the industry. The soap industry is vivacious, varied, creative and tricky, and has the prospective to provide a gratifying career. With increasing popularity there has been increase in potential competitors but it still has the opportunity of further exploitation.

Today with increase in disposable incomes all around the world, demand for these products expected to increase because consumers are moving up towards premium products. With increasing awareness of hygienic standards, the market for the Soap is growing at a rate higher than 8% annually. People have become more creative in trying to find new ways in which they can make soap either for domestic use or commercial purposes. This book will provide all the basic facts and information you need to get started. You will be able to slowly build your way up to completely master the art of soap making.

The book contains processes formulae, Photographs of Plant & Machinery with Supplier's Contact Details, Addresses of Raw Material Suppliers and providing information regarding manufacturing method of different washing and toilet soaps. Some of the fundamentals of the book are raw material oil and fats, fatty acids, manufacture of soap products, technology of soap manufacturing, various formulations of soaps, soap perfumery, management of soap factories, analytical methods.

This book will be a mile stone for its readers who are new to this sector, will also find useful for professionals, entrepreneurs, those studying and researching in this important area.

Introduction
 Definition
 Uses
 Cleansing Mechanism
 Characteristics of Soap
 Saponification of Fats - The Basic Chemical
 Reaction Making Soap

2. Raw Materials Oil and Fats (The Main Raw Materials for Soaps) Classification of Fats/Oils Some of the Most Useful Fats and Oils Tallow Coconut Oil Palm Oil Palm Kernel Oil Cottonseed Oil Castor Oil Chinese Vegetable Tallow Corn Oil **Rice Bran Oil** Linseed Oil Olive Oil Groundnut Oil Tall Oil Mahua Oil Babassu Oil Neat's-Foot Oil Lard Greases Fish Oil Hydrogenated Oils **Purification of Soap Fats** Acid Washing Alkali Refining Bleaching Absorbent Bleaching **Bleaching By Using Oxidizing Agents Testing Of Soap Fats** Properties Non Fatty Raw Materials For Soap The Alkalis Soap Builders Filler Stabilizers, Anti-oxidants Other Additives (Foam Producers) Foaming Agents Used in Soap Solvents Medicaments/Deodorants/Bacteriostatic Agents Clarifiers **Colouring Matters Preparation of Colours** Water Soluble **Oil Soluble Alcohol Soluble** Milled Soaps Full-boiled/Semi-boiled/cold-made Soaps Soap Bases and Liquid Soaps Washing/Laundry Soaps **Medicated Soaps**

Perfumes **Comprehensive Details Essential Oils** Isolates Synthetic Chemicals 3. Fatty Acids Types of fatty acids and their physical properties Physical properties of fatty acids Melting point **Boiling point** Viscosity Density Solubilities **Refractive Index** Heat of crystallisation Polymorphism Fatty acids of oils and fats Raw materials of fatty acids Animal fats Tall oil Vegetable oils and soap stocks Manufacture of fatty acids Pretreatment of feed stock Fat splitting High pressure catalytic splitting High pressure steam splitting Continuous fat splitting Refining of crude fatty acids Distillation of fatty acids Mazzoni fat splitting and distillation process Distillation of crude fatty acid Splitting Distillation Splitting plant using thermic fluid instead of steams Fractional distillation of fatty acids Development trends in fatty acid distillation Panning & pressing process Solvent crystallisation process Lurgi Wetting Method Recovery of glycerine Pre-treatment and evaporation of spent-lye Pre-treatment and evaporation of sweet water Distillation of crude glycerine Synthesis of fatty acids

4. Manufacture of Soap Products Health and safety Factors Classification of Soap Products Methods of Manufacture

Various Finishing Methods Production Full Boiling Process (Description) The Process First Stage Second Stage Third Stage Fourth Stage Fifth Stage Washing Bar/Cake Soap From Neat Soap **Jet Saponification Process Glycerine Recovery** Semi-Boiling Process and Cold-Made Process **General Description** Production of Washing Bar/Cake Soap by Semi-Boiling/Cold-Made Process Equipments **Process Operations** Examination of Cold-Made Products Formulations for Washing Soaps Washing Soap Using Soap Stock as Main Fatty Raw Material A Typical Batch **Toilet Soap** Milling Process Floating Toilet Soap Cake Manufacture of Toilet Soap by Semi-Boiled/ **Cold-Made Process** Procedure Alkali Milled Finished Soap A Typical Batch For Toilet Soap Mottled Soap Carbolic Acid Soap **Suggested Formulation** Procedure Medicated Soaps **Castile Soap** Castile Soap by Boiling Process Some Suggested Formulations for Castile Soap **Deodorant Soaps** Various Industrial Soaps **Textile Soaps** Laundry Washing Alds A Fabric Cleaning Compound **Cotton Scouring Soap** Dry Cleaner's Soap Water Softener Jelly Soap/Soft Soap Automobile Soap Wire Drawing Soap Scouring Soap Preparation of Washing Soap Powder

Simplified Method Powdered By Pulverising Method Washing Powder by Spray-Crystallization Soap Beads or Granules by Spray-Drying Soap Flakes Shaving Soaps Procedure Shaving Cream Other Formulation Brushless/Latherless Shaving Cream Liquid Shaving Cream **Basic Combination Thicker Cream Aerosol Package** Liquid Soaps/Shampoos **Process of Manufacture** Equipments Liquid Toilet Soap Concentrates Liquid Washing Soap Concentrate Shampoos Classification **Physical States** Characteristics Various Additives of Shampoos Imparting **Special Properties** Solubilizer **Opacifiers** Thickeners for Body or Viscosity **Foam Stabilizers Conditioning Agents** Agents for Resistance of Hard-Water **Germicidal Agents** Preservatives Soap Shampoos **Older Methods** Modern Methods Some Typical Formulations Shampoos Based on Synthetic Surfactants **General Formulations** Liquid Cream Shampoos and Paste Cream Foamless Oil Shampoos **Baby Shampoos** Medicated Dandruff Shampoos Other Miscellaneous Shampoos Aerosol Shampoos (Pressure Dispersed) Method of Continuous Saponification of Fats by Alkali Solution Method of Continuous Splitting of fats into fatty Acids and Glycerol with Simultaneous Neutralization of free fatty Acids with Alkali Yielding Soap **Continuous Neutralization Process Description of A Process**

Advantages Disadvantages **Continuous Neutralization Process using Fatty** Acids Instead of fats Batch Methods of Splitting fats into fatty Acids and Glycerol **Purification of Fatty Acids** 5 Technology of Soap Manufacturing Manufacturing Soap Techniques Saponification Equipments used by the Small-scale sector Equipment for batch soapmaking Improved methods of saponification Lve Absorption Saponification Loop Saponification of Distilled Fatty Acids Alfa Laval Continuous Saponification Washing of saponified soap Staight washes Counter current washes using a set of pans Counter current washes in a single divided pan Rotating disc contactor (RDC) Fitting of Soap Method of Expressing Free Alkali, Chloride and TFM Plant for Total Soapmaking Operation **Construction Materials for Soapmaking Plants** Earth bleaching of oils Chemical bleaching Fatty acids Lye treatment Storage of raw lye Output of Soap and Glycerine Analysis of oils Ester value of oils **Glycerine Recovery** Introduction **Glycerine Recovery Procedure** Purpose of Lye Treatment Method of Lye Treatment Treatment of Sweet Water First treatment Second treatment Evaporation **Continuous Finisher Refining of Crude Glycerine** Production of Laundry and Toilet Soaps Introduction Frame Cooling of Soap Production of Filled Soaps on the Mazzoni

Billeting Technology of Toilet Soaps Introduction Oil blend Production of toilet soap Mixing of soap Preservatives Perfumes Colours **Opacifiers Optical brightners** Super-fatting agent Structurants Bactericides and germicides Miscellaneous additives Design of mixers Refiners vs. Mills Plodding Stamping Wrapping Packing **Carbolic Soap Transparent Soaps** Introduction Manufacturing methods Manufacturing method **Translucent Soaps** Oil blend Floating Soap Marbled Soap Process Control Introduction Pre-treatment of Raw Materials Soapmaking Fat charge control Colour of soap base Free alkali and chloride Unsaponified fat Glycerol in soap Process Controls Beyond Pan Room: **Domestic Soap Toilet Soap** Other Soaps Soap Chips Soap Noodles Soap Flakes Soap Powder for Laundries Shaving Cream Soft Soap Medicated Soap Shaving Soap

6 Various Formulations of Soaps

Toilet Soap of Inferior Quality Process Toilet Soap of Lux Type Process Khas Soap Amla Soap Rose Soap Sandal Soap Musk Soap Almond Soap **Transparent Soaps** Process **Medicated Soaps** Stock Soap Formulae and Process Description for Various Medicated Soaps Process **Carbolic Soap** Process Procedure Neem Soap Process Camphor Soap Procedure Chaulmogra Soap Procedure Shaving Soaps and Creams Shaving Soaps Solid Shaving Preparation Lather Shaving Cream Liquid Soaps and Shampoos **Process of Manufacture** Liquid Shampoos Egg Shampoos Herbal Shampoos Washing Soap (Various Types) Precautions regarding Manufacture of Soap **Nerol Washing Soap** Process Soap Removal Procedure Formulae for Nerol Soap 7 Soap perfumery Soap compounds **Brown Windsor** Carnation Chypre

- Cologne Cyclamen
- Fougere
- Heliotrope
- Hyacinth
- Jasmin

Lilac Lily 8 Management of Soap factories **Technical Efficiency** Introduction Yield Fatty acid yield Glycerol yield Active detergent yield Over/under usage of materials Packing loss/gain Oil usage pattern Scrap and downgrading losses Productivity Steam, water, electricity **Financial Summary Pollution Control** Introduction Source of Pollution Oil spills Chemical spills Bleaching Chemical treatment Soap-making **Glycerine Recovery** Laundry Soaps **Toilet Soap** Synthetic Detergents Sulphonation Detergent powder manufacture **Boiler House** Coal spillages Water treatment Section **Boiler Blow Down** Chimney exhaust Boiler ash Effluent Treatment Space and location Effluent characteristics The requirements of treated effluent Effluent treatment methodology **Treatment of Gaseous Effluents** Chemical bleaching Saponification of oils Toilet soap mixer Refrigeration system Oleum handling in the sulphonation plant Oleum still furnace Exhaust from spray drying tower and air lift NSD bar mixer exhaust Boiler exhaust

Lavender

Analytical Support Introduction Oils Chemicals Packaging Materials In-process Materials **Finished Products** Microbiological Controls **Analytical Equipments General Comments** Quality Control Introduction Organisation Facilities **Specifications** Chemicals Packaging materials **Finished Product** Manufacturing Method Fat Charge Chemicals for soap-making Sampling Sampling of Raw Materials Packing materials **Finished Products** Vendor education and rating Process audit Reporting **Micro-biological Controls Bureau of Indian Standards Specifications Quality Assurance** Introduction Conventional Approach to Quality Recommended Approach to Quality Implementation of Quality Assurance Quality Control **Quality Audit** Summary Total Quality Management (TQM) ISO 9000 Series Standards **Common Quality Problems of Soaps** Introduction Laundry Soaps Lather Cracking Detergency **Toilet Soaps** Base odour Rancidity Discoloration of soap Cracking Blisters Sandiness

Mushiness Wear Hardness Lather Efflorescence Storage and Product Assessment Tests Storage **Product Assessment** Assessment in laundry soaps Detergency Lather Perfume Impact Wear Cracking Assessment of toilet soaps Feel of soap in use Mush **Common Quality Problems of Detergents Detergent Powder** Solubility Skin irritation Poor lather/detergency **Detergent Cake** Sogginess Roughness Whitish deposit Poor colour Poor lather and detergency Stain Removal Introduction Type of stains **Removal of Stains** Lime soap Protein stains Iron compounds Stains due to dyes Mildew stains Physical methods of stain removal Assessment of stain removal 9 Analytical Methods **Determination of Soap Composition** For Nature of Fatty acids in soap For Anhydrous soap and total alkali content Procedure Isolation of Fatty Acids and Rosin Acid From Soap Acid Value **Sponification Value** The Saponification **Iodine Value** Wijs Solution (Iodine monochloride solution) Determination

Titer Test Procedure **Rosin Value** Procedure Determination of Total Anhydrous Soap and **Combined Alkali Content** Procedure Unsaponified and Unsaponifiable Matter Determination Testing of Fatty Oils used for Soap Moisture and Volatile Matter **Insoluble Impurities** Soluble Mineral Matter Determination of Total Fatty Acids of soap stock and acidulated soap stock Acid value Ester value Determination of rancidity Rosin Test Colour Test **Bleach Test** Smoke Point Flash Point **Turbidity Point Cloud Point** 10 Plant and Machinery Four Blades Chipping Machine **Other Chipping Machines Packing Machine** Spray Drier for making Detergent Powder Portal Stirrer (Mechanical Agitator) High Speed Dissolver **Planetry Mixer** Centrifuae Emulsifier **Edge Runners** Ball and Pebble Mills Automatic Liquid Filling and Weighing Machine Automatic Paste Filling and Crimping Machine Automatic Power Filling Machine Marking and Printing Machine Marking and Printing Machine **Bottle Washing Machine Ribbon Blender Batch Mixer**

Plodders Cutters Soap Press

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About NIIR

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