Kaeliver designs customised cooling systems

Efficient refrigeration and freezing systems for the fish industry

Fish quality is directly related to the temperature at which it is stored. Deterioration of the product starts immediately upon the death of the animal and from then on can not be reversed, but only arrested. Keeping product at the correct temperature is crucial to bringing the process of deterioration almost to a standstill, thereby maintaining quality. A substantial body of scientific literature has proven the direct link between the temperature at which the product is maintained and its shelf life. If the integrity of the cool chain is compromised even briefly, this will influence the shelf life of the product.

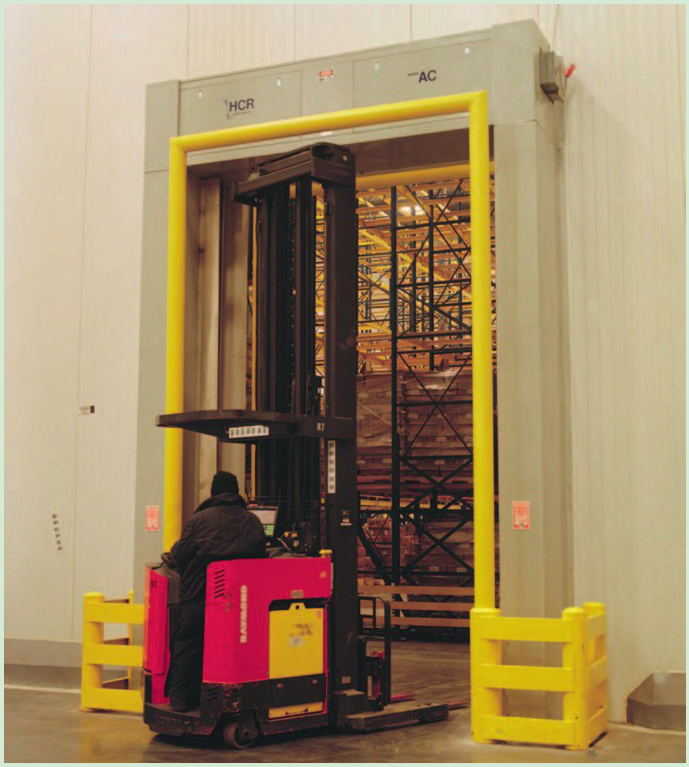
Fresh and chilled products are particularly sensitive and have to be maintained at the correct temperature from the boat or farm to through the value-addition chain to the final customer even if he is on the other side of the world. This places demands on product storage facilities which must maintain the product at the correct temperature before it proceeds to the next step in the chain. Cold and frozen storages are highly dynamic places with products, people and equipment constantly moving in and out. Maintaining a constant temperature in this environment is a challenge as other constraints including cost, energy efficiency, and the build-up of ice must all be taken into account.

Collaboration with major international manufacturers

Kaeliver is an Icelandic company that specialises in the installation and maintenance of cooling and freezing systems for buildings. Based in Reykjavik and active throughout the country Kaeliver designs and builds systems using ammonia or other refrigerants for large and small applications. Ammonia is typically used for bigger applications such as large coldstores or freezing or refrigerating plants, while other refrigerants are preferred for smaller applications. The company's main customers are freezing plants, abattoirs and shrimp processing plants using ammonia-based systems, but it has also worked with many other kinds of facilities on-shore and on-board including vessel operators and smaller fish and meat processing units, shops, cafeterias, hotels, restaurants, farmers and vegetable producers. When designing a system all the larger components, such as compressors, monitoring systems, and doors, are sourced directly from the manufacturer. Kaeliver has extensive experience in integrating these components to deliver a turnkey project for the client.

Huge facility being established for Icelandic customer

One of the projects the company is currently working on is the installation of a spiral freezer. This, however, is not just any installation, but, according to Hilmir Vilhjalmsson, the sales and marketing manager, possibly the biggest installation of its kind in Europe with an output of 900 kW at minus 40 degrees centigrade. The project is being built in the north eastern part of Iceland. The megaproject is a typical illustration of how Kaeliver uses its in-house expertise to integrate equipment from different supplier into one smoothly functioning unit. In this case two Sabroe compressors with 315 kW motors will drive a Dantech (Marel) double drum spiral freezer almost 10 m high. The system will use R-717 ammonia, a highly efficient



Freezer vestibules provide unrestricted doorway usage, are completely frost free, and ensure superior energy efficiency where conventional refrigeration is employed.

refrigerant that has been in use since the 1930s and has minimal impact on the environment.

One of the key components in any refrigerating or freezing facility is the door as it is the channel for the passage of goods, machines, and personnel, as well as the conduit for heat and cold. Kaeliver is the distributor in Europe for the American HCR Air Doors, a company with nearly 40 years of experience in re-circulatory air doors. HCR stands for its working principle: a Horizontally directed air stream that travels in a Curvilinear path and is Re-Circulatory. HCR applies the principles of psychrometrics, the science of air conditions such as humidity and temperature and their changes, in the design of its doors. The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), has demonstrated that once a door is opened the air on either side is exchanged within seconds. If there is a big temperature gradient on either side of the door the exchange of air results in cold outgoing air being replaced with warm moist air from outside increasing the load on the refrigerating unit. Rigid doors work well when there is little traffic through the door or when the difference in temperature on either side of the door is not great. In many refrigerated storages however traffic through the door can be so intense that having a door is no more effective than not having a door.

Kaeliver Company Fact File

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Sales and marketing manager: Hilmir Vilhjalmsson
Activities: Installation and maintenance of cooling and freezing systems
Markets: Iceland (95%), rest of Europe
Employees: 8-20 depending on the active projects

Conditioned air vestibule instead of doors

HCR's solution is to remove the door altogether and to replace it with a vestibule that provides a continuous barrier with conditioned air. There are several advantages to this approach. The lack of a physical door facilitates the traffic into and out of the storage space. The conditioned air in the vestibule means that warm moist air is not entering the storage chamber preventing the presence of frost, fog and the build-up of ice in the chamber. The vestibule thus contributes to greater energy efficiency, worker safety, and lower maintenance costs. These solutions are available in several formats to cater to different applications and can be customised to suit the exact requirements of the client.

Kaeliver provides a range of services in addition to designing and building cooling systems. Once the system has been installed and tested the company can offer comprehensive service and maintenance agreements under which the system is regularly overhauled, tested and adjusted. Damaged or worn out elements are replaced with original spare parts sourced directly from the manufacturer. It is this attention to detail and the high level of service that distinguishes Kaeliver from others in the business says Hilmir Vilhjalmsson. Also the knowhow that we have accumulated over the years we have successfully deployed to solve problems that were proving to be quite intractable. Most of our work is done on Iceland (about 95%), but we also get contracts in continental Europe, particularly for the installation of systems on vessels, to carry out inspections, and to provide advice. Currently, however, due to the economic conditions, vessel renovations are less frequent than shore-based projects.

Kaeliver sees enormous potential in the HCR Air Doors and will be promoting them widely in the future as they are an effective and economic tool for a wide range of refrigeration purposes.