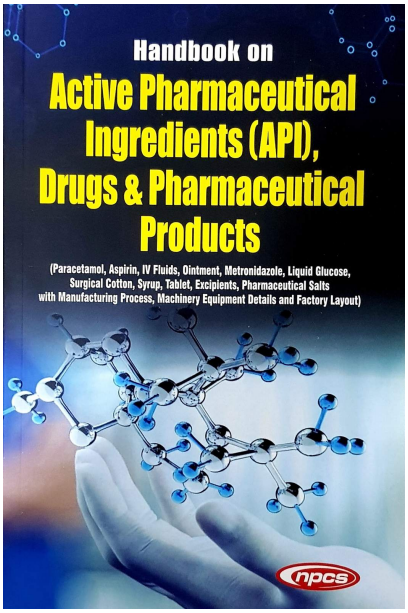
Entrepreneur India

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 Active Pharmaceutical Ingredients (API), Drugs & Pharmaceutical Products

Code	NI355
Format	paperback
Indian Price	₹2495
US Price	$225
Pages	552
ISBN	9788195830435

Publisher	NIIR PROJECT CONSULTANCY SERVICES

Description

Handbook on Active Pharmaceutical Ingredients (API), Drugs & Pharmaceutical Products(Paracetamol, Aspirin, IV Fluids, Ointment, Metronidazole, Liquid Glucose, Surgical Cotton, Syrup, Tablet, Excipients, Pharmaceutical Salts with Manufacturing Process, Machinery Equipment Details and Factory Layout)

An active pharmaceutical ingredient (API) is the active substance in a pharmaceutical drug that produces its therapeutic effect. APIs can be synthetic chemicals or natural sources such as plant extracts. APIs are components of drugs, the majority of which are manufactured by pharmaceutical companies. Drugs, on the other hand, are dosage forms that contain an API and are distributed to patients for use. Pharmaceutical products are any compounds used in the medical industry to diagnose, treat, cure, or prevent diseases. These products are typically formulated as drugs, vaccines, biologics, and medical devices, which can either be prescribed by a doctor or bought over-the-counter (OTC). They come in various forms such as tablets, capsules, syrups, ointments, creams, solutions, suspensions, implants, patches, and powders. Pharmaceutical products are manufactured under strict guidelines and must adhere to various regulations such as Good Manufacturing Practices (GMP).

The global market for Active Pharmaceutical Ingredients (API), Drugs & Pharmaceutical Products is expected to grow rapidly over the next few years. This growth will be driven by rising demand for improved healthcare services and an increasing number of new treatments. The market for active pharmaceutical ingredients is anticipated to rise at a CAGR of 5.90%. The development in the production of active pharmaceutical ingredients (APIs) as well as the increased incidence of chronic diseases including cancer and cardiovascular conditions are both responsible for the expansion. Government regulations that are supportive of API manufacturing, together with shifting geopolitical conditions, are accelerating market expansion.
The pharmaceutical products market has grown steadily in recent years, and is expected to continue to do so. This growth is driven by a number of factors, including increased demand for new drugs, changing disease patterns and aging populations in some countries, as well as the emergence of innovative drugs and technologies. The market is being shaped by the rise of emerging economies and their increasing healthcare needs. This has led to increased investment in drug research and development, as well as an increase in the number of multinational companies setting up operations in various countries.
Furthermore, generic drugs are becoming increasingly popular as a way of reducing

healthcare costs. Generic drugs are copies of brand-name drugs, which are manufactured by generic drug companies. They offer an effective alternative to branded drugs and are often much cheaper. As a result, generic drugs are increasingly being used in countries across the world, leading to an increase in the global pharmaceutical products market.

Overall, the global market for pharmaceutical products and drugs are set to continue to grow in the coming years. New products, innovative technologies and emerging markets will drive growth, and this will bring both opportunities and challenges for the industry.

The books' main subjects include Active Pharmaceutical Ingredients (API), Drugs, Aspirin, Paracetamol, IV Fluids, Ointment, Metronidazole, Liquid Glucose, Surgical Cotton, Syrup, Tablet, Excipients, Pharmaceutical Salts with formulations, factory layout, and images of machinery with contact information for suppliers.

A thorough guide to manufacturing and business operations in the Active Pharmaceutical Ingredients (API), Drugs & Pharmaceutical Products industry. The Active Pharmaceutical Ingredients (API), Drugs & Pharmaceutical Products manufacturing industry is full with opportunity for producers, traders, and business owners, and this book is your one-stop resource for all the information you require. The only complete manual on the creation of commercial Active Pharmaceutical Ingredients (API), medications, and pharmaceutical products is this one. It offers a wealth of information on how to do things, from concept through equipment acquisition.

Content

1. INTRODUCTION
1.1 The Pharmaceutical Sector
1.2 Research, Development and Exploration
1.3 Ahead-of-Clinical Trials
1.4 Product Validation
1.5 The Value and Significance of Pharmaceutical Quality
1.6 Use
2. HOW TO A START PHARMACEUTICAL MANUFACTURING
2.1 Steps to Set up a Pharmaceutical Manufacturing
2.1.1 Choose an Appropriate Name for the Company
2.1.2 How Do Register?
2.1.3 Manufacturing License Procedure and Documents Required
2.1.4 Goods and Service Tax (GST) Registration
2.1.5 Machineries and Analytical Equipments
3. TYPES OF TABLET AND ITS MANUFACTURING PROCESS

3.1 Types
3.1.1 Pills
3.1.2 Caplets
3.1.3 Orally Disintegrating Tablets (ODT)
3.1.4 Film Coated Tablets (FCT)
3.2 Tabletting Formulations
3.3 The Making of the Tablets
3.3.1 Tablet Compaction Simulator
3.3.2 Tablet Presses
3.3.3 Tablet Coating
3.4 Tablet Manufacturing Processing
3.4.1 Sizing
3.4.2 Powder Blending
3.4.3 Granulation
3.4.4 Drying
3.4.5 Tablet Compression
3.4.6 Coating and Polishing Machines
3.4.7 Tablet Testing
3.4.8 Tablet Deduster
3.4.9 Fette Machine
3.4.10 Physical Features of Compressed Tablets
3.4.11 Packaging
4. TABLET COATING PROCESS
4.1 Principles of Tablet Coating
4.2 Primary Components Involved in Tablet Coating
4.2.1 Tablet Properties
4.2.2 Coating Process, Design & Control
4.2.3 Coating Equipment
4.3 Traditional Coating Techniques
4.3.1 Sugar Coating
4.3.2 Film Coating
4.3.3 Enteric Coating
4.3.4 Press Coating
4.4 Equipment
4.4.1 Standard Coating Pan
4.4.2 Perforated Pan Coating
4.4.3 Fluidized Bed Coater
4.5 Principle of Operation
4.6 Process Advantages
4.7 Advantages of Tablet Coating
5. PARACETAMOL TABLET MANUFACTURING

5.1 Chemistry
5.2 Mechanisms of Actions
5.3 Pharmacokinetics
5.4 Physical Properties
5.5 Formation of Paracetamol
5.6 Types of Paracetamol
5.7 Synthesis of Paracetamol
5.7.1 Phenol Route
5.7.2 p-Nitrochlorobenzene Route
5.7.3 Nitrobenzene Route
5.7.4 Hoechst-Celanese process (p-Hydroxyaceto-phene Hydrazine Route)
5.8 Paracetamol on the Pharmaceutical Market
5.9 Process of Tablet Manufacturing
5.9.1 Dry Mixing
5.9.2 Drying
5.9.3 Wet Granulation
5.9.4 Binder Solution Preparation
5.9.5 Compression
5.10 Evaluation Parameters of Tablet for Process
Validation
5.10.1 Content Uniformity
5.10.2 Weight Variation
5.10.3 Thickness
5.10.4 Hardness
5.10.5 Friability
5.10.6 Dissolution Test
5.10.7 Disintegration Test
6. METRONIDAZOLE TABLET
6.1 Medical Uses
6.1.1 Bacterial Vaginosis
6.1.2 Trichomoniasis
6.1.3 Giardiasis
6.1.4 Dracunculus
6.2 Materials and Procedures
6.2.1 Wet Granulation
6.2.2 Dry Granulation
6.2.3 Direct Compression
6.2.4 Tablet Evaluation
6.2.5 Weight Uniformity Test
6.2.6 Crushing Strength/Hardness Test
6.2.7 Friability Test

6.2.8 Content Uniformity Test
6.2.9 Disintegration Test
6.2.10 Dissolution Test
7. ASPIRIN MANUFACTURING
7.1 Introduction
7.2 Chemical Properties
7.3 Synthesis
7.4 Physical Properties
7.4.1 Polymorphism
7.5 Uses
7.5.1 Ache and Enlargement
7.5.2 Treating Heart Attacks
7.5.3 Preventing Heart Attacks and Strokes
7.6 Raw Materials
7.7 Manufacturing Process
7.7.1 Weighing
7.7.2 Mixing
7.7.3 Dry Screening
7.7.4 Compression
7.7.5 Testing
7.7.6 Bottling and Packaging
8. IV FLUIDS PRODUCTION
8.1 Introduction
8.2 Types of IV Fluids
8.3 Crystalloids
8.3.1 Isotonic IV Fluids
8.3.2 Hypotonic IV Fluids
8.3.3 Hypertonic IV Fluids
8.4 Colloids
8.5 Human Albumin
8.6 Dextrans
8.7 Etherified Starch
8.8 Gelatin
8.9 Plasma Protein Fraction (PPF)
8.10 Intravenous Fluids Used
8.11 Effects of Dehydration
8.12 Manufacturing Process
8.12.1 Preparation of Distilled Water
8.12.2 Solution Creation
8.12.3 Filling and Filtration
8.13 Intravenous Solutions Market

9. OINTMENT MANUFACTURING
9.1 Introduction
9.2 Types
9.2.1 Non Medicated Ointments
9.2.2 Medicated Ointments
9.3 Ointments According to Penetration
9.4 Advantages
9.5 Ointment Applications
9.6 Type of Preparation
9.6.1 Ointment Prepared by Trituration
9.6.2 Ointment Preparation by Chemical Reaction
9.6.3 Preparation of Ointments by Emulsification
9.7 Properties of the Ointment Manufacturing Plant
9.8 Advantages of Ointment Manufacturing Plant
9.9 Manufacturing Procedure of Ointment
9.10 Parts of Ointment Manufacturing Plant
10. LIQUID GLUCOSE MANUFACTURING
10.1 Molecule of Glucose (Glucose Chemical Structure)
10.2 Specifications of Glucose
10.3 Formula of Glucose and Fructose
10.3.1 Formula for D-Glucose
10.3.2 Carbon Anomer in Glucose
10.3.3 Carbohydrates have an Open Chain Structure
10.3.4 Formula for a Fructose Molecule
10.3.5 Fructose has a Cyclical Structure
10.3.6 Structure of Glucose in Cycles
10.3.7 Glucose’s Furanose Structure
10.4 Glucose’s Chemical Properties
10.4.1 Glucose Oxidation to Create Sugar Acids
10.5 Manufacturing Process
11. SURGICAL COTTON PRODUCTION PROCESS
11.1 Required Raw Materials and Their Availability
11.2 Process of Fabrication
11.3 Machinery & Equipment Required for the Manufacturing
11.3.1 Blower Room Device
11.3.2 Bleaching Intensity
11.3.3 Hydraulic Extractor
11.3.4 Dryer
11.3.5 Lapping Device
11.3.6 Carding Device

11.3.7 Rolling Device
11.3.8 Cutting Device
11.3.9 Packaging Equipment
11.4 Business Outlook and Trend
12. HOW TO START A BUSINESS OF SURGICAL COTTON
12.1 Machine Required
12.2 Necessary Raw Materials to Create Surgical Cotton
12.3 Registration and Licensing
12.4 Documents Needed to Apply For a Licence to Operate a Business Manufacturing Surgical Cotton
12.5 Fabrication of Surgical Cotton
13. PRODUCTION OF SYRUP
13.1 Benefits of Syrups
13.2 Why Syrups Used?
13.3 Ingredients in Syrups
13.4 Formulation of Sugar Based Syrups
13.4.1 Sucrose Solutions in Aqueous Forms: Stability
13.5 Advantages of Sucrose
13.6 Syrup Preparation
13.6.1 A Heat-Assisted Solution
13.6.2 Agitation-based Solution without Heat
13.6.3 Percolation
13.7 Dextrose Based Syrup
13.8 Utilizing Solubilization in the Formulation of Syrup
13.9 Synthesis of Artificial Syrups
13.9.1 Sugar-Free Syrups
13.10 Sorbitol-Based Syrup
13.11 Application of Syrups
13.12 Method of Preparation for Syrups
13.13 Process
14. VARIOUS TECHNIQUES FOR MAKING PHARMACEUTICALLY ACCEPTABLE SALTS
14.1 Why are Some Drugs Available in Salt Form?
14.2 Salt-Selection Strategy
14.3 Preparation of Salts of Basic Drug Substances
14.3.1 Hydrochlorides
14.3.2 Nitrates
14.3.3 Phosphates
14.3.4 Succinates
14.3.5 Maleates
14.3.6 Citrates
14.3.7 Tartrates

14.3.8 Gluconates
14.3.9 Lactobionates
14.3.10 Lauryl Sulfate Salts
14.3.11 Glutamates
14.3.12 Acetamidobenzoates
14.4 Preparation of Salts of Acidic Drug Substances
14.4.1 Potassium and Sodium Salts
14.4.2 Calcium Salts
14.4.3 2-Aminoethanol Salts
14.8.4 Lysine Salts
15. HOW IS ACTIVE PHARMACEUTICAL INGREDIENT (API) MANUFACTURED
15.1 Pharmaceutical Industry’s Use of API
15.2 Applied API
15.3 Different APIs
15.3.1 Chemical Synthetic Drug
15.3.2 Natural Chemical Drug
15.4 Some API Products
15.4.1 Streptomycin
15.4.2 Metformin
15.4.3 Doxycycline
15.4.4 Neomycin
15.5 Production Process
15.5.1 Handling of Feed
15.5.2 Responses
15.5.3 Mixture Reactors
15.5.4 Reactor Loop
15.5.5 Bulk Autoclave
15.5.6 Natural Process
15.5.7 Fermenters
15.5.8 Recovery
15.5.9 Distillation
15.5.10 Membranes
15.5.11 Crystallization
15.5.12 Filtration
15.5.13 Centrifugation
15.5.14 Drying
15.6 API Production and Demand
15.7 API Market Outlook
16. WHAT IS AN ACTIVE PHARMACEUTICAL INGREDIENT (API)
16.1 Medicine Elements
16.2 APIs’ Potency

16.3 Best API Producers
16.4 Where are APIs manufactured?
16.5 Rules
17. EXCIPIENTS AND ACTIVE PHARMACEUTICAL INGREDIENTS
17.1 Abbreviations
17.2 Excipients
17.3 Properties of Selected Excipients
17.4 Fillers/Binders
17.4.1 Lactose
17.4.2 Polyvinylpyrrolidone
17.4.3 Hydroxypropylmethylcellulose
17.4.4 Starch
17.5 Coloring Agents
17.5.1 Tartrazine
17.6 Sweeteners
17.6.1 Saccharin
17.6.2 Aspartame
17.6.3 Sucralose
17.6.4 Sorbitol
17.7 Alcohols
17.7.1 Benzyl Alcohol
17.7.2 Polyethylene Glycol
17.8 Preservatives
17.8.1 Sodium Benzoat
17.8.2 Benzalkonium Chloride
17.9 Lubricants
17.9.1 Magnesium Stearate
18. GOOD MANUFACTURING PRACTICE FOR ACTIVE PHARMACEUTICAL INGREDIENTS
18.1 Regulatory Applicability
18.2 Scope
18.3 Quality Management
18.3.1 Principles
18.3.2 Production Activities Responsibilities
18.3.3 Product Quality Review
18.4 Personnel
18.4.1 Employee Qualifications
18.4.2 Personnel Hygiene
18.5 Buildings and Facilities
18.5.1 Design and Building
18.5.2 Utilities

18.5.3 Water
18.5.4 Sanitation and Upkeep
18.6 Process Equipment
18.6.1 Design and Building
18.6.2 Cleaning and Maintenance of Equipment
18.6.3 Computerized Systems
18.7 Documentation and Records
18.7.1 System of Documentation and Specifications
18.7.2 Record of Equipment Cleaning and Use
18.7.3 Records of Raw Materials, Intermediates, API
Labelling and Packaging Materials
18.8 Materials Management
18.8.1 General Controls
18.8.2 Receipt and Quarantine
18.8.3 Sampling and Testing of Incoming Production
Materials
18.8.4 Storage
18.8.5 Re-Evaluation
18.9 Packaging and Identification Labelling of APIs and Intermediates
18.9.1 General
18.9.2 Packaging Materials
18.9.3 Label Issuance and Control
18.9.4 Packaging and Labelling Operations
18.10 Storage and Distribution
18.10.1 Warehousing Procedures
18.10.2 Distribution Procedures
18.11 Rejection and Re-Use of Materials
18.11.1 Rejection
18.11.2 Reprocessing
18.11.3 Reworking
18.11.4 Recovery of Materials and Solvents
18.12 Glossary
18.12.1 Acceptance Criteria
18.12.2 Active Pharmaceutical Ingredient (API) (or Drug Substance)
18.12.3 API Starting Material
18.12.4 Batch (or Lot)
18.12.5 Batch Number (or Lot Number)
18.12.6 Bioburden
18.12.7 Calibration
18.12.8 Computer System
18.12.9 Computerized System

18.12.10 Contamination
18.12.11 Contract Manufacturer
18.12.12 Critical
18.12.13 Cross-Contamination
18.12.14 Deviation
18.12.15 Drug (Medicinal) Product
18.12.16 Drug Substance
18.12.17 Expiry Date (or Expiration Date)
18.12.18 Impurity
18.12.19 Impurity Profile
18.12.20 In-Process Control (or Process Control)
18.12.21 Intermediate
18.12.22 Lot
18.12.23 Manufacture
18.12.24 Material
18.12.25 Mother Liquor
18.12.26 Packaging Material
18.12.27 Procedure
18.12.28 Process Aids
18.12.29 Process Control
18.12.30 Production
18.12.31 Qualification
18.12.32 Quality Assurance (QA)
18.12.33 Quality Control (QC)
18.12.34 Quality Unit(s)
18.12.35 Quarantine
18.12.36 Raw Material
18.12.37 Reference Standard, Primary
18.12.38 Reference Standard, Secondary
18.12.39 Reprocessing
18.12.40 Retest Date
18.12.41 Reworking
18.12.42 Signature (signed)
18.12.43 Signed (signature)
18.12.44 Solvent
18.12.45 Specification
18.12.46 Validation
18.12.47 Validation Protocol
18.12.48 Yield, Expected
18.12.49 Yield, Theoretical
19. ACTIVE PHARMACEUTICAL INGREDIENT (API) CHEMICALS

19.1 Method of Biomasses Conversion in APIs Synthesis
19.1.1 Chemical Approach
19.1.2 Biotechnological Approaches
19.2 Some Important Types of API Chemicals
19.2.1 Shikimic Acid
19.2.2 Succinic Acid
19.2.3 Erythritol
19.2.4 Clavulanic Acid
19.2.5 Rifampicin
19.2.6 Pregabalin
19.2.7 Ectoine
20. LIST OF IDENTIFIED PRODUCTS FOR PRODUCTION LINKED INCENTIVE (PLI) SCHEME
21. ACEBUTOLOL
21.1 Manufacturing Process
22. ACETAZOLAMIDE
22.1 Manufacturing Process
23. ALLOPURINOL
23.1 Manufacturing Process
24. AMPHETAMINE PHOSPHATE
24.1 Manufacturing Process
25. APALCILLIN SODIUM
25.1 Manufacturing Process
26. BACITRACIN
26.1 Manufacturing Process
27. BECLAMIDE
27.1 Manufacturing Process
28. BENFURODIL HEMISUCCINATE
28.1 Manufacturing Process
29. BROMOPRIDE
29.1 Manufacturing Process
30. BUMADIZON
30.1 Manufacturing Process
31. CAMAZEPAM
31.1 Manufacturing Process
32. CARBINOXAMINE MALEATE
32.1 Manufacturing Process
33. CEPHALOGLYCIN
33.1 Manufacturing Process
34. CLINDAMYCIN HYDROCHLORIDE
34.1 Manufacturing Process

35. CLOFIBRATE
35.1 Manufacturing Process
36. CYCLOPENTAMINE HYDROCHLORIDE
36.1 Manufacturing Process
37. DACTINOMYCIN
37.1 Manufacturing Process
38. DACTINOMYCIN
38.1 Manufacturing Process
39. DIAZEPAM
39.1 Manufacturing Process
40. DOXEPIN HYDROCHLORIDE
40.1 Manufacturing Process
41. DYDROGESTERONE
41.1 Manufacturing Process
42. EDROPHONIUM CHLORIDE
42.1 Manufacturing Process
43. ENDRALAZINE
43.1 Manufacturing Process
44. EPICILLIN
44.1 Manufacturing Process
45. EPIRIZOLE
45.1 Manufacturing Process
46. ERYTHROMYCIN
46.1 Manufacturing Process
47. FAZIDINIUM BROMIDE
47.1 Manufacturing Process
48. FELYPRESSIN
48.1 Manufacturing Process
49. FLUBENDAZOLE
49.1 Manufacturing Process
50. FLUNITRAZEPAM
50.1 Manufacturing Process
51. FURALTADONE
51.1 Manufacturing Process
52. GALLAMINE TRIETHIODIDE
52.1 Manufacturing Process
53. GENTAMICIN SULFATE
53.1 Manufacturing Process
54. GLYMIDINE
54.1 Manufacturing Process
55. GRAMICIDIN

55.1 Manufacturing Process
56. GUANFACINE
56.1 Manufacturing Process
57. HALOPERIDOL
57.1 Manufacturing Process
58. HEPARIN
58.1 Manufacturing Process
59. HOMOFENAZINE
59.1 Manufacturing Process
60. HYDROCHLOROTHIAZIDE
60.1 Manufacturing Process
61. HYDROXYSTILBAMIDINE ISETHIONATE
61.1 Manufacturing Process
62. IBUPROFEN
62.1 Manufacturing Process
63. IDOXURIDINE
63.1 Manufacturing Process
64. IFENPRODIL TARTRATE
64.1 Manufacturing Process
65. INDENOLOL
65.1 Manufacturing Process
66. IODAMIDE
66.1 Manufacturing Process
67. KANAMYCIN SULFATE
67.1 Manufacturing Process
68. KEBUZONE
68.1 Manufacturing Process
69. KETOTIFEN
69.1 Manufacturing Process
70. LACTULOSE
70.1 Manufacturing Process
71. LEVODOPA
71.1 Manufacturing Process
72. LIDOCAINE
72.1 Manufacturing Process
73. LOPERAMIDE HYDROCHLORIDE
73.1 Manufacturing Process
74. LOXAPINE
74.1 Manufacturing Process
75. MANNITOL
75.1 Manufacturing Process

76. MELPHALAN
76.1 Manufacturing Process
77. METYRAPONE
77.1 Manufacturing Process
78. MIDECAMYCIN
78.1 Manufacturing Process
79. MOTRETINIDE
79.1 Manufacturing Process
80. MUZOLIMINE
70.1 Manufacturing Process
81. NALOXONE
81.1 Manufacturing Process
82. NEFOPAM HYDROCHLORIDE
82.1 Manufacturing Process
83. NIAPRAZINE
83.1 Manufacturing Process
84. NIMETAZEPAM
84.1 Manufacturing Process
85. NOXIPTILIN
85.1 Manufacturing Process
86. OCTOPAMINE HYDROCHLORIDE
86.1 Manufacturing Process
87. OLEANDOMYCIN
87.1 Manufacturing Process
88. ORGOTEIN
88.1 Manufacturing Process
89. OXACILLIN SODIUM
89.1 Manufacturing Process
90. OXACEPROL
90.1 Manufacturing Process
91. PAPAIN
91.1 Manufacturing Process
92. PENICILLIN G BENZATHINE
92.1 Manufacturing Process
93. PHENAGLYCODOL
93.1 Manufacturing Process
94. PICOPERINE
94.1 Manufacturing Process
95. POLYESTRADIOL PHOSPHATE
95.1 Manufacturing Process
96. PYRIDINOL CARBAMATE

96.1 Manufacturing Process
97. QUINESTROL
97.1 Manufacturing Process
98. QUINETHAZONE
98.1 Manufacturing Process
99. QUINIDINE POLYGALACTURONATE
99.1 Manufacturing Process
100. QUINUPRAMINE
100.1 Manufacturing Process
101. RANITIDINE
101.1 Manufacturing Process
102. RESCINNAMINE
102.1 Manufacturing Process
103. RIMITEROL
103.1 Manufacturing Process
104. RITODRINE
104.1 Manufacturing Process
105. ROSOXACIN
105.1 Manufacturing Process
106. SALICYLIC ACID
106.1 Manufacturing Process
107. SECOBARBITAL SODIUM
107.1 Manufacturing Process
108. SINCALIDE
108.1 Manufacturing Process
109. STREPTOKINASE
109.1 Manufacturing Process
110. SULFACYTINE
110.1 Manufacturing Process
111. TALAMPICILLIN
1111 Manufacturing Process
112. TESTOLACTONE
112.1 Manufacturing Process
113. THIAMPHENICOL
113.1 Manufacturing Process
114. TICRYNAFEN
114.1 Manufacturing Process
115. TOCAINIDE
115.1 Manufacturing Process
116. UBIDECARENONE
116.1 Manufacturing Process

117. URACIL MUSTARD
117.1 Manufacturing Process
118. URAPIDIL
118.1 Manufacturing Process
119. UROKINASE
119.1 Manufacturing Process
120. VANCOMYCIN
120.1 Manufacturing Process
121. VERAPAMIL
121.1 Manufacturing Process
122. VIDARABINE
122.1 Manufacturing Process
123. VILOXAZINE HYDROCHLORIDE
123.1 Manufacturing Process
124. VIMINOL
124.1 Manufacturing Process
125. VINBLASTINE SULFATE
125.1 Manufacturing Process
126. WARFARIN SODIUM
126.1 Manufacturing Process
127. XANTHINOL NIACINATE
127.1 Manufacturing Process
128. XIBORNOL
128.1 Manufacturing Process
129. XIPAMID
129.1 Manufacturing Process
130. XYLOMETAZOLINE HYDROCHLORIDE
130.1 Manufacturing Process
131. ZERANOL
131.1 Manufacturing Process
132. ZIMELIDINE
132.1 Manufacturing Process
133. ZIPEPROL
133.1 Manufacturing Process
134. ZOMEPIRAC
134.1 Manufacturing Process
135. ZOTEPINE
135.1 Manufacturing Process
136. ZOXAZOLAMINE
136.1 Manufacturing Process
137. PACKAGING OF PHARMACEUTICAL PRODUCTS

137.1 Packaging Requirements of Pharmaceuticals
137.1.1 Moisture Protection of Solid Oral Preparations
137.1.2 Abrasion
137.1.3 Selection of Containers
137.2 Types of Packaging
137.2.1 Components Based on Rubber
137.2.2 Glass
137.2.3 Plastic
137.2.4 Films, Foils and Laminations
137.3 Latest Development in Packaging
137.3.1 Blister Pack
137.3.2 Strip Pack
137.3.3 Tamper Resistant Packaging
137.3.4 2-D Barcodes / Mass Encryption Technology
137.3.5 Hologram
137.4 Machinery for Packaging
137.4.1 Strip Packing Machine
137.4.2 Blister Packing Machine
137.4.3 Cartoning Machine
137.4.4 Ampoule Filling Line
137.4.5 Syringe Filling Machine
137.4.6 Liquid Filling Machine
137.4.7 Automatic Labelling / Gumming / Stickering Machine
138. BIS STANDARDS
139. ISO STANDARDS
140. PLANT LAYOUT AND PROCESS FLOW CHART & DIAGRAM
141. PHOTOGRAPHS OF PLANT AND MACHINERY WITH SUPPLIER'S CONTACT DETAILS
• Tablet Making Machine
• Tablet Press Machine
• Granulator Machine
• Film Coating Machine
• Tablet Hardness Tester
• Surgical Cotton Bleaching Machine
• Vaccum Tray Dryer
• Surgical Cotton Roll Making Machine
• Conveyor Fiber Dryer
• Coating Pan
• Blister Packaging Machines
• Pharma Centrifuges Machine

- Tray Dryer
- Vibro Sifter Machine
- Jacketed Stainless Steel Mixing Tank
- Labeling Machine
- Colloid Mill
- API Machine
- Dispax Reactor DR
- Conical Screw Vacuum Dryer for API
- Filter Press
- Dry Syrup Powder Filling & Sealing Machine
- Paste Kettle
- Storage Vessels
- Capping Machine
- Automatic Tube Filling and Sealing Machine
- Powder Sampling Rod

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.