



CRYOLINE® SI. Immersion IQF freezer.



Concept The CRYOLINE® SI is an all-in-one liquid nitrogen immersion and post-cooling freezer providing highest-quality individually quick frozen (IQF) food products. The CRYOLINE® SI is suitable for a full range of IQF products such as shrimp, sliced/diced chicken products, pizza toppings, cooked pasta, fruit and prepared food. The freezer is designed for small to medium production capacity (less than 907 kg (2,000 lbs)). The CRYOLINE® SI has a built-in vibratory inlet conveyor to improve continuous product flow and reduce product surges of free-flowing products.

Refrigerant The CRYOLINE® SI technology employs nitrogen as the cryogenic medium for an instant crust freeze that locks in natural flavours and moisture.

Operation The CRYOLINE® SI freezer is the newest immersion technology on the market. The fully-IQF-integrated concept is highly innovative: the entire system is designed to optimise IQF performance and maximise the freezer's efficiency. Linde has reduced the problems seen with other immersion systems by having a single integrated control for the critical control points for an IQF operation. The food product enters the freezer controlled by a vibratory in-feed conveyor. This reduces the risk of product clumping and excessive product surges without the need of additional labour. The vibratory inlet conveys the food product directly into the efficient shallow-pan nitrogen immersion bath (depth: 50 mm). The cold liquid nitrogen instantly crust-freezes the product surface and locks in the moisture, maintaining product yield and quality, critical for value-added IQF products. The crust-frozen, hardened surface prevents the individual pieces from sticking together. The cold gas energy from the immersion bath stage is further utilised within the post-cooling tunnel to extract as much cold energy as possible. This series of processing steps provides the user with the highest quality of IQF with the most efficient use of cryogen consumption.

The CRYOLINE® SI can be controlled via the built-in touch screen. The main menu displays the current product, motor speeds, safety status, machine messages, selected operational mode and the freezer temperature, and provides access to other screens and menus. In the event of a fault, the operator is given specific information about the cause of the fault in the message display area. Recipes can be entered into the unit's computer by accessing the recipe screen, where the user can store and recall the operational parameters of all product types.

Hygiene The simplicity of the design enables the customer to maximise the productivity by reducing cleaning and maintenance downtimes. CRYOLINE® freezers are designed for ease of sanitation, starting with the freezer's sloping floors and centre trough drainage. All internal components are made of stainless steel or polyethylene. Modules are fully welded, ground and finished. The freezer top lifts vertically via an electric screw jack, providing full access to the tunnel for sanitation. Control panels allow storage of up to one year's operating parameters for quality assurance tracking and traceability.

Model range The CRYOLINE®SI is available in 600-mm belt width with a base freezer of 7 metres overall length.

Standard configuration The fully assembled and pre-tested freezer is delivered with the following features:

- Multi-language touch-screen control panel
- Retention time control
- Variable-speed exhaust fans to maximise efficient use of the refrigerant
- Variable-speed circulation fans with automatic defrost
- Fully welded stainless-steel construction
- Stainless-steel mesh belt
- Height-adjustable feet

Options Linde offers a belt washer as an optional addition to the CRYOLINE®SI freezer. The belt washer connects to the freezer at the product in-feed.

Technical data **CRYOLINE®SI 600-5**

Voltage	3 ph (3/N/PE) 360/500V, 32A
	Metric
Liquid connection type	25.4 mm NPT
Vapour connection type	6 mm
Exhaust system	
Number of connections	2 (variable speed)
Diameter	300 mm
Belt washer connections	
Fitting size	25.4 mm FNPT
Belt	
Belt type	0.7 mm, wire opening 0.8 mm
Overall belt width	650 mm
Usable belt width	600 mm
In-feed height (top of belt)	Vibrator top: 1,400 mm, bottom: 1,200 mm, belt inside: 950 mm
Out-feed height (top of belt)	900 mm
Product constraints	
Max. product height	50 mm
Freezer dimensions	
Height closed (lowest leg adj.)	2,450 mm ± 100 mm
Height open (lowest leg adj.)	2,900 mm ± 100 mm
Leg adjustment	± 100 mm
Freezer width	1,525 mm
Base unit	
Model name	CRYOLINE®SI 600 - 5
Overall length	7,206 mm
Vibratory zone length	848 mm
Overall immersion length	2,150 mm
Immersion bath length	1,000 mm
Freezer weight	2,500 kg
Retention time in nitrogen bath	2–60 seconds
Retention time in tunnel	1–60 minutes