ISIMSAN®

MIXER & PLANT ENGINEERING

Alkyd Resin Plant

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WHAT IS ALKYD RESIN?

Alkyd is a kind of polyesther synthetic resin created by the polycondensation reaction of polyhidric alcohols and dibasic acids and modified with oil or fatty acids.

Considered as the first polyesther study, Berzelius's (1847) synthetic resin study started with the reaction of tartaric acid and glycerin, then speeded up with alkyd resin studies after the World War II and began to be used widely in paint and varnish manufacturing. The word alkyd derived from alcohol and anhydride and the polyesther part in alkyd resin helps the resin's hardness while the oil and fatty acid part helps the flexibility, adhesion, pigment wetting and its' solubility with solvents.

Alkyd resin is the most important building block of paint and varnish systems which directly effects the film forming as well as determining the important properties of coating films like physical and chemical resistance, adhesion and durability.

Today conventional alkyds are widely used and because their chemical structures are suitable they can be used by cold blending with most of the resins or radical groups or by modified as "hot blends". It's possible for the specialities of alkyd polymer to be improved.

While differently modified alkyd resins can be produced with new designs, today the trend toward the high solid systems and especially emulsified alkyds is rapidly increasing.

HOW ALKYD RESIN PRODUCED ?

Alkyd resin is produced by the estherification of polyhydric alcohols and dibasic acids and through modification with oil and fatty acids in 200-240°C.

There are two methods of alkyd resin production process; process with solvent and process without solvent (fusion). In the process with solvent, after the reactants are loaded the water came out from the estherification reaction will be removed from the environment by making an azeotropy mixture with the help of a solvent and polycondensation reaction will be carried out untill the desired acidity and viscosity properties are achieved.

The process without solvent will made with the help of an inert gas, by removing the water came out from reaction by vacuum. This method is especially used in long oil alkyds.

There are four kinds of alkyd production methods:

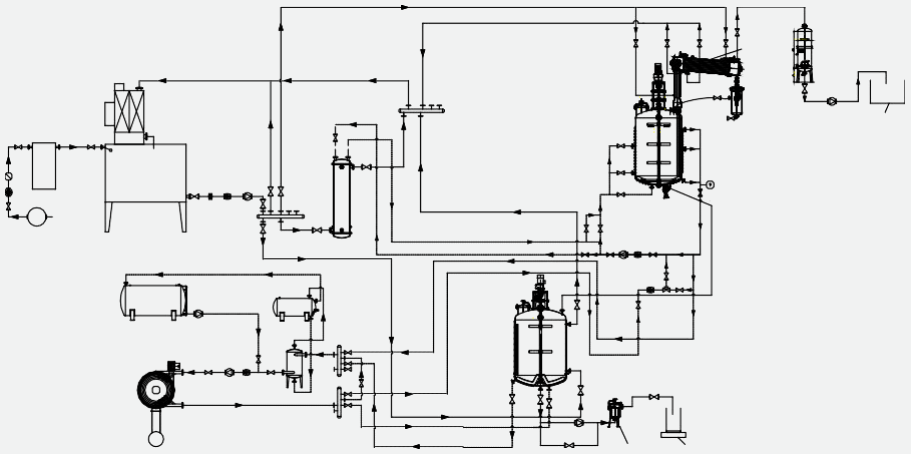
Alcolysis (Monoglyceride) method: In this method the oil which are the triglycerides of fatty acids will be turned into the mono-glyceride formation as a result of the esther exchange reaction with polyalcohol by the help of a catalyst. By adding anhydride (polyacid) estherification reaction will goes on in 200-240°C until the desired acidity and viscosity is achived. This is the most preferred method because it's economic.

Fatty acid method: Fatty acid will be loaded in the polyacid and polyalcohol reactor. Estherification reaction will goes on in 200-240°C until the desired acidity and viscosity properties are achived and as a result alkyd resin will be produced. It's a widely used method.

Oil-polyacid (acidolysis) method: After the reaction of oils mainly with isophtalic acid in 260-270°C, polyhydric alcohol will be added. As a result of the condensation reaction alkyd resin will be gotten. It's preferred for some special products.

Fatty acid-oil method: It's a method where polyalcohol and polyacid are added after the use of fatty acid together with oil, but not preferred much.

P&ID:
ALKYD PRODUCTION



ALKYD RESIN PRODUCTIONS MADE BY ISIMSAN

The mechanical engineering of Isımsan is considering up- and down stream processes to the smallest details. That enables us to experience complex plant systems as turnkey deliveries. Isımsan is holding the leading position on mechanical engineering for alkyd resin plants with a market share of more than 30 percent in Turkey. With the construction of all four alkyd resin production methods Isımsan is participating in domestic and also foreign markets.

COMPONENTS

- Alkyd resin reactors
- Condenser
- Columns
- Decanter
- Tanks
- Hot oil boilers
- Heat exchangers
- Cooling towers
- Packaging systems
- etc.

APPLICATIONS

- Alkyd Resin
- Ink
- Paint
- Chemicals

REMARKS

- Compliance with flammable and explosive substances regulations
- Atex exproof compliance of lighting and electrical components
- Implementation of fire regulations
- Complying with occupational safety regulations
- Take precaution to avoid static electricity

CERTIFICATIONS

Isımsan manufactures according to the following International directives and regulations:

- CE 2006/42/EC (Machinery Directive)
- CE 2014/29/EU (Pressure Vessel Directive)
- CE 2014/68/EU (Pressure Vessel Directive)
- ATEX product line 2014/34/EU
- EHEDG (Hygienic Engineering Certifications)
- GMP (Good Manufacturing Practices)
- FDA (U.S. Food and Drug Administration)
- EAC (EuroAsia Comformity)

Isımsan is certified in terms of quality management (ISO 9001) environmental standards (ISO 14001), welding technology and supervision (ISO 3834 & 14731) and control technology (2006/42/EC).

PLANT IMPRESSIONS

OUR GLOBAL SALES REPRESENTATIVES

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