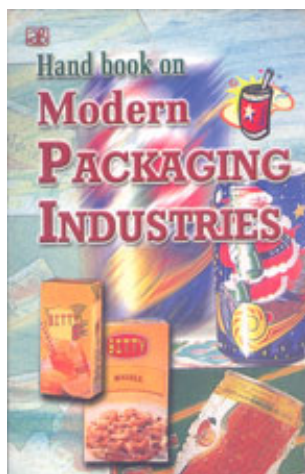


Hand Book on Modern Packaging Industries



Author: NIIR Board
Format: Paperback
ISBN: 8178330865
Code: NI72
Pages: 820
Price: Rs. 975.00 **US\$** 100.00
Publisher: Asia Pacific Business Press Inc.
Usually ships within **3** days

The book has been written for the benefit of entrepreneurs who can not invest large amounts and case has been taken to present the matter in a simple and comprehensive language so that person without much technical background can grasp the subject easily. An attempt has been made to give the manufacturing details of Various types of packaging materials.

Contents

1. Adhesives for Packaging Industries
 - Typical Application in packaging
 - Classification
 - (a) Loss of water or solvent
 - (b) Loss of Heat
 - Theories of adhesion
 - a. Mechanical Interlocking
 - b. Electrostatic Interaction
 - c. Diffusion Theory
 - d. Absorption Theory
 - Factors affecting adhesion
 - Spreading
 - Roughness
 - Porosity
 - Diffusion
 - Rheology
 - Thickness
 - Pressure
 - Starch
 - Degradation Products of Starch
 - Comparison between starch and Sodium Silicate
 - Polyurethane

Basic urethane chemistry
Acrylics
Casein
Natural Rubber
Polyvinyl Acetate
Polyvinyl Alcohols

2. Tin Plate Containers for Foods, Pharmaceuticals
and Cosmetics
Manufacturing Process
Can Sealants

3. Tinplate Containers
Definition
Uses
Types
Open Top containers
General Line containers
Nomenclature
Manufacturer of Tinplate containers
Decoration
Sizing
Coating
Printing
Varnishing
Lacquering
Manufacture in Press Shop
Slitting
Component/end manufacture on presses
Ancillary operations
Manufacture of Assembly Lines
Slitting
Notching
Folding
Forming
Locking
Soldering/Cementing
Flanging
End seaming
Ancillary operations (if any)
Packing/Palletising
Flattened Cans
Process Control
Blackplate Containers
Tinplate Closures

4. Metal Container Industry In India
Raw Material
Manufacturing Process

5. Tin Plate Usage In Packaging
Round Ends tinplate Layout Systems And Procedures
Straight and Single

Double Row Staggered
Straight, Single Scrolled
Duble Row Staggered Scrolled
Multiple Row Fully Stagered Plain
Double Row Staggered With Primary (deep)
or Secondary Scroll
Coil Feed : Single Or Multiple Die Set up:

6. Packaging of Cereals and Cereal Products

Spoilage Factors
Whole Grains & Split Pulses
Jute Bags
Advantages of Jute Bags and Jute Fabrics
High mechanical strength
Soft surface with high resistance to friction
Porous structure
Disadvantages of Jute Bags
Availability
Mineral oil contamination
Insect breeding
Cost
High Density Polyethylene (HDPE)/
Propylene (PP) Woven Sacks
MANUFACTURING Process of HDPE Woven Sacks
Extrusion Of Slit Film
Looming
Lamination
Cutting
Stitching
Printing
Bale Pressing and Packing
Advantages of HDPE & PP Woven Sacks
Disadvantages of HDPE & PP Woven Sacks
Quality Parameters to be Considered for Woven Sacks
Consumer Packs for Whole Food Grains
Milled Grain Products (Flours)
Bulk Packs
Consumer Packs
High Molecular High Density Polyethylene (HMHDPE)
Co-Extruded Films
Biaxially Oriented Polypropylene Film : (BOPP)
Laminates
Processed Cereal and Pulse Products
Cereal Based Convenience Foods
Weaning Foods

7. Trends in Packaging of Spices and Spice Products

Packaging of Ground Spices
Bulk Packaging and Storage of Whole Spices
Packaging of Oleoresins and Volatile Oils
Insect Infestation and Fumigation
Literature Data on Packaging
Future Trends

8. Packaging of Edible Oils, Vanaspati and Ghee

Introduction

Spoilage Factors

Distribution Pattern

Packaging Systems/Types of Pack

Package Types

Tinplate Containers

Glass Bottles

Semi-Rigid Containers

HDPE (High Density Polyethylene) Containers

PET (Polyethylene Terephthalate) Bottles

PVC (Poly Vinyl Chloride) Bottles

Other Semi-rigid Packs

Flexible Pouches

Analysis of Needs and Shifts

Structures and Critical Polymers

Critical Polymers

Polyester

A Closer Look

Flexibles as Economical Media

Flexibles as Effective Solid Waste Reducing Media

Indian Standard for Packaging of Edible Oils, Vanaspati and Ghee

Legislations

Conclusion

9. Metal Containers for Food Packaging

Abstract

Introduction

Tinplate Containers

Developments in Tinplate Manufacture

Structure of Tincoating

Light tin coated steel (LTS)

Developments in can fabrication

Two Piece Cans

Drawn Thin Redraw (DTR) and precision sidewall thickness

control (PSTC) process

Plain Cans

Acid resistant lacquered cans

Sulphur resistant lacquered cans

High Tin Fillet (HTF) can

Corrosion problem in food cans and its inhibition

Quality control tests

Thickness of tinplate

Grain structure of tincoating

Coating continuity (porosity) test (ISV)

Tin oxide

Chromium in passivation layer

Special property tests

Tincoating

Tin Free Steel Cans

Manufacture

Cansuper

Hinac coat
Hi-top
Stainless weirchrome
Fabrication of TFS cans
Mira seam
Conoweld
Forge welding
Advantages and Disadvantages of Tin Free Steel
Physical characteristics of HI-Top Plate
Corrosion resistance
Lacquering quality
Formability
Weldability and solderability
Canning Food Products in Tin-free steel cans
Fish products
Meat products
Fruit and Vegetable products
Aluminium containers
Package forms
Aluminium closures and ends
Conventional closures
Easy open ends are of two types
Packaging of Food Products in Aluminium Cans
Fruit and vegetable products
Lacquered cans
Meat products
Marine products
Milk products
Alcoholic drinks
Corrosion in Aluminium cans
External decoration and Printing
Future Scope
Evaluation of indigenous electrolytic tinplate
Assessment of differential tinplate
Evaluation of indigenous aluminium cans for processed foods
Acknowledgement

10. Packaging of Drinking Water

Brief History
Main Processing System
Packaging Materials
Bottle Filling
Bottle Labelling

11. Bottle Labelling

Introduction
The Product Group
Packaging Materials for Snack Foods
Packaging Systems
Gas flushing
Compensated vacuum

12. Packaging Aspects of Sugar and Chocolate Confectionery

Introduction
Packaging Requirements
Packaging Requirements
Sugar Confectionery
Chocolates
Packaging Materials and Packages
Packaging Materials

13. Packaging for Biscuits
Protection Presentation, Information and Convenience
The Wrapping Materials
The Packaging Styles

14. Packaging Trends for Cheese and Other Dairy Products
Milk Powder-Bulk
Milk Powder-Retail
Butter
Yogurt
Ice Cream
Cheese
Cheese - Retail

15. Packaging of Milk

16. Packaging of Fish
Introduction
Important Quality Aspects of Fresh Fish
Packaging Concepts
Vacuum Packaging
Modified Atmosphere Packaging
Active Packaging
Packaging Requirements
Examples
Conclusion
Final Remarks and Future Developments

17. Packaging for Irradiated Foods
Food Borne Illness is a Global Concern
Commercialization of Food Irradiation Worldwide
Food Irradiation in the U.S.A.
Barriers to Widespread Commercialization of
Food Irradiation in the U.S.A.
The Consumer Acceptance Barrier
The Cost Barrier
The Capacity Barrier
The Regulatory Barrier
Pasteurized Milk Case History
Packaging for Irradiation
Packaging Materials for use during Irradiation of Food
What action should Food Processors Take?

18. Development in Modified Atmosphere Packaging Of Meat,
Poultry and Fish

- Introduction
- Historical Development
- Modified Atmosphere Technology
- Equipments and Films For MAP
- Patents Available
- Effects of Gases on MAP Foods
- Effect of MAP on the Quality of Fresh Meats
- Effect of Map on Processed Meats
- Package Integrity and Quality of MAP Foods
- Safety Concerns of MAP Muscle Foods
- Cost Benefit Relationship

19. Packing of Meat & Meat Products in Tin Containers

- Raw Materials
- Cans and Lids
- Coating
- Vinyl Lacquers
- Phenolic Lacquers
- Corrosion
- Internal Corrosion
- Filling Operations
- Can Seaming
- Dehydrated Meat Products

20. Aseptic Packaging

- Microbiological Aspects of Aseptic Packaging
- Sterilization of the Packaging Material Food Contact Surface
- The Tetra Classic Aseptic System (TCA)
- The TBA/3-System
- The TBA/8 and TBA/9 Systems
- The TBA/10-System

21. Aluminium Cans for Heat-Sterilized Food Products

- Summary
- Current Usage
- Characteristics
- Recent Innovations
- Material Recyclability
- Conclusion

22. Aluminium Container for Fish Canning

- Introduction
- Materials and Methods
- Results and Discussion
- Conclusion

23. Aluminium in Flexible Packaging

- Introduction
- Benefits of Aluminium based Packaging Materials
- Technical properties of Aluminium Foil
- Some Technical Applications of Aluminium Foil
- Other way of Classifying Applications
- Various Popularly known product groups and structures

Why Aluminium is preferred in Various Applications
Machines and Equipment for the manufacture of
Flexible Packaging Material
Wet Laminating Machine
Dry Laminating Machine
Hot Coating Laminating Machine
Extrusion Laminating Machines
Coating Machine
Printing Machines
Various QC Test Relevant to Applications
Modern Trends in Packaging
X. New Technologies
Solventless Lamination
Advantages of Solventless Lamination
Digital Printing

24. Aluminium Foil in Pharmaceutical
Packaging-Recent Developments
Influential factors on pharmaceutical products
The Alu-Alu blister (Formpack)
Multi Axial Dehnung (Stretching)
Lidding foils
Summary and outlook

25. Aluminium Foil
Standard Conditions of Bare Aluminium Foil
Standard Finishes of Bare Aluminium Foil

26. Aluminium and Foil Production Methods
How Aluminium is Made
Rolling Aluminium Foil

27. Aluminium In Packaging : Current Scenerio

28. The Process of Producing Collapsible Aluminium Tubes
Accumulator
Producing Tubes of different Diameters and Forms
Chains in Dryers and Ovens
Lubrication of Machines
Technical Developments

29. Aluminium Cans in Packaging
Introduction
Aluminium
Properties
Manufacturing Process
Coating and Decoration
Recycling
Easy Open Ends
Lacquers and Coating
Testing and Quality Control
Future

30. Aluminium Foils for Composite Containers
Aluminium Foil Membrane on Tin Cans

31. Aluminium Collapsible Tubes

32. Aluminium collapsible tubes their suitability-reliability-availability

33. Pharmaceutical Packaging Collapsible Tubes
Pharmaceutical Containers
Collapsible Tubes
Advantages of collapsible tubes
Pharmaceutical Forms Packed in Collapsible Tubes
Selection in metal collapsible tubes
Testing of collapsible tubes
Eye Ointment tube
Shelf life tests
Filling of collapsible tubes

34. The Birth of an Aluminium Collapsible Tube

35. Embossing Aluminium Foil

36. Wooden Containers
Classification of Timbers
Seasoning of Wood
Physical and Mechanical Properties of Timber
Mechanical Properties
Methods of Preservation of Timber
Form and size of Each Component
Thickness of Components
Size and Spacing of Nails
Number of Planks in a Shook
Type of Joints
Style of Container
Reinforcements
Workmanship
Consideration for a Design of the Box
Easy Load
Average Load
Difficult Load
Grouping of Indian Timbers
Plywood Boxes - Battened Construction

37. Tinplate Container for Packaging of Fruit and Vegetable Products
Abstract
Introduction
Standards for Metal Containers
Summary

38. Tetra Pak Application in Food Packaging
Introduction

39. Printing on Foil

40. Aerosol

A Pressurised Form of Packaging and Dispensing a product

41. Foil Bag, Pouch and Envelope Production

Envelope making

Pouch making

Folding Carton Production

Foil/Fibre can and Drum Production

42. Packaging of Cashew Kernels in Tin Plate Containers

43. Packaging of Paints in Tin Plate Containers

44. Application to Food Packaging-Form-Fill-Seal Machines

45. Shrink Packaging-Food Products

46. The Aerosol Package-Container Manufacture

47. Sterilization Methods for Packaging Materials used in aseptic systems

Testing Procedures

Requirement of Aseptic Systems

48. Blow Moulded Containers for Food Packaging

Basic Process Concepts

Technology Development for Food Packaging

Aseptic Containers

Barrier Containers

PET Containers

Newer Developments

49. Thermoformed and Blow Moulded Containers for Food Packaging Applications

Introduction

Polypropylene

Polystyrene

50. Role of BOPP Films in Food Packaging

Introduction

Manufacture

Properties of BOPP Films

Advantages

Role of BOPP Film in Food Packaging

New Developments in BOPP Films

Conclusion

51. Modified Atmosphere Packaging of Fresh Fruits and Vegetables

Factor Influencing Shelf-life of Fruits and Vegetables

Respiratory Metabolism

Controlled Atmosphere (CA) Storage Technology

Advantages of MAP Technology

Limitations of MAP Technology
Dynamics of Gaseous Exchange in MAP
MA Package Design
Mathematical Modelling of Gaseous Exchange in MAP
Computer-Aided Design of MAP
Verification of Predicted Values
Tailored Plastics Film-Laminates

52. Plastics

Distinction Between Plastics, Fibres and Elastomers
Techniques of Polymerization
Processing of Plastics
Compression Moulding

53. Plastic Corrugated Board

54. Polyester Film

55. Nylon-6 Film - A Revolution in Packaging

56. Plastic Woven Sacks

Introduction
Plastic Woven Sack Materials
High Density Polyethylene (HDPE)
Polypropylene (PP)
Method of Making Woven Sacks
Flexible Intermediate Bulk Containers (FIBC)
Construction of FIBC
Use of Woven Sacks/FIBC
Conclusion

57. Low Density Polyethylene Additives

58. High Density Polyethylene

59. PVC in Packaging

60. Biaxially Oriented Polypropylene Film

61. Expanded Polyethylene Material

62. Expanded Polystyrene Properties of EPS

63. Shrink and Stretch Wrapping Shrink Packaging Stretch Wrapping Pilfer- Proof Packs Pallet Stretch Wrapping

64. New Developments Paper pulp Based Moulded Containers for Fruits and Vegetables

Apple Tray Packaging Concept
Consumer Pack Trays
Tray Hand Wrapping Machine
Conclusion

65. Solid Fibre Board Box as a Transport Pack
B. Combination Board-What is it?
C. Solid fibre board with moisture/water proof inner or outer lining
D. Solid Fibre Board with Hessian Lining
Conclusion

66. "Quality Control-Specifications and Performance Requirements of Fird Boxes"
Quality Control
Quality Control on Cor
Specifications and Performance Requirements of Fibreboard Boxes

67. Folding Board Cartons and Coated Cartons Manufacture
Introduction
Relevant Properties of Paper/Board for Carton Manufacture
Grammage
Caliper
Bursting Strength
Shade
Grain Direction
Folding
Moisture Content
Stiffness
Manufacturing Process
Computer Controlled Inking

68. Cellulosic Films

69. Multiwall Paper Sacks

70. Speciality Papers for Packaging

71. Flexible Packaging Laminates and Coatings Application
Disaster Relief Packages
Snack Food Packaging
Corn Chips
Cross Laminated Film
Modified Atmosphere Packaging
Fresh Red Meat
Fish
Cold Seal Adhesives for Flexible Packaging
Hot Melt Adhesives
Metallising Film/Paper

72. Adhesive Tapes
Introduction

73. G.I. Drums-Oil Drums-Closures
Introduction

Capacity
Type of Drums
Standardisation of Metal Container
Selection of Drums
Manufacture of Drums
Reconditioning Industry
Quality Control
Closures
Essential Functions of Closures
Recent Development in Drums
Market Analysis
Market Share and Competitors Activities

74. Packaging in Glass Containers
Testing

75. Laminated Tubes
Introduction
Market Trends

76. Converting Materials and Methods
Coatings
Adhesives
Laminating Materials
Laminating Aluminium Foil
Coating Aluminium Foil

77. Aseptic Packaging Materials and Package Forms

78. Printing Inks for Food Packaging
Printing Processes and Printing Inks
Dispersion
Hue and Strength
Drying Time
Strength (Concentration of Pigment): Reduction Test

79. Closures in Food Packaging
Introduction
Functions of a closure
Components involved in a good seal
Materials used in the manufacture of closures
Resilient Materials
Facing Materials
Compatibility of closures and migration limits
Factors Effecting A Good Seal
Types of closures
Roll-on-Pilferproof Closures
Screw Caps
Lug Cap
Crown Caps
Plastic Closures
Epilogue

80. Packaging Laws and Regulations

SWMA

PFA Rules

Ingredients

Other Labelling Rules under PFA

FPO Rules

MFPO Rules

Agmark Rules

Directory Section

Suppliers of Machinery & Plants

Suppliers of Raw Materials

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, directory, 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 bureau, consultants and consultancy firms as one of the input in their research.

National Institute of Industrial Research , 106-E, Kamla Nagar, New Delhi-110007, India. **Email:** niir@vsnl.com **Website:** NIIR.org

Wed, 07 Jan 2009 18:24:50 -0500