

Disposable Products Manufacturing Handbook

Author:- NPCS Board of Consultants & Engineers

Format: paperback

Code: NI261

Pages: 528

Price: Rs.1575US\$ 150

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Usually ships within **5** days

Disposable Products Manufacturing Handbook

(Plastic Cups, Cutlery, Paper Cups, Banana Leaf Plates, Facial Tissues, Wet Wipes, Toilet Paper Roll, Sanitary Napkins, Baby Diapers, Thermocol Products, PET Bottles)

Everyday life products manufacturers worldwide produce a multitude of items that are intended for one use only. A disposable is a product designed for a single use after which it is recycled or is disposed as solid waste. The term often implies cheapness and short-term convenience rather than medium to long-term durability. The term is also sometimes used for products that may last several months distinguish from similar products that last indefinitely.

The fast moving life and modernization simultaneously lead to the necessity of disposables in one's life. One cannot wash utensils all the time, neither can afford to arrange fine and good cutlery of glass or steel in a party for the guest. At such times, people rush for the disposables available in the market with variety of colors and designs.

For a manufacturer, to produce disposables is a good deal keeping in view the present demand and growth in the market. This handbook is a complete well to do package for a layman to understand the basic steps to be followed for setting up a plant for a particular disposable product. The book contains raw material details, product manufacturing process, machinery details, images with raw material and machinery suppliers.

The Disposable Products Manufacturing Handbook is about producing Plastic Cups, Cutlery, Paper Cups, Banana Leaf Plates, Facial tissues, Wet Wipes, Toilet Paper Roll, Sanitary Napkins, Baby Diapers, Thermocol Products, PET Bottles that are used by masses in their day to day life. This well-established text provides a comprehensive coverage of the manufacturing processes adopted to manufacture various disposable products. It gives a holistic view of products produced, which has inputs from diverse fields. The book discusses the importance and objectives of processes and material used for the production of disposable products. Many examples have been provided to illustrate the concepts discussed.

1. INTRODUCTION

Plastic

Polypropylene

Polystyrene (PS)

Different Types of Disposable Products in Market

Pet Bottles
Thermocol & Its Products
Paper Cup
Plastic Cutlery
Facial Tissue, Wet Wipes and Toilet Rolls
Plastic Cups
Disposable Banana Leaf Plates
Baby Diaper and Sanitary Napkin
Diaper
Sanitary Napkin

2. PLASTICS

Introduction
Composition
Additives
Classification
Thermoplastics & Thermosetting Polymers
Other Classifications
Biodegradability
Natural vs. Synthetic
Crystalline vs. Amorphous
Properties of Plastics
Toxicity
Plastics & Their Uses

3. THERMOPLASTIC

Stress Strain Graph of Thermoplastic Material
Acrylic
Nylon
Polyethylene
Polypropylene
Polystyrene
Polyvinyl Chloride
Teflon
Properties of Various Thermoplastic Products

4. THERMOSETTING PLASTIC

Process
Properties and Their Uses
Examples

5. POLYETHYLENE

Structure of Polyethylene
Process
Monomer
Polymerization
Production of Polyethylene
From Naphtha
As a Gas

Properties
Physical Properties
Chemical Properties
Classification
LDPE
Properties
Chemical Resistance
LDPE Quick Facts
Production of LDPE
Applications
LLDPE
Production and Properties
Processing
Properties
Physical Properties
Application
HDPE
Properties
Physical Properties
Chemical Properties
HDPE Resistance
HDPE Quick Facts
Production of HDPE
Applications
Properties Comparison Chart for LDPE and HDPE
Processing Polyethylene into Products
The Making of Molded Products
The Making of Foil
The Making of Multi-Layer Foil
The Making of Sheets
The Making of Foam Applications for Insulation
Additions
Joining

6. POLYETHYLENE TEREPHTHALATE (PET OR PETE)

Production
Dimethyl Terephthalate Process
First Step
Second Step
Terephthalic Acid Process
General Process Involved in the Manufacturing of PET
Properties
General Properties
Application
Sustainable
Polyethylene Terephthalate Films
Intrinsic Viscosity
A PET soft drink bottle
Fiber Grade
Film Grade
Bottle Grade
Monofilament, Engineering Plastic

Property Chart for PET
Drying of PET
Copolymers
Degradation
Acetaldehyde
Antimony
Safety
Bottle Processing Equipment

7. POLYPROPYLENE

Chemical and Physical Properties

Polypropylene Resistance

Polypropylene Quick Facts

Polypropylene Fabrication

Degradation

Synthesis

Industrial Processes

Manufacturing

Properties & Applications

A Common Application for Polypropylene is as Bi-Axially Oriented Polypropylene (BOPP)

Other Useful Properties

PP Structure

PP Parameters

Basic Types of PP

Crystallinity

Presence of Selected Additives during Polymerization

Antioxidants and Stabilizers

Nucleants and Clarifiers

Antistatic Agents

Chemical Resistance

Stress Cracking Resistance

Permeability

Organoleptics

Notch Effects

8. POLYSTYRENE

Structure

Polymerization

Atactic Polystyrene

Syndiotactic Polystyrene

Properties of Polystyrene

Properties of Polystyrene

Physical Properties

Mechanical Properties

Optical Properties

Thermal Properties

Electrical Properties

Chemical Properties

Uses

Strength, Durability, Comfort, Safety

Applications of PS

- Packaging
- Appliances
- Consumer Electronics
- Construction
- Medical
- Other
- Degradation
- Biodegradation
- Incineration
- Forms Produced
- Sheet or Molded Polystyrene
- Disposable Polystyrene Razor
- Foams
- Expanded Polystyrene
- Extruded Polystyrene Foam
- Fused Cell Expanded Polystyrene Foam
- Copolymers
- Oriented Polystyrene

9. INJECTION MOULDING

- Process Characteristics
- Advantages of Injection Molding
- Disadvantages of Injection Molding
- Applications
- Examples of Polymers Best Suited for the Process
- Equipment
- Mold
- Injection Molding Die with Side Pulls
- Mold Design
- Mold Storage
- Tool Materials
- Machining
- Cost
- Injection Process
- What is Injection Molding Cycle?
- Different Types of Injection Molding Processes
- Process Cycle
- Equipment
- Injection Unit
- Clamping Unit
- Machine Specifications
- Tooling
- Mold Base
- Mold Channels
- Mold Design
- Materials
- Tolerances and Surfaces
- Power Requirements
- Molding Defects
- Silver Streaks
- Short Shot
- Jetting

Flow Marks
Color Streaks
Weld Lines
Flash
Delamination
Stringiness
Sink Marks
Warping or Twisting

10. EXTRUSION MOULDING

Types of Extrusion
Plastic Extrusion
Single Screw Extrusion Machinery
Extrusion Dies
Screw Design
Cooling and Sizing Equipment
Pros and Cons of Extrusion Molding
Pros
Cons
Defects

11. COMPRESSION MOULDING

Process Definition
Process Characteristics
Process Schematic
Pros & Cons of Compression Moulding
Pros
Cons

12. BLOW MOLDING

Typologies of Blow Molding
Extrusion Blow Molding
Continuous Extrusion Equipment
Intermittent Extrusion Machinery
Advantages of Blow Molding
Disadvantages of Blow Molding
Spin Trimming
Injection Blow Molding
Disadvantages
Injection Stretch Blow Molding Process
Advantages
Disadvantages
Process Explanation
Advantages
Disadvantages
What is PET Blow Moulding?
PET Blow Moulding Process
Advantages of Blow Molding
Defects & Troubleshooting
Blow Moulding Glossary

13. THERMOFORMING

Vacuum Thermoforming

Process

Applications

Pressure Thermoforming

Advantages of Pressure Forming

Applications for Pressure Forming

Mechanical Thermoforming

Thin Gauge and Heavy (Thick) Gauge Thermoforming

Types of Thermoforming Molds

Applications

Benefits

When and Where does Thermoforming Fit?

Plastics Used

Thermoforming Materials

ABS

HDPE

HIPS

PETG

PC

Acrylic

Chart of Plastic Materials - Advantages, Disadvantages and Industry Examples

Advantages of Thermoforming

Pros & Cons of Thermoforming

Pros

Cons

14. PLASTIC CUPS

Introduction

Plastic Cups

Manufacturing Method

Thermoforming

Heating

Forming

Cooling

Trimming

Machine Type

Application of Thermoforming Technique

Raw Material

Steps

Polypropylene Characteristics

Compatibility of Polypropylene with Common Products

Properties of Poly Propylene

Specific Gravity

Mechanical Properties

Electricals

Chemical Resistance

Specification of Thermoforming Machines

Moulds

Glass

Cups
Plates
Spoons
Printing on Polypropylene
Printing on Cups, Glasses and Plates
Roto Gravure Printing
For Multicolor Printing
Flow Diagram for Disposable Plastic Cups
Plant and Machinery Details
Thermoforming Machine
Specifications
Thermoformable Extrusion Line
Mono & Multilayer Thermoformable Sheet Lines
Specifications
Plastic Cup thermoforming Machine
Usage
Hydraulic Automatic Cup Making Machine
Parameter
Functions and Characteristics
Complete Line: Extrusion + Cup Making Machine
Plastic Sheet Extruder
A. Main Parameters
B. Configuration and Specification
1. Main Extruder: one
2. Non-stop Fast Screen Changer With Double-sieve: one set
3. Die-Head
Calendar Roll Stack: one
4. Thermostat System: Two sets (Only use for making PS sheet)
5. Air Cooling Stand: one
6. Trimming Unit: one
7. Haul Off Unit: one
8. Single-shaft Winder (One set)
9. Electronic Control Cabinet: one set
10. Waste sheet re-winder: one set
Main Technical Data
Feature
Key Electric Components
Assistant Machines
Automatic Cup Stacking Machine
Usage
Main Technical Parameter
Screw Air Compressor
Industrial Chiller (Air Cooled)
Model Specification
Thermoforming/Vacuum Forming Sheet Extrusion Line
PP/PS Specification
Multi-Layer Co-Extrusion Sheet Line
Technical Specification
Features
HIPS / ABS / PC / PMMA / PS Extrusion Sheet Line
Technical Specification
Suppliers of Plant & Machinery
Raw Material Suppliers

15. BABY DIAPER & SANITARY NAPKINS

Introduction

Baby Diaper

Types of Diapers

Disposable

Reusable: Cloth Diaper

Sanitary Napkins

Uses and Applications

Baby Diaper

Sanitary Napkin

Properties of Baby Diapers

Properties of Sanitary Napkins

Advantages & Disadvantages of Disposable Diaper

Features of Disposable Baby Diapers

Components of Disposable Diaper

Raw Materials for Manufacturing of Disposable Diaper

Absorbent Pad

Nonwoven Fabric

Other Components

Diaper Structure

Diaper Acceptance Criteria

Function of Baby Diaper

Manufacturing Process

Formation of the Absorbent Pad

Preparation of the Nonwoven

Assembly of the Components

Mathematical Models for Disposable Diaper Manufacturing

By-Products/Waste

Quality Control

Process Flow Sheet for Baby Diapers Manufacture

Absorbent Pad Formation

Formation of Top sheet and Bottom sheet from Non-Woven Fabric

Assembly of Components

Preparatory Processes for Sanitary Napkins

Opening

First Stage is Opening

Second Stage

Third Stage is Kiering Bleaching & Washing

Bleaching

Sterilisation

Dry Heat

Auto Claving

Exposure to Ethylene Oxide

Hydro - Extracting

Drying

Raw Materials Required

Raw Materials Description

Roll Pulp

Non-Woven Fabric

Polyethylene Film

Tissue

Hot Melt & Polyextruded Adhesive
Pressure Sensitive Adhesive
Silicone Release Paper
Specifications of the Raw Materials
Wood Pulp
Non-Woven Fabric
Silicone Release Paper
Hot Melt
Process of Manufacture of Sanitary Napkins
(A) Preparation of Cotton Lint Sliver
(1) Cotton Opening
(2) Lapping
(3) Carding
(4) Draw Frame
(5) Tissue Paper Wrapping
(B) Manufacture of Sanitary Napkins
(1) Cone Winding
(2) Knitting & Insertion of Tissue paper Wrapped Sliver
(3) Cutting & Looping of Both Ends of Sanitary Napkins
(4) Packing
Process Flow Sheet for Sanitary Napkins
Disposable Diaper Machine Photographs
Full Servo Baby Diaper Making Machine
Specifications
Full Servo Pull-Up Baby Diaper Machine
Specifications
Main Technical Parameter
Main Function Features
Sanitary Napkins Machinery Photographs
Fast & Easy Packing Wing Style Sanitary Napkin Equipment
Equipment Functions
Structure & Configuration
Main Technical Parameter
Fast-Easy Packing Women Sanitary Pad Machine
Function & Assemble Parts
Structure & Character
Main Technical Parameter
Sanitary Napkin Production Line
Main Machine
Crusher
Model: Multiple-Function Machine for Sanitary Napkin
Main Production Line
Specifications
Suppliers of Plant and Machinery (For Baby Diapers)
Suppliers of Raw Materials
Suppliers of Plant and Machinery (For Sanitary Napkins)
Raw Materials Suppliers

16. DISPOSABLE BANANA LEAF PLATE

Introduction

Function

Properties of Banana Leaf Plates

Use and Application of Banana Leaf Plates

Utility

Area of Usage

Raw Material

Banana Tree/Leaves

Manufacturing Process of Banana Leaf Plates

Process Steps

Description

Flow Diagram

Machinery Description

Leaf Plate Making Machine

Description

Materials

Construction

Working

Leaf Plate Making Machine

Machinery Details

Suppliers of Plant and Machinery

Suppliers of Raw Material

17. FACIAL TISSUE & BABY WET WIPES

Introduction

What is a Tissue Paper?

Properties

Production

Applications

Hygienic Tissue Paper

Facial Tissues

Paper Towels

Wrapping Tissue

Toilet Tissue

Table Napkins

Facial Tissue

Properties

Manufacturing Process for Facial Tissues

Steps

Pulping and Retting

Pressing

Creping

Reeling and Cutting

Uses of Facial Tissue

Size

Effects

Wet Wipes

Introduction

Production

Uses

Baby Wipes

Cleansing Pads

Industrial Wipes

Pain Relief

Personal Hygiene

Manufacturing Process Flow Diagram for Facial Tissue & Wet Wipes
Pet Care
Healthcare
Facial Tissue and Wet Wipes Machine Details
Facial Tissue Machine
Specifications
Professional Facial Tissue Machine
Specification
Wallet Pocket Facial Tissue Machine
Specification
Full-Automatic Box-drawing Facial Tissue Machine
Descriptions
Function and Features
Technical Data
The Name of Spare Part of the Machine
Specification of Raw Material
Industrial Facial Tissue Making Machine
Supplier of Plant and Machinery
Suppliers of Raw Material

18. PAPER CUPS

Introduction
Advantages of Paper Cups
Waterproofing
Printing on Paper Cups
Properties of Paper Cups
Environmental Impact
Recycling
Paper vs. Plastic
Emission
Habitat Loss Trees Used
Lids
Uses & Applications
Per Case Contents Measurements
Manufacture
Process Flow Chart
Other Processes
1. Paper Cup Manufacturing Process
Cup Forming Process
2. Paper Cup Making Machine Technical Data
Complete Production Line for Paper Cup Forming
Flow Chart
1. High Speed Extrusion Laminating Machine
Process 1
2. Four Color Flexographic Printing Machine
Process 2
3. Computerized Micro-Gap Flat Creasing and Die Cutting Machine
Process 3: Cut the Printed Roll Paper into Small Pieces
4. High Dpeed Paper Slitting Machine
Process 4: Split the Big Roll PE-Coated Paper into Small Roll Paper
5. Middle Dpeed Paper Cup Forming Machine
Machinery with Specifications

1. High Speed Extrusion Laminating Machine
Features of High Speed Extrusion Laminating Machine
Main Parameters of High Speed Extrusion
2. Four-color Flexographic Printing Machine Laminating Machine
Specifications of Four-color Flexographic Printing Machine
3. Creasing & Cutting Machine
Description of Creasing & Cutting Machine
Features of Creasing & Cutting Machine
Technical Parameters of Creasing & Cutting Machine
4. Middle Speed Paper Cup Forming Machine
Characteristics
Advantages of Middle Speed Paper Cup Forming Machine
Technical Parameters
5. Paper Cup Forming Machine
Main Parameters of Paper Cup Forming Machine
6. Double Side PE Coated Paper Cup Machine
Description of Double Side PE Coated Paper Cup Machine
Technical Parameters of Double Side PE Coated Paper Cup Machine
Suppliers of Plant and Machinery
Suppliers of Raw Material

19. PET BOTTLES

Introduction
Uses & Applications
Production of Base (Amorphous) Pet Chips
Properties
Main Advantage of PET
Food Grade
Aesthetics
Strength
Weight
Airtight & Leak Proof
Chemical Resistance
Manufacturing Process
Plasticizing the PET
Injection Molding the PET Preform
Heating the PET Preform
Process Flow Diagram
Stretch Blow Molding the PET Container
PET Container Ejector
Machinery Suppliers
Pet Stretch Blow Molding Machine
Technical Specifications
Pet Blow Molding Machine
Specification
PET Bottle Making Machine
Technical Specifications
High Pressure Three Cylinder Air Compressor
Specification
Automatic Pet Blow Moulding Machine
Two Stage PET Blow Moulding Machine
Features of Automatic Pet Blow Moulding Machine

Machine Technical Specifications
Air Recovery System
Hydraulic Injection Moulding Machine
Injection Moulding Machine
Injection Moulding Machine
Horizontal Injection Moulding Machines
Injection Moulding Machine
Injection Moulding Machine
Injection Moulding Machine
Suppliers of Plant and Machinery
Suppliers of Raw Material

20. THERMOCOL & ITS PRODUCTS

Introduction
Typical Properties
Applications
Uses & Applications
Food Packaging
Properties of Thermocol
Light Weight
Durability
Moisture Resistance
Thermal Efficiency
Shock Absorption
Versatility
Ease of Use
Environmental Benefits
Manufacturing Process
Basic Raw Material Required
Basic Plant and Machinery Required
For Plates
For EPS Glass & Cups
Method Used
Process
Making Styrene
Making Polystyrene
Preparing the Beads
Making Expanded Polystyrene Foam (EPF)
Molding
Making Extruded, Expanded Polystyrene Foam
Cutting, Bonding and Coating
EPS Products (Plates/Cups/Glasses)
Raw Material & Availability
Moulding
Main Equipment and Technical Parameter
For Plates
1. PS Foam Sheet Extrusion Line
Components
A. Mixer
B. Automatic Feeding System (Automatic Self-control System)
C. 1st Extruder
High pressure Butane Pump

- D. 2nd Extruder
- E. Cooling System
- F. Hauling-off System
- G. Winding Device
- 2. Automatic Vacuum Forming Machine
- Components
- 3. Double Worktables Hydraulic Cutting off Machine (PLC controlling)
- 4. Crusher
- 5. Recycling System
- For EPS Glass & Cups
- A. Material expander: (1 set)
- B. Dryer: 1set
- C. Crusher: 1set
- D. Central System of Sending Material: 1set
- E. Foaming Machine: 4 sets
- F. Other Assistant Equipments
- 1. Water Tank (10m³): 2
- 2. Cooling Water Tower
- 3. Centrifuge
- 4. Air Compressor
- Manufacturing Process
- Basic Raw Material Required
- Basic Plant and Machinery Required
- For EPS Glass, Cups and Plates
- Process Description
- Process Flow Diagram
- Flow Diagram for EPS (Thermocol) Plates/Cups/Glasses
- Raw Material, Product & Machinery Photographs
- Fully Automatic Shape Moulding Machine
- Features & Technical Specification
- Automatic EPS Shape Moulding Machine
- Fully Automatic EPS Shape Molding Machine
- Automatic Thermocol Packing Machine
- EPS Pre-Expander Machine
- EPS Preformer
- EPS/Thermocol Block/Sheet Cutting Machine
- Tech Details
- PD Foam Sheet Extrusion Line
- Automatic Vacuum Forming Machine
- Features
- Technical Specification of Automatic Vacuum Forming Machine
- Automatic EPS Foam Cup Molding Machine
- EPS Foam Cup Making Machine
- Foam Cup Manufacturing Machine
- Technical Data
- Suppliers of Plant & Machinery
- Suppliers of Raw Material

21. PLASTIC CUTLERY

Introduction

Importance of Plastic Cutlery

#1 - Cost

#2 – Convenience

Problems

#1 – The Vast Majority of Plastic Cutlery cannot be Recycled

#2 – It creates Waste

Properties of Plastic Cutlery Items

Uses of Disposable Plastic Cutlery Items

Manufacturing Process

Disposable Plastic Cutlery Items

Basic Raw Material Used

Basic Plant and Machineries Required

Step 1: Loading

Step 2: Liquification

Step 3: Mould Loading

Step 4: Moulding

Step 5: Packaging

Product Specification

Process Flow Diagram

Plant & Machinery Details

Injection Moulding Machine

Component List for Injection Moulding Machine

Technical Parameter

Types of Machine

Spare Parts

Mould for the Production of Plastic Spoons

Cutlery Packaging Machine

Product Description

Scope of Application

Features

Universal Machinery

Manufacturing Factory 1

Manufacturing Factory 2

Packaging Machine

Rotary Packing Machine

I. Main Performance and Structure Features

II. Application

III. Optional Devic

IV. Specification

Suppliers of Plant & Machineries

22. TOILET PAPER ROLLS

Introduction

Description

Bleaching of Fibers

Chemicals

Material

Color and Design

Manufacturing Process Flow Diagram for Toilet Paper Roll

Uses

Manufacturing Process for Toilet Paper Rolls

Toilet Paper Machinery Details

Full-automatic High-speed Rewinding and Perforated Toilet Paper Machine

Description of the Equipment

Features
Technical Data
Optional Equipment
The Name of Spare Part of the Machine
Specification of Raw Paper
Toilet Paper Cutting Machine
Functions and Features
Main Technology Parameter
Toilet Roll Embossing Machine
Specifications
Toilet Paper Processing Equipments
1. Rewinding Machine
2. Toilet Paper Rolls Slitter
3. Sealing Machine
4. Product
Supplier of Plant and Machinery
Suppliers of Raw Material

About NIIR

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, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

NIIR PROJECT CONSULTANCY SERVICES, 106-E, Kamla Nagar, New Delhi-110007, India.
Email: npcs.india@gmail.com Website: NIIR.org

Fri, 14 Feb 2025 18:45:34 +0000