



# Thermal solutions

**Solution overview for the food and beverage industry**



# Clean, lean, green machines

Your customers want to be sure the products they buy for their families are fresh, delicious, convenient – and most of all safe. And government regulations demand it. Choosing the pasteurization or sterilization solution that best suits your products can make all the difference – it can also cut your energy consumption, help you lower emissions and waste, and save you money.



# Let us help you find your perfect thermal solution



SteriTherm scraped surface heat exchanger for viscous products and products with particles.



SteriTherm annular heat exchanger for viscous and very viscous products.



SteriTherm plate heat exchanger for liquid products without particles and for high-energy recovery.



SteriTherm Ohmic for viscous products that are heat sensitive or include large particles.

## How viscous is your product? Is it fibrous? Or is it smooth? Do you need to pasteurize? Or sterilize?

At Alfa Laval, we know how the answers to questions like these impact equipment choices and engineering decisions. Since we have a long history of providing customers in the food and beverage industry with complete pasteurization and sterilization solutions. And we've been helping to safeguard hygienic production of products since 1883.

Our innovative products and solutions can help you get the most out of your ingredients – by preserving their nutritional value and the natural characteristics that make them delicious, while ensuring that they're always 100% safe.

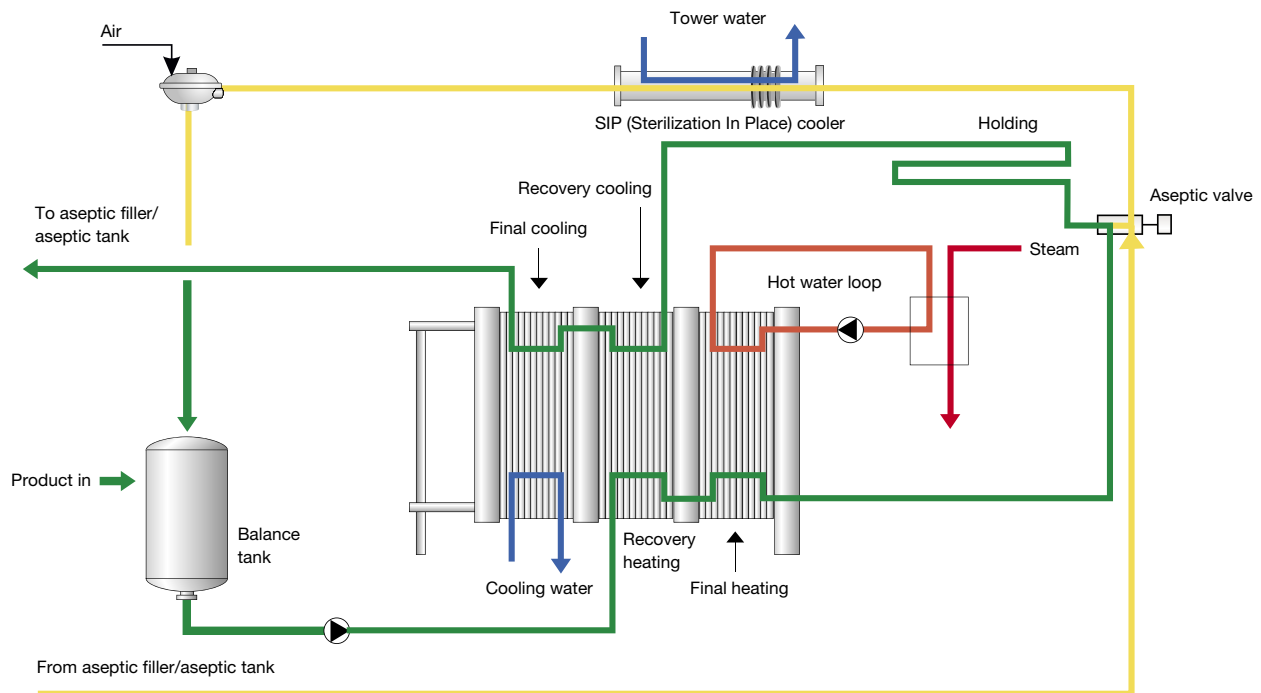
We offer the largest portfolio of thermal components on the market. And we make a point of staying on top of developments in your industry. So when you tell us about your requirements and the characteristics of your raw materials, we're ready to design and deliver solutions that perfectly suit your needs.

Our in-depth knowledge and expertise also mean that we can help optimize your entire process, ensuring that all components work together in the most effective way possible.

This guide will give you a clear overview of the products and solutions we offer.

# Alfa Laval pasteurizers and sterilizers

Alfatherm and Steritherm are our range of pasteurizers and sterilizers for food products. Their flexible, modular design makes it possible to treat a wide variety of foods – from low viscosity clear fluids to pulpy or fibrous products and fruit and vegetable particle, to viscous products like fruit purees, juice concentrates and vegetable pastes.



## Which solution is best for you?

The choice between an Alfatherm or Steritherm module is based on whether the line itself will be sanitized or sterilized. For installations sanitized with water <100°C, Alfatherm is the right choice. For installations sterilized with water >120°C, Steritherm should be selected. Alfatherm and Steritherm share nearly all the same features and benefits.

### Shared components – Alfatherm and Steritherm

**Balance tank:** Ensures constant feed. Also used to recirculate product or water (for SIP or CIP).

**Pump group:** LKH centrifugal pump, SRU rotary lobe pump, SCPP circumferential piston pump or twin piston pump designed for fruit and vegetable pieces.

**Heat exchangers:** Indirect – plate, tubular and scraped surface. Direct – direct steam injection.

**Regeneration section:** Direct steam injection and Ohmic.

**Final heating:** With hot water, steam or electricity.

**Holding tube:** Heated product passes through the holding tube.

**Final cooling:** With tower water or chilled water.

**Automation:** Automated control ensures reliable operation.

### Additional components – Steritherm

**Aseptic diversion valve:** Keeps untreated product out of the cold section.

**SIP cooler:** Cools SIP water.

**Counter-pressure valve:** Prevents SIP water from boiling.

**Aseptic valves:** All post-holding valves have aseptic barriers.

## Benefits of Alfa Laval pasteurizers and sterilizers

- **Efficiency:** Alfa Laval pumps ensure top performance and low energy use
- **Energy savings:** Savings of 30-95% on heating and cooling duties.
- **Hygiene:** Alfa Laval components meet the highest hygienic standards.
- **Integration:** Alfa Laval's Astepo aseptic tanks match all aseptic and non-aseptic fillers perfectly.

# Application and product guide

Theoretically, any Alfa Laval hygienic heat exchanger can be used at the heart of an Alfatherm or Steritherm solution. But colour, freshness and texture of the food product influence the best choice of heat exchanger for a specific application.

FrontLine

Wide Stream

BaseLine

✓ = Very suitable

✓ = Suitable



		FrontLine	Wide Stream	BaseLine
<b>Fruit and vegetable juices, no fibres</b>		✓		✓
<b>Fruit and vegetable juices, with fibres</b>			✓	
<b>Single strength puree / juice concentrate</b>		✓	✓	
<b>Functional ingredients, natural colours</b>		✓		
<b>Fruit and vegetable pieces/diced</b>				
<b>Concentrated purees / vegetable paste</b>				
<b>Sauces, no particles / syrups / confectionary</b>		✓		✓
<b>Sauces, with particles / marmalade / fruit fillings</b>				
<b>Nutritional drinks and shakes</b>		✓		✓
<b>Beverages, ready to drink</b>		✓		✓
<b>Coffee and tea</b>		✓		✓
<b>Prepared food / desserts</b>				
<b>Egg</b>		✓		✓
<b>Baby food</b>		✓		
<b>Honey</b>		✓		✓

					Pasteurizers					Evaporators				
ViscoLine VLM multitube	ViscoLine VLR regeneration	ViscoLine VLA annular tube	ViscoLine VLA HP annular high pressure	ViscoLine VLO monotube	Contherm scraped surface	SteriOhm electric	Blancher cooker	SteriTherm direct steam injection (DSI)	Alrox Deaerator	AlfaVap plate evaporator	AlfaFlash	ConVap scraped surface	Tubular falling film	ViscoVap
														
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# Product specification guide

# guide

FrontLine

Wide Stream

BaseLine

✓ = Very suitable

✓ = Suitable



## Food and beverage characteristics

### Fiber length (mm)

< 1		✓	✓	✓
1 < x < 5			✓	
5 < x < 20				

### Particle size (mm)

Up to 1		✓	✓	
Up to 3			✓	
Up to 10				
Up to 25				
Up to 50				

### Particle integrity, colour & texture



### Viscosity (cps) 20°C 50-1S

< 800		✓	✓	✓
800 < x < 4,000		✓		
4,000 < x < 10,000				
> 10,000				

## Thermal solution characteristics

Fouling resistance				
Corrosion resistance		✓		
Energy saving & recovery		✓	✓	✓
Lower investment costs				✓
Lower operation costs		✓		
Floor space		✓		✓

This table provides an indication of which Alfa Laval components are suitable for raw materials with various characteristics. However, specific recommendations are always based on a dialogue and your specifications.





# Alfa Laval auxiliary components



*Blancher cooker*



*Alrox - flash cooler*



*Fillers - 3 to 1,000 litre bags*



*Hybrid powder mixer*



*Tank equipment - SteriTanks*



*Boilers*

## Blancher cooker

Alfa Laval continuous blancher cookers are designed for gentle heat treatment and/or defrosting of products that contain mixed components, such as soups, jams, sauces and baby food. They are unique in that they can handle batch or continuous production and function under vacuum.

## Hybrid powder mixer

The Alfa Laval hybrid powder mixer combines pump and powder-dissolving technologies in a single versatile unit. It's also capable of mixing products with a high concentration of dry matter.

## Alrox Deaerator

Alrox is a special process module designed for removing free, dispersed and/or dissolved air from a wide range of food products using vacuum de-aeration. It ensures better retention of important nutrients and better flavour and colour stability.

## Tank equipment - SteriTanks

Alfa Laval aseptic tanks store liquid and viscous products prior to aseptic filling. They meet the most stringent hygiene requirements and are fully compatible with cleaning-in-place procedures (CIP). Capacities from 50 to 20,000 litres.

## Fillers - 3 to 1,000 litre bags

The wide range of flexible Alfa Laval Astepo aseptic and non-aseptic fillers for pumpable food, dairy and beverages are available for bag-in-box, bag-in-bin and bag-in-drum, for manual and automatic filling, and with capacities suitable from pilot to industrial scale.

## Boilers

A variety of Alfa Laval Aalborg boilers are available for supplying steam and hot water for processes such as heating, cooling and cleaning.

# ViscoLine – tubular heat exchanger



The Alfa Laval ViscoLine range is a series of highly efficient tubular heat exchangers designed for gentle handling of low to high viscosity products, or products containing particles. Used widely in the food and beverage industry, the series is suitable for heating, cooling, pasteurization, UHT treatment, heat regeneration and other heat-transfer duties.

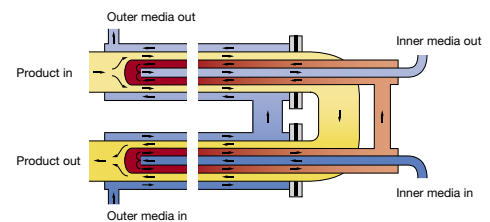
Alfa Laval ViscoLine tubular heat exchangers can be delivered as complete customized integrated systems, including automation, holding cell, pumps, valves, aseptic tanks, and so on. ViscoLine modules can be assembled on a support frame or a full frame and integrated as a heat transfer unit with various other modules.

## ViscoLine models

- **Annular (VLA)** for high viscosity products with or without particles
- **Multitube (VLM)** for low viscosity products with small particles
- **Monotube (VLO)** for products with large particles
- **Regenerator (VLR)** for product-to-product (direct) heat exchange
- **CIP (VLC)** for cleaning-in-place



**Applications:** Fruit juices, mash, purees and diced fruits, vegetable juices and tomato juice, tea/coffee extracts and liquors, ketchup, tomato paste and mayonnaise, egg products and sandwich spreads, baby foods, puddings, soups, sauces, pulps, nectars, concentrates, wine must, crushed and de-stemmed must, ice-related products.



## Features and benefits

- Designed for high levels of hygiene
- Different models can be combined on the same frame
- Welded construction for pressure-resistant, nearly maintenance-free tubes
- Different tube types and wide range of sizes for efficiency and low capital costs
- Different types of connections available
- Can be combined with any type of heat exchanger to increase running time

## FrontLine – top of the line



FrontLine is a top-of-the line series of plate heat exchangers. Able to meet the highest demands on hygiene, it features a superior, flexible design that allows easy handling and modification.

Among the main applications for FrontLine are fiber-free fruit and vegetable juices, single-strength purees and sauces, nutritional drinks, UHT treatment and the processing of heat-sensitive products. FrontLine frames can be supplied in stainless steel and silver-coated versions, and plates are available in a wide range of materials for corrosive applications. FrontLine is suitable for CIP.



*Plate options: Standard, WideStream and Gemini for optimal processing.*



**Applications:** Fibre-free fruit and vegetable juices, single-strength purees and juice concentrates, particle-free sauces, syrups and confectionary, nutritional drinks and shakes, ready-to-drink beverages, coffee and tea, egg, baby food, honey.

## BaseLine – cost-effective design



With its cost-effective frame design, the BaseLine series of plate heat exchangers is a competitive choice for process and utility duties.

Working at pressures of up to 10 bar (g), they not only handle heating and cooling, but pasteurization at low flow rates as well. Typical BaseLine applications include simple pasteurization, cooling, media heating and or cooling and heating of CIP chemicals.



**Applications:** Particle-free sauces, syrups and confectionary, nutritional drinks and shakes, ready-to-drink beverages, coffee and tea, baby food, honey, fibre-free fruit and vegetable juices.

## Contherm – scraped surface



The Alfa Laval Contherm scraped surface heat exchanger (SSHE) can handle any viscous, sticky and or heat-sensitive pumpable process fluids. It's used widely in the food and personal care industries.

Available in a number of models, Contherm can handle products with low to extremely high viscosity, or products containing particles. It's also suitable for special applications and process requirements such as evaporation.



**Applications:** Concentrated purees and vegetable pastes, sauce, marmalade and fruit fillings, prepared foods and deserts, single-strength puree and juice concentrate, functional ingredients and natural colours, fruit and vegetable pieces, nutritional drinks and shakes, egg, baby food, honey.

## SteriTherm – Direct Steam Injection (DSI)



**Direct Steam Injection**  
SteriTherm is a module that works with our tubular pre-heater and cooler or with a plate heat exchanger. It's used to quickly heat products to sterilization temperature. The culinary steam is then flash cooled in a vacuum vessel and extracted in the form of gas in precisely controlled quantities.

Appropriate for long running times and heat-sensitive products, SteriTherm DSI makes it possible to avoid fouling, browning and texture depreciation. It's suitable for white and viscous products that require HTST (High Temperature Short Time) processing to retain their natural, nutritional and organoleptic characteristics. Sizes and models are available for processing quantities of 1,000 to 8,000 litres per hour.



**Applications:** Baby food, nutritional drinks and shakes, prepared food and desserts.

## SterilOhm – electric heat exchanger



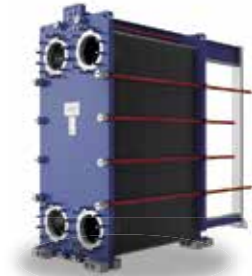
SterilOhm uses Ohmic heating technology, which is especially useful for retaining texture and size integrity, nutritional value, vitamin content and taste when pasteurizing or sterilizing products with large particles. SterilOhm heating units are also widely used for processing a variety of fouling products such as liquid eggs.

Each SterilOhm unit consists of a transformer, annular electrodes, and software that automatically adjusts voltage to match the conductivity of different products. SterilOhm units are available for mounting either horizontally or vertically depending on the viscosity of the product and the size of any particles. In order to ensure correct heat treatment, the outlet temperature is self-regulating once set.



**Applications:** Fruit and vegetable pieces/diced, sauces with particles, marmalade, fruit filling, prepared food and deserts, functional ingredients and natural colours, particle-free sauces, syrups and confectionary, egg.

## Heat exchangers for heating and cooling media and CIP chemicals



We offer a comprehensive range of Alfa Laval plate or tube (VLC) heat exchangers for efficient heating, cooling, heat recovery, condensation and evaporation of heating and cooling media and cleaning solution. There are also choices available for steam-based and high-temperature applications.



CIP (VLC) for cleaning-in-place.

# Engineered solutions



Do you have special design requirements?  
Is your market crying out for new products?  
Do you need to treat different products in  
one production line?

We design and deliver purpose-built solutions that meet your needs. Because we offer the widest variety of thermal components and understand how raw materials and the qualities of finished products influence equipment choice. Our products and solutions are flexible to accommodate changing requirements.

### **Intelligent automation**

Alfa Laval equipment features intelligent automation for controlling and monitoring critical parameters – from temperature to pressure to quantities of ingredients in products.

It alerts you to the need for adjustment and lets you document processes and track difficulties. It's compatible with all major PLCs, it integrates with other systems, and reports can be displayed with your favourite software. Plus, our remote monitoring service frees up your staff.

Together with the right equipment, intelligent Alfa Laval automation ensures safe, high-quality products at all times.

# Service



Global support that makes a difference  
on your bottom line

We partner with you to provide top lifecycle performance of equipment and processes for the best possible return on your investment. Our service offering, technical know-how and global network ensure high uptime and efficient operation every step of the way.

### **The Alfa Laval 360° Service Portfolio**

The Alfa Laval 360° Service Portfolio includes all the services you need from start-up to maintenance and ongoing monitoring and support, to original-part supply and improvements down the line. And our performance agreements provide reliability and fixed costs that make budgeting easy. Whatever level of service you need, we can provide a tailor-made performance agreement that's right for you.

### **A worldwide network of service and distribution centres**

Our worldwide network of service centres is manned by experts. They work with our field service engineers to ensure you get the attention you require. And our global spare-parts distribution network with its regional centres gets you the right parts at the right time – at great value for your money.

### 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)

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