Milk Cooling & Storage Solutions

Effecient cooling systems to reduce energy costs

GEA engineering for a better world

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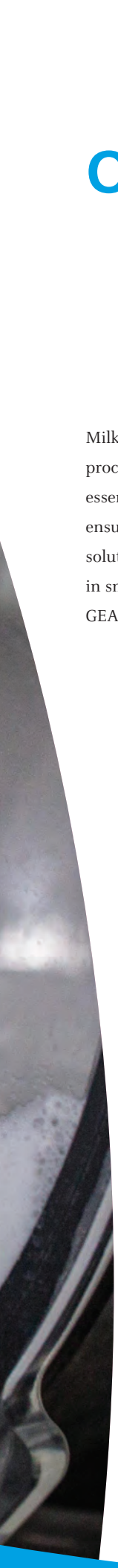
ABSOLUTE LEADER WORLDWIDE

GEA is a step ahead of the competition with respect to efficient cooling: As a glance at our market share shows, the high quality of the GEA milk cooling tanks is valued worldwide.

Overview

Your cows produce precious milk every day and fundamental to the task of collection, is the storage.

Milk quality can only be guaranteed when the milk cooling process is efficient and reliable. The refrigeration of milk is essential to maintain its quality, prevent bacterial growth and ensure high quality milk for processing. Whether it is a standard solution for storage of milk or an integrated solution which takes in smart controls, snap chilling, energy saving and heat recovery, GEA has a solution to meet your cooling needs.



Intelligent cooling strategies, individual tailoring

GEA provide you with the perfect, long lasting cooling strategy. Ensure that your milk is of the highest quality while minimising energy use and ongoing operating costs at the same time.

Also take advantage of the extensive selection of tank variants and volumes. In combination with high-performance cooling units, the entire system can be individually tailored to your production method from the milking to the tank. Compatible heat recovery systems also transform your cooling system into a small power plant. Produce free hot water, purely as a sideline and at zero expense!

Content


TANKER DRIVER INSTRUCTIONS

TCool - Horizontal Cooling Tank

GEA's efficient TCool series is a cooling concept that guarantees the best results when it comes to milk quality, with simultaneous low energy use.

The key characteristics of the milk tank are:

- The milk tank is available in 24 variants: a large selection for customized milk cooling
- Milk tank with top-quality insulation
- Individually configured milk intake: With inlet from above, from below, front the front and from the back
- Long-lasting evaporators: high reliability of milk storage thanks to constant quality control.

Storage, cooling and monitoring

The efficiency with which you are able to cool and store the milk becomes obvious when you look at the statistics. The TCool milk tank prevents the formation of thermal bridges and limits the temperature increase to 0.5°C in a period of 12 hours.

ICool control system enables you to monitor and control every parameter from energy consumption, the unique cleaning procedure to alerting you of any errors which have occurred.

Get the most out of your ICool control system with ICool Analyzer. Analyzer gives you easy access to status information for up to 4 cooling units and the agitation process. The software also provides an option to record comprehensive volume and temperature profile information.

You can access the last 100 washing cycles directly from the display, and archive up to 10 years' worth of data onto a USB stick. The data can also be exported as a CSV file for further analysis in Excel.

Excellent cleaning for high quality milk

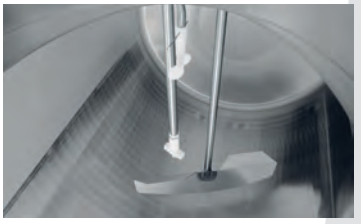
A complete drainage at the end of the cleaning process is possible with a vertical high-performance pump to prevent the milk from freezing which could impair the milk quality. An intake filter on the pump prevents the spray head from clogging and additionally protects the pump.

The general dosage of the cleaning agent is carried out using the pump. This prevents direct contact with the cleaning agents and offers the additional advantage of precisely regulated quantities. The ICool control system handles changes to the cleaning agent, which saves you time and prevents contact with powerful cleaning agents which could be hazardous to your health.

When storing and cooling milk several forms of contamination can occur, making the use of various cleaning processes necessary.

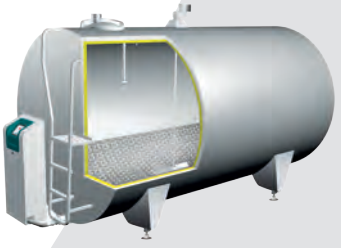
Choose between alkaline and acidic cleaners. If desired, disinfection using a third pump is also possible.

Suitable preferred connection and safe hygiene: Professional robot connection via patented 3-way valve technology separates water and milk during cleaning and milking processes.



Here everything revolves around the best milk quality: The agitator stirs the milk gently while the spray nozzles ensure spotless cleaning at turbo speed. Depending on the tank volume, a 1 or 3-blade agitator is used.

Concentrated cleaning: The metering pumps measure acid and alkaline cleaning agents automatically. A third metering pump can be used for disinfection.

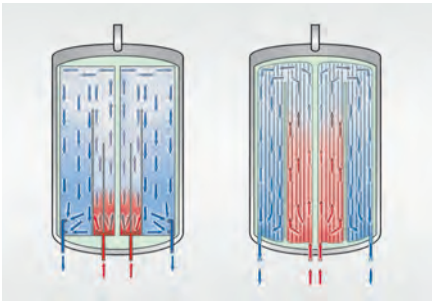


Energy-efficient tank: The CFC-free insulation, which has an especially high density, maintains the milk at an ideal storage temperature over long periods of time and reduces the power requirement to a minimum.

A network of individual options

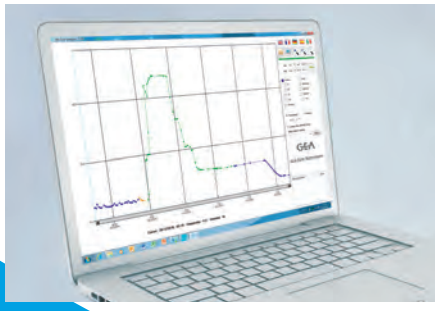
Use the numerous equipment and connection options to integrate the TCool seamlessly into your operating concept.

Officially approved: The patented and digital dipstick records the quantity of milk automatically.

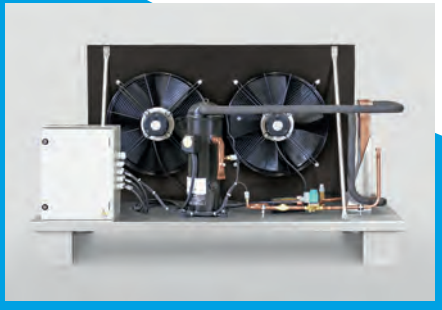


Innovative design for effective performance: STI and STIL evaporators cool the milk with minimum use of energy in the fastest possible way. With these evaporators you receive a durable, pressure resistant heat exchanger with highly efficient performance.

Safe cooling into the future with ICool: The intelligent tank control unit reliably cools, agitates and monitors your valuable, high-quality milk while you are waiting for it to be taken away. Regular cleaning intervals ensure the tank is kept as hygienic as possible. And ICool is already looking towards the future: all processes can be configured and adapted individually to suit changing requirements.



Excellent energy-efficiency, documented hygiene procedures: As ICool ensures that the cooling units and components are supplied with only the energy they need, it plays a key role in keeping your operation running as efficiently as possible. And the included ICool-Analyzer system keeps logs of all of the processes so you can generate detailed reports.



Designed to save energy: The scroll compressor and highly efficient condensers can be adjusted to the expected milk quantity. Altogether, 25 different cooling units with a refrigerating capacity of between 3.82 and 30.7 kW/h and a milk cooling efficiency of between 110 to 945 l/h are available.

A choice of tank volumes ranging from 1,010 to 33,500 litres in 24 variants is available.

Tank volumes ranging

Diameter (mm)	Litre	Height (mm)	Length (mm)
1,260	1,010	1,741	1,829
	1,500	1,733	2,339
	2,110	1,736	3,070
Diameter (mm)	Litre	Height (mm)	Length (mm)
1,510	2,500	2,020	2,406
	3,100	2,025	2,798
	3,600	2,030	3,104
	4,200	2,050	3,507
	5,200	2,060	4,147
	6,200	2,080	4,821
Diameter (mm)	Litre	Height (mm)	Length (mm)
1,785	5,000	2,299	3,083
	6,000	2,305	3,570
	7,000	2,333	4,058
	8,000	2,343	4,534
	9,000	2,359	5,012
	10,000	2,370	5,518
Diameter (mm)	Litre	Height (mm)	Length (mm)
2,250	10,000	2,805	3,905
	12,000	2,810	4,500
	15,000	2,815	5,385
	19,000	2,880	5,975
	25,000	2,921	8,362
	30,000*	2,977	10,010
Diameter (mm)	Litre	Height (mm)	Length (mm)
3,000	25,000	3,585	5,130
	30,000	3,610	5,980
	33,500	3,625	6,580

*The newly created 30,000L tank is designed to allow transport in container

aquaCHILL - Snap Chilling Solution

aquaCHILL is designed to help any farmer to meet cooling standards, ideal for a retrofit situation or a new install. aquaCHILL is a booster for your cooling system.

The advantages of aquaCHILL:

- Runs in tandem with existing vat chilling
- Hot water reclaim available
- A simpler solution means lower prices
- 'Plug and Play' solution (very little installation required)
- Can be moved from farm to farm if required
- Class leading energy efficiency (ERR)*

How does it work?

The aquaCHILL is a direct-on-line snap chilling system. What this means is that the power available for cooling at the Plate Heat Exchanger (PHE) is only what is produced by the chiller. The aquaCHILL only runs during milking.

The Glycol is circulated through the evaporator to the milk PHE and back to the buffer tank. The buffer tank provides a 'thermal shock absorber' and prevents compressor short cycling with milk pump switching.

*When compared to water or ice bank systems

What is included in the aquaCHILL package?

The aquaCHILL package is a 'plug and play' solution which requires minimal installation on site compared to any other snap chilling solution on the market.

All the required components are neatly assembled on a galvanized steel plinth and tested before delivery.

Components on the Plinth are:

- Air-cooled water chiller with Ciat CONNECT2 controller
- Lowara 210/5 circulating pump
- Single bank Ecoflex NT50M 8000L Plate Heat Exchanger
- 500L Buffer Tank

The only installation required is diverting the milk line to the Plinth mounted PHE and running power to the chiller from the switchboard. In an ideal installation the chiller can be installed and running between milkings.

THE AQUACHILL PACKAGE...

IS A 'PLUG AND PLAY' SOLUTION WHICH REQUIRES MINIMAL INSTALLATION ON SITE

Why Snap Chill Milk?

Milk starts to deteriorate the moment it is harvested from the cow.

Naturally occurring bacteria in the milk starts multiplying straight away and only temperature can slow the process down to preserve milk quality. Needless to say then, snap chilling milk has a number of fundamental benefits for both the milk producer and the processor.

High quality milk has a longer shelf life and can be processed into more high value products than raw milk that has higher levels of bacteria.

Milk Quality Compliance

- Bactoscan (bacteria count, milk chilling related)
- Thermoduric (heat resistant bacteria)
- Coliforms (wet weather / manure bacteria)

All of the above issues can be greatly improved by snap chilling and high grade heat recovery for maximum plant hygiene.

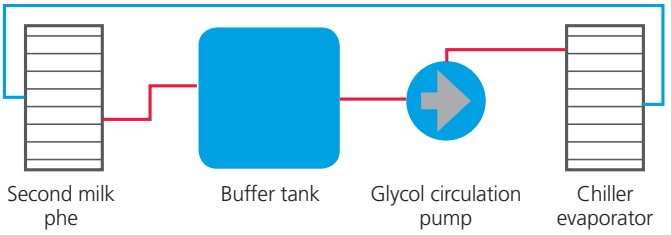
The regulatory standards:

a) be cooled to 10°C or below within four hours of the commencement of milking; and
b) be cooled to 6°C or below within the sooner of:
   i) six hours from the commencement of milking, or
   ii) two hours from the completion of milking; and
c) be held at or below 6°C without freezing until collection or the next milking; and
d) must not exceed 10°C during subsequent milkings.

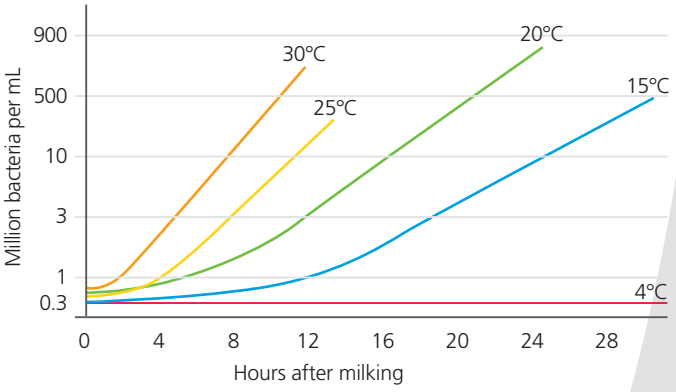
Key features

- Improved milk quality
- Assured milk processing compliance
- Future proof your farm in accordance with MPI compliance

HOW THE AQUACHILL SYSTEM WORKS



HOW CHILLING EFFECTS BACTERIA

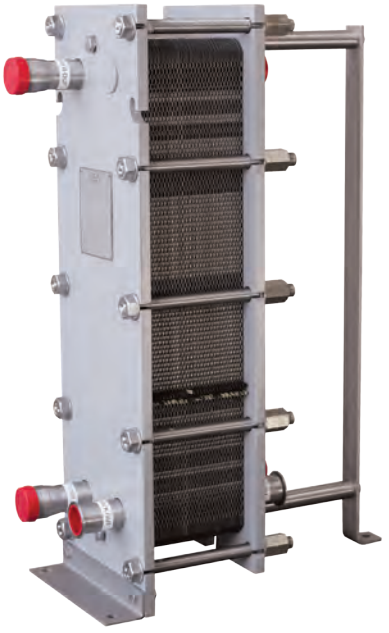


This graph above clearly demonstrates why milk processors insist on milk being chilled to 6°C or below as quickly as possible at the end of milking. The lower the milk temperature into the Bulk Milk Tank, the lower the bacteria or bacto count when the processor collects the milk.

Note: Below 10°C bacteria growth is seriously reduced and is practically stopped at 4°C.

Plate Heat Exchanger

Rapid exchange in a counterflow arrangement.



In your cooling system, focus on the highest efficiency throughout. The outstanding efficiency of GEA plate coolers impresses on two counts: Firstly, the flow-optimised profile of the cooling plates, which operate according to the counterflow principle, provides for outstanding cooling efficiency during milking. Secondly, the extremely low flow resistance during the cleaning process.

Usage as a primary and, if required, as a secondary model for rapid cooling:

- In the counterflow of 2L of water per litre of raw milk the milk temperature is cooled to a value of approx. 1°C above the water temperature*
- The water heated in the heat transfer can be used for other purposes, e.g. watering the cows

*Dependent on PHE type

Professional cooling, storage and delivery for maximum returns

Take advantage of globally recognised expertise across the entire cooling process. The intelligent cooling systems from GEA impress with their outstanding hygiene and exemplary energy balance. Also take advantage of the expert advice offered by our representatives and local GEA dealers. Joint, intensive planning enables your wishes to become reality.

With the professional solutions from GEA you achieve the highest returns for quality milk with low costs for ongoing operations.

Plate Heat Exchangers

Industrial Coolers

Single Bank Option

GEA Industrial Coolers are well suited to large installations. The coolers have less plates than traditional units. However the cooling surface area of each plate is greatly increased.

This has the advantage of fewer plates to service (lowering operating costs) while making the cooler a compact unit. The coolers provide very little backpressure, creating better cooling per litre of water. The cooler has 50mm tri-clover milk inlet and outlets with 50mm BSP water connection ports.

Double Bank Option

The Double Bank option has a primary and secondary cooling circuit built into a single compact cooler frame. This allows two liquids to be used to cool the milk.

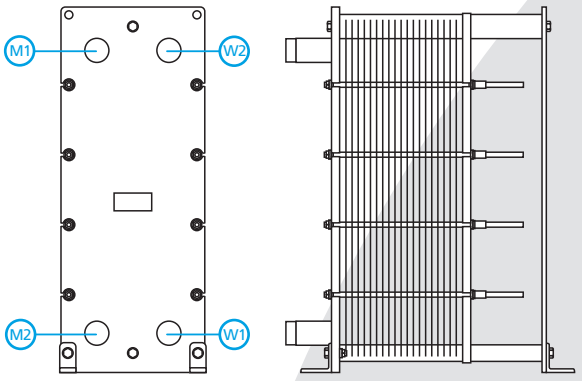
The primary connection typically carries ground water which reduces the milk temperature to within 2 degrees of the ground water temperature. The secondary cooling circuit typically carries glycol which reduces the milk temperature further. This is usually the same temperature as the milk which would be stored in the bulk tank.

The GEA range of industrial double bank plate coolers have been sized with additional capacity in the secondary bank to optimise the performance of all snap chilling solutions.

Both PHE options are available in a standard M frame or as a larger X frame.

The X frame allows you to chill milk to within 1°C of the chilling liquid. ie. 1°C difference in outlet temperature over 20,000L means you need 12kW less electrical consumption.

SINGLE BANK COOLER

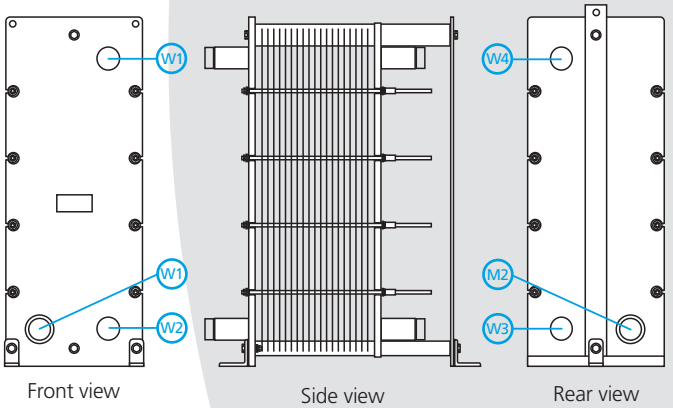


Front view Side view

Litre/Hr Milk	Litre/Hr Water
3000	6000
4000	8000
5000	10000
6000	12000
7000	14000
8000	16000
9000	18000
10000	20000
11000	22000
12000	24000
13000	26000

REF	Description
M1	Milk in
M2	Milk out
W1	Water in
W2	Water out

DOUBLE BANK COOLER



Front view Side view Rear view

Litre/Hr Milk	Litre/Hr Water
4000	8000
5000	10000
6000	12000
7000	14000
8000	16000
9000	18000
10000	20000

REF	Description
M1	Milk in
M2	Milk out
W1	Water in
W2	Water out
W3	Chilled water in
W4	Chilled water out

engineering for
a better world

We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 Index.

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