



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 Industrial Polymers, Additives, Colourants and Fillers

Code	NI180
Format	paperback
Indian Price	₹1100
US Price	\$125
Pages	512
ISBN	8178330091
Publisher	Asia Pacific Business Press Inc.

Description

The Indian plastic and polymer industry has taken great strides. In the last few decades, the industry has grown to the status of a leading sector in the country with a sizable base. The material is gaining notable importance in different spheres of activity and the per capita consumption is increasing at a fast pace. Numerous plastics and fibers are produced from synthetic polymers; containers from propylene, coating materials from PVC, packaging film from polyethylene, experimental apparatus from Teflon, stockings from nylon fiber, there are too many to mention them all. The reason why plastics are popular is that they may offer such advantages as transparency, self lubrication, light weight, flexibility, economy in fabricating and decorating. Properties of plastics can be modified through the use of fillers, reinforcing agents and chemical additives. Silicones are by far the most important industrial polymers and are based on silicon, an element abundantly available on our planet. Polymers are classified in three broad groups; addition polymers, condensation polymers and special polymers. It is well known that the major consumption of additives is in PVC compounds.

Approximately 80% of additives are being used in PVC; however the left over 20% is consumed in compounding of other thermoplastics. Plastic master batches and fillers have their own importance in plastic processing industries. Colorants are the materials that give colour and opacity to plastics are chemically characterized as either pigments or dyes. Pigments are finely pulverized natural or synthetic particles which may be of inorganic or organic origin and insoluble in the matrix in which they are dispersed. Permanent red 2B is a mono azo pigment that is widely used in thermoplastics because it is inexpensive and has high tinting strength and good bleed resistance. Fillers are commonly employed in opaque PVC compounds to reduce cost and to improve electrical insulation properties, to improve deformation resistance of cables, to increase the hardness of a flooring compound and to reduce tackiness of highly plasticized compounds. Various calcium carbonate are used for general purpose work, china clay is commonly employed for electrical insulation, and asbestos for flooring applications. Also employed occasionally are the silicas and silicates, talc, light magnesium carbonate and barites (barium sulfate). Polymer Energy system is an award winning, innovative, proprietary process to convert waste plastics into renewable energy. Polymers are the most rapidly growing sector of the materials industry. No wonder polymers are found in everything from compact discs to high tech aerospace applications. On the basis of value added, Indian share of plastic products industry is about 0.5% of national GDP.

Some of the astonishing fundamentals of the book are industrial polymers, addition polymers

polyolefins, polyethylene, chlorinated polyethylene, cross linked polyethylene, linear low density polyethylene (LLDPE), high molecular weight polyethylene, high density polyethylene, ultrahigh molecular weight polyethylene, polypropylene, poly(vinyl chloride), stabilizers, plasticizers, extenders, mineral filled or glass bead/milled glass grades, antistatic/electro conductive grades, electroplatable grades, etc.

The present book enlightens the processing of industrial polymers, additives, colourant and fillers. This book is an invaluable resource to new entrepreneurs, technocrats, researchers, professionals etc.

Content

1. INDUSTRIAL POLYMERS

INTRODUCTION

PART I: ADDITION POLYMERS

POLYOLEFINS

Polyethylene

Chlorinated Polyethylene

Cross-Linked Polyethylene

Linear Low-Density Polyethylene (LLDPE)

High-Molecular-Weight High-Density Polyethylene

Ultrahigh-Molecular-Weight Polyethylene

Polypropylene

Poly(Vinyl Chloride)

Stabilizers

Plasticizers

Extenders

Lubricants

Fillers

Pigments

Impact Modifiers and Processing Aids

Properties and Applications

Pastes

Poly(Vinylidene Chloride)

Polytetrafluoroethylene

Processing

Applications

Polyisobutylene

Polystyrene

Polybutadiene (Butadiene Rubber)

Polyisoprene

Polychloroprene

OLEFIN COPOLYMERS

Styrene-Butadiene Rubber

Nitrile Rubber

Ethylene-Propylene Elastomer

Butyl Rubber
Thermoplastic Elastomers
Styrene-Diene-Styrene Triblock Elastomers
Thermoplastic Polyester Elastomers
Thermoplastic Polyurethane Elastomers
Thermoplastic Polyolefin Elastomers
Ionic Elastomers
Fluoroelastomers
Styrene-Acrylonitrile Copolymer
Acrylonitrile-Butadiene-Styrene Terpolymer
Ethylene-Methacrylic Acid Copolymers (Ionomers)
Ionomers
ACRYLICS
Polyacrylonitrile
Polyacrylates
Polymethacrylates
Polyacrylamide
Poly(acrylic acid) and Poly(methacrylic acid)
Acrylic Adhesives
VINYL POLYMERS
Poly (Vinyl Acetate)
Poly(Vinyl Alcohol)
Poly(Vinyl Acetals)
Poly(Vinyl Cinnamate)
Poly(Vinyl Ethers)
Poly(Vinyl Pyrrolidone)
Poly(Vinyl Carbazole)
PART II: CONDENSATION POLYMERS
POLYESTERS
Poly(Ethylene Terephthalate)
Poly(Butylene Terephthalate)
Poly(Dihydroxymethylcyclohexyl Terephthalate)
Unsaturated Polyesters
Polyester-Glass-Fiber Laminates (GRP, FRP)
Polyester Molding Compositions
Aromatic Polyesters
Wholly Aromatic Copolyester
Polycarbonates
POLYAMIDES
Aliphatic Polyamides
Properties

Applications
Aromatic Polyamides
Polyimides
Modified Polyimides
FORMALDEHYDE RESINS
Phenol-Formaldehyde Resins
Resols
Novolac
Urea-Formaldehyde Resins
Molding Powder
Processing
Properties and Applications
Melamine-Formaldehyde Resins
POLYURETHANES
Polyesters
Polyethers
Polycaprolactone
Polyurethane Rubbers and Spandex Fibers
Cross-Linked Polyurethane Rubbers
(a) Prepolymer formation
(b) Chain extension of prepolymer
(c) Cross linking of chain-extended polyurethane
Thermoplastic Polyurethane Rubbers
Spandex Fibers
Flexible Polyurethane Foam
Applications
Rigid and Semirigid Polyurethane Foams
Polyisocyanurates
Polyurethane Coatings
ETHER POLYMERS
Polyacetal
Poly(Ethylene Oxide)
Applications
Polyethylene Glycol
Poly(ethylene Oxide)
Poly [Propylene Oxide]
Epoxy Resins
Resin Preparation
Curing
Other Epoxies
Applications

POLY(PHENYLENE OXIDE)

CELLULOSIC POLYMERS

REGENERATED CELLULOSE

Cellulose Nitrate

Cellulose Acetate

Other Cellulose Esters

Cellulose Ethers

PART III: SPECIAL POLYMERS

Heat-Resistant Polymers

POLY(PHENYLENE SULFIDE)

POLYSULFONE

Properties

Polyether Ether Ketone

Polybenzimidazole

SILICONES AND OTHER INORGANIC POLYMERS

Silicones

Silicone Fluids

Silicone Resins

Silicone Rubbers

Polyphosphazenes

Polythiazyl

FUNCTIONAL POLYMERS

Ion-Exchange Resins

Applications

Polymeric Reagents

Photoconductive Polymers

Electroconductive Polymers

Light-Sensitive Polymers

Piezoelectric Polymers

2. POLYETHYLENE, HIGH DENSITY (HDPE)

INTRODUCTION

CATEGORY

HISTORY

POLYMERIZATION

DESCRIPTION OF PROPERTIES

APPLICATIONS

ADVANTAGES/DISADVANTAGES

Advantages

Disadvantages

PROCESSING TECHNIQUES

Processability of HDPE

RESIN FORMS

SPECIFICATION OF PROPERTIES

Master Outline of Materials Properties

PROCESSING REQUIREMENTS

PROCESSING-SENSITIVE END PROPERTIES

SHRINKAGE

Mold Shrinkage Characteristics

3. ACETALS

ACETAL

CATEGORY

HISTORY

POLYMERIZATION

DESCRIPTION OF PROPERTIES

Specialty Grades

Reinforced Grades

Mineral-filled or Glass Bead/Milled Glass Grades

Antistatic/Electroconductive Grades

Electroplatable Grades

APPLICATIONS

ADVANTAGES/DISADVANTAGES

PROCESSING TECHNIQUES

Standard design chart for Acetal

Master Material Outline

RESIN FORMS

SPECIFICATION OF PROPERTIES

Master Outline of Materials Properties

PROCESSING REQUIREMENTS

PROCESSING-SENSITIVE END PROPERTIES

SHRINKAGE

Standard Tolerance Chart

4. ALLYL RESINS (DAP/DAIP)

INTRODUCTION

CATEGORY

HISTORY

POLYMERIZATION

DESCRIPTION OF PROPERTIES

Mechanical Properties

Thermal Properties

Reinforcements

APPLICATIONS

Reinforced Laminates

Decorative Laminates
ADVANTAGES/DISADVANTAGES
PROCESSING TECHNIQUES
RESIN FORMS
SPECIFICATION OF PROPERTIES
PROCESSING REQUIREMENTS
PROCESSING-SENSITIVE END PROPERTIES
SHRINKAGE

5. FLUOROPOLYMERS, POLY(VINYLDENE FLUORIDE) (PVDF)

POLY(VINYLDENE FLUORIDE)

CATEGORY

HISTORY

POLYMERIZATION

DESCRIPTION OF PROPERTIES

Thermal Properties

Mechanical Properties

Optical Properties

Environmental Properties

APPLICATIONS

ADVANTAGES/DISADVANTAGES

PROCESSING TECHNIQUES

RESIN FORMS

SPECIFICATION OF PROPERTIES

PROCESSING REQUIREMENTS

PROCESSING-SENSITIVE END PROPERTIES

SHRINKAGE

6. IONOMERS

IONOMER

CATEGORY

HISTORY

POLYMERIZATION

DESCRIPTION OF PROPERTIES

APPLICATIONS

ADVANTAGES/DISADVANTAGES

PROCESSING TECHNIQUES

RESIN FORMS

SPECIFICATION OF PROPERTIES

PROCESSING REQUIREMENTS

Film Extrusion

Injection Molding

PROCESSING-SENSITIVE END PROPERTIES

Moisture Absorption

Effect of Temperature on the Melt Flow

SHRINKAGE

7. POLYAMIDE-IMIDE (PAI)

STRUCTURE

CATEGORY

HISTORY

POLYMERIZATION

DESCRIPTION OF PROPERTIES

APPLICATIONS

ADVANTAGES/DISADVANTAGES

PROCESSING TECHNIQUES

RESIN FORMS

SPECIFICATION OF PROPERTIES

PROCESSING REQUIREMENTS

PROCESSING-SENSITIVE END PROPERTIES

SHRINKAGE

8. POLYBUTYLENE (PB)

STRUCTURE

CATEGORY

HISTORY

POLYMERIZATION

PROPERTIES

APPLICATIONS

ADVANTAGES AND DISADVANTAGES

PROCESSING TECHNIQUES

RESIN FORMS

SPECIFICATION OF PROPERTIES

PROCESSING REQUIREMENTS

PROCESSING-SENSITIVE END PROPERTIES

SHRINKAGE

9. POLYCARBONATE (PC)

POLYCARONATE

CATEGORY

HISTORY

POLYMERIZATION

DESCRIPTION OF PROPERTIES

APPLICATIONS

ADVANTAGES/DISADVANTAGES

PROCESSING TECHNIQUES

RESIN FORMS
SPECIFICATION OF PROPERTIES
PROCESSING REQUIREMENTS
PROCESSING-SENSITIVE END PROPERTIES
SHRINKAGE
10. POLYETHYLENE LINEAR LOW
DENSITY (LLDPE)
INTRODUCTION LLDP
CATEGORY
HISTORY
POLYMERIZATION
DESCRIPTION OF PROPERTIES
APPLICATIONS
ADVANTAGES/DISADVANTAGES
PROCESSING TECHNIQUES
RESIN FORMS
SPECIFICATION OF PROPERTIES
PROCESSING REQUIREMENTS
PROCESSING-SENSITIVE END PROPERTIES
11. FLEXIBLE POLY (VINYL CHLORIDE) (FPVC)
INTRODUCTION
CATEGORY
Vinyl Additives
HISTORY
POLYMERIZATION
DESCRIPTION OF PROPERTIES
Physical Properties
Thermal Properties
Mechanical Properties
Optical Properties
Environmental Properties
APPLICATIONS
ADVANTAGES/DISADVANTAGES
PROCESSING TECHNIQUES
RESIN FORMS
Additives
Polyblends
SPECIFICATION OF PROPERTIES
PROCESSING REQUIREMENTS
PROCESSING-SENSITIVE END PROPERTIES
SHRINKAGE

12. FILLERS, CALCIUM CARBONATE

CATEGORY

SOURCE

KEY PROPERTIES

PROCESSING CHARACTERISTICS

APPLICATIONS

COMMERCIAL GRADES

COMPOSITES CHARACTERISTICS

13. FILLERS, KAOLIN

AIR-FLOATED KAOLIN

WATER-WASHED KAOLIN

CALCINED KAOLIN

SURFACE-MODIFIED KAOLINS

14. FILLERS, MICA

CATEGORY

SOURCE

KEY PROPERTIES

PROCESSING CHARACTERISTICS

APPLICATIONS

COMMERCIAL GRADES

COMPOSITE CHARACTERISTICS

15. COLORANTS

INTRODUCTION

Color and its Measurements

Light

Colorants

PIGMENTS AND DYES

Major Organic Pigments

Inorganic Pigments

Characteristics of Dyes

Colorant Forms and Functions

The Importance of Dispersion

Coloring Do's and Don'ts

Color Measurement and Matching

16. FILLERS, ALUMINA TRIHYDRATE (ATH)

CATEGORY

SOURCE

KEY PROPERTIES

PROCESSING CHARACTERISTICS

APPLICATIONS

POLYMERS FILLED

Unsuaturated polyester
Epoxy
Cross-Linked Ethylene-Vinyl Acetate
Urethane
EPDM
PVC
Polyethylene
COMMERCIAL GRADES
COMPOSITE CHARACTERISTICS
17. ACRYLONITRILE-BUTADIENE-
STYRENE (ABS)
INTRODUCTION
CATEGORY
POLYMERIZATION
Chemistry
Other Monomers
Compounding
Pricing
PROPERTIES
Impact Resistance
Strength
Creep and Stress Relaxation
Fatigue
Heat Deflection
Flammability
Optical Properties
Ultraviolet Resistance
Chemical Resistance
Reinforcement
APPLICATIONS
Appliances
Automotive
Building and Construction
Business Machines/Consumer Electronics
Other Applications
ADVANTAGES/DISADVANTAGES
PROCESSING TECHNIQUES
Injection Molding
Extrusion
Thermoforming
Cold Forming

RESIN FORMS

MATERIAL PROPERTIES

PROCESSING REQUIREMENTS

Drying

Degradation

Regrind

PROCESSING-SENSITIVE END PROPERTIES

Molding Conditions to Maximize Specific Properties

Thermoforming

SHRINKAGE

18. FILLERS, FIBER GLASS

CATEGORY

SOURCE

KEY PROPERTIES

PROCESSING CHARACTERISTICS

APPLICATIONS

POLYMERS FILLED

COMMERCIAL GRADES

COMPOSITE CHARACTERISTICS

19. POLYETHYLENE, LOW DENSITY (LDPE)

INTRODUCTION

CATEGORY

POLYMERIZATION

DESCRIPTION OF PROPERTIES

APPLICATIONS

ADVANTAGES/DISADVANTAGES

RESIN FORMS

SPECIFICATION OF PROPERTIES

PROCESSING REQUIREMENTS

PROCESSING-SENSITIVE END PROPERTIES

SHRINKAGE

20. FILLERS, CALCIUM SULFATE

CATEGORY

Source

KEY PROPERTIES

PROCESSING CHARACTERISTICS

APPLICATIONS

Polyester Resin Systems

Laminate Sheet

Bulk Molding Compound

PVC Molding Compounds

PVC Plastics
POLYMERS FILLED
Thermoplastics
Thermosets
COMMERCIAL GRADES
COMPOSITE CHARACTERISTICS

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.