

UHT

Sterilisation of liquid and low-viscosity food products



APPLICATION

Ultra-High-Temperature (UHT) treatment is a processing technology employed to kill microbial spores in order to guarantee safe and stable shelf life to food products by exposing them to high temperature, usually between 135°C and 145°C, over a very short time period ranging from 2 to 5 seconds.

The products treated in such a way can be maintained under unrefrigerated conditions for months.

OPERATING PRINCIPLE

UHT treatments are carried out in different ways, according to the nature of the product to be subjected to sterilisation. Inoxpa offers:

- Indirect heating UHT solutions, through tubular heat exchangers.
- Direct heating UHT solutions, through tubular heat exchangers for heat recovery and steam injection for product sterilisation.

The heating of the product occurs in tubular heat exchangers designed to offer high thermal efficiency and optimum cleanability to ensure long operation which stands for increased plant availability.

In direct heating plants, the product is firstly heated by heat recovery in the tubular heat exchanger, while the sterilisation temperature is achieved by steam injection followed by flash cooling to remove the excess water originated by steam condensation.

Excellent thermal exchange and very accurate control of the injected steam ensure that the product is gently treated to preserve its nutritional and organoleptic features.

DESIGN AND FEATURES

Layout: Modular and compact skid-mounted units on height-adjustable feet, with built-in power and control switchboard contained in a stainless-steel cabinet.

Heat exchangers : Modular tubular heat exchangers, available in various configurations to meet the widest range of process requirements of most liquid and low-viscosity food products. The heat exchangers module features heat-insulated, stainless-steel, safety panels and polycarbonate windows to protect the operators against the contact with hot surfaces.

Automation: High end automation allowing the continuous monitoring of all process parameters thus guaranteeing reliable performance. PLC-based controls with possibility of integration with the existing plant control system.

MATERIALS

Parts in contact with the product	AISI316L
Control cabinet	AISI 304
Skid, frames and supports	AISI 304
Gaskets in contact with the product	EPDM or Silicone
Pumps' mechanical seals	C/SiC/EPDM
Surface finish	Ra ≤ 0,8 µm

TECHNICAL SPECIFICATIONS

Suitable for: Milk, cream, ice cream mix, dairy and vegan desserts, fruit juices, concentrated fruit juices, plant-based drinks and, in general, liquid and low-viscosity food products.

Typical process temperature range: 130°C – 150°C, according to process requirements.

Typical temperature holding time: 2 sec. – 10 sec, according to process requirements.

Heating mode: Indirect, through tubular heat exchangers, or direct, through tubular heat exchangers and steam injection.

Power supply: 3-phase; power consumption based on plant capacity.

Steam: 8 bar min.; consumption based on plant capacity.

Tower water: Consumption based on temperature of tower water and plant capacity.

Cooling water: Consumption based on temperature of cooling water and plant capacity.

Potable water: Quality as per Directive (EU) 2020/2184; consumption based on plant capacity.

Compressed air: 6-8 bar; consumption based on plant design.

OPTIONS

Homogeniser: Aseptic, high-pressure homogeniser, to evenly disperse the fat globules and/or fine solid particles contained in the product, to reduce the risk of phase splitting and sedimentation in the packages.

Aseptic tank: Buffer tank to serve the aseptic filler while maintaining the sterility of the product.

Product's sterility is guaranteed through the steam-sterilisation of the tank prior to the introduction of the product. The overpressure prevents then the entry of contaminants from the outside.

The tank is provided with agitation system to keep the product stirred and guarantee the homogeneity.

Aseptic tanks can also be offered as an individual equipment and designed to be operated separately from the UHT line in a fully automated mode.

Deaerator: Vacuum deaerator, to be integrated in the UHT skid; it allows the removal from the product of undesirable gases causing unpleasant odour and oxidation. The aromatic fractions that are also separated, can be recovered through condensation and reintroduced into the product.

