



# Flexitherm Core

– pre-engineered pasteurization payoffs

Standardized modules for pasteurization of beer and beverages

A close-up photograph of a golden beer with numerous bubbles rising to the surface. The text 'FLEXITHERM Core' is embossed in a metallic, 3D style onto the beer's surface. 'FLEXITHERM' is in all caps and 'Core' is in title case.

FLEXITHERM  
Core

# High-performance pasteurization – ready to run

## From customized to standardized

The Alfa Laval Flexitherm pasteurization system – currently used in more than 350 custom designed installations worldwide – is a well-established technology for destroying microorganisms that can risk spoiling beverage products of all kinds.

In the beverage and brewing industries, Flexitherm technology is widely considered the solution of choice for making sure that hygienically packaged perishable beverages, whether carbonated or not, have a long shelf life.

To give customers an even more comprehensive choice of heat-based, product stabilization systems, Alfa Laval provides a range of standardized Flexitherm Core pasteurization modules. These are pre-engineered with mainstream process design configurations and automation setups that are the ideal match for pre-defined sets of operating conditions.



Skid-mounted Flexitherm Core module, with the holding cell on top and compact footprint.

## General operating assumptions

The standardized configurations in the Flexitherm Core range are designed to cover the vast majority of normal pasteurization capacity requirements between 40 and 400 hl/hour.

Each configuration is optimized to efficiently deliver a constant pasteurization effect (selectable from 10–100 units) at variable flow, based on the following operating conditions:

- Product inlet/outlet temperatures and pressures of 2°C and 200 kPa, respectively
- CO<sub>2</sub> content up to 6.0 g/litre
- Pasteurization temperatures of 67–76°C
- Holding time of 30 seconds at maximum capacity.

## Pre-engineered advantages

Each Flexitherm Core module is a self-contained pasteurization unit that is pre-configured, pre-assembled and factory tested before delivery. These modules – conceived on the basis of “keep it simple” thinking – provide cost-effective, pre-engineered solutions that ensure uncompromising performance and quality at relatively limited cost.

This enables operators to minimize the total cost of ownership for pasteurization equipment used in tandem with ultra-hygienic filling systems.

## The Flexitherm Core payoffs

Flexitherm Core modules provide you with many clear-cut benefits:

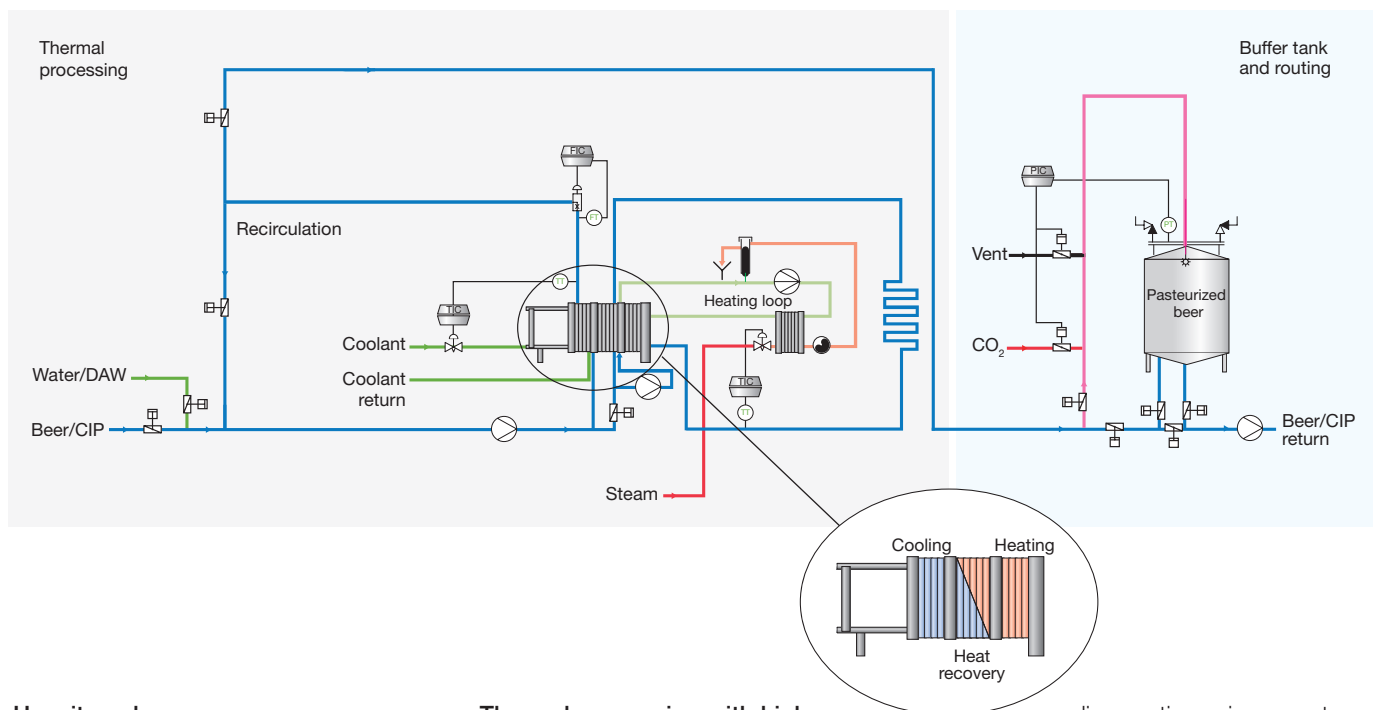
- Stable product treatment even during variable flow, with a capacity turndown of up to 50% from the nominal.
- Reliable PU control system that ensures consistent pasteurization (PU variations within +/- 10% of target level assuming constant operating conditions)
- Very low energy consumption (effective energy recovery up to 94%)
- Standardized plug-in design ensures quick, on-time delivery (units are normally ready to ship 12 weeks after order is finalized)
- Pre-assembly and factory testing of the frame-mounted module requires only a minimum of on-site installation and commissioning (as little as two weeks)
- Exceptional reliability and low maintenance requirements, keeping downtime to a bare minimum (requiring as few as 10 maintenance hours annually, with spare parts costs normally amounting to less than 2% of the base module price)
- A state-of-the-art automated control system provides exceptional production efficiency that minimizes production losses and precludes the need for operator intervention during production
- Well-structured PLC software ensures straightforward integration of the automated control system to a larger-scale monitoring system via Ethernet or Profibus.



*“Falkenberg chose the Flexitherm because it fits our existing standards for equipment and parts. Of special note is the user interface (HMI), which operators easily accepted since it is already in use on several other lines. Closeness of service and spare parts was also important.”*

Thomas Hedman  
 Technical Manager at Carlsberg Sweden, Falkenberg

### Alfa Laval Flexitherm Core pasteurization system for beer and beverages



#### How it works

Flexitherm Core modules employ a high-efficiency plate heat exchanger to thermally destroy the number of unwanted microorganisms present in the product, increasing its microbiological stability (also known as shelf life). The desired treatment, expressed in pasteurization units (PU), is achieved by subjecting the product to a combination of high temperature and holding time.

The modular design has two distinct parts:  
 1) thermal processing equipment  
 2) buffer tank and routing

A comprehensive selection of standardized, tried-and-tested configurations is available.

#### Thermal processing with high heating recovery and flexible capacity

The thermal processing equipment lies at the heart of the Flexitherm Core module, and is where incoming product is heated, treated and cooled.

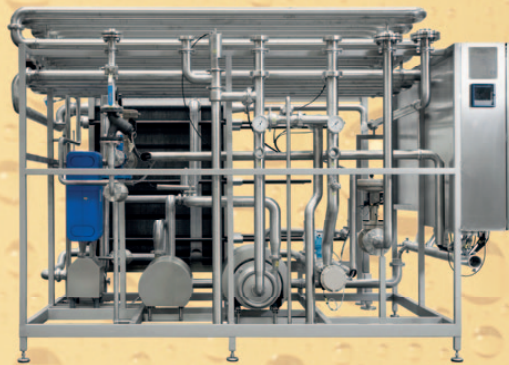
Product heating takes place first in the heat recovery section, which keeps energy consumption to a minimum, then to the required pasteurization temperature in a dedicated heating section. To minimize product degradation from exposure to high temperature, the heating section re-circulates water through a brazed plate heat exchanger that is fed with steam.

To reach the required outlet temperature, treated product is first cooled in the heat recovery section, then in a dedicated

cooling section using an external cooling media. In case of an unstable cooling media supply, an optional recirculation pump ensures consistent and optimal cooling conditions that prevent product from freezing inside the heat exchanger.

The capacity of the thermal processing equipment can be adjusted to accommodate variations in demand during the filling process, with the pasteurization temperature automatically adjusted to maintain a consistent PU effect at all times.

Optional features for the thermal processing equipment include control of the inlet pressure, automatic media shut-off valves, steam pressure regulation, condensate recovery, among others.



# Modular efficiency, standardized reliability

## Buffer tank and routing

The buffer tank for the pasteurized product is an important part of the Flexitherm Core module as the level of product in the tank is used to control capacity. If the filling process is interrupted, the tank level increases and the thermal processing throughput will decrease. If tank is full, the pasteurized product is automatically routed back to the pasteurizer inlet. The module can also be automatically emptied during this recirculation and water introduced to prevent undesirable thermal impact on the pasteurized product.

The tank top pressure set point is adjusted via the operator panel. Pressure relief and anti-vacuum valves located on buffer tank top minimize the risk of over-pressurization or implosion.

To avoid oxygen pick-up or loss of carbon dioxide, the buffer tank is filled from the bottom. A booster pump after the tank provides the required pressure towards the filler.

Options for the buffer tank and routing include the tank, frequency control for the booster pump, sensor for phase detection, sterile gas filtering, air flushing, among others.

## Control system

Flexitherm Core modules are fully automated, with a control panel placed where required to easily operate the system. The operator selects the required functions via a logically arranged control interface, using a colour touch panel that displays relevant process data (including process status, current

and set point values, alarms and controller settings).

A data recorder is available as optional equipment to maintain a historical record of process data. Other optional features available include extended data communication as well as valve position control.

## Pressure management and product security

Flexitherm Core modules are designed to keep the product pressure throughout the system higher than the saturation pressure, thus preventing gas in carbonated products from breaking out during pasteurization. An inlet feed pump, which provides the required pressure head throughout the system, can be outfitted with an optional frequency controller to maintain a constant pressure in the holding cell.

A booster pump provides additional pressure before the product enters the heating section. This ensures that the pasteurized product pressure is always higher than that of the unpasteurized product, eliminating any risk of unpasteurized material leaking into the pasteurized product.

The arrangement for internal product recirculation and water flushing uses butterfly valves, designed to eliminate any risk of pasteurized and unpasteurized product getting mixed.

## Cleaning-in-place

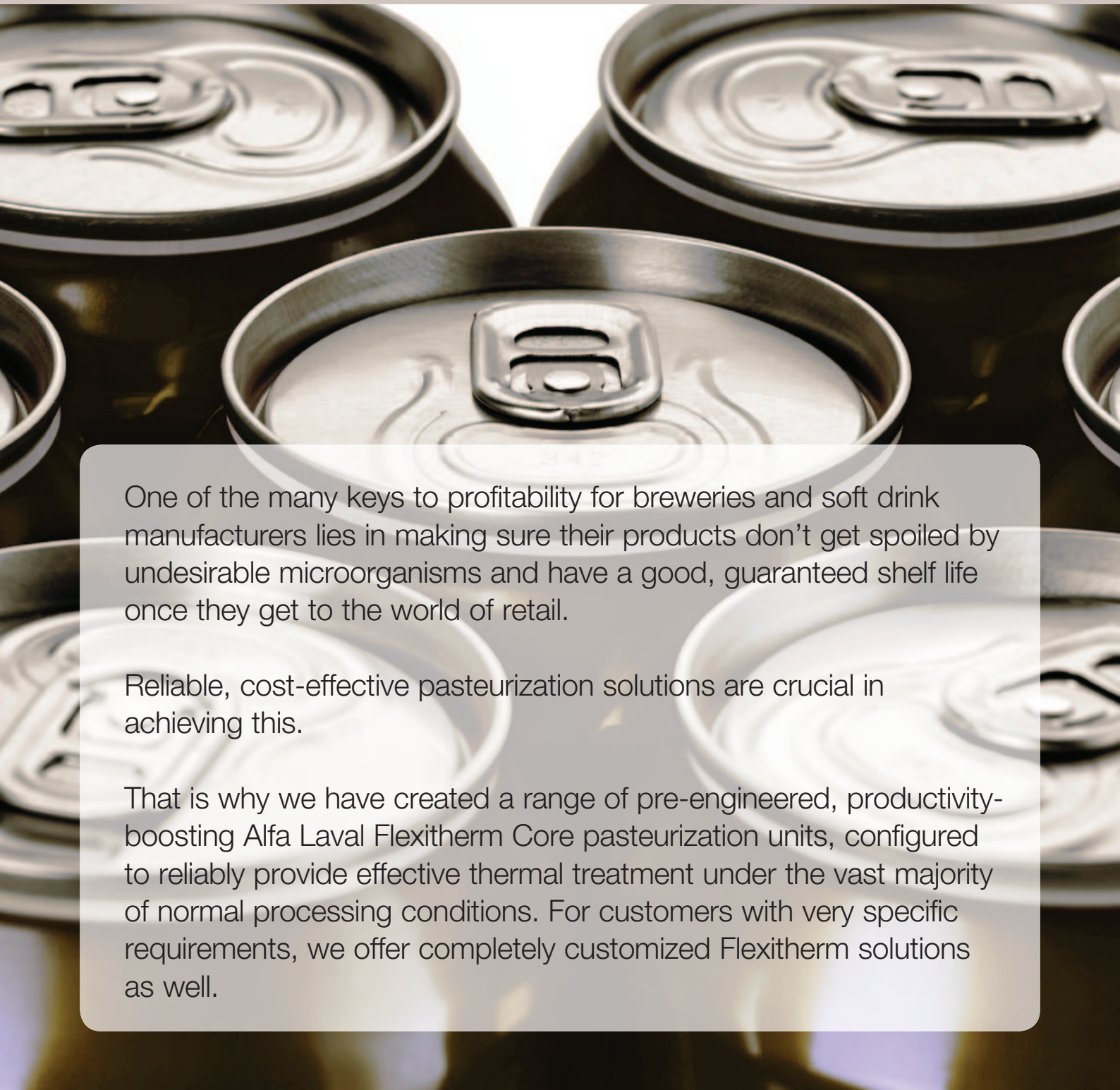
Flexitherm Core modules all feature a built-in CIP program so that they can easily be cleaned while in place, ensuring a minimum of downtime or production disruption. The entire module and buffer tank arrangement are normally cleaned together, in a single, fully automated process.

A flow line that bypasses the heat recovery section reduces start-up times and makes it easy to achieve quicker sterilization and CIP.



The routing part of the Flexitherm Core module, including routing valves and circulation pump.





One of the many keys to profitability for breweries and soft drink manufacturers lies in making sure their products don't get spoiled by undesirable microorganisms and have a good, guaranteed shelf life once they get to the world of retail.

Reliable, cost-effective pasteurization solutions are crucial in achieving this.

That is why we have created a range of pre-engineered, productivity-boosting Alfa Laval Flexitherm Core pasteurization units, configured to reliably provide effective thermal treatment under the vast majority of normal processing conditions. For customers with very specific requirements, we offer completely customized Flexitherm solutions as well.

### **Alfa Laval in brief**

Alfa Laval is a leading global provider of specialized products and engineered solutions. Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

### **How to contact Alfa Laval**

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com)

