
DELTA SC®
Surface Control Additives
delta
little makes difference
MORDRY®
Driers
DELTA FC®
Foam Control Additives
DELTA DC®
Dispersion Control Additives
DELTA S®
MORDRY®
Specialty Additives

Foam Control Additives

Air can be incorporated into a coating by mixing during the polymer/pigment grinding and let-down steps, by pumping during package filling…etc.

Effective foam control additives are beneficial in preventing or reducing many common coating problems such as viscosity increase and loss of mechanical shearing power during milling, volume increase during the letdown and mixing steps…etc.

Delta Specialties offer a comprehensive range of foam control additives (silicone-free and silicone-based) to help you get rid of foam and achieve foam-free formulations in coatings, printing inks, adhesives and plastics (composite).

Composition of a Foam Control Additive

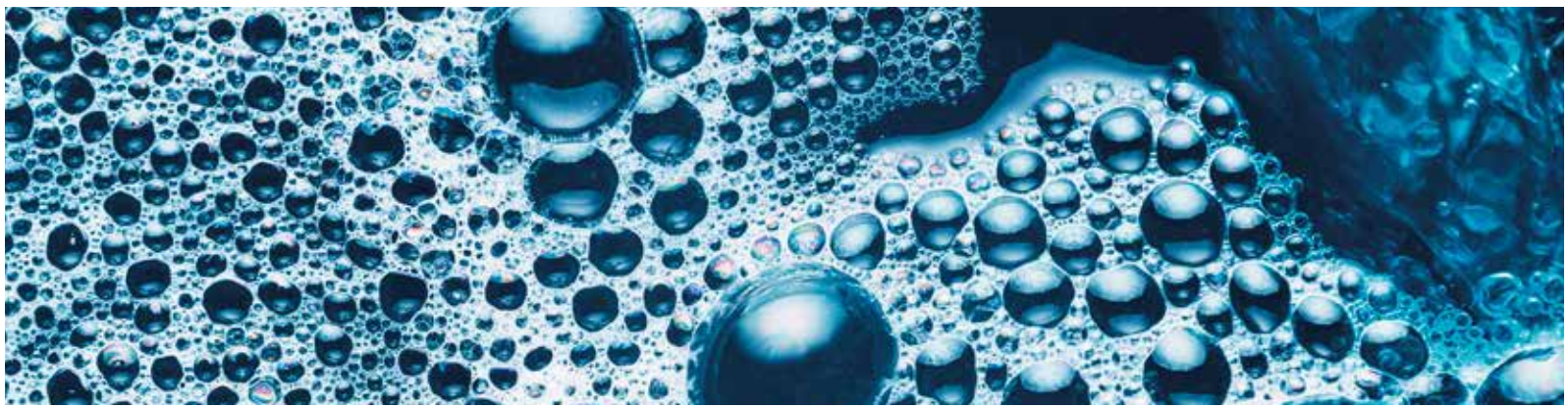
Typical foam control additives consist of the following components:

- Carrier fluids: They act to transfer the generally hydrophobic active substance uniformly into the hydrophilic medium. Typical carrier fluids include aliphatic and aromatic mineral oils, solvent blends, and water in the case of pre-emulsified defoamers.

- Surface active agents: They bring the active substance to the air interface and into contact with the stabilized foam structure. These substances work by having a general incompatibility with the formulation and disrupt the spreading mechanism for stabilizing foam.

- The most often used substances showing incompatible spreading include fatty acid esters and amides, glycols, silicones, and modified silicones.

- Active substances: They adsorb surfactant ingredients present in the formulation and destabilize foam. Hydrophobic particles such as metal soaps, waxes and hydrophobic fumed silica are adsorption compounds for foam destruction.



Choosing a Foam Control Additive

For solvent-based and solvent-free systems, polysiloxanes, polyacrylates and polyolefins are effective.

Pure polysiloxanes are also suitable but critical in terms of their compatibility, which can cause cratering. The best balance between compatibility and incompatibility is achieved through organically-modified polysiloxanes.

Modification of the polysiloxane backbone with fluorine results in the socalled fluoro-silicones known for their very low surface tension and strong defoaming properties.

For waterborne systems, a wider range of chemical structures can be used due to the generally higher surface tension of these systems.

Foam control additives for waterborne systems can generally be based upon:

- Mineral oil: As opposed to solvent-based systems, the spreading of mineral oils in water-based systems is sufficient to act as a foam control additive. In the presence of hydrophobic particles, the mineral oil acts in addition as carrier for these particles.

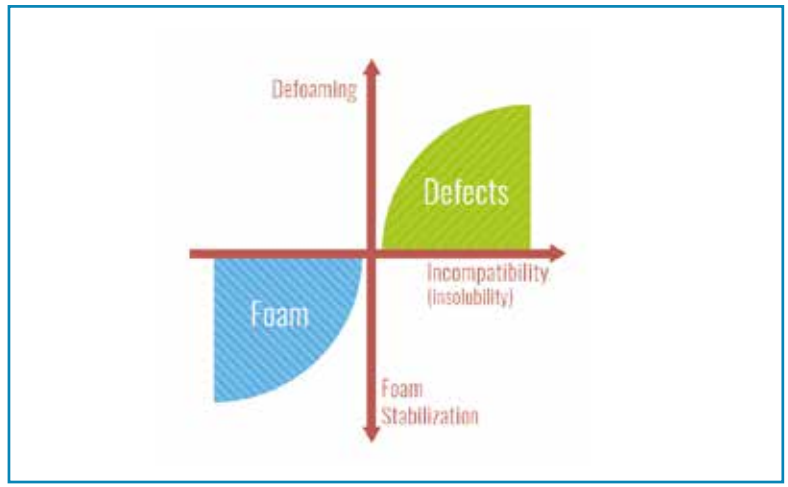
- Silicone: Both dimethylpolysiloxanes and modified polysiloxanes can be used as foam control agents in water-based systems.

An important point to consider is the incorporation of the foam control additive in the paint system. Since they are not soluble in the system, a good distribution of the active substance is necessary. This can be controlled by the mixing speed and time, otherwise craters can be formed or loss of defoaming efficiency is observed.

Since the performance of a foam control additive is difficult to predict due to the variety of raw materials used in a paint formulation and the application method, evaluation of your own system is indispensable.

The stirring or shaking tests are based on the incorporation of air in a system. After this air incorporation, the samples can be analysed on weight or volume. The foam reduction over time of these stirred or shaked samples can also be observed. These tests give the effectiveness of the foam control additive during the manufacturing process.

The roll test can be used to control the foam behaviour during the application of the paint. After application of the paint with a roller on a testpaper, the wet and dry film is analyzed on surface defects.



Foam Control Additives

● Highly Recommended
○ Potentially Suitable

Product Name	Chemical Type	Active Ingredients %
DELTA FC® 1020	Silicone-free	-
DELTA FC® 1022	Silicone-based	-
DELTA FC® 1030	Silicone-based	-
DELTA FC® 1040	Silicone-based	-
DELTA FC® 1041	Silicone-based	-
DELTA FC® 1501	Mineral oil	>98
DELTA FC® 1504	Mineral oil	>98
DELTA FC® 1520M	Mineral oil	60
DELTA FC® 1522M	Mineral oil	>98
DELTA FC® 1525	Silicone-based	23
DELTA FC® 1531	Mineral oil	>98
DELTA FC® 1590	Silicone-based	28
DELTA FC® 1720	Silicone-free	-
DELTA FC® 1722	Silicone-based	-
DELTA FC® 1730	Silicone-based	-

Product Name	Solvent-based coatings	Acid curable	Acrylic OH-functional	Acrylic self-crosslinking	Acrylic thermoplastic	Long-oil alkyd	Medium-oil alkyd	Short-oil alkyd	Alkyd & PE OH-functional	Alkyd & PE OH-melamine	Chlorinated rubber	Solvent-based epoxy	Solvent-free epoxy	Nitrocellulose	Unsaturated polyester	Silicon resin	Vinyl copolymer
DELTA FC® 1020		●	●	●	●		●	●				●		●	●		
DELTA FC® 1022			●	●			●	●	●	●		●	●				
DELTA FC® 1030												●	●		●		
DELTA FC® 1040			●	●	○	●	●		●	●	●	●		○		○	○
DELTA FC® 1041			●	●	○	●	●	●	●	●	●	●		○		○	○
DELTA FC® 1501																	
DELTA FC® 1504																	
DELTA FC® 1520M																	
DELTA FC® 1522M																	
DELTA FC® 1525																	
DELTA FC® 1531																	
DELTA FC® 1590																	
DELTA FC® 1720												●	○		●		
DELTA FC® 1722													●				
DELTA FC® 1730													●				

Product Name	Water-based coatings and Adhesives	Acrylic emulsion	Acrylic water reducible	Alkyd emulsion	Alkyd melamine	Alkyd water reducible	Epoxy	Polyester melamine	Polyurethane emulsion	Polyvinyl Acetate
DELTA FC® 1020										
DELTA FC® 1022										
DELTA FC® 1030										
DELTA FC® 1040										
DELTA FC® 1041										
DELTA FC® 1501		●	●	○	○	○				
DELTA FC® 1504		●	●	○	○	○				●
DELTA FC® 1520M		●	●	○	○	○				
DELTA FC® 1522M		●	●	○	○	○				●
DELTA FC® 1525		●	●	●	●	●	●	●	●	
DELTA FC® 1531		●	●	○	○	○				●
DELTA FC® 1590		●	●	○	○	○				
DELTA FC® 1720										
DELTA FC® 1722										
DELTA FC® 1730										

Product Name	Printing inks	UV curable	Packaging (gravure & flexo)	Water-based	Composite	Gelcoats	Laminating	Lay-up & spray-up
DELTA FC® 1020			●			●	●	●
DELTA FC® 1022			●					
DELTA FC® 1030		●	○			●	●	●
DELTA FC® 1040			○					
DELTA FC® 1041		●	○					
DELTA FC® 1501				○				
DELTA FC® 1504				●				
DELTA FC® 1520M				○				
DELTA FC® 1522M				●				
DELTA FC® 1525				●				
DELTA FC® 1531				○				
DELTA FC® 1590				○				
DELTA FC® 1720		●	○			●	●	●
DELTA FC® 1722						●	○	○
DELTA FC® 1730						●	○	○

Additives for Coatings, Printing Inks, Adhesives and Composites

little makes difference

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