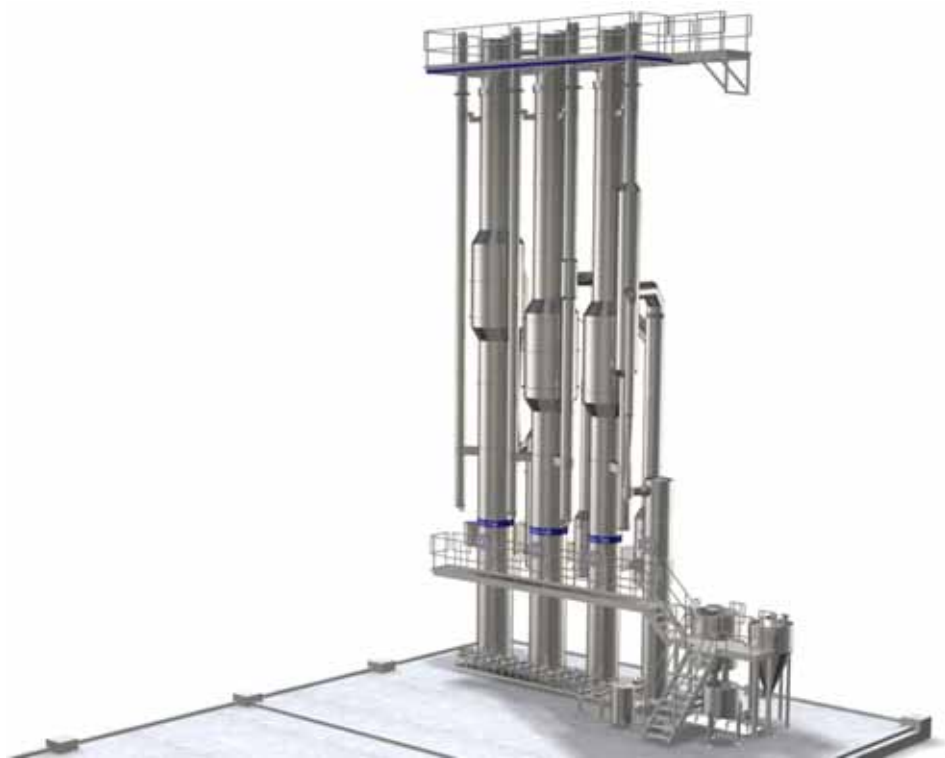




Tetra Magna™ Evaporator – TVR

Continuous milk evaporation system



Highlights

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

Application

Tetra Magna Evaporator TVR provides a fully automatic and continuous evaporation system. Tetra Magna Evaporator TVR 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

Tetra Magna Evaporator TVR is fed from the wet process area. From the balance tank product is preheated with tubular preheaters using excess vapours from condenser and flash vessel. Depending on final product demand, product will be hold for a defined period at a defined temperature. Final preheating is achieved with a direct steam injector (DSI). Product is cooled down in the flash vessel and fed into the first pass of the first calandria.

Product starts to evaporate in the top of the first calandria. The evaporator works according 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 particles are separated from the vapour.

Concentrated product is pumped to the next stage, whereby the product is further concentrated. After the final stage, the product is pumped into the concentrate tanks of the dryer.

As the amount of water evaporation is limited and the required temperature difference is relatively high, steam is used as driving force. This is referred to as thermal vapour recompression (TVR). Depending on capacity and specific product needs the number of stages and thermo-compressors are defined.

A density controller in the concentrate flow is used to set the steam flow to the thermo-compressor.

Capacity

Capacity of the evaporator system depends on milk composition and milk intake.

For example if whole milk is concentrated from 12 to 50% total solids for a 20,000 kg/hr feed, a typical system would consist of the following scope of supply:

Scope of supply

- Balance tank
- Feed pump
- Pre-heaters
- Direct steam injector
- Flash vessel
- Thermo-compressor
- Calandria (4x)
- Vapour separator (4x)
- Condensor
- Ducting
- Instrumentation
- Documentation and engineering

Options

- Low thermophile
- Steam side cleaning

Consumptions

Based on a capacity of 20,000 kg/hr whole milk from 12 to 50% and during normal production.

The evaporator is also capable to concentrate skim milk from 9 to 50%.

Steam (incl. DSI)	3,000 kg/hr
Electricity	50 kW (absorbed)
Cooling water	70 m ³ /hr with 30 °C in and 45 °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 15 x 7 metres

Required building height is 18 metres