

Because we love good food

Freezing and cooling technology for the food industry.





The art of keeping food fresh, tasty and healthy. Cryogenic freezing and cooling.

In the fast-moving food industry of today, keeping up with the competition is of vital importance.

Customers demand better and 'newer' products almost every other day, and they also expect low prices and high availability. Being able to meet these demands means inventing new food products and using the best technology for processing them and keeping them fresh, tasty and healthy. With decades of experience as a food production supplier, we are able to offer a wide variety of high-quality, state-of-the-art freezing and cooling equipment for the food industry.

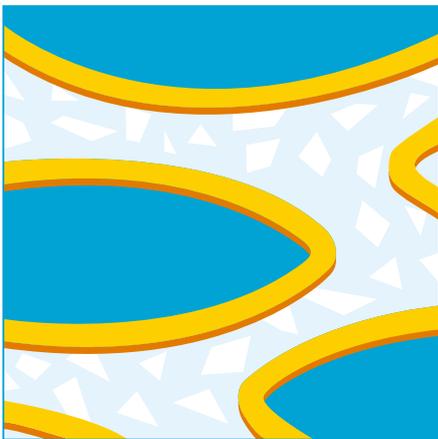
Liquefied gases serve as excellent coolants.

Liquid carbon dioxide and nitrogen can be stored at very low temperatures (CO_2 at $-78\text{ }^\circ\text{C}$, N_2 at $-196\text{ }^\circ\text{C}$). When these liquids vaporise in contact with warmer materials, they absorb a large amount of heat from them and turn into very cold gases. These gases can then be used to remove heat from other materials before being safely released into the atmosphere. This method, known as cryogenic freezing and cooling, has been in industrial use for over 40 years and is well known for producing high-quality frozen and chilled goods.

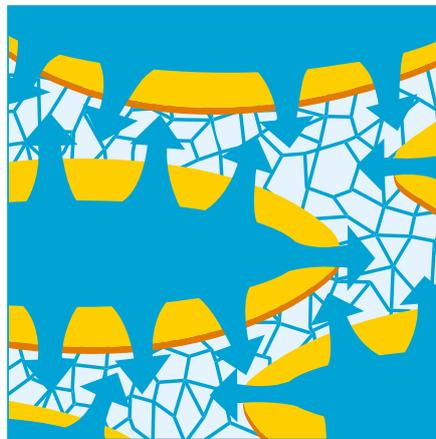
Advanced technology for better products.

Slow freezing can damage food products.

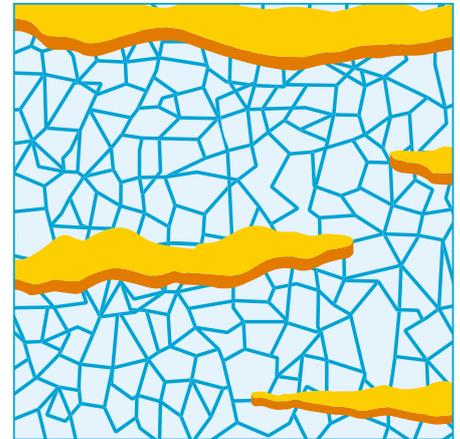
When any foodstuff is frozen, there are three steps to this process. First, the temperature is reduced to the freezing point. The water in the foodstuff then turns into ice (this is also called the latent heat phase). Finally, the temperature is further reduced to the final freezing point, usually $-18\text{ }^{\circ}\text{C}$. Slow freezing, however, can damage food products because the process destroys their cells.



1. Free water surrounding the food cells is the first to crystallise during slow freezing methods.



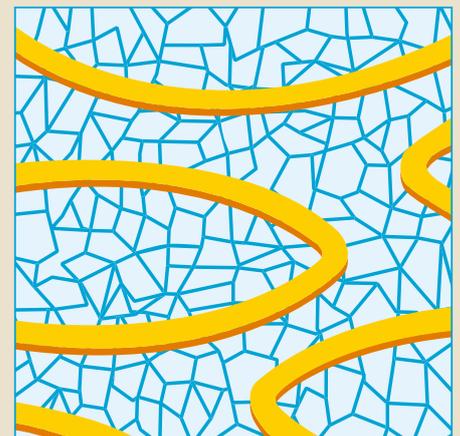
2. As soon as the water balance is destroyed, the water within the food cells starts to break out of the cells, destroying the cell walls. The longer the freezing time the more cells are destroyed.



3. Finally, the ice crystals become so big that the cells are completely broken down, leading - among other disadvantages - to a high degree of water loss when the product is defrosted or re-heated.

Higher quality through faster freezing.

Because of the reasons explained above, the freezing process must be passed through as quickly as possible in order to reach high product qualities. By using fast cryogenic freezing, the water inside and outside of the cells freezes at the same rate, ensuring that the cells remain intact and the food keeps its freshness, flavour and texture - as if it hadn't been frozen at all.



The organic cell structure remains virtually unchanged when fast freezing technology is applied.



The benefits of freezing and cooling equipment by BOC.

With our innovative equipment, freezing and cooling processes can be carried out quickly and efficiently, significantly increasing the output and making your products highly available. Moreover, faster refrigeration increases the IQF food quality (IQF – individually quick-frozen). This in turn enables you to develop and lead the market with new and attractive food products.

BOC has a wide range of machines available for a variety of food products. With a high degree of flexibility and smaller footprints, other benefits of our machines are:

- Fast freezing means higher product quality than with slow cooling
- Products lose less water when defrosted
- Lower dehydration leads to higher yield
- Flexible choice of models.

Additional benefits.

Apart from increasing your output and product quality, while keeping your production maintenance costs low, our machines come with a number of additional benefits:

- Most machines are delivered ready to use, allowing for quick installation
- Easy-to-use machinery
- Hygienic design
- Modular design – expand to meet your needs
- Start up training for key personnel.



Specially tailored services for the food industry.

Cryogenic freezing and cooling is one of our main business fields. Apart from various models of patented freezing and cooling equipment, we have developed a number of services in order to help you to maximise the benefits of this method.

Test centres.

In order to provide a full service for the food industry, we demonstrate our cooling and freezing equipment at special test centres in Europe and the United States capable of simulating realistic production conditions. These facilities allow us to verify our theoretical calculations and show our customers the efficiency and capabilities of our refrigeration technology.

Professional support.

Specially trained engineers are available to help you with every aspect of an installation, from the initial planning to the start-up phase. But our service doesn't stop there: once the equipment is in operation, our engineers will regularly check and when necessary, optimise the whole installation.

Get in touch with BOC.

With many years of practical experience and highly qualified employees in the field of freezing and cooling, we help our customers in the food industry to increase the efficiency of production processes, improve product qualities and raise their profits.

If you would like to know more about our freezing and cooling technology for the food industry, just contact your local BOC outlet.

Discover a wide variety of top-quality solutions.



CRYOLINE® XF Spiral Freezer.

The CRYOLINE® XF is a high-performance spiral freezer built for relatively large production capacities. The patented CRYOLINE® XF technology delivers twice the heat transfer rate of standard cryogenic spiral freezers, making it twice as powerful. In addition, the CRYOLINE® XF has a smaller footprint, a higher production capacity and a higher efficiency than existing cryogenic spiral freezers.

Typical products:

- Meat proteins
- Ready meals and other convenience foods
- Fish and seafood
- Bakery products
- Cooked poultry



CRYOLINE® MT Tunnel Freezer.

This is a general-purpose, in-line tunnel freezer and cooler, combining state-of-the-art electronic controls with a high level of hygienic design. Adjustable, high-speed internal fans, controllable exhaust levels and gas injection make the use of cryogenic gases highly efficient. The tunnel has an attractive, easy-to-clean outer design which covers all the motors and pipes.

Typical products:

- Meat and meat products
- Dairy products
- Fish and seafood
- Ready meals and other convenience foods
- Bakery products



CRYOLINE® SC Super Contact Freezer.

For products which are difficult to handle, the CRYOLINE® SC in-line tunnel freezer uses a patented, disposable foil belt. The unit can easily freeze or cool liquid and/or marinated products or harden soft products (e.g. fillets of fish or chicken) prior to final freezing. Because the belt is disposable, it is possible to change products during the production cycle without having to clean it. Another advantage over mesh belts is that the foil is smooth, which is perfect for processing soft foodstuffs without belt marks.

Typical products:

- Fillets of fish
- Soft products such as pancakes
- Tenderloin steaks
- Purées
- Liquid and semi-liquid products
- Pasta products



CRYOLINE® CW Multi-purpose Freezer.

Easily switching between IQF mode and standard flat-belt tunnel freezer, the CRYOLINE® CW is a versatile multipurpose cryogenic freezer. The CRYOWAVE® controllable vibration technology allows adjustable product amplitude for optimisation of IQF foods, while also providing the ability to perform as a standard tunnel for many other food types of differing shapes and sizes. The freezer is available in various models with typical achievable production rates of 500–2,700 kg/h (1,100–6,000 lb/h)*.

* Depending on product and temperature requirements.

Typical products:

- Meat and meat products
- Fish and seafood
- Fruit
- Ready meals and other convenience foods



CRYOLINE® CS Compact Spiral Freezer.

The CRYOLINE® CS, with its patented, self-stacking spiral belt and its relatively small footprint of only 2.5 x 3.4 m, is capable of freezing and cooling large quantities of food products. The unique design, with the body of the freezer built around the belt, uses the coolant very efficiently. The self-stacking belt also minimises the possibility of production stops due to belt jams. Unlike most other spiral freezers, this unit can be transported to the production site in one piece for rapid installation and immediate start-up.

Typical products:

- Meat and meat products
- Dairy products
- Fish and seafood
- Ready meals and other convenience foods
- Bakery products



CRYOLINE® PE 800 Pellet Freezer.

The patented CRYOLINE® PE works by simply filling the cavities in a belt pre-cooled by liquid nitrogen. The extremely low temperature of the belt rapidly freezes the liquid into the shape of the cavity, thereby stabilising the product before it is released at the end of the belt. The product is then transferred to an integral CRYOLINE® MT tunnel freezer to complete the process and form a 'chocolate bar' of pellets. Due to the very low thickness of the joining product, the pellets are easily separated into individual pieces.

Typical products:

- Prepared sauces
- Purées
- Fruit juices
- Other liquid products

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