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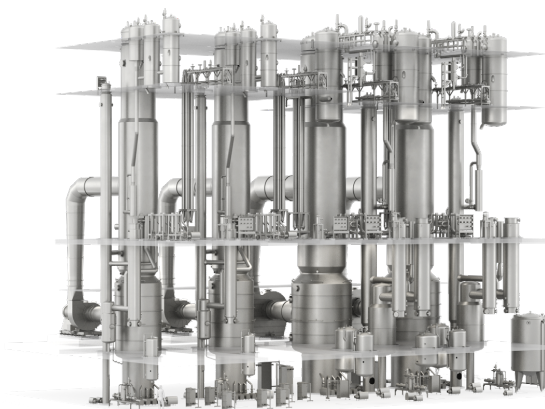
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СИСТЕМЫ ДИСТИЛЛЯЦИИ И ФЕРМЕНТАЦИИ FF Технические характеристики



Technology overview



Pre-treatment

Pre-treatment increases the product temperature from cold storage up to boiling point. During this process, the product needs to be protected from any harm, and avoid bacterial development, in an economical way. The technologies we use are:

Direct contact preheating: 'vapor mixed into liquid.' Our low mesophile and low thermophile preheaters help reduce bacterial development by reducing the heating surface and helping to increase the running time.

Indirect contact preheating: 'robust and cost effective'. Using a set of GEA liquid-liquid or liquid-vapor tubular heaters (EHEDG approved). It is the most economical solution with improved hygiene.



Heat-treatment

Involves the heating of the product from thermization up to UHT to tailor the product functionalities (denaturation and protein stability) as well as guaranteeing an excellent and safe microbiological profile for human and animal consumption.

GEA regenerative/flash vessels: recycle the energy and divide the steam consumption necessary for heat treatment by a factor of 2 to 4.

GEA tangential swirl heater: A direct steam injection device designed to reach the highest temperatures with minimum fouling and scorching.

GEA UHT plant: to provide indirect contact heating for the highest temperatures.

GEA infusion technology: for heating viscous and concentrated products.



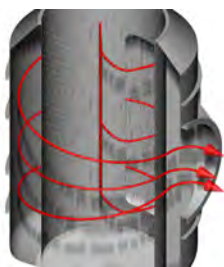
Evaporation

Evaporation concentrates the product for volume reduction prior to transport and before drying while keeping its tailor-made functionalities and minimizing the heat load on the product.

Hygienic design: easy to clean with minimum downtime and chemical usage. Vapor side and sanitation cleaning are possible.

Open type product distribution, product inlet from outside: hygienic and robust design (no chimney) with even distribution.

Open/semi closed/closed calandria top: designed to match each application, sight glasses for easy inspection, hygienic design.



Separation

This involves the separation of the product liquid droplets from the vapor by centrifugal force. It's possible to achieve clean, transparent condensate and maximize product recovery.

Tangential separator: installed adjacent to the calandria with tangential circular inlet, without baffles and/or angles, hygienic and easy inspection.

Wrap around separator: integrated into the calandria foot for 360° separation and footprint reduction. Hygienic and optimized design, spray balls and easy inspection.



Post-treatment

This adjusts the product properties to match the subsequent process steps.

Tubular re-heater: beneficial for sweetened and condensed milk.

Flash cooler: used typically for instant cooling of whey/permeate/condensed milk, and instantaneous pre-crystallization without blockages.

Plate heat exchanger: for pre-concentrate cooling and heat recovery.

Pilot Plant

Standard pilot range

We offer a full range of standard, free-standing falling film evaporators, all supplied as skid mounted units. The plants are pre-erected in our workshop, tested and delivered ready for plug-and-play connection to the product network and utilities.

EVAPORATIVE CAPACITY

Plant size		FF-50	FF-100	FF-200	FF-400	FF-800	FF-1500	FF-2000
Feed	kg/h	50	100	200	400	800	1500	2000
9% TS, 25°C								
Evaporation	kg/h	40	80	160	320	640	1200	1600
Concentrate	kg/h	10	20	40	80	160	300	400
45% TS, 50°C								

Thermal and mechanical solutions

Thermal Vapour Recompression

TVR is applied to multi-effect evaporators in which live-steam is used to recompress product vapor with the resulting mix being used as a heating medium in the first effect. Generated product vapors are sent to the following effect and used as heating media, effect by effect. Unused vapor is condensed via a cooling tower.

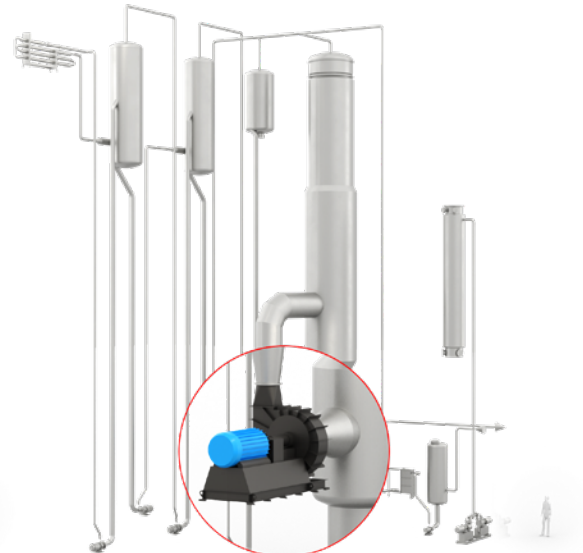
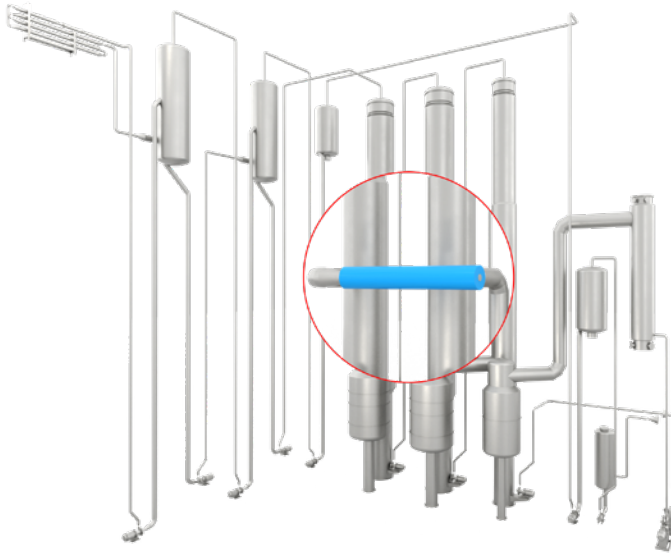
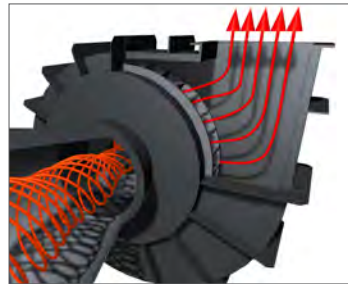
TVR evaporators are suitable for small evaporation rate applications (below 5000 kg/h) or cases where steam is inexpensive to produce: generally, below 15 Euros/T. The process generates warm condensates that can be returned to the boiler house and sent to the spray dryer preheaters.



Mechanical Vapour Recompression

MVR is usually applied to single-effect evaporators where a compact design is required. Product vapor is recompressed and recycled to the heating side of the same effect using electricity. An MVR effect can be combined with another, or a TVR effect.

MVR evaporators are suitable for larger evaporation rates, in countries where electricity is easily available and steam cost generally exceeds 20 Euros/T. Average specific consumption is about 15 kW/T of water evaporated. It generates cold condensates that can be easily treated by Reverse Osmosis allowing further use in a sustainable way and achieving the lowest CO2 footprint.



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