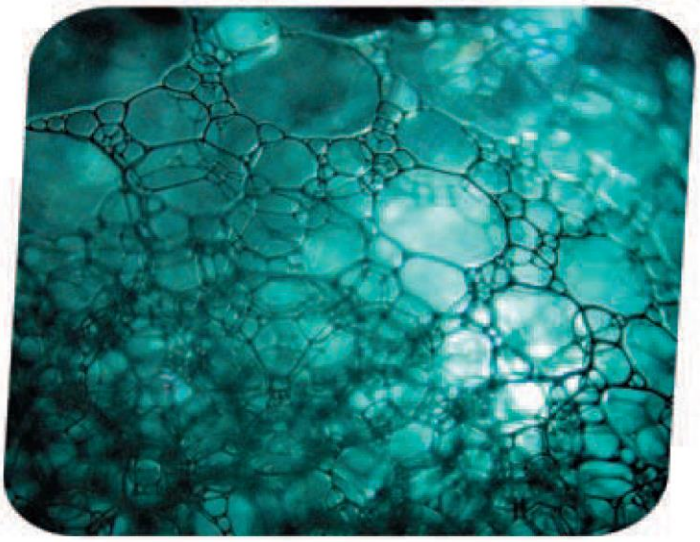
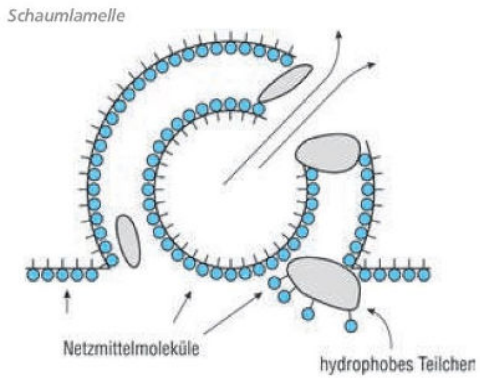
Less Gas!
Defoaming of coating circuits with AGITAN™



With beer and baths, foam is very welcome butIn applications like paper coating, bubbles interfere with the process and impair coating quality. Defoaming agents are used to prevent this.. however, they must contain different active ingredients, to meet the different demands. MÜNZING offers a wide range of products of the AGITAN ™series from agents based on mineral oils, natural and synthetic raw materials to emulsion defoamers and silicone defoamers.

MÜNZING CHEMIE is a reputable manufacturer of additives for paints, construction materials, leather and paper industry. In the development and manufacture of its products it combines tradition with innovation, highest quality with economics and applied technical knowledge.



For many years MÜNZING has offered air release and de-foaming additives for various applications under the name AGITAN ™.

ACAT and MÜNZING have a close, long-term partnership in the sector of paper additives. An important additive in paper production and paper finishing are air releasing agents and defoamers. The cooperation of ACAT paper specialists with MÜNZING application engineers enables us to offer customers optimal technical, economic and ecological solutions.

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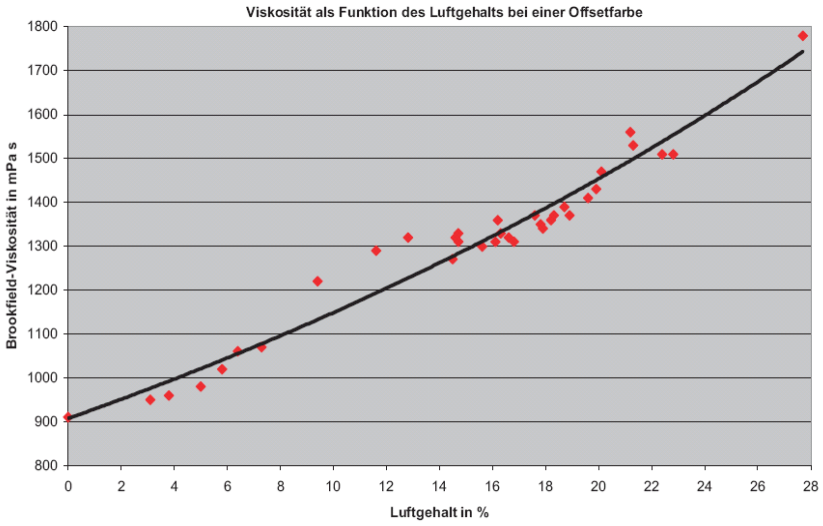
How is foam formed?

Foam is a stable dispersion of gas in a liquid. Without surface-active substances in a liquid such as water, gas bubbles rise to the surface where they burst due to high interfacial tension differences. In aqueous systems such as coating colours the gas bubbles are stabilized by the molecules of the surfactant and wetting agents from the binder or pigment dispersions. The hydrophobic-hydrophilic surfactant molecules orientate with their hydrophobic side towards the hydrophobic surface of the gas bubble, while the hydrophilic side orientates towards the aqueous phase. Due to buoyancy the bubbles rise to the surface of the liquid and form together with the existing layer of the wetting agent a stable double-layer of surfactant molecules (foam lamella; figure on the left.).

Who needs defoaming agents?

Defoaming agents are needed to destroy formed foam and to inhibit new formation. The substrate of the defoamer spreads across liquid surface, reduces surface elasticity and transports the hydrophobic active ingredients to the foam lamellae. The hydrophobic compounds of the defoamer adsorb surfactant molecules of foam lamellae. If they are suitably sized, they will be able to penetrate into the double layer and enlarge the distances between the wetting agent molecules until foam lamellae burst and air escapes.
Due to different bubble geometries and the variety of foam stabilizing surfactants and wetting agents, a range of different defoamers with different active substances is needed in order to offer the most suitable product for each application. The defoamer also must not cause interference such as fish eyes, craters or wetting problems.



Viskosität als Funktion des Luftgehalts einer Offset-Streichfarbe

The influence of viscosity on the air content of an offset coating colour

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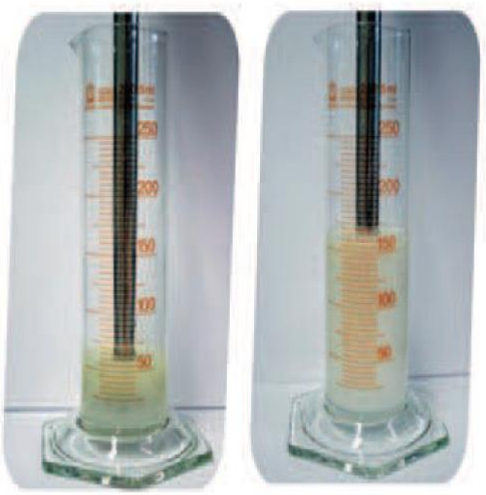
Other criteria for the selection of the defoamer are environmental compatibility, duration of effectiveness and the regulatory requirements for paper coming in contact with food. MÜNZING offers a wide range of products of the AGITAN ™series, from agents based on mineral oils, on natural as well as on synthetic raw materials, up to emulsion defoamers and silicone defoamers

Effective foam control with AGITAN™

With beer and baths, foam is very welcome but in applications like paper coating, bubbles interfere with the process and impair coating quality. During the coating process air can enter coating colour at numerous points: during coating preparation in the disperser by strong shear movement, during transport from preparation to working tank, during pumping and due to unfavourable inlet conditions. But experience shows that most of the air is incorporated during the coating process. In roller coating, air is carried along from the roller nip. In free-jet application it is incorporated by the application of the coating colour to the paper web and in airbrush application in levelling procedure compressed air is injected into the coating colour.
The inclusion of air particularly depends on coating speed, coater, coating colour circuit and the coating colour used. Concerning coating colour especially solids content, viscosity, type of binder, binder quantity, surface of pigments and temperature influence the air content.



For the dissolver test the sample to be tested is mixed with various types and concentrations of defoamers. Under defined conditions air is introduced by a dissolver disk.

If coating colours contain a high content of air, working tanks can foam over, bare spots in the coating will be able to rise and gloss and the homogeneity of the coat will be reduced and this will lead to an unsatisfactory printout. Increasing air content increases also the Brookfield viscosity of the coating colour and a higher pump output is required. The diagram on page 17 below shows the influence of viscosity on air content in the case of an offset coating colour. Air bubbles also increase cavitation on the blades of the radial flow pumps, and this means a greater wear. By the use of AGITAN ™, these problems can be minimized or eliminated.

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As it is very difficult to predict the effect of a defoamer on a special coating colour informative and practice-related laboratory test methods for the selection of appropriate AGITAN ™ type are essential. MÜNZING has various test methods for this purpose based on wide experiences and intensive collaboration with customers.
Solids content, viscosity, foaming and last but not least the used coating procedure are the most important parameters for the choice of a customized practically relevant test method. In agreement with the customer tests are carried out with suitable AGITAN ™ types. ACAT paper specialist or MÜNZING application engineers measure the air content at different sections of the coating colour circuit to check the effectiveness of the AGITAN ™ defoamers.

Dissolver test shows the effectiveness of the defoamer

For the dissolver-test the sample to be tested is mixed with various types of defoamers and concentrations, and under defined conditions air is introduced by a dissolver disk. The height of foam and the speed of foam degradation are the parameters for the determination of the effectiveness of defoamers. The picture above shows the measurement of the foam height of a starch preparation with dissolver test. By measuring the density the air content can also be determined in the medium. In addition to the AGITAN ® series for coating colours MÜNZING also offers air releasing agents and defoamers for paper and board production.

Customers can expect the same service as in the coating colour defoaming. If needed, MÜNZING will provide an online gas content measurement device for the real time monitoring of gas content during production process. Other coating colour additives from the MÜNZING product range are thickeners (TAFIGEL ™) and water retention agents (METOLAT ™). As for the AGITAN ™ series MÜNZING offers customized laboratory testing and technical support for the introduction of these products into the paper coating process.

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