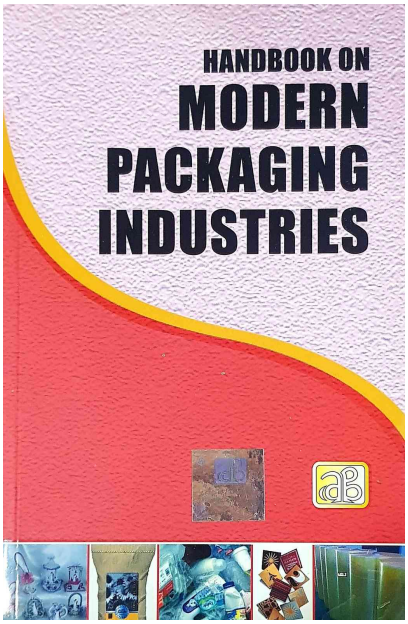
Entrepreneur India

106-E, Kamla Nagar, New Delhi-110007, India.
Tel: 91-11-23843955, +91 9097075054
Mobile: +91-9097075054
Email: npcs.ei@gmail.com, info@entrepreneurindia.co
Website: www.entrepreneurIndia.co



Handbook on Modern Packaging Industries (2nd Revised Edition)

Code	NI72
Format	paperback
Indian Price	₹1675
US Price	$150
Pages	848
ISBN	9788178330860

Publisher	Asia Pacific Business Press Inc.

Description

Packaging is a means of ensuring the safe delivery of a product to the ultimate consumer in a sound condition at the minimal overall cost. Packaging not only differentiates one brand from another but also, at times, gives a preview of the product being sold. Although it is a subject of recent technological origin, the art of packaging is a sold as the primitative humans. Packaging is the science, art, and technology of enclosing or protecting products for distribution, storage, sale, and use, also refers to the process of design, evaluation, and production of packages and can be described as a coordinated system of preparing goods for transport, warehousing, logistics, sale, and end use. Packaging contains, protects, preserves, transports, informs, and sells. In many countries it is fully integrated into government, business, institutional, industrial, and personal use. The continual technological growth systems have undergone significant changes in recent years. A lot of packaging process has been streamlined to give a more scientific and rational approach. The role of packaging continues from the coordinated system of preparing goods to the end use. It has become a big tool for launching new specific products in different shapes and sizes. The packaging industrial growth has led to greater specialization and sophistication from the point of view of health (in the case of packaged foods and medicines) and environment friendliness of packing material. The demands on the packaging industry are challenging, given the increasing environmental awareness among communities. The packaging industry is growing at the rate of 22 to 25 per cent per annum thus is to play a unique role in preserving the wealth or value created by many industries.

This book describes the techniques and process behind packaging of different specific products which are used in our day to day life. The specific products include cereal, spices, edible oils, drinking water, chocolate and confectionery, fruits and vegetables, marine products and many more. Some of the vital contents of the book are adhesives for packaging industries, factors affecting adhesion, tin plate containers for foods, pharmaceuticals and cosmetics, tin plate usage in packaging, packaging of cereals and cereal products, trends in packaging of spices and spice products, packaging of edible oils, vanaspati and ghee, metal containers for food packaging, packaging aspects of sugar and chocolate confectionery, packaging for irradiated foods, packing of meat & meat products in tin containers etc.
This book is an invaluable resource for all its readers, entrepreneurs, scientists, existing industries, technical institution, etc in the field of packaging.

Content

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 Filling113
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
Stadard 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, 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.