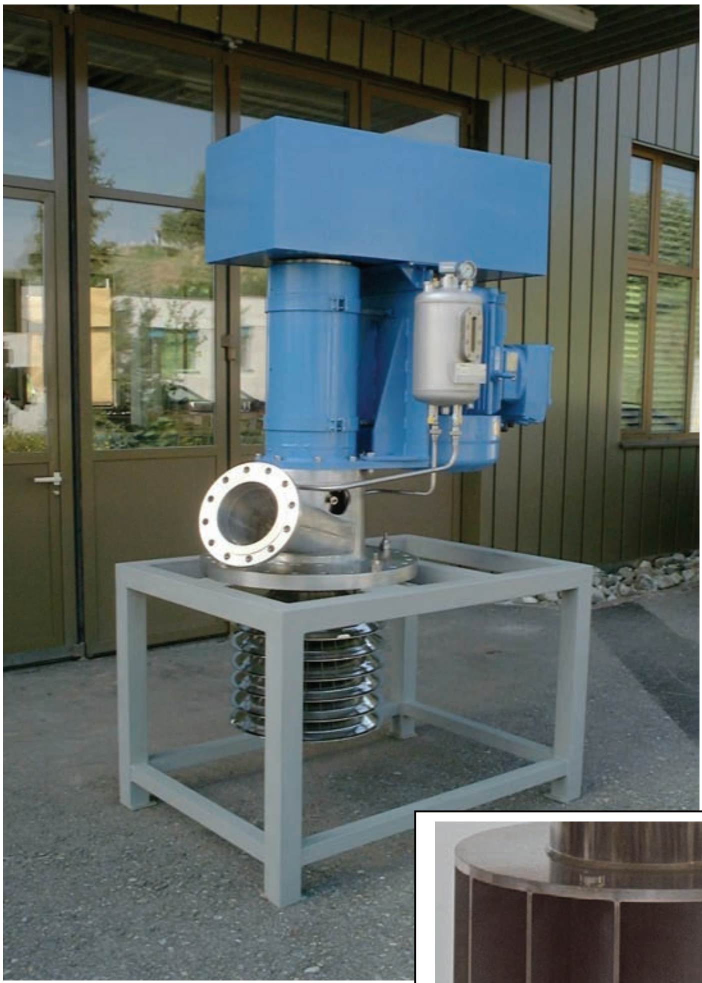
FUFO Mechanical foam separator

In all processes which involve intimate reactions between the liquid and gas phases, the finest possible dispersion of the gas phase must be obtained for optimum conditions.

The most effective methods of dispersion are used to achieve this, producing inevitably foams of the finest emulsion.

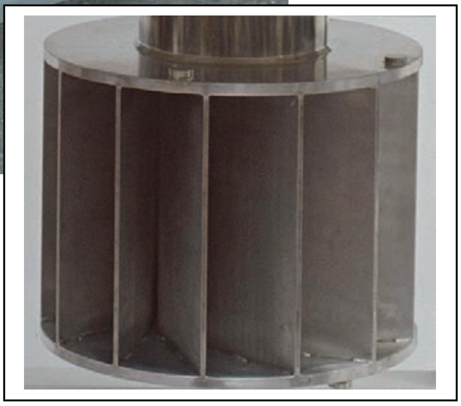
These systems offer the largest possible reaction surface at the interface of the bubbles and the liquid phase, thus accelerating the reaction. In a continuous reaction, the gas phase must be continuously fed into the liquid phase, and the additional gas phase which is inevitably formed in this reaction must be continuously removed. Since gas/liquid emulsions of such fine dispersion form very stable foams, the removal of the effluent residual gas poses a problem which must be solved in order to make the reaction as such feasible.



Foam separator FUFO size 5 in front of our workshop in Wangen SZ

The foam separator consists of conical blades/discs mounted on a rotating shaft, which has openings pointing outwards. The foam separator rotates in a mechanical seal, permitting operation either under pressure or vacuum.

The separate drive permits mounting on any reactor vessel. The rising foam enters the space between the rotating turbine. The liquid portion of the emulsion is flung back into the reactor by centrifugal force, whereas the lighter phase, the gas, is pushed through the hollow turbine part, whence it escapes to the outside. The mechanical foam separator thus enables you to solve the foam problem where it starts, i.e inside the reactor, without any additives which would affect the reaction and present problems in the recovery process steps. Furthermore, the mechanical foam separator always allows a substantial in- crease of working volume in the reactor.



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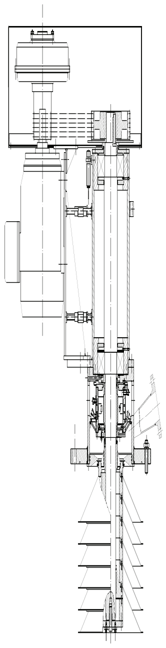

Description

The Mechanical foam separator consisting of a drive unit and of a separator nest is flanged on to the top cover of a closed reactor.

The separator nest is equipped with several blades/discs discs (depending on its size), which carry at the side a great number of radial baffles.

An electrical motor drive sets the separator nest into rotation so that the foam which enters the separator nest is divided into its liquid and gazeous phase by centrifugal action.

The liquid phase is flung back into the reactor, whilst the gazeous phase leaves it droplet-free through the Mechanical foam separator. In this way the most difficult foam problems have been solved since years in a simple and elegant fashion.

bio-t Standard foam separator program

Separator Size	Air/gas through-put	Exhaust nozzle	Motor power	Total weigth	Dia turbine D	Immersion depth	Total height	Main flange outer diameter
	Nm3/min	ISO DN	kW	kg	mm	mm	mm	mm
00	0,05	10	0,25	12	75	75	600	95
0	0,3	15	1,1	25	120	130	700	120
1	0,6	25	2,2	75	180	150	750	150
2	1,8	40	4	100	200	180	780	175
3	5	80	7,5	325	300	270	1200	265
4	20	150	22	750	440	470	1800	315
5	30	200	37	950	540	580	2000	480
6	50	250	45	1500	660	770	2600	520
7	70	300	55	2250	740	800	2810	915
8	100	350	90	2800	800	800	2900	1065

Dimension changes expected

Choice of volume of equipment and of demonstration models.The amount of air, resp. gas, which is to leave the reactor determines the required separator size.
We gladly help you to arrive at the right size by answers to our questionnaire.

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Applications

Fermentation Industry

In the fermentation industry, the use of the Mechanical foam separator has literally become a household word. Its use practically eliminates the need for antifoam reagents.

The use of antifoam reagents is not only costly in terms of actual purchase of such materials: antifoam reagents very appreciably reduce oxygen-transfer-rates, thus also reducing the utilisation rate of expensive sterile air. Furthermore, in many processes the elimination of antifoam reagents in the recovery and final refining steps becomes both difficult and expensive.

The use of the Mechanical foam separator also reduces the aerosol load on the effluent air sterile filters and incinerators. It is thus very apparent why the Mechanical foam separator is the optimum approach to the elimination of the foam in fermentation processes. The larger working volumes, allowed by the use of the Mechanical foam separator also makes for greater economy in the process.

Chemical Industry

Foam in the chemical industry is also a vexatious problem, both from the point of view of loss of product, as well as environmental pollution.

1) Monomer-stripping for PVC production :

The removal of Vinyl chloride monomer from the finished polymer, be it in dispersion or emulsion polymerization, has now become a truly continuous process. All of the non-reacted Vinyl chloride is recovered - an important point not only economically but also from a health point of view: Vinyl chloride is very carcinogenic. The time required for stripping is drastically reduced. The vacuum is applied continuously - no intermittent evacuation is required any more. Decompression can now be applied with impunity. The foam texture of dispersion polymerization is very straight forward and presents no problems! In emulsion polymerization the texture of the foam sometimes demands the mounting of baffles alongside the Mechanical foam separator. It is important that the volume of monomer be ascertained, which has to be removed from the batch in a given period of time - it is this information which determines the size of the Mechanical foam separator. The principle of stripping a gas phase applies to many processes: in nearly every case this step involves a foam problem.

2) Mentioning

This amino acid is manufactured on a big scale over the world today. Several processes are in use for this synthesis. Hydrolysis of intermediates, neutralization with CO_2 gas and precipitation of final product with H_2SO_4, are all steps which involve considerable foaming. A larger working volume, possible through the use of the Mechanical foam separator have made these processes much more economical.

3) Phosphoric Acid -Fertilizer Industry

The digestion of Phosphate rock with H_2S0_4, for the production of phosphoric acid, results in very heavy foaming. This causes a low working volume in the reactors, as well as intermittent addition of H_2S0_4: foam must subside before the digestion can be completed. The use of the Mechanical foam separator increases the working volume enormously and the process can proceed smoothly and more quickly.

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4) Vacuum distillations

Vacuum distillations of organic solvents and reactants nearly always involve heavy foaming. The use of the Mechanical foam separator permits such processes to be performed with impunity, resulting in higher efficiency. Such destillations occur in the synthesis of flavor and aromatic compounds, steam stripping of fatty acids, halogenations of various types, etc. Retardation of ebullition is no longer a source of loss of product or accidents.

5) Vacuum Evaporation

In wiped film and falling film evaporation, foam frequently forms at the vacuum side of the equipment. Often ebullition erupts suddenly, causing fouling of the vacuum equipment and actual loss of product. The insertion of a Mechanical foam separator elegantly solves this problem. Worry about shut-down and loss of vacuum are eliminated. phase, and the additional gas phase which is inevitably formed in this reaction must be continuously removed. Since gas/liquid emulsions of such fine dispersion form very stable foams, the removal of the effluent residual gas poses a problem which must be solved in order to make the reaction as such feasible.

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