



Products for Paint

Rheology Modifiers for Latex / Alkyd Paint

The Alcogum® products are associative alkali soluble viscosifiers designed for use in water based paints. These products are supplied as a stable, ready to use anionic latex emulsion. The Alcogum line offers good viscosity stability over time when compared to other rheology modifiers.

Alcogum L 340 is designed for use in water based paints. It offers high ICI viscosity with a moderate Brookfield viscosity.

Alcogum L 344 has high shear characteristics that make it an ideal choice when good leveling and anti-splatter are desirable. This product can be added either to the pigment grind or as the final rheology modifier in the manufacture of paints.

Alcogum L 350 offers sag resistance, and good color acceptance at low dose levels. The product is designed to enhance scrub resistance,

Surfactant Compatibilizers for Latex Paint

Water borne “latex” paints, contain various ingredients, and all need to be compatible with one another. Solid components include pigments, fillers, thickeners and polymers. Also various fluid components such as coalescing agents, defoamers and dispersants and protective colloids are included. Surfactants are always naturally present since they come with the polymer dispersion “latex”. Colorants are dispersions of fine pigment particles, and contain additional surfactants to stabilize the colorant.

Stability problems may occur, meaning that the solid components agglomerate, potentially causing difficulties like flocculation or poor color acceptance.

In order for the paint system to be stable with all these ingredients, additional surfactant may be introduced. The improved wetting / dispersing of pigments may also lead to enhanced paint gloss. The surfactants interact with the thickener, and can give other effects for example, prevention of post thickening, during storage at high ambient temperatures, or flocculation.

Depending on the nature of the paint, hydrophobic / hydrophilic, a surfactant should be chosen correspondingly. As a general rule a hydrophilic surfactant should be used in a hydrophobic paint, or a hydrophobic surfactant should be used in a hydrophilic paint to assure good color acceptance. The typical

dosage of surfactant is approximately 0.3%. Generally the surfactant should be added at the let down stage. Products that can be used as compatibilizers follow:

Product	Chemical Description	Solvent
<i>Hydrophilic</i>		
Ethylan® TD 100	Alcohol Ethoxylate	None
Ethylan SN 90	Alcohol Alkoxylate	None
<i>Hydrophobic</i>		
Berol® 840	Narrow Range Alcohol Ethoxylate	None

Freeze Thaw Stabilizers

Surfactants may be added to the paint formulation to help stabilize the matrix when freezing occurs. The following products may be used to improve freeze thaw stability of the formulation.

Trade Name	Chemical Type	Ionic character
Petro® D-425 Liquid	Naphthalene Sulfonate	Anionic
Emcol® CNP-110	Polyoxy Carboxylate	Anionic
Witconol™ NP-60	NP Ethoxylate	Nonionic
Witconol NP-100	NP Ethoxylate	Nonionic
Witconol H-31-A	PEG ester	Nonionic
Amadol® 5138	Diethanolamide	Nonionic

Dispersants and Wetting Agents in Water Based Colorants

Surfactants are key components for dispersion of pigments in water based colorants. Typically 1 – 10% of a surfactant is added to wet the pigment, resulting in a low viscosity paste with well dispersed pigment particles. The amount of surfactant needed is dependent on the particle size of the pigment. The following surfactants are applicable for both inorganic as well as organic pigments. For inorganic pigments, the phosphate esters are primarily recommended, since their negative charge is attracted to the positive charge often present on inorganic particles.

Several of the products mentioned in this group also enhance properties when included in architectural paints. These enhancements include pigment

dispersion, gloss and color acceptance. Phosphate esters have additional benefits such as improved metal adhesion and corrosion control.

Product	Type	Actives, %	Chemical Description
Amphoteen® T-27W	Amphoteric	25	Betaine
Emcol CNP-110	Anionic	90	Carboxylate
Lankropol™ 4500*	Anionic	70	Sulfosuccinate
Lankropol K-8300	Anionic	40	Sulfosuccinate
Petrol D-425 Powder	Anionic	100	Naphthalene Sulfonate
Phospholan™ PS 131	Anionic	100	Phosphate Ester
Wiconate™ P-1059*	Anionic	90	Dodecylbenzene Sulfonate
Witconate 93S	Anionic	90	Dodecylbenzene Sulfonate
Amadol 511	Nonionic	100	Amide Ethoxylate
Amadol 5138	Nonionic	80	Amide Ethoxylate
Amadol WE	Nonionic	80	Amide Ethoxylate
Ethylan SN 70	Nonionic	90	Alcohol Ethoxylate
Witconol H-31A	Nonionic	100	Alcohol Ethoxylate
Witconol NP-60	Nonionic	100	Nonyl Phenol Ethoxylate
Witconol NP-100	Nonionic	100	Nonyl Phenol Ethoxylate

* Especially good for carbon black dispersion

Polymeric Dispersants

The Alcosperse® products are efficient for targeted dispersion as shown in the following table.

Product	Dispersant / Property
Alcosperse 149	Clay
Alcosperse 240	Carbon Black
Alcosperse 408	Titanium Dioxide
Alcosperse 747	Hydrophobic / Hydrophilic Compatibilizer



Leveling and Wetting

Surfactants allow the coating to “spread” on the intended surface. And help give good coverage to the surface. Surface tension reduction is a useful guide to determine the dosing level of surfactant needed to improve spreading. The following study is a comparison in the water air interface, and practical dosing in the coating formulation will require higher levels.

Product	Surface tension mN/m		
	1.00%	0.10%	0.01%
Emcol CNP-110	32.2	31.2	30.2
Lankropol 4500	25.3	31.9	46.5
Lankropol K-8300	28.0	27.5	26.9
Witconol H 31-A	35.8	36.1	36.8
Witconol NP-60	28.6	28.9	29.2

Surfactants also offer leveling. Leveling is the ability of the coating to have one even surface depth with reduced mechanical action. Surfactant products that offer leveling are listed in the following table.

Product	Description
Witconol H-31A	PEG 400 Oleate
Witconol NP 60	Nonyl Phenol Ethoxylate 6M
Witconol NP 100	Nonyl Phenol Ethoxylate 10M

Alkyl Emulsifiers

Water born paints that are based on alkyds as binders may be prepared using surfactant. The surfactant allows for a fine emulsion of the alkyd in water. The oil type of the alkyd will dictate the surfactant needed. In the case of industrial paint, typically short oil length alkyds are used. These require more hydrophilic surfactants. For the more hydrophobic, decorative coatings long oil length alkyds should be selected and the surfactant should be more hydrophobic.



Product	Form	Type	Actives, %	Chemical Description
Short Oil Length				
Ethylan TD-100	Powder	Nonionic	100	Alcohol Ethoxylate
Witcolate™ LES-60C	Liquid	Anionic	28	Alky Ether Sulfate
Long Oil Length				
Amadol WE	Liquid	Nonionic	100	Amide Ethoxylate
Ethylan DA-4	Liquid	Nonionic	100	Alcohol Ethoxylate
Amadol 511	Liquid	Nonionic	100	Amide Ethoxylate
Ethomeen® O/12	Liquid	Nonionic	100	Amide Ethoxylate
Arquad® 2HT-75	Liquid	Cationic	75	Dialkyl Dimethyl Quat

Epoxy Emulsifiers / Dispersants

Water borne coating compositions based on epoxy emulsion / dispersion in water also demand proper choice of surfactants. The following are primary recommendations for good wetting and dispersing additives.

Product	Type	Actives, %	Chemical Description
Ethylan TD 100	Nonionic	100	Alcohol Ethoxylate
Witconol NP 90	Nonionic	100	Nonylphenol Ethoxylate

Emulsion Polymerization

A number of products are available as emulsifiers and dispersants for polymer dispersions and latex. These polymers are common film formers used in "latex" paint and include poly-acrylates, poly-vinylacetate, polystyrene, etc. The surfactants allow inclusion of these homo and copolymers with other reactants in the formula. Following is a brief offering of products offered for this application.

Product	Appearance	Type
Lankropol	Liquid	Anionic
Phospholan	Liquid	Anionic
Witcolate	Liquid	Anionic
Ethylan	Liquid	Nonionic
Amadol	Liquid	Nonionic

Solvent Based Paints

Surfactants will facilitate incorporation of pigments and other solids whether they are inorganic or organic into solvent based resins and paints. The role of the surfactant is to facilitate dispersion and hinder re-agglomeration. The cationic surfactants are suitable in this respect as the nitrogen atom contained in them has high substantivity for the solid surface. The nitrogen attaches firmly and the fatty tail extends into the oil, converting these solids to a very oil-compatible form. Amines, amine salts and quaternary amines have proven very useful in this respect.

These cationic products soften the pigment which reduces the time and energy required for milling. The main function of the cationic surfactant is to make the pigment compatible with the hydrophobic resin or paint, with the added benefit of corrosion inhibition.

In particular Duomeen® TDO has an extremely strong effect that displaces all water from solid hydrophilic surfaces. This provides for strong corrosion inhibition and the possibility of the formulated paint to adhere to damp / wet surfaces. Such coatings are in the protective and marine application areas.

Product	Type	Actives, %	Chemical Description
Armeen® O	Cationic	100	Primary Amine
Arquad® 2C-75	Cationic	75	Dialkyl Dimethy Quat
Arquad 2HT-75	Cationic	75	Dialkyl Dimethy Quat
Duomeen TDO	Cationic	100	Amine Fatty Acid Salt
Ethoduomeen® T/13	Cationic	100	Diamine Ethoxylate

Curing Agents

Fatty alkyl amines with more than one amine functionality are being used to cure epoxy, and possibly other curable binders such as in industrial paints. The fatty moiety of the amine provides for a coating that has benefits of higher flexibility, stronger hydrophobicity, better corrosion resistance and protective features.

Product	Type	Actives, %	Chemical Description
Duomeen C	Cationic	100	Diamine
Duomeen O	Cationic	100	Diamine
Triameen® YT	Cationic	100	Triamine

Other Application Areas

Ethylan HB-4 is a plasticizer and coalescing solvent for acrylic and vinyl acetate copolymers

Berol 840 is a defoaming agent in certain water based latex paints as well as in emulsion polymerization.

Armeen M2C is a catalyst for curing epoxy, polyurethane as well as other setting resin based coatings.

Ethoquad® C/12, Ethomeen C/25 and Arquad 2C-75 act as antistatic / tribostatic agents when added to solvent based spray applied paints. These products reduce the need to use polar solvents such as aromatic solvents.

Product	Type	Actives, %	Chemical Description
Ethylan HB-4	Nonionic	100	Phenol Ethoxylate
Berol 840	Nonionic	100	Proprietary Ethoxylate
Armeen M2C	Cationic	100	Tertiary Amine
Ethoquad C/12	Cationic	75	Ethoxylated Monoalkyl Quaternary
Ethomeen C/25	Cationic	100	Amine Ethoxylate
Arquad 2C-75	Cationic	75	Dialkyl Dimethyl Quaternary



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