PRODUCT DATA SHEET

TVR+ MVR EVAPORATORS

Overview

RELCO's Thermal Vapor Recompression (TVR) and Mechanical Vapor Recompression (MVR) evaporators are designed to efficiently process a wide range of dairy products, including skim and whole milk, whey, and permeate.

Pre-evaporators are engineered for feed concentrations typically ranging from 35–45% total solids, depending on the specific application. From the pre-evaporator, a finisher concentrates the product to 62% total solids or higher, while carefully controlled operating temperatures within each evaporation stage help preserve product quality.

RELCO systems can be configured using TVR, MVR, or a combination of both technologies across multiple evaporation stages to optimize performance, energy efficiency, and operating cost.

Key Features - TVR Evaporators

- Non-mechanical vapor recompression design reduces installation complexity and ongoing maintenance requirements
- Integrates seamlessly with existing plant infrastructure
- Streamlined, reliable design minimizes downtime
- Multiple TVR effects improve steam efficiency and help reduce operating costs
- Broad operating temperature range enables precise solids control, automated operation, and extended run times

Key Features - MVR Evaporators

- Turbofan technology mechanically recompresses evaporated water vapor to maximize overall energy efficiency
- Reduced steam boiler fuel demand lowers operating costs and supports CO_2 reduction initiatives
- Automatic discharge solids control improves process stability
- Constructed using high-quality components for long-term reliability and performance
- Intuitive automation platform requires minimal operator training and intervention

Advanced components include the following system elements:

Product Contact Surfaces - 316L stainless steel product contact surfaces are available for enhanced durability and service life.

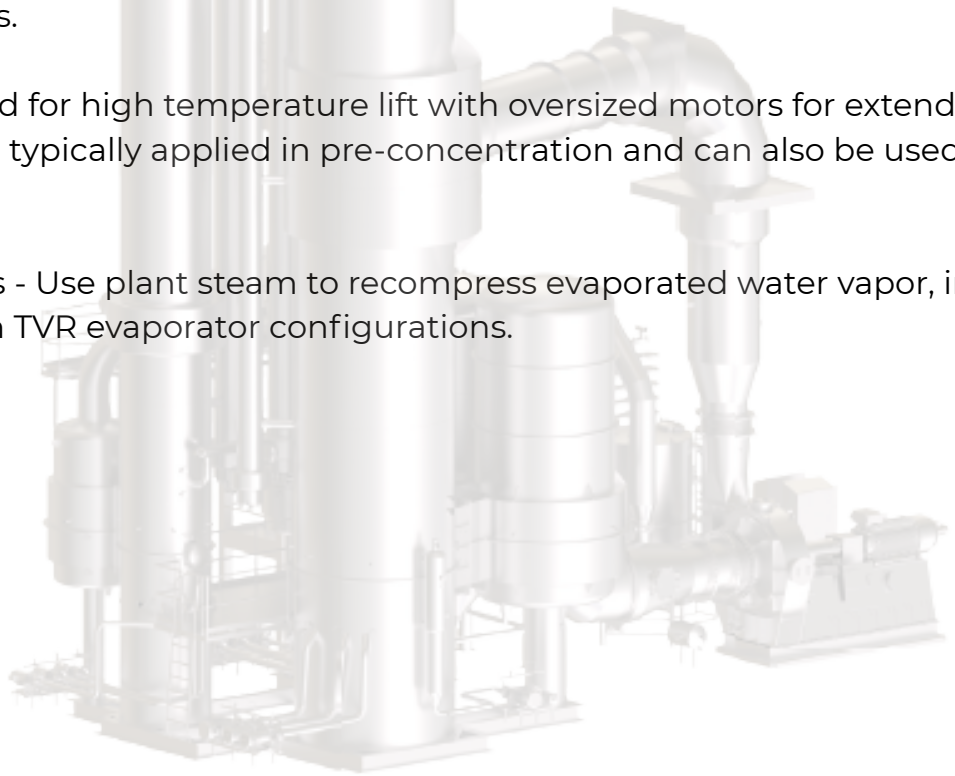
Preheaters - Preheating systems are configured to maximize heat recovery and may include a combination of plate heat exchangers, tubular heaters, and/or direct steam injection (DSI), depending on process requirements.

Calandrias - Tubular falling-film calandria designs are customized for each application to optimize surface area, tube wetting, and vapor velocity. An integrated balance tank minimizes equipment footprint. Forced-circulation and plate-type calandria options are also available.

Vapor Separators - External vapor separators are standard and are sized to optimize evaporator condensate quality. Internal vapor separator designs are available depending on application needs.

Turbofans - Designed for high temperature lift with oversized motors for extended run times. Turbofans are typically applied in pre-concentration and can also be used in finisher stages.

Thermocompressors - Use plant steam to recompress evaporated water vapor, increasing thermal efficiency in TVR evaporator configurations.



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