

New rheological additives for water-based coatings compared with existing additives

The fifth presentation was given by Harold Faber of Faber and VanderEnde. Harold started his career in research and development at PPG Coatings in the Netherlands and later worked for many years as a distributor for several manufacturers of resins and thickeners.



Comparing and contrasting new and established rheological additives was the form taken by Harold Faber in his talk.

Harold founded Faber and Vanderende BV in the year 2000 and the company now represents several manufacturers of speciality minerals and binders for the European market.

Harold started his presentation by introducing the new rheological additives, these being *Acti-Gel 208* and *Cirgel 2080*. He indicated that *Acti-Gel* is a highly purified, clay-based, powdered product and that the worldwide patented purification process results in a magnesium aluminium silicate product with unique properties, i.e. those of a high-performance anti-settling agent, rheology modifier used in a wide variety of water-based coatings. He implied that the raw material i.e. attapulgite clay, changes drastically in properties as a result of the aforementioned purification process. The material is made from a wet process which significantly removes most of the grit (SiO_2 and CaCO_3) and other impurities such as smectite. The product is made without the aid of grinding with the impurities being mechanically removed. This results in a product with completely homogeneous rod-shaped particles, with pseudo-nano dimensions. The particles are positively charged on the ends and negatively charged along the axis. Although *Acti-Gel 208* has a water adsorption of 200% by weight, it is surface adsorption rather than internal absorption.

Harold then went on to outline how the product actually works. When at rest, the material forms a network with fillers and/or pigments, resulting in high viscosity. Then under shear, the network easily breaks down, resulting in very low viscosity. Then at rest, the viscosity is very

quickly restored due to the regular shape of the particles.

Harold then went on to inform the audience of the findings of a paint formulation study, carried out by the company, using *Acti-Gel 208*. The study involved the formulation of a series of interior emulsion paints to compare the rheological effects of the *Acti-Gel 208* product versus *Rheolate 2001* and *Acrysol RM 825*. For the study, *Acti-Gel* was used at levels from 0.1% to 0.5% to show the direct replacement effect versus only *Rheolate 2001*, or only *Acrysol RM 825*. *Acti-Gel* was also used in combination with *Methocel J20MS* to evaluate their synergistic benefits.

The study results obtained for *Acti-Gel 208* versus *Rheolate 2001* (at equal use levels), indicated that *Acti-Gel 208* created a higher degree of viscosity and thixotropy within the paint. In addition, it also achieved higher film build during application and better anti-settling properties. The results for *Acti-Gel 208* versus *Acrysol RM 825*, at equal use levels, indicated that the *Acti-Gel* product had better syneresis and settling control compared with the *Acrysol* product, which resulted in higher film build and higher opacity. When *Acti-Gel 208* was used in combination with *Methocel J20MS*, the results indicated good synergy and indicated that *Acti-Gel 208* can replace part of the cellulose thickener in paint formulations. For *Methocel* to be used, it was first made into a 3% gel in water, which was done by adding the *Methocel* to water with mixing and then the pH was raised to between 8.0 and 9.0 using ammonium hydroxide. When *Acti-Gel 208* was used in combination with *Methocel J20MS*, this eliminated after-thickening, and showed stability to bacteria, enzymes and prolonged dispersion.

Harold then briefly mentioned *Cirgel 2080*, which is pre-dispersed *Acti-Gel 208* in water at 20% solids. This material allows post-addition and is also stable to bacteria, enzymes and prolonged dispersion.

Finally, it was mentioned that *Acti-Gel 208* and *Cirgel 2080* are already being used in the following areas of paint application: sprayable wall paint, water-based pigment dispersions, in the stabilisation of water-based coating, preventing syneresis and sedimentation in wall paints and preventing colour float in water-based lacquers. The products were also being used for non-paint applications such as sprayable concrete, self-levelling and self-compacting concrete, catalysts, glazes and slurries and suspensions.

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