



Tetra Magna™ Evaporator – MVR

Continuous milk evaporation system



Highlights

- Long production runs due to high hygienic standards
- Proven technology
- Fully cleanable (Cleaning in Place)

Application

The Tetra Magna Evaporator provides a fully automatic and continuous evaporation system. The Tetra Magna Evaporator is suitable for the production of the complete range of dairy products.

The system is customer specific designed, and therefore available for a wide range of product compositions and capacities.

Working principle

The Tetra Magna Evaporator is fed from the wet process area. From the balance tank product is preheated with plate heat

exchanger (PHE) pre-heaters against concentrate and excess vapours from the calandria. Final heating is achieved with a PHE against hot water. Product starts to evaporate in the top of the first calandria. The evaporator works according to the falling film principle, which means that product and vapour are flowing downwards through the tubes. At the bottom, concentrate falls down and vapour is sucked into the separator, whereby the smaller concentrate droplets are separated from the vapour. Concentrated product is pumped to the next pass, whereby product is concentrated further.

When steam costs are high and/or the amount of water evaporation is high, preferably mechanical vapour recompression (MVR) is used. Major parameters to check are: availability, reliability and costs of electricity. A density controller in the concentrate flow is used to set the speed of the MVR fan.

After the final pass product is pumped to the Tetra Magna TVR calandria, using steam as driving force. Final concentrate is pumped into the concentrate tank of the dryer.

Capacity

Capacity of the evaporator system depends on milk composition and milk intake. For example if skim milk is concentrated from 9 to 50% total solids for a 44,000 kg/hr feed a typical system would be as follows:

Scope of supply

- Balance tank
- Feed pump
- Pre-heaters
- Calandrias
- Vapour separators
- Condensor
- Ducting
- Instrumentation
- Documentation and engineering

Options

- High heat system
- External or integrated MVR vapour separator
- Cleaning vapour side calandria, heaters and condenser
- 24 hours/day operation
- Low thermophile

Consumptions (for both MVR and TVR)

Based on a capacity of 44,000 kg/hr skim milk from 9.0 to 51 % and during normal production:

Steam (incl. DSI)	995 kg/hr (medium heat)
Electricity	420 kW (absorbed kW for MVR and pumps)
Cooling water	15 m ³ /hr with 30°C in and 48°C out
Ring water	1.0 m ³ /hr with 20–25°C
Sealing water	1.0 m ³ /hr with 20–25°C

Dimensions

Required footprint is 18 x 7 metres

Required building height is 30 metres