

ELEMENTIS

Performance specialties

Asia



Unique chemistry,
sustainable solutions

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Overview

Elementis is a global specialty chemicals company that delivers enhanced performance through applied innovation. We partner with our customers to provide innovative and leading technologies in personal care, coatings, and energy around the globe.

We offer a variety of rheology modifiers and specialty additives for architectural and industrial paints and coatings, adhesives and sealants and inks.

In close partnership with our customers, we develop innovative solutions for both waterborne, solvent and solvent-free systems that enhance the look, feel, and stability of our customers' products. Our technology addresses performance needs through our rheological additives, wetting and dispersing agents, defoamers, waxes and slip aids, adhesion promoters and other performance enhancing additives.

Our trademarks, such as BENTONE®, RHEOLATE®, THIXATROL®, THIXCIN®, M-P-A®, DAPRO®, NUOSPERSE®, SLIP-AYD®, SUPREAD™, DeuRheo, NALZIN®, Defom, Levelol, Levaslip, Disponer are recognized worldwide.

We continue to focus on harnessing our expertise in high-performing ingredients to enhance our customers' product performance and bring new technologies to the markets we serve.

Rheological additives

RHEOLATE® nonionic synthetic associative thickeners

Basic principles

Elementis’RHEOLATE® nonionic synthetic associative thickeners (NiSATs) consist of hydrophobically modified ethoxylated polyurethanes and hydrophobically modified polyether polyols. Both ranges of NiSATs represent advanced technology for waterborne systems and provide superior rheological performance and excellent balance of thickening efficiency, flow & leveling, with minimum adverse effects on film properties. The large variety of RHEOLATE® associative thickeners allows maximum flexibility in adjusting and fine-tuning the flow characteristics of coating formulations to meet specific performance needs.

Main product lines are RHEOLATE® 200 series, RHEOLATE® 300 series, RHEOLATE® 600 series, RHEOLATE® FX, HX and CVS series. RHEOLATE® 600 series of products are VOC-free versions of their RHEOLATE® 200 equivalents. RHEOLATE® 300 series are based on hydrophobically modified polyether polyols.

Recommendations

The new RHEOLATE® HX series comprises several new generation of high efficiency, high shear NiSATs with excellent performance characteristics. RHEOLATE® HX 6008 shows outstanding high shear efficiency with moderate mid-shear viscosity build in waterborne systems. It is effective across a broad range of latex chemistries, in particular acrylic and styrene acrylic emulsions.

RHEOLATE® HX 6050 works especially well with hydrophilic resins such as VAE, vinyl-acrylic and vinyl versatate emulsions in building high shear viscosity.

RHEOLATE® HX 6010 and RHEOLATE® HX 6025 give the most Newtonian flow profile among the RHEOLATE® HX range, with minimal contribution to mid-shear (KU) viscosity. They confer excellent flow and leveling, film build and applied hiding to coatings formulated with acrylic and styrene acrylic emulsions.

RHEOLATE CVS® 15 is a low-to-mid shear associative thickener that minimizes viscosity drop upon point-of-sale or in-plant tinting. It gives excellent color properties such as improved color float resistance and rub up performance. The product has superior anti-sagging and leveling performance upon application by brushing, rolling or spraying.

RHEOLATE® IF series of products are developed to comply with the labelling requirements such as EU Ecolabel, Nordic Swan, Blaue Engel, Asthma Allergy Nordic, French NF, etc. in Europe. These products are based on the existing offerings but are free of isothiazolinone-based preservatives (BIT/MIT) and VOC, hence are well suited for paint formulations targeted for consumers that demand safer products for their homes and the environment.

The large variety of available RHEOLATE® associative thickeners allow maximum flexibility to adjust and fine-tune the flow behavior of a system to meet the required performance.

RHEOLATE® Powder NiSATs

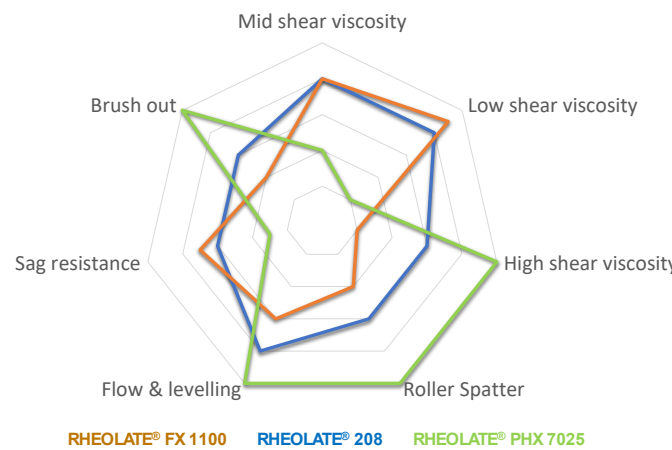
With a market demanding higher performing, safer and more sustainable solutions,

Elementis added a powder range of NiSATs in the early years of 2000. These are our answer to safer

ingredients, less storage space requirement, and consequently a lower carbon footprint on transportation.

Our 100% solid powders can easily be incorporated into paint formulations, resulting in improved handling,

and increased efficiency while meeting the latest health- and safety requirements. Since then our powder NiSATs were adopted by many customers in their products.



Architectural coatings

Architectural coatings typically contain a combination of mid-shear (Stormer) viscosity builders and high shear (ICI) viscosity builders. This combination provides formulators with maximum flexibility in adjusting rheological and application properties of a paint. Examples are the combination of RHEOLATE®655 and RHEOLATE® 212 or RHEOLATE CVS® -15 and RHEOLATE® HX 6025.

Depending on the paint formulations, PVC and choice of binders, sometimes a single associative thickener such as RHEOLATE® 244, RHEOLATE® HX 6008 IF, RHEOLATE® HX 6050 IF or RHEOLATE® 678 should be used to avoid excessive Stormer viscosity build. RHEOLATE® associative thickeners recommended for decorative coatings enable the formulation of VOC-complaint coatings, or even VOC-free if required.

Industrial coatings

For industrial coatings, good sag resistance, flow and leveling coupled with a shear thinning flow profile are essential for spray application.

The following products are recommended for industrial coatings:

RHEOLATE® 299 for high build, spray applied coatings

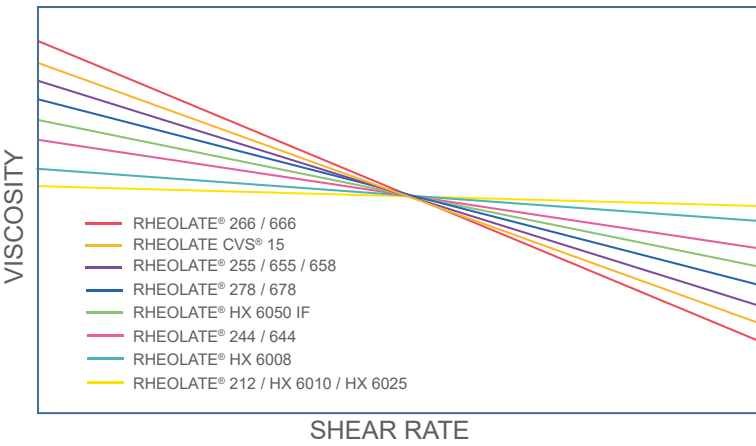
RHEOLATE® 288 for spray applied coatings, particularly clear coats

RHEOLATE® 310 D for general industrial coatings

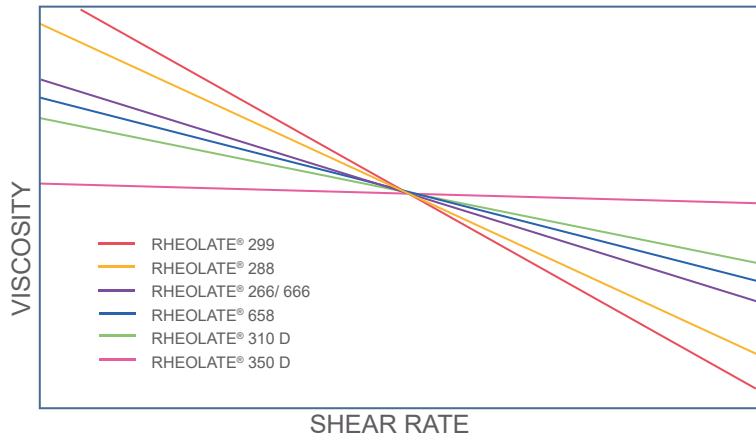
RHEOLATE® 266/666 for general industrial spray applied coatings

RHEOLATE® 350 D for wood coatings in general

RHEOLATE® NiSAT for architectural coatings



RHEOLATE® NiSAT for industrial coatings





Rheological additives

RHEOLATE® acrylic thickeners

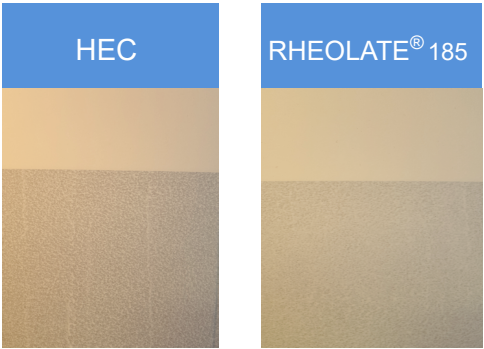
Basic principles

RHEOLATE® alkali swellable emulsion (ASE) thickeners are free-flowing liquids that contain 25 - 30 % active polymer in water. Each product enhances viscosity development, flow and application properties and can easily be post-added in the manufacturing process. RHEOLATE® hydrophobically modified alkali swellable emulsion (HASE) additives are highly efficient thickeners with predictable rheological profiles. They can be used as full or partial replacements of HEC and HMHEC thickeners. They enhance spatter resistance, flow and leveling, and being enzyme resistant, they give improved bio-stability, all at a lower cost in use.

Recommendations

RHEOLATE® 1 and RHEOLATE® 125 are efficient low-shear ASE thickeners that build strong shear-thinning flow profiles. They can be used as alternatives to cellulosic thickeners, with improved resistance to sagging and settling of solid particles. They are used in architectural and spray-applied industrial coatings. RHEOLATE® 150S and RHEOLATE® 175S are cost effective HASE thickeners developed for medium and high PVC emulsion paints and adhesives. RHEOLATE® 150S is designed for excellent low-shear viscosity build while RHEOLATE® 175S provides a balance of low- and mid-shear viscosity build.

RHEOLATE® 135 is a new, APE-free Newtonian HASE developed for latex paints and other WB systems. It imparts a Newtonian flow, enhances high shear viscosity and reduces paint spattering. In most cases, RHEOLATE 135 should be combined with a KU builder to achieve a balanced performance and application properties. RHEOLATE® AP-425 is used for mid-shear viscosity build in medium and high PVC formulations. It imparts a good balance of properties and shows improved leveling and spatter resistance while retaining good sag control. RHEOLATE® 465 is a highly associative HASE thickener that builds high-shear and mid-shear viscosities efficiently. It gives an excellent balance of spatter resistance and flow and leveling. Owing to these attributes, it is recommended for high quality decorative coatings. RHEOLATE® 185 is a highly-efficient HASE thickener developed as a cost effective alternative to cellulosic thickeners for architectural paint formulations. It shows improved applied hiding because of its superior roller pattern and leveling (see figure below). Like all HASE thickeners, it gives improved spatter resistance compared to cellulosic thickeners. Water dilutability of paints formulated with RHEOLATE® 185 is comparable with those based on cellulosic thickeners.



Improved applied hiding with RHEOLATE® 185

Rheological additives

RHEOLATE® thickeners

Product name	Composition	Description	Solventborne	Waterborne	Application																				Shear Rate			
					Architectural coatings					Industrial coatings					Construction					Others								
					Exterior coatings	High PVC coatings	Flat coatings	Semi-gloss/gloss coatings	Water reducible coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coating	Wood coatings	Asphalt emulsion	Concrete coatings	Grouts	Plaster/stucco	Roof coatings	Tile adhesives	Adhesives and sealants	Inks	Leather coatings	Low	Medium	High
Acrylic thickeners																												
RHEOLATE® 1	Acrylic emulsion	Excellent low shear ASE-type viscosity builder. Cost-effective replacement for medium molecular weight HEC with improved sag and settling for low PVC systems, including wood, architectural, and industrial coatings.		●	○	●	●	●	●	●	●		●		●	●	●	●		●			●		●	●	○	
RHEOLATE® 135	Acrylic emulsion	Excellent performance in high PVC and contractor grade paints. Good contribution to mid and high shear viscosity.		●	○	●	●	●	●							○	●	●			●						○	●
RHEOLATE® 150S	Acrylic emulsion	Excellent low shear viscosity builder. Most pseudoplastic of all HASE products shown. Cost-effective alternate to high molecular weight HEC. Recommended for interior paints.		●	○	●	●	●	○	○	○		●		○	○	●	○		●			●	●	●	●	○	
RHEOLATE® 175S	Acrylic emulsion	Excellent mid to high shear viscosity builder. Provides excellent film build, leveling and spatter resistance.		●	○	●	●	●	○	○	○		○		○	○	●	○		●			●	●	●	○	●	
RHEOLATE® 185	Acrylic emulsion	Excellent low-shear acrylic thickener that was developed to replace HEC in interior and exterior formulations, giving improved applied hide and reduced spatter.		●	○	●	●	○	○								●	○		●				●	●	●	●	
RHEOLATE® 465	Acrylic emulsion	HASE thickener with unique flow and leveling properties. Works well across all decorative latex systems.		●	○	○	●	●	●	○	○		○		○	○		●			○					○	●	
RHEOLATE® AP 425	Acrylic emulsion	Economical and versatile hydrophobically modified alkali swellable thickener designed to fully or partially replace cellulosic thickeners in a variety of waterborne systems.		●	○	○	●	●	●	○	○		○		○	○								●	●	○	●	
DeuRheo WT-115	Anionic-polyacrylate	A highly efficient alkali swellable acrylic associate thickener (HASE). It is easy to use with excellent thickening effect, flow and leveling. When applied by roller it eliminates spattering and has good syneresis resistance.		●	○	○	○	○					●											●	●		●	

Rheological additives

RHEOLATE® thickeners

Product name	Composition	Description	Solventborne	Waterborne	Application																				Shear Rate				
					Architectural coatings					Industrial coatings					Construction					Others									
					Exterior coatings	High PVC coatings	Flat coatings	Semi-gloss/gloss coatings	Water reducible coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coating	Wood coatings	Asphalt emulsion	Concrete coatings	Grouts	Plaster/stucco	Roof coatings	Tile adhesives	Adhesives and sealants	Inks	Leather coatings	Low	Medium	High	
Nonionic associative thickeners (NiSAT)																													
RHEOLATE CVS® -10	Polyurethane solution	Excellent low-mid shear viscosity builder, provides good balance of sag, flow and leveling, reduced viscosity loss on tinting, excellent color properties and syneresis control.		●	●		●	●	●				●					●		●				●	●		●	○	
RHEOLATE CVS® -15	Polyurethane solution	Highly efficient, zero VOC , mid-shear viscosity builder with minimum KU drop upon tinting.		●	●		●	●	●	●	●		●	●	●	●		●		●	●			●	●		●	○	
RHEOLATE® 212	Polyurethane solution	Excellent high-shear viscosity builder. Highly Newtonian profile with little influence on mid-shear viscosity. Used often in combination with RHEOLATE® 666, RHEOLATE® 655, or RHEOLATE CVS® thickeners for ideal balance of properties.		●	●	○	●	○	○	●	●	●	●	●	●	●		●			●			●	○				●
RHEOLATE® 212 IF	Polyurethane solution	Isothiazolinone (BIT/CMIT/MIT)-free version of RHEOALTE® 212		●	●	○	●	○	○	●	●	●	●	●	●	●		●			●			●	○				●
RHEOLATE® 222	Polyurethane solution	Highly efficient high-shear viscosity builder for aqueous applications, provides excellent flow and levelling.		●	●	○	●	○	○	●	●	●	●	●	●	●		●			●			●	○				●
RHEOLATE® 244	Polyurethane solution	Good high-shear viscosity build. Higher KU build in small particle-size binders than RHEOLATE® 212. Best balance of KU/ICI viscosities, ideal for use as sole thickener in small particle-size binders.		●	●	○	●	●	●				●														○	○	
RHEOLATE® 255	Polyurethane solution	Good mid-shear viscosity builder, especially with small particle-size binders. Works well in flat through gloss paints.		●	●		●	●	●	●	●		●	●	●	●							●	●	●	○	●		
RHEOLATE® 266	Polyurethane solution	Excellent low-shear viscosity builder. Highly pseudoplastic rheology, excellent for spray and thick film application.		●	●		●	●	●	●	●		●	●	●	●							●	●		●	○		
RHEOLATE® 278 TF	Polyurethane solution	Excellent mid-high shear viscosity builder. Can be used as the sole thickener in quality acrylic flats and eggshell finishes.		●	●	○	●	●	●	●	●		●	●	●	●		●								○	●	○	
RHEOLATE® 288	Polyurethane solution	Suitable for high-gloss, clear and pigmented coatings and haze-free architectural and industrial finishes.		●	●		●	●	●	●	●		●	●	●	●		●			●					●			
RHEOLATE® 299	Polyurethane solution	Highly efficient thickener that provides excellent sag resistance on spraying.		●	●		●	●	●	●	●		●	●	●	●							●	●	●	●			

Rheological additives

RHEOLATE® thickeners

Product name	Composition	Description	Solventborne	Waterborne	Application																				Shear Rate			
					Architectural coatings					Industrial coatings						Construction					Others							
					Exterior coatings	High PVC coatings	Flat coatings	Semi-gloss/gloss coatings	Water reducible coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coating	Wood coatings	Asphalt emulsion	Concrete coatings	Grouts	Plaster/stucco	Roof coatings	Tile adhesives	Adhesives and sealants	Inks	Leather coatings	Low	Medium	High
Nonionic associative thickeners (NiSAT)																												
RHEOLATE® 310D	Polyether polyol solution	RHEOLATE® 310 is a solvent-free version of RHEOLATE® 300.		●	●		●	●	●				●			○		●					○		●	○	●	
RHEOLATE® 350D	Polyether polyol solution	Excellent high-shear viscosity build, great synergy with RHEOLATE CVS® rheology modifiers, excellent color properties and good syneresis resistance. More contribution on the mid-shear viscosity than RHEO-LATE® 212.		●	●		●	●	●	●	●		●	●	●	●		●					●	●	●			●
RHEOLATE® 644	Polyurethane solution	Low VOC, solvent free, APE-free, provides efficient thickening in high and mid-shear viscosity ranges		●	●	○	●	●	●				●													○	○	
RHEOLATE® 655	Polyurethane solution	Low VOC, solvent-free, APE-free, provides thickening efficiency primarily in the medium-shear rate range viscosity.		●	●		●	●	●	●	●		●	●	●	●						●		●		●		
RHEOLATE® 658	Polyurethane solution	Excellent mid-shear viscosity builder, especially with small particle-size binders. Works well in low and zero VOC flat through gloss paints.		●	●		●	●	●	●	●		●	●		●					●	●		○	●			
RHEOLATE® 666	Polyurethane solution	Low VOC, solvent free, APE-free, provides viscosity at low and medium-shear rates and provides effective flow and leveling control.		●	●		●	●	●	●	●		●	●	●	●					●	●		●	○			
RHEOLATE® 678 IF	Polyurethane solution	RHEOLATE® 678 is a solvent-free version of RHEOLATE® 278.		●	●		●	●	●	●	●		●	●	●	●		●			●			○	●	○		
RHEOLATE® FX 1070	Polyurethane solution	Zero-VOC liquid rheology modifier for high shear viscosity in aqueous coatings.		●	●		●	●	●	●	●		●	●	●	●		●				●	●				●	
RHEOLATE® FX 1010	Polyurethane solution	Rheology modifier for low to mid shear viscosity. provides good sag resistance, and anti-settling properties.		●						●	●		●	●	●	●							●	○	●			
RHEOLATE® FX 1080	Polyurethane solution	Very low VOC, high efficiency, high active content polyurethane mid-shear thickener for the use in aqueous coatings.		●	●		●	●	●				●					●						○	●			
RHEOLATE® HX 6008 IF	Polyurethane solution	Efficient, Zero VOC, APEO free, high-shear builder. Excellent efficiency with both hydrophobic and hydrophilic resins with some low-shear contribution.		●	●	○	●	○	○	●	●		●	●	●	●		●		●		●	●	●		○	●	
RHEOLATE® HX 6010 IF	Polyurethane solution	Highly efficient, zero VOC, APEO free, Newtonian high-shear builder. Excellent efficiency with hydrophobic resins with exceptional application properties.		●	●	○	●	●	●	●	●		●	●	●	●		●		●		●		●			●	
RHEOLATE® HX 6025	Polyurethane solution	Zero VOC, APEO free, high-shear builder. Excellent stain resistance and applied hide		●	●	○	●	●	●				●					●		●							●	
RHEOLATE® HX 6050 IF	Polyurethane solution	Highly efficient, zero VOC, APEO free, high-shear builder. Excellent efficiency with hydrophilic resins and significant low-shear contribution.		●	●	●	●			●	●		●	●	●	●					●				○	●		
Powdered NiSATs																												
RHEOLATE® 208	Polyurethane powder	Powdered rheology modifier, excellent mid-shear viscosity builder.		●	●		●	●	●				●											○	●	○		
RHEOLATE® FX 1100	Polyurethane powder	Powdered, high efficiency, NiSAT for low to mid shear viscosity build in sustainable waterborne systems		●	●		●	●	●				●					●		○	○	○	●		○	●		
RHEOLATE® PHX 7025	Polyurethane powder	Zero VOC, high-shear builder. Excellent stain resistance and applied hide. Powdered rheology modifier for sustainable formulations		●	●	○	●	●	●				●				●	●	●	●		●					●	

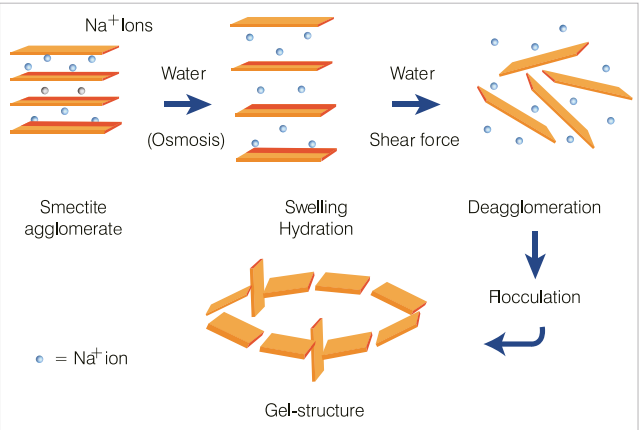
Rheological additives

BENTONE® and BENAQUA® clays for waterborne applications

Basic principles

Elementis’BENTONE® and BENAQUA® clay thickeners for waterborne systems are mainly based on hectorite, a naturally occurring smectite clay that swells in water under high shear. Hectorite clays compose of silicate sheets, which delaminate in water to provide an open, three- dimensional gel structure. Because of this behavior, hectorite clays are used to thicken aqueous systems, impart yield points and enhance suspension property and storage stability.

BENTONE® clay thickening mechanism



BENTONE® rheological additives are easy to handle powders and disperse readily in water under high shear. They are also suitable for applications requiring fast water release and exceptional sag resistance. In construction applications, they enhance workability in tile adhesives, grouts, skim coats and mastics.

Recommendations

BENTONE® DE is a refined natural hectorite clay modified for easy dispersion. It allows for a high solids pregel preparation (up to 14%) with a pourable viscosity. BENTONE® DE provides excellent in-can stability and sag control for a wide range of coating formulations.

BENTONE® DY is an optimized blend of smectite clay with a natural polymer. This product was specifically designed to prevent syneresis in standard architectural paints while maintaining open time. It is also suitable for industrial coatings such as waterborne epoxy primers.

BENTONE® EW-NA is a highly-purified (beneficiated), easy to disperse hectorite clay. This product is suitable for architectural and industrial paint applications. It imparts high low shear viscosity and reduces syneresis and settling issues.

BENTONE® LT is an organically modified hectorite clay that builds viscosity and shear-thinning flow efficiently in waterborne systems. It may be used as a direct substitute for HEC thickeners.

Product name	Composition	Description	Solventborne	Waterborne	Application																				Shear Rate						
					Architectural coatings					Industrial coatings							Construction					Others									
					Exterior coatings	High PVC coatings	Flat coatings	Semi-gloss/gloss coatings	Water reducible coatings	Can coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coating	Wood coatings	Asphalt emulsion	Concrete coating	Grouts	Plaster/stucco	Roof coatings	Tile adhesive	Adhesives and sealants	Inks	Leather coatings	Water treatment	Low	Medium	High	
BENAQUA® 4000	Modified smectite clay	Hectorite clay-polymer for textured, spray applied and high build coatings		●	●		●			●									●					●				●			
BENAQUA® 5000	Modified smectite clay	Hectorite clay composite for adhesives and grouts		●															●	●			●					●			
BENTONE® DE	Modified smectite clay	Hyperdispersible hectorite clay for waterborne decorative coatings		●						●	●	●	●	●	●	●					○		○		●	●					
BENTONE® DY	Modified smectite clay	Modified clay to improve sag resistance and flow in waterborne systems		●	●		●	●			●	●	●	●	●	●	●											●	○		
BENTONE® EW NA	Modified smectite clay	Hectorite clay for suspension control for waterborne systems		●	●	○	●	●	●	●	●	●	●	●	●	●	●			●			●	●	●	●	●	●			
BENTONE® GS	Modified smectite clay	Hectorite clay for waterborne adhesives/sealants and construction systems		●	●											●		●	●	●	●	●					●				
BENTONE® HC	Modified smectite clay	Refined hectorite for waterborne adhesives, sealants and high PVC emulsion paints		●		●											●	●	●			●				●	●				
BENTONE® HD	Modified smectite clay	Hyperdispersible hectorite clay for industrial coatings		●										●		●									●	●					
BENTONE® LT	Modified smectite clay	Modified hectorite clay for waterborne paints		●		●			●	●	●	●	●	●	●	●	●						●	●	●		●	○			
BENTONE® CT	Smectite clay	Hectorite clay for waterborne construction systems, 50% active		●	●					●									●	●	●		●				●	●			
BENTONE® WBS	Smectite clay	Recommended for plasters, mortars and renderings based on lime, cement and gypsum		●	●	○	●		○										●	●	●		●					●			

Rheological additives

BENTONE® and BENGEL® organoclays for solventborne applications

Basic principles

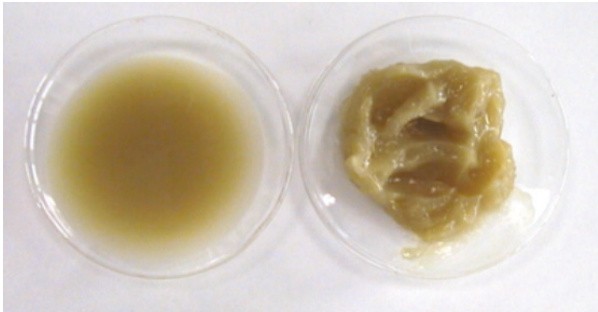
BENTONE®, BENTONE SD®, and BENGEL® rheological additives are organically modified smectite clays. They are optimally developed for solvent-borne systems of varying degrees of polarity. Apart from coatings, they may be used in inks, adhesives, road marking, cosmetics, and multiple other systems. When activated properly, they build low shear viscosity, reduce sagging and pigment settling in those systems.

Thickening mechanism and incorporation

In a system containing the fully dispersed and separated organoclay platelets, a gel structure will develop by edge-to-edge hydrogen bonding between hydroxyl groups on the organoclay platelet edges. The most efficient gel structure develops when the hydroxyl groups are bridged by water molecules. If the water bridge is not present, the hydrogen bonding is significantly weaker, causing poor gel development

- Typical incorporation of organoclays follows these steps:
1. Add organoclay to a mixture of solvent and resin
 2. Mix for 5 minutes
 3. Add the polar activator (if needed)
 4. Disperse at high shear for a minimum of 15 minutes
 5. Continue with the rest of the formula

As supplied, BENTONE®, BENTONE SD® and BENGEL® additives are powders in the form of agglomerated platelet stacks. A combination of wetting and mechanical energy deagglomerates the platelet stacks. Conventional BENTONE® and BENGEL® additives require chemical or polar activators for proper activation, whereas the super dispersible BENTONE SD® grades do not. Suitable polar activators are methanol (95/5 methanol/water), ethanol (95/5 ethanol/water) and propylene carbonate.



BENTONE® 34
pregel without polar
activator

BENTONE® 34
pregel with polar
activator

Solvent compatibility

Organoclays are compatible with most resin systems, including acrylics, epoxies, and polyurethane. The choice of BENTONE® and BENGEL® additives depends on the solvent and the resin used in the system. BENTONE® and BENGEL® rheological additives are available in conventional and super dispersible form for easier

Low polarity Systems	Mid polarity systems	High polarity systems	Activation	
Aliphatic Solvents, Mineral Spirits, Isopars, Naphtha, etc.	Aromatic and Hydrocarbon Solvents, Xylene, Toluene, etc.	Aldehydes, Acetates, Alcohols, Esters, Ethers, Glycols, Ketones.	Polar activator required	Easy to disperse
Organoclay additives				
BENTONE® 34, BENTONE® 1000			•	
BENGEL® 434, BENGEL® 908			•	
BENGEL® 818, BENGEL® 958				•
BENTONE SD®-1				•
BENTONE® 52			•	
BENTONE® 54				•
	BENTONE® 38 (*)		•	
	BENTONE SD®-3 (*)			•
	BENTONE SD® -2			•
	BENGEL® 828			
		BENTONE® 27 (*), BENTONE® 57	•	
	BENGEL® 988			•

* Hectorite-based

Typical polar activators: methano/water 95/5, propylene carbonate



Rheological additives

BENTONE® and BENGEL® organoclays

Product name	Composition	Description	Solventborne	Waterborne	Application														Polarity		
					Deco	Industrial coatings								Construc- tion		Others					
					Long-oil alkyds	Can coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coatings	Wood coatings	Asphalt	Roof coatings	Adhesives and sealants	Inks	Leather coatings	Low	Medium	High
BARAGEL® 3000	Organoclay	Organically modified bentone clay for low polarity systems	●			●				●				●	●	●	●		●		
BENATHIX®	Organoclay	Modified smectite clay for unsaturated polyester, plastisols and putties	●														●			●	
BENGEL® 434	Organoclay	Conventional organoclay for wide range of low polarity systems	●					○		●	●	●	●				●	●		●	
BENGEL® 818	Organoclay	Superdispersable organoclay for low polarity applications	●					○	●	●	●	●	●				●	●		●	
BENGEL® 828	Organoclay	Super dispersible rheological additive that greatly simplifies the formulation and manufacture of paint systems that contain moderate to high polarity solvents.	●						●	●	●	●	●				●	●			●
BENGEL® 908	Organoclay	General purpose and highly cost effective organoclay designed for low to medium polarity aliphatic and aromatic coating systems. It also works well in other high polarity systems.	●							●	●		●				●	●		●	●
BENGEL® 958	Organoclay	A grade that is easy to disperse and provides good thixothropy, sag resistance, and anti-settling properties. It is recommended to be used in diverse low to medium polarity binders and solvent systems.	●		●	○	○	●	○	●	●	○	○		●	●	●		●	●	
BENGEL® 968	Organoclay	Designed for low to medium polarity coating systems. It can be used for versatile coating applications and provides good compatibility, viscosity increase as well as anti-settling properties.	●							●	○	○	●							●	●
BENGEL® 988	Organoclay	Easy to incorporate and designed for use in low to high polarity system of containing aliphatic solvents, aromatic solvents. ketones, esters, glycol ethers and alcohols.	●			○	○	○	○	●	●	●	●						●	●	●
BENTONE SD®-1	Organoclay	Superdispersable organoclay for low polarity applications	●		●	●	●	●	●	●	●	●	●		●	●	●		●		
BENTONE SD®-2	Organoclay	Superdispersable organoclay for high polarity applications	●			●	●	●	●	●	●	●	●				●	●			●
BENTONE SD®-3	Organoclay	Organoclay for intermediate polarity applications	●			●	○	○	○	●	○	○	○				●	●		●	
BENTONE® 1000	Organoclay	High performance organoclay for low to intermediate polarity systems	●		●	●				●				●			●	●		●	
BENTONE® 27	Organoclay	Conventional hectorite-based organoclay for high polarity systems, polyol, epoxy, etc.	●			●	●	●	●	●	●	●	●				●	●	●		●
BENTONE® 34	Organoclay	Conventional organoclay for wide range of low polarity solvent systems	●		●	○	○	○	○	●	●	●	●	●	●	●	●	●		●	
BENTONE® 38	Organoclay	Conventional organoclay for intermediate polarity organic solvent systems	●			●	●	●	●	●	●	○	●				●	●		●	●
BENTONE® 52	Organoclay	Conventional organoclay for intermediate polarity solvent systems	●				○	○		●	●	●	○					○		●	●
BENTONE® 54	Organoclay	Organoclay for low to mid-polarity solvent systems	●		●			●			●		●	●	○			●		●	●
BENTONE® 57	Organoclay	Conventional organoclay for high-polarity solvent systems	●							●	●						●				●
BENTONE® 54K	Organoclay	This rheological additive is designed for low to intermediate polarity organic systems.	●			○	○	●	○	●	●	○	○				●			●	●

Rheological additives

THIXATROL® organic thixotropes and M-P-A® wax dispersions

Basic principles organic thixotropes

THIXATROL® and THIXCIN® rheological additives are based on castor oil and its modified derivatives, polyamides, diamides and polyester amides. They typically require proper wetting, deagglomeration, high shear and minimum activation temperature to reach an activated state and develop full performance. Optimum rheological effectiveness is achieved when the active substance is completely swollen without turning into a dissolved state.

Recommendations

THIXATROL® MAX provides outstanding sag resistance in high solids solventborne epoxy primers and polyurethane topcoats. Overcoatability of coatings containing THIXATROL® MAX is excellent. THIXATROL® AS 8053, PM 8056 and PM 8058 are new additions to the portfolio featuring low activation temperatures, high structure build and thixotropic flows at low loading levels. They

enable shorter production cycles, energy savings and excellent structure conservation upon storage in coatings, adhesives and sealants applications. They offer superior usage efficiency compared to older generation of diamide waxes, organoclays, fumed silica, etc.

THIXATROL® AS 8053 performs particularly well in high-performance sealants such as MS polymer sealants. Depending on the formulation, it may also be used in industrial protective coatings.

THIXATROL® PM 8056 has been developed for high-performance high build protective coatings while THIXATROL® PM 8058 is able to tolerate a wider range of solvent polarity including polar solvents such as alcohols.

The THIXATROL® P200 series of products are pre-activated diamides in various solvents for post-corrections. THIXATROL® P230X provides strong thixotropic and sag resistance performance in low to medium film build solventborne coatings.

DeuRheo 556 series is based on solventborne copolymeric wax dispersions, which can be used to improve orientation of metallic flakes in paints .

DeuRheo 201P is a 10% active, polyethylene wax dispersion that acts as an anti-settling agent without significantly affecting the bulk viscosity. It can be handled easily and dispersed rapidly in solventborne coatings, DeuRheo 202P is a higher solid grade at 20% solids. It needs to be premixed in the mill base before dispersing with high shear equipment at a temperature of 20 to 40 °C.

DeuRheo 2810 is a highly efficient polyurea-based liquid rheology modifier for solventborne coatings. It can be easily incorporated and does not require a specific activation temperature. It prevents settling and sagging of paints even after dilution.

Basic principles M-P-A®

M-P-A® anti-settling agents inhibit pigment, filler and extender movement in the paint via polymeric chains entanglement mechanism. M-P-A® grades can be used alone or in combination with other thixotropic additives for enhanced performance. Product selection typically depends on the coating type and activation condition of the system.

For waterborne industrial coatings, THIXATROL® P2100W and THIXATROL® 5020W are new formulating tools for improving anti-settling, anti-sagging and metallic flakes orientation. These additives significantly increase low shear viscosity and viscoelastic property of the coatings, a pre-requisite for good metallic flakes orientation.

THIXATROL® P2100W is a special polyamide wax paste developed for waterborne baking paints.

THIXATROL® 5020W is a modified EVA emulsion additive designed for waterborne air-dried metallic coatings. It can be readily incorporated under mild shearing.



Rheological additives

M-P-A® wax dispersions

Product name	Composition	Description	Solvent	Solid %	Solventborne	Waterborne	Application											Polarity			
							Industrial coatings								Others						
							Can coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coatings	Wood coatings	Adhesives and sealants	Inks	Leather coatings	Low	Medium	High	
Anti settling agents																					
M-P-A® 1075	Organic compound	Solid paste, easy incorporation, anti-settling agent for virtually all water-reducible and butanol compatible coatings system	Butanol	45		●						●	○							●	
M-P-A® 1078-X	Organic compound	Very soft paste, anti-settling agent for industrial coatings	Xylene	40	●							●						○	●		
M-P-A® 20-X	Complex polyolefin compound	Translucent soft paste rheological additive which prevents pigment settling in solventborne coatings. It is especially designed to prevent settling in non-aqueous systems with no significant increase in viscosity.	Xylene	20	●							●						○	●		
M-P-A® 2000-X	Organic compound	Easy incorporated, highly efficient, liquid, pourable anti-settling and sag control agent	Xylene	20	●			●	●			●		●	○				○	●	
M-P-A® 24X	Complex polyolefin compound and xylene	Translucent paste thixotropic rheological additive for solvenborne coatings. It prevents pigment settling and gives good suspension.	Xylene	24	●			●	●			●	●	●	●						
M-P-A® 60-X	Organic compound	Soft paste anti-settling agent dispersed in xylene	Xylene	24	●		○	○	○	○		●	●	○	○				○	●	
DeuRheo 201	Polyethylene wax	A polyethylene wax dispersion based anti-settling agent which can be handled easily and dispersed rapidly.	Xylene/IPA	10	●			●	●			●	●	●	●					●	●
DeuRheo 201P	Polyethylene wax	A polyethylene wax dispersion based anti-settling agent which can be handled easily and dispersed rapidly.	Xylene/IPA	10	●			●	●			●	●	●	●		○	●		●	●
DeuRheo 202	Polyethylene wax	An anti-settling agent for highly filled solvenborne coatings	Xylene	20	●			●	●	●	●	●	●	●	●					●	
DeuRheo 202P	Polyethylene wax	A polyethylene wax dispersion based anti-settling agent for highly efficient control of pigment settling	Xylene	20	●			●	●	●	●	●	●	●	●				●	●	
DeuRheo 202SP	Polyethylene wax	A polyethylene wax dispersion based anti-setting agent for highly efficient control of pigment settling	Xylene	25	●			●	●			●	●	●	●					●	
DeuRheo 211	Polyethylene wax	A polyethylene wax dispersion based anti-setting agent which can be handled easily and dispersed rapidly.	Xylene	10	●			●	●			●	●	●	●					●	
DeuRheo 211F	Polyethylene wax	An aromatic free polyethylene wax dispersion based anti-settling agent, which can be handled easily and dispersed rapidly.	n-butyl Acetate/ Methylcyclohexane	10	●			●	●			●	●	●	●		●			●	●
DeuRheo 212	Polyethylene wax	A polyethylene wax dispersion based anti-settling agent for highly efficient control of pigment settling	Xylene	20	●			●	●	●		●	●	●	●					●	
DeuWax FA-110	Polyethylene wax	Flattening agent for silky smooth surfaces, improves scratch resistance of flattening silica.	Xylene/n-butyl acetate	10	●									●	●		●	●		●	●
DeuWax FA-115	Polyethylene wax	Unique wax based dispersion which gives exceptional flattening and slip resistance to paint films.	Toluene	15	●									●	●		●	●		●	●
Metallic orientation																					
DeuRheo 556F	Ethylene-vinyl acetate copolymer	An aromatic-free copolymeric-wax dispersion, improves the orientation of effect metallic pigment.	n-butyl acetate/ n-butyl alcohol	6	●				●	●				●						●	●
DeuRheo 556S	Ethylene-vinyl acetate copolymer	A copolymeric-wax dispersion, improves the orientation of effect metallic pigment.	Xylene/n-butyl acetate/ n-Butyl alcohol	6	●				●	●				●						●	●

Wetting and dispersing agents

Dispersing agents for WB coloarnts and pigment concentrates

Basic principles

Proper pigment wetting and dispersion are essential for optimum coating performance and appearance. Pigment dispersions and concentrates should provide full color strength, broad compatibility and excellent stability against reflocculation of pigments and viscosity change, all obtained through maximum grinding efficiency with minimum processing time to ensure high production throughput.

NUOSPERSE® wetting and dispersing agents are excellent tools to meet these goals.

In high concentration pigment dispersions, NUOSPERSE® multifunctional dispersing agents wet and deflocculate pigment particles without excessive foaming and adversely affecting film properties of the final coatings. NUOSPERSE® dispersing agents provide the following benefits:

- Rapid pigment wetting
- Good flow at high pigment loading
- Increased mill output
- Maximum tinting strength development
- Full color development
- Compatibility with a broad range of coatings
- Elimination of floating, flooding and rub-up
- Long-term viscosity stability

Waterborne pigment dispersions

NUOSPERSE® FX 7500W is based on a high molecular weight copolymer with multiple anchoring groups. It works exceptionally well with carbon blacks and organic pigments resulting in high jetness and color strength performance. It also has a broad resin compatibility, hence negligible impact on film gloss in tinted systems.

Waterborne light industrial pigment dispersions can be formulated with a combination of NUOSPERSE® FX 365 and NUOSPERSE® FX 600. The amounts and ratios between these two additives are dependent on the pigments used.

Organic pigments and carbon blacks need to be processed on a media mill, while most inorganic pigments can be dispersed via a high speed disperser.

NUOSPERSE® polymeric dispersing agents

NUOSPERSE® FX 600 is a polycarboxylate dispersing agent for waterborne industrial coating systems. Being an effective dispersing agent, NUOSPERSE® FX 600 has no negative influence on water and corrosion resistance of coating films. NUOSPERSE® FX 618, NUOSPERSE® FX 631 and NUOSPERSE® FX 665 are versatile hydrophobic copolymer dispersants that find use in interior and exterior decorative coatings, gloss and semigloss paints, inorganic pigment dispersions, DTM, metal primers, etc. They offer higher gloss potential, increased water and stain resistance. NUOSPERSE® FX 618 shows good stability with zinc oxide and other reactive pigments.

NUOSPERSE® non-ionic wetting agents

NUOSPERSE® and Disponer non-ionic wetting agents are used for pigments wetting and improving storage stability of paints, including freeze-thaw stability. They are also used for substrates wetting and overcoming compatibility and color acceptance issues. Featured low-foaming APE-free products are: NUOSPERSE® FN 211: decorative indoor and outdoor paints and low-cost paints. NUOSPERSE® FN 265: decorative indoor and outdoor paints, pigment concentrates and colorants. NUOSPERSE® FN 270: decorative indoor and outdoor paints, pigment concentrates and colorants. NUOSPERSE® FX 365: industrial coatings, pigment concentrates and colorants Disponer W-18: decorative indoor and outdoor paints

NUOSPERSE® color acceptance improvers

Universal point-of-sales colorants can cause color acceptance issues at times. A quick remedial is to use color acceptance improvers to overcome the problem and improve compatibility between base paints and colorants and reduce rub out issue. NUOSPERSE® 2006 and NUOSPERSE® FA 196 are versatile color acceptance improvers that can be used in all types of waterbrone and solvent-thinned coatings. They ensure homogeneous distribution of the pigment particles and compatibility of the paint components in tinted systems. The result is more homogeneous and consistent color shades from batch-to-batch. NUOSPERSE® FA 115 improves color acceptance similarly to NUOSPERSE® 2006 but only in waterborne systems.

DAPRO® and SUPREAD™ interfacial tension modifiers DAPRO® and SUPREAD™ are surface active additives used to promote substrates wetting, eliminate or reduce film defects such as crawling, fish-eyes and cratering. They promote spreading and uniform film formation on hard-to- wet or contaminated surfaces without affecting recoatability. SUPREAD™ 3410 is an innovative, specially developed branched polysiloxane additive that gives strong surface tension reduction and adsorption effect at liquid/solid interface, resulting in excellent substrate wetting and anti-cratering properties with a low-foaming property. It is suitable for water-based industrial coatings for multiple substrates such as wood, plastic, glass, metal, etc. In wood coatings, it shows excellent pore filling and minimizes microfoam and macrofoam. It can be added at any stage of the manufacturing process and does not impact film gloss, drying time, hardness, block resistance and water resistance properties.

Dispersing and wetting agents for waterborne coatings

Starting point formulas with NUOSPERSE® FX 7500W

Pigment	Conc. [%]	NUOSPERSE® FX 7500W [%]	Defoamer [%]	Preservative [%]	DMAE [%]	Propylene glycol [%]	Water [%]
Carbon Black MA 100	35.0	17.5	0.1	0.1	0.3	4.0	43.0
Evonik® FW 200	15.0	22.5	0.3	0.1	1.0	—	61.1
MONARCH® 1300	15.0	16.5	0.3	0.1	1.0	—	67.1
MONARCH® 1400	18.0	22.5	0.3	0.1	1.0	—	58.1
EMPEROR® 2000	18.0	21.6	0.3	0.1	1.0	—	59.0
Raven® 5000	20.0	30.0	0.3	0.1	1.0	—	48.6
Heliogen® Blue D 7079	37.0	24.0	0.3	0.1	—	—	38.6
Ti-Pure™ R-706	72.0	10.8	0.1	0.2	—	—	16.9
Bayferrox® 3920	55.0	19.3	—	0.2	—	—	25.4

Wetting and dispersing agents

Dispersing agents for solventborne applications

Recommendations

NUOSPERSE® AP 657 is a versatile wetting, dispersing and stabilizing aid for solventborne coatings such as alkyd paints. It is compatible with a broad range of air-drying resins as well as plasticizers.

NUOSPERSE® FA 196 is a 100% active dispersing agent for a wide range of pigments and carbon blacks. It is effective in reducing rub-up and preventing pigment flooding and floating.

NUOSPERSE® FX 9200 and NUOSPERSE® FX 9360 are hyperdispersants used in industrial & automotive coatings and inks (including UV) applications. Based on high molecular weight branched copolymers with multiple pigment anchoring groups, they provide exceptional pigment wetting and dispersing efficiency thereby allowing high pigment loading with full color strength development after a short dispersion time.

Disponer® 9250 is a versatile carboxylated copolymer that works across all types of TiO₂ and inorganic pigments. It results in coatings with enhanced storage stability and color strength.

NUOSPERSE® FX 9086, Disponer 983 and Disponer 9850 are polymeric dispersing agents that are effective for dispersing carbon blacks and organic pigments. They are used in a wide range of high performance solventborne industrial coatings



Wetting and dispersing agents

Wetting and dispersing agents

Product name	Composition	Description	Actives [%]	Solventborne	Waterborne	Compatibilizer	Application																									
							Architectural coatings					Industrial coatings							Construction		Others		Pigments									
							Exterior coatings	High PVC coatings	Flat coatings	Semi-gloss and gloss coatings	Water reducible coatings	Can coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coatings	Wood coatings	Asphalt emulsion	Roof coatings	Adhesives and sealants	Inks	Leather coatings	White	Extenders/fillers	Carbon black	Oxides, sienna and umber	Organic yellow, orange, red	Organic red, violet, purple	Phthalo blue, green	
Wetting agents for waterborne system																																
NUOSPERSE® FN 211	Nonionic surfactant	APE and VOC free, low foaming	100.0		●		●	●	●	●	●									●	●	●	○	●	●	●						
NUOSPERSE® FN 265	Nonionic surfactant	APE and VOC free wetting agent for waterborne decorative paints and colorant systems	90.0		●	●	●	●	●	●	●									●	●	●	○	●	●	●	●	●	●	●	●	
NUOSPERSE® FN 270	Nonionic surfactant	APE and VOC free wetting agent for waterborne decorative base paints, low foaming	100.0		●	●	●	●	●	●	●									●	●	●	○	●	●	●	●	●	●	●	●	
NUOSPERSE® FX 365	Nonionic surfactant	Pigment wetting and dispersing agent for industrial systems	90.0		●	●	○			○	●		●	●		●		●	●	○	○	●	●		●	●	●	●	●	●	●	
NUOSPERSE® 2006	Anionic surfactant	Wetting agent and color acceptance improver	76.0	○	●	●	●	●	●	●	●												●		○	○	○	○	○	○	○	
SUPREAD® 3410	Modified polysiloxane	Excellent substrate wetting and anti-cratering property, low foaming tendency, specially developed for waterbased industrial coatings for wood, plastic, metal, etc.	>90.0		●								●	●		●	●	●	●				●	●								
DAPRO® W-77	Anionic surfactant mix	Interfacial tension modifier for industrial coatings and inks	50.0		●											●		●	●				●	●	●							
Disponer W-18	Non-ionic surfactant	Non-ionic wetting, dispersing, anti-floating, anti-flooding and emulsion stabilizer for waterborne systems.	100.0		●		●	●	●	●	●												●	●	●	●	●	●	●	●	●	
Disponer W-19	Non-ionic surfactant	Non-ionic wetting, dispersing, anti-floating, anti-flooding and emulsion stabilizer for waterborne systems.	100.0		●		●	●	●	●	●													●	●	●	●	●	●	●	●	
Dispersing agents for waterborne and universal pigment dispersions																																
NUOSPERSE® 2000	Hydrophilic humectant	Liquid carrier and humectant with pigment dispersing functionality for low-VOC universal colorants	71.0		●		●	●	●	●	●															●	○	●	○	●	●	●
NUOSPERSE® W-22	Mixture of wetting and dispersing agents	Dispersing agent for waterborne systems, organic yellows, reds, carbon blacks and whites	29.0		●	○	○			○	●		●	●		●	●	●	●				●	●	●	●	●		●	○		
NUOSPERSE® W-30	Anionic dispersant	A wetting and dispersing agent for the manufacture of highly concentrated, low viscosity waterborne pigment dispersions	42.0		●	●					●					●		●	●				●	●	●	○	○	○	○	●	●	●
NUOSPERSE® FA 620	Anionic dispersant	Wetting and dispersing agent for pigment concentrates	50.0		●	●					●					●		●	●				●	●	●	○	○	○	○	●	●	●
NUOSPERSE® FX 7500W	Polymeric dispersant	Highly efficient dispersant for waterborne industrial applications	40.0		●						●	●	●	●	●	●	●	●	●				●	●	●	●	●	●	●	●	●	●
NUOSPERSE® FX 504	Ammonium salt of a polycarboxylic acid	Pigment dispersant for deco coatings	30.0		●		○	●	●											○	●					●		●				
NUOSPERSE® FX 600	Multi-functional polymer	Pigment dispersant for industrial and deco coatings and colorants	25.0		●						●		●	●		●		●	●		○	●	●	●	●	●		●	●	●	●	○
NUOSPERSE® FX 605	Sodium salt of a polycarboxylic acid	Pigment dispersant for deco coatings	45.0		●			●	●													●			●			●				
NUOSPERSE® FX 618	Ammonia neutralized copolymer	Hydrophobic copolymer dispersant, intended for use in high performance interior and exterior waterbased coatings. Good compatibility with NiSat's	35.0		●		●			●	●					●					●				●	●		●				
NUOSPERSE® FX 631	NaOH neutralized copolymer	General purpose dispersant for coatings and inorganic pigment dispersions. Good compatibility with NiSAT's	25.0		●		●			●	●										●				●	●		●				
NUOSPERSE® FX 665	Ammonia neutralized copolymer	Hydrophobic dispersant with excellent water resistance for waterborne industrial and high performance deco paints.	22.0		●		●			●	●										●				●	●		●				

Wetting and dispersing agents

Wetting and dispersing agents(page 2)

Product name	Composition	Description	Actives [%]	Solventborne	Waterborne	Compatibilizer	Application																								
							Architectural coatings				Industrial coatings								Construction		Others		Pigments								
							Exterior coatings	High PVC coatings	Flat coatings	Semi-gloss and gloss coatings	Water reducible coatings	Can coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coatings	Wood coatings	Asphalt emulsion	Roof coatings	Adhesives and sealants	Inks	Leather coatings	White	Extenders/fillers	Carbon black	Oxides, sienna and umber	Organic yellow, orange, red	Organic red, violet, purple	Phthalo blue, green
NUOSPERSE® FA 115	Anionic dispersant	Additive to improve the incorporation of universal colorants into base paints	50.0		●	●					●														○	○	○	○	○	○	
NUOSPERSE® FA 182	Anionic surfactant	Wetting agent and color acceptance improver for dispersion paints; also used to reduce resistance of electrostatic spray paints	65.0	●	●	●																									
NUOSPERSE® FA 196	Phosphate ester	Pigment dispersant for carbon blacks and organic pigments	91.0	●	●	●				○	●	●	●	●	●	●	●	●	●			●	●	●	●		●	●	○	○	○
Disponer W-518	Ammonium salt of a polycacrylic acid	Low foaming polymeric dispersing agent which works effectively for a wide variety of pigments and extenders used in waterborne coatings.	34.0		●		●	●	●	●	●										●		●	●	●						
Wetting and dispersing agent for solventborne system																															
NUOSPERSE® 2008	Anionic dispersant	Pigment dispersant for carbon blacks and organic pigments	100.0	●	●	●					●			○		○	○	○	○						●		●	●	○	○	○
NUOSPERSE® AP 657	High molecular weight polyester	Pigment dispersant for industrial and deco coatings and primers	70-75	●												●	●					●		●	●		●	●	○	○	
NUOSPERSE® 757	High molecular weight polyester	Pigment dispersant for industrial and deco coatings and primers	70-75	●												●	●					●		●	●		●	●	○	○	
NUOSPERSE® FX 9086	Polymeric dispersant	Dispersant for industrial coatings.	50.0	●								●	●	●	●	●	●	●	●			●	●	●	●	●	○	○	○	○	
NUOSPERSE® FX 9200	Polymeric dispersant	NUOSPERSE® FX 9200 is suitable for solventborne and non-solvent inks. It provides good wetting and dispersing performance to organic pigments and carbon blacks.	100.0	●																		●	●	●	●	●	●	●	●	●	
NUOSPERSE® FX 9360	Highly branched copolymer containing multiple anchoring groups	It provides good wetting and dispersing performance to organic pigments and carbon blacks.	40.0	●								●	●	●	●	●	●	●	●				○	●	●	●	●	●	●	●	●

Wetting and dispersing agents

Wetting and dispersing agents(page 3)

Product name	Composition	Description	Actives [%]	Solventborne	Waterborne	Compatibilizer	Application																										
							Architectural coatings					Industrial coatings								Construction		Others		Pigments									
							Exterior coatings	High PVC coatings	Flat coatings	Semi-gloss and gloss coatings	Water reducible coatings	Can coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coatings	Wood coatings	Asphalt emulsion	Roof coatings	Adhesives and sealants	Inks	Leather coatings	White	Extenders/fillers	Carbon black	Oxides, sienna and umber	Organic yellow, orange, red	Organic red, violet, purple	Phthalo blue, green		
Wetting and dispersing agent for solventborne system																																	
Disponer 903	Modified polysiloxane	Additive to eliminate floating, flooding and silking in multi-pigment system. Post addition possible.	8.5 - 10.5	●								○	○	○	○	●	●	●	●							○	○	○	○	○	○	○	
Disponer 904	High molecular weight	Wetting dispersing, anti-floating and anti-flooding agent for solventborne paints	49.0 - 51.0	●								○	○	○	○	●	●	●	●							●	●		●				
Disponer 904S	Solution of polycarboxylic acid polymer with modified polysiloxane	Additive for polar and non-polar systems. Activity for the most part independent of the binder. For systems based on alkyd, epoxy, acrylic resins, PUR, polyesters and vinyl compounds.	49.0 - 51.0	●								●	●	●	●	●	●	●	●							●	●		●				
Disponer 912	Solution of a salt of polyamide and polyester, electroneutral	Suitable for use with various organic and inorganic pigments. Higher pigment loadings are possible with lower viscosities.	48.0 - 52 .0	●								○	○	○	○	●	○	●	●							●	●		●				
Disponer 923S	Electroneutral amine salt of polycarboxylic acid with modified polysiloxane	Exceptional pigment wetting, dispersing, anti-settling, flooding and floating additive. Acts as activator for bentonites.	38.0 - 41.0	●								○	○	○	○	●	○	●	●							●	●		●				
Disponer 9250	Solution of a copolymer with acidic groups	Excellent wetting and dispersing agent for the stabilization of inorganic pigment	48.5 - 51.5	●								●	●	●	●	●	●	●	●							●	●	●		●	○	○	○
Disponer 929	Anionic surfactant	An unique dispersant specifically for carbon black, excellent color development and flocculation stability	48.0 - 51.0	●												●										●	●	●					
Disponer 983	High molecular weight polymer	Polymeric dispersant for wetting and dispersing of carbon black, prevents pigment reflocculation.	52.5 - 54.5	●								●	●	●	●	●	●	●	●					○		○	○	●					
Disponer 9850	High molecular weight polymer solution	Developed for organic pigment, exhibits excellent dispersing and wetting performance.	44.0 - 47.0	●								●	●	●	●	●	●	●	●					○	●	●	●	●	●	●	●	●	

Defoamers

Defoamers for waterborne applications

Selecting the optimum defoamer

Foam control is a complex problem. No single product is adequate for all applications. DAPRO® defoamers are based on a variety of active materials to provide air release and bubble-breaking for most applications. Elementis DAPRO® defoamers are effective in both the grind and letdown stages in the manufacture of a wide range of coating systems. This enables customers to reduce the number of foam control agents in their inventory. It is suggested to evaluate several DAPRO® foam suppressors to determine the most effective one for any given formulation.

Basic principles

In general, defoamers work by destabilizing foam through an incompatibility mechanism. It is important to select a combination of grind and letdown defoamers that works synergistically. This combination is often required when the pigment dispersion retains a lot of air. When the optimum grind and letdown defoamers are used together, a lower total amount of defoamer is required.

Defoamers which are more dispersible improve compatibility and gloss, reduce film defects and improve color acceptance. Typically, letdown defoamers are less hydrophobic and have better dispersibility.

When there is little air entrained in the grind paste, a small amount of a defoamer appropriate for the letdown can often be used in both the grind paste and letdown.

Grind defoamers require shear to disperse into the system. The lower the dispersibility, the more shear is required and the more effective the defoamer will be. Typically, grind defoamers are very hydrophobic and have low dispersibility. They are usually very effective and only a small amount is used. They are normally not recommended for letdown as they may cause surface defects.

Letdown defoamers require low shear to disperse into the system. The higher the dispersibility, the easier the defoamer will mix into the system.

Mineral oil defoamers are cost effective and have good persistency; however, in some systems they can cause gloss reduction at higher dosage levels.

Glycols and polyglycols do not reduce gloss and have good compatibility with resins but are often less effective and persistent than oil-based defoamers.

Product highlights

DAPRO® AP 7010 is a tried-and-true industry standard defoamer offering outstanding anti-foaming, bubble breaking and superb storage stability. It is free of APEO and VOC and specially developed for architectural paints and adhesives systems.

DAPRO® AP 7015S is an APEO- and VOC-free defoamer which gives excellent balance between anti-foaming, bubble breaking and compatibility. It provides optimum storage stability and water dispersibility in waterborne systems.

DAPRO® AP 7072 is a water dispersible foam control agent. It has good compatibility in most waterbased systems, while exhibiting excellent defoaming and anti-foaming performance. DAPRO® AP 7072 is recommended for use in architectural coatings and adhesives applications.

DAPRO® DF 7079 is an APEO-free and cost effective defoamer for architectural paints such as low odor environmentally friendly coatings. This defoamer offers excellent anti-foaming and defoaming performance with good long-term persistency.

DAPRO® DF 7160 is a highly dispersible mineral oil-based defoamer with fast spreading speed, easy emulsification for low shear incorporation. It is suitable for a wide range of applications, such as pressure sensitive adhesives, water based ink, emulsion polymerization and leather finishing offering excellent antifoam and defoaming performance.

DAPRO® DF 696 is a highly efficient silicone grind defoamer which gives effective and persistent foam control in water-based inks and coatings formulations. It is easy to incorporate and disperses well into a wide range of formulations giving excellent performance and compatibility.

DAPRO® BIO 9910 is a vegetable oil-based defoamer that gives similar, if not better than, defoaming/anti-foaming performance as standard mineral oil defoamers such as DAPRO® AP 7010. It shows excellent compatibility and can be used in milbase and letdown processes.

Defoamers for solventborne applications

Basic principles

DAPRO® and Defom defoamers are silicone and silicone-free polymers. This broad product line offers a multitude of solutions in combating foam generated during the manufacture and application processes of solventborne coatings.

Defom 3500 is a polyacrylate defoamer specially developed for alkyd-based wood primers containing zinc stearate. When used together with Disponer 912, a synergistical effect in defoaming and wetting on wood pores is seen.

Products highlights

DAPRO® AP 1622 is a highly effective silicone defoamer used in oil and alkyd modified urethanes, nitrocellulose lacquers, chlorinated rubber and epoxies.

Defom 5300 is a general purpose silicone defoamer that provides excellent defoaming and compatibility in industrial solventborne coatings such as auto refinishing coatings.

Defom 5800F is an aromatic-free, general purpose defoamer for industrial solventborne coatings. It shows good system compatibility in various coating systems. Defom 6800 is a strong anti-foamer and deaerator based on polysiloxane and hydrophobic particles that finds use in thick film build epoxy coatings and flooring and silk screen inks.



Defoamers

Defoamers

Product name	Composition	Description	Solventborne	Waterborne	Application																							
					Architectural coatings						Industrial coatings								Construction						Others			
					Deco grind	Deco letdown	Flat coatings	Semi-gloss/gloss coatings	Water reducible coatings	Can coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coatings	Wood coatings	Asphalt emulsion	Concrete	Grouts	Plaster/stucco	Roof coatings	Tile adhesive	Adhesives and sealants	Emulsion synthesis	Inks	FRP	Leather coatings
DAPRO® AP 1622	Modified polysiloxane solution	Has outstanding defoaming properties in a variety of solvent systems. Easy to incorporate in solvent-borne coatings and inks.	●							●	●	●	●	●	●	●							●		●			
DAPRO® AP 7010	Dispersion of wax in mineral oil	It is specially recommended for systems with good emulsifying properties, such as surfactant stabilised emulsions and emulsion paints.The product shows very good long-term efficiency.		●		●	●							●	●		○										●	
DAPRO® AP 7015S	Dispersion of wax in mineral oil	A defoamer for waterborne systems with good emulsifying properties. It has excellent anti-foaming and de-foaming effects.		●	●	●	●							●	●		○	●				●	●	●		●	●	
DAPRO® AP 7072	A blend of hydrophobic silica, emulsifiers and mineral oil	Effective in high quality rubber applications and provides excellent foam suppression and defoaming erformance. DAPRO® AP 7072 is readily dispersible in water.		●																		●	●	●				
DAPRO® DF 605	Silicone emulsion	An excellent defoamer for water based elastomeric coatings, mastics and water reducible industrial coatings		●					○									○	●	●		●	●					
DAPRO® DF 675	Blend of glycols and modified polysiloxanes	Useful in high quality decorative and no-VOC decorative coating for maintaining gloss and minimizing surface defects		●	●		●	●	●	●	●	●	●	●	●	●	●						●		●		●	
DAPRO® DF 677	Silicone emulsion	An excellent defoamer for water based industail coatings and inks.		●						●	●	●	●	●	●	●	●						●		●		●	
DAPRO® DF 696	A blend of glycols, hydrophobic silica powder and organic modified polydimethylsiloxanes	Optimum foam control in pigment grinding process; may be used in letdown stage in certain systems		●	●		●	●	●	●	●	●	●	●	●	●	●							●		●	●	
DAPRO® DF 7005	dispersion of wax in mineral oil, Silicone free	Silicone free mineral oil type defoamer for deco paints application with long-term efficiency		●	●	●	●																●					
DAPRO® DF 7073	An emulsion of water, hydrophobic silica and mineral oil	Water dispersible foam control agent for decorative paints and coatings. It is effective in a broad range of high PVC paint systems by providing rapid bubble break at low concentrations. DAPRO® DF 7073 has little to no effect on gloss.		●			●																					
DAPRO® DF 7079	A blend of hydrophobic silica in mineral oil	Excellent foam control as both the grind and let down defoamer in paints and coatings. It is particularly effective in semi-gloss and high gloss paints in providing rapid bubble break at low concentrations.		●			●							●	●		●						●					
DAPRO® DF 7160	Hydrophobic silica blending with mineral oil	Easy disperse for pressure sensitive adhesive, latex syntheis and ink application with excellent antifoam and defoaming performance. Shows excellent foam control, less microfoam and increase coating speed while roller coating adhesive latex on BOPP film to reduce file transparency concern after processing.		●		●	●							●								●	●	●		●		
DAPRO® BIO 9910	Fine dispersion of wax in vegetable oil	Vegetable oil based defoamer for waterborne applications; excellent compatibility, fast defoaming performance and good long-term persistency		●		●	●							●	●		○									●		
DAPRO® PD 801W	A blend of liquid defoamer on an inert carrier	Effective in the defoaming of entrained air in drywall joint compounds and other dry mixes		●														●	●	●								
DAPRO® PD 829	A blend of liquid defoamer on an inert carrier	Effective at preventing air entrainment in dry wall joint compounds and other dry mixes		●														●	●	●								

Defoamers

Defoamers (Page 2)

Product name	Composition	Description	Solventborne	Waterborne	Application																						
					Architectural coatings					Industrial coatings								Construction					Others				
					Deco grind	Deco letdown	Flat coatings	Semi-gloss/gloss coatings	Water reducible coatings	Can coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coatings	Wood coatings	Asphalt emulsion	Concrete	Grouts	Plaster/stucco	Roof coatings	Tile adhesives	Adhesives and sealants	Emulsion synthesis	Inks	FRP
Defom 2700	Foam destroying polymer silicone-free	A silicone-free bubble releasing and anti-foaming agent for solventborne or solvent-free systems. It is more suitable for epoxy, unsaturated polyester and UV curing coatings.	●										●	●		●						●					
Defom 3100	Foam destroying polymer silicone-free	A silicone-free bubble releasing and anti-foaming agent for solventborne and solvent-free system.	●											●	●		●						●		●		
Defom 3200	Foam destroying polymer silicone-free	A silicone-free bubble releasing and anti-foaming agent for solventborne and solvent-free systems.	●											●	●		●						●		●		
Defom 3500	Foam destroying polymer, silicone-free	A silicone-free bubble releasing and anti-foaming agent for solventborne and solvent-free systems, especially in deaeration of high filler content wood primer.	●											●			●						●		●		●
Defom 5300	Modified polysiloxane	A bubble releasing, anti-foaming agent for high build PU coatings.	●						●	●	●	●		●	●	●	●						●				
Defom 5400	Modified polysiloxane	A solventborne bubble releasing, anti-foaming agent characterized by its improved compatibility.	●						●	●	●	●		●	●	●	●						●				
Defom 5500	Modified polysiloxane	A bubble releasing, anti-foaming agent for solventborne coatings.	●						○	●	●	○		●	●	●	●						●				●
Defom 5800F	Modified polysiloxane	An aromatic-free defoamer used in solventborne coatings.	●						●	●	●	●		●	●	●	●						●				
Defom 6500	Modified polysiloxane	A bubble releasing, anti-foaming agent for solventborne coatings.	●						○	●	●	○		●	●	●	●						●				
Defom 6800	Polysiloxane containing hydrophobic particles	A bubble releasing, anti-foaming agent for thick film epoxy floor coatings and silk screen ink.	●											●	●								●		●		●
Defom W-082	Mixture of mineral oil and hydrophobic particle	A hydrocarbon based waterborne defoamer, exhibit excellent antifoaming and defoaming effect.		●			●	●															●	●	●		●
Defom W-086	Mixture of mineral oil and hydrophobic particle	Hydrocarbon based waterborne defoamer, exhibits excellent anti-foaming and defoaming properties. Disperses well in water.		●			●	●															●	●	●		

Slip and leveling additives

Basic Principles

DAPRO®, Levaslip and Levelol leveling and slip agents are based on modified polysiloxane and polyacrylate chemistries. They improve surface slip and leveling by quickly migrating to the coating surface and reduce surface tensions of the drying films. They promote levelling and eliminate the development of Benard cells, thus providing a uniform surface and color. In addition, the structures of the modified polysiloxanes provide a low coefficient of friction on coating surface after drying and enhance surface smoothness, slip and anti-scratch properties.

Polysiloxane leveling agents can negatively impact recoatability of dried films if they are too incompatible with other paint components or degrade under high temperature. Where the use of polysiloxane leveling agents is not recommended, Levelol polyacrylate leveling agents are the best alternatives for systems requiring good recoatability such as primers. They not only enhance film smoothness, but also promote leveling speed and substrate wetting. For very demanding applications, fluorocarbon-modified additives such as Levelol 837 and Levelol 839 are recommended.



Slip and leveling additives

Slip and leveling additives

Product name	Composition	Description	Solvent	Non-volatile content [%]	Solventborne	Waterborne	Application										
							Industrial coatings								Others		
							Can coatings	Car-OEM coatings	Car refinsh coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coatings	Wood coatings	Adhesives and sealants	Inks	Leather coatings
SLIP-AYD® FS 444	Modified polysiloxane	Slip and mar resistance agent for a wide range of applications such as waterborne and polar solventborne applications	Dipropylene glycol ether	50.0	●	●			●		●		●	●	●	●	●
Levaslip 411	Modified polysiloxane	Improves slip and leveling properties, reduces craters, fish eyes and pinholes.	Toluene	7.2	●						●	●	●	●			●
Levaslip 432	Modified polysiloxane	Provides leveling, slip and substrate wetting, enhances orientation of matting silica to achieve uniform appearance.	Xylene/ethyleneglycol monobutyl ether/ toluene	13.5	●				●		●	●	●	●			
Levaslip 435	Modified polysiloxane	Provides excellent slip, anti-silicone effect, reduces coating's defects such as pinholes and craters on contaminated substrates.	None	>98.0	●						○		○	○		●	●
Levaslip 455	Modified polysiloxane	Enhances leveling, slip and and anti-floating properties. Provides anti-blocking for both water- and solventborne applications.	Ethyleneglycol monobutyl ether	50.0	●	●					●		○	○	●	○	●
Levaslip 466	Modified polysiloxane	Good flow, leveling and slip performance, excellent wetting properties. Prevents surface defects.	Xylene/ethyleneglycol monobutyl ether	24.0	●						●	●	●	●			
Levaslip 810	Modified polysiloxane	A modified polysiloxane, imparts leveling and slip performance.	N.A.	>90.0	●				●		●	○	●	●		●	●
Levaslip 836	Modified polysiloxane	Good compatibility and recoatability in various non-aqueous coatings, enhances orientation in metallic and mat coatings.	Xylene/isobutanol	24.0	●						●	●	●	●			
Levaslip 866	Modified polysiloxane	An additive to increase mar resistance and to improve slip as well as surface flow, suitable for solventborne systems	Xylene/ethyleneglycol phenyl ether	24.5	●						●	●	●	●			
Levaslip 875	Modified polysiloxane	Polysiloxane surface additive with excellent compatibility, anti cratering, slip and leveling for wood coatings and general industrial coatings	Aromatic hydrocarbon solvent/ r-btyrolactone	50.0	●						●		●	●			
Levaslip 876	Modified polysiloxane	Good compatibility polysiloxane surface aditive to provide good substrate wetting, ant-cratering performance, slip and excellent leveling for wood coatings, and general industrial coatings.	Xylene/ethyleneglycol phenylether	13.0	●						●	●	●	●			
Levaslip 879	Modified polysiloxane	Excellent slip performance, good compatibility and recoatability	N.A.	>94.0	●				●		●	●	●	●	●	●	
Levelol 495	Acrylic copolymer	Non-silicone flow and leveling agent, reduces craters and pinholes.	Xylene	50.0	●		●	●	●	●	●	●	●	●	●		
Levelol 835	Acrylic copolymer	Improves flow and leveling, good compatibility and intercoat adhesion.	Xylene	50.0	●		●	●	●	●	●	●	●	●			●
Levelol 837	Fluorocarbon modified polyacrylate	Excellent substrate wetting, improves flow and leveling, good compatibilty and intercoat adhesion.	Xylene	70.0	●		●	●	●	●	●	●	●	●	●		●
Levelol 839	Fluorocarbon modified polyacrylate	An aromatic free, flow and leveling agent used in solventborne coatings. It can reduce the surface tension of a coating system, and shows good substrate wetting. It prevents crater, pinhole, and fisheye defects.	Proplene glycol monomethylether acetate	50.0	●		●	●	●	●	●	●	●	●	●		●
Levelol TSP	High boiling point solvents with surfactant	Leveling, anti-blushing, anti-popping agent, helps release of entrapped air	Aromatic hydrocarbon solvent	100.0 (active)	●		●	●	●	●	●	●	●	●			
Levelol W-469	Modified polysiloxane	Silicone type substrate wetting agent for waterborne systems	N.A.	ca. 100.0	●	●		●	●		●	●	●	●	●	●	●



Specialty additives

Rust Inhibitors

NALZIN® FA 179 and NALZIN® FA 180 are flash rust and corrosion inhibitors for waterborne coatings to counteract flash rusting. They may be used as inhibitors against in-can corrosion as well.



	After 1 hr.	After 2 hrs.	After 3 hrs.	After 24 hrs.
+0.30 wt% NALZIN® FA 179	0	0	0	0
Blank	6	6	16	90

Adhesion Promoters

Elementis supplies a range of Adherent and DAPRO® adhesion promoters to improve adhesion of coating films on various substrates. Adherent 1121 is an amino silane coupling agent which improves the adhesion of air-dry alkyd paints to glass and metal substrates. It also improves the salt spray resistance of epoxy coating film when subject to high humidity or water immersion conditions.

Adherent ADP is a non-silicone polymeric compound that improves adhesion of paint film on non-ferrous substrates. Used mainly in baking paints, it improves the flexibility and impact resistance of paint films and shows good thermostability. Adherent ADP does not discolor at elevated temperature.

Adherent APW is an additive that improves intercoat adhesion and binding of metal pigments in the paint film. It also improves the flexibility and chemical resistance of paint films of acrylic and alkyd baking paints.

Adherent CP-7540 is a chlorinated polyolefin modified acrylic resin that gives excellent adhesion property in solventborne primers for PP bumpers. DAPRO® ACP- 16W is an APEO and VOC-free waterborne acrylic modified chlorinated polyolefin dispersion that provides excellent adhesion on polypropylene (PP) and thermoplastic polyolefin (TPO) substrates.

DAPRO® ACP-16W can be used as the main resin or combined with other resins. It may be formulated into clear coat or colored coat for waterborne automotive basecoats, adhesives and inks, etc.

Specialty additives

Specialty additives

Product name	Composition	Description	Solventborne	Waterborne	Application																							
					Architectural coatings						Industrial coatings							Construction					Others					
					Exterior coatings	High PVC coatings	Flat coatings	Semi-gloss/gloss coatings	Water reducible coatings	Can coatings	Car-OEM coatings	Car refinish coatings	Coil coatings	General industrial coatings	Marine protective coatings	Plastic coatings	Wood coatings	Asphalt emulsion	Concrete	Grouts	Plaster/stucco	Roof coatings	Tile adhesives	Adhesives and sealants	Inks	Leather coatings		
Adhesion promoters																												
DAPRO® ACP-16W	Chlorinated polyolefin modified acrylic emulsion	Promotes adhesion of waterborne coatings and inks on polypropylene substrates.		●								●					●									●		
Adherent 1051	Epoxy silane	Improves adhesion of solvent-borne coatings to inorganic surfaces.	●							●	●		●	●		●									●	●		
Adherent 1121	Amino silane	Promotes adhesion of paint to glass and metal substrates and enhances salt spray resistance.	●	●						●	●		●	●		●									●	●		
Adherent ADK	Non-silicone polymeric solution	Improves adhesion of OPP laminating inks on PET film. Does not effect gloss or color strength of printing inks.	●													●									●	●		
Adherent ADP	Non-silicone polymeric compound	Improves adhesion of stoving paints on non-ferrous substrates.	●										●	●														
Adherent APC	Non-silicone polymeric solution	Improves adhesion of 2K PU coatings on polycarbonates.	●														●											
Adherent APW	Non-silicone polymeric solution	Improves inter-coat adhesion and fixing of aluminum flakes.	●											●		●										●		
Adherent CP-7540	Chlorinated polyolefin modified acrylic resins	Improves adhesion of primer on PP substrates.	●									●	●				●											
Adherent PPB	Chlorinated PP	Improves adhesion of primer on PP substrates.	●									●	●				●									●		
Coalescents																												
DAPRO® FX 514	Plasticizer	Coalescing agent for VOC compliant systems		●	●	○	●	●															●		●			
Flash rust inhibitors																												
NALZIN® FA 179	Zinc complex in a mixture of solvents	Liquid flash rust inhibitor for waterborne systems		●					●					●	●													
NALZIN® FA 180	Zinc complex in a mixture of solvents	Liquid flash rust inhibitor for waterborne systems		●					●					●	●													
Amine Neutralizer																												
DeuAdd MA-95	Aminoalcohol	Neutralizer to adjust and stabilize pH of waterborne systems.		●	●	●	●	●	●					●	●		●	●							●	●	●	
Catalysts																												
Catacure KB	Acidic polymer	Curing catalyst for melamine baking paint.	●												●													
Catacure KC	Amine salt of p-toluenesulfonic acid	Blocked curing catalyst for fully alkylated melamine baking paints, enables lower baking temperatures or shorter baking times	●												●													

Hydroxyl acrylic resins

Basic principles

Polyurethanes coatings are two-component systems consisting of hydroxyl acrylic resins, pigments, additives and solvents on the one part, and isocyanate curing agents on the other part. They provide many good features such as excellent mechanical properties, decorative properties (high gloss, high film build), weathering resistance, chemical resistance, and adhesion to a wide range of substrates.

The coating film can be cured under ambient drying and low temperature baking conditions. Film gloss and appearance can be customized on demand. Because of these features, they are widely used in protective coatings, marine coatings, auto refinishes, metal coatings, general industrial coatings, coatings for public transport (buses, trains, trucks, etc.) and ACE machineries (agriculture, construction and earth moving), plastic coatings, wood coatings, etc.

Hypomer MT-series of high performance matting resins
Hypomer MT-2550F and Hypomer MT-2550K are hydroxyl acrylic resins that give excellent matting effect yet better clarity and transparency than conventional 2K PU coatings containing silica matting agents. Apart from the excellent optical properties, these resins also provide good hand feel, slip as well as excellent adhesion on plastic substrates such as ABS and ABS/PC. A key benefit of these resins is their gloss consistency over a wider range of dry film thickness compared to the conventional system in spray application.

Both Hypomer MT-2550F and Hypomer MT-2550K allow the formulation of coatings with varying degrees of gloss (from full matt to semi-gloss finishes) by combining with other hydroxyl acrylic resins. The resultant coatings can be used in various industrial applications such as 3C products (computers, communication and consumer), automotive interior and exterior coatings, auto refinishes, wood coatings and inks.

Hypomer FS-2060A for special substrate

Hypomer FS-2060AF is an aromatic-free hydroxyl acrylic resin developed for difficult-to-adhere substrates such as aluminum and its alloys, galvanized sheet, chrome plated sheet, polycarbonate, ABS/PC, nylon, etc. It also shows good pigment wetting and compatibility with CAB. It can be formulated into pigmented coatings and metallic coatings with excellent substrate/intercoat adhesion, good film properties and ease of application.

Hypomer FS-4075AF

Hypomer FS-4075AF is a new generation of high solid content and low viscosity hydroxyl acrylic resin with no benzene, toluene and xylene present. It effectively reduces the VOC of a paint formulation and is more environmentally friendly.

In spray application, Hypomer FS-4075AF provides excellent film performance including long/short wavelength leveling, high film build, high gloss and DOI. With all these benefits, it is suitable for high quality paint film coatings, such as automotive coatings, car refinish coatings and railway coatings.



Resins

Resins

Product name	Composition	Description	Non-volatile content %	OH %	Application					
					Car-OEM coatings	Car Refinish coatings	General industrial coatings	Inks	Plastic coating	Wood coating
BLR-8086	Blocked aliphatic polyisocyanate	BLR-8086 is a blocked aliphatic polyisocyanate, which is used to formulate one component polyurethane baking paint	74.0 - 76.0	N.A.	•		•			
Hypomer AC-7435	Acrylic copolymer	Fast drying, good hardness, good adhesion to plastic surfaces. Good water sweat and alcohol resistance	48.0 - 52.0	N.A.					•	
Hypomer AC-7450	Acrylic copolymer	Rapid drying, good adhesion to plastics, alcohol resistance	48.0 - 52.0	N.A.					•	
Hypomer FS-2050	Hydroxyl acrylic copolymer	Rapid drying, good adhesion to plastics	49.5 - 52.0	1.00	•	•	•		•	
Hypomer FS-2052	Hydroxyl acrylic copolymer	Fast drying, weather resistance, good compatibility with CAB	48.0 - 52.0	1.00	•	•	•	•	•	
Hypomer FS-2060AF	Hydroxyl acrylic copolymer	Good adhesion to plastics and metal substrates, good weather resistance, BTX-free	58.0 - 62.0	1.20	•	•	•		•	•
Hypomer FS-2060B	Hydroxyl acrylic copolymer	Automobile refinishes, plastic coatings	58.0 - 62.0	1.20	•	•	•		•	•
Hypomer FS-2451	Hydroxyl acrylic copolymer	Fast drying and high hardness, good adhesion to plastic substrates. Good alcohol resistance, good orientation of metallic pigments, good compatibility with cellulose acetobutyrate (CAB) and nitrocellulose	48.0 - 52.0	1.20	•	•	•		•	
Hypomer FS-2451F	Hydroxyl acrylic copolymer	Fast drying, high hardness, good solvent resistance, good adhesion to plastic substrates, good orientation of metallic pigments, more environmentally friendly solvent	48.0 - 52.0	1.20	•	•	•		•	
Hypomer FS-2460A	Hydroxyl acrylic copolymer	Good adhesion to plastics, excellent weather and yellowing resistance	59.0 - 62.0	1.44	•	•	•		•	•
Hypomer FS-2820	Hydroxyl acrylic copolymer	Good adhesion to plastics, excellent weather and yellowing resistance	59.0 - 62.0	1.68	•	•	•		•	•
Hypomer FS-2860A	Hydroxyl acrylic copolymer	High film build, gloss and DOI, good leveling, good pigment wetting	58.0 - 61.0	1.68	•	•	•		•	•
Hypomer FS-2860AF	Hydroxyl acrylic copolymer	High gloss, good hardness, high curing speed, BTX-free	58.5 - 61.5	1.68	•	•	•		•	•
Hypomer FS-2970B	Hydroxyl acrylic copolymer	High film build, high gloss	67.5 - 70.0	2.03	•	•	•		•	
Hypomer FS-2970F	Hydroxyl acrylic copolymer	High film build, gloss and DOI, good leveling, good pigment wetting	67.0 - 71.0	2.03	•	•	•		•	
Hypomer FS-3060	Hydroxyl acrylic copolymer	Low viscosity, excellent film build, gloss and DOI, fast curing speed, excellent hardness and solvent resistance, pigment dispersibility	59.0 - 62.0	1.80	•	•	•		•	•
Hypomer FS-3270	Hydroxyl acrylic copolymer	High film build, high gloss, DOI	68.0 - 72.0	2.24	•	•	•		•	•
Hypomer FS-3566F	Hydroxyl acrylic copolymer	Excellent film build, gloss and DOI, fast cure, long pot-life, low VOC, BTX-free	63.0 - 67.0	2.28	•	•	•		•	•
Hypomer FS-4075AF	Hydroxyl acrylic copolymer	High solids low viscosity, good leveling, high film build	73.0 - 77.0	3.00	•	•	•		•	
Hypomer FS-4365AF	Hydroxyl acrylic copolymer	Automobile refinish, transportations and industrial applications.	63.0 - 66.0	2.80	•	•	•		•	
Hypomer FS-4470	Hydroxyl acrylic copolymer	High solid with low viscosity, high gloss and film build, good leveling	68.0 - 72.0	3.10	•	•	•		•	
Hypomer FS-4660P	Hydroxyl acrylic copolymer	Superior gloss and DOI, good leveling, solvent resistance	57.5 - 61.5	2.76	•	•	•		•	•

Product name	Composition	Description	Non-volatile content %	OH %	Application					
					Car-OEM coatings	Car Refinish coatings	General industrial coatings	Inks	Plastic coating	Wood coating
Hypomer FX-2050	Hydroxyl acrylic copolymer	Rapid drying, good adhesion to plastic substrates	50.0 - 52.0	1.00	•	•	•		•	
Hypomer FX-2451F	Hydroxyl acrylic copolymer	Fast drying and high hardness, good adhesion to plastic substrates, good alcohol resistance, more environmentally friendly solvent composition	48.0 - 52.0	1.20	•	•	•		•	
Hypomer FX-2820F	Hydroxyl acrylic copolymer	Good pigment wetting, good weather resistance, more environment friendly solvent composition	58.0 - 62.0	1.68	•	•	•		•	•
Hypomer FX-2860A	Hydroxyl acrylic copolymer	High gloss, good hardness, rapid drying, fast curing, solvent resistant, good film build	58.0 - 62.0	1.68	•	•	•		•	•
Hypomer FX-2970A	Hydroxyl acrylic copolymer	High film build, gloss and DOI	67.5 - 70.5	2.03	•	•	•		•	
Hypomer FX-3270	Hydroxyl acrylic copolymer	High film build, high gloss, DOI	67.0 - 71.0	2.24	•	•	•		•	•
Hypomer FX-4660	Hydroxyl acrylic copolymer	High gloss, superior leveling, hardness and high crosslinking density	58.5 - 61.5	2.76	•	•	•		•	•
Hypomer MT-2350	Hydroxyl acrylic copolymer	Good matting function, easy incorporation, less sedimentation	48.0 - 52.0	1.17	•	•	•	•	•	•
Hypomer MT-2550F	Hydroxyl acrylic copolymer	Matting resin, yields better transparency than conventional matt coatings based on silica matting agents, smooth film with excellent touch feel, good weathering resistance	48.5 - 52.0	1.25	•	•	•	•	•	•
Hypomer MT-2550K	Hydroxyl acrylic copolymer	Based on the polymer in Hypomer MT-2550F but contains a more environmentally friendly solvent mixture	48.5 - 52.0	1.25	•	•	•	•	•	•
Hypomer PE-8043F	Hydroxylate polyester polyol	High film build, good leveling, excellent low temperate elasticity, good pigment wetting	77.0 - 81.0	3.40					•	

