TERLOTHERM®

Scraped surface heat exchanger

Creams, bakery ingredients and emulsions

Products

- Chocolate creams
- Bakery creams
- Spreads
- Margarines
- Fillings for waffles and cheese biscuits

Applications

- Fat crystallization and structure development

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terlet

MEMBER OF THE MPE GROUP






TERLOTHERM® Applications in the production of water-in-oil emulsions

Cooling/crystallization of spreads and margarines

The TERLOTHERM is used in the production of water-in-oil emulsions to crystallize the fat phase, creating a matrix in which fat and oil are "locked up".

Process

Preparation of fat phase: Oil and fat are mixed and heated to a temperature above the melting temperature of the hard fat. Other fat-soluble components, such as emulsifiers, are mixed in. After heating,the fat phase is tempered (kept at one temperature for a period of time) before it is pumped to the homogenizer.

Preparation of water phase: Water, salt and other possible components (milk powder, e.g.) are mixed into a homogeneous solution. Traditionally, soured milk was added to obtain a flavor comparable to butter. The water phase is brought to the temperature of the fat phase and pumped to the homogenizer.

Homogenizer: In order to obtain a good fat/water distribution, the two phases are pumped through a "rotor-stator" homogenizer before the crystallization process.

Crystallization process: The fat phase is crystallized in the TERLOTHERM. Crystals form on the cooled wall. The "residence time" on the wall - the time between two scraper movements - and the ΔT determine the size of the crystal and thus its primary structure. The crystal is then scraped from the wall and forms agglomerates with other crystals. The angle of the scrapers on the wall and the speed of the scrapers together determine the shear on the product. It is precisely this shear that determines the very important secondary structure, which is primarily responsible for the "mouth feel". Nearly the entire cooled surface is scraped, preventing the formation of any lumps with a deviant structure that would negatively influence the product.
The TERLOTHERM also ensures an optimum structure in the matrix. The mass constantly shifts from the outer wall to the inner wall, alternately creating new primary crystals on the wall, and the secondary structure is formed in the space between the walls. Traditionally, margarine crystallizes over several phases. But the "residence time" in the TERLOTHERM makes it possible to accommodate these phases within one unit. The final result is a margarine / spread with fat primarily in the ß-crystal form and a tiny fraction of non-crystallized fat. Pumping the product through a pin-mixer and/or holding tube can further process the emulsion.

Advantages of TERLOTHERM® for the crystallization of water-in-oil emulsions

- No pressure build-up
- Simple system
- Crystallization in one phase

TERLOTHERM® Applications in the sweets and bakery ingredients industry

Cooling/crystallization of chocolate and fat creams

The TERLOTHERM developed by Terlet is used for fat crystallization and structure in the production of chocolate and bakery creams. The cooling phase is often followed by the aeration of the fat creams.

Process

These creams generally consist of a mixture of oil, a hard fat phase, sugar and various powders. These components are made into a homogeneous mixture through heating. Heat melts the hard fat, spreading it evenly. The mass is pumped from the preparation tank to the TERLOTHERM. The crystal size and structure are essential elements in achieving the final consistency. The hard fat must build up a matrix containing the oil component, in which the powder component is enclosed. The TERLOTHERM is perfectly suited for achieving this crystallization.

Crystals form on the cooled walls. The "residence time" on the wall - the time between two scraper movements - and the ΔT determine the size of the crystal and thus its primary structure. The crystal is then scraped from the wall and forms agglomerates with other crystals. The angle of the scrapers on the wall and the speed of the scrapers together determine the shear on the product. It is precisely this shear that determines the very important secondary structure, which is primarily responsible for the "mouth feel".

Nearly the entire cooled surface is scraped, preventing the formation of any lumps with a deviant structure that would negatively influence the product. The TERLOTHERM also ensures an optimum structure in the matrix. The mass constantly shifts from the outer wall to the inner wall, alternately creating new primary crystals on the wall, and the secondary structure is formed in the space between the wall. Directly after the cooling and crystallization phase, the product can be aerated.

Products that can be prepared with the TERLOTHERM include sweet creams such as chocolate creams, bakery creams and savory products, such as fillings for waffles and cheese biscuits. Products such as whipped (aerated) butter can be prepared with a similar process.

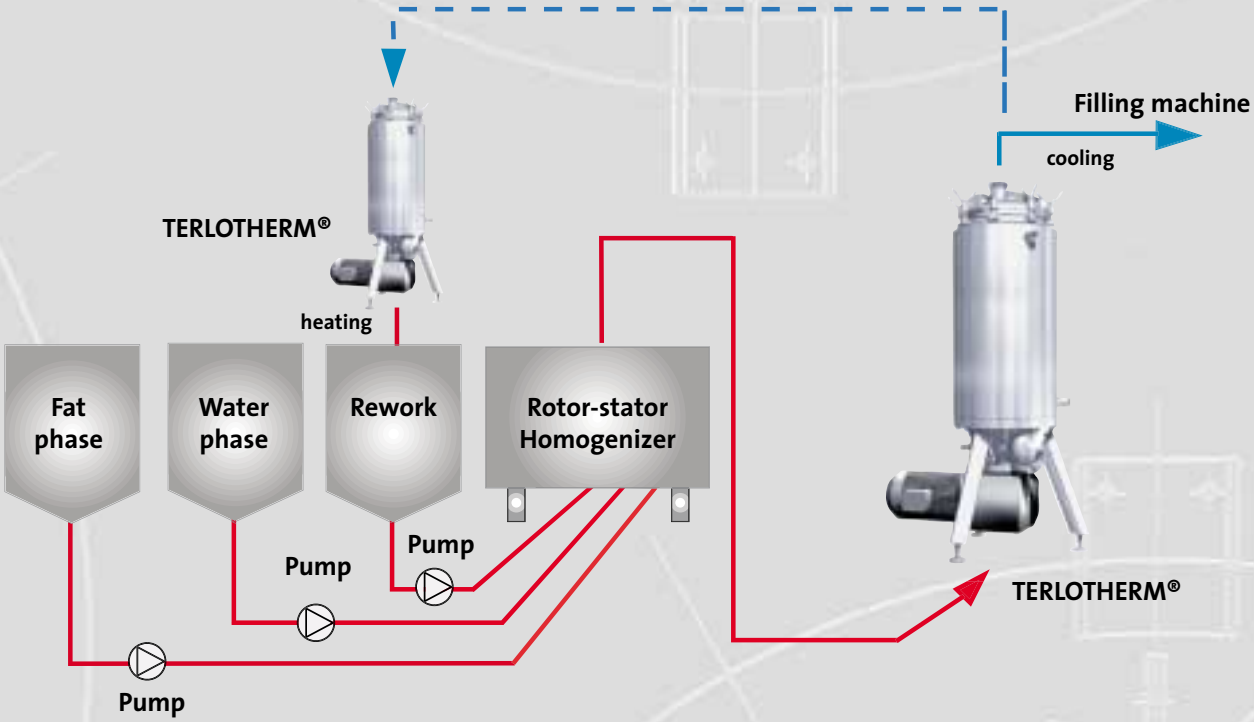
Advantages of TERLOTHERM® for the crystallization of chocolate and fat creams

- Low pressure on the product side, no damage of structure
- Scraper construction ensures uniform build-up of crystal structure
- Virtually entire interior surface is scraped






TERLOTHERM® cooling and crystallization of emulsions



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 m²	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 m³/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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