



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



The Complete Technology Book on Plastic Films, HDPE and Thermoset Plastics

Code	NI182
Format	paperback
Indian Price	₹1175
US Price	\$125
Pages	608
ISBN	8178330113
Publisher	Asia Pacific Business Press Inc.

Description

Plastic Films, HDPE and Thermoset Plastics are now an accepted part of the industrial and domestic scenes but this growth has been comparatively recent. Plastic films are typically used for sealing food items in containers to keep them fresh over a longer period of time. Plastic wrap, typically sold on rolls in boxes with a cutting edge, clings to many smooth surfaces and can thus remain tight over the opening of a container without adhesive or other devices. The past several years have seen numerous plastic films developed for the packaging industry, the most used today being polyethylene. Cast polypropylene film, like polyethylene film is unoriented (not stretched), but it was found that an improved film could be obtained by orientation (stretching the cast in one or more directions). Biaxial orientation is the process whereby the continuous cast film or sheet of plastic is heated up to bring it to a temperature that makes it stretchable. BOPP film possesses superior tensile strength, flexibility, toughness, shrink ability, good barrier and optical characteristics. The use of polyethylene terephthalate film is increasing considerably in recent years in video audio magnetic tapes, computer tapes, photo and X ray films, power capacitors, insulation tapes and metallizing for artificial zari. High density polyethylene (HDPE) or polyethylene high density (PEHD) is a polyethylene thermoplastic made from petroleum. The major applications of HDPE are in the manufacturing of containers, pipes, house wares, toys, filament, woven sacks, film, wire and cable insulation. HDPE is lighter than water, and can be moulded, machined, and joined together using welding (difficult to glue). Thermoset, or thermosetting plastics are synthetic materials that strengthen during being heated, but cannot be successfully remolded or reheated after their initial heat forming. This is in contrast to thermoplastics, which soften when heated and harden and strengthen after cooling. Thermoplastics can be heated, shaped and cooled as often as necessary without causing a chemical change, while thermosetting plastics will burn when heated after the initial molding. Additionally, thermoplastics tend to be easier to mold than thermosetting plastics, which also take a longer time to produce (due to the time it takes to cure the heated material).

Some of the astonishing fundamentals of the book are salient features of contemporary, technology and current research, three basic processes: advances, modern polyethylene, processes using high yield catalysts, solution polymerization processes, polyolefins, low density polyethylene, polyvinylidene chloride (PVDC), vinyl chloride/vinyl acetate copolymers, polyvinyl acetate, polyvinyl alcohol, physical and chemical properties, manufacturing methods, extrusion of film, slit die extrusion (flat film extrusion), comparison of blow and cast film processes, water cooled polypropylene film, calendaring, solvent, casting, casting of regenerated cellulose film, orientation of film, expanded films, plastics net from film, unsaturated polyester and vinyl ester resins, thermoset polyurethanes, guidelines and theories in compounding polyurethane elastomers, compounding for thermoset polyurethane elastomers, cellulose and cellulose derivatives, thermoplastic polymers etc.

The present books offer an up to date overview of the processing of plastic films, HDPE

and thermoset plastics. This book is suitable for entrepreneurs, researchers, professionals, technical institutions etc.

Content

CHAPTER 1 BOPP FILMS

Background

Structural Development of Plastics in India

History of films

Film Properties

Applications of Films

Process of Manufacture

Tenter Process

Comparison of the processes

Polyester Films

Raw materials

Capital equipment

General

CHAPTER 2 SALIENT FEATURES OF CONTEMPORARY TECHNOLOGY AND CURRENT RESEARCH

Introduction

Three basic processes: Advances

Modern polyethylene processes using high yield catalysts

Solution polymerization processes

Slurry processes

Gas phase processes

Processing

Comparative evaluation of contemporary technologies

Process selection based on capability

Latest development

CHAPTER 3 POLYOLEFINS

Low density polyethylene

Properties

Uses 120

Irradiated Polyethylene

High density polyethylene

Properties

Uses 123

Polypropylene

Properties

Poly (Methyl pentene) (TPX)

Ethylene/vinyl acetate copolymers (EVA)

Properties

Poly (BUTENE-1)

Properties

Uses 129

Melt flow index (MFI)

CHAPTER 4 VINYL

Polyvinyl Chloride (PVC)

Properties

Polyvinylidene chloride (PVDC)

Vinyl chloride/Vinyl acetate copolymers

Polyvinyl acetate

Polyvinyl alcohol

CHAPTER 5 MECHANICAL PROPERTIES

Tensile and yield strength elongation and young's modulus

Test Methods

Burst strength

Impact strength

Impact Fatigue

Tear strength

Puncture penetration test

Stiffness

Flex resistance

Coefficient of friction

Blocking

CHAPTER 6 PHYSICAL AND CHEMICAL PROPERTIES

Optical properties

Light transmission

'See-Through' Clarity

Haze

Gloss

Permeability

Water vapour permeability

Gas Permeability

Odour Permeability

Density

- Heat sealability
- Dimensional stability
- Water absorption
- Effect of chemicals
- Effect of Light
- Effect of Temperature
- High Temperature
- Low Temperature
- Flammability

CHAPTER 7 MANUFACTURING METHODS

- Extrusion of Film
 - Slit Die Extrusion (Flat Film Extrusion)
- Comparison of Blow and Cast Film Processes
- Water Cooled Polypropylene Film
- Calendering
- Solvent Casting
- Casting of regenerated cellulose film
- Orientation of film
- Expanded films
- Plastics Net From Film

CHAPTER 8 HEALTH SAFETY OF PLASTICS FILMS

- Overall system
- Base Lines for Evaluation
- Food Spoilage
- Toxicity and Adulteration
- Interactions
- Safety evaluation Mass transfer
- Law
- Licensing Type Systems
- International trade
- Individual countries
 - United Kingdom
 - USA

CHAPTER 9 ODOUR AND TAIN IN PLASTICS FILMS

- Introduction to organolepsis and tainting
- Causes of tainting
- Loss of Volatile Material From Food to Environment
- Diffusion of Volatiles, additives, and Volatile Residual Reactants

from Plastics to Food
Vapour From Environment t to Food
Micro-organisms to Food
Marco-Organisms to Food
Radiation from Environment to Food Stuff
Assessment
Samples
Food
Tests Methodology
Remedies
Masking and Counteraction
Conclusions

CHAPTER 10 SEALING OF FILMS

Mechanical methods
Heat sealing
Sealing of oriented film
High frequency heating
Ultrasonic sealing
Adhesives
Choice of method

CHAPTER 11 PRINTING ON PASTICS FILMS

Pre treatment
Solvent treatment
Chemical treatments
Flame treatment
Electrical treatment
Tests for efficiency of pre- treatment
Method of Printing
Screen printing
Letterpress
Flexographic printing
Photogravure printing
Hot stamping
Electrostatic printing
Printing inks
Vaccum metallisation

CHAPTER 12 WRAPPING EQUIPMENT

Wrapping with thermoplastics films
Feeding the Wrapping Material

Forming the pack
Closing the pack
Continuous wrapping machines
Pouch making equipment
Sachet making machines
Vaccum and gas packaging
Shrink wrapping
Scope of Process
Types of Shrink Wrap
Shrink wrapping equipment
Tray Erection
Film Wrapping and Sealing
Shrink Tunnels
Properties of heat shrinkable films
Shrink Temperature
Degree of Shrinkage
Shrink Tension
Pallet overwrapping
General advantages and problems

CHAPTER 13 UNSATURATED POLYESTER AND VINYL ESTER RESINS

Unsaturated polyesters
Vinyl ester resins
Compounding of unsaturated polyester and vinyl ester resins
Applicable manufacturing processes
Recent Developments

CHAPTER 14 THERMOSET POLYURETHANES

Introduction
Polyurethane Chemistry
What are Polyurethanes ?
Polyurethane raw materials and moisture
Handling of polyurethane components
Types of polyurethane systems
Advantages of adduction
Range and types of polyurethane products
Polyurethane uses
Neoprene Lubricant Adhesive #106
Polyurethane Coatings
Components for Polyurethanes
Industrial Mathematics for Polyurethanes

Terminology

Guidelines and Theories in Compounding Polyurethane Elastomers

Compounding for Thermoset Polyurethane Elastomers

General consideration

Appendix

Method for Preparation of MDI Prepolymers

CHAPTER 15 CROSSLINKED THERMOPLASTICS

Crosslinking of thermoplastics

Effects of Crosslinking on Polymer

Chemical Crosslinking

Rotational molding

Post irradiation effects

Acrylates

CHAPTER 16 MISCELLANEOUS

Nylons (Polyamides)

Polycarbonate

Polyethylene terephthalate (Polyester)

Acrylic multipolymer

Propylene/vinyl chloride copolymer

Rubber hydrochloride

Fluoropolymers

Polyvinyl Fluoride

Polyurethane

Polyimides

CHAPTER 17 IONOMERS

Properties

CHAPTER 18 STYRENE POLYMERS AND COPOLYMERS

Polystyrene

High impact polystyrene

Expanded polystyrene

Styrene/acrylonitrile copolymer (SAN)

Acrylonitrile/Butadiene/Styrene (ABS)

CHAPTER 19 CELLULOSE AND CELLULOSE DERIVATIVES

Regenerated cellulose

Substituted Celluloses

Cellulose nitrate (Celluloid)

Cellulose acetate

Cellulose Triacetate
Cellulose acetate/butyrate (CAB)

CHAPTER 20 THERMOPLASTIC POLYMERS

Polymerization Concepts
Polymerization Mechanisms
Methods of Polymerization

CHAPTER 21 THERMOSET POLYMERS

Crosslinked Polymers
Thermoset Polyester
Polyurethane Elastomers
Polyimides
Ladder polymers

CHAPTER 22 PROCESSING AND FABRICATION

Orientation of molecules and fibers
Reinforced thermoset processing
Thermoplastic processing
Molds
Mixing equipment
Adhesive Application

CHAPTER 23 BAG AND SACK MANUFACTURE

Nature of the film
Bags made from tubular film
Bags made from Flat Film
Heavy duty sack manufacture

CHAPTER 24 THERMOFORMING

Methods of thermoforming
Vaccum forming
Skin pachaging
Pressure forming
Matched mould forming
Machine variables
Heating
Cooling
Moulds
Trimming
Printing

Materials and applications
PVC
Toughened polystyrene
Biaxially oriented polystyrene
ABS
Low density polyethylene
High density Polyethylene
Polypropylene
Cellulose acetate
Cellulose acetate/butyrate
Polycarbonate
Cold forming

CHAPTER 25 LAMINATION

Coating
Predetermined systems
Reverse roll coaters
NIP roll coaters
Gravure coaters
Calender coating
Curtain coating
Extrusion coating
Adhesive lamination
Wet bonding
Dry bonding
Coextrusion
Cross laminated film

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.