



# Freshline<sup>®</sup> Solutions for Asia's Food Processing Industry

Unparalleled industry experience,  
innovation and technical leadership

Backed by fifty-plus years of experience, Air Products is a world-leading supplier of gases, equipment, services and solutions to the food processing industry.

Whether you're a well-established food manufacturer with multiple product lines, a small food processor with a niche product, or an entrepreneur with an idea for the next food sensation, Air Products' flagship Freshline solutions offer unique high-purity gases and equipment, and – most importantly – unmatched industry experience and technical expertise anywhere in the world and bring you better product quality and safety.

In Asia, our Asia Food Laboratory in China serves as a Center of Excellence to enable the region's food processors and manufacturers develop and enhance their food freezing and packaging processes, with advanced cryogenic and non-cryogenic technologies and equipment.



### Freshline solutions for food freezing, chilling and packing applications

For companies needing a one-stop-shop, our Freshline solutions provide expert support, equipment and services that make life easier. With over 50 years experience in the food industry we understand our customers and can be relied upon to respond quickly. Our pricing structure is simple and we innovate to provide more flexible solutions for our customers.

Freshline solutions provide safe, efficient and environmentally-friendly food freezing and chilling by improving product texture and taste, reducing processing time, increasing shelf life, reducing weight loss in thawing and keeping food products as fresh as possible.

#### If you:

- Chill or freeze your products continuously or in batches
- Produce or coat IQF products with sauces
- Need to produce a high quality sliced product
- Mix or form your products
- Wish to extend the shelf-life of your food product

#### Our solutions include:

- Continuous and batch cryogenic freezing technology
- A range of IQF freezers
- Crust freezing solutions
- Innovative coating, mixing and forming offerings
- Expertise in modified atmosphere packaging

In 1965, Air Products helped pioneer the use of liquid nitrogen (LIN) for ultra-fast food freezing. Since then, we have supplied food industry customers with the latest gas-based technologies for a diverse range of applications.

LIN, the most environmentally friendly freezing and chilling available today, offers an ideal food freezing option for food processors because it:

- Lowers overall operating cost
  - Minimum capital investment
  - Costs are directly related to production
  - Reduced dehydration and drip loss
- Achieves better yields and efficiency
  - Reduced dehydration and drip loss
- Enhances product quality
  - Improved texture, taste and appearance
  - Moisture is locked in, no weight loss on thawing, longer shelf life
- Brings flexibility to turn production rate up/down
- Allows smaller foot print
- Requires no maintenance cost for rental
- Is easy to operate

### Serving a variety of sectors in Asia

Bakery	Meat
Beverage	Poultry
Dairy	Prepared foods
Edible oil	Seafood
Fruit and vegetables	Snack








### Crust freezing

Crust freezing is a special freezing method which can be combined with other freezing systems such as cryogenic tunnel freezers or mechanical freezers. As a market leader in crust freezing, Air Products' Freshline solutions bring you the following benefits:

- More than 30% reduction of overall freezing cost
- Lower moisture loss comparing to conventional freezing systems
- Reduction of belt marks on products
- Reduction of moisture loss by crust freezing the surface before full freezing in conventional freezing system
- Prevention of frozen products from sticking to each other
- Improvement of slicing efficiency by increasing the rigidity of surface
- Production rate increase with minimum capital investment



## The complete Freshline solutions portfolio of gases and equipment for all kinds of food applications

Application	Offering		Details
Tunnel freezing and chilling	Freshline MP Tunnel Freezer		Designed to meet the latest global hygiene standards and incorporates the latest technology in an efficient and powerful freezer.
	Freshline EAF Tunnel Freezer		Designed to provide a simple, efficient and cost-effective food freezing and chilling solution.
Batch freezing and chilling	Freshline Batch Freezer		The perfect solution for fast economic freezing or chilling of foods.
IQF freezing	Freshline MP-DM Freezer		Further enhance the significant benefits of the Freshline MP freezer with the "DM" system. Provides high capacity, efficient operation for both IQF and non-IQF products in the same freezer with the same in-line production layout.
	Freshline IQF+ Freezer		Developed to eliminate product clumping by means of multi step conveyor belts. To complete the freezing process, the product is crust frozen and separated into individual pieces.
	Freshline Rotary Freezer		Uses liquid nitrogen at -196°C for fast economic chilling or freezing of diced foods such as raw and cooked meats, pasta and vegetables, delivering high quality and totally IQF products.
	Freshline Immersion Freezer		Equipped with an accurate level control system, this freezer enables you to produce consistently high quality IQF products such as seafood (shrimps, shellfish), soft fruits (strawberries, raspberries) or vegetables.

Application	Offering		Details
Coating, mixing and forming	Freshline Coating and Mixing Solution		Air Products' Freshline range of IQF coating and mixing equipment harnesses the speed and economy of liquid nitrogen for the fast freezing of a variety of free-flowing food products – in a very unique way.
	Freshline LIN Injection Solution (LIN-IS)		The LIN-IS is a specially designed liquid nitrogen injection solution which can be retrofitted to new or existing mixers, blenders and any type of stainless steel vessel.
	Freshline Tumbler Freezer		Delivers the technology to help make frozen meals look more appealing to consumers.
Sauce chilling	Freshline Continuous Sauce Chiller		A unique development which, by using the direct injection of liquid nitrogen into the mayonnaise, chills the dressing within seconds, and permits the manufacturing process to run continuously.
Beverage processing	Freshline Mixing Panel for N <sub>2</sub> /CO <sub>2</sub> Mixtures		For beers and carbonated drinks, accurate maintenance of a given level of CO <sub>2</sub> and/or nitrogen is essential for quality control. Air Products can provide a mixing panel for N <sub>2</sub> /CO <sub>2</sub> mixtures to suit particular requirements and maintain correct dissolved gas levels.
	Freshline Nitrogen Dispenser		Combining this product with the correct use of nitrogen gas blankets and tunnels can provide accurate levels of nitrogenation and package pressurization coupled with extremely low levels of oxygen pick-up.
Modified atmosphere packaging	Freshline MAP gases		One of the most effective methods of increasing shelf-life, preserving quality and improving packaging presentation.



## Asia Food Laboratory: A Center of Excellence

Our Asia Food Laboratory is strategically located in Shanghai, China, one of the world's most populated countries and a leading food processing market. This facility serves as a Center of Excellence to help Asia customers develop and enhance their food process with advanced technologies and equipment. It showcases a broad selection of our Freshline cryogenic and non-cryogenic solutions.

### It provides:

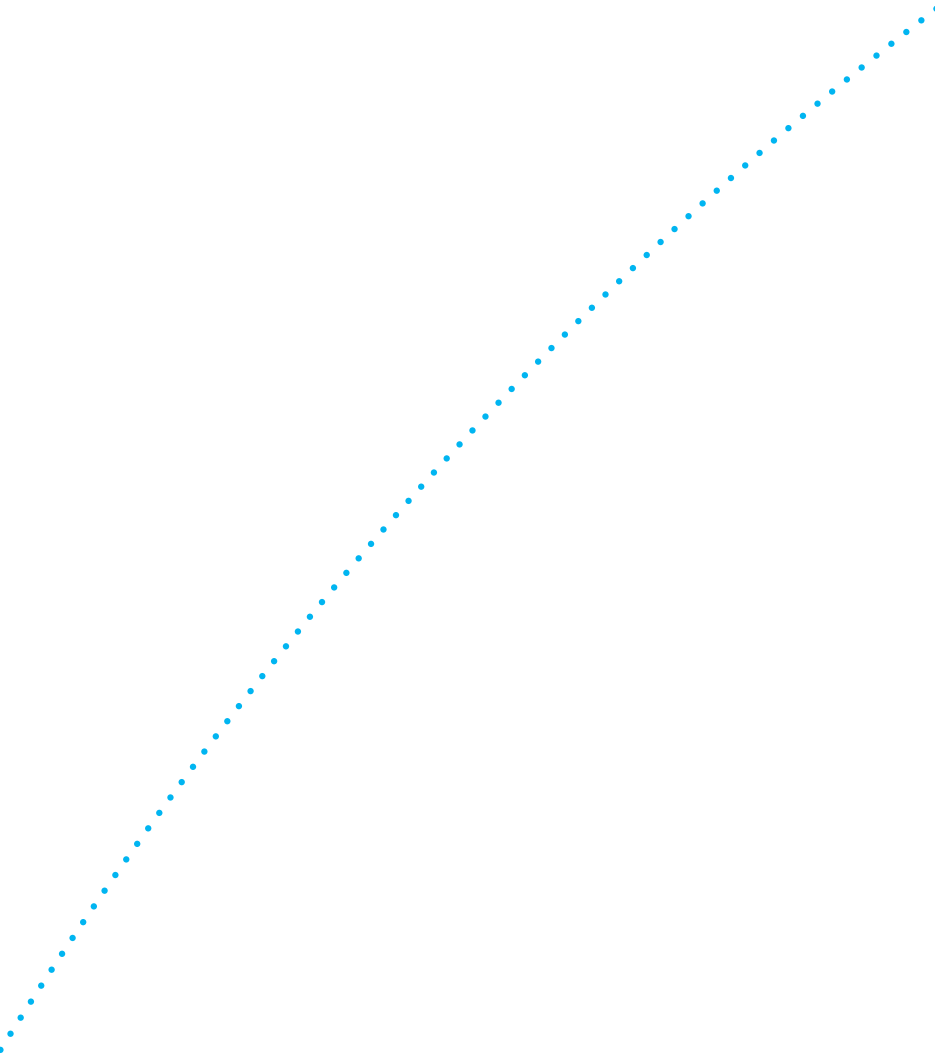
- A **showroom and demonstration** facility for our Freshline solutions for food freezing, chilling and packing applications
- **Research and development capability** that enables customers to improve existing and develop new food freezing technologies as well as the local development of equipment
- A state-of-the-art **training** facility for customers, universities and employees
- A **laboratory kitchen**, where previously frozen or MAP food can be prepared and tasted by customers to ensure the desired quality has been achieved

The laboratory is integrated into the Air Products Global Advanced Technology network, complementing existing technical facilities in North America and Europe.

## Innovations and technology partnership to keep you ahead of the crowd

Air Products' technology has represented the cutting edge of cryogenic food freezing from its earliest beginnings, when we helped launch the first liquid nitrogen tunnel freezer for the fast-food hamburger market. Over the years, we've invested extensively in research and development to help our customers continually stay ahead. We have technology partnerships and alliances globally with universities, labs, consortia, and other companies. Our history of innovation includes numerous pioneering efforts and food industry breakthroughs.





## About Air Products

Air Products (NYSE:APD) is a world-leading Industrial Gases company in operation for nearly 80 years. The Company provides industrial gases and related equipment to dozens of industries, including refining, chemical, metals, electronics, manufacturing, and food and beverage. Air Products is also the world's leading supplier of liquefied natural gas process technology and equipment.

The Company had fiscal 2019 sales of \$8.9 billion from operations in 50 countries and has a current market capitalization of about \$55 billion. More than 17,000 passionate, talented and committed employees from diverse backgrounds are driven by Air Products' higher purpose to create innovative solutions that benefit the environment, enhance sustainability and address the challenges facing customers, communities, and the world.

## tell me more

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