

coverage

NEWS AND PRODUCT INNOVATIONS FROM COGNIS COATINGS & INKS

Introducing FoamStar® – **The first defoaming breakthrough in 25 years**

Cognis Corporation's Coatings & Inks Division recently introduced FoamStar®, a revolutionary new defoamer technology that represents a major breakthrough for Cognis and the coatings industry. The FoamStar® defoamer product line offers an effective—and in many ways superior—means of eliminating foam, while enhancing other coating properties. Just as importantly, FoamStar® reduces costs, while providing greater efficiency than conventional defoamers.



According to Dave Brown, Cognis Corporation's senior market manager for Additives, "FoamStar® represents a huge advancement for the coatings industry. Because it offers much improved efficiency, customers can use less with significantly improved defoaming performance. Better yet, customers will save money. This is a win-win product, and we're offering our customers the technical support necessary to take full advantage of all the benefits FoamStar® has to offer."

An innovation in defoaming chemistry

Unlike conventional defoamers, FoamStar® works on a molecular level, making it one of the most significant advancements in defoamer technology in 25 years. In technical terms, the development of FoamStar® was based on "antagonistic surfactant™" technology.

Introducing FoamStar®

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This involves the introduction of a surfactant by the defoamer, which, when mixed with the foam-stabilizing surfactant, forms a film that is easily ruptured.

Here's a familiar example of how this works. When you pour a mug of beer, the beer forms a "head" because the protein in the beer acts as a foam stabilizing surfactant. Likewise, dishwashing detergent is a foam stabilizing surfactant as evidenced by the foam formed in the sink as you wash dishes. But, if you wash a mug in this detergent and don't rinse it thoroughly, then pour beer into the mug, no head of foam will form; the beer appears "flat." This is an example of how two surfactants (beer protein and dishwashing detergent) which, by themselves, stabilize foam, but result in a defoamed system when used together.

This phenomenon is based on the fact that some surfactant mixtures tend to form a rigid film rather than an elastic one as a result of a repulsive interaction between the surfactant chains. This interaction of two surfactants is described as an "interaction coefficient." Although most pairs of surfactants will exhibit a positive interaction coefficient resulting in an elastic film, some interact to yield a negative value resulting in an inelastic and unstable film.

With FoamStar®, the antagonistic surfactant™ mechanism is used to its maximum advantage in a new class of polymeric molecule that has a star-shaped hyper-branched (HB) structure. This structure was developed to function as an antagonistic surfactant in today's aqueous coating systems. The chemistry is novel and has been TSCA registered and patented.

Improved defoaming and wetting

The polymeric molecules that form FoamStar® are all grown from the same basic chemistry and

can be manipulated (varying molecular weight, functional species, etc.) to yield improved wetting as well as powerful defoaming. For example, in one water-based adhesive, the use of this compound allowed the formulator to eliminate dioctylsulfosuccinate as a surfactant without sacrificing wetting properties. This had the double effect of reducing the inherent foaminess of the system while introducing a potent defoamer.

In applications involving thin latex paper coatings applied to glass, defoamers often cause film defects. In one such application, the FoamStar® hyper-branched polymer-based defoamer caused zero film defects. Additionally, it eliminated fish eyes caused by small bits of coagulum in the defoamer-free latex. In other words, the defoamed latex wetted better than the "blank."

In paint applications, formulated versions of these hyper-branched compounds (with other defoaming components) have yielded defoaming results that are not achievable with conventional products. These results are accomplished without the need for any silicone chemistry, which is both expensive and side-effect sensitive.

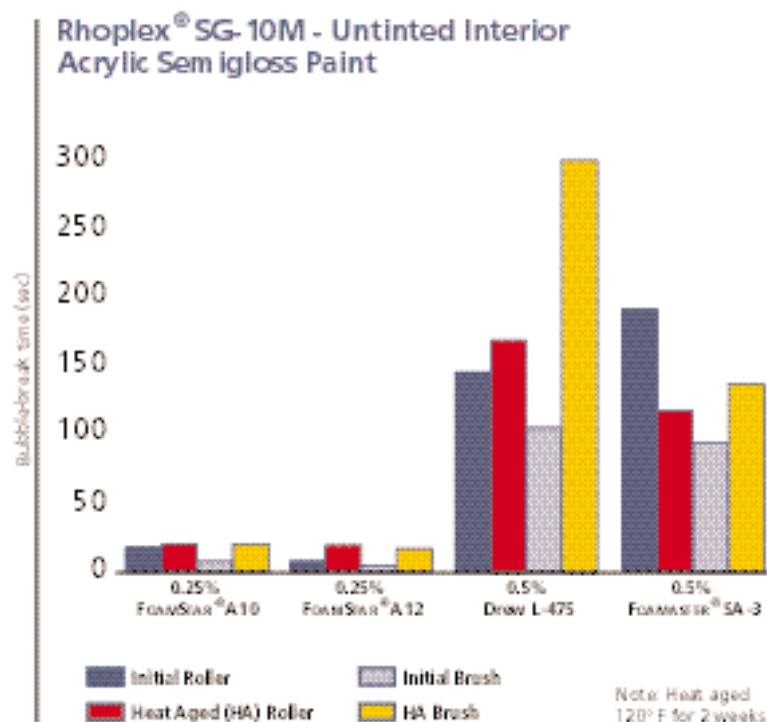
Architectural applications and beyond

The first FoamStar® products to be released, FoamStar® A10 and FoamStar® A12, are designed for the architectural coatings market. Because FoamStar® A10 and FoamStar® A12 are 30 percent to 50 percent more efficient than conventional defoamers, they can be used at reduced levels and result in a corresponding reduction in total formulation costs.

In addition to providing superior performance in eliminating microfoam in architectural formulations, FoamStar® A10 and FoamStar® A12 also improve other performance properties, including enhanced wetting.

Although the first FoamStar® products are geared toward the architectural coatings market, Brown notes that the chemistry behind FoamStar® will lead to additional new products for the higher-end coatings applications. Cognis currently has several additional products in development.

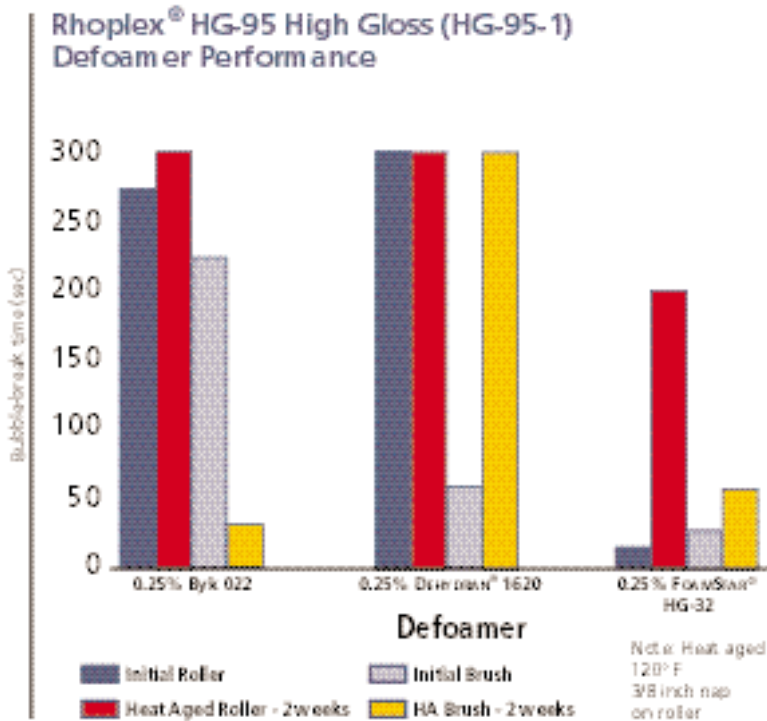
"This class of compounds has the potential to revolutionize formulation chemistry by enabling manufacturers to achieve effective



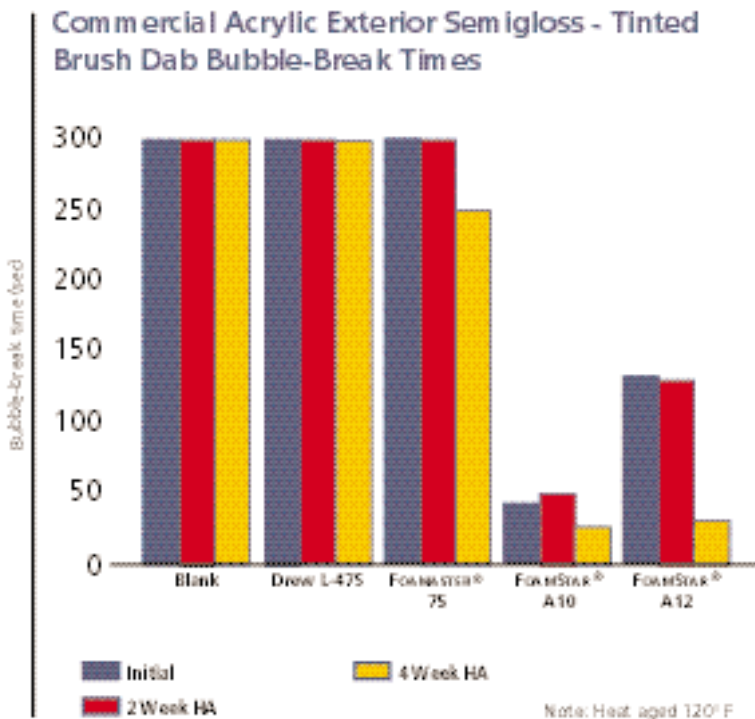
Note here not only the exceptional bubble-break rates but also the results achieved by FoamStar® defoamers at half the level of the benchmarks.

defoaming performance, while enhancing dispersing, wetting, and other desirable film properties," notes Ken Breindel, Additives technical manager. "In doing so, FOAMSTAR® defoamers may well prove to be the most versatile additive chemistry on the market." ♦

For additional information about FoamStar® defoamers contact Dave Brown, senior market manager for Additives, at (215) 628-1152.



Both gloss results and defoaming again markedly outperform the benchmarks in this high-gloss system.



FoamStar® defoamers proved markedly superior to the current "best defoamers" for this system, especially when evaluated via brush-dab in the tinted system.

FoamStar® outperforms conventional defoamers

In evaluating the new FoamStar® defoamers, Cognis chose paint systems that represented current industry practice. To select the best existing product to use as a benchmark versus FoamStar® defoamers, the paint systems were first thoroughly screened using an array of conventional defoamers originating from many manufacturers.

Test systems chosen for FoamStar® defoamer evaluation included those that are based on UCAR® 379 vinyl/acrylic, Rhoplex® AC 2642, SG-10M, and HG-95 acrylics and styrenated acrylics in addition to a number of commercial paint systems. Defoaming was evaluated via accepted industry methods, including roll-out and brush-dab on MS lab paper (timing bubble break) for both tinted and untinted systems initially and after several periods of heat aging. Color acceptance, gloss, film integrity on draw down, and scrub resistance were also determined.

UCAR® is a trademark of Union Carbide Corporation
Rhoplex® is a trademark of Rohm & Haas Company



In the new millennium, scientists will discover
new stars, new planets, and new galaxies.

But only one star will revolutionize paint defoaming . . .



FoamStar®
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Our new FoamStar® defoamer is truly a breakthrough in defoaming technology.

FoamStar® will cut your total defoamer costs by at least 20 percent. It defoams on a molecular level, making it different from—and better than—existing defoamer chemistry. It is twice as efficient as existing defoamer technologies, so you can use half as much with better performance.

And this is only the beginning . . .

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