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FOAM DETECTION & CONTROL

COMMON INDUSTRY FOAM PROBLEMS

Foam generation can be an integral and important part of a process, but more often than not it is an unwanted side effect. Uncontrolled foam generation can negatively affect productivity in a wide range of industries. In particular, it is problematic to the wastewater, pharmaceutical, and food and beverage sectors.

BACKGROUND

While there are several strategies employed to control foam, the most common is dosing with a defoaming chemical. Most defoamers are 'surface active,' meaning they work on the surface of foam bubbles. Defoamer additives are formulated to be absorbed into bubble surfaces where they increase drainage rates and cause bubbles to collapse. An effective defoamer disperses foam in a matter of seconds.

Read on to find out more about foam problems in a few specific industries. Don't worry if your industry is not listed—we have solutions for you too!

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Proper foam management systems can improve product quality while saving labor time on clean up and reducing chemical costs.

FOOD & BEVERAGE

In the food-processing and beverage industries, foam is generated throughout the production process. Mostly, this is caused by proteins, fatty acids and sugars reacting with water. Foam is a particular problem in alcohol distillation, and the production of deep-frozen foods, deep-frying oils, and gelatin, as well as in fruit preserves and vegetable washing.

When excessive foam is created, product properties are impaired in many ways. Foam spillages are disruptive to plant process flow, and time-consuming to clean up. Silicone antifoam agents, the most common chemicals used, are very effective at preventing spillages, but overuse, aside from being costly, can cause product contamination. The practice of continuous, uncontrolled additions of chemical antifoam can therefore be problematic to both final product quality and the bottom line.

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WASTEWATER

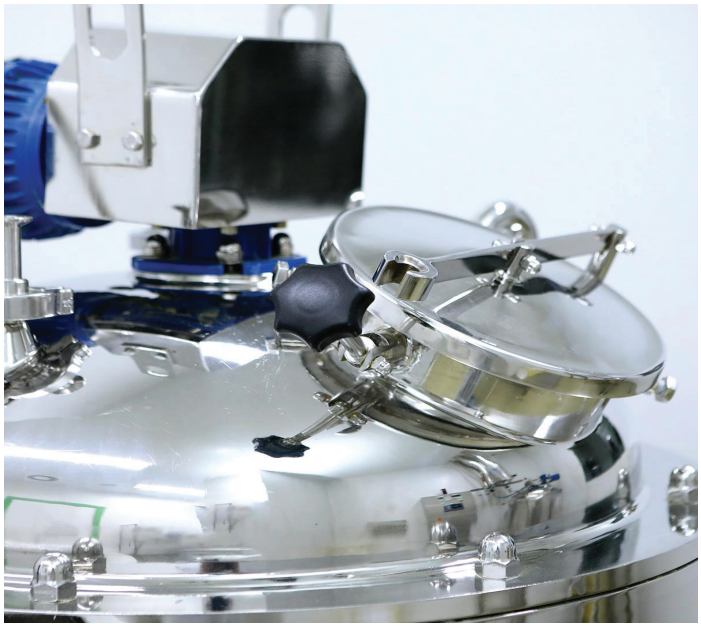
Foam and bulking sludge are undesirable, complicated, and unpredictable challenges for many wastewater treatment plants (WWTP). Large quantities of foam are caused by the floating filaments which come from bulking sludge. This foam may vary in depth and extend throughout the biological circuit, as well as to anaerobic digesters and dewatering units. Because of this, foam can be both widespread and difficult to get rid of throughout the treatment process.

The traditional approach is to continually dose antifoam chemical into the process. Dose rates are often set to cope with foam levels seen during plant peak demand, but this rate is far higher than needed when there is less or no foam. In other situations, antifoam chemicals are only added once an excessive amount of foam has already built up. The quantity of chemical added ends up being greater than needed because of the time it takes to perform its function. Unnecessary costs are generated due to excessive antifoam chemical usage as well as extra pumping and equipment wear and tear. A real time active monitoring and proactive control strategy for reducing foam can substantially lower these costs.

BIOTECHNOLOGY

Antibiotics, vaccines, steroids, and other drugs are frequently produced using biotech processes involving natural organisms including bacteria, algae, and animal cells. These methods, however, can involve a great deal of agitation and air/gas mixing, and in a media rich in nutrients and protein, can create conditions that encourages the formation of an unwanted stable foam layer on top of the media's surface.

If not vigilantly monitored and quickly managed, this foam layer can grow too large for the bioreactor headspace and spill out in what is known as a 'foam-over.' This can destroy the product, and equipment as well. A ruined batch can cost hundreds of thousands of dollars in lost production, in addition to the cost of any equipment damage and clean-up. Typically, antifoam chemicals are added to fermenters to control foam build-up, but the quantity required is difficult to control. Antifoam chemicals can also have unwanted side effects. By reducing surface tension, gas bubble size increases, reducing the mass gas transfer into the broth and limiting the yield of the process. Secondly, some antifoam chemicals can be difficult to remove, contaminating the end product and reducing its quality.



THE SOLUTION

Hycontrol has developed a versatile range of foam detection and control systems to meet the challenges of foam in all industries.

The technology behind these systems originated directly from foam control research, meaning that these highly specialized devices were designed specifically for foam control applications. They are not simply modified level sensors—these are tools that have been created specifically for this challenging task.

The problem with using standard level sensors for detecting foam is twofold:

1. They are designed to be used in liquid and as foam is only about 1% liquid, they are operating at the very limit of their capability.

2. Foam coats everything! Liquid level probes, once coated with foam will often give false positive indications of foam presence, defeating the objective of having the probe in the first place.

Hycontrol probes are designed specifically for foam service. In order to be reliable in use, Hycontrol probes use IMA technology, a patented method of ignoring coating and fouling on their active surfaces so they remain reliable, even when heavily soiled.

Hycontrol SureSense+ and SmartFoam instrumentation uses probes that are based on enhanced conductivity measurement technology. The Smartfoam probe is a single point switch that provides an output when foam is detected.

The SureSense+ system is a fully featured detection and control unit. It can be used as a standalone or in conjunction with a supervisory control system to automatically add defoamer chemicals on demand as foam is detected.

A typical system comprises of a sensor and a controller connected via special cables. The sensor probe is installed in the process such that it sits above the liquid level. When the foam level reaches the probe, the controller will begin dosing chemical using a configured strategy until the foam level subsides.

Hycontrol SmartFoam and SureSense+ instruments:

- Generate significant cost savings by reducing antifoam use and protecting equipment
- Reduce downtime and labor costs
- Increase productivity and quality of product

WORK WITH THE EXPERTS IN AUTOMATED FOAM DETECTION AND CONTROL.

CALL TODAY!

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