

Why use cryogenic freezing?

In industrial food production processes, cryogenic freezing has considerable advantages, such as:

- Significant reduction in freezing time
- Reduction in the size of the ice crystals
- Reduction in weight loss caused by dehydration
- Reduction in enzyme and oxidative deterioration
- Increase in quality and improvement in the texture
- Improvements to the appearance and colour
- Prevention of microbial growth
- Flexibility in production
- Low financial investment
- Reduction in space taken up by the equipment

Facts

Modified Atmosphere Packaging is a proven method of extending the shelf-life of food products by modifying the atmosphere in its packaging *. Depending on its properties, each product has its ideal atmosphere to slow down its degradation. This atmosphere is composed of a combination of gases (usually CO₂, N₂, and/or O₂) that inhibits the growth of bacteria and prevents certain reactions impacting the product's sensorial properties such as color change or oxidative rancidity.

*combined with cold temperatures and appropriate packaging

Cryogenic freezing consists in using extremely cold liquid nitrogen or carbon dioxide to freeze very quickly different types of products. Scientific studies have proven the faster the freeze the better the product quality. Cryogenic freezing is among the fastest techniques available.

About Air Products

When it comes to food Modified Atmosphere Packaging (MAP), cooling, chilling, freezing and wastewater treatment, no one has more experience in the field than Air Products.

In 1965 we helped pioneer liquid nitrogen technology for ultra-fast cryogenic freezing. Since then, Air Products has been supplying quality gases, gas enabled freezing or chilling equipment and technical services to the food industry around the world. Through continuous research and development, we will work closely with you to find the systems that precisely fit your requirement.

To find out more about the broad and flexible range of applications and equipment Air Products has developed for your industry, please visit our website.

tell me more

Visit our new **Freshline® Superfresh Solutions** microsite to find out more about what this exciting solution can do for you or request for the scientific case study results!

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Freshline® Superfresh Solutions – Freshness on demand

Extending even more of the life
and quality of food products





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Air Products' Freshline® Superfresh Solutions allow you to keep chilled food products fresh for longer with no compromise on safety or quality. This innovative process developed by Air Products' R&D team can help you to deal with seasonal or specific production needs, while optimizing costs. And, as cherry on top of the cake, it helps to reduce food waste in the supply chain right through to the end consumer.

Freshline® Superfresh Solutions - Combining the best of 2 worlds for freshness on demand

Freshline® Superfresh Solutions is a process which combines cryogenic freezing and modified atmosphere packaging (MAP) in a specific way, extending the life and quality of products available from chilled counters. This methodology is the result of systematic scientific studies, which demonstrated that the process slows down accelerated food deterioration occurring after thawing. In this way, frozen thawed products can display comparable quality, appearance and shelf life to standard MAP chilled products, and in some cases an even longer life span. In all products tested, the results showed that when thawed under the right conditions, the product can be refrozen safely at home.

Freshline® Superfresh Solutions vs standard MAP process

Produce preserved by the Freshline® Superfresh Solutions method has the following characteristics compared to standard chilled produce packaged under MAP*:

- Comparable general appearance, taste and texture
- Similar low levels of drip loss
- In all tested cases, results showed the product can be refrozen safely (when thawed under the right conditions)
- Same shelf life once foods reach the chilled area (and in some cases even longer), in addition to the period when the product is kept frozen

Who uses Freshline® Superfresh Solutions?

Freshline® Superfresh Solutions has been created to meet your needs, whether you're a fresh or frozen food processor or a retailer. You can use it to respond to consumers' increasing demands for choice, variety and value from food products. In addition, with food waste reaching alarming levels globally, Freshline® Superfresh Solutions helps you to contribute to the drive to reduce food loss, while also supporting your sustainable development targets.

*for all products tested.

What are the benefits for you?

Once preserved using Freshline® Superfresh Solutions, products can be stored and distributed in their frozen state. They can then be delivered and thawed on demand, introducing a greater degree of flexibility to the logistics process. This can help you when dealing with peak season or specific production needs, resulting in cost savings with no compromise on food safety or quality.

Freshline® Superfresh Solutions has a number of benefits for food processors and retailers alike:

- If you're a frozen food processor wishing to enter the fresh products market, you can do so with few changes to your operational processes, enabling frozen food to be thawed and offered with a shelf-life and quality comparable to that of chilled product
- As a fresh food processor you can reduce product waste through better stock management, buying raw materials at their seasonal best for future use on demand
- Retailers can reduce food losses and better manage the supply chain by thawing product only when needed in store.