

# TERLOTHERM®

Scraped surface heat exchanger

Dairy



## Products

- Condensed full milk
- Non-dairy creamers
- Processed cheese
- Soft cheese
- Quark
- Fermented dairy drinks
- Umer (Balkan originated quark)

## Applications

- Heating and cooling pasteurization processes
- Heating and cooling of viscous liquids
- Cooling fermented products
- Preheating or pasteurizing concentrate in the spray dryers



[www.terlotherm.com](http://www.terlotherm.com)

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# TERLOTHERM® Applications in the dairy industry

## Cooling fermented dairy products

The TERLOTHERM, developed by Terlet, is widely used in the dairy industry for cooling fermented products such as soft cheese, cottage cheese, umer (Danish Yogurt) and fermented dairy drink. Characteristic of these products are the relatively high level of viscosity and their sensitive structure.

### Process

The dairy products mentioned are fermented at temperatures between 20°C (68°F) and 40°C (104°F), depending on the bacterial culture chosen. Immediately after this process has finished, the temperature should be brought down as quickly as possible. This quick drop in temperature ensures that fermentation stops, and rules out the possibility of contamination with, for instance, moulds and yeasts.

The optimum cooling process for fermented products such as cottage cheese and yogurts is quick, and even involves no pressure.

In the TERLOTHERM, quick and even cooling is achieved by means of cooling the inner and outer jacket, both of which are scraped at a relatively low peripheral speed. In this way, the product is mixed in the best possible way; caking against the wall is avoided and the structure remains completely intact.

The TERLOTHERM can be CIP cleaned and is fully accessible for visual inspection. For products that do not undergo a "final heat treatment" in particular, it is important that the effect of CIP cleaning can be subjected to a visual inspection.

### Advantages of TERLOTHERM in cooling fermented dairy products:

- Low pressure on product side
- Optimum hygiene
- Closed systems
- Fruit parts remain undamaged

## Sterilization of processed cheese

The TERLOTHERM, is particularly suitable for heating and cooling viscous liquids. It is also very suitable for thermal processes such as tempering and crystallization. Within the processed-cheese industry, the TERLOTHERM has gained a reputation for heating and cooling in pasteurization and sterilization

### Process

After mixing and melting the processed cheese, it is pumped to the TERLOTHERM. The construction of the TERLOTHERM, which allows for heating both the inner and outer jacket, ensures a high heat-exchanging capacity in combination with gradual, "product friendly" heating. Both inner and outer jacket are scraped, thus preventing caking to or even burning against the wall. The flowing profile in the TERLOTHERM guarantees even heating, reaching the time/temperature combination required for the entire product. The TERLOTHERM can be combined with a holding tube if necessary in order to reach the required sterilization time. One or more TERLOTHERMS can be used for cooling down to filling temperature. The TERLOTHERMS form a fully closed cooling system, which rules out the possibility of contamination. In many cases, the mixture of ingredients is melted in a batch-melting vessel. The TERLOTHERM can transform this part of the process into a continuous process. The product-friendly method of heating and scraping in the TERLOTHERM guarantees the ideal circumstances for the "creamier" process, which involves the "unfolding" of the casein. The TERLOTHERMS can be placed in an in-line position, enabling step-by-step melting, sterilization and cooling. Processed-cheese products are increasingly often enriched with ingredients such as herbs, vegetables, prawns, etc. "Fresh cheese textures" which give processed cheese and soft fresh cheese their "fresh" appearance, remain fully intact in the TERLOTHERM.

### Advantages of TERLOTHERM in sterilization of processed cheese:

- No risk of burning against the wall
- Low pressure on product side
- High capacity

## Pre-heating milk concentrate for the spray-dryer

The TERLOTHERM, preheats or pasteurizes the product before it is dried in the spray-dryer.

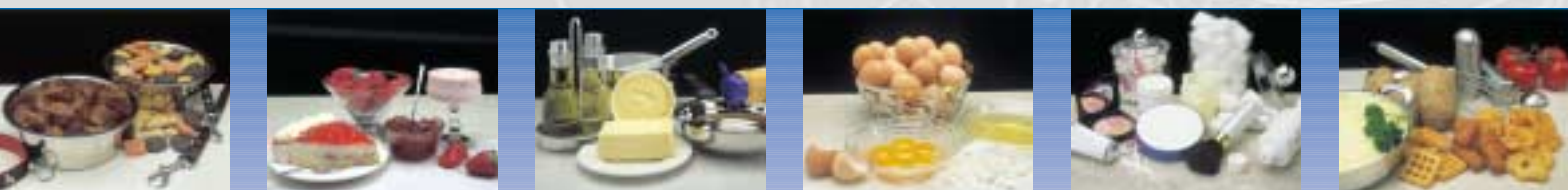
### Process

The TERLOTHERM can be used as a heater for concentrated milk before the milk reaches the spray-dryer. Because the viscosity level of the condensed product (often more than 65% of dry material) is very high, the TERLOTHERM undoubtedly is the right choice. Products suitable for this process include condensed skimmed and full-fat milk, non-dairy creamers and (fat-added) mother liquor. The TERLOTHERM has been designed specially to cool and heat product with high viscosity levels. Both inner and outer jacket function as heat-exchanging surfaces and ensure optimum heat transfer. The scrapers keep the product from the wall continually and guarantee optimum mixing in a horizontal direction. Especially for products that are prone to burning, e.g. whey/egg white concentrates; it is of vital importance that the product does not get the chance to stick to the wall. The temperature normally goes from 40°C (104°F) to about 80°C (176°F). The final temperature will depend on the purpose of heating (preheating or pasteurization) and the product to be heated. The heating medium is reduced steam of 1,5 Bar (125°C) or (257°F).

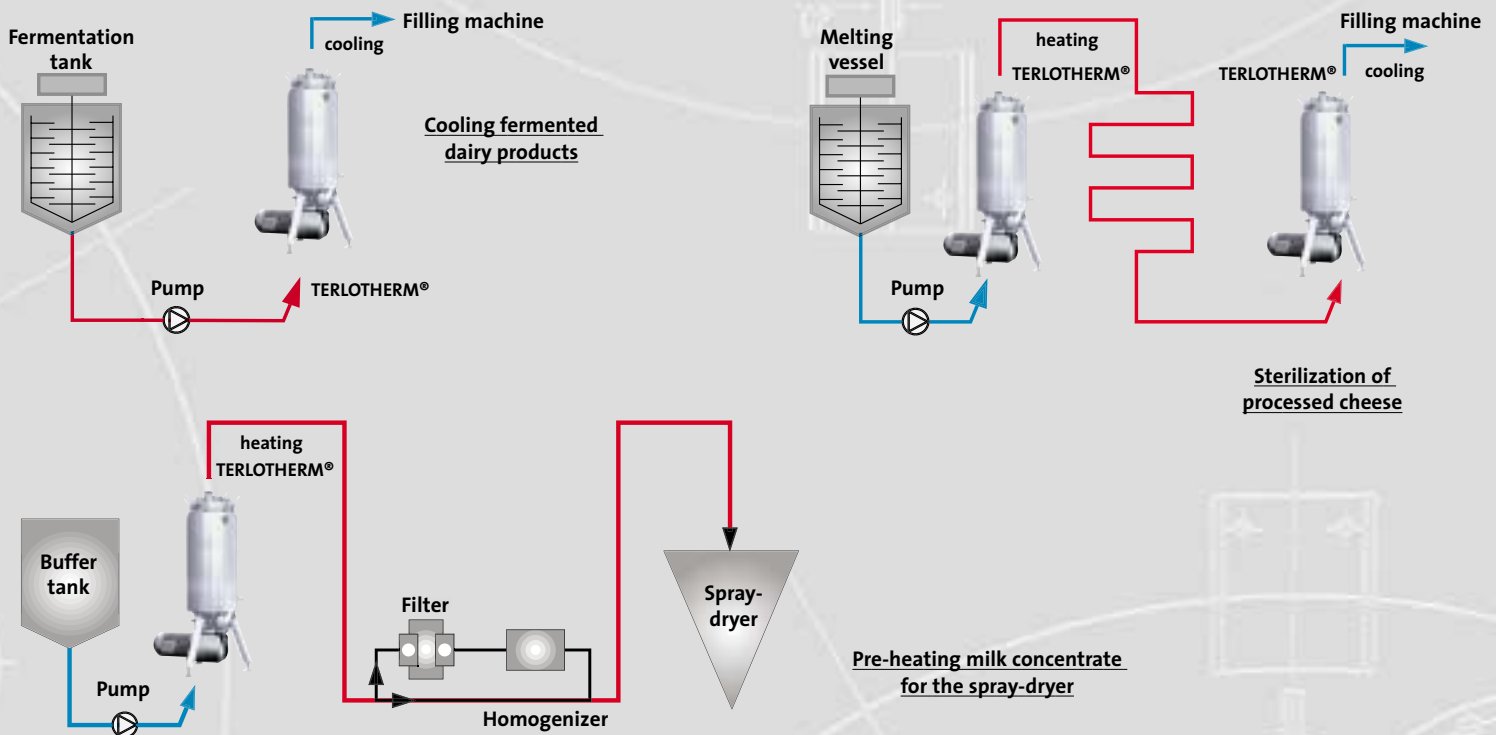
The result of preheating the concentrate in the TERLOTHERM is a more energy-efficient process. Heating in the TERLOTHERM consumes far less energy than heating in the spray-dryer. Furthermore, the preheated concentrate is distributed much better in fine drops at the nozzle or disc, resulting in an optimum division into equal particles and better drying effect.

### Advantages of TERLOTHERM in pre-heating milk concentrate for the spray-dryer:

- Lower bacterial content in the powder to be produced.
- More energy-efficient drying process in the spray-dryer
- Higher capacity in the spray-dryer



# TERLOTHERM® and your process



## TERLOTHERM® advantages and applications



### Advantages

- Scrapers can easily be replaced
- Can be CIP cleaned
- Inspection without removing seal
- Lid can be opened with clamps
- Large heating area on limited floor area
- Tangential inlet
- Acceleration and deceleration area
- No damage to product
- Maintenance-friendly; only one seal and one drive

### Applications

- Heating
- Aseptic cooling
- Deep-cooling
- Crystallisation
- Tempering
- Sterilization
- Pasteurization
- Polymerization
- Gelling



# TERLOTHERM® Technical information

Type	Number of scrapers	Heated surface in m <sup>2</sup>	Number of scraper rows	Total height in mm ca.	Cylindrical height in mm ca.	Ground Clearance in mm ca.	External diameter in mm ca.	Product inlet in NW	Product outlet in NW	Medium inlet interior cylinder inch	Medium inlet external cylinder inch	Medium outlet interior cylinder inch	Medium outlet external cylinder inch	Rinse / leak detection pipes in mm	Product space in mm	Scraper peripheral velocity in metre/second	Maximum drive capacity in Kw	Product temperature range from to in °C	Maximum product area pressure in bar g	Cooling & heating medium in m <sup>3</sup> /hour	Product volume in litres
T1/2	8	0,6	4	1108	552	556	423	50	50	3/4	1	3/4	1	8	50	0,5-3,0	4,0	0-150	5 of 10	5-8	20
To-4	16	1	4	1427	871	556	423	50	50	3/4	1	3/4	1	8	50	0,5-3,0	4,0	0-150	5 of 10	5-8	30
T1-4	24	2,4	4	2015	1340	675	573	80	80	1	1 1/2	1	1 1/2	8	50	0,5-3,0	17,0	0-150	5 of 10	10-15	70
T1-6	36	2,4	6	2015	1340	675	573	80	80	1	1 1/2	1	1 1/2	8	50	0,5-3,0	17,0	0-150	5 of 10	10-15	70
T2-4	32	4,4	4	2460	1690	770	723	80	80	1 1/2	2	1 1/2	2	8	50	0,5-3,0	22,0	0-150	5 of 10	20-25	130
T2-6	48	4,4	6	2460	1690	770	723	80	80	1 1/2	2	1 1/2	2	8	50	0,5-3,0	22,0	0-150	5 of 10	20-25	130

Applied heating media:  
Steam and water

Applied cooling media:  
Water, ice water, brine, glycol and ammonia

## TERLOTHERM® types



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