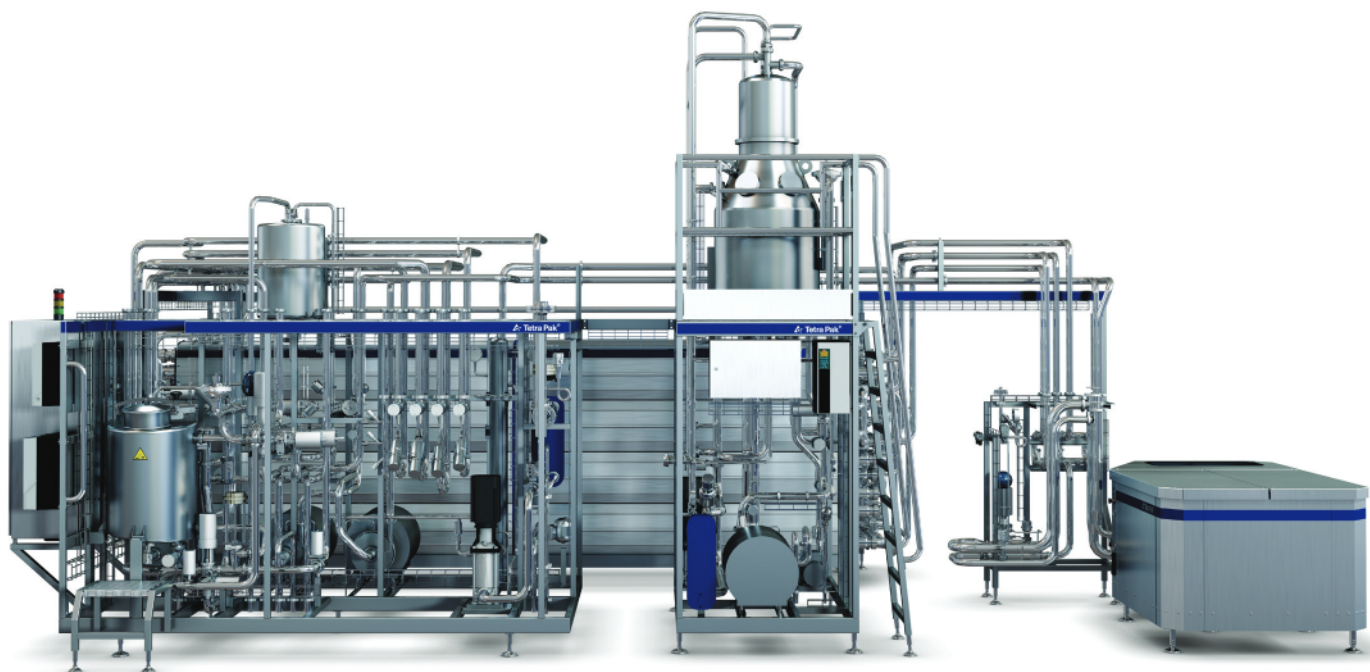


Tetra Pak® Indirect UHT unit DE

Powerful efficiency.



APPLICATION

Tetra Pak® Indirect UHT unit is a processing unit for highly efficient, continuous ultra-high temperature treatment of dairy products. The unit is of aseptic design, and a tubular or plate heat exchanger is used for indirect heating to obtain a product that can be stored at ambient temperatures. Tetra Pak Indirect UHT unit is suitable for dairy products such as milk, flavoured milk, cream, yoghurt drinks, buffalo milk and formulated dairy products, as well as for other low acid products such as plant-based dairy alternatives. Combinations with non-dairy applications such as juice, tea and coffee are also possible. Tetra Pak® Indirect UHT unit is available as a stand-alone unit or as part of a complete line solution.

HIGHLIGHTS

- Maximized operational efficiency, due to long running time and minimized energy consumption
- Minimized product losses thanks to low-loss balance tank function
- Consistent product quality

- Improved uptime as a result of optimized cleaning
- Efficient operation with full production overview and control of the heating unit from the operator interface
- Guaranteed performance

MAXIMIZING EFFICIENCY

Tetra Pak® Indirect UHT combines the best possible scope of supply with the lowest total cost of ownership throughout the complete production lifecycle. The heating unit optimizes efficiency and environmental load by reducing operational costs related to energy and water consumption.

Tetra Pak® Indirect UHT unit ensures maximum operational efficiency with a closed pre-sterilization loop that enables a quick start-up and minimal energy consumption during pre-sterilization. If there is a time gap between pre-sterilization and production, up to 85% of extra energy can be saved during water circulation by using hibernation mode.

Efficient performance is guaranteed thanks to product-to-product heat regeneration, which minimizes steam consumption during production. The UHT unit is designed to meet the desired running time. Up to 40 hours can be reached with fouling control. Additionally, losses at product change are reduced thanks to the bottom-filling balance tank, and consistent product quality is ensured through quick heating and cooling.

Further, production uptime can be significantly increased with the IntelliCIP 2.0 optimization solution.

The graphical user interface effectively displays information for everything from layout to screen colors and symbols. The interaction between humans and the computer puts the whole process in seamless synergy, making sure operators of every experience level easily can control the machine, and more experienced users can utilize the advanced functions to gain even greater efficiency.

WORKING PRINCIPLE

The module is fully automated to safeguard aseptic status while in production. The operation is divided into four steps:

- Pre-sterilization
- Production
- Intermediate cleaning (IC)
- Cleaning-in-place (CIP)

Before production can start, it is necessary to sterilize the aseptic area by circulating pressurized hot water. In the tubular version, the balance tank is bypassed by a pressurized pre-sterilization loop, minimizing energy consumption and start-up time. After sterilization, the unit is cooled to production temperature. Finally, sterile water is circulated through the production unit.

When an aseptic tank or filling machine is ready, production can start. Production starts by filling the unit with product via the balance tank. The product displaces the water/product mix to the drain or reject tank. A specially designed balance tank with bottom filling minimizes the amount of product loss. The balance tank includes level control and CIP device, which safeguards the gentle treatment of the product and ensures a high degree of cleanability.

The product is regeneratively pre-heated in a Tetra Pak® Tubular Heat Exchanger, or alternatively in a Tetra Pak® Plate Heat Exchanger, before being homogenized in a Tetra Pak® Homogenizer. Final heating takes place by means of an indirect hot water circuit. The product is held in a holding tube for the required period of time. Regenerative cooling to packaging temperature occurs in the heat exchanger. If required, the product is further cooled by ice or tower water in the final cooling section. The tubular version uses either heat-efficient product-to-product regeneration or product-to-water regeneration. In the latter case, a secondary water circuit is used for regeneration, which prolongs production time for specific products.

Intermediate cleaning (IC) can be performed to extend the production period between cleaning-in-place (CIP). When IC is selected, the product is displaced by sterile water before cleaning starts. During IC sequences, the holding tube is kept at sterilization temperature, keeping the aseptic parts of the unit sterile. IC can be performed with lye or with a lye/acid flush. After each production run, the unit under-goes CIP with both lye and acid. These can be supplied by a central CIP system or the chemicals may be automatically dosed directly into the balance tank by an internal cleaning system. The CIP sequences can be configured for optimized cleaning result. In the event of a product supply failure, the unit goes into sterile water circulation.

The operator interface is used for process monitoring and the selection of required functions. The process controller controls and supervises both the basic process and optional units for deaeration and homogenization.

A data logging system in the unit keeps track of date of production, processed volumes, processing times, type of CIP performed, etc. Using a serial protocol, or optional I/O connections, the process controller can communicate with objects like aseptic tanks and filling machines.

PROCESSING PARAMETERS

The temperature program is specifically designed for each product, for example:

UHT Milk: 5 – 75 (Homogenization) – 138 – holding time 4s. – 20/25 °C.

CAPACITIES

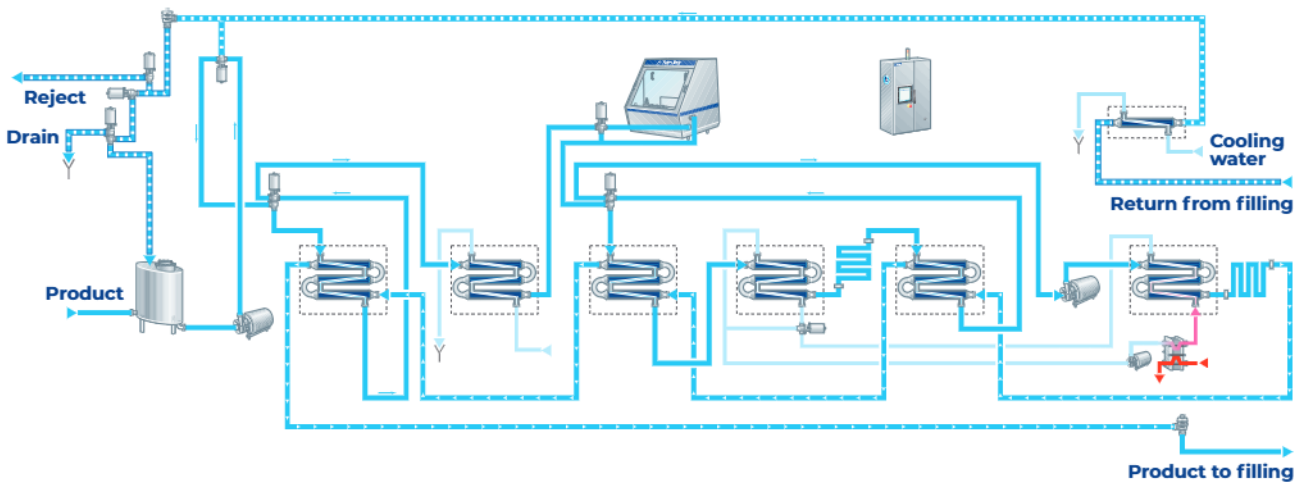
The Tetra Pak® Indirect UHT unit is available with variable capacity and can run capacities from 1,000 L/h up to 40,000 L/h.

SCOPE OF SUPPLY

- Product balance tank (BT) with level control
- Frequency controlled centrifugal product feed pump
- Frequency controlled centrifugal pump for water
- Centrifugal booster pump
- Flow controlled by electronic flow meter
- Flow transmitters in the water circuits
- Centrifugal booster pump
- Free-standing Tetra Pak® Tubular Heat Exchanger (THE) with floating connections; or Tetra Pak® Plate Heat Exchanger (PHE) with cooling, regenerative and heating sections, including protection panels/sheets
- Hot water circuit, incl. brazed PHE, pump, steam valve and trap, expansion vessel, shut-off valves, etc.
- Control panel in stainless steel including process controller (PLC), solenoid valves and motor starters
- Automated PLC operated sequences
- Automated process interaction with downstream equipment
- Automated fault supervision and action for pumps, temperatures
- Registration of sterilization and outlet temperatures
- Valves, pipes, fittings
- Frequency converters, mounted on the frame

EXAMPLE FLOWCHART

Tubular heat exchanger with product-to-product heat regeneration up to 125°C.



- Pre-wired, signal/power cables
- Pneumatic, remote-controlled sanitary valves
- Product piping in AISI 316
- Set of pipes, bends, valves, internal signal wiring, pipes for signal wiring and fittings required for the pre-erction of the UHT system
- Factory pre-assembled and tested before delivery
- Engineering
- Technical documentation in EEA languages

OPTIONAL FEATURES

AUTOMATION AND CONTROL

- PLC Control system: Siemens or Rockwell
- 21" Industrial PC operator panel mounted in the control cabinet
- Free standing PC as operator interface (HMI)
- Tetra Pak® PlantMaster integration
- Uninterrupted power supply (UPS)
- Control panel air cooling
- Digital paperless recorder

PRODUCTION EFFICIENCY

- Reduced steam consumption with Eco heating Protein denaturation holding tube for controlled fouling
- Temperature control for protein denaturation holding tube
- Inlet temperature control to final heating section
- Additional heating area in the final heating section
- Controlled hot water flow to minimize ΔT
- Correction cooler to homogenizer
- Hibernation mode
- Insulation of Tetra Pak® Tubular Heat Exchanger

PRODUCTION FLEXIBILITY

- Variable capacity 1:3 max.
- Variable capacity incl. split heater
- F0 control
- Extra holding time in additional tubes

REDUCED OUTLET TEMPERATURE

- Automatic media control
- Final cooler with manual or automatic valves

PRODUCTION SAFETY AND CONVENIENCE

- Supervision of differential pressure
- Coarse strainer after product feed pump
- Integrated leakage test
- Valve feedback

DEAERATOR

- Deaerator on separate skid
- Closed water loop for cooling of deaerator condenser
- Closed water loop on deaerator vacuum pump

HOMOGENIZER

- Aseptic homogenization
- Aseptic or non-aseptic homogenization, changeable by swing-bends
- Split homogenization
- Automatic air refill and cleaning of homogenizer dampers for increasing overall equipment effectiveness

CLEANING

- CIP from CIP station or from internal CIP system
- Internal CIP system with automated addition of CIP detergent into the balance tank via ratio dosing or header batch system
- CIP recipe editor with possibility to design unique cleaning recipes
- IntelliCIP 2.0 for cleaning according to need
- Conductivity transmitter

TECHNICAL DOCUMENTATION

- Other languages than EEA languages
- CE marking for countries outside of the European Economic Area

Please note that most of the above options are also available as upgrades.

TECHNICAL DATA

Approx. consumption data for tubular heat exchanger-based module with product-to-product heat regeneration up to 125°C (per 1,000 litres of product), with a temperature program of 5–75 (Homogenization) –138 – holding time 4s. –20°C.

STEAM (700 KPA)

- 20 kg/h

COOLING WATER (300 KPA, 20°C):

- 0–100 L/h during production (increases with fouling in the unit)
- No consumption during pre-sterilization or hibernation mode
- 500 L/h during cooling

ENVIRONMENT

- Tetra Pak® Indirect UHT unit is built in a modular design, which makes it easy to rebuild and adapt for new duties

- The unit consists of parts that can be separated for recycling purposes

RINSING WATER CIP (300 KPA):

- 1,000–2,000 L/h during CIP rinsing (depending on heat exchanger size and configuration)

INSTRUMENT AIR (600 KPA):

- 50 NI/min, total, regardless of capacity

ELECTRICITY (380V/50HZ):

- 9–22 kW, excluding homogenizer

DIMENSIONS

- Approximate measurements including required service are in mm.
- Dimensional drawing shows optional sub-units for homogenization, automatic homogenizer damper deaeration and PHE cooler
- Specific measurements will vary depending on capacity and configuration

