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 °C, N$_2$ at -196 °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.

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 individually quick-frozen (IQF) food quality. And this in turn enables you to develop and lead the market with new, attractive food products.

When using our machinery, you can also profit from a high degree of flexibility. Different types of freezers are available for a wide range of food products. And because they usually have a small footprint, they need only very little space.

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

Additional benefits.
With professional equipment by BOC, your company uses state-of-the-art technology for freezing and cooling a wide range of food products. Apart from increasing your output and product quality while keeping your production and maintenance costs low, our machines come with a number of additional benefits:

- Standard material readily available (in most countries also for rent)
- Most machines are delivered ready to use
- Quick installations
- Easy-to-use machinery
- Start-up training for key personnel.

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 °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.
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 there 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.
Safety is more than just a layer of clothing. BOC has you covered from head to toe.

BOC is well-known as a national distributor of gas and equipment but we also understand that workplace safety is of vital importance too.

Whether you’re on the production line or loading up a freezer, if you need head and face protection, protective clothing and footwear or other safety equipment – we’re there. Our BOC Safety Specialists are trained to help you achieve your safety initiatives. They can visit your workplace to identify risks, make assessments and offer recommendations for a safer workplace.

Just as we protect our own people, you can count on BOC’s reputation and commitment to help protect yours.
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® 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.

CRYOLINE® PE Pellet Freezer.
The patented CRYOLINE® PE uses a solid, stainless-steel belt with cavities to form pellets of liquid or semi-liquid foodstuffs – even with solids such as onions – before these are entirely deep frozen. The pellets are then transferred to a final freezer to finish the process. The equipment can be used to make pellets of sauces for ready meals, so that the consumer can defrost just as much as he needs for a particular recipe. The freezer is delivered in one piece, tested and immediately ready to use, which minimises installation and start-up time. The standard size of the pellets is 30 x 30 x 6 mm, but they can also be customised.

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

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

Typical products:
- Sauces
- Purées
- Soups
- Pastes
BOC

BOC is a member of The Linde Group which supplies compressed and bulk gases, chemicals and equipment around the globe. The company develops safe, sustainable and innovative solutions for customers in many specialty sectors, heavy industry and medical environments.

For more than a century the company’s gases and expertise have contributed to advances in industry and everyday life, including refining, chemical processing, steelmaking, environmental protection, wastewater treatment, welding and cutting, food processing and distribution, glass production, electronics and health care.

The Linde Group

The Linde Group is a world leading gases and engineering company with almost 48,000 employees working in more than 100 countries worldwide. In the 2010 financial year it achieved sales of EUR 12.87 billion. The strategy of the Linde Group is geared towards sustainable earnings-based growth and focuses on the expansion of its international business with forward-looking products and services.

Linde acts responsibly towards its shareholders, business partners, employees, society and the environment – in every one of its business areas, regions and locations across the globe. Linde is committed to technologies and products that unite the goals of customer value and sustainable development.

For more information contact the BOC Customer Service Centre on

Australia
131 262
www.boc.com.au

New Zealand
0800 111 333
www.boc.co.nz