



TETRA PAK® EVAPORATOR FALLING FILM TVR

Continuous evaporation system



APPLICATION

The Tetra Pak® Evaporator Falling Film TVR provides a fully automatic and continuous evaporation system. The Tetra Pak Evaporator Falling Film 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.

HIGHLIGHTS

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

WORKING PRINCIPLE

The Tetra Pak Evaporator Falling Film TVR is fed from the wet process area. From the balance tank product is heated to at least boiling temperature of the first calandria, depending on the final product demands. This can be done by plate heat exchangers, tubular heat exchanger and/or direct heaters by use of condensate, excess vapours, steam and/or hot water. After the heating process the product

is fed to the first calandria where the product starts to evaporate.

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 droplets are separated from the vapour. Concentrated product is pumped to the next pass, whereby the product is further concentrated.

After the final calandria pass product is pumped, depending on the product and required concentrate properties, to a next calandria, concentrate tanks of the dryer or via a flash cooler to crystallisation tanks.

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 product composition and 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 be as follows:

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
- High heat system
- 24 hours/day operation
- Sanitation in place (SIP) of the evaporator system
- Steamless system with hot water replacing steam

CONSUMPTION

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%.

TVR system

| | |
|-------------------|---|
| 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 | 1.5 m ³ /hr with 20-25°C |

DIMENSIONS

| | |
|--------------------------|----------|
| Required footprint | 15 x 7 m |
| Required building height | 18 m |

