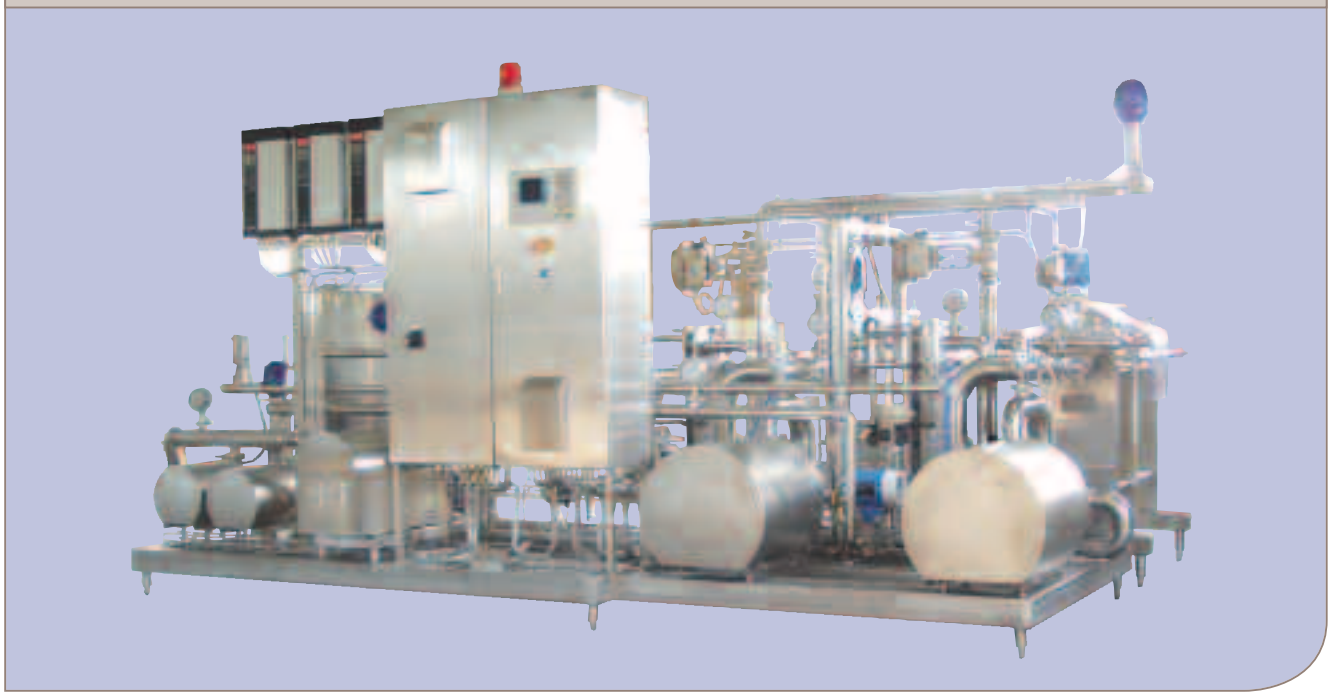
Alfa Laval beer recovery system

Standardized microfiltration membrane filtration system for beer recovery



Introduction

Alfa Laval membrane filtration systems provide a straightforward solution that enables breweries to both recover beer and concentrate the surplus yeast at the same time. This is done via a highly efficient, continuous process.

50–60% of the surplus yeast, the equivalent of 1–2% of the total beer production, can be filtered out and recovered as high-quality near-sterile beer with no oxygen pick-up. During this process, the yeast cells are concentrated up to a level of 20% dry matter.

Design

The special Alfa Laval cross-flow system for beer recovery features purpose-designed Alfa Laval microfiltration membranes, mounted in the well-proven Alfa Laval M39H plate-and-frame module with open channels.

The special FSM0.45 membranes are made of polyvinylidene fluoride (PVDF), with a pore size of 0.45µm. These inert, beverage-grade fluoropolymer membranes comply with all FDA regulations.
The membrane surface in one unit can vary from 30 m^2 up to 168 m^2. Depending on the capacity required, the system will consist of one to five loops.

Optimized flow dynamics

The Alfa Laval M39H plate-and-frame module has been developed specifically for the microfiltration of medium-to-high viscosity products that contain suspended solids. The open-channel design results in good flow dynamics under low-pressure conditions. This also keeps energy consumption to a minimum.

The Alfa Laval surplus yeast filtration system provides the following features and benefits: :

Features

- 0.45µm microfiltration membranes ensure good retention of both yeast and other micro-organisms
- Plate-and-frame system with open channels that ensure good flow dynamics and high efficiency
- Modular design makes the system easy to extend to meet growing requirements
- Low membrane replacement cost compared to ceramic systems
- Fully automated system that can operate continuously for 20 hours/day, with no batch recirculation required
- Gentle handling of yeast
- Compatible with commercially available cleaning agents
- Beer recovery from fermentation and maturation surplus yeast

Benefits

- Low operating costs (labour, energy, chemicals, etc.)
- Continuous processing ensures maximum utilization and accurate yield control
- No oxygen pick-up ensures that the recovered beer is of high quality
- Well-proven, robust design results in very reliable operation
- Low operating temperature
- Minimum autolysis by tank to tank operation

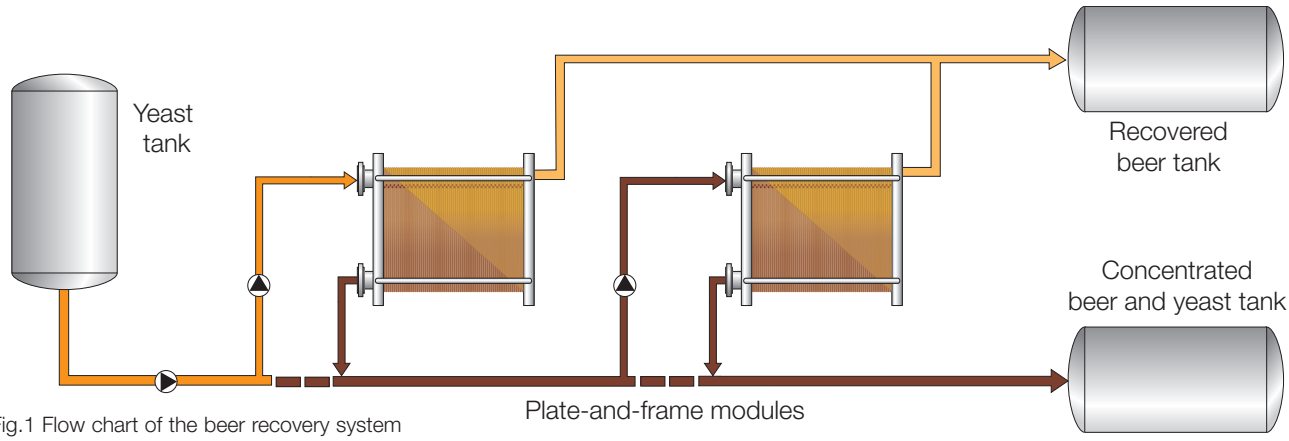


Fig.1 Flow chart of the beer recovery system

Technical specifications

Plant type	Beer RecoverAL 30	Beer RecoverAL 48	Beer RecoverAL 78	Beer RecoverAL 128	Beer RecoverAL 168
Feed concentration ➔ output concentration	5 ➔ 20% dry matter / 12 ➔ 20% dry matter				
Operation temperature (°C (F))	20 (68) or lower				
Operation mode	Continuous				
Number of loops	1	2	3	4	5
Number of modules	1	2	3	4	5
Membrane area (m^2 (ft^2))	30 (322.9)	48 (516.7)	78 (839.6)	128 (1,378)	168 (1,808)
Power consumption (kW)	25	50	75	130	175
Space required, L x B x H (m)	3.5 x 4 x 2.5	4 x 4.5 x 2.5	5 x 4.5 x 2.5	6 x 5 x 2.5	7 x 5 x 2.5
Weight (kg)	2,800	3,500	4,400	5,900	7,000
Capacity (hl/day (GPD))					
0% FY + 100% MY	25 / 45 (660.4 / 1,189)	95 / 105 (2,510 / 2,774)	170 / 180 (4,491 / 4,755)	295 / 305 (7,793 / 8,057)	405 / 390 (10,700 / 10,300)
100% FY+ 0% MY	55 / 100 (1,453 / 2,642)	205 / 230 (5,416 / 6,076)	380 / 395 (10,040 / 10,430)	650 / 680 (17,170 / 17,960)	900 / 870 (23,780 / 22,980)
Recovered beer (hl/day)					
0% FY + 100% MY	22 / 22 (581.2 / 581.2)	80 / 50 (2,113 / 1,321)	145 / 85 (3,830 / 2,245)	250 / 145 (86,604 / 3,830)	345 / 175 (9,114 / 4,623)
100% FY+ 0% MY	45 / 45 (1,189 / 1,189)	175 / 110 (4,623 / 2,906)	325 / 185 (8,586 / 4,887)	560 / 320 (14,790 / 8,454)	770 / 390 (20,340 / 10,300)
Operation time (h/day)					
0% FY + 100% MY	18				
100% FY+ 0% MY	20				

FY = Fermentation Yeast
MY = Maturation Yeast

PCM00069EN 0706

How to contact Alfa Laval
Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com