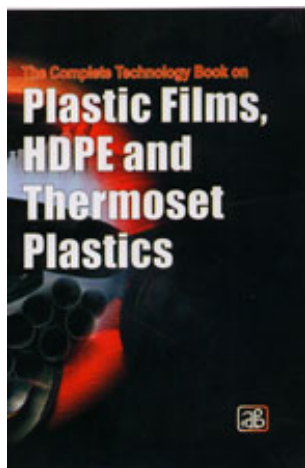


The Complete Technology Book on Plastic Films, HDPE and Thermoset Plastics



Author: NIIR Board of Consultants & Engineers

Format: Paperback

ISBN: 8178330113

Code: NI182

Pages: 608

Price: Rs. 1,175.00 **US\$** 125.00

Publisher: Asia Pacific Business Press Inc.

Usually ships within **5** days

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 brings 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 videos audio magnetic tapes, computer tapes, photo and X ray films, power capacitors, insulation tapes and metalling 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.

Contents

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 TAINT 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

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.

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

Sat, 18 Nov 2017 01:20:25 +0530