

# Ultra-pasteurization

*DHE - FSH vacuum steam infusion systems.*



# New



**DEN HOLLANDER ENGINEERING B.V.**

*Supply of dairy and total food processing systems*

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**Introducing:**

## A new pasteurization system for extremely heat sensitive products.

Den Hollander Engineering B.V. (DHE) has developed a pasteurization system for extremely heat sensitive products using direct steam infusion.



Photo 1: FSH module

Den Hollander Engineering BV has combined its specific know-how and experience of direct and indirect heat-exchange technologies to create an optimum new concept in process technology. In designing our new pasteurization system, we have aimed to keep the product as original as possible by combining gentle heat treatment and highly effective heat transfer in a single system. This innovative system is flexible, economical, virtually maintenance-free and has a competitive price tag and offers unrivalled production process options.

### System design features

The power of this pasteurization system lies in the fact that maximum heat transfer can be achieved with a minimum surface. This has been achieved by maximizing the specific capabilities of the heat-exchangers used in the process. The system is highly versatile, even for high-viscosity and flexible in capacity. By applying our patented FSH direct steam infusion heater and flash-cooling tech-

nology, the system's heat-transfer area is drastically reduced. At critical temperatures, extended production times can be achieved.

An additional advantage of this is that, even with these extended production times, the heat-transfer parameters stay constant, as a result of which the required quality of the final product remains the same from start to finish.

This leads to energy savings because the equipment operates more closely to optimum processing parameters. Because tubular heat-exchangers with direct product against product generation are used, in combination with steam infusion and vacuum cooling (see photograph 2), relatively little heat-transfer area is required in the system.

Self-evidently, the system is competitive in terms of price. This is especially true for high-viscosity products or if special materials, such as duplex or titanium, have to be applied.



Photo 2 Ultra Corrugation tubular heat exchanger

### Key Benefits

- Enables better and more efficient pasteurization of (high viscosity) products.
- Faster heat-transfer and effective heat generation.
- Maximum lethality with minimum heat load on sensitive products.
- Control of product characteristics through accurate and stable heat transfer factors in the process.
- Extended production times, with reduced and shorter cleaning.
- Because of the low volume in the complete system and the "plug flow" features of the heaters, the system is also attractive for producing small batches.
- Low production losses and low cleaning costs as a result of smaller system levels.
- The product is fully de-aerated.
- Treatment of corrosive and viscous products.
- Easy to operate and maintain.

### Configurations

Other configurations are possible. The modularity of the system can be modified to the specific requirements of the product.

### Capacities

Standard capacities are between 300 and 12,000 kg per hour, depending on the product.

### Designs

- The system can be integrated in part or full into your current process system.
- The key elements are delivered as skids with the miscellaneous main components, complete with pipes and wiring.

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A typical standard system consists of the following modules:

- Automation module, PLC with MCC and MMI.
- Balance tank module with pumps and valves.
- FSH module with vacuum cooler, condenser, coil heater, pumps and valves.
- Heat exchanger module in frame.
- Holding module with flow plate.
- Culinary steam filter module with condensate dryer.

## Automation

As a standard, the system is automated and operated by a Siemens S7 PLC with WIN-CC Scada software on a PC-MMI system.

## Specific requirements

### Materials:

304 / 316 is applied as a standard. For salt-based or corrosive products, special materials such as duplex or titanium can be used at critical points in the process system.

## Optional modules

*Homogenizer (Soavi)*

*Cooling tower system (Baltimore/DHE)*

*Blending/mixing (DHE)*

*De-aeration (FSD)*

*Extra vacuum coolers (DHE)*

*Standardisation system (DHE)*

*Rework tank system (DHE)*

*Aseptic surge tank system (DHE)*

*Aseptic air supply (Donaldson-DHE)*

*Aseptic pigging (Aseptomag/DHE)*

*Sterile water pressure system (Donaldson-DHE)*

*Positive Displacement pumps (PD)*

*Tubular heat exchangers, coil, straight, etc. (DHE)*

*Heat exchangers plate, tubular (various)*

## Typical applications

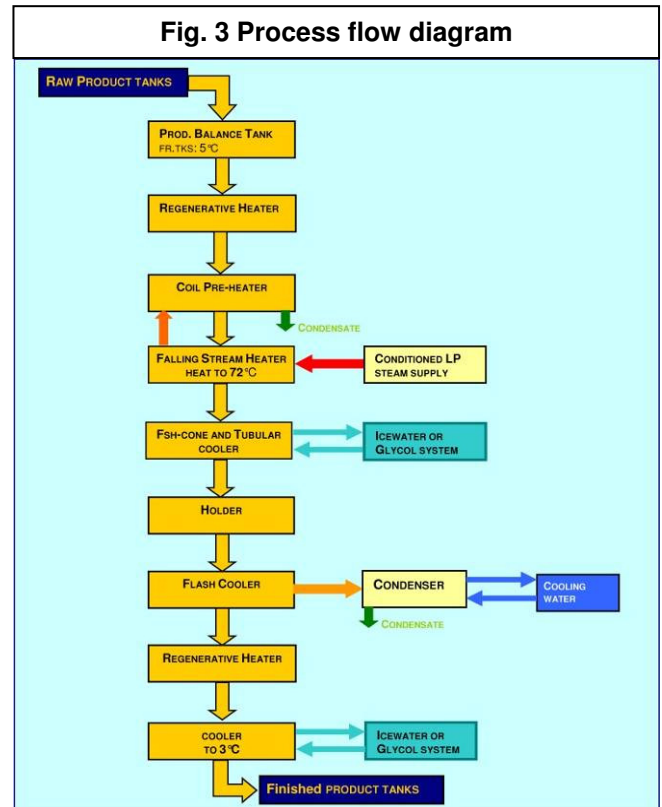
Whey, WPC, cheese milk, yogurt products, juice concentrates, ice-cream mix, acid aseptic products, liquid whole egg, egg whites, 11% salted yolks, sweetened egg yolks, fresh fruit juices, sports drinks, tea, milk, salad dressings, mayonnaise, ketchup, etc

### Example process description (egg products, see fig. 3)

- The first step in the process is heat regeneration. This consists of a unique tubular heat-exchanger with special helix-shaped corrugation, thus producing optimum heat-transfer with a minimum drop in pressure. Furthermore, a sanitary "product against product" design for this heat-exchanger has been chosen to give maximum heat regeneration levels.
- In order to reach the right temperature before the FSH, a vapour heatexchanger is used.

- After this, the pasteurization phase with steam infusion takes place.
- An intermediate cooler cools the product down to the required temperature and is then held at this temperature.

**Fig. 3 Process flow diagram**



- The product is then cooled by means of a vacuum cooler to remove the condensation water added to the product during the steam infusion.
- In the next step, the product is cooled by regeneration of heat against the cold feed flow.
- The product then undergoes further cooling by means of a cooler to give the product its storage temperature. A plate cooler has been chosen for this purpose because of its increased effectiveness at lower temperatures.

**DHE - supplies complete process systems for the food, beverage and dairy industry. We specialize in heat-treatment, evaporation and aseptic processing.**

## Contact

Please contact us if you would like to know more about our process systems and the possibility of applying DHE technology in your business. See our website [[www.dhe.nl](http://www.dhe.nl)] for more information.