The Complete Technology Book on Industrial Adhesives

Author:- NPCS Board of Consultants & Engineers
Format: hardcover
Code: NI208
Pages: 592
Price: Rs.1675**US$** 150
Publisher: NIIR PROJECT CONSULTANCY SERVICES
Usually ships within **5** days

Adhesives were utilized in a sophisticated manner even in ancient times. Recent years have seen the rapid development of adhesive bonding as an economic and effective method for the fabrication of components and assemblies. The great many types of adhesives are currently in use and there is no adequate single system of classification for all products. The adhesives industry has generally employed classifications based on end use, such as metal to metal adhesives, wood adhesives, general purpose adhesives, paper and packaging adhesives etc. An adhesive or formulation is generally a mixture of several materials. The extent of mixture and the ratio usually depend upon the properties desired in the final bonded joint. The basic materials may be defined as those substances, which provide the necessary adhesive and binding properties. The type of adhesive material is easier to define and usually falls into three categories; thermosetting resins, thermoplastic resins and elastomeric resins. A thermosetting system, 100 percent reactive when in a pure state, the epoxies are very desirable and more widely used than any other chemical type. Epoxy is one of the newer types and has penetrated more fields of manufacturing operations in a shorter space of time than any of its predecessors. The many catalysts used with epoxies produce systems of variable properties. The most common are the aromatic amines and cyclic anhydrides. The phenolics or phenol formaldehyde resins are formed by the condensation reaction of phenol and formaldehyde. The phenolic resins have been used extensively in the lamination of plywood and in filament wound structures. There are two basic classes of phenolic resins resoles and novalacs, and both begin as phenol alcohols. When combined or alloyed with other adhesive systems, they become excellent structural adhesives and are widely used in this manner throughout the aerospace industry. The vinyl polymers do not stand alone as a structural adhesive, but hundreds of adhesives are formulated by the use of this class of polymer. The vinyls are important to adhesive bonding not only from the adhesive standpoint, but because the films derived from these substances are widely used as vacuum bags, slip sheets, etc. The more widely used ones are polyvinyl chloride, polyvinyl alcohol, and polyvinyl fluoride. There are numerous kinds of adhesives used in different industries; polyvinyl acetate wood adhesives, aminoresin wood adhesives, phenolic resin wood adhesives, cynoacrylate adhesives, hot melt adhesives, water based adhesives etc. The market for adhesives is comprised of thousands of end uses. The realm of market applications expands as new end uses keep developing, driven by the need for new and innovative attachment solutions. When looking at the total market, adhesives account for about 75% of the volume consumed.

This book basically deals with adhesive properties and general characteristics, adhesive materials and properties, adhesives types, thermoplastic adhesives, thermosetting adhesives, rubber resin blends, properties of basic adhesives types, acrylics acrylic acid diesters, allyl

diglycol, carbonate, animal glues, blood albumen, butadiene styrene rubbers, butyl rubber and polyisobutylene casein, cellulose derivatives, cellulose acetate, acetate butyrate cellulose, caprate cellulose, nitrate (nitrocellulose or pyroxylin), ethyl cellulose, hydroxy ethyl cellulose, methyl cellulose and sodium carboxy methyl cellulose, ceramic or refractory inorganic adhesives
cyanoacrylates, epoxy adhesives, epoxy nylon, epoxy polyamide, epoxy polysulphide, epoxy polyurethane, fish glue, furanes etc.
The present book covers the manufacturing processes of different industrial adhesives with their formulae. It is hoped that the book can serve to new entrepreneurs, technocrats and existing units to the technology of adhesive and guide them to a useful understanding of the wide variety of adhesives which exist today.

Cellulose Acetate-butyrate
Cellulose Caprate
Cellulose Nitrate (Nitrocellulose or Pyroxylin)
Ethyl Cellulose
Hydroxy Ethyl Cellulose
Methyl Cellulose and Sodium Carboxy Methyl Cellulose
Ceramic or Refractory Inorganic Adhesives
Cyanoacrylates
Epoxy Adhesives
Epoxy-Nylon
Epoxy-Polyamide
Epoxy-Polysulphide
Epoxy-Polyurethane
Fish Glue
Furanes
Hot-Melt Adhesives
Inorganic Adhesives and Cements
Sodium Silicate
Phosphate Cements
Basic Salts (Sorel Cements)
Litharge Cements
Sulphur Cements
Hydraulic Cements
Inorganic Polymers
Ionomer Resins
Isocyanates
Isocyanate Adhesives
Isocyanateâ€”Modified Adhesives
Isocyanateâ€”Polyester Methane Adhesives
Melamine Formaldehyde
Natural Rubber
Nitrile Rubbers
Permanence
Nylon Adhesives
Solution Adhesives
Hot-melts
Phenolic-nylon
Phenolic-epoxy
Phenol Formaldehyde (Acid Catalysed)
Phenolic Formaldehyde (Hot Setting)
Phenolic-Neoprene
Phenolic-Nitrile
Phenolic-Polyamide
Phenolic-Vinyl Butyral
Phenolic-Vinyl Formal
Phenoxy
Polyamides
Polyaromatics
Polyimides (PI)
Polybenzimidazoles (PBI)
Polybenzothiazoles (PBT)
Polyphenylenes (PP)
Polychloroprene (Neoprene) Rubbers

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Sat, 17 May 2025 09:27:42 +0000