



INDUSTRIAL REFRIGERATION AND HEATING

Sustainable solutions for food, beverage and
dairy processes & storage



WORLD-CLASS, INTEGRATED COOLING AND HEATING SOLUTIONS

GEA is a global specialist in high-efficiency refrigeration and heat pump technologies for food, beverage and dairy processes & storage.

MEETING YOUR PRECISE TEMPERATURE REQUIREMENTS – NATURALLY



Efficiency



Reliability



Safety



Operating
costs

Our focus is on product quality, reliability, safety and total cost of ownership

Optimal Product Quality

Food, beverage and dairy processors require precise temperatures for optimal product quality. They also seek to maximize the efficiency of their production systems. GEA's expertise extends to a full range of reliable cooling and sustainable, energy-saving solutions which provide exactly that.

Our sophisticated refrigeration and related technologies include complete turnkey cooling installations, compressor packages, chiller systems and heat pumps – custom engineered to meet your exacting specifications.

By focusing on PQRST, we not only maximize product quality, we also maximize the performance of your process using our energy-efficient refrigeration and heat pump solutions utilizing natural refrigerants such as ammonia and CO₂. Combined with a tailor-made GEA service agreement, we ensure that your processes continue to operate at peak condition throughout the full life cycle of your plant.

Integrated solutions – a key advantage

One-Supplier Capacity

A key link between your production process and your end product, GEA's industrial refrigeration and heating solutions serve as the common element of GEA's broader solutions. GEA's expertise includes design and installation of complete processing plants, delivered by our GEA experts specializing in our food, beverage and dairy sectors. Our customers value GEA's unique ability to serve as a single-source supplier.

Whether you are addressing current requirements or planning and implementing a new course for your company's future, GEA will take time to understand your needs and work with you to develop and deliver ideal solutions.

SERVING UP SOLUTIONS FOR ALL TASTES

Customized, sustainable solutions for food processing

As a global leader in process technology for the food industry, GEA's process cooling and heating systems are employed in our turnkey food application solutions.

In step with global trends and environmental concerns
As the world's population increases, so does the demand for greater and better quality food. Producers must maximize their efficiencies and product quality in order to meet these needs.

Food hygiene, waste reduction, higher output and reduced perishability are key drivers for food processors, and GEA industrial refrigeration, freezing and sustainable energy technologies address these challenges. We provide proven temperature control reliability, custom engineered to meet your specifications.

But that's not all. GEA's unique offering includes helping our customers to significantly reduce their running costs using customized solutions, energy-efficient designs, waste heat recovery and heat pump technologies.



Every third chicken nugget is produced using GEA technology.





FIRST-CLASS TECHNOLOGIES FOR THIRST-QUENCHING DRINKS

Efficient cooling and heating solutions for superior beverage production

For decades, leading beverage companies throughout the world have selected GEA to provide innovative, comprehensive solutions, including sustainable refrigeration solutions, to meet their rigorous demands. From ingredient management to processing, filling and storage, we apply our proven expertise in cooling and heating solutions to maximize beverage quality and thoughtfully address environmental considerations.

A refreshing approach

Soft drinks, coffees, teas and juices all require temperature-sensitive processes during production. These processes rely on exact cooling and heating conditions to ensure processing hygiene and product safety.

By delivering the right temperatures to the right places in the production cycle, GEA's sustainable, energy-efficient cooling and heating solutions ensure that our customers, consumers and our environment are well served.

Cheers to great beers

GEA's beverage industry expertise also extends to brewing. Our refrigeration systems help customers achieve what they care about most — high-quality beer and optimal energy efficiency.

Our comprehensive approach includes conducting a complete analysis and assessment of all processes. This provides the basis from which customized solutions are created and implemented, including an integrated approach to energy. The result is a brewery optimized for efficiency, reducing both energy consumption and the brewery's carbon footprint.



Approximately half of all beer is brewed with the aid of GEA systems and solutions.



FORWARD-LOOKING SOLUTIONS FOR FARM-FRESH PRODUCTS

Sustainable refrigeration and heating for modern dairy processing

With more than 125 years of experience in dairy processing, GEA's deep industry roots combine with its innovative technologies to provide customers unparalleled expertise in processing milk – one of the world's most important and versatile foods.

Refrigeration – the common requirement

We design, engineer and supply equipment, processing lines and turnkey solutions for treating raw milk and milk-based products – from butter, ice cream, yogurt and cheese to infant formula, milk powder and whey. Whatever the product, GEA provides the necessary temperature management systems to ensure the highest product quality.



Giving temperatures and the environment the attention they deserve

Customers enjoy significant, measureable benefits as a result of the approach we take in providing the precise temperatures required at each step in the processing cycle. GEA's refrigeration experts design customized systems that not only meet process-critical cooling needs, but also reduce energy costs and minimize the use of natural resources.



Approximately one quarter of processed milk comes from GEA production systems.





PRESERVING THE FRESHNESS OF VALUABLE INVENTORY

Holistic, reliable solutions for cold stores and distribution centers

The cold chain involves managing the temperature of perishable products to maintain quality and safety from the point of origin to the consumer, including each step of the distribution chain along the way. GEA plays a major role in this essential process by providing customers with efficient refrigeration and heating solutions that deliver the precise temperatures required for cold stores and distribution centers.

For both the fresh food chain (where fruits and vegetables represent most products and are stored at temperatures typically ranging from 0 – 12°C) and the frozen food chain (where temperatures can vary from -10°C to -40°C at various steps along the cold chain), GEA's proven, customized technologies are designed to meet each customer's unique requirements.

The GEA advantage – for you and for the planet

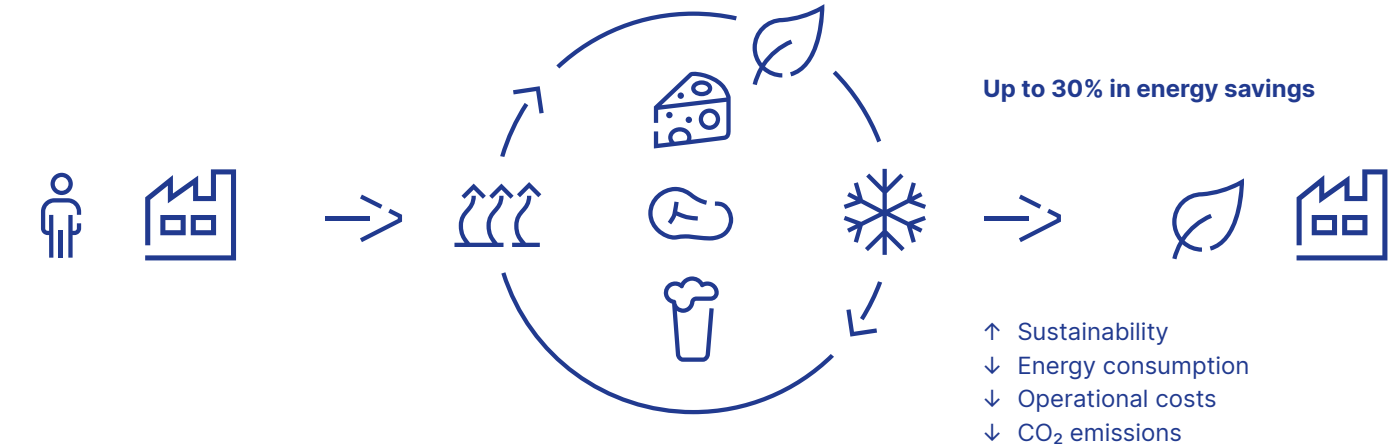
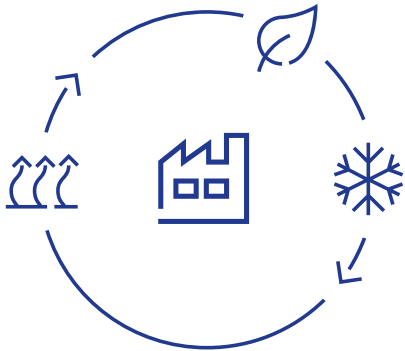
We understand that energy is often the number one cost faced by operators. Our team of experts specializing in sustainable energy solutions holistically evaluate your entire operation and provide optimized, integrated and measurable approaches to energy efficiency. Keeping food fresh while minimizing the cost and energy needed to do so – that's good for your business and good for our planet.



LET'S TALK SENS.

GEA's Sustainable Engineering Solutions, common sense for your business and our planet.

SEnS – GEA's Sustainable Engineering Solutions – will enable you to integrate process solutions with cooling & heating demands in the best possible way. What can you expect? A holistic approach by our top experts, resulting in lower energy consumption, minimized operating costs, and reduced carbon footprint.



Brown- or greenfield site focusing on **OPEX, energy and carbon footprint optimization**

Process analysis & proposal for a **sustainable and integrated process solution**

Implementation of the solution for an optimized site and **sustainable plant**



Why SEnS makes sense?



Integrate process & utilities solutions
A unique, holistic approach from a single-source supplier.



Improve your energy related total cost of ownership
Significant OPEX savings of up to 30%.



Reduce your carbon footprint
Up to 90% less CO₂ pollution and lower related costs.



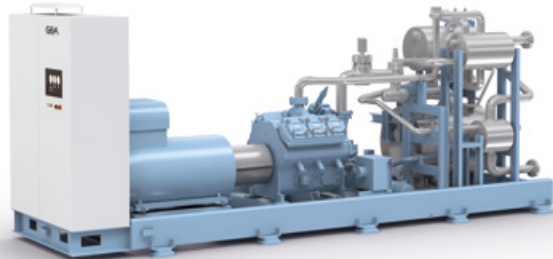
Meet your sustainability goals
A joint effort to protect our planet.

Interested in our Sustainable Engineering Solutions?
Please contact us at sens@gea.com



GEA HEAT PUMP TECHNOLOGY

Good for your bottom line. Good for the environment.



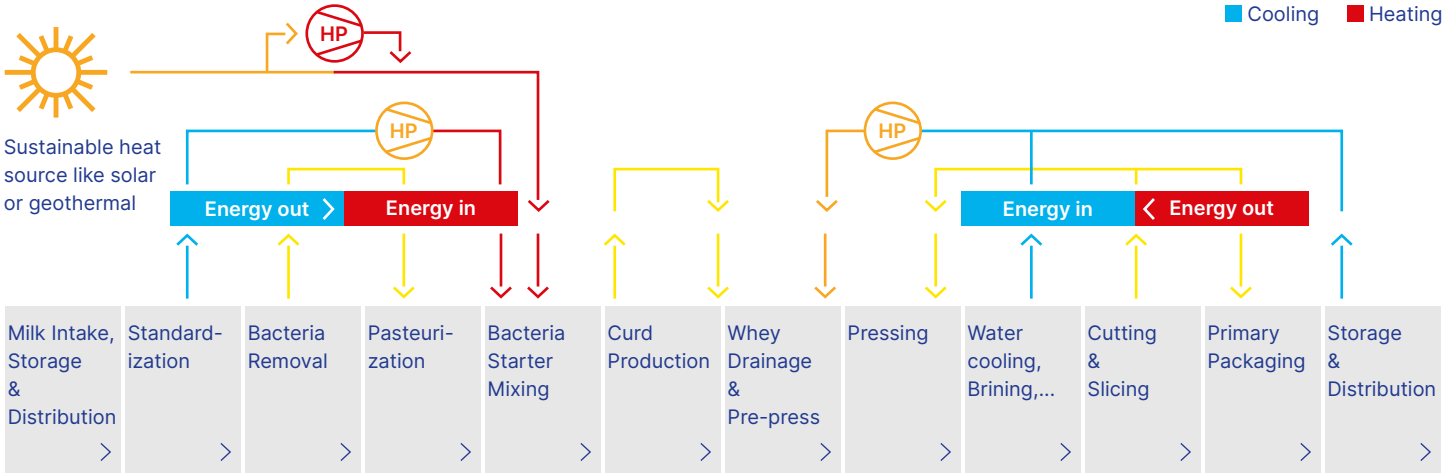
In food, beverage and dairy processing, heating and cooling are essential. The cooling system consumes a substantial amount of electrical energy and releases the rejected heat and the electrical energy to the environment. GEA's innovative heat pump technology upcycles this waste heat to create useful warm water, subsequently saving huge quantities of fossil fuel that would otherwise be needed in the heating process. In addition, water consumption by the cooling tower or evaporative condenser is substantially lowered.

In this way, GEA heat pumps help you to reduce water and energy consumption and lower your carbon footprint – a win-win outcome that we can all appreciate.

This dairy processing example illustrates the levels at which sustainable heat may be managed in order to achieve a zero-carbon-emission solution.

- Level 1:**
Reusing energy that flows directly via heat exchangers.

Level 2:
Applying a heat pump to elevate the temperature level to a higher value.
- Level 3:**
Harvesting solar heat (directly from solar collectors or indirectly from geothermal heat) and applying it directly in the process after a temperature lift with a heat pump.



A SWEET STORY

Mars chocolate factory in Veghel, The Netherlands



GEA scope of supply

GEA solution:
Customized heat pump system

Heating capacity:
1,400 kW

Supplied temperature:
63°C

COP:
5.9 (yearly average)

Compressor type:
GEA reciprocating compressors

Natural refrigerant:
Ammonia



Mars Wrigley Confectionery, the world's leading manufacturer of chocolate, chewing gum, mints and fruity confections, has achieved energy and CO₂ reduction with GEA's heat pump solution at its facility in Veghel, the Netherlands – one of the largest chocolate factories in the world.

The customer challenge

As a step along the way toward a sustainable future, Mars has been seeking to reduce its carbon footprint and its use of natural resources at its production facilities. One of the key focuses is to make its production process more energy efficient.

The GEA solution

The customized GEA heat pump solution makes it possible to extract and boost what is otherwise unusable low-temperature heat from the refrigeration units, which is then used to heat water. This water is then channeled through the factory's specially installed rooftop warm water piping network, from where it is sent to various processes and uses within the plant, for example, chocolate and syrup storage, and air-handling units.

The result

Paul Simons, global technology leader of utility/civil at Mars, said "We engaged in fruitful discussions with the GEA team on how to achieve further energy efficiency and CO₂ reduction at our facility – and the approach of installing heat pumps systems to reach this goal has proven successful." – At Mars' Veghel site, GEA innovative heat pump solution has contributed to a reduction of 1,000,000 m³ of natural gas per year, equivalent to a reduction of more than 1,000 tons of CO₂ per year, or more than 1,800 tons of CO₂ per year if green electricity is applied.

GEA REFRIGERATION AND HEATING TECHNOLOGIES

Your full-service partner for a world of applications

Beyond energy-efficient compressors, compressor packages, chillers and controls, GEA Refrigeration and Heating Technologies' expertise extends to sophisticated, high-spec engineered systems and solutions. GEA enjoys a long and proven track record of serving a myriad of industries' most demanding and challenging requirements across the globe. And our comprehensive service programs support our customers throughout the full life cycle of their plant and equipment to ensure peak performance.

Screw & reciprocating compressors

GEA has an extensive range of screw and reciprocating (also known as piston) compressors for industrial refrigeration, each featuring the latest in compressor technology. They are designed with a special focus on energy-efficiency, reliability, safety and ease of maintenance.

Compressor packages

GEA compressor packages are precisely configured and feature carefully selected ancillary equipment on stable, low-vibration frames. With our packaged solutions for refrigeration, you can rest assured that everything has been well thought out for you at our factory. And you'll enjoy low installation costs, since the units are delivered fully assembled and ready to install.

Chillers & heat pumps

Our extensive portfolio of ammonia chillers and heat pumps are designed for virtually any industrial refrigeration and heating application. Both as turnkey units with compact footprints – such as the models in the GEA Blu chiller range

and GEA Red heat pumps – as well as tailored solutions in a modular design, our chillers and heat pumps provide proven reliability and optimal energy efficiency.

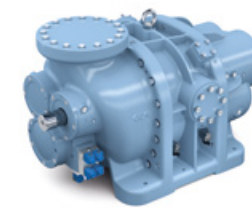
GEA Omni control panel

A standard feature of GEA compressor packages, chillers and heat pumps, GEA Omni control panel offers what operators expect from a control panel – maximum efficiency and reliable operation of their system. This innovative, intuitive, next-generation control panel integrates and optimally coordinates all system components, resulting in a demand-driven and highly energy-efficient system operation.

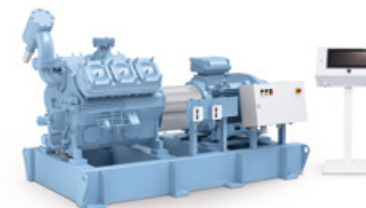
Customized refrigeration and heating solutions

Would your business benefit from working with a company that thoroughly understands your industry and the various requirements that your processes demand of your refrigeration and heating systems? Is energy efficiency, total cost of ownership, sustainability and system reliability important to you? If yes, then GEA Refrigeration Technologies stands ready to serve you.

We tackle all of your refrigeration and heating challenges – not only with high-quality products, but also via energy-efficient solutions tailored to your needs. We are at your side during the design and planning phase and we handle project engineering, implementation, commissioning and maintenance of your systems.



GEA screw & reciprocating compressors



GEA compressor packages



GEA chillers & heat pumps



GEA Omni control panel





KEEPING IT COOL, WITH GEA SERVICE.

Reduce the life cycle cost of your plant and equipment.

We work alongside our customers in close partnership, supporting them throughout the full life cycle of their plant and equipment to ensure lasting business success.

Getting you started

As a supportive and committed partner for life, we plan and build around individual needs, sharing process knowledge, training employees and supporting operators to get our customers up and running and ensure a smooth, seamless on-going service.

Keeping it running

To ensure our customers benefit from continuous production processes for minimal unexpected downtime, we provide fast support, efficient maintenance and top-quality spare parts, whenever and wherever needed.

Constantly improving

We safeguard our customers' investments by constantly looking ahead through modernizing or upgrading of equipment and optimizing of processes to meet changing needs and new market demands. We are always working to increase production efficiency and ensure peak performance.

Together with you

Commitment to our customers and their business means investing in their objectives, their risks and their future success. We work in ever-closer collaboration, providing on-going systems audits and on-site support through innovative new service models in order to generate improved performance.

Our four stages of continued success



