

# Freshline<sup>®</sup> food freezing and preservation systems

Preserve quality, improve yield, and  
increase operational efficiencies



# Enhancing food quality . . . and your bottom line.

Food is a delicate product and thus food processors are challenged to insure that their food products maintain their taste and quality right through the moment they are eaten. Critical to that success for many food products is choosing the right freezing and preservation methods.

Air Products' Freshline offerings provide innovative freezing and preservation systems to the food industry that not only enhance product quality, but are also designed to help increase production rates and capacity plus improve yields with less waste. All this adds up to lower costs and a more efficient system.

Air Products supplies a full line of Freshline liquid nitrogen and CO<sub>2</sub> freezing systems that can be tailored to meet your specific needs. Our tunnel and immersion freezers can freeze a wide variety of seafood, including raw, cooked, marinated, and breaded products. All of our freezing systems use our cryogenics, which provides the most efficient means of freezing and cooling available.

## Why use cryogenics?

Cryogenics allows food to be brought down in temperature in much less time than mechanical freezing. Whether cooling or freezing, using liquid nitrogen (LIN) or carbon dioxide (CO<sub>2</sub>) can speed up your entire process by decreasing the time needed to remove heat from your food process. Cooling or freezing with liquid nitrogen or carbon dioxide has numerous benefits to both the **quality** and the **operation** of your food process.

## Quality benefits

### Moisture retention

When cooling or freezing, bringing the temperature of a food down exposes it to very cold, dry air. This inevitably results in moisture loss of your product. By using extremely cold cryogenics to reduce the temperature of your food, you will be exposing the food to the dry air for less time. A faster freeze means less moisture loss.

### Texture retention

Crystallization in frozen food leads to the destruction of cells within a food. This causes texture loss and results

in a mushy, low quality thawed product. Cryogenics shortens the crystallization of water that occurs when food freezes. In turn, this allows for a better quality thaw, and better retained texture.

### Retained flavors

When a food is heated, some of the fragrances and flavors are lost through VOCs (volatile organic compounds). These VOCs move more freely in hot food versus cold food. Freezing or cooling quickly using cryogenics secures the fragrances and flavors in the food better.



## Tunnel Freezing

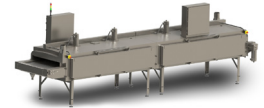
### Freshline QS Freezer

A low-cost, in-stock continuous freezer for almost any processor. The Freshline QS freezer has been designed with simplicity, speed, and cost in mind. The QS requires minimal up-front capital investment and can be quickly and easily integrated into your existing or new production line providing you with an efficient, continuous freezing solution.



### Freshline IQ Freezer

Designed with economy, efficiency and hygiene in mind. It offers continuous high throughput on a broad range of foods with easy clean up. Constructed in ten-foot modular sections making it field expandable with minimal up-front capital investment. An optional remote monitoring system allows for trouble shooting or efficiency tracking from afar.



### Freshline MP Freezer

Provides the most efficient freezing and cooling without sacrificing sanitation, maintenance, or ease of use. Air Products' Freshline MP freezer gives you the most output from the least input; the best-ever heat transfer from the least floor space; the best hygiene from the easiest cleaning; and the longest operation from the least maintenance.



## Individually Quick Frozen (IQF)

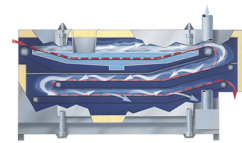
### Freshline DM Tunnel Freezer

For fast and flexible freezing of both IQF and non-IQF products. Air Products' innovative Freshline DM tunnel freezer has been designed with flexibility in mind. Easily switch between IQF and non-IQF products without changing equipment. It allows you to vary throughput without affecting efficiency, while increasing production capacity and extending manufacturing.



### Freshline Immersion Freezers

Our CP and RH Immersion Freezers allow you to produce consistently high-quality individually quick frozen products (IQF), including foods that can be difficult to freeze without clumping using traditional freezing methods. Instantaneous immersion freezing of the food's outer surface using liquid nitrogen helps maintain the product's form, taste, and texture and prevents moisture and quality losses.



## Direct Injection

### Freshline Continuous Sauce Chiller

High volume sauce chilling in a small package. The unique Freshline continuous sauce chiller uses the extraordinary power of liquid nitrogen to instantly cool a variety of flow-able food products. Products such as sauces, gravies, marinades, custards, purees and almost anything you are able to pump can be chilled in-process or in the cooking vessel depending upon your needs.



### Freshline LIN-IS

Freshline LIN-IS is used to control the temperature of food through precise injection of liquid nitrogen into the product during processing. The high-speed processing required to be successful in the food industry generates more heat than it ever has in the past. Liquid nitrogen systems can bring about a rapid drop in temperature and thus a very efficient chilling solution. This can be used effectively to control temperature, giving you high quality products and repeatable/reliable processes.



### Freshline Precision Cooling

Freshline Precision Cooling may be the perfect solution for your machine-component or food-surface cooling applications. Directly targets cold nitrogen precisely where needed, whether it's knives/ blades/fixtures or directly on food spots or surfaces. It has a very flexible design with a wide range of flow rates and temperatures. It's easy to directly target nitrogen, even in complex equipment.



## Modified Atmosphere Packaging

### Modified Atmosphere Packaging (MAP)

Air Products' Modified Atmosphere Packaging can help extend a product's shelf life by up to 4 times versus non-MAP packaging. Extended shelf life can allow you to increase distribution distance; preserve quality by slowing deterioration and rancidity; reduce the need for artificial preservatives; and help minimize food waste which allows a store to order your product more accurately.



## Operational benefits

### Increased throughput

With cryogenics, a shorter cool or freeze time equals a shorter process time. This allows for increased throughput of units in the same amount of time.

### Yield

Cryogenics results in less product waste in your food production. Quick cooling or freezing allows more of your product to retain quality by preventing dehydration and crumbling by firming the product faster, plus makes the product quality consistent.

### Footprint

Whether you require a tunnel freezer, an IQF, or any other Air Product's offering, cryogenic freezing takes up the least amount of space of all your cooling or freezing equipment options. This accommodates for smaller facility size, or frees up space for other production.

## Flexibility

Our cryogenic equipment can reduce food's temperature to anywhere from just cool to -320°F. You can ramp production up or down, and it gives you the power to control exactly how cold or fast you want your food production output to be.

## Why use MAP?

Air Products' Modified Atmosphere Packaging can help extend a product's shelf life by up to 4 times versus non-MAP packaging.

Extended shelf life can enhance your product's desirability because it:

- Increases distribution distance possibilities
- Preserves quality by slowing deterioration and rancidity, not only in transit, but also after it reaches your customers' destinations
- Reduces the need for artificial preservatives and creates a more environmentally-friendly product
- Minimizes food waste which allows a store to order your product more accurately



---

For more information,  
please contact us at:

### Corporate Headquarters

Air Products and Chemicals, Inc.  
7201 Hamilton Boulevard  
Allentown, PA 18195-1501  
T 800-654-4567  
F 800-272-4449  
gigmktg@airproducts.com



tell me more  
[airproducts.com/food](http://airproducts.com/food)