

HTST

Pasteurisation of liquid and low-viscosity foods



APPLICATION

High-Temperature-Short-Time (HTST) thermal treatment, also named pasteurisation, is a processing technology based on the effect that the exposure to high temperature (70-100°C) for a certain time (15-300 sec.) has on food products. Such thermal treatment is employed to eliminate pathogens, to make the product safe for consumption and extend its shelf life.

Microorganisms and enzymes that are responsible for food spoilage are either destroyed or deactivated even though most bacteria spores can be only killed by higher temperature, using UHT processing technology.

OPERATING PRINCIPLE

Pasteurisation is carried out by heating the product through plate or tubular heat exchangers. Normally, plate heat exchangers are used for liquid products while tubular exchangers are employed for the treatment of viscous products or products containing suspended solids.

The product is heated in high efficiency, multiple-sections heat exchangers up to the pasteurization temperature, to allow heat recovery hence considerable energy saving. It is then maintained at the pasteurisation temperature for a certain time, typically from 15 up to 300 sec., depending on process requirements.

Careful design guarantees a gentle treatment of the product while maximising energy recovery and increase C.I.P. washing efficiency.

The pasteuriser can be designed for multiple thermal programs to allow the processing of milk for the production of different dairy products (i.e. market milk, cheese, fermented products, etc.).

The heating of the product can be through either steam, hot water or resistors, to adapt the plant to the existing/available conditions.

Pasteurisers can be provided with or prepared for the integration of centrifugal separators, deaerators, and homogenisers to satisfy any process requirement.

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: plate or tubular heat exchangers, available in various configurations to meet the widest range of process requirements.

Product pump: wide selection of sanitary pumps (centrifugal, lobe, progressive cavity) to guarantee the best possible product handling.

Temperature program: each pasteuriser can be designed to operate one or more, different temperature programs, based on process requirements.

Pasteurisation temperature: automatically controlled.

Automation: different levels of automation, from basic systems to fully automated solutions with possibility of integration with the existing plant control system. Remote monitoring and control options.

MATERIALS

Parts in contact with the product	AISI 316L / AISI 304
Control cabinet	AISI 304
Skid, frames and supports	AISI 304
Gaskets in contact with the product	EPDM
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, all liquid and low-viscosity food products.

Typical process temperature range: 70°C – 100°C, according to process requirements.

Typical temperature holding time: 15 sec. – 300 sec, according to process requirements.

Heating mode: indirect, through plate or tubular heat exchangers.

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

Heating media: heating by hot water, to guarantee gentle heating of the product. The hot water required to achieve the pasteurisation temperature can be obtained directly from the boiler or heated by steam or electrical resistors and circulated in a closed circuit; utilities consumption based on temperature program and capacity.

Heat recovery: Up to 95%, based on temperature program.

Cooling media: tower water, mains water, chilled water, according to the required temperature program; consumption based on cooling media temperature, cooling requirements and plant capacity.

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

OPTIONS

Homogeniser: high-pressure, one or two-stage 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.

Centrifugal separators: clarifiers, bacteria clarifiers and cream separators can be integrated with the pasteurisers, based on process requirements.

Deaerator: vacuum deaerator, to be integrated in the pasteuriser's 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.

Mixing stations: powder-liquid or liquid-liquid mixing stations for the dosing and the perfect blending of the ingredients required by the recipe of the product to be pasteurized.

Dedicated CIP: dedicated CIP automated system to allow the independent CIP operation for the pasteuriser.

Directive 92/46/CEE: pasteurisers for the Dairy Industry can be provided with the necessary automated controls to comply with the EU Directive 92/46/CEE.



Pasteuriser with mixing station and homogeniser