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Application Leaflet
January 2014

Additives for Wood and Furniture Coatings



Innovation • Compliance • High Performance



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Introduction

Wood coatings present tremendous challenges in view of the porous nature of wood. The presence of air bubbles and poor wetting during and after application are some of the prominent surface defects encountered by coating formulators. The use of sanding aid and fillers in sealers and primers also causes settling due to their high densities. In addition, wood topcoats are required to give good quality finish such as good leveling, surface slip property, scratch resistance, good touch-feeling and surface evenness. [Elementis Specialties](#) offers a series of additives to help customers meet these challenges and solve the day-to-day problems. This brochure outlines the main products of Elementis that have been used successfully in this market and highlights the attributes of several key products.

Defoamers

Product	Composition	Principal Use
DAPRO® AP 1622	Silicone/hydrocarbon solvent	Oil and alkyd modified urethanes, nitrocellulose lacquers, chlorinated rubber and epoxies
Defom 5300	Modified polysiloxane	Solvent-based coatings
Defom 5800F	Modified polysiloxane	Solvent-based coatings, toy coatings
Defom 6500	Modified polysiloxane	Solvent-based coatings, industrial coatings, epoxy coatings
Defom 2700	Foam destroying polymer, silicone-free	UV curing coatings, unsaturated polyester composites, epoxy coatings
Defom 3150	Foam destroying polymer, silicone-free	Unsaturated polyester coatings
Defom 3500	Foam destroying polymer, silicone-free	Wood primers

Defoamers for Sealers/Primers/Color base coat

Wooden materials need to be properly sealed with carefully formulated sealers or primers. A common problem of these coatings is the air bubbles caused by zinc stearate, calcium carbonate, and talc which are commonly used in the formulations. [Disponer 912A](#) and [Defom 3500](#) are recommended for to solveing this kind of problem effectively as shown in Figure 1 and 2. They also help to de-aerate the air trapped in the wood pores.



Figure 1 Foam suppression after high speed mixing (top view)

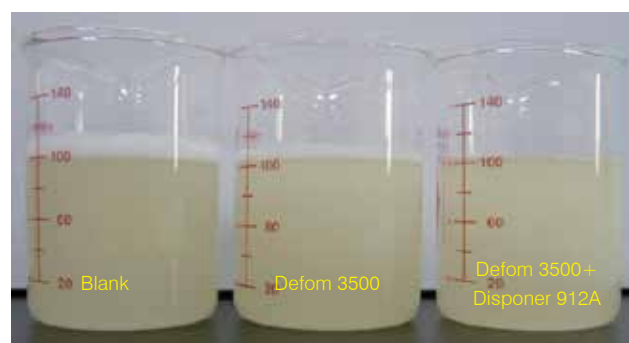


Figure 2 Foam suppression after high speed mixing (side view)

Disponer 912A is an effective agent for wetting and dispersing of pigments fillers as well as an activator for organoclays. It effectively reduces the viscosity and stabilizes the dispersion. It also promotes good wetting of wood pores thereby allowing fast air release.

Defom 3500 can quickly eliminate the air bubbles in primer formulations generated during mixing, transportation and application. It can also have synergistic effect when combined with **Disponer 912A**. The bubbles elimination on the wood pores after spraying is shown in Figure 3.



Figure 3 Defoamer, De-Bubble Behavior

Dispersing Agents

Product	Composition	Principal Use
Disponer 912A	Solution of a salt of polyamide and polyester, electro neutral	Solvent-based coatings, wood primer
Disponer 923	Electroneutral amine salt of polycarboxylic acid	Medium to high polarity inorganic pigment system
Disponer 923S	Electroneutral amine salt of polycarboxylic acid with polysiloxane	Medium to high polarity inorganic pigment system
Disponer 926	Anionic surfactant	Medium to high polarity organic pigment system
Disponer 929	Anionic surfactant	Organic pigment system
Disponer 983	High molecular weight polymer	Solvent-based coatings
Disponer 9250	Solution of a copolymer with acidic groups	Acrylic/melamine, acrylic polyurethane
Disponer 9850	Modified polyurethane	Acrylic/melamine, alkyd/melamine, acrylic polyurethane
NUOSPERSE® FX 9086	Polymeric surfactant dissolved in methoxy propyl acetate	Industrial coatings

As shown in Figure 4 and 5 addition of **Disponer 912A** as activator for organoclay, improves the pourability of the gel and appearance of the wood surface by giving a nice and uniform finish.



Figure 4 *Disponer 912A: As a Bentone Activator*



Figure 5 *Wetting effect on wood substrate*

Disponer 9250 is an effective wetting & dispersing and viscosity reduction additive for dispersion of TiO_2 and fillers. It can be used for all types of TiO_2 and gives better viscosity reduction as shown in Figure 6.

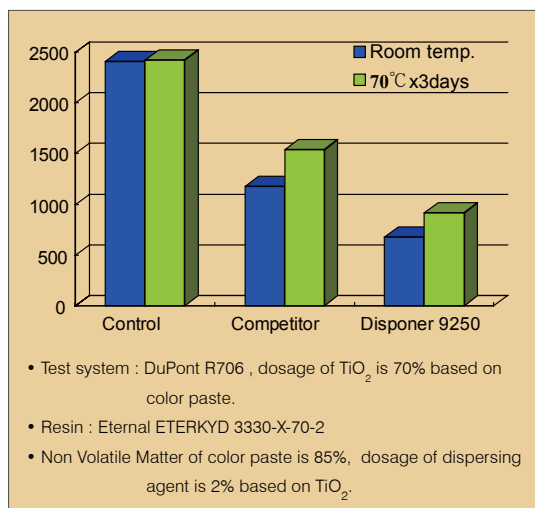


Figure 6 *The viscosity reduction feature of Disponer 9250 on Titanium Dioxide*

Leveling Agents

The major purpose of adding leveling agents and mar & slip agents to wood coatings are:

- To improve coating's rheology and flow property
- To avoid defects, such as orange peel, crater, framing, brushing mark
- To improve touch feeling of coating surface
- To minimize the surface tension difference within the coating
- To enhance the orientation of filler and matting agents in coatings

Besides improving the wetting property, **Levaslip 875** also enables the coating to quickly level off during the coating process as shown in Figure 7.

Polymer type leveling agents **Levelol 495**, **Levelol 835** and **Levelol 837** are all acrylic-based leveling additives. Due to the minor incompatibility in the coating system, this type of leveling agents can quickly migrate to the coating surface and other interphases during the drying process thereby reducing the surface tension difference. Aside from having good leveling speed, **Levelol 495** also gives rise to defoaming effect. **Levelol 835** has a broad range of compatibility with the different kinds of resins. **Levelol 837**, a fluorocarbon-modified acrylic leveling agent, can quickly reduce the surface tension. As shown in Figure 8, **Levelol 837** has lower dynamic surface tension compared to the conventional acrylic leveling agent.

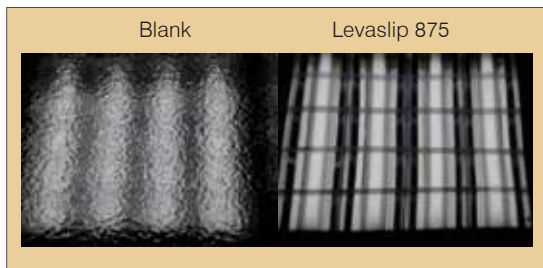


Figure 7

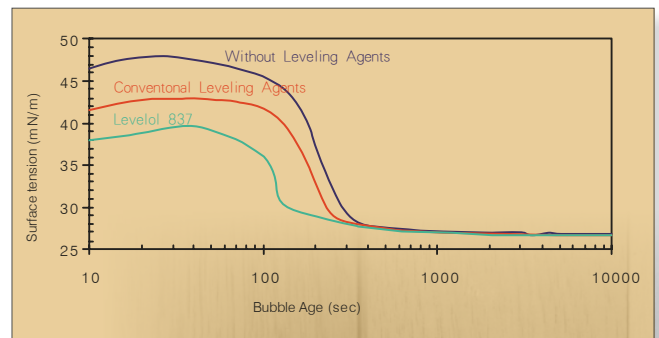


Figure 8 *Levelol 837* shows lower dynamic surface tension than others

Choice of Leveling Agents

- Excellent compatibility : **Levelol 835**, **Levaslip 876**
- Combination of leveling and defoaming : **Levelol 495**
- Fast leveling : **Levelol 837/839**, **Levaslip 875**
- Orientation of matting agent : **Levaslip 432/882**
- Recoatable after curing at high temperature : **Levelol 835**, **Levaslip 872**
- Substrate wetting, mirror effect : **Levaslip 875**
- UV system : **Levaslip 8627**
- Touch feeling : **Levaslip 8627/875/876/882/879**

Organoclays

Product	Composition	Principal Use
BENTONE® 27	Organic derivative of a hectorite clay	High polarity aromatic and oxygenated systems
BENTONE® 34	Organic derivative of a bentonite clay	Low polarity aliphatic and aromatic systems
BENTONE SD® -1	Organic derivative of a bentonite clay	Low polarity aliphatic and aromatic systems
BENTONE SD® -2	Organic derivative of a bentonite clay	High polarity aromatic and oxygenated systems
BENTONE® 1000	Organic derivative of a bentonite clay	Low polarity aliphatic and aromatic systems
BENGEL® 434	Tetra-alkyl ammonium bentonite	Low polarity aliphatic and aromatic systems
BENGEL® 818	Organic derivative of a bentonite clay	Low polarity aliphatic and aromatic systems
BENGEL® 828	Organic derivative of a bentonite clay	High polarity aromatic and oxygenated system
BENGEL® 988	Organic derivative of a bentonite clay	Medium-high polarity aromatic and oxygenated systems
Organic Rheology Additives		
THIXATROL® P220X	Special polyamide wax and xylene, etc	Solvent-based coatings, ink system, sealant
THIXATROL® P240X	Special polyamide wax and xylene, etc	Solvent-based coatings, ink system, sealant
DeuRheo 209	Polyamide wax	Solvent-based coatings, ink, anti-corrosion primer, sealant
DeuRheo 2810	Modified polyurea	Medium polar systems like epoxy coatings, polyurthane coatings
DeuRheo 219	Polyamide wax	Metallic, pearlescent, mat coatings
Organic Thixotropes		
M-P-A® 4020BA	Organic rheological additive	Medium-high polarity aromatic and oxygenated haps free systems
M-P-A® 4020X	Proprietary organic rheological additive	Medium-high polarity aromatic and oxygenated systems
DeuRheo 202SP	Polyethylene wax	Solvent-based system, anti-corrosion system
DeuRheo 211	Polyethylene wax	Metallic paint, pearlescent coating and mat coatings
DeuRheo 212	Polyethylene wax	Medium to low polarity system, anti-corrosive coatings, industrial coatings

Organic Thixotropes

The major roles of rheological agents in wood coatings:

- To prevent settling of fillers, such as silica, zinc stearate
- To enhance the orientation of silica
- To enhance the matting effect in paints
- To prevent settling or hard sedimentation of pigments

THIXATROL® P200X series and **DeuRheo 219** are effective in most solvents, provide excellent sag control, are seed resistant and have a broad activation temperature activation window. **M-P-A®** and **DeuRheo** anti-settling agents minimize the settling of pigments, fillers and extenders in coatings. These products perform through chain entanglement and can be used alone or in combination.

As shown in Figure 9, **DeuRheo 219**, a polyamide wax, has the best anti-settling effect. Compared to the polyolefin wax pastes, it clearly increases medium shear viscosity. Polyamide and polyolefin wax pastes can work together to achieve the required viscosity and rheological behavior of coating formulations.

DeuWax FA-110 is a polyethylene wax paste that is easy to use and can be directly added to the coatings without high shear mixing or dispersing. It has a unique touch felling and matting effect. Compared with regular silica matting agent, this wax results in a more transparent and smoother matting effect is fine and neat. Figure 10 shows the evenness and fine orientation of **DeuWax FA-110**-based coating under optical microscope.

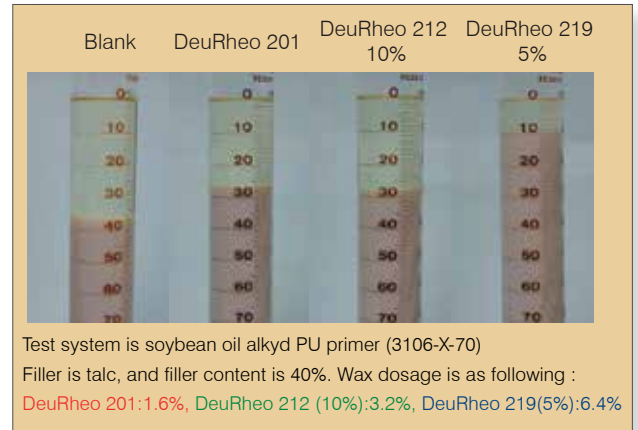


Figure 9



The finer surface added **DeuWax FA-110** is tested by optical microscopy.

Figure 10





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