

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



AN ISO 9001 : 2015 CERTIFIED COMPANY

Author: NIIR Board of Consultants & Engineers**Format:** hardcover**Code:** NI110**Pages:** 496**Price:** Rs 1425 | US\$ 150**Publisher:** NIIR PROJECT CONSULTANCY SERVICES**Shipping:** 5 days

About the Book

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.

Contents

1. 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 Aids

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
Lye 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 brighteners
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

Lavender

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
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
Saponification 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
Planetary Mixer
Centrifuge
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

11 Addresses of Raw Material Suppliers

12 Photographs of Plant & Machinery with Supplier's Contact Details

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, Market Research, Manufacturing Process, Machinery, Raw Materials, Project Feasibility, Investment Opportunities, Technical Consultancy and Startup Help.

NPCS also publishes process technology books, technical books, startup books, directory, business database, detailed project reports and market research reports.

Our Detailed Project Report aims at providing all the critical data required by entrepreneurs for starting new business ventures.

NIIR PROJECT CONSULTANCY SERVICES
106-E, Kamla Nagar, New Delhi-110007, India

Email: npcs.india@gmail.com **Website:** <https://www.niir.org/>