Tetra Pak® Pasteurizer PFC

Highlights

- Gain access to all our food engineering know-how
- Low total cost of ownership with guarantees
- Flexible and future-proof
- Faster time to market
- Ensures food safety

Application

The Tetra Pak® Pasteurizer PFC for prepared foods is an investment-efficient and versatile continuous processing unit. It is designed for indirect heating and cooling of desserts, fruit preparations, soups, sauces, tomato preparations and baby food, as well as other low- or high-acid viscous products with or without particles.

The unit can be equipped with different types of heat exchangers, depending on the application. The pasteurizer is available as a standalone unit or as part of a complete line.

High quality at a low cost

Tetra Pak Pasteurizer PFC makes it possible to produce high-quality products with low operating costs.
Using heat regeneration design, when applicable on the water side, it offers optimized energy consumption.

A tubular heat exchanger with a floating protection system minimizes maintenance and eliminates tube cracks. For corrosive products, such as ketchup, a corrosion-resistant material like SMO254 is used. Stainless steel protection panels reduce energy loss by up to 15%. Straight tubes enable visual inspection if needed. A plate heat exchanger with an optimized chevron and distribution pattern maximizes heat transfer efficiency. A plate heat exchanger is easy to open, which minimizes service downtime. For products containing high salt content, such as soy sauce, corrosion-resistant titanium plates are used.

The unit offers optimal versatility and the possibility to produce a wide range of products with different viscosities, as well as products that are smooth or contain particles of up to 9 mm in diameter. An optional hibernation function reduces energy use by up to 75% during disinfected water circulation. An optional pressurized internal disinfection loop minimizes energy consumption during start-up and water circulation. Advanced automation reduces human error and maintains product quality. Logging of process parameters enables traceability for food safety.

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Working principle

The module is fully automated using PLC control for safe operation and production. The operation can be divided into four steps:

- Pre-disinfection
- Production
- Intermediate cleaning
- Cleaning-in-place (CIP)

Before production can start, it is necessary to disinfect the downstream side area of the unit by circulating pressurized hot water. An internal disinfection loop minimizes energy consumption and start-up time. After disinfection, the unit is cooled step by step to production temperature. Lastly, disinfected water is circulated through the unit. When the receiving equipment is ready, production starts by filling the unit with product, displacing the water to drain.

The water/product mix phase can be sent to drain or a reject tank. Thereafter, production is continuous. If product supply or receiving equipment fails, disinfected water displaces the product and the pasteurizer goes into disinfection circulation. The product is heated in either tube or plate heat exchangers by an indirect hot water circuit.

The product passes through a holding tube for the required period of time. A temperature guard automatically monitors product temperature after the holding tube. If the temperature drops below the pre-set level, an alarm is activated, production automatically ceases and the receiving equipment closes. Cooling to filling temperature takes place in additional tube or plate heat exchangers.

To prolong the production period between CIP, an intermediate cleaning can be performed. When intermediate cleaning is selected, disinfected water displaces the product before cleaning starts. During the intermediate cleaning sequences, the holding tube is kept at the disinfection temperature, meaning that disinfected parts of the module remain disinfected. The intermediate cleaning can be performed either with lye only or lye and acid flush. This enables longer available production time on the pasteurizer before full CIP is required. After each production run, the module undergoes CIP with both lye and acid. The CIP sequences can be configured for optimal cleaning results.

Processing parameters

Temperature program and capacities are specific for each application.

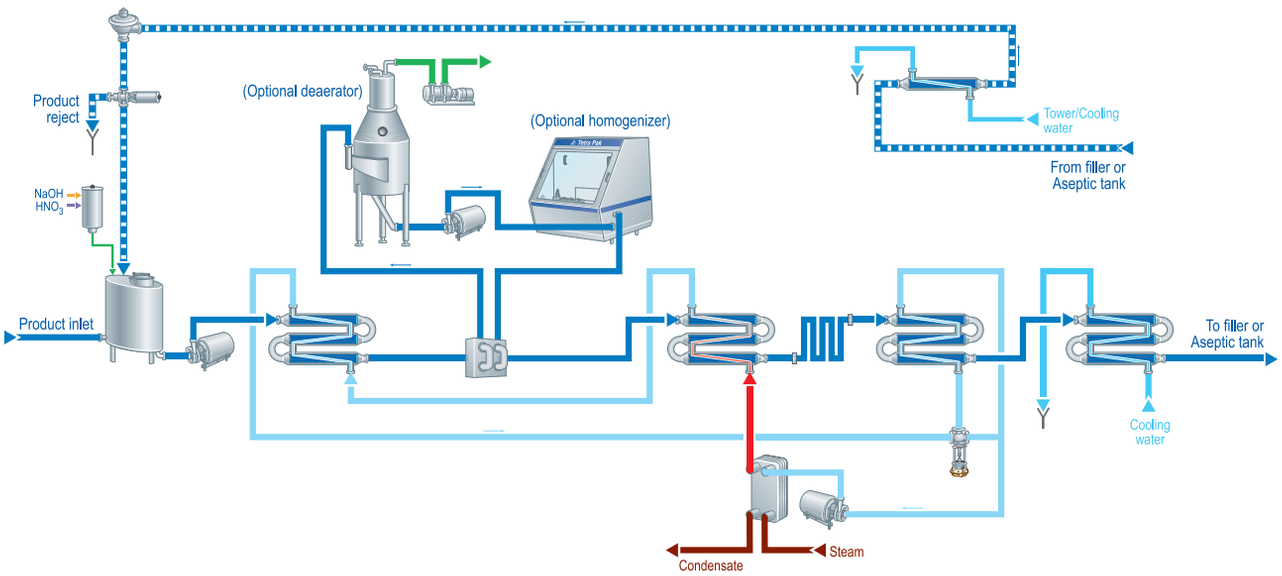
Capacities

The capacity range depends on the application. Typical capacities ranges from 2 000 l/h to 30 000 l/h. For detailed information, please contact your Tetra Pak representative.

Scope of supply

- Product balance tank with level control
- Frequency controlled product pump
- Centrifugal water pump
- Product flow meter
- Water flow meter
- Centrifugal CIP 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 and diversion valve
- Frequency converters, mounted on the frame
- 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 pre-erection of system
- Factory pre-assembled and tested before delivery
- Engineering, programming
- Technical documentation in European Economic Area (EEA) official languages

Flowchart



Optional features

Automation and control

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

Production efficiency

- Automatic CIP of balance tank
- Energy hibernation (EH) for reduced energy consumption
- Different levels of heat recovery

Special food treatment

- High temperature program for product safety
- Deaerator for product quality and long running time
- Multiple holding tubes
- TetraPak® Homogenizer for product quality

Food safety

- SMO254 material in tubular heat exchanger and titanium in plate heat exchanger for corrosive products
- Positive product pressure and pressure supervision

Cleaning-In-Place (CIP)

- Ratio dosing of CIP detergents
- Conductivity switch for supervision of CIP media change
- Back-flush cleaning of heat exchanger for products containing fibres

Technical documentation

- Non-EEA languages
- CE marking for countries outside the EEA

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Consumption data

For ambient filling of ketchup 5 000 kg/ h

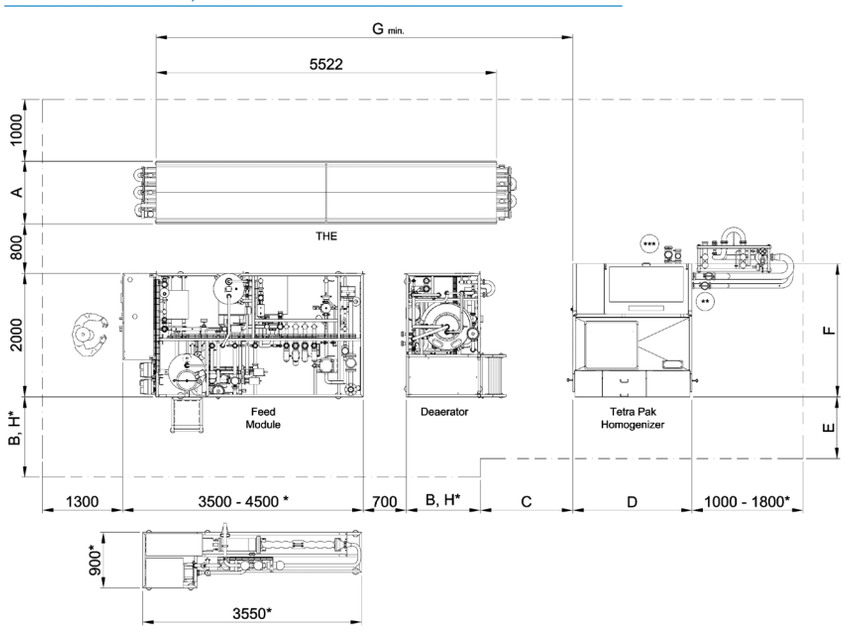
Media	Design temperature	Design temperature	Consumption Pre-sterilization	Consumption Production	Consumption CIP
Steam	-	6 bar	1 065 kg/h	765 kg/h	593 kg/h
Instrument air	-	6 bar	50 Nl/min	50 Nl/min	200 Nl/min
Potable water	15 °C	3 bar	5 000 l/h*	600 l/h	11 290 l/h*
Ice water	2 °C	3 bar	30 000 l/h**	30 000 l/h	-
Tower water	30 °C	3 bar	-	30 000 l/h	-

* No or low consumption during circulation. ** During pre-sterilization above 100 °C

Media	Voltage	Consumption	Note
3-phase power	380V/ 50Hz	20 kW	Homogenizer not included
1-phase power	220V/ 50Hz	1 kW	

Example of production parameters for ketchup

	Pasteurization	
	Ambient filling	Hot filling
Product inlet temp °C	30	30
Deaeration temp °C	70-75	70-75
Homogenization temp °C	65-70	65-70
Pasteurization temp °C	95-98	95-98
Holding time (Volumteric, seconds	30	30
Product outlet temp °C	30	85-95
Pre-sterilization temp °C	98-110	98-110
Pre-sterilization time, min	30	30



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