
TECHNOLOGY OF PET BOTTLES, PREFORM AND PET RECYCLING

Pet Plastic Packaging

Properties of Pet

- PET Properties
- PET Characteristics
- Use of PET
Recycling of PET

- Virgin PET
- PET synthesis
- Virgin PET thermal transitions
- and crystallisation
- PET applications and processing
- Extrusion
- Extrusion moulding
- Extrusion to produce foam
- Inject ion moulding
- Blow moulding
- Recycled PET
- Contamination
- Acid producing contaminants
- Water
- Colouring contaminants
- Acetaldehyde
- Other contaminants
- POSTC-PET conventional
- recycling processes
- Chemical recycling
- Mechanical recycling
- Contaminants removal
- Drying
- Melt processing
- Increasing recycled PET intrinsic viscosity
- Reprocessing under vacuum
- Stabilizers
- Solid sidle polymerisation
- Chain extension
- Chain extension process
- End groups effect
- Cross-linking reaction
- Chain extenders
- Chain extension process
- experimental variables
- Chain extension process
- equipment
- Reactive extrusion process
- Single-screw extruder
- Twin-screw extruder
- Stability of reactive extrusion
- system
- The effect of chain extension
on PET crystallinity and
thermal transitions
Thermal Transitions and
Crystallinity
Multiple melting peaks
phenomena
ISBM process
Preform moulding
Bottle stretch blow moulding
ISBM of RER-PET
Bottle physical properties
Orientation and conformation of molecules of PET bottle
Trans Gauche-Conformational Changes
Dichroism

ASEPTIC FILLING OF PET BOTTLES

- Concept

FLEXO INKS FOR THE PRINTING OF NON-TREATED POLYESTER FILMS (PET) ON CENTRAL IMPRESSION FLEXO PRESSES

- Flexo printing of non-treated polyester films (PET)
- Printing and lamination of PET films

PRODUCTION AND FILLING PROCESS OF A PET-BOTTLE

- Handling of empty PET Bottles
- Tray Loader
- Tray Loop
- Pelletizer
- Installation of a Tray Storage
- Discharge at several production lines
- Separation of Blow moulder and Filling Line
- Application of commercially available Plastic Trays as means of Transportation
- Summary
PET BOTTLE RECYCLING

PET PREFORM AND BOTTLE BLOWING

- PET Container Applications
- Popular applications
- Manufacturing Processes
- Quality Requirements
- Single Stage Process
- Two Stage Process
- Two Stage System
- Injection Moulding Machine
- Machines to give
- Dehumidification
- Chillers
- High pressure compressor
- How are the physical
- properties of PET
- improved by stretching?
- International trends
- Indian Scene
- Future Scene Expected
- The Future is Big and Good.
- PET Resin Industry Structure

ADVANTAGES OF COEXTRUDED PET-FILMS IN FLEXIBLE PACKAGING

- Introduction
- Properties of PET films
- Advantages of three layer
- co-ex PET films
- Hostaphan RD
- Hostaphan RHB
- Hostaphan RHS
- Hostaphan MPK
- Summary

THERMOFORMING OF APET SHEET

- Introduction
- Why A PET
• Thermoforming
• Preparation
• Heating
• Thermal Diffusivity
• Thermoforming
• Cooling
• Removal From Mould
• Cutting
• Sealing
• Productivity
• Advantages Over PVC
• Manufacture of Buster Paching
• General Guidelines For Part
• Design in APET
• Recycling

PROJECT PROFILES

• Pet Bottles from Pre-Form PET
• Properties
• Food Grade
• Aesthetics
• Strength
• Weight
• Airtight & Leak Proof
• Space Utility
• Chemical resistance
• Environment Friendly
• PET (Polyethyleneterephthalate)
• Plant Economics of
• Pet Bottles from
• Pre-Form PET
• Plant & Machinery
• Fixed Capital
• Working Capital
• Requirement/Month
• Raw Materials
• Total Working Capital/Month
• Total Capital Investment

PET Pre-Form PET Resin

• Introduction
• Injection Moulding machines
• Blow Moulding
• Uses
• Properties
• Manufacturing Process
• Manufacturing Processes of PET Preform
• Process Flow Sheet
• Plant Economics
• Plant & Machinery
• Fixed Capital
• Raw Material
• Total Working Capital/Month
• Total Capital Investment
• Turn Over/Annum

PET Bottle from Pre-Form (Capsules)

• Plant Economics
• PET Containers
• Plant & Machinery
• Fixed Capital
• Working Capital
• Requirement/Month
• Raw Materials
• Total Working Capital/Month
• Total Capital Investment
• Turn Over/Annum

PET Bottles/Containers from PET Grains

• Manufacturing Process
• Formulation for PET
• Containers
• HDPE, PVC and PET
• Bottles
• Coloured ‘Mellnar’ PET
• Process Flow Sheet
• (For Plastic (PET)
• Containers
• Plant Economics
• PET Containers
• Plant & Machinery
• Fixed Capital
**Project Profile on PET Bottles**

- Introduction
- Market
- Raw Material
- Manufacturing Process & Technology
- Investment
- Means of Finance
- Profitability Assumptions

**Advanced Recycling**

- Introduction
- Extrusion process
- Mixing
- Degassing
- Flexibility
- Specific examples
- rPET
- Low Bulk Density Scraps
- Such as Agricultural Films or Payarn

**Class 0 aseptic filling of pet bottles**

- Reprocessing of PET bottles waste
- Status today
- Current scenario of PET usage
- Recycled PET bottles waste-products thereof
- MISC
- Sub: PET bottles recycling
  - some important points
• Caution
• Current scenario
• Chemical recycling
• (Bottle to Bottle)
• Food safety evaluation of
• recycled material
• Chemical Recycling
• Chemical Recycling
• (Bottle to Bottle)
• Methanolysis
• AWRAP-UP

Polycarbonate (PC) blends with recycled polyethylene terephthalate (R-PET)

• Introduction
• Results and Discussion
• Mechanical Properties
• Electrical Properties
• Optical Properties
• Physical Properties
• Thermal Properties
• Effect of Process Variable - Injection pressure
• Cost Reduction and Applications

PET Recycling

• The process
• Virgin vs used PET
• Use for reclaimed PET
• Challenges involved
• Expanding scope
• Developing Indian market

PET Plastic Reclamation Processes

• Sorting and Granulation
• Cleaning
• Material Separation
• Drying and Filtering

Developing new Opportunities

• The shape of things to come PET
• Barrier solutions
• Beer best before
• Glass Ceiling
• Increased PET production
• Future factors
• Emergence of PET Beer
• Bottles
• Improving Barrier Properties and Shelf Life
• Recent Developments in PET
• Has Customer Perception Changed?
• Future of PET Beer Bottles

Coding Solutions for PET Blow Molders

• Commercial Director
• Domino Laser, Inc.
• PET Manufacturing Process
• Product Types
• Key Drivers
• Coding Need Summary
• PET Marking Solution
• PET Solution - Blue Laser
• Tubes
• PET Solution - Through-beam photocell
• PET Solution - Motion sensor
• PET Installations Motion sensor
• PET Installations Adjustable laser head stand
• PET Solution - Anti-static device
• PET Solution - Fume
• Extraction system
• PET Marking Solution
• PET Solution - The Domino
• Difference

PET Barrier
Capabilities &
Design Flexibilities

• Design flexibility

Auxiliary Equipments
in PET Processing

• Drying-Chilling-Air Conditioning
• Don’t Try Without Dry
• Drying Systems
• Why to Dry PET Before
• Processing ?
• (A) Oven Drying
• (B) Hopper Dryer
• Container - Reverse
• Conical Flow
• Dehumidified Air Dryer
• Dehumidified Air Dryerworks
• on dew-point principle
• Key Components
• Drying Agent
• Heater
• Air Shut-Off Valve
• Switching Valve
• Suction Container
• [Exhaust Valve]
• Return Line Air Cooler
• Selection of Dryer /
• Dehumidified Air
• Dryer (DAD) and
• Drying Bins
• (A) Dryer / DAD
• (B) Drying Container
• Important Parameters to
• achieve efficient drying.
• Air Temperature
• Air dew point
• Air Flow
• Chilling Plant / Mould Dehumidifier Cooling and Heating
• Plays Important Role in
• Plastics Processing Air
• Cooled Chiller
• Advantages
• Disadvantages
• Water Cooled Chiller
• Advantages
• Disadvantages
• Precaution Requeued for
• Air Cooled Unit
• Application of Chiller in Injection Moulding Machines
• Machine Cooling
• Selection Criteria
• Working Principle
• Key Components
• Compressor
• Condenser
• Water Pump
• Water Tank
• Microprocessor Based Control
• Purpose
• Requirement of Process

Masterbatches

• Inorganic Pigments
• Organic Pigments
• Dyestuffs
• The additives
• Performance Additives
• Processing Additives

PET Bottle
Manufacturing

• Pellets
• Preforms
• Bottles
• Caps