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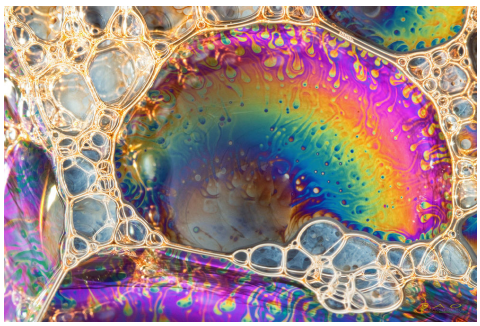
DEFOAMERS – ANTIFOAM AGENT

RANGE OF PRODUCTS AND USE



BASIC PRINCIPLES

Foam formation is the result of dissolved molecules in a liquid. The dissolved molecules alter the surface tension of the liquid, and can be viewed as surface active agents (surfactants). The surfactants can be nonionic, cationic, anionic, or amphoteric. The liquid can be either aqueous, nonaqueous, or both (some industrial systems may contain dissolved organics which require special consideration). Different surfactants will generate different types of foam, and foam stability. When agitated, bubbles will form, which will immediately encounter gravitational effects pulling liquid along the bubble walls back down into the liquid beneath the bubble. A simplified picture of a bubble can be described as spherical, having both an outer wall and inner wall.

Nonionic surfactant generated foam is generally depicted as having a hydrophobic head (water insoluble portion) at the air-liquid interface, and the hydrophilic tail (water soluble portion) at an aqueous solution. Its orientation would be reversed in nonaqueous liquids.

Anionic surfactant generated foam would have a negative charge on the hydrophilic tail. As aqueous liquid is pulled down over the bubble's surface, the negative charges reach a concentration at the bubble at the liquid interface. Most often the negative charge serves to stabilize the bubble, and will begin to repel each other at the interface. This phenomenon is known as an electrostatic repulsion.

Cationic surfactant generated foam would have a positive charge on the hydrophilic tail, and would exhibit similar behavior as the anionic surfactant in an ideal aqueous liquid.

When the surface tension is high enough, bubble formation becomes more rigid and stable. If a bubble is subjected to mechanical agitation, bubbles caused by entrained air, would form very stable lamellar structures. In some cases, the aqueous liquid is being pulled through the bubbles' walls creating regions of low and high surfactant concentrations, which sets up a gradient along the bubbles' surface. The gradient would pump liquid back onto the bubble walls, where this phenomenon is referred to as a surface transport.

The bulk viscosity also contributed to foam stability. As the viscosity of liquids increase, entrained air, now a bubble, can be trapped below the liquid's surface. Increasing viscosity of the system also reduces the coalescence capability of smaller bubbles merging to become larger bubbles. If the bubbles become large enough (increasing the diameter), bubble stability decreases. The surface viscosity is also important, as it effects the coalescence formation between bubbles. The higher the bulk viscosity becomes, the lower the coalescence formation is between bubbles.

When the surface tension is lowered on the bubble, it will burst. The resulting interaction of the defoamer to disperse the foam and its bubble formation is a physical interaction with the aqueous liquid. We engineer defoamers to work with specific applications and their systems.

Defoamers are used to either control foam formation or eliminate foam from forming during the intended process. When the formation of foam is prevented, the chemical is usually referred to as antifoam. Most often, the terms defoamer and antifoam are used interchangeably.

Foam can be generated by either mechanical agitation or through a chemically influenced mechanism, such as fermentation process, for example. Defoamers are manufactured and engineered to work in specific environments. Environments in which defoamers are expected to work could include temperature, pH, solubility or its insolubility, under pressure, or chemical constituent’s compatibility. Defoamers may even be required to meet certain regulations such as The Food and Drug Administration Code of Federal Regulations, EPA, National Science Foundation, Kosher or Kosher for Passover Certification, or just be used for industrial applications meeting local, state, and federal guidelines.

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In INTECNA GROUP, de-foamers and antifoam agents are produced in NYATEC (sister Company) located in Centre of Italy.

Production Capacity is over 2500 Tons/year

INTECNA's technically advanced antifoams, defoamers and foam control agents are formulated to control unwanted foam generation and are ideal for use in a wide range of process applications including wastewater and effluent treatment, steam generation, cooling water systems, distillation and fermentation processes, food processing, sugar manufacturing, paper and paperboard production, plastics, adhesives and more.

Formulations are continuously tested in our Laboratory by using the most diffused Standard Methods

Our high performance foam control chemical formulations include both food grade and non-food grade antifoams, and silicone and mineral hydrocarbon based products.

Our product are suggested for the following applications :

FERMENTATION

Our range F is a family of concentrated antifoam and foam control agent for use in various fermentation processes and similar food industry applications where foaming is an inherent problem.

Chemical nature is based on the poly-alkylene glycol technology, and complying with all the relevant food grade approvals,

This high performance antifoam product effectively controls the foam produced in a wide range of fermentation process applications, including citric acid, yeast, antibiotic, alcohol, glutamic acid, enzyme, protein, pharmaceutical

Products shows low toxicity and practically odorless, are dispersible / self-emulsifiable in water, allowing it to be safely used in applications with ultra filters.

This highly efficient range of products are soluble on cooling to below 20^{o}C, so that all traces of defoamer can be removed by washing with cold water and can be easily sterilised by normal heating and/or autoclaving methods without affecting product stability or performance

VEGATEBLE PROCESSING

Our Range A is a high performance antifoam and foam control agent formulated for use in potato processing, vegetable washing and sugar beet applications where foaming is an inherent problem.

Such Range is formulated to comply with current
FDA CFR 21 No 173.340, 175.105, 175.300, 176.170, 176.180, 176.200, 177.1220, 177.2260;
BGA Chapters 14 and 36 and the French "Repression des Fraudes".

CRISP MANUFACTURE

During the washing and slicing of potatoes starch is released into the water, and over time the concentration of starch increases, resulting in the generation of foam which when left uncontrolled can adversely affect crisp production efficiency.
Foam carried through to the blanching process can also affect the quality of crisps produced and must therefore be controlled.

Our products are added to the potato water circuit at the washing and slicing stage of the manufacturing process, reducing foam build-up, and so optimizing production efficiency and product quality.

POTATO PROCESSING , VEGETABLE WASHING , SUGAR BEET PROCESSING AND PAPER PRODUCTION

Our Foam control agent has been specially designed for use in a number of direct and indirect food processing applications including potato and vegetable processing, sugar manufacture, paper and paperboard production, plastics and adhesives.

BOILERS CARRYOVER - DESALINATION PLANTS – PHOSPHORIC ACID PRODUCTION

Our Range P is a range of antifoam formulated for use in steam boilers , desalination plant ecc.
It is used to prevent boiler water carryover due to unwanted foaming and acts at the water/steam interface to control unwanted foam generation.

Chemical nature is based on poly-alkylene glycol; and has an inverse solubility in water becoming insoluble but dispersible at temperatures greater than 60^{o}C.

SILICON BASED DEFOAMERS

Our range S is a low toxicity, food grade silicone antifoam formulated for use in a wide range of food processing applications.

This highly effective antifoam gives the same superb results in hot and cold foaming systems over a wide pH range. Range S provides the most effective control of foam and can be added directly into the foaming media or blended directly into certain formulations.
This antifoam is formulated using emulsifiers, thickeners and biocides which meet the relevant regulations for use in direct food applications.
Due to their inertness and low toxicity, silicone antifoams can be used in a host of food grade applications including:

- Potato, fruit and vegetable processing
- Fermentation processes
- Vegetable oil manufacture and deep fat frying
- Distillation processes
- Brine systems, salt extraction.
- Jam, rice, syrup, starch, fruit juice, egg, seafood and sauce processing

OIL BASED DE-FOAMERS

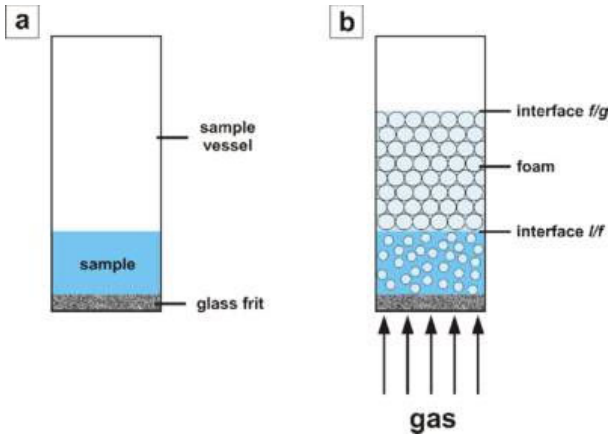
Our Range SOL is a range of hydrocarbon based antifoam and de-foamer formulated for wastewater treatment and sludge de-watering applications and other industrial applications including textile manufacture, paint production, paint booths, paper, chemicals, wastewater treatment etc.

LABORATORY DE-FOAMER ANTIFOAM EVALUATION

In our Laboratories we are using as method for Products efficiency and performances the Guidelines of :

ASTM E2407 - 04(2009) Standard Test Method for Effectiveness of De-foaming Agents

Principle is reported in the scheme



We are able to reproduce in laboratory the field conditions and are available to give our technical support to the customer by formulating our product on the base of specific need.

Our mission is to offer services for the engineering, selection, testing, supply up to site assistance of chemicals and plants for:

Treatment of process, waste, drinking, primary and industrial water with major emphasis on chemicals to be used in the process with particular attention to environmental impacts and final water discharge.

The gained technical knowledge of the water treatments allow INTECNA to propose "Technological Solutions" including products, equipment and services.