



Alkyd Resins
Manufacturing,
Formulation and
Processing

Introduction

Alkyd resins are poly-esterification products derived from organic acids and alcohols. The majority of the alkyd used commercially have, as part of their acids component, long-chain fatty acids typically derived from vegetable oils. When alkyd are produced without fatty acids modification, they are referred to as polyesters or oil-free alkyds.

One of the important attributes of alkyd resins is their good compatibility with many other coating polymers. Alkyd resins are important ingredients in many synthetic paints, varnishes and enamels and find also applications as thermosetting plastics that can be molded.

The principal applications are furniture and architectural coatings, product finishes, special-purpose coatings and automotive refinishing primers. Alkyd resins are manufactured from the condensation reaction between oil or polyols, acids, and alcohol. They are typically used as binders for coatings and printing inks.

More economical alkyd resins are produced from the alcoholysis or glyceride process where end product quality control is not as paramount.

In this process raw vegetable oil, high in unsaturated component, is combined with additional polyol and heated to cause Trans esterification of the triglycerides into a mixture of mono- and diglyceride oils. To this resulting mixture acid anhydride is added to build molecular weight of the resin into roughly the same product as in the fatty acid process.

Alkyd resin, which is used in the production of a wide variety of paints, is supplied to the Indian market both from domestic production and import.

As Indian industries are producing paint of amount approximately Rs.15000 crores which needs Alkyd Resin of amount near about Rs. 3000 crores. Due to construction of apartments, buildings, roads there is huge demand of paint in this sector. Increased demand of paint will need the basic raw material of paint i.e. alkyd resin simultaneously.

The Alkyd resins market is estimated to reach 16,321.02 thousand tons by volume by 2019, signifying a firm CAGR of over 5.42% between 2014 and 2019.

Alkyd resins are any of a large group of thermoplastic resins that are essentially polyesters made by heating polyhydric alcohol with polybasic acids or their anhydride and used chiefly in making protective coatings and good weathering properties. These resins are useful as film forming agents in paint, varnished and enamels & as thermosetting plastics that can be moulded into solid objects. Hence, alkyd resins are one of the important ingredients in the synthetic paint industry. Alkyd resins are the synthetic resins which have a dominant position among the synthetic resins with respect of production volume & the frequency of the use in paint & varnish materials.

Despite the growing popularity of acrylic, polyurethane and epoxy resins, alkyd resins remain highly favoured among paint producers for its variability of compositions & better value for money. Originally, alkyd resins were merely the reaction products of phthalic anhydride and glycerin. But these products were too brittle to make satisfactory coatings. The use of oils or unsaturated fatty acids in combination with the brittle alkyds resulted in the air-drying coatings which revolutionized the chemical coating industry. The oil or fatty acid portion of the alkyd is one of the factors which determine the paint formulator's choice of resin to be used.

Alkyd resins products are suitable for wide range of products with application in decorative, maintenance and contractor paints where excellent gloss and good durability are required. Experts believe that the total consumption of paint & varnish materials will rise to a great extent in the coming years. Both cost wise & performance wise, alkyds have proven themselves over a wide swath of demands, from agriculture/construction equipment to general industrial metal and even architectural finishes.

Some of the fundamentals of the book are the basic chemistry of unsaturated polyesters, factors affecting alkyd production, monitoring the alkyd reactions, alkyd calculations, alkyd formulations based on theory, practical alkyd formulations, assessment of the performance of single and multicoat red iron oxide alkyd paint systems, styrenated alkyd resins based on maleopimaric acid, mechanical properties of alkyds resin varnish films and the effect of different weathering conditions on them, modification of alkyds, copolymerization of alkyd silicons for coatings, styrene copolymers in alkyd resins, etc.

This book contains alkyd formulation, modification of alkyds, styrene copolymers in alkyd resins, copolymerization of alkyd silicon, polyblends of polystyrene glycol and alkyd in surface coatings, alkyd calculations, and alkyd nomograms. This book will find very helpful to all its readers, entrepreneurs, scientists, technical institution, existing industries, paint technologist etc.

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Thorough analysis of the project

Economic feasibility study of the Project

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Report Compilation

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- *Minerals And Minerals*
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- *Printing Inks*
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- *Plantations, Farming And Cultivations*
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