DAIRY PROCESSING

Milk Processing

Hygienic transfer and thermal control from reception to chilled milk.



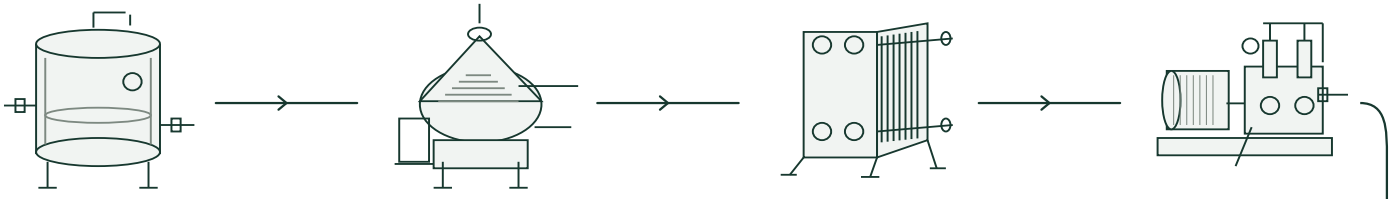
Milk, in the product context.

Photo / Eiliv Aceron

MATERIAL ROUTE / EQUIPMENT / BRANCHES

Chilled milk, through the validated heat route.

Raw milk / standardised milk / treated product



Reception and chilling

Incoming quality; chilled raw buffer

Separation / standardisation

Cream split; specified fat content

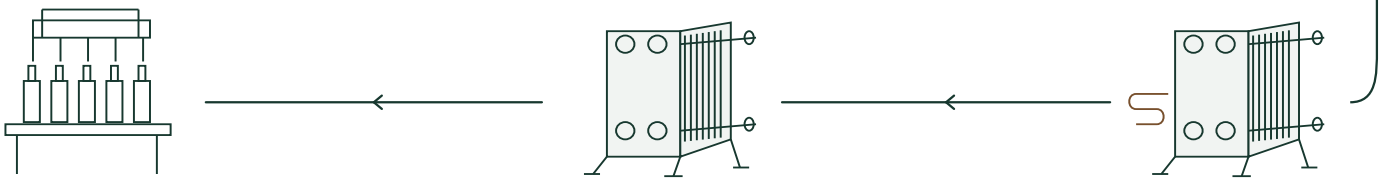
Regenerative preheating

Separate raw and treated milk paths

Homogenisation

Product-specific emulsion treatment

Main product route / follow the connected material path.



Hygienic filling

Protect treated milk; cold chain

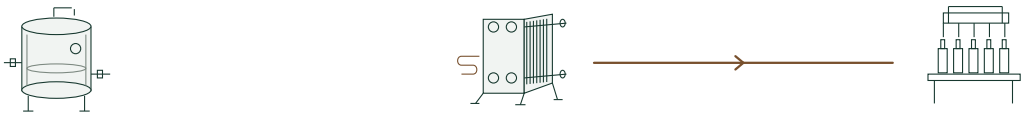
Final cooling

Specified chilled storage condition

Pasteurisation and holding

Validated treatment; safeguards

Cream leaves standardisation independently; UHT is a different treatment route.



Cream branch

UHT treatment, if chosen

Aseptic filling

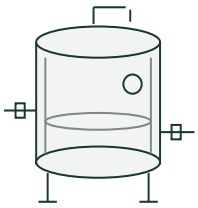
SonFlow / qualified hygienic thermal duties; DanPumps S-FP / product transfer; ABEL CM / separate residual or sludge duty.

PROCESS STUDY / 01

Receive, clarify and standardise

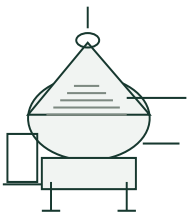
Reception links farm quality to the processing line. Check the incoming milk against the plant's acceptance criteria, cool and store it under controlled conditions, and preserve lot traceability. Clarification and separation remove the intended fractions; fat standardisation establishes the product specification. Homogenisation, where selected, reduces fat-globule size and supports physical stability. These are dedicated operations rather than functions of a transfer pump or plate exchanger. An S-FP duty can be assessed for milk transfer after confirming hygienic construction, suction conditions and operating range. The line should distinguish raw and treated zones, including tank interfaces, sampling and cleaning connections.

OPERATION STUDY / SELECTED PROCESS DETAILS



Reception and chilling

Check incoming milk and preserve its quality during chilled storage.



Separation and standardisation

Separate cream and set the required fat content.

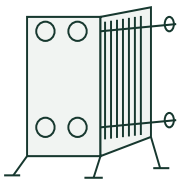
Explanatory equipment studies / configuration, controls and treatment conditions follow the selected product route.

PROCESS STUDY / 02

A heat exchanger belongs to a controlled line

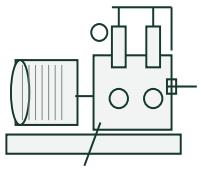
In an HTST route, regenerative heating transfers heat from outgoing treated milk to incoming raw milk through separated channels. A final heating section, holding arrangement, instrumentation and diversion logic provide the specified treatment. Cooling follows, again using regeneration where appropriate, then a final chilled-water duty. The relevant pressure relationships protect the treated side against contamination in the event of a leak. Specify the complete control arrangement and treatment validation rather than describing an exchanger as a complete pasteuriser. Milk formulation, flow, holding time and heating conditions must remain within the approved operating envelope. UHT and extended-shelf-life routes require their own process designs.

OPERATION STUDY / SELECTED PROCESS DETAILS



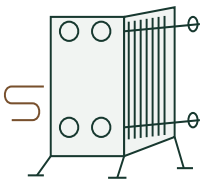
Preheating

Raise milk temperature, with regeneration where the process permits.



Homogenisation

Reduce fat-globule size when required by the product specification.



Pasteurisation and holding

Apply a validated time-temperature treatment with the required safeguards.

Explanatory equipment studies / configuration, controls and treatment conditions follow the selected product route.

PROCESS STUDY / 03



Protect the milk after treatment

Treated milk enters hygienic storage and filling, followed by the distribution regime appropriate to its process. A chilled pasteurised product needs a controlled cold chain; a commercially sterile ambient product requires a validated aseptic process and package. These are different manufacturing routes. Prevent raw-side crossover and contamination during sampling, tank switching and cleaning. Follow product quality beyond the machine outlet: shelf life depends on incoming milk quality, processing hygiene, packaging and storage. A pump selection must also cover restart, tank-emptying and cleaning flows, which can differ substantially from steady production.

Milk-product packaging at Emmi Mittelland Molkerei, Suhr, Switzerland.

Photo / bauernverband / CC BY 2.0 / cropped & resized

SONFLOW / SANITARY PLATE HEAT EXCHANGER

Control the thermal step

SonFlow offers stainless-steel sanitary plate exchangers for dairy heating and cooling, including pasteurisation applications. Specify the actual product and utility conditions together.

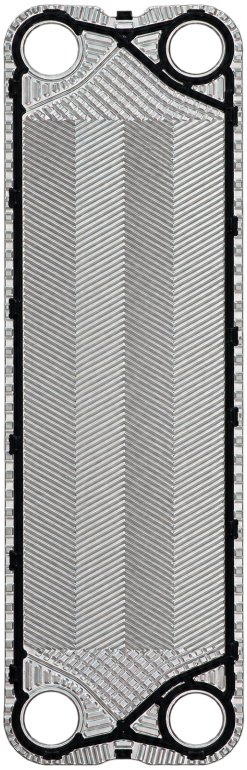


PLATE / FLOW PASSAGE



FRAME / COMPLETE UNIT

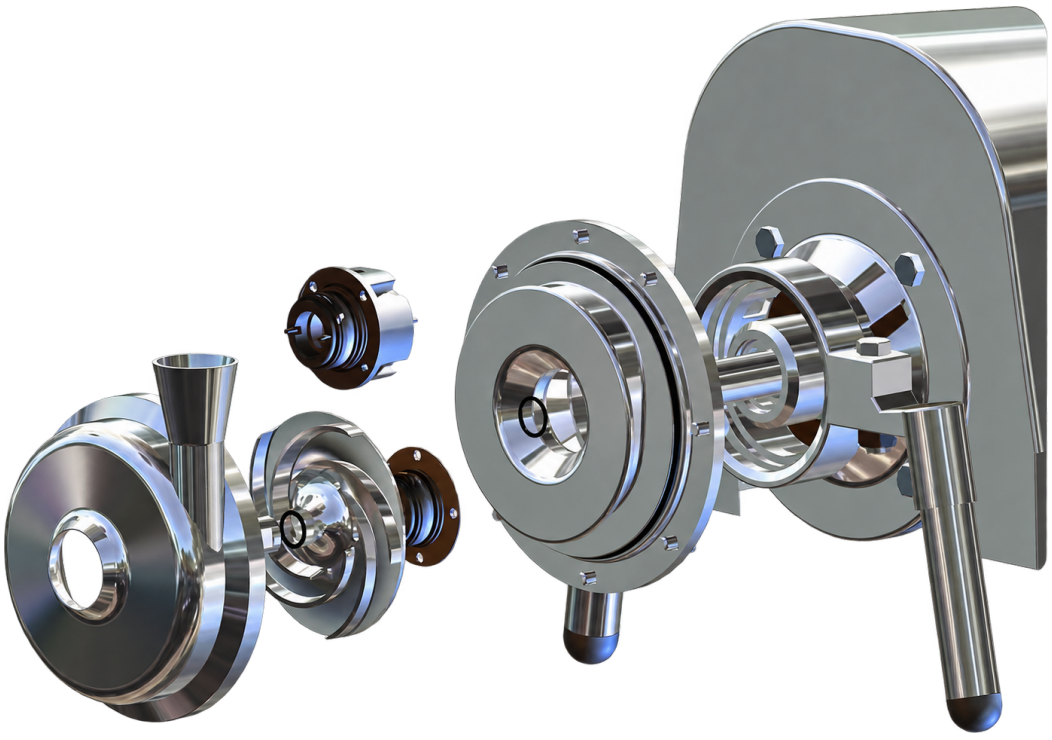
Pasteurisation requires a validated system with holding time, flow control, pressure relationships and required protective controls; the exchanger alone is not a pasteuriser.

EXPLORE SONFLOW /

DANPUMPS / S-FP SANITARY CENTRIFUGAL PUMP

Transfer with a defined duty

The S-FP catalogue identifies milk and other dairy liquids among its applications. Select the hydraulic and seal arrangement for reception or process transfer, with cleaning requirements included.



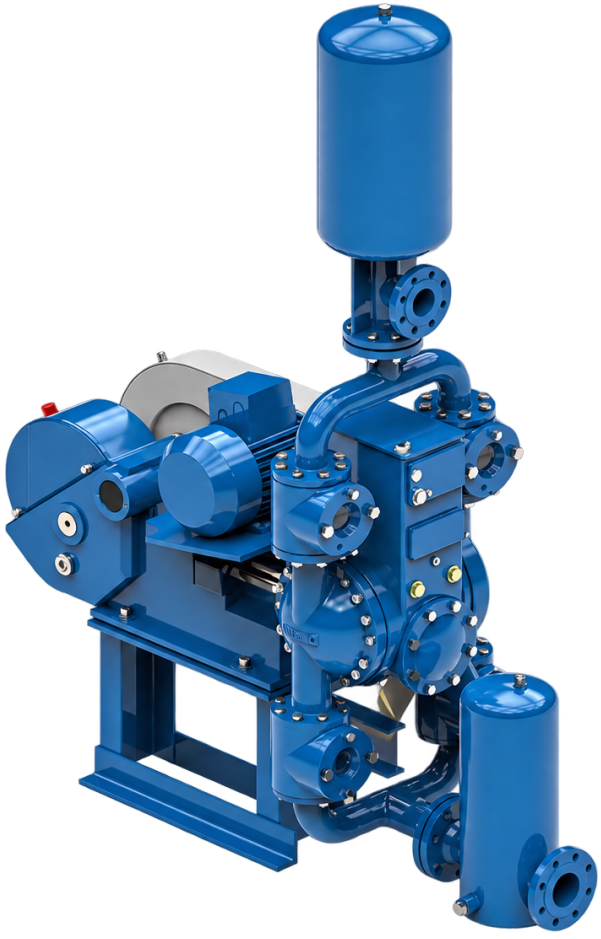
DANPUMPS / S-FP EXPLODED ASSEMBLY STUDY

Check suction conditions, entrained air and pump speed. Do not assume aseptic or UHT suitability from the sanitary series name.

EXPLORE DANPUMPS /

ABEL / CM / RESIDUAL-TRANSFER STUDY

Give residues their own route.



Assess a CM compact diaphragm pump for a defined pumpable residual or sludge stream. Select the material execution and valve arrangement for its composition, solids and pressure duty. Collection, equalisation and subsequent treatment remain separate parts of the plant.

ABEL / CM COMPACT DIAPHRAGM FAMILY

Confirm solids, particle passage, suction conditions, materials and the operating pressure range. This CM family illustration represents an auxiliary residual-stream assessment; the finished food or beverage follows its separately specified hygienic path.

EXPLORE ABEL /

CONTROL THE PROCESS OUTCOME

Verify the whole barrier.

The critical treatment record links temperature, time, flow and diversion behaviour to the actual product. Check exchanger integrity, instruments and pressure relationships under the site's validation programme. Product release also considers composition, microbiology and storage performance. Cleaning removes milk deposits through a verified sequence; it is not established simply by stating that a component is CIP-compatible. Inspect the interfaces between raw, treated and cleaning circuits.



Milk at the point of serving.

Photo / engin akyurt

VERIFY AT THE RELEASE POINT

The engineering brief should state throughput, fat content, temperatures, allowable pressure drop and the operating schedule. It should also describe cleaning fluids, concentrations and temperatures. A utility heat-recovery project should be assessed against measured heat availability and steam demand, rather than assumed to improve every dairy automatically.

THE AUXILIARY ROUTE

Do not lose regeneration.

Measure heat recovery with actual production and cleaning schedules. Regenerative efficiency can deteriorate with deposition or unsuitable flow conditions. Useful hot-water recovery must have an identified demand. Cleaning returns and product losses create different wastewater loads. ABEL CM is a candidate for an assessed residual or sludge-transfer duty, while CM filter-press feed belongs only to a separately selected wastewater-dewatering route.



Drinking-water treatment plant; a reference for the dedicated water-treatment duty.

Photo / Eric Vance / US EPA

EXPLORE THE RELATED EQUIPMENT /

TURN THE ROUTE INTO A USEFUL ENQUIRY

Specify the material. Define the duty.

The engineering brief should state throughput, fat content, temperatures, allowable pressure drop and the operating schedule. It should also describe cleaning fluids, concentrations and temperatures. A utility heat-recovery project should be assessed against measured heat availability and steam demand, rather than assumed to improve every dairy automatically.

01 Milk composition and incoming quality

02 Treatment and holding specification

03 Pressure relationships and diversion

04 Raw/treated separation and CIP

05 Filling route and cold-chain requirements

RESEARCH BASIS / SELECTED PRIMARY REFERENCES

Alfa Laval dairy processing / Tetra Pak Dairy Processing Handbook: pasteurised and ESL dairy products / SonFlow sanitary exchangers / SonFlow sanitary and food industry / DanPumps S-FP catalogue / Skyven Arcturus

PHOTOGRAPHIC REFERENCES

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BEGIN THE CONVERSATION

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