DOW CORNING

Antifoam Tips

Answers to commonly asked questions about foam.

What is foam?

Foam is a dispersion of air or other gases in a liquid or solid.

Some foams are useful:

- Shampoos
- Shaving creams and lathers
- Hair styling mousses
- Fire-fighting foams
- Carpet cleaners
- Polyurethane and other plastic or rubber foams that insulate homes, add comfort to footwear
- Whipped cream, egg whites, ice cream

Industrial processing foams cause problems:

- Overflow vessels
- Increase housekeeping costs
- Interfere with processing
- Damage materials
- Slow drainage during drying
- Interfere with packaging

Why and how is foam controlled?

To achieve maximum return on investment in processing equipment and raw materials, process foam must be controlled. Foam control promotes smooth, efficient operation and the production of consistent, high-quality products.

There are two ways to control problem foam:

- Destroy it (defoam)
- Prevent it (antifoam)

Defoamers – Chemicals or formulated products that destroy, or knock down, foam that has already formed. Defoamers, except in relatively large amounts, don't prevent foam from forming.

Antifoams – Chemicals or formulated products that prevent the formation of foam.

Sometimes antifoams are called defoamers and vice versa. When discussing these materials, it is important to notice at what point in the process they are used. There are other factors you should consider as well.

What should I consider when choosing an antifoam?

There are thousands of chemicals that behave as antifoams, either alone or in combination with others. That's why it's important to talk with an expert when choosing an antifoam. Another reason is that when selecting an antifoam, you must consider numerous variables, including:

- Regulatory status
- Effectiveness
- Cost
- Service by the supplier

Antifoam products should be formulated to have minimal impact – other than foam suppression – on the products in which they are used. Generally, the smaller the amount of antifoam required, the less impact there will be on the product. This is one reason why silicone antifoams are frequently the first choice for combating foam in industrial processes.

Silicone antifoams:

- Are efficient
- Are long-lasting
- Act as antifoams *and* defoamers
- Are safe (many comply with FDA, EPA, USDA and other regulatory requirements)
- Have low surface tension for effective foam control in a variety of foaming media

How do silicone antifoams work?

Basically, a silicone antifoam droplet or particle penetrates a bubble wall, spreading the liquid-gas interface and causing the bubble wall to become unstable and collapse.

How do I know which antifoam to use?

To obtain the best antifoam for your process, it is wise to work with an expert – such as a Dow Corning distributor. Or call the Dow Corning Additives Technical Service Line, 1-800-252-9899. When requesting assistance, be prepared to answer these questions:

1. Is the system aqueous or nonaqueous?
2. If aqueous, what is the pH?
3. What is the temperature of the foaming system?
4. Is there agitation? If so, what type?
5. What is the volume or batch size of the foaming material?
6. What defoamer are you using now?

Be prepared to briefly describe the process and explain where it foams.

And remember, while proper product formulation is important, so is efficient use.

How can I test an antifoam?

Simulate the conditions in which the antifoam is expected to perform. Use a test medium that is similar – preferably identical – to the foaming medium in which the antifoam will be used.

Various test methods are available to assist in your evaluation:

- ASTM D 892-74 simulates bubble formation at the base of a reaction vessel.
- ASTM D 1173-53 can predict foam generation in showers or cascading liquids.
- ASTM D 3519-76 uses a blender to simulate conditions of high shear and air entrapment.
- ASTM D 3601-77 simulates a low-shear foaming environment.

Whichever test method you choose, follow these procedures:

- Use only clean apparatus.
- Avoid cross-contamination between runs.
- Make multiple runs and statistical evaluations to avoid wrong conclusions.
- Compare your findings with in-plant performance.

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Dow Corning Corporation
Midland, Michigan 48686-0994