

The Complete Book on Resins (Alkyd, Amino, Phenolic, Polyurethane, Epoxy, Silicone, Acrylic) Paints, Varnishes, Pigments & Additives (Surface Coating Products with Formulae)

Author:- Dr. Himadri Panda

Format: paperback

Code: NI343

Pages: 632

Price: Rs.2275US\$ 200

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Usually ships within **5** days

Resins are synthetic or natural substances that act as binders in paints and varnishes. They provide adhesion, durability, and flexibility to the finish. Common types of resins Alkyd, Amino, Phenolic, Polyurethane, Epoxy, Silicone and Acrylic. Each resin has its unique characteristics, such as fast drying time, high gloss, or resistance to chemicals.

Paints consist of pigments suspended in a binder, which can be a resin or oil. Pigments are finely ground particles that give paint its color. They can be organic or inorganic and come in a vast array of shades. The type and quality of pigments used can greatly affect the appearance and longevity of the finish. Different types of paints include acrylic, oil-based, water-based, and specialty paints like metallic or chalk paint.

Varnishes are transparent or translucent finishes applied over painted surfaces to protect and enhance the underlying colors. They provide a glossy, satin, or matte sheen and offer protection against UV rays, moisture, and abrasion. Varnishes can be solvent-based or water-based and are available in various formulations for different purposes.

Additives are substances added to paints, varnishes, or pigments to alter their properties. They can improve flow and leveling, prevent sagging or foaming, or enhance drying time and durability. Additives are often used in specific applications such as automotive coatings, industrial finishes, or decorative paints.

Surface coating products encompass a wide range of materials that are used to protect and enhance surfaces. These products go beyond just paints and varnishes and include coatings specifically designed for different applications and industries.

The global resin market is expected to grow at a CAGR of 6.4%. The growing demand for epoxy resin in the paints and coatings industry is driving the market. In addition, demand is likely to be driven by the growing use of epoxy in the electronics and electrical industries as an insulator and to protect components from dust, short-circuiting, and moisture. Resins offer excellent adhesion, durability, and flexibility, making them an essential component in creating beautiful and long-lasting finishes for a wide range of surfaces. The market for resins is driven by various factors, including the growing construction industry, the increasing use of coatings in automotive and aerospace sectors, and the rising demand for eco-friendly and sustainable products. Manufacturers are constantly developing new resin formulations to meet these evolving needs and regulations. In addition to traditional applications, such as architectural coatings and industrial finishes, resins are finding new markets in the growing sectors of 3D printing and advanced materials. These emerging applications present exciting opportunities for resin

manufacturers to expand their product offerings and cater to evolving customer needs. The book covers a variety of topics related to Oleoresinous Media, Varnishes, Alkyd Resin, Polyesters, Amino Resins, Phenolic Resins, Polyurethane Resins, Epoxy Resins, Water Dispersible Epoxy Coatings, Silicone Resins, Acrylic Solution Resins, Emulsion Polymerization, Emulsion Polymers, Water-Reducible Resins, Water-Soluble Polymers, Solvents, Inorganic Pigments, Titanium Dioxide Pigments, Organic Pigments, Extender Pigments, Paint Driers, Paint Additives, Architectural Paints.

This book is primarily intended for entrepreneurs and startups, but it is also a priceless tool for academics, consultants, financiers, and the Resins industry. Because of its all-encompassing perspective, it may serve a wide range of readers, all of whom have an interest in the Resin industry's continued success.

Contents

1. THE PAST, PRESENT AND FUTURE OF THE SURFACE COATINGS INDUSTRY

2. OLEORESINOUS MEDIA

Industry Terminology

Raw Materials Used in Oleoresinous Production

Finished Products Based on Oleoresinous Media

Manufacturing Equipment

Process Control Testing

3. VARNISHES: COMPOSITION, MANUFACTURE AND USE

Composition

Oils Used in varnishes

Gasproofing

Water and Alkali Resistance

Manufacture of Oleoresinous Varnishes

Varnishes Vs. Alkyds

4. ALKYD RESIN TECHNOLOGY

Raw Materials

Formulation of Alkyd Resins

Calculation of Alkyd Formulations

Calculation of Raw Materials for an Alkyd Prepared by the Monoglyceride Process

Typical Formulations (all quantities by mass)

5. MANUFACTURE OF ALKYD RESINS

Alcoholysis

Catalysts

Control of Alcoholysis

Fatty and Process

Comparison of Fusion and Azeotrope Processes

Raw Materials Handling

Alkyd Manufacturing Plant

6. POLYESTERS

Main Components of Unsaturated Polyesters

Functions of Initiators, Accelerators, Inhibitors

Effect of Structure on Properties of Cured Products

Polyester Coating Compositions

7. APPLICATIONS OF ALKYD RESINS

Very Long Oil Alkyds: 75 per cent and above

Long Oil Alkyds: 60 to 75 per cent

8 AMINO RESINS

Formation of Amino Resins

Urea Formaldehyde Resins

Melamine Formaldehyde Resins

Uses of Amino Resins

Water Based Coatings

9. PHENOLIC RESINS

Phenol-Formaldehyde Reactions

Oil Soluble 100 per cent Phenolic Resins

Baking Phenolics

10. POLYURETHANE RESINS

Tolylene Diisocyanate (TDI)

4, 4 Diphenylmethane Diisocyanate (MDI)

Other Diisocyanates Used in Coating Systems

Hydroxy Component

Hazards of Isocyanates

Classification of Polyurethanes

Moisture-cured Urethanes

Blocked Isocyanate Systems

Two-component Catalyst-cure Polyurethanes

11. EPOXY RESINS

Epoxide Group Content (ECG)

Curing Agents for Epoxy Resins

Principles in Formulating with Epoxy Resins

Solvent-based Coatings

Single-pack Thermoplastic Epoxy Systems

12. WATER DISPERSIBLE EPOXY COATINGS

Epoxy/Polyamide Emulsions

Water-dispersible Epoxy Resin Coatings for Electrodeposition

13. SILICONE RESINS

Preparation of Silicones

Polymerization

Methyl-and Phenyl-content

Blending Resins¹⁷⁸

Preparation and Formulation of Silicone-Resin based Coatings

Application Guides

Applying the Coating

14. ACRYLIC SOLUTION RESINS

Backbone Monomers

Addition Polymerization

Copolymerization

Thermoplastic Acrylics

Thermosetting Acrylics

Acid Copolymers

15. EMULSION POLYMERIZATION THEORY

Polymerization in Emulsion Systems

16. EMULSION POLYMERS: MANUFACTURE AND TESTING

Process Variables

Delayed Addition Process

Alternative Processes

Surfactant Addition Techniques

Agitation

Surfactant Addition Techniques

Emulsion Testing

Ultracentrifugation

17. APPLICATIONS OF EMULSION POLYMERS

Architectural Applications

Examples of Decorative Paints

Industrial Applications

Adhesives Industry

Pressure Sensitive Uses

18. WATER-REDUCIBLE RESINS

Water-soluble Polymers

Acrylic-modified Water-soluble Alkyds

Silicone-modified Alkyds and Polyesters

Keeping the Epoxide Ring Available for Subsequent Cross-linking

Thermoplastic Polymers

Thermosetting Polymers

Melamine Formaldehydes

Other Water-soluble Polymers

Variation of Amine Levels

Drying Properties

Coupling Efficiency

Driers for Air Dry and Force Dry Systems

Cross-linking of Water-soluble Coatings

Trouble Shooting with Water-Soluble Polymers

19. WATER-SOLUBLE POLYMERS

Cellulose and its Derivatives

Flow Characteristics of Water Soluble Polymer Solutions

Thixotropy

Rheology

20. SOLVENTS

Evaporation Rate

Liquid/Liquid Boiling Equilibrium

Applications Technology

Evaporation from Polymer Film

Chemical Solvents

Nitrocellulose and Other Lacquers

Latex Paints

Solvent Control

Gas Chromatography

21. INORGANIC PIGMENTS

The Functions of a Pigment

Properties of Pigments

The Classification of Pigments

Properties of Inorganic Pigments

Lead Chromate

Chrome Oxide Pigments

Zinc Oxide

Zinc Sulfide Lithopone

Calcium Plumbate

Mixed Phase Pigments

22. TITANIUM DIOXIDE PIGMENTS

The Chloride Process

Applications of Titanium Pigments

Dispersion of Titanium Pigments

Gloss Development

23. ORGANIC PIGMENTS

Colour and Chemical Constitution

Azo-Condensation Pigments

Pigment Conditioning

Dyestuffs

Colour Index Classification

24. EXTENDER PIGMENTS

Particle Size and Shape

Particle Size Distribution

Types of Extender Pigment

China Clay (Kaolin)

25. PAINT DRIERS

Drier Recommendations

Stability of Drying Performance on Storage

Driers for Use in Water based Systems

26. PAINT ADDITIVES

Wetting and Dispersing Agents

Aluminium Soaps

Hydrogenated Castor Oil (Triglyceride of 12-hydroxy Stearic Acid)

Anti-skinning Agents

Anti-flood and Anti-float Additives

Recognizing Flooding and Floating

Identification of Mildew

Latex Paint Additives

Stabilizing Surfactants (Non-ionics)

Latex Thickening Agents

Coalescing Aids

27. MANUFACTURE OF PAINTS

28. ARCHITECTURAL PAINTS

Formulating Exterior Paints for Wood

Interior Paints for Plaster and Wallboard

Exterior Emulsion Paints for Masonry

Exterior Solution Type Paints for Masonry

Interior and Exterior Enamels

Enamels for Wood and Concrete Floors

29. INSIDE IMAGES OF A PAINT FACTORY

30. PHOTOGRAPHS OF PLANT & MACHINERY WITH SUPPLIER'S CONTACT DETAILS

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, 09 May 2025 11:06:23 +0000