



Airflow technology that  
delivers quality and profit

# Frigoscandia® Impingement Freezers Perfect freezing and chilling



**+ JBT  
Marel**

# Fast, food-focused and cost-effective

Delivering all the quality, speed, throughput and flexibility – at half the cost – impingement technology has quickly proved itself as the most efficient, food-focused method to:

- Quick-freeze a wide range of thin or flat products, including high-value IQF products.
- Crust freeze and surface stabilize meat logs for seamless portioning.
- Improve throughput, yield and hygiene in deli-product slicing.
- Rapidly super chill various perishable meat cuts to preserve freshness, prolong shelf life and for a safer chilled distribution.

## Airflow technology that delivers quality and profit every time

Achieving rapid heat removal without otherwise affecting the product, our patented Frigoscandia ADVANTEC™ impingement airflow technology excels – both at freezing and chilling. Dehydration is minimized. Yield is maximized. Taste, mouthfeel and product quality are assured. As a result, after defrosting, the flavor, appearance, texture, and nutritional value of the food remain as fresh as when first processed.

## Superior handling, unrivalled flexibility

The ADVANTEC technology uses a unique straight belt that moves food product through the freezing zone without wrinkling or deformation. Product shape and appearance are preserved. The result is superior quality, all the time, every time. Custom-designed to quickly and efficiently freeze flat products up to 25 mm thick, and to crust freeze and chill products up to 200 mm thick, ADVANTEC impingement freezing is tailored to rapidly and cost-effectively freeze or chill each product you produce.

## Developed to match your process needs

Our engineers are quick to adapt impingement airflow technology to suit the specific requirements of an ever-growing range of food products and processes.



Frigoscandia pioneered impingement freezing in the 1990's because food processors needed a cost-effective alternative to cryogenic freezing.

# Matching your product needs

**Broad range of applications within freezing, chilling and stabilizing**

## Fish and seafood

Quick, cost-effective freezing or refreezing after glazing of high-volume, high-throughput and high-value flat and thin uncoated fish & seafood products.



## Meat and Poultry

- Efficiently freeze a wide range of thin or flat meat and poultry products.
- Rapidly super-chill raw meat products for safer chilled distribution.



## Meat portioning

Crust freeze meat logs, to improve throughput, yield and hygiene in portioning and slicing operations.



## Baked goods

Quick-freeze of light, flat baked goods like pancakes, bread, and pastries, with airflow technology that prevents issues such as product shifting or wrinkling.



# Frigoscandia impingement freezers



## ADVANTEC™

Setting the standard in impingement freezing and chilling, the **ADVANTEC** impingement freezer is the ideal means to quick-freeze small and thin products with minimal dehydration, the gentlest product handling and highest product quality.

## ADVANTEC™ Narrow

The **ADVANTEC Narrow** Impingement Freezer retains the high capacity and exceptional freezing technology of our standard ADVANTEC Impingement Freezer but with a significantly smaller footprint. Developed in response to market needs, it's perfect for producers upgrading from cryogenic freezing equipment to a more modern, cost-effective method. The slim design allows for seamless integration into tighter spaces, reducing operational costs while maintaining top-tier performance.



**Measurements:**  
A) 3131, 3431 or 3731 mm  
B) 2300, 2600 or 2900 mm  
C) 3155 mm



## ADVANTEC™ Compact Chiller (CC)

The **ADVANTEC CC** impingement freezer is the perfect modular 'plug-and-play' in-line production resource for small- and mid-sized processors who for instance need a faster, more cost-effective way to surface-stabilize or rapidly chill their product prior to slicing operations.

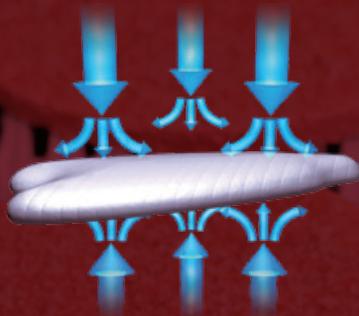
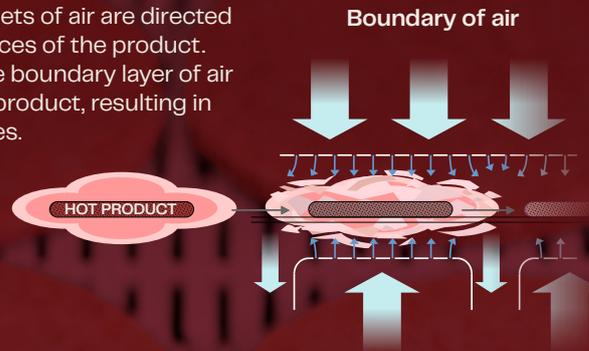
**Perfect surface stabilization for deli processors.**

# What is impingement?

Impingement technology is the best choice for food-focused freezing or chilling of a wide range of high-value food products.

## Patented Impingement Technology

Thousands of high velocity jets of air are directed at the top and bottom surfaces of the product. These air jets blast away the boundary layer of air that holds heat around the product, resulting in extremely fast freezing times.

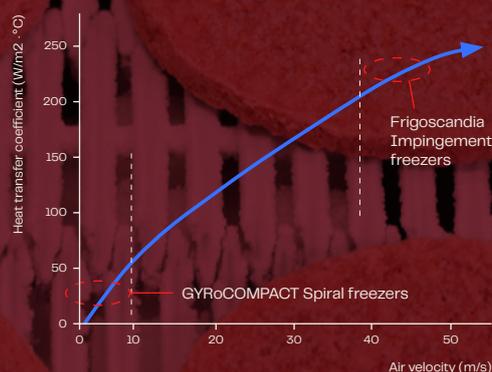


## Factors that determine retention time

- True impingement means no thermal boundary layer
- Retention time depends on heat conductivity in the product
- Product thickness plays an important role. The natural limit for freezing applications is about 25 mm (1")
- Beneficial effects of cryogenics are matched or exceeded, but at much lower cost and higher flexibility

## Heat transfer

- Valid for vertical airflow
- Double-sided action
- Optimised technology to reach acceptable power consumption



## What are the flexibility features?

Impingement technology offers you maximum processing flexibility at the same time it enables you to quickly expand, reconfigure or relocate your processing layout. You can also:

- Convert batch operations to in-line processing.
- Increase your capacity and throughput on existing spiral lines.
- Explore entirely new applications, like surface stabilization and chilling.

ADVANTEC™  
Freezer, chiller and  
surface stabilizer

# Bringing increased versatility into impingement freezing



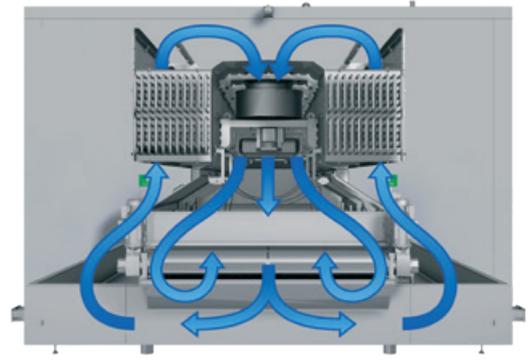
- 1 Patented impingement airflow ensures fast, efficient freezing and very low dehydration.
- 2 Single- or double belt configuration with variable belt speeds.
- 3 Variable belt directions available for up to 2 module freezer length without modification.
- 4 Fan air pressure is contained – doors can be opened during production for inspection.
- 5 The stainless steel tube and aluminum fin heat exchangers are effective and easy to clean.
- 6 Easy cleaning- and inspection access to all areas of the freezer, for maximum hygiene.
- 7 Modular design facilitates easy relocation.
- 8 Stainless steel construction facilitates thorough cleaning.
- 9 Optional cleaning systems available.
- 10 Interior floor is entirely stainless steel with fully seal-welded hygienic enclosure.

## Optional

- Continuous operation, with **ADF** available. By systematically and continuously removing snow build-up, the PLC-controlled automated ADF gives you a minimum of 22 hours non-stop freezing.
- **LVS** (Low Volume System) Refrigeration™ provides a dry return from the freezer to the refrigeration plant which minimises the pressure drop and temperature loss.

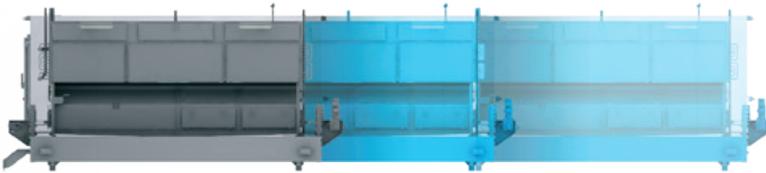
## Impingement technology ensures economy and hygiene

- 'Dry side' fans minimize snow build-up, extend production uptime, and deliver greater freezing capacity and reliability.
- Evaporator construction optimises air velocity and maximizes heat transfer and performance. Rapid cool-down and warm-up.
- The stainless steel tube and aluminum fin heat exchangers are effective and ensure easy cleaning and defrosting.
- Full visual inspection of all surfaces, to eliminate risk of unseen hygiene hazards.



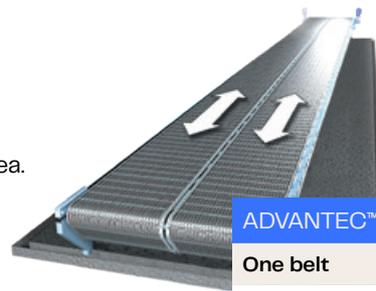
## Modular design keeps your options open

- Modular design gives flexibility to expand operation by adding extra modules to the existing one.



## The belt that delivers throughput and flexibility

- Multiple belt widths to choose from.
- Straight belt assures optimum efficiency and use of freezing area.
- Two parallel belts offer greater flexibility: Independent speed control, to simultaneously freeze products with different thicknesses. U-configuration, for entry and exit of product from same end.
- Direct airflow over the product means the belt can be loaded up to 90%, to achieve higher throughput.



### ADVANTEC™ BELT WIDTHS

One belt	Two belt option
1,250 mm (49 in)	2 x 625 mm (2 x 24½ in)
1,800 mm (70 in)	2 x 900 mm (2 x 35½ in)

# Why impingement?

## Performance

- The fastest, most cost-efficient way to freeze delicate, thin products up to 25 mm thick, and to chill products up to 200 mm thick.
- Maximum yield. Dehydration less or equal to cryogenic freezing.
- Modular design makes it quick and easy to expand your production capacity as your customer demand grows.
- Optimized air velocity through the evaporator, maximizing heat transfer, frost pick-up and performance.
- Rapid cool-down and warm-up. Hygiene-by-Design™ construction ensures quick turnaround without compromising thorough cleanliness.

## Flexibility

- Modular design enables easy expansion and rapid reconfiguration.
- Single- and double-belt alternatives, with variable belt speeds and directional controls, ensure maximum processing flexibility.
- State-of-the-art touch-screen controls – to match your processing needs precisely, and simplify operators' control of the process.

## Hygiene

- Stainless steel freezing area, with rounded corners and sloped surfaces, to eliminate risk of bacteria build-up.
- Fully accessible freezing zone and evaporator coil are designed for easy, efficient defrosting, cleaning and maintenance.
- Fully seal-welded floor is entirely stainless steel, providing an easily drained, hygienic surface.
- Elevated construction ensures effective cleaning around and beneath the machine.
- Complete visual inspection of all surfaces, to eliminate risk of unseen hygiene hazards.

## Reliability and safety

- Stable, user-friendly LINK® control system – easy for the operator to use, and easy for maintenance and management to extract information from.
- Greater commonality with upstream- and down-stream equipment.
- Component standardization, ensuring fast, cost-effective parts replacement.
- Two-step operator commands at control panel.

