Refrigeration technology for seafood

In touch – cost-effective solutions for
fish and seafood processing




The export of seafood products has attained a leading commercial role throughout the world. For this development we can thank outstanding developments in advanced cooling and freezing technologies. Ice machines, cold-storage facilities, and various freezer products by GEA Refrigeration Technologies assure that fish successfully make the long journey from the depths of the ocean to our dinner plates, and that they land there in excellent quality.

In touch with your processes and requirements

Seafood: fresh from the catch onto the table of your ultimate customers

For us, "in touch" means customer proximity in every respect. GEA Refrigeration Technologies stands for refrigeration solutions oriented as closely as possible to the requirements of our customers: cost-effective, long-life, energy-efficient, sustainable – and made carefully to order.

Refrigeration processes and products, and temperature control of transported goods: this is the specialty of GEA Refrigeration Technologies – since the end of the nineteenth century. The growing fish industry profits from this experience. Seafood, of course, is increasingly growing in popularity. On the one hand, the number of health-conscious customers is growing who appreciate the beneficial properties of seafood. High-quality protein and polyunsaturated fatty acids are the essential constituents of the light and healthy cuisine favored by so many nowadays. On the other hand, fish is also a staple of diet in many countries.

It's not always simple, though, for the layperson to recognize fresh fish. The characteristics of a really fresh fish – glossy skin, firm and rounded lenses, and bright-red gills – can be determined only by studying the entire fish. It takes the specialist years of experience to be able to evaluate the freshness of a fish fillet. To stay on the safe side, consumers resort increasingly to the deep-frozen alternative – and are enthusiastic about what they get. The good quality of frozen seafood now convinces even die-hard gourmets. To maintain this quality and satisfaction, fishermen, fish processers, and all



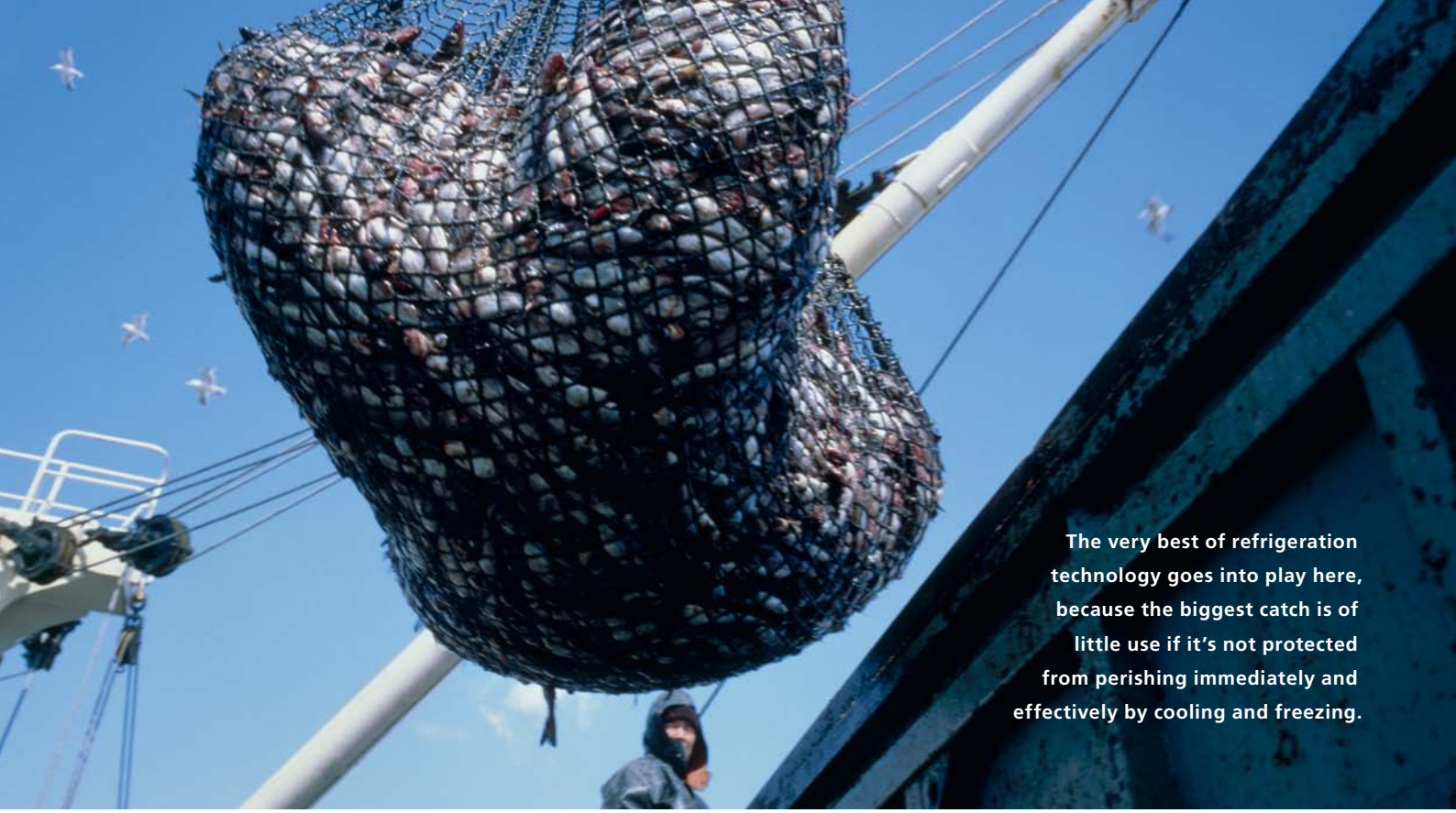

others involved in the transport and distribution chain must observe strict food regulations and keep their sensitive wares – i.e., fresh fish – perfectly cooled.

Nothing is left to chance with GEA's refrigeration technology. You catch the fish, and we capture its freshness. Our refrigeration technology is on board on many large and small fishing ships and seafood factory vessels. After sorting and gutting the fish, plate freezers immediately freeze the fish as whole-round, headed and gutted or fillets. After off-loading in port, the frozen fish can be directly processed to final products, e.g. as fish sticks or canned fish. Since space is at a premium on ships, our developers have stressed the importance of easily integrating such freezers on board. Compact, advanced, and energy-efficient systems cool the finished cargo, or help with pre-cooling and intermediate storage. The reliability of this technology is absolutely essential in enabling fishing in increasingly distant fishing grounds.

On small fishing trawlers and fishing cutters, a bed of ice represents the ideal intermediate storage for a catch of fish. Here as well, the special needs of each part of this industrial sector must be taken into consideration. Not all ice is equally effective. GEA Geneglace ice machines produce just the right ice that is needed: for example, flake ice, which can be made either from saltwater or freshwater. Once the seafood reaches port, though, the cooling chain is by no means at its end. Nor the work of GEA Refrigeration Technologies. With its inventive and innovative spirit – together with effective technology – GEA stands ready to support its customers so that precious foodstuffs reach their destination in the best shape. But individuality is essential here: no one operation is the same as another. As a result, standard solutions do not fit all processes. This is why virtually all larger refrigeration facilities must be exactly tailored to your requirements – to keep your investments low and your benefits high.

Our engineers work hard to provide you the refrigeration technology best suited to your specific needs – with the same love of detail that you show in processing fish in your plant. Our goal is not only to create long-term and cost-effective solutions for you, but also to provide you with energy-saving and environmentally harmonious systems. What counts, after all, is the maximum possible benefits under economic conditions – with optimum protection of our climate and the environment.

Every area of the fish-processing industry sets its own specific requirements for carefully controlled temperature – not only for production, but also for transport and storage. In accordance with the particular application, refrigeration technology from GEA assures just the right temperature: cool or ice-cold, within one degree of precision if required.



The very best of refrigeration technology goes into play here, because the biggest catch is of little use if it's not protected from perishing immediately and effectively by cooling and freezing.

Large fishing ships no longer need expensive and time-oriented logistics to quickly take their catch to the final users. Their catches are now directly frozen on board – for example, with plate freezers from GEA Refrigeration Technologies.

Refrigeration technology for top product quality

On the high sea: GEA Refrigeration Technologies captures freshness

Horse mackerel are an important source of protein, especially at the entire west coast of Africa.

In many countries, fish represent the most important source of protein. This applies, for example, to the entire west coast of Africa. To assure such staples of diet for the African population, the trawler *Jupiter* of our customer Namsov Fishing Enterprises (Pty) Ltd is on duty in the ocean off Namibia. Equipped with trawls and extensive GEA refrigeration systems, the ship is on the hunt for horse mackerel – with good success.

Nature itself helps here toward a rich harvest: favorable ocean streams carry tremendous amounts of plankton from the Antarctic Ocean to the ocean off the southwest of Africa. Schools of these mackerel nourish themselves from this plankton. At the same time, the very best of refrigeration technology goes into play here – after all, the biggest catch is of little use if it's not protected from perishing immediately and effectively by cooling and freezing. The relatively high outdoor temperatures represent an additional challenge for the refrigeration systems in these waters.

The trawler *Jupiter*

- Owner — Namsov Fishing Enterprises (Pty) Ltd
- Launched — 1990
- Length — 120 m
- Height — 19 m
- Propulsion output — 7,200 PS
- Refrigeration system — 1,260 kW
- Freezing capacity — 170 t/d
- Storage capacity — 2,000 metric tons

Modernized with GEA technology: today, the "Jupiter" carries 2,000 metric tons of cargo. Its freezing capacity is 170 tons per day – 2.5 times its original volume.

Jupiter was launched in 1990 by the shipbuilders Volkswerft, in Stralsund, Germany. Since almost two decades on the high seas had taken their toll, the ship was recently renovated. In 2006 GEA Refrigeration Technologies brought its refrigeration systems up to the state of the art – with GEA responsible from planning to implementation. Today, the *Jupiter* has a cargo capacity of 2,000 metric tons. Freezing capacity has risen by around 250 %: from originally 65 to now an average of 170 tons per day. For the *Jupiter* this was a major breakthrough – and almost routine for the experienced GEA team, who are intimately familiar with this ship type (Atlantik 488).

But it's not only the quantity that plays a key role: quality is likewise critical. No time may be lost. The sea creatures taken aboard must be cooled immediately after the catch. If, for example, the *Jupiter* takes in a particularly large school of fish, it will place them in intermediate storage tanks and pre-cool them there with refrigerated seawater or liquid ice. This advanced technique is known as cooling with refrigerated seawater (RWS) – a technology for which GEA is already hard at work. GEA supplied the pumps, flaps, valves, and fittings for the seawater system aboard the Jupiter. Effective filters assure hygienic conditions.

After automatic sorting of the mackerels in special machines, ten vertical plate freezers go into action. Packed in like sardines, the mackerels are frozen between freezer plates to handy blocks 65 x 250 x 800 mm in size, with an average weight of around 10 kg. They are then packed into cartons. This size of fish blocks is very popular on African fish markets, since they can be simply handled and transported by individual persons. These icy blocks remain in giant isolated storage rooms in the ship until its arrival in port – kept at -25 °C/ -13 °F by GEA air coolers.

But it's not only people who enjoy the benefits of professional cooling of the beloved mackerels. During fish production on board, a valuable by-product is created: fish meal. The refrigeration technology of GEA is also used in the production and storage of this high-quality fodder.

GEA Grasso compressor unit

Vertical plate freezers

Refrigeration systems on board of the *Jupiter*

- 10 vertical plate freezers (V-32)
- 2 GEA Grasso screw compressors (Y-1)
- 1 GEA Grasso screw compressor unit (SK-3)
- 2 GEA air coolers (each 45 kW)
- Valves and control units
- Refrigerated seawater system (RSW)
- 2 saltwater pumps

Experts claim that fresh fish loses one entire day of shelf live for every hour that it remains uncooled. An ice bed made of flake ice is therefore ideal intermediate storage. For cooling of freshly caught fish on board, GEA Geneglace ice machines produce flake ice from freshwater or seawater. For smaller trawlers or fishing ships, investments in energy-efficient and long-life ice machines pay off handsomely.

Fresh fish remains fresh fish

Placed “on ice” in the truest sense

GEA is the first manufacturer of ice machines in Europe. Designed according to a simple principle, GEA Geneglace ice generators benefit from over 50 years technical experience and a continuous policy of development – for economical and energy-efficient solutions to produce, store, and handle the ice.

It’s not on all fishing ships that the fish are gutted, dressed, frozen, or further processed on board. For such smaller fishing ships or cutters that must keep the catch cool during the entire voyage, GEA offers the matching product portfolio. And flexibility is likewise in demand here: some fishing boats leave port in early morning and return to their home port on the same day. Others are underway for days on end. To maintain freshness quality in any case, the catch should be immediately cooled to around 0 °C/ 32 °F. There are two solutions possible here: the ice is either loaded on board when the ship leaves the harbor, or the ice is produced on the ship as needed.

This all sounds easy enough, but it demands considerable expertise. Ice machines dedicated to this purpose cool water in a vertical cylinder until it freezes on the inner wall. The ice is scraped off and falls into an ice container located below. The flake ice gained in this way is ideal for use on the high seas, especially since it is “fish-friendly”.

Despite the name “flake ice”, the small curved pieces of ice have no sharp corners – which protects the thin, delicate skin of a fish. Flake ice is even softer on fish skin when it has been made from seawater: the salt content makes the ice even “softer”. In addition, fish does not swell when it is stored on ice. The cool mass has just the right consistency – not too hard and not too liquid – and can be easily handled on a ship, since it can be heaped up.

Cold: yes. Too cold: no. There is a temperature below which fish cannot be stored. Otherwise, dreaded freezer burn will take place and will rob seafood of its taste and its attractive color. The purpose of the ice, however, is not only to keep the fish at a particular temperature. As the ice slowly melts, this automatically washes the fish – and the natural mucous layer and the moisture of the skin will remain.

Whether on land or on board, whether for seawater or freshwater: GEA Refrigeration Technologies knows what it's doing. As the first European manufacturer of ice machines, GEA has collected a great deal of experience and can now offer more than 40 models. Daily ice capacity of the GEA Geneglace ice machines is between 200 kg and 50 metric tons, depending on the equipment type. These ice machines are available alone or as compact ice machines with so-called ice packs.

Ice machines that directly produce the ice on board are especially designed for the rough conditions on the high seas. They carry on even despite heavy waves and are not sensitive to corrosion by the saline content of sea air.

GEA Geneglace flake ice generator

In flake ice made from freshwater or seawater, the fish on board will retain its freshness.

The operators of the fish-storage facilities at the French seaport of Port de pêche de la Turballe cool the freshly caught fish on GEA ice, until it can be further transported.

Refrigeration technology for storage and distribution

Fresh from the catch, and long after the catch

On land as well, GEA provides fishermen in all the world with ice-making systems. In Morocco, France, Belgium, Chile, Mexico, and Spain – to give only a few examples – GEA has already outfitted hundreds of fishing ports with ice machines and ice towers.

The freshly-caught fish is picked up from the distribution center

Ice tower with ice-transport system

Placed on ice – to assure top quality

Once the fishermen have brought their catch to land, it must be immediately placed on ice. One example here is at the French fishing port Port de pêche de la Turballe. This port, located near the city of Saint-Nazaire, is a gigantic turnover center for fish – primarily for sea bass, mackerel, and octopus. The fishing industry is second only to tourism as a source of income for this town. The harbor landscape there is distinctively characterized by the colorful fishing fleet with its netters, coastal fishing boats, and its deep-sea trawlers – and this fleet needs ice in great quantities. Some trawlers sail out only for short periods, around 15 to 30 minutes at a time, so as to pamper their customers with very special fish quality. They market their catch in the port's own distribution center, Center de Mare. At this facility, various dealers and wholesalers operate refrigerated storage facilities that are directly filled with fish by the fishermen.

The required ice, of course, must not run short until trucks pick up the freshly caught fish. GEA Refrigeration Technologies has therefore set up an ice maker with ice-storage silo (ice tower) in this distribution center. To assure enough ice during peak demand, these ice machines produce the ice in advance and store it in the tower. These storage facilities ensure that the ice on stock meets all requirements for hygiene, perfect consistency, and conformity with food and beverage regulations.

These ice towers are equipped with an indicator that tells the level of ice remaining on stock. An integrated weighing function and a coin-operated vending machine make the procedure simple: whoever needs fresh ice, pays for it onsite according to the weight required. The ice is always sold according to the first-in, first-out principle, with a screw conveyor transporting the cold wares from the tower to the customer.

In addition to the flake ice produced and sold in this application example, the fishing sector is increasingly using liquid ice: a water-ice suspension. The aqueous consistency of liquid ice makes it easy to pump – which in turn means that the ice-production facilities and point of sale can lie relatively far from each other. The extremely small ice crystals are gentle to the skin of the fish, and allow especially fast and uniform cooling of the cargo. The GEA product portfolio has also kept up with this trend, and includes five land-based liquid-ice machines.

GEA Refrigeration Technologies for storage and distribution in a fishing port:

- GEA Geneglace ice machines
- Automatic ice storage for 30 to 100 tons
- Transport system, with automatic dispensing from 10 to 30 tons per hour
- Weighing function and coin-operated vending machine

GEA Geneglace pneumatic conveyor

Hard shell – soft core: shrimp guarantee a highly diverse culinary delight, far removed from old-fashioned home cooking. With their delicate aroma, these crustaceans enhance Mediterranean and Asian dishes and are an attractive eye-catcher at buffets. Consumers buy them enthusiastically, since crustaceans are available in any supermarket and, in addition, represent a low-calorie source of protein.

Refrigeration technology that uses its head for shrimp

Refrigeration for crustaceans

Shellfish, once expensive, are more affordable than ever before, and are now well-established even in discount supermarkets. We enjoy them on pizzas, in salads, with pasta – and we love to grill, fry, boil, or steam them. With herb dips, hot or cold. They are welcome ingredients in many diet recipes, since they offer only 80 kcal per 100 g, with plenty of protein. As a result, they are popular among the many of us looking for light culinary enjoyment. These pink delicacies, in addition, are an outstanding source of calcium and iodine. Although some consumers shrink back when they learn of the exorbitantly high cholesterol values, that shouldn't actually dampen our enjoyment. On the contrary: the exceptionally great concentration of valuable omega-3 fatty acids in shrimp has a positive influence on the health-relevant relationship between LDL and HDL cholesterol, and allows the triglyceride level to fall.

There is hardly any controversy over the culinary and dietary benefits of crustaceans, but there is hardly any agreement on the other hand on the nomenclature of these animals. There are certainly enough designations: shrimp, pink shrimp, scampi, prawns, gambas, etc. The fact that the terms used in biology for a particular crustacean species do not always coincide with the names used in commerce does not make orientation easier for the layperson. For example, what Germans call a "North Sea crab" (Crangon crangon) is actually a shrimp.

The names for crustaceans typically used in trade and in catering are – on the one hand – oriented partly to their origin: northern shrimp, for example, come from the northern parts of the Atlantic and Pacific, and from the Arctic Ocean. Warm-water shrimp live in considerably warmer oceans of the southern hemisphere. A third group comprises the freshwater shrimp, which live in lakes, rivers, and brackish water. On the other hand, the size of these animals can determine their designations. This depends on the number of individual crustaceans in a unit of weight: either in the avoirdupois system with their number per imperial pound (items/lb), or in the metric system per kilogram. In many countries, for example, the English term "shrimp" is used for small animals with more than 200 ea. per pound. The larger specimens, with fewer than 200 ea. per pound, are sold over the counter as prawns. The Spanish use the word gambas as a rule to designate large unshelled shrimp with heads and tails. The Italian term is scampi.

Once a luxury article, shrimp long ago became a trend food.

The size of these crustaceans is not only important for their commercial names: it is also decisive when it comes to selection of the most effective freezer equipment. In addition, knowledge of the product temperature is essential to enable professionally proper freezing – both for product entry into the freezing process, and for its exit from this process. It is likewise essential to consider the extent to which the goods have been prepared: i.e., whether they should be input to the freezing process raw, boiled, deep-fried, battered, shelled, gutted, and with or without tails.

The names for crustaceans are chosen according to their origin and their size. The size depends on the number of individual crustaceans in one unit of weight.

Freezers from GEA Refrigeration Technologies: efficient handling in touch with your production process.

Whether raw, boiled, or in a batter jacket: GEA Refrigeration Technologies offers advanced refrigeration systems for crustaceans. These solutions are everything but crusty.

Solutions for every kind of crustaceans

Professionally proper freezing

Raw, shelled, and gutted shrimps may not lie on top of each other in a freezer unit, since the protein on the product surface would immediately bond them together. For this reason, tunnel freezers with IQF technology are used here (IQF means individually quick frozen). Here, the shrimp are distributed uniformly and with sufficient intervals (usually automatically) onto a long conveyor belt, which takes them through the tunnel freezer. In the freezer, cold air blows from the top down through the conveyor belt. The product is kept in continuous motion until the surface is frozen and the fish can no longer stick together. The consumer can later divide up the shrimp into servings and can even take them out individually.

GEA tunnel freezer with IQF technology

GEA E-Tec spiral freezer

If boiled shrimp are frozen, it is almost always a case of "northern shrimp". They are popular for being especially delicate and aromatic, but they are especially small: 200 to 500 ea. per pound, and broken. This classification "broken" refers to pieces of the shrimp, since – even when great care is taken – it is not always possible to prevent breakage of the tail off the graceful shrimp. This of course has no effect on the taste, although the resulting "crabmeat" is sold for a lower price. For application here, GEA Refrigeration Technologies offers tunnel freezers with tightly meshed conveyor belts. These systems are pre-assembled in the factory and are usually designed for capacities of one to two metric tons per hour. Larger shrimp (20 to 100 ea. per pound), without heads but with tails, can be frozen in tunnel freezers: either raw or cooked, with or without shell. The tunnel freezer will be dimensioned according to the product size.

Tunnel freezer catwalk for safer access

Spiral freezer

If the shrimp have both shells and heads, then we have to use our own heads to ensure proper freezing. It is essential to preserve the very long antennas on the finished products. Spiral freezers are most effective here. If the processor intends to freeze the individual animals, horizontal plate freezers and impingement freezers are also effective. Impingement freezers blow cold air under great pressure onto the shrimp, simultaneously from both above and from below. This ensures fast freezing and is especially effective for flat products – which makes these systems ideal for the larger shrimp.

Crustacean products that have already been further processed – i.e., cooked in bread crumbs or battered – require especially careful treatment. Spiral freezers are usually the best solution, to ensure that the delicious surface remains intact. In many cases, this kind of freezer is still being loaded manually.

If the shrimp are not already provided with a tasty coating, they must often have a system exit temperature of less than -18 °C/ -0.4 °F, so that they retain their last processing step: the ice glazing. A fine spray water mist produces this extremely thin, shiny layer of ice. This procedure automatically involves a slight warming of the shrimp, especially the smaller ones. As a result, one more "after freezer", or "hardener" step is required after the glazing finish. This is an extra freezing step that pays off. Its purpose is by no means limited to optical enhancement, since the ice layer protects the shrimp from drying out in their frozen condition. The customer profits from the longer life of the product, and from better quality. Fast after freezing forms only small ice crystals. If the shrimp were frozen more slowly, larger ice crystals would develop and destroy the cell walls. Then, when the shrimp thawed out, water would flow out of the broken cell walls – leading in turn to drying out and loss of aroma.

Once the fish has been unloaded from a trawler or cutter after long days on the high sea, speed is once again essential – as is refrigeration. GEA Geneglace ice machines are first choice for overland transportation as well – and for storage in halls and for product presentation of fresh fish and other seafood in supermarkets.

Ensuring that good things reach the customer in good shape

Gourmets don't hesitate to select from this choice

The better the fish are cooled underway, the higher the price they can command on the market.

The eyes eat along as well. On board a trawler or cutter, the optical aspect plays no major role – but at the fish counter in a supermarket or fish store, fresh seafood just has to look good. Appetizing and clean as a whistle – when these characteristics prevail for goods offered at the fish counter, then gourmets will not hesitate to choose.

For this reason, flake and slurry ice have for many years played a major role at the fish counters of supermarkets. GEA can claim the same: for example, GEA has equipped several stores of the French supermarket chain *Leclerc* with ice machines. The advantages of this kind of ice are apparent: it can be easily formed and distributed. It does not form clumps, and it does not stick. Specialized sales persons find it easy to give their products an attractive ambience – one that lasts the whole day and does not shrink to an unappealing mass. Sales staff can model little ice hills or valleys – and can attractively arrange each fish, each clam, and each shellfish so as to appeal to the

Fresh fish and seafood: appetizing and hygienic presentation with flake ice

appetite of their clientele. In addition, staff can form a sales surface sloping toward the customer, so that he or she can optimally inspect the delicacies. Elements purely serving for decoration can also have a stable base in the ice. No basket with clams will fall over, nothing will collapse, and none of the items on sale will slide apart.

The pure white of the ice flakes naturally forms a charming contrast to the vivid colors of the seafood on display – an effect that should not be underestimated in effective presentation of goods. A dash of psychology is also involved here: after all, in most cultural circles, the color white has long symbolized cleanliness and purity. Flake ice has a temperature of around -7 °C/ 19.4 °F and melts much slower than other types of ice. The continuous rinsing of the seafood with meltwater reduces the formation of microorganisms. The ice is relatively dry, but still moist enough to prevent the fish from drying out. The thin and delicate ice flakes also guarantee that the sensitive skin of fish remain intact, and that neither pressure points nor freezer burn will compromise quality. With these benefits, flake ice represents the perfect basis for healthy freshness that lasts and lasts – and eventually supports solid business relations between fishmongers and their customers.

Every morning, seafood salespersons must provide fresh ice for their displayed wares. Staff of *Leclerc* supermarket in France have it particularly convenient in this sense. They often have access to an ice dispenser over the counter – they simply press a button, a flap opens, and the ice falls directly to the counter where it is needed. This sophisticated technology saves ice transport in special vehicles, and it eliminates the need to shovel ice. This means fast and hygienic work: the less the ice must be handled, the less the danger of contamination of the ice by staff and tools (such as shovels). But it is not possible to implement such technical sophistication in all supermarkets: no one shop is identical to another. But GEA Refrigeration Technologies can in any case offer ice at the push of a button – even if ice maker and ice storage are a few steps away.

GEA refrigeration technology not only assures an appetizing appearance and otherwise good product quality for fresh fish – it also offers the required freezer technology for those in a hurry who select convenience food. The chain of GEA equipment and services extends from the fishing ships, to the processing industry, and from there to the supermarket.

Our products are not simply products. They are also solutions for the problems that you face. We present you with a great number of pre-defined as well as individually configurable solutions. This enables you to find the optimal configuration for your application – one that balances out expenses for planning and equipment installation, functionality, as well as investment and operational expenses.

GEA Refrigeration Technologies for the fishing industry

Our products for your products

Valves and fittings

They are inconspicuous at first glance, but immensely important at second: the most suitable valves and fittings. They are matched to their particular application – and not only with regard to maximum permissible pressures. The response behavior of the GEA valves, the resistance of the components to the media used and to external influences, and much more mean that these small components make a major contribution to the service life and the safety of your systems.

Chillers

Chillers from GEA Refrigeration Technologies assure sufficient cold on fishing ships. The basis for these systems is their onshore cousins that have day after day proven their functional capability. And they are fully capable of meeting the demands of conditions on the high seas. Experience has shown that neither the pitch of a ship nor heavy-sea influence can interrupt cold-water production by chillers from GEA Refrigeration Technologies.

Freezers

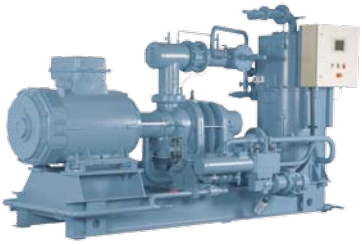
Floating fish factories spend days or weeks at sea – during which time no freshness should be lost. For this reason, the catch is frozen immediately on board: for fish that has been unprocessed, filleted, or portioned and otherwise prepared for the convenience of consumers. And if large catches exceed the freezer capacity of the ship, refrigeration technology by GEA has provided intermediate storage to ensure that fresh fish always lives up to its name. GEA delivers the freezers required here.

Ice machines

Refrigeration at the press of a button – possible with ice machines from GEA Refrigeration Technologies. As the leading European manufacturer of ice machines, the company can resort to decades of experience for offering more than 40 models in various sizes. The machines deliver various ice qualities, including slurry ice and dry flake ice – with both types used extensively, for example, in the transport of seafood.

Ice-storage systems

It's not always possible to perfectly coordinate ice production and consumption. This means that it's advisable to keep a stock of ice on hand in advance. GEA ice-storage units are ideal for this purpose. They are offered in various models and in various capacity ratings. The storage units can be set up inside or outside. A GEA pneumatic conveyor system moves the ice to where it is needed.



Packages and skids

Perfectly inter-coordinated compressors, including their complete periphery, on stable, low-vibration frames – these are the packages and skids from GEA Refrigeration Technologies. With our package solutions for refrigeration, you can rest assured that everything has been well thought out for you at our factory. And you can also be satisfied with low installation costs, since the units are completely delivered on a package or skid – ready to be hooked up and plugged in.

Piston and screw compressors

With its extensive offerings of piston and screw compressors, GEA Refrigeration Technologies covers all normally encountered requirements placed on the supply of refrigeration. These machines have especially proven their reliability at sea. After all: when the nearest service support point is hundreds or thousands of sea miles away, the ruggedness of the machines is doubly important. This is why GEA has optimized its valves and fittings to match the adverse conditions of maritime service under continuous operation.

Control systems

Similarly to valves and fittings, control systems often remain unnoticed, since their performance cannot be measured in impressive kilowatt ratings or volumetric flow. But it can be expressed in intelligence – which helps to find the optimal operating point, to save energy, to determine machine operating times and capacity utilization, and to thus enable maintenance based on the operating state. Whether for individual units or complete refrigeration systems – we deliver the control systems that assure you maximum benefits.

The products named here represent only a small selection from our comprehensive portfolio. But this selection should make it clear that refrigeration technology has many facets for GEA. This enables us to assemble those products for you – from the correct standpoint and from the great options in our portfolio – that will optimally satisfy your requirements. In this process you will profit from tried and proven system components that are assembled to provide a harmonious overall solution, and to offer you what you are looking for: moderate investments, minimal operating costs, and maximum benefits.

We offer not only products – we offer solutions. They result from close coordination with you. And we're not only at your disposal during the planning phase: we also take care of project realization, commissioning, and maintenance of the facilities.

In touch with our customers

With a view to your success

Planning and consulting

Finding the technically best solution for your requirements is a challenge that we gladly accept. From the extensive product portfolio of GEA Refrigeration Technologies we assemble the most effective system for your special case. In addition, we supply the complete measurement and control technology. Our team also supports the erection of the facilities, supervises assembly onsite, and supports the commissioning process. After all, when everything functions flawlessly from the very beginning, you can rest assured that you can use your systems for years and decades – on land and on sea.

Engineering

To prevent a technically and economically optimal solution from failing owing to investment difficulties, we optimize not only the concept of your refrigeration technology, but also take the financial constraints into full account.

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 equipment – with a highly competent service network. Preventive and remedial service are the keys to long service lives of your assets, a maximum of cost effectiveness, and operations that are 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 spare-parts service.

We are ready to help you: we provide strong support with financing, implementation of facilities, initial startup, and maintenance.

GEA Refrigeration Technology stands for:

- Comprehensive consultation
- Detailed market knowledge and sector know-how
- Great investment security
- Future-proof solutions
- Maximum plant service life
- Long system life cycles
- Low energy consumption
- Minimized operational costs
- Highly competent service
- Climate- and environmentally friendly technologies
- 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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