DURASTAB 36
RHEOLOGY MODIFIER FOR PRINTING INKS

Durastab 36 is an organo-aluminium compound in a hydrocarbon base.

Durastab 36 is primarily used to develop body and reduce tack in printing ink vehicles. In addition it enhances pigment wetting, flow, setting, rate, gloss and reduces penetration and drying time as desirable side effect. These effects are brought about through chemical reaction of the gellant with the ink resin.

Durastab 36 is supplied as a pale yellow coloured liquid. It is readily soluble in the normal solvents used in the printing ink industry and is compatible with most oil, resin and vehicles like refined and bodied drying oils natural and synthetic oil soluble resins, alkyds, petroleum resins and mineral oils used in the printing ink industry. The use of highly polar solvents will be detrimental and is to be avoided as a viscosity adjustment measure of the base media.

The aluminium atom in Durastab 36 is extremely electrophilic and would react with both acid and alcohol termi (Present in ink media via an addition reaction even at atmospheric temperature resulting in increased MW of the system. At elevated temperatures the reactions are accelerated. These reactions result in viscosity increase leading to gelation in the extreme case if excess gellant is used. It should be noted that the resulting gel in a 3D network formed through covalent bonds and are fundamentally quite different from "mechanical gels" formed by aluminium soaps (octoate, stearate etc.) with hydrocarbon oils wherein a network of fibres held together by hydrogen bonding traps resin oil modecules and the networks (or gels) are broken reversibly and easily by small inputs of energy heat, shear forces etc.

Processing

The reaction of Durastab 36 with the vehicle is governed by a number of factors such as concentration, temperature, media characteristics like acid value and hydroxy1 value. Durastab 36 des not gel solvents, oils and consequently the presence of such non reactive ingredients retard the reaction rate and result in reduced structure modification. It is particularly recommended that laboratory trials establish process parameter precisely. Optimum conditions and quantities would vary with the particular media used, but the following is offered as a general recommendation. The order of addition, temperature, agitation time at temperatures and formulations are amongst the most important parameters. Initial evaluation should be made around 3% to 4% of Durastab 36 on the resin. At room temperature Durastab 36 may take upto 2 to 3 days to react fully with the media during which time agitation should be used periodically until the desired structure is achieved. A high temperature e.g. 90º - 120ºC say 10 to 20 minutes would suffice for a complete reaction. The addition of durastab 36 must be made at as low a temperature as possible (preferably at room temperature) and the temperature slowly increased under good agitation. The temperature is maintained for 10 to 20 minutes at 100º to 120º C before discharging. It is imperative that the gellant be thoroughly dispersed before reaction commences.

When hard resins are used to modify alkyd resins, higher processing temperatures may be required.

Caution

Durastab 36 is very reactive to water in any formatmospheric moisture or water in any of the solvents or media ingredients. The first manifestation of hydrolysis is skinning of the gellant. It must therefore be kept sealed and opened the container should be used as soon as possible. It is recommended that Durastab 36 be diluted too atleast 50% by weight with a non-reactive hydrocarbon oil and appropriately added to the printing ink vehicle ink as a good manufacturing practice. This addition of the gellant in a diluted form has another form has another important advantage : it helps quick and even dispersion into the media..

"DURAGEL"

"DURAGEL" is a valuable thickening agent. It produces firm and stable gels in many hydrocarbon solvents at room temperature. The gels so formed are firmer than can be obtained from other known gelling agents at the same concentration. Gels formed with "DURAGEL" develop enhanced "long-string" consisency in many petroleum solvents and this property contributes towards brushability of paints and adds to thixotropic body required in inks.

"DURAGEL" can be used as a thickening agent in chlorinated hydro-carbons, fireproof paints and paint remover formulations. The advantages are the high body of the paint remover and solvent retention.

In chlorinated rubber paints, "DURGEL" helps in improving viscosity for pigment suspension, maintaining at the same time the smoothness and brushability to the paint.

"DURAGEL" reduce oil bleeding in putties.

In printing inks, "DURAGEL" is used to prevent exessive penetration of the ink into the paper while retaining the gloss of the ink, thereby facilitating successive over-printing of colours. "DURAGEL" forms stable gels with the oils used.

"DURAGEL" is stable even in the presence of additives which tend to destroy the gels made with aluminum stearates. Small addition of lead octoate, cobalt octoate, , cobalt octoate, water or diethanolamine does not hinder the gel formation of "DURAGEL".

The selection of solvent when useing "DURAGEL" is more critical than when other aluminum soaps are used.

"DURAGEL" will not gel mineral oil, oil, ketones, esters, lower alcohols and other solvents such as butyl cellosolve.

SOLUBILITY:

Water : insoluble

Ethyl alcohol : insoluble

Acetone : insoluble

Benzene : Soluble

Mineral Spirit : Soluble

Mineral oils : practically insoluble

Vegetable Oils : insoluble in the cold but sparingly soluble when hot.