



EVAPORATOR SERIES



AN  **ATS** COMPANY

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EVAPORATION TECHNOLOGY

Evaporation plants serve as a thermal separation technology for concentrating or separating liquid solutions, suspensions, and emulsions. Typically, the desired final product is a liquid concentrate that remains pumpable. However, evaporation can also aim to separate volatile constituents, or distillate, as seen in solvent separation systems. Throughout these processes, it is crucial to maintain and preserve product quality. These requirements, along with many others, result in a wide variety of evaporator types, operating modes, and arrangements.

CFT GROUP EVAPORATION SYSTEMS

The first Rossi & Catelli evaporator was patented in 1957. Since then, we have designed and manufactured a diverse range of evaporation solutions for the Food and Beverage industry, applying various technologies to a wide array of products. Today, our evaporation technologies include three different methods of utilizing vapor:

- Multiple Effects: This system processes highly viscous products through thermal gradient differences across stages.
- Mechanical Vapor Recompression (MVR): MVR evaporators mechanically re-compress vapors released by the product.
- Thermal Vapor Recompression (TVR): This system reuses vapors released by the product by adding boiler steam.

Although Multiple Effects technology remains the preferred method for achieving very high concentrations, MVR is continually developing and is the most energy-efficient option. These solutions can also be combined to produce highly concentrated products while saving a significant amount of energy.



CFT GROUP RANGE OF EVAPORATORS

ART3MIS LONGRUN MVR™

Using the most advanced MVR technology and a descending circulation design, this evaporator sets new standards in energy efficiency for the production of high-quality HB tomato mid concentration products, achieving up to 14 Bx for 90 working days without cleaning and up to 16 Bx for 30 working days without cleaning.



- **Industries:** Tomato/ Fruit
- **Viscosity:** Medium Viscosity
- **Steam Consumption:** Low Steam consumption
- **Max Capacity:** Up to 1,800 tons/day
- **Technology:** MVR

BENEFITS

- **Enhanced steam efficiency and energy savings:** virtually zero steam consumption during regular operation powered by MVR Technology. With 99% of energetic consumption being electrical usage, it helps reduce CO2 emissions avoiding the burden of carbon tax.
- **Unmatched operational periods between CIPs in the market:** operating continuously throughout the entire tomato season, for up to 90 days, based on the product's brix level.
- **Breaking concentration barriers:** up to 16 brix on HB products, equivalent to more than 80% total water removal on tomato paste production.
- **Improved product quality:** enhanced product quality from superior heat transfer efficiency and lower residence time.

FEATURES

- Water removal up to 70 tons/hour in a single unit (data referred to 10 brix concentration)
- 25% higher heat transfer coefficient compared to rising/descending evaporation
- Reliable and easy to operate thanks to a completely automatic CIP system
- Easy expandable modular system
- Possibility to process crushed and fiber enriched tomatoes
- Smooth operation with total water removal easily controlled through the compressor rpm





APOLLO MVR

Cutting-edge falling film evaporator with MVR technology, which ensures up to 98% steam savings by mechanically recompressing acidic vapors.



- **Industries:** Fruits/Milk & Dairy/Tomato
- **Viscosity:** Low Viscosity
- **Steam Consumption:** Low Steam consumption
- **Max Capacity:** Up to 1,800 tons/day
- **Technology:** MVR

BENEFITS

- **Unmatched energy efficiency:** realizing up to 98% steam savings through advanced mechanical vapor recompression.
- **Minimal CO2 emissions:** extremely high energy efficiency not only helps save gas costs, but also leads to substantial carbon footprint savings.
- **Reduced operational costs:** MVR technology translates into reduced operational costs, enhancing overall cost-effectiveness.
- **Superior quality guarantee:** minimal residence time and low ΔT ensures the product retains its full organoleptic characteristics.

FEATURES

- Up to 98% of steam savings
- Short residence time (3-10 min)
- Ideal for the concentration of products from 5° to 8-10° Bx (low viscosity)
- Extremely low product/steam ΔT , maximum 10° C
- High energy recovery of heat-sensitive products, both fibrous and clear
- Water removal up to 60 tons/hour





MIXFLOW MVR

Employing mixed circulation (upward/downward), this evaporator is enhanced by innovative Mechanical Vapour Recompression (MVR) for energy saving.



- **Industries:** Fruits/Tomato
- **Viscosity:** Medium Viscosity
- **Steam Consumption:** Low Steam consumption
- **Max Capacity:** Up to 800 tons/day
- **Technology:** MVR

BENEFITS

- **Superior energy efficiency:** realizing up to 98% steam savings through advanced mechanical vapor recompression.
- **CO2 emissions reduction:** extremely high energy efficiency not only helps save gas costs but also leads to CO2 emissions reduction.
- **Ideal for viscous products:** high-efficiency circulation pumps with open impeller which allow the processing of viscous fluids.
- **Preservation of product quality:** low temperatures and reduced residence time preserve product color and taste.

FEATURES

- 83% water removal achievable with almost no steam consumption due to MVR technology
- Very short product residence time inside the heat exchanger
- The “annular chamber” separator allows low vapor velocity without increasing its diameter
- Product flavor recovery thanks to an indirect condenser
- The “annular chamber” separator allows low vapor velocity without increasing its diameter
- Water removal up to 25 tons/hour





VENUS

Standard multiple effect evaporator which employs the principle of forced downward circulation of the product.



- **Industries: Fruits/ Tomato**
- **Viscosity: Ultra High Viscosity**
- **Steam Consumption: High Steam Consumption**
- **Max Capacity: Up to 2,400 tons/day**
- **Technology: Multiple Effect**

BENEFITS

- **Color preservation and consistency:** high product performance assured through low circulation temperatures and short residence time in the heat exchanger.
- **Long-term fouling reduction:** with a low product/steam ΔT , fouling is minimized, enabling 50 days without washing.
- **Exceptional circulation efficiency:** minimal pressure loss, high circulation rates and a superior heat transfer coefficient guarantee unmatched efficiency.
- **Zero product burning:** no burned product due to our patented design, featuring a heat exchanger installed atop the steam separation chambers.

FEATURES

- High product circulation (up to 5000 tons/day) in all the effects for handling very viscous products
- Patented design with the heat exchanger installed on the top of the vapour separation chamber
- Very short product residence time inside the heat exchanger
- Low average product circulation temperature





POSEIDON

A falling film multiple effect evaporator, which can be equipped with TVR (Thermal Vapor Recompression) technology for energy saving.



- **Industries:** Fruits/Milk & Dairy/Tomato
- **Viscosity:** Low Viscosity
- **Steam Consumption:** Average Steam consumption
- **Max Capacity:** Up to 750 tons/day
- **Technology:** TVR

BENEFITS

- **High energy efficiency:** compact pumps are enabled by falling film technology, with steam recovery facilitated by the thermo-compressor.
- **Ideal for juice processing:** perfect solution to process clear and cloudy fruit and vegetables juices.
- **Preservation of product quality:** low temperatures and reduced residence time preserve product color and taste.
- **Flexible configuration:** It can be designed for both parallel flow and counter flow, with 2 or 3 effects, with or without thermo-compressor.

FEATURES

- High concentration ratio (up to 1:25)
- Very short product residence time inside the heat exchanger
- Embedded pasteurization with 95% heat recovery
- Parallel flow for browning prevention
- Low average product circulation temperature
- Water removal up to 25 tons/hour





HYBRID EVAPORATOR

Our hybrid evaporator leverages the strengths of three separate evaporators - Apollo MVR, ART3MIS LONGRUN MVR™ and Venus - offering excellent energy savings and unmatched flexibility.

- **Industries: Fruits/Tomato**
- **Viscosity: High Viscosity**
- **Steam Consumption: Low Steam consumption**
- **Max Capacity: Up to 2,500 tons/day**



BENEFITS

- **Energy efficiency:** achieving 1:10 efficiency ratio, it minimizes steam usage, leading to a substantial cut in gas consumption.
- **CO2 emissions reduction:** it enhances efficiency, offering both environmental and economic benefits, such as incentives and savings related to carbon taxes.
- **Reduced running costs:** the initial higher cost is recovered in less than 4 years thanks to the greatly reduced running costs of an hybrid installation.
- **Flexible combinations:** the three different evaporation technologies can be combined to obtain products with different concentrations.

FEATURES

- Apollo MVR – ideal for pre-concentration (5° to 8-10° Bx), preserving the product's color and flavor at their best
- Art3mis Longrun MVR™ – it takes concentration a step further (15-16° Bx) without compromising quality
- Venus – it handles the final concentration stage to achieve the maximum requested concentration
- 75% water removal achievable with almost no steam consumption due to MVR technology



COMPETITIVE ADVANTAGES

SUMMARY

PRESERVATION COLOR AND CONSISTENCY

Ensures high product quality through low circulation temperatures and brief residence times in the heat exchanger.

REDUCED CO2 EMISSIONS

Improved efficiency offers both environmental and economic benefits, including eligibility for incentives and the avoidance of carbon taxes.

VERSATILE COMBINATIONS

The three distinct evaporation technologies can be integrated to achieve products with varying concentrations.

EXTENDED TIME BETWEEN CLEANINGS

Capable of continuous operation throughout the entire tomato season, up to 90 days, depending on the product's brix level.

SURPASSING CONCENTRATION LIMITS

CFT's MVR technology can achieve up to 16 brix in HB products, which translates to over 80% total water removal.





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