Refrigeration technology for sports and leisure facilities

In touch – efficient solutions for
the leisure industry

engineering for a better world

GEA Refrigeration Technologies




Snowball fights in the summer and skiing in the desert – GEA Refrigeration Technologies makes all of this possible. GEA systems keep leisure athletes on the go and make it easy for winter-sport pros to train beyond their season. And GEA assures just the right cold in zoos and theme parks – for example, for penguins and polar bears.

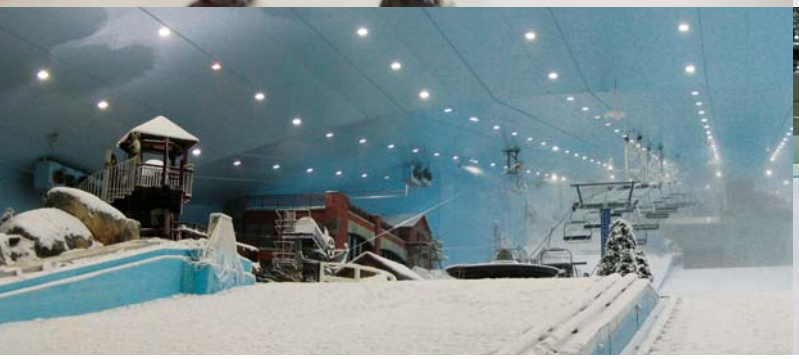
In touch with your processes and requirements

Pleasantly cool – for sports, fun, and games

Our goal is to create long-life and cost-effective solutions that save energy and the environment as well. After all, what counts is a maximum of benefits under economic conditions, with optimal environmental and climate protection.

The specialty of GEA Refrigeration Technologies – since the end of the nineteenth century – is the cooling of processes and products, and the climate control of transported goods. The operators of leisure and sports facilities can also handsomely profit from this experience. We find it difficult to talk about "industrial" refrigeration technology for this target group and for a number of others, even if similar technology is applied to all. But we cannot ignore this market – since we are indeed very good at making ice and snow.

Strolling through the zoo and watching the polar bears play? Ice skating with the grandparents? Rolling in the snow with the whole family on an indoor ski slope? Thank goodness, these activities are not just a privilege of the wealthy: they are now accessible to much of society. One reason for these opportunities is the achievements of modern refrigeration technology – after all, the less energy required, the lower the prices to enjoy such facilities. The leisure industry offers a true wonderland to modern consumers. Social trends also guide the development of the present huge variety of offerings.



As a result, there are many senior citizens nowadays who are by no means tight-fisted with their money – to the satisfaction of the leisure industry. Our seniors are much more athletic and fit than people of the same age were decades ago – and they have a few things to show the younger generation on the ski slopes, for example. Other age groups are of course in the midst of their professional lives. Their leisure time is scarce – which makes it all the more valuable. What could then be closer or more natural than to look for physical and mental recreation in, say, the Ski Dome of the region – or to spend a lunch break in the zoo? Families with children, on the other hand, have other expectations. Being together is the most important thing here – but, then, there should be something for everybody. Both of these are wonderfully combined in a Ski Dome: sledding and snowball fights for the little ones, while their parents get their kick on snowboards. Everyone, though, shares an enhanced consciousness for wellness. This means that movement is all-important, indoors or out under the open sky. The leisure industry offers a tremendous diversity of possibilities here to plan our time off.

With GEA Refrigeration Technologies at your side, you will never find yourself on thin ice. Wherever you need ice and snow – our engineers commit their enthusiasm for detail to provide you with the refrigeration technology you need.

In addition to changing social structures, technical innovations have also brought movement into the leisure market – including cooling and freezing technology. A prime example here is our snow cannons, which also function above freezing. They guarantee vacationers the fun on skis that they expect, and they assure a livelihood for ski-slope and hotel operators. Advanced refrigeration technology can also bond cultures. For example, they allow people who live in the desert to experience snow directly at home. In Dubai, GEA Refrigeration Technologies has equipped the Ski Dome with top-class refrigeration technology. This is a special challenge: to maintain temperatures just below freezing in the Dome, with at least 40 °C/104 °F outside. Such an extravagant project can be cost-efficiently implemented only if the refrigeration technology proves to be energy-efficient – which can be taken for granted with GEA Refrigeration Technologies.

But, at the same time, it's not only that penguins and polar bears just like the ice. They need it to survive. To make sure that they feel comfortable in warmer climates, we assure the right ambience for them in zoos.

Ice skating has become a trendy sport over the past years. It trains the entire body, promotes good posture, and is equally fun for young and old. Expensive equipment is not even necessary – you can rent ice skates if you wish. But advanced, reliable, and energy-saving refrigeration technology is indeed required – best by GEA Refrigeration Technologies.

GEA Refrigeration Technologies for ice stadiums

Hotly loved for ice rinks

Modernization of the Kennemerland ice rink in Haarlem (Netherlands):

- Ice surface expanded to approx. 7,000 m^2
- Total cooling duty: 2,400 kW
- Volume of refrigerant in the system: 16,500 kg CO_2 and 1,800 kg NH_3
- Compressors: 3 GEA Grasso RC 911, as well as 1 newly installed GEA Grasso RC 912E

The history of ice rinks proves that developers at GEA Refrigeration Technologies always have a new innovation up their sleeves. In 1961, the first 400 meters ice rink of the Netherlands was opened and named for the famous Dutch speed skater Jaap Eden. It was designed and built by GEA Refrigeration Technologies. It was the first 400 meters rink in the world to be cooled by a direct system in which liquid ammonia (NH_3) evaporates in a network of steel pipes. At that time, it represented an enormous energy saving of 22 to 25 percent over the conventional indirect ice systems that used the refrigerant R22. The new cooling system was furthermore really impressive by providing a skating surface with especially uniform temperatures prevailing over the ice. The basic benefits of such systems mean that they are still in use today. In the course of renovation since 1989, the pipes were replaced by those with smaller diameters. This enables reduction to less than half the amount of ammonia volume needed to fill the pipes.

In 2004 GEA scored an additional technical triumph: our engineering team converted the cooling system at the 400 meters open-air round Kennemerland Rink in Haarlem (Netherlands), built in the 1970s, to a modern system with liquid carbon dioxide. This created an additional, highly advanced ice surface. Our experienced technicians even succeeded in this modernization project to save time and money: they kept the old steel pipes, pumps, evaporative condensers, and piston compressors for further use, and added the required technology. The additional systems included an ammonia-carbon dioxide cascade condenser and a compressor.

The Dutch have of course cultivated ice skating as a cultural tradition for centuries now, so it is not surprising that we can call attention to another of our reference projects in the Netherlands: the Eindhoven IJssportcentrum with an ice surface of 8,400 square meters, which offers three ice rinks – two covered rinks and one 400 meters half-covered rink, in addition to a heated ice-hockey hall with a playing surface of 30 x 60 meters. A special attraction here is the largest Disco on Ice in the country, open on weekends. Seven GEA Grasso compressors with a total rating of 2.8 megawatt assure effective cooling of the ice surfaces. It was not difficult for the contracting parties to decide for GEA: our good customer relations with them have existed for decades now. And reliable and prompt GEA service speaks for itself.

GEA Refrigeration Technologies enables you to train your whole body on the ice, even without freezing temperatures outside.

Bobsled competition places strict demands not only on teams, but also on refrigeration systems. For a Russian bobsled track, GEA Refrigeration Technologies equipped the refrigeration system with the natural refrigerant ammonia – a premiere for Russia.

Refrigeration technology for bobsled runs

Bobsled pilots run on refrigeration systems by GEA Refrigeration Technologies

GEA Refrigeration Technologies delivered the refrigeration systems for the bobsled track in Krasnaya Polyana (Russia).

At the bobsled run in Krasnaya Polyana (Russia), everything goes smooth for pushers and pilots – thanks to refrigeration systems from GEA Refrigeration Technologies. They reliably ensure that the sleds have enough ice under their blades. The project agreement was signed by the Moscow Sales Organization of GEA Refrigeration Technologies and the contracting party, NPO Mostovik (Omsk), one of the largest Russian construction companies. The order included project engineering of the entire refrigeration systems, delivery and installation of the refrigeration units, equipping the machine house, and installation of 4 kilometers of main ammonia piping along the track. Special achievement here: for the first time, a Russian athletic facility was equipped with a refrigeration system based on ammonia.

A key element of the new refrigeration system is four screw compressor packages from the Large Series, three Type WB-5A units, and one Model PB-5A – such as used, for example, in the food and beverage industry. These units provide combined refrigeration duty of 4.2 megawatt, with outstanding efficiency – which is not least the result of use of the natural refrigerant ammonia.

A novelty here is the use of ammonia, which – owing to the very strict safety regulations in Russia – had not been approved as refrigerant for athletic facilities. The GEA Refrigeration Technologies project team, however, was able to convince the authorities of the benefits of this natural refrigerant in comparison to synthetic alternatives – with the result that special approval was granted for this project. The ammonia supply lines alone, adjacent to the sled run, include 4 kilometers of piping, in which the great evaporation enthalpy and the above-average volumetric cooling output enable obvious positive results. The required output can be transported with reduced amounts of refrigerant and, as a result, in thinner pipes in comparison to conventional facilities. To minimize the health risk in the event of a possible leak in the machine room, GEA installed a gas scrubber there. It would filter any escaped ammonia from the air and would drastically reduce the concentration of the gas. To prevent leaks from the very beginning, rigorous pressure tests and other testing procedures were conducted before turnover of the plant.

A novelty for Russia: the ice track of the new bobsled run is refrigerated with an ammonia circuit.

In the desert city of Dubai, people now have to put on warm clothes at outdoor temperatures around 40 °C/104 °F in the shade – at least when they want to spend a few pleasant hours in the indoor ski slope of the city. It's truly icy cold inside, to ensure absolute winter sports fun. Extreme conditions such as these demand rugged and reliable refrigeration technology.

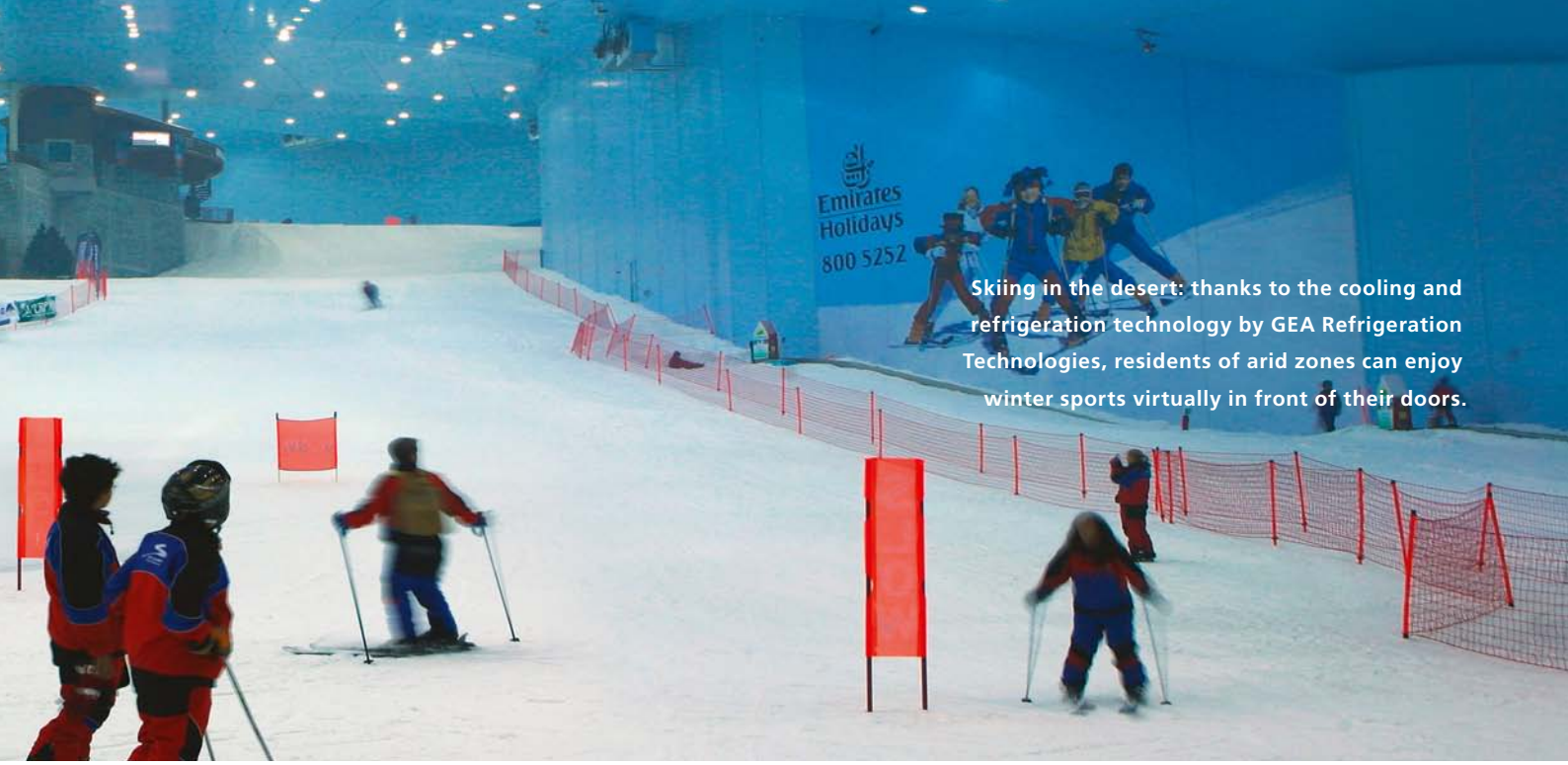
Refrigeration technology for top snow quality

GEA Refrigeration Technologies assures snow flurries instead of sandstorms

GEA Refrigeration Technologies for indoor facilities:

- Planning, delivery, and installation of customized cooling and snow-making systems
- Energy-saving cooling of indoor skating and skiing facilities
- Top snow quality

Skiing in the desert at 40 °C/104 °F in the shade? No problem with that, thanks to professional refrigeration technology. Ski Dubai, the first Ski Dome of the Middle East, lies in the center of Dubai, United Arab Emirates. The snow surface of 22,500 square meters offers five ski slopes, with varying heights and slopes. The longest is 400 meters. This means that beginners, more advanced skiers, and pros all get what they expect. Newcomers can even reserve a course in the ski school. For snowboarders, the 90 meters halfpipe assures sufficient excitement. For more serene activities, the Snow Park offers, for example, snowman building and sledding. It's not only the slopes that excite the visitors, but also the individual charm of the skiing facilities with their natural landscapes, including tall trees and a snow cave. In addition, the guests to the Dubai Ski Dome can expect everything that goes to make up a sophisticated winter-sport facility: e.g., cafés and restaurants for the après-ski scene. Those looking for a suitable outfit can buy one just next door in the shopping center.



Skiing in the desert: thanks to the cooling and refrigeration technology by GEA Refrigeration Technologies, residents of arid zones can enjoy winter sports virtually in front of their doors.

Outstanding insulation is of course necessary in light of the extreme temperature differences between indoors and out. The indoor ski slope has walls five meters thick and amounts to one giant refrigerator. The refrigeration technology is just as carefully thought out: three GEA Grasso screw compressors form the key components of the entire refrigeration plant. They assure a temperature of -1 °C/30 °F that enable young and old to move about briskly and forget the roasting heat of their everyday world outside. To save energy, a computer-supported control system adapts the cooling output exactly to momentary requirements.

After midnight, it begins to snow, as if guided by an invisible hand. But GEA is behind it all: 29 GEA air coolers, with a total cooling duty of 2,600 kilowatt, lower the temperature inside the Ski Dome to -10 °C/14 °F. The water blown out of 21 snow cannons crystallizes in the icy air to provide 30 tons of fresh snow – each and every day. Melt water is collected and used for climate-control of the adjacent mall and for watering the plants.

A further reference project of GEA Refrigeration Technologies is the SnowWorld indoor ski center in Landgraaf (Netherlands). Just as at Ski Dubai, SnowWorld offers a special feature: the center offers an official FIS racing slope on which World Cup ski racing as well as the Snowboard World Cup (2010) have taken place. Here, the quality of the slope has top priority – and this means that the refrigeration systems must assure a temperature of -6 °C/21 °F. If the temperature is higher, snow quality deteriorates; if it is lower, users become unsure. The snow is produced at -15 °C/5 °F by spraying water into the air at high pressure. The operators, SnowWorld Leisure N.V., contracted GEA Refrigeration Technologies to upgrade the existing refrigeration plant to the state of the art, so as to be prepared for upcoming races. It was a special challenge to integrate the heat pump for the adjacent new four-star hotel SnowWorld into the overall plant. This heat pump not only serves heating purposes: it also provides, day after day, hot water for the hotel guests – every day at the same temperature.

Ski Dubai is the first indoor ski resort in the Middle East and offers an amazing snow setting to enjoy skiing, snowboarding and tobogganing or just playing in the snow. The construction covers an amazing 22,500 m² covered with real snow all year round.

Snowboarding, snowball fights, and sled races – when others come back with a sunburn from open-air vacations. This is not magic – it is simply the artificial snow systems from GEA Refrigeration Technologies that let snow fall even above freezing.

Artificial cold for ski slopes

Winter fun – when it's summer outside

Artificial cold as a factor of fun: we'll let it snow for you – indoors or outside in the open, regardless of the temperature.

Mild winters mean lean business for many skiing centers. Especially smaller hotels are hardly able to financially survive a poor winter season. Our solution: if you can't depend on the weather, then depend on the snow cannons of GEA Refrigeration Technologies. They assure realistic snowfalls, even when Father Frost decides not to help.

GEA Refrigeration Technologies has equipped the indoor ski slope in Moscow (the Moscow Snowdome) with three GEA Geneglace snow cannons (SL 50 Snowline). These cannons, mounted on containers, produce 150 cubic meters of snow daily. GEA Refrigeration Technologies has made a name for itself as specialist for the production of industrially used flake ice – and has employed this profound know-how in the production of artificial snow as well. After all, this snow actually consists of crushed ice – without any additives. This ice is produced in advance and is stockpiled in heaps near the indoor ski slopes. When the slope is not being used, the artificial snow is blown under great pressure through a flexible hose up to a distance of 100 meters to the required places: for example, in order to compensate for unevenness or to prepare the slope for a new session.

The best of all here: it does not have to be really cold for these snow cannons to properly function. Snowline also functions at temperatures above freezing – whether indoors or out. At a Belgian ski resort near Brussels, professional snowboarders and skiers have tested Snowline snow at summer outdoor temperatures of 20 °C/68 °F. They were excited over the natural loveliness and the good quality of the artificial snow. The SL 50 Snowline snow cannon produces from 50 to 55 cubic meters of snow per day – output that suffices to cover an area of 1,000 square meters with 20 centimeters of snow in three to four days.

Likewise, in the Japanese ski region of Utopia Saioto, GEA Geneglace Snowline snow cannons guarantee a perfect and long skiing season. Indoors or outside in the open, Snowline produces the same results even beyond the winter season: "Great conditions for skiing and tobogganing."

At the Océanopolis theme park at Brest, in France, the rockhopper penguins there enjoy visitors. They love the cool ground that our ice machines provide for them.

Polar bears and penguins would never encounter each other in the wild, since the bears live in arctic regions, and penguins are at home in the southern hemisphere. At best, they come closer together in the zoos of the world. There they share their great delight – for ice made by ice machines of GEA Refrigeration Technologies.

Ice machines for zoos and theme parks

Frosty home for polar bears and penguins

Children love to go to zoos and animal gardens. And adults have their fun as well in observing domestic or exotic animals and to take a little chance to relax. Entirely apart from the fun factor, zoos are important institutions, since they serve to breed and research rare animals. This is reason enough for GEA Refrigeration Technologies to contribute to their well-being with effective refrigeration technology – for example, at the nature theme park Océanopolis in France. Océanopolis is located adjacent to the port of Brest and – in entertaining yet educational manner – acquaints its visitors with oceanic fauna and flora from various climate zones of the earth. The adventure world at Océanopolis centers on the various oceans and is broken down into exhibition areas for tropical, moderate, and polar seas.

Our GEA Geneglace F90V flake-ice machines are in operation in the polar section, where they produce up to 3.5 tons of ice daily. The ice machine at Océanopolis produces the flake ice as needed. An ice storage area with a capacity of 4 tons serves as a buffer between ice production and consumption. The two GEA units are located in a machine room 40 meters from the penguin area, so that the operational noise does not disturb them. A pneumatic conveyor system – also by GEA Refrigeration Technologies – assures plentiful ice supply: the ice moves to the penguins through a 40 meters pipe with an internal diameter of 50 millimeters. This arrangement enhances ice quality, since during transport the ice flakes rub against each other and break into smaller pieces. Once it arrives at the penguin section, the ice is fine enough for the penguins to comfortably walk over it. The penguins at Océanopolis appear to enjoy the quality of the ice: their physical activity and their numerous offspring are surely evidence that these animals feel at home in Brittany, despite the mild climate there.

Russian animal ice-lovers also enjoy our refrigeration technology: in the Moscow Zoo, the oldest zoo in Russia, a GEA Geneglace ice machine serves for a natural environment in the polar-bear section. Here as well, regular births of offspring lead to the conclusion that the bears are well and healthy there.

One highlight of Floriade 2012, the World Horticultural Expo, is Villa Flora. This glass building complex sets standards for sustainable building. One key component of its impressive building-services system is an ammonia heat pump from GEA Refrigeration Technologies.

A GEA heat pump for climate control of a building complex

Greenhouse with office tract

Showpiece of Floriade 2012 and a pioneering example for sustainable building: Villa Flora with a heat pump from GEA Refrigeration Technologies.

Gardens and balconies with plants are more popular than ever. Not infrequently, they mutate to an extended living room. Trend research calls this phenomenon "outdoor homing" and "urban gardening." No wonder, then, that millions of visitors are streaming to Floriade 2012, the World Horticultural Expo. At this international garden show in Venlo (the Netherlands), visitors can enjoy over one hundred gardens and pavilions from the entire world. But Floriade is not intended only for entertainment and motivation for the visitors' own garden design: environmental protection and sustainability are not less close to the hearts of exhibition organizers. Under consideration of these aspects, the Dutch architect Jón Kristinsson designed his Villa Flora for Floriade 2012 in Venlo. This huge glass building, 30 m high, is a marvelous example of sustainability and serves as a symbol for the symbiosis of people and plants. Villa Flora encloses an opulent array of flowers and plants, as well as exhibition space in its giant greenhouse, and it also includes an office tract hooked on with pioneering features in sustainability.

This combination of a greenhouse and office building consists not only of recyclable construction materials (the cradle-to-cradle principle), but is also pioneering in the energy sense – and is CO_2-neutral. Solar panels generate electric power, as well as the elevators when they travel downward. In addition, organic waste is collected – including fecal matter from the vacuum toilets – and serves for the production of biogas, which is in turn used to produce heat.

The building is heated and cooled by an underground long-term heat- and cold-storage system, in combination with a heat pump from GEA Refrigeration Technologies with two dual-well systems. Cold water pumped upward from one of the wells cools the building in summer. This water absorbs heat from the building and then flows into the second well system. Until the following winter, the water flows approximately 100 meters to the second well system, where it is pumped up to the building for heating. Since its initial temperature, however, is not sufficient for building heating, the GEA heat pump raises the water temperature to the required level. A GEA Grasso V700 compressor drives this heat pump. One of the key features of this heat pump is its synchronous permanent-magnet motor with frequency control – which helps the heat pump to achieve a coefficient of performance (COP) of up to 11. An additional reason for the outstanding efficiency of this heat pump is the refrigerant used: ammonia (NH_3). This natural refrigerant has no ozone-depletion potential and is very energy-efficient.

Get on board, sit down, and relax: with elimination of the stress involved in searching for a parking place, and of tiresome transfer between transit lines, bus trips have today become a popular form of travel. Air conditioning systems with compressors from GEA Refrigeration Technologies further contribute to no-disturbance travel.

Compressor for bus air conditioning

Relaxed travel with GEA Refrigeration Technologies

Whether holiday, event, or theme travel: the spectrum of bus offers continues to grow. In addition to attractive prices and interesting destinations, bus-travel companies pamper their customers with comfort in the form of modern sanitary facilities, comfortable seats with generous foot space, and above all good air conditioning. For their luxury tour buses, almost all prominent bus manufacturers – including MAN, Mercedes Benz, and Neoplan – depend on compressors from GEA Refrigeration Technologies.

GEA Bock compressors, Type FK40 or FK50, are used in these buses, depending on the swept volume required. The high-performance, compact, and rugged compressors in these air conditioning systems assure that bus passenger can relax – for example, on the way to a sports event. But it's not only sports spectators who can enjoy flawless comfort during their trip to the stadium – the players themselves have learned to value perfectly air conditioned team buses. In these buses, operated by many sports teams, GEA Bock compressors guarantee that the teams will reach the stadium in fit and rested condition. And after a hot match, good air in the bus is more than welcome to recover from the strenuous game.

Vehicle compressors from GEA Refrigeration Technologies assure a good climate in modern touring buses.


Our products are not merely products. They are solutions to the problems you face. We provide you with a great number of pre-defined as well as individually configurable solutions. This allows us to find the configuration for your application that harmonizes planning and installation expense, functionality, and investment and operating costs.

GEA Refrigeration Technologies for sports and leisure facilities

Our products for your products

Ice machines

Refrigeration at the press of a button – possible with GEA ice machines. As the leading European manufacturer of ice machines, GEA Refrigeration Technologies takes advantage of its decades of experience and offers more than 40 models in various sizes. The machines supply ice in various qualities, including the flake ice that is used, for example, in zoos, animal parks, and theme centers.

Ice towers

It's not always possible to perfectly coordinate ice production and consumption. That's when it's advisable to stockpile ice – as offered by GEA Refrigeration Technologies with its ice towers, available in various versions and volume capacities. These storage silos can be set up indoors or out. A pneumatic conveyor system takes the ice to where it is needed.

Piston and screw compressors

With its comprehensive portfolio of piston and screw compressors, GEA Refrigeration Technologies covers all conventional requirements placed on refrigeration – including those for indoor ski slopes and ice stadiums. We'll find the right compressor for you, whether with ammonia, CO_2, or glycol as refrigerant – of course while observing all legal stipulations and safety regulations.

Production of artificial snow

The name says it all: the two models of GEA all-weather snow cannons provide for falling snow regardless of temperature or relative humidity. They can be set up indoors or out and guarantee ski-slope operators a good season. The snow that they make lasts for a long time and provides a perfect base, even for professional athletes.

We offer also experience in our sector and in daily operations. This means that we are at your service not only in the planning phase: we support implementation of your projects, initial start-up of facilities, and maintenance of the plant.

In touch with our customers

With a view to your success

Planning and consulting

Finding the optimal solution for your project requirements is a challenge that we gladly accept. From the comprehensive product portfolio of GEA Refrigeration Technologies, we assemble the most suitable plant for your specific needs. We also provide the complete measurement and control technology. Our team likewise supports the installation of the facilities, supervises assembly onsite, and aids in initial start-up. When everything flawlessly functions from the very beginning, you can rest assured that you can use your facilities over years and decades.

Financing

To prevent a technically and economically optimal solution from failing owing to investment problems, we optimize not only the concept for your refrigeration technology, but also consider the financial framework. And we can support you in applying for and utilizing any subsidies due to you.

Service

Do you also love to hear that chugging sound? The continuous purring of equipment? We certainly do. This is why we remain at your service after setting up our units and systems – with an international, highly competent service network. Preventive and remedial service is the key to long service lives of your assets, a maximum of cost effectiveness, and operations as smooth as possible. But, if a malfunction should still occur in your plant, we are there for you – online or with you onsite, we see to the fastest possible elimination of any trouble. Also included is of course a world-wide, spontaneous spare-parts service.

GEA Refrigeration Technologies represents:

- Comprehensive consulting and responsible project support
- Detailed market knowledge and sector know-how
- Great investment security
- Future-proof solutions
- Maximum plant run time
- Long plant life cycles
- Low energy consumption
- Minimum operational expense
- Highly competent service
- Technologies harmonious with the climate and environment
- Fast delivery of spare parts

Would you like to learn more about us and our solutions?

Go to GEA Refrigeration Technologies at www.gea.com

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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