## The Complete Book on Adhesives, Glues & Resins Technology (with Process & Formulations) 2nd Revised Edition

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An adhesive is a material used for holding two surfaces together. In the service condition that way adhesives can be called as "Social" as they unite individual parts creating a whole. A useful way to classify adhesives is by the way they react chemically after they have been applied to the surfaces to be joined. There is a huge range of adhesives, and one appropriate for the materials being joined must be chosen. Gums and resins are polymeric compounds and manufactured by synthetic routes. Gums and resins largely used in water or other solvent soluble form for providing special properties to some formulations. More than 95% of total adhesive used worldwide are based on synthetic resins. Gums and resins have wide industrial applications. They are used in manufacture of lacquers, printing inks, varnishes, paints, textiles, cosmetics, food and other industries.

Increase in disposable income levels, rising GDP and booming retail markets are propelling growth in packaging and flexible packaging industry. Growth of disposable products is expected to increase, which leads to increase in consumption of adhesives in packaging industry. The global value of adhesive resins market is estimated to be \$11,339.66 million and is projected to grow at a CAGR of about 4.88% in coming years. Rapid urbanization coupled with growing infrastructure and real estate construction projects is projected to further fuel demand for adhesives in India.

This handbook covers photographs of plant & machinery with supplier's contact details and manufacturing aspects of various adhesives, glues & resins. The major contents of the book are glues of animal origin, fish glues, animal glues, casein glues & adhesives, blood albumen glues, amino resin adhesives, cyanoacrylate adhesives, epoxy resin adhesives, phenolic resin adhesives, polychloroprene resin adhesives, polysulfide sealants & adhesives, resorcinolic adhesives, furan resin adhesives, lignin adhesives, polyamide adhesives, rosin adhesive, tannin adhesives, terpene based adhesives, starch adhesives, acrylic adhesives and sealants, pressure sensitive adhesives, hot melt adhesives, alkyd resins, acrylic modified alkyd resins, alkyd –amino combinations based on neem oil, amino resins, carbohydrate modified phenol-formaldehyde resins, epoxy resins etc.

It will be a standard reference book for professionals, entrepreneurs, those studying and researching in this important area and others interested in the field of adhesives, glues & resins

**ADHESIVES** 1. Glues of Animal Origin **Properties** Methods of Manufacture **Commercial Grades and Specifications** Methods of Analysis Sampling Procedure Identification **Physical Measurements Determination of Other Constituents** 2. Fish Glues Introduction Manufacturing Process **Properties Applications & Formulations** Rubber-to-Steel Strawboard-to-Steel Rubber-or Cork-to-Plywood Paper-to-Steel Straight Line Gluing 3. Animal Glues Introduction **Chemical Composition** Manufacture of Animal Glues **Properties** Liquid Animal Glues Formulation & Applications Methods of Application 4. Casein Glues and Adhesives Introduction Properties **Casein Blend Glues** Lime free Casein Adhesives Applications Casein Adhesives for Bonding Paper Casein Adhesive for Binding Dissimilar Materials 5. Blood Albumen Glues Introduction Solubility Categories Properties **Blood-Soybean Flour Combinations** Mold Resistance Application 6. Amino Resin Adhesives Introduction Manufacturing Technology Urea Adhesive for Plywood Urea Adhesive for Particle Board

Spray Dried Melamine-formaldehyde Resins Foundry Resin Aniline-Formaldehyde Resin Ø Represents benzene ring Sulfonamide-Formaldehyde Resins **Applications** Adhesives for Hardwood Plywood Sand Core Binder Water Proof Corrugated Board Compounding and Formulation 7. Cyanoacrylate Adhesives Introduction Bonding with Cyanoacrylates **Adhesive Properties** Applications 8. Epoxy Resin Adhesives Introduction Chemistry **Epoxy Novolac Resins** Flexible Epoxy Resins **Epoxidized Olefins** Speciality Epoxy Resins & Derivatives **Epoxy Esters of Rosin Epoxy Esters of Styrenated Rosin** Epoxy Esters of Disproportionated Rosin **Epoxy Novolac Esters** Epoxy Ester of Maleopimaric Acid Compounding **Curing Agents** Diluents **Modifiers** Flexibilizers Fillers Accelerators **Speciality Additives** Manufacture of Adhesives 9. Phenolic Resin Adhesives Introduction Resole resin **Novalac Resins** Manufacture **Applications and Formulations Contact Adhesives** Adhesive Compounding Nitrile/Phenolic Contact Adhesives Structural Adhesives Vinyl/Phenolic Epoxy/Phenolic Hot Melt Adhesives Hot Melt Vinyl Film to Wood Laminating Adhesives Pressure Sensitive Adhesives (PSA) 10. Polychloroprene Resin Adhesives Introduction

Types of Polychloroprene **Applications and Formulations** Applications 11. Polyester Resin Adhesives Introduction Linear Polycarbonates **Polymerized Oils** Alkyd Resins **Unsaturated Polyester Adhesives** Adhesives for Flexible Printed Circuit Allyl Ester Adhesives 12. Polyethyleneimine in Adhesives Introduction Applications **General Adhesives Tie Coat Adhesives** 13. Polysulfide Sealants and Adhesives Introduction **Polysulfide Sealants** Chemistry Compounding Curing Agent Retarder Reinforcement Adhesion Additives Primers Improved Heat Resistance Applications Adhesives from Polysulfide Liquid Polymer **Epoxy Resin Reactions** 14. Resorcinolic Adhesives Introduction **Resorcinol-Phenol Formaldehyde Resins Modified Resorcinol Resins** Aspects of Adhesion Mechanism Formulation of Glue Mixtures Laminating 15. Ethylene Copolymer Hot Melt Adhesives Introduction Crystallinity Compatibility Pressure Sensitive Tack Hot Melt Adhesive Formulating **Book Binding Adhesives** Carton and Case Sealing Adhesives Carpet Application Shoe Adhesives Pressure Sensitive Adhesives (PSA) **Furniture Adhesives** 16. Furan Resin Adhesives Introduction 17. Isocyanate Adhesives

Introduction Advantages of Isocyanate Adhesives **Disadvantages of Isocyanates** Applications Types and uses of Isocyanate based Adhesive System 18. Lignin Adhesives Introduction Formulations 19. Polyamide Adhesives Introduction Class I: Thermoset Adhesives Containing Liquid **Polyamide Curing Adhesives** Class II: Nylon-Epoxy Resins Class III: Thermoplastic Hot Melt Polyamide Adhesives **Class IV: Thermoplastic-Thermoset Adhesives** 20. Polyimide Adhesives Introduction Adhesive and Bonding Technology Foam System 21. Rosin Adhesives Introduction Applications Formulations Solvent Adhesives **Emulsion Adhesives** Hot Melt Adhesives Methods of manufacture 22. Silicone Adhesives and Sealants Introduction Chemistry Oxime silane Properties **Rheological Characteristics Thermal Stability** Weathering Characteristics **Adhesion Characteristics** Applications Industrial Construction 23. Tannin Adhesives Introduction Formulation 24. Terpene Based Adhesives Introduction Chemistry Beta-pinene resins **Dipentene resins** Alpha-pinene resins Physical characteristics of resins Pressure sensitive adhesives Hot melt adhesives Analytical methods Commercial resins and their uses

Commercial production Applications in pressure sensitive adhesives Applications in hot melt adhesives 25. Starch Adhesives Introduction **Unmodified Starches High Strength Adhesive Cheap Diluted Adhesive** Non-weather Proof Corrugated Board Adhesive Water Resistant Corrugated Paper Box Adhesive **Final Mixture** Acid Modified or Thin Boiling Starch Adhesive **Oxidised Starch Adhesives Dextrin Based Adhesives Properties** 26. Acrylic Adhesives and Sealants Polymerization Solution Polymerization Properties of the product **Emulsion polymerization** Properties of the dispersion **Properties** Formulations and Applications Adhesives to paper coated with PVDC Delayed tack adhesive Adhesives for Laminating Laminating Plasticized PVC film to textiles Laminating PVC film to particle board Laminating plasticized PVC film to split leather High temperature & pressure lamination **Flocking Adhesives Building Adhesives** Adhesives for plasticized PVC floor tiles Adhesives for ceramic tiles **Pressure-Sensitive Adhesives** Flame Resistant & Pressure Sensitive Adhesive **Acrylic Sealants Aqueous Acrylic Sealants** Solvent-Based Acrylic Sealants 27. Pressure Sensitive Adhesives Adhesive Strip for Antomotive Trim Eva-Trialkyl Cyanurate Copolymer Adhesive Carboxylate Polymer Based Adhesives Fumaric Diester Vinyl Acetate Polymer 28. Hot melt Adhesives Introduction **Advantages** Disadvantage **Formulations Ethylene-vinyl Acetate** Amorphous polypropylene and Petroleum Resin Isopropenyltoluene Copolymers as Tackifiers Chlorinated Polyphenyl, Chlorinated

Polyisoprene and Nitroso Compound **Carpet Backing Formulation** Other Polyolefin Compositions Amorphous Polyolefin and Styrene Butadiene **Block Copolymers** a-Methylstyrene Tert Butyl Styreneolefin terpolymers Alkoxystyrene-Acrylonitrile, Copolymers Boric Acid as Viscosity Stabiliser in Ethylene-**Propylene Adhesives** Thermoplastic Polymer and Chelate of Aminoacetic Acid Coal Tar Pitch and Ethylene-Acrylic-Acid Copolymer Water-Moistenable Vinyl Pyrrolidone-Vinylacetate Product RESINS 1. Alkyd Resins Introduction Classification **Synthesis** Etherification Addition reactions of unsaturated monobasic fatty acids Addition reactions with other unsaturated alkyd inaredients Reactions during coating formation with drying alkyds Reactions during coating formation in alkyd blends Raw materials Manufacture Health and Safety **Quality Control and Specifications** Analysis Calculations Uses Use of Alkyds in Trade-Sales Finishes Methods of Analysis Determination of Composition **Chemical Methods Determination of Properties and Impurities** 2. Acrylic Modified Alkyd Resins Traffic paints Industrial applications Conclusion 3. Alkyd-Amino Combinations Based on Neem Oil Aim of present investigation Uses of oils in surface coatings Neem oil Alkyd resins Amino resins **Experiments & Results** Preparation of alkyd resin Alkyd resin preparation Preparation of amino resin

Testing of performances of resin samples Discussion Analysis of neem oil Preparation of alkyd from neem oil Preparation of urea formaldehyde resin Preparation of thiourea formaldehyde resin Preparation of various samples (mixtures) Performances of various resin samples Scratch hardness Conclusion 4. Amino Resins Introduction Raw materials Chemistry of resin formation Typical resin formulations and techniques Urea formaldehyde resins High solids urea-formaldehyde adhesive resin Protective coating resin with high mineral spirits tolerance Methylated urea formaldehyde textile resins Urea-formaldehyde particle board adhesive Melamine-formaldehyde resins Butylated melamine protective coating resin Chlorine resistant melamine resin Trimethoxymethyl melamine Hexamethoxymethyl melamine Melamine resin molding powder Melamine resin acid colloid Control of the extent of the reaction Free formaldehyde estimation Viscosity tests Solubility tests Cure tests Urea versus melamine resins Package stability Competitive product analysis Chemical modification for water soluble products Chemical modification for oil soluble products Ethyleneurea Methylated uron textile resins Uron resins Glyoxal resins Miscellaneous resins Amino resins in the paper industry Formulations for regular and HE colloids Toxicity Methods of Analysis **Competitive Product Analysis** 5. Carbohydrate Modified Phenol-formaldehyde Resins Introduction Research on Carbohydrate Modified Resins Carbohydrate-Modified Base-Catalyzed PF resins

**Bonding Veneer Panels Bonding Flakeboard Panels** Carbohydrate-Modified PF Resins Cured at **Neutral Conditions Bonding Veneer Panels** Color of Bondline Conclusions 6. Epoxy Resins Introduction Synthesis of Resin Intermediates Cycloaliphatic epoxies Epoxidized polyolefins Epoxidised oils and fatty acid esters Aliphatic-cycloaliphatic glycidyl type resins Epoxy novolac resins Resins from phenols other than bisphenol A Resins from aliphatic polyols Resins from long chain acids Fluorinated epoxy resins Epoxy resins from methylepichlorohydrin Miscellaneous epoxy resins **Epoxy esters** Water borne epoxy resins and derivatives **Diluents and modifiers** Epoxide reactions and curing mechanisms Curing of epoxy esters 7. Photographs of Plant & Machinery with Supplier's Contact Details

## About NIIR

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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.

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