

Laboratory Pasteuriser – FT75

The Armfield Laboratory Pasteuriser is an example of the modern high temperature, short time (HTST) pasteurisers used in commercial food production. It utilises a three-stage plate heat exchanger and provides an excellent example of a 'production line' approach to food manufacturing, complete with associated 'systems and control' aspects.

**CLEAN IN PLACE (CIP)
DATA LOGGING
PROCESS CONTROL FEEDBACK**

**Demonstration Capabilities**

- ▶ Continuous production process
- ▶ Pasteurisation of milk, comparison of raw and treated product
- ▶ Control of pathogenic bacteria, shelf-life assessments
- ▶ In-line logging/data monitoring
- ▶ Heat transfer
- ▶ Energy conservation, cost and environmental benefit
- ▶ Calibration
- ▶ Cleaning in place (CIP)
- ▶ Process control/feedback
- ▶ Quality assurance/quality control
- ▶ Links between technology and science

Benefits

The equipment illustrates a number of major messages associated with food such as 'Food is a material', manufactured in a factory and not in a kitchen; 'Heat kills germs, cold doesn't' (including the importance of hygiene); 'Energy efficient processes keep prices down and protect the environment'.

In addition to pasteurisation, the FT75 can be used to demonstrate a wide range of important issues in the field of food technology. These topics can be covered at a simple introductory level and at much more sophisticated levels to suit higher educational needs.

Description

The FT75 Laboratory Pasteuriser accurately reproduces in miniature the industrial high temperature, short time process (HTST). Nominal throughput is only 10 litres/hour. Although primarily designed for use with milk, other food liquids can be pasteurised providing that their solids content is not too high.

Pasteurising temperatures and holding times are easily adjusted, enabling the effectiveness of the product treatment to be investigated. When correctly operated, cleaned and sterilised the FT75 can produce a correctly treated and pasteurised product. However it is not intended that this apparatus be used to manufacture products for human consumption.

The HTST process involves heating the process liquid (milk) to a minimum temperature of 72°C, holding this temperature for 15 seconds and cooling to a storage temperature as quickly as possible.

The three-stage plate heat exchanger of the FT75 (fig. 1) achieves these parameters by (1) heating the process liquid with hot water prior to its entry into the holding tube and then by (3) cooling with cold water to storage temperature. An intermediate heat exchanger (2) transfers heat from the treated product to the feed liquid. This provides dual benefits in reducing the energy required to reach the pasteurising temperature and in reducing the cooling required. An optional Armfield CW17 Chilled Water Circulator is available. Full instrumentation and controls are provided to regulate heating water temperature and also feed pump speed, which in turn regulates holding time.

Optional computer linkage is available to control the process and to log production data.

A user instruction manual provides installation, commissioning and maintenance data together with project exercises. For secondary/high school use, a full set of worksheets and simple explanations is available on request.

Requirements

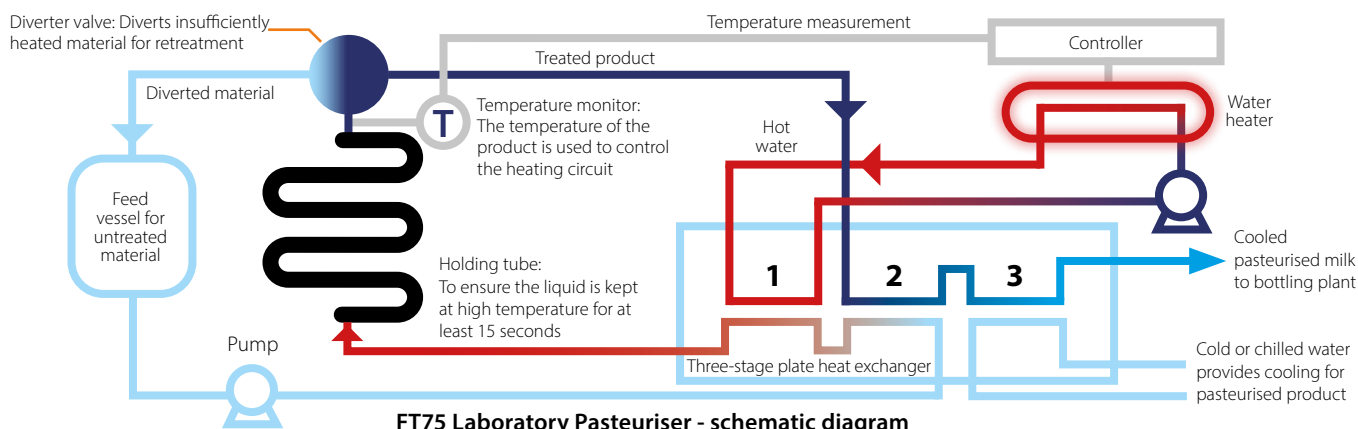
Scale



- **Electricity supply:** Single or Three phase (see ordering codes)
- **Water supply:** Required for product cooling, typically 5 l/min (or FT63 Process Chiller)

Ordering Specification

- A benchtop miniature high temperature, short time (HTST) system for the demonstration of the industrial pasteurisation process
- Includes a transparent feed tank, a feed pump, a three-stage heat exchanger, a holding tube, a divert system and a hot water circulator
- The feed pump is a peristaltic pump with a variable-speed control
- The heat exchanger is fully representative of large-scale industrial units
 - It uses stainless steel heat transfer plates
 - It can be dismantled for examination and cleaning
 - It comprises three stages, a final heating stage, a regeneration stage and a cooling stage
- Holding time is 15s at 10 l/hr, in a stainless steel holding tube
- Process temperature is measured and controlled
- Hot water is circulated around the heating stage of the heat exchanger in a closed-loop system
- A PID controller is used to adjust the electric water heater, keeping the product process temperature at the requested value
- Optional data logger with USB interface is available



FT75 Laboratory Pasteuriser - schematic diagram

Three-stage plate heat exchanger

1. The preheated feed material is brought up to pasteurisation temperature
2. Hot treated product is used to preheat the feed material, losing heat in the process
3. Cold or chilled water further reduces the heat of the pasteurised product which is piped onward for storage

Overall dimensions

Length	1.00m
Width	0.50m
Height	0.55m
Packed and crated shipping specifications	
Volume	0.50m ³
Gross weight	30Kg

Optional Accessories

CW17: Chilled Water Circulator

FT75-DTA-ALITE: Data logging system - Includes both hardware and software. Requires a PC running Windows 98 or above with a USB port.

ST55: Additional temperature sensor (for use with data logger), up to two may be used for more sophisticated experiments involving quantitative analysis of heat transfer characteristics.

Ordering codes

- FT75-A: 220-240V / 1ph / 50Hz / 10 amp
- FT75-B: 120V / 1ph / 60Hz / 20 amp
- FT75-G: 220-240V / 1ph / 60Hz / 10 amp

Knowledge base

- > 28 years expertise in research & development technology
- > 50 years providing engaging engineering teaching equipment

Benefit from our experience, just call or email to discuss your laboratory needs, latest project or application.

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