

Alfa Laval Centriskim

A continuous process for reducing DAF skimmings

Introduction

The Centriskim process provides an inexpensive solution for reducing DAF skimmings to recovered fat and an easily disposable water phase, as well as a wet concentrated solid phase. After this reduction process, the solid phase usually comprises less than 15% of the original weight, and fat recovery typically amounts to 10–15%.

Application

Most meat and poultry processing companies have reduced their potential pollution problems from process water by installing DAF (dissolved air flotation) systems. More and more of these companies, however, also face a secondary problem – what to do with the recovered DAF skimmings.

Benefits

- Value of the recovered fat combined with the reduced disposal cost usually means very high profitability in Centriskim projects.
- Extremely compact Centriskim installation fits into a space no larger than 3 x 7.5 metres (9 x 25 feet). The height clearance required is less than two metres (6 feet 8 inches).
- Extremely flexible system layout which can be fitted into practically any suitably sized space in an existing plant.

Design

All Centriskim processes use centrifugal separation in a thermal process to extract fat and a highly concentrated solids phase. The solids can be transported to a central recycling plant, or further processing can be undertaken on site. The fat is normally recovered in the process, either by using a 3-phase decanter, or in a secondary separation process using a high-speed separator.

Centriskim processes can be tailored to meet local requirements, with or without the use of chemical conditioners.

The equipment has all been specially designed and modified to withstand the additional wear produced by DAF products. This enables extra long service time with typically 5000 and 7000 hours of operation between any major maintenance.

Working principle

DAF skimmings are collected in a buffer system and then passed through a continuous steam injection heater to be



heated to a temperature suitable for the centrifugal separation by either one process:

- Single-stage separation using a 3-phase decanter to extract solids, fat and water phase
- Two-stage separation, which requires a 2-phase decanter for the solids/liquid split and a high-speed separator to extract the fat.

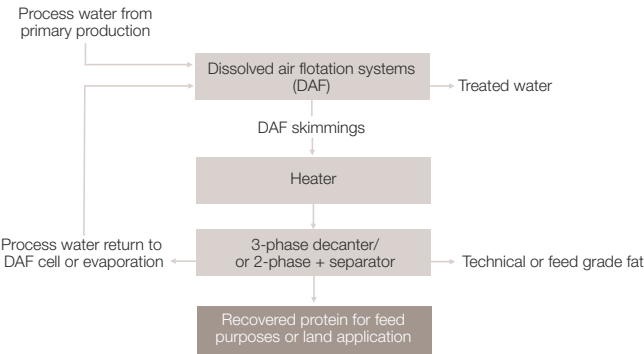
Single-stage separation is preferable in cases where the composition and consistency of the DAF skimmings are fairly constant. Two-stage separation is a more versatile method, which provides the best separation performance on products with more variations in composition, quality and chemicals, etc. Two-stage separation thus normally produces a water and fat phase of greater purity. The fat (grease) complies with more demanding specifications as regards impurities, and the water phase has a lower BOD loading.

The waste water separated from a single-stage system often requires further processing (returned to DAF or concentrated by evaporation), while the two-stage stickwater better complies with discharge criteria.

Recovered protein: The defatted and dewatered solids can be dried for feed purposes or used in other recycling solutions.

Recovered fat: Depending on both the freshness of the DAF skimmings and the flotation chemicals used, the recovered fat is usually of a lower quality. However, fresher skimmings are

usually acceptable as a direct feed-grade product, while lower grades are only used in technical applications.



Options

Under certain conditions, the process results can be improved by the addition of flocculation chemicals prior to separation. The flocculants assist the finely dispersed fat droplets and/or the colloid solids to agglomerate into clusters, which are easier to separate.

A conditioning station comprises a conditioning tank with stirrer, a chemical dispensing injector, one or more dosing pumps, and the necessary flow control equipment and electrical controls.

Skimmings sometimes contain large-sized foreign contaminants such as metal pieces, wood chips, plastics, etc. that disturb the separation quality in Centriskim equipment. To prevent this from happening, either a disintegrator (or macerator) or a screen can be placed upstream in the process to remove such objects or reduce them to an acceptable size.

Technical data

Plant characteristics/ Plant type ¹		Centriskim 4000	Centriskim 6000	Centriskim 12500
Throughput	Kg/h	3500-4500	5000-7000	10000-15000
	Lbs/h	7700-9900	11000-15400	22000- 33000
Power consumption	kWh/h	20	43	53
	HPh/h	27	58	71
Steam consumption	Kg/t	175	175	175
	RMH			
	Lbs/ tRMH	385	385	385
Space requirement	Sq m	13	19	22
	Sq ft	140	204	237

¹ Approximate throughputs and consumption figures

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