

# Modern Technology of Surface Coating with Formulae & Their Applications



**Author:** NIIR Board  
**Format:** Paperback  
**ISBN:** 8178330628  
**Code:** NI64  
**Pages:** 756  
**Price:** Rs. 975.00 US\$ 100.00  
**Publisher:** Asia Pacific Business Press Inc.  
Usually ships within 3 days

The development of science and technology revolutionized the surface coating industry in the progressive countries of the world. There has been considerable impact in this field. We have completely replaced costly petroleum solvent with water. So we get cheaper finished products with no evaporation loss and tire hazard. So we can say surface coating industry is now eco-friendly. Finally this book will help old as well as new entrepreneurs and technocrats to achieve improved performance on various surface coating raw materials as well as finished products.

## 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

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 Resins

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  
Cacium 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. Industrial Finishes  
30. Corrossion-Resistant and Chemical-Resistant Paint Systems  
Corrosion Mechanism  
Control of Corrosion  
Vehicles for Corrosion-Inhibiting Primers  
Typical Formulas for Primers  
Defense in Depth Coatings  
Metal Conditioners.  
Metal Lead Primers  
Titanium Ester Coatings  
Blistering, Water Absortion and Permeability  
Coal Tar-Epoxy Resin Coatings  
Allylated Methylol Phenol Resins

## 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 varies technology books, directory, 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 bureau, consultants and consultancy firms as one of the input in their research.

---

**National Institute of Industrial Research** , 106-E, Kamla Nagar, New Delhi-110007, India. **Email:** [niir@vsnl.com](mailto:niir@vsnl.com) **Website:** [NIIR.org](http://NIIR.org)

Sat, 05 Jul 2008 14:28:58 -0400