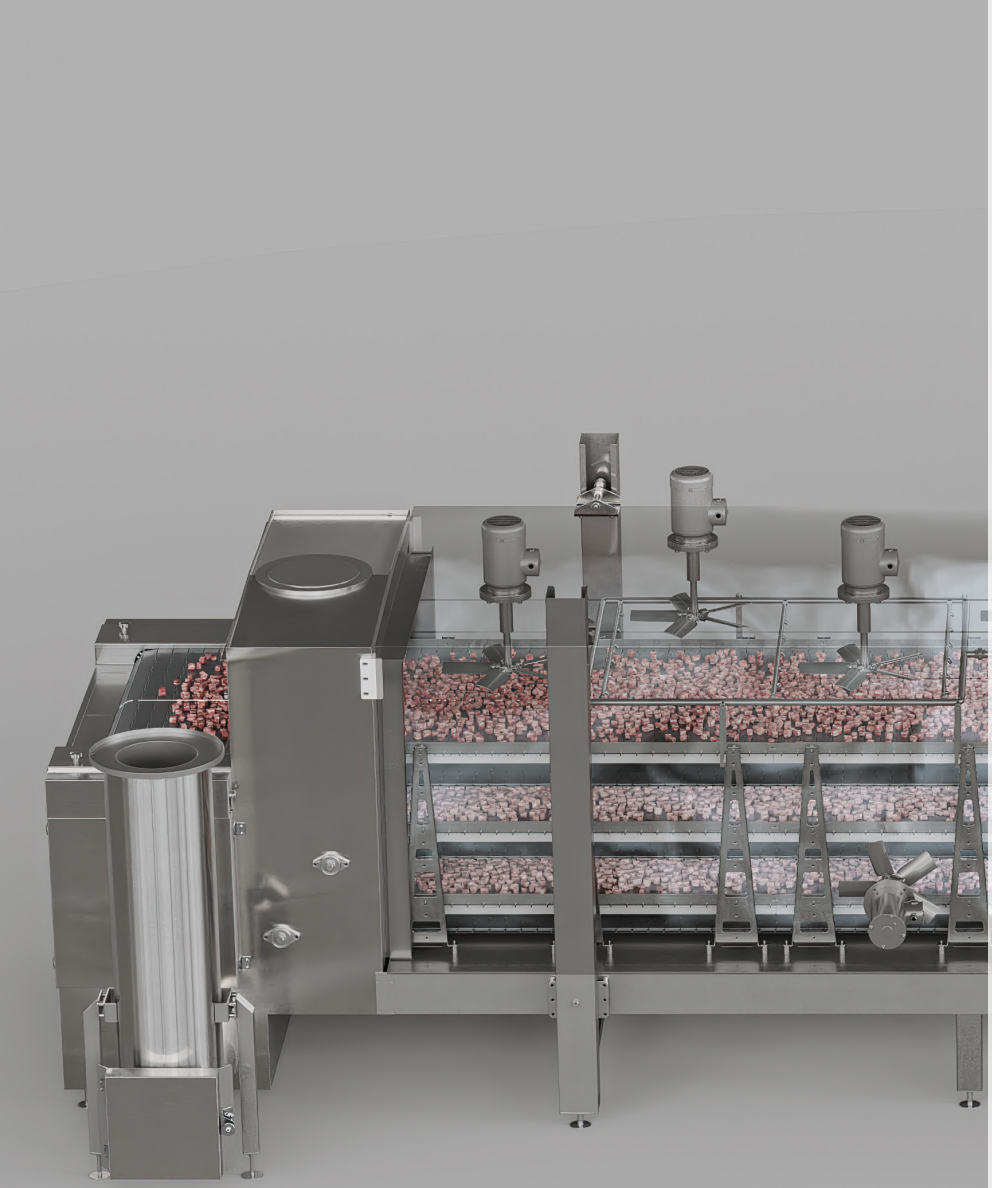


individual quick freezing

cryogenic IQF for extremely fast freezing

DSI DANTECH

we are DSI Dantech

our solutions allow you to **optimize your production** while sparing the environment

We offer the global food industry the full range of mechanical, cryogenic, and plate technology from just one company – from freezing to cooling and heating of quality food.

We partner with food suppliers and manufacturers to supply our customized solutions. We excel in faster freezing, cooling, and heating, our running time is longer, and our processing costs are lower. This results in higher yield, better preservation, and optimal product quality.

freezing, cooling & heating solutions

table of **contents**

solutions

cryogenic IQF freezing

Cryogenic freezing is the fastest IQF freezing method on the market. In cryofreezing, the items are sprayed or immersed directly in liquid nitrogen or carbon dioxide and frozen almost instantly. The method prevents the formation of macro crystals – which is preferable, as large ice crystals rupture the food's cell membranes and cause fluid loss. The lack of macro crystals results in the highest product quality of frozen and chilled food that sustains its natural nutritional value, taste, and shape.

food safety

hygiene and **defrost**

Cryogenic freezing always takes place in an inert environment, and due to the very low temperatures of liquid nitrogen and CO2, cryogenic freezing equipment is highly hygienic. Combined, this affects the safety of your food as no bacteria can survive the extremely cold environment in a cryofreezer.

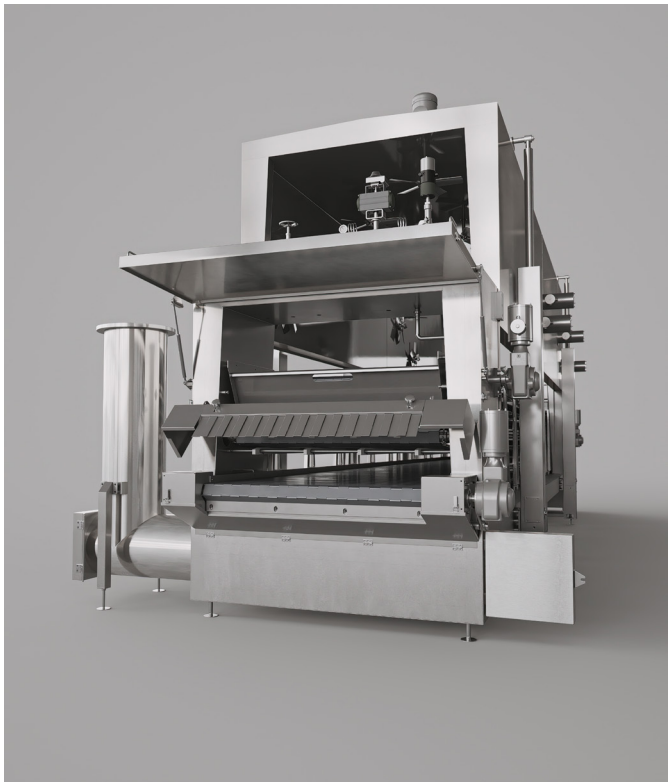
A cryofreezer can run for 8, 12, or 16 hours a day if the products are tempered. With crust frozen products, the cryofreezer can run for 20-24 hours without defrosting.

fast freezing

sustain **food quality**

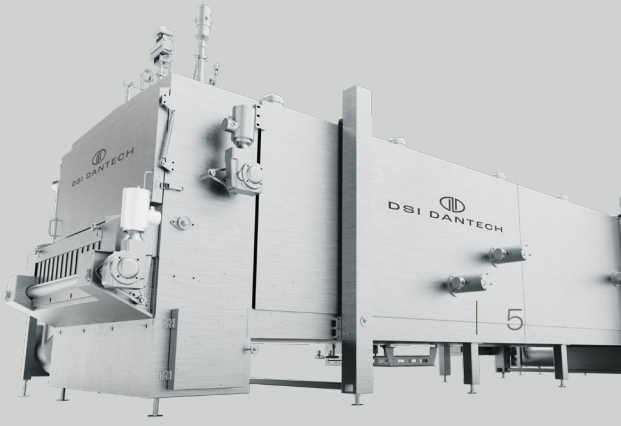
Fast freezing is the best way to sustain food quality, especially when it is frozen at its peak freshness. It reduces the activity of microorganisms, chemical and enzymatic reactions, and it sustains a high degree of nutritional value. It also results in less yield loss and better product quality.

Cryofreezing is shock freezing. It is the fastest method of freezing available. That is why it suits quality food. In the case of cryogenic freezing, the loss of weight per kilogram is only 0.2-0.3%.



customize your solution

we recommend **cryogenic freezing** for **new** production lines, **seasonal** or **small** & **medium** productions of high-quality food



spiral freezer

flexible and **large** volume chilling and freezing

Our cryogenic spiral freezer is suitable for large volume chilling and freezing of IQF products but not for bulk or free roling products. The design is space saving and allows for extensive flexibility in your production.

In the Spiral Freezer, the food proceeds on a continuous spiral conveyor belt where the internal freezer temperature can reach as low as -100°C. High-velocity liquid nitrogen is injected into the freezer for optimum heat transfer. Fans circulate the cryogen gas through all of the tiers in the spiral for efficient and uniform cooling and freezing.

DSI Dantech spiral freezer consists of a freezer-belt encircling a rotating drum. The freezer-belt enters at the bottom of the drum at the infeed location and wraps in a helix to the top, where it makes a discharge. The belt returns through an automatic tensioner, take-up and anti-flip device. The heart of the structural system is the cage or the drum. The drum is driven and acts as a friction drive for the contacting inside edge of the belt and performs the vast majority of the work. The injection system and its controls will depend on the cryogenic refrigerant used, the size of the spiral freezer and the products to be cooled or frozen.

cooling system

Cryogenic cooling is achieved through use of a refrigerant such as liquid carbon dioxide (LCO2) or liquid nitrogen (LIN). DSI Dantech custom designs despersal systems based on product parameters.

reducing **kW** consumption and production **costs**

- Lowest cost of frozen product
- Lowest kW consumption
- Custom design and product flow
- Space saving
- Quick installation time
- High product yield
- Low weight loss
- Low capital investment
- Easy adapted for line expansion
- Small carbon footprint

industries

solutions **suitable** for

- fish & seafood
- meat & poultry
- fruit & vegetables
- ready to eat
- baked goods
- dairy
- further processing
- plant based food
- ice cream
- pet food
- non-food

technical data of cryogenic spiral freezer*

punctuality is an indication of competence

EUROPEAN specifications

Model	Production Capacity		Lenght		Width		Height		Inlet height		Outlet height		Belt Width		Usable Belt Length		Product Clearance		Cooling Medium	Power Supply
	kg/hr	lbs/hr	mm	ft	mm	ft	mm	ft	mm	in	mm	in	mm	in	m	ft	mm	in		
SF660-95 RR 10 levels CC=185	500	1100	4580	15'	4300	14'	3550	11'	850	33"	2700	106"	660	25"	65	196'	130	5"	LIN or CO_2	3x400V
SF660-115 RR 12 levels CC=155	1000	2200	4580	15'	4300	14'	3550	11'	850	33"	2700	106"	660	25"	80	262'	100	3.5"	LIN or CO_2	3x400V
SF660-135 RR 14 levels CC=130	1500	3300	4580	15'	4300	14'	3550	11'	850	33"	2700	106"	660	25"	95	311'	70	2.75"	LIN or CO_2	3x400V

Note: Overall height may be altered slightly by adjusting legs

US specifications

Model	Production Capacity	Width, Usable Belt "A"	Length, Usable Belt*	No. Tiers	Product Clearance "B"	Length, Enclosure "C"	Width, Enclosure "D"	Height, Enclosure "E"	Height, Inlet** "F"	Height, Outlet** "G"	Weight	Cooling Medium	Power Supply
	lbs/hr	in	ft		in	in	in	in	in	in	lbs		
SF28-11T	up to 16000	28	225	11	4.76	182	168	135	25	108	15000	LIN or LCO_2	480V
SF28-13T	up to 18000	28	263	13	3.63	182	168	135	25	108	18000	LIN or LCO_2	480V
SF28-15T	up to 20000	28	301	15	2.79	182	168	135	25	108	20000	LIN or LCO_2	480V

* Values listed for straight-through design. Will vary slightly for L-shaped and U-shaped

* * Values listed for upward moving spiral. Reverse for downward configuration. Overall height may be altered slightly by adjusting legs

flexibility

The modular design allows for a variety of styles, available as both standard and made-to-order, up or down cage spiral freezer systems. All configurations utilize the same basic components, which results in reduced lead time.

optimized & space saving **design**

DSI Dantech Spiral Freezers are mostly used for products that need long dwell times, when large chilling or freezing capacities are necessary, or when a minimum of floor space is available. Choose from six layouts (straight through, L-Shaped, U-shaped and the mirrored counterparts) and determine whether product flow will be from bottom to top (top discharge) or from top to bottom (bottom discharge).

* US specifications and build are different from the European one

linear tunnel freezer

superior product freezing or chilling

Our Linear Tunnel Freezer is ideal for cooling, chilling, or freezing of hot baked IQF food. The cryogenic tunnel system can process a wide variety of food – from small items such as burger patties to large items such as bread loafs or large cut meat.

The Linear Tunnel Freezer has a field-expandable modular design and offers the widest configuration of cryogen spray and circulation fan arrangement to achieve superior freezing or chilling without thermal shock, yield loss, or dehydration. The rugged, in- and outside welded, stainless steel construction ensures trouble-free operation and the outstanding service life of the equipment.

Freezer controls are arranged in a user-friendly, easy to operate control panel. Coolant spray and batch cycle time are easily adjustable for any variety of food items. Other advantages include easy access for cleaning and maintenance through our unique Top Lifting design, a cleanable self-draining structure that prevents any standing water to eliminate bacterial growth, dual flow setup for horizontal and vertical airflow on all products, plug-n-play communication via Ethernet IP for easy integration in existing lines, speed controlled fans to optimize air velocity and heat exchange to accommodate even the most delicate products, a modular-yet-compact design to allow for future expansion and production growth while adhering to minimum floor space requirements and optimized production.

fast and **efficient** freezing, cooling or chilling

- Unique Top-lifting design
- Space saving
- High product yield
- Low capital investment
- Quick installation time
- Variable belt speed for all belts
- Compact design
- Easy adapted for line expansion

industries

solutions **suitable** for

- fish & seafood
- meat & poultry
- fruit & vegetables
- ready to eat
- liquids & fluids
- baked goods
- dairy
- further processing
- plant based food
- ice cream
- pet food
- non-food

technical data of cryogenic linear tunnel freezer*

punctuality is an indication of competence

EUROPEAN specifications

Model	Width		Height, open		Inlet height		Outlet height		Usable Belt Width		Belt length up to		Product clearance		Cooling Medium	Power Supply
	mm	ft	mm	ft	mm	ft	mm	ft	mm	ft	m	ft	mm	in		
LT 660	2050	6.5’	3450	11’	1400	4.5’	550	1.5’	660	2’	20	65’	160	6’’	LIN or CO_2	3x400V
LT 915	2350	7.5’	3450	11’	1400	4.5’	550	1.5’	915	3’	20	65’	160	6’’	LIN or CO_2	3x400V
LT 1220	2650	8.5’	3450	11’	1400	4.5’	550	1.5’	1220	4’	20	65’	160	6’’	LIN or CO_2	3x400V
LT 1525	2650	8.5’	3450	11’	1400	4.5’	550	1.5’	1220	4’	20	65’	160	6’’	LIN or CO_2	3x400V

US specifications

Model	Production Capacity	Width, Overall Belt “A”	Width, Usable Belt* “B”	Length, Usable Belt** “C”	Product Clearance “D”	Length, Overall** “E”	Width, Overall “F”	Height, Overall Open “G”	Height, Inlet*** “H”	Height, Outlet*** “J”	Weight	Cooling Medium	Power Supply
	lbs/hr	in	in	ft	in	in	in	in	in	in	lbs		
LT24x20	4000	26	24	20	6.5	26	66	100	45	45	4000	LIN or LCO_2	480V
LT36x20	6000	38	36	20	6.5	26	78	100	45	45	7000	LIN or LCO_2	480V
LT48x20	8000	50	48	20	6.5	26	90	100	45	45	10000	LIN or LCO_2	480V
LT58x20	10000	60	58	20	6.5	26	108	100	45	45	13000	LIN or LCO_2	480V

* Values listed for single belt tunnels. Dual-belt options available

** Values listed for 20 ft length body design. Body sections come in 10’ increments. Add approx. 6’ for end blocks

*** Overall height may be altered slightly by adjusting legs

hygiene & **safety**

The rugged, in and outside welded stainless steel construction ensures a trouble free operation and an outstanding service life. Top-lifting design offers easy access for cleaning and maintenance, while clean-in-place system utilizes the self-draining design to eliminate standing water and bacterial growth.

efficiency & cooling system

An optimum cold distrubution is obtained by the combination of the recirculation fans. This makes it possible to increase the belt loading density during the cooling and freezing processes. Cryogenic cooling is achieved through use of a refrigerant such as liquid carbon dioxide (LCO_2) or liquid nitrogen (LIN). Our custom designs despersal system is based on product parameters.

* US specifications and build are different from the European one

multi-pass freezer

freezing and cooling of **prolonged** food cycles

Our Multipass Tunnel Freezer is ideal for cooling and freezing IQF food with prolonged cycles, e.g. small portioned boiled, fried, or baked meat, fish, poultry, bakery products, shrimp, cockles, and mussels.

The Multipass Tunnel is linear and has three stacked belts. At the end of the first tier, the product is discharged to the second tier and returned to the entrance end of the freezer and discharged again onto the third tier and conveyed back to the exit end of the freezer. The speed of each belt is independently controllable, and an optimum cold distribution is obtained by the combination of recirculation and side wall fans. This makes it possible to increase the belt loading density during the cooling and freezing process.

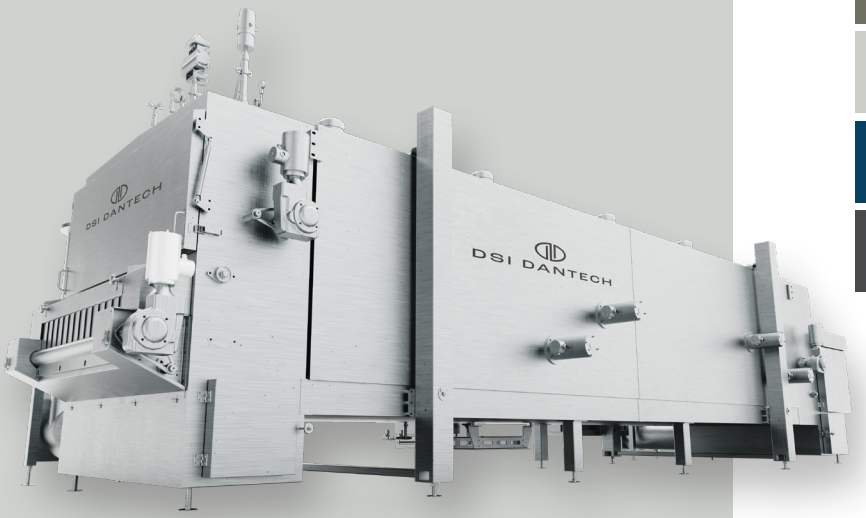
The rugged, in- and outside welded, stainless steel construction is ensuring a trouble-free operation and an outstanding service life of the equipment. Freezer controls are arranged in a user friendly, easy to operate control panel. Coolant spray and batch cycle time are easily adjustable for any variety of food items.

maintenance & **cleaning**

Easy access for cleaning and maintenance through our unique top lifting design, a cleanable self-draining structure that prevents any standing water to eliminate bacterial growth, dual flow setup for horizontal and vertical airflow. Modular-yet-compact design to allow for future expansion and production growth while adhering to minimum floor space requirements and optimized production.

minimize **weight loss** and ensure higher **yield**

- Variable belt speed for all belts
- Unique Top-lifting design
- Wide configuration of spray and circulation fan arrangement
- High product yield
- Low capital investment
- Quick installation time
- Optimum cold distribution
- Top and side cooling
- Easy adapted for line expansion
- Freezing/chilling without thermal shock, yield loss or dehydration



industries

solutions **suitable** for

- fish & seafood
- meat & poultry
- fruit & vegetables
- liquids & fluids
- baked goods
- dairy
- further processing
- plant based food
- pet food
- non-food

technical data of cryogenic multi-pass freezer*

punctuality is an indication of competence

EUROPEAN specifications

Model	Overall length		Overall width		Height, open		Inlet height		Outlet height		Usable Belt Width		Belt length		Product clearance		No. of Tiers	Cooling Medium	Power Supply
	mm	ft	mm	ft	mm	ft	mm	ft	mm	ft	mm	ft	m	ft	mm	in			
MP 3 x 6 x 0.6	8250	27'	2050	6.5'	3450	11'	1400	4.5'	550	1.5'	660	2'	18	60'	160	6''	3	LIN or CO_2	3x400V
MP 3 x 6 x 0.915	8250	27'	2350	7.5'	3450	11'	1400	4.5'	550	1.5'	915	3'	18	60'	160	6''	3	LIN or CO_2	3x400V
MP 3 x 6 x 1.22	8250	27'	2650	8.5'	3450	11'	1400	4.5'	550	1.5'	1220	4'	18	60'	160	6''	3	LIN or CO_2	3x400V

Note: Based on 6M body. Length increases by 1M increments

US specifications

Model	Production Capacity	Width, Overall Belt "A"	Width, Usable Belt "B"	Length, Usable Belt*	No.Tiers	Product Clearance "C"	Length, Overall* "D"	Width, Overall** "E"	Height, Overall Open "F"	Height, Inlet*** "G"	Height, Outlet "H"	Weight	Cooling Medium	Power Supply
	lbs/hr	in	in	ft		in	in	in	in	in	in	lbs		
MP24x20	up to 16000	26	24	61	3	6.5	26	86	134	54	21	8000	LIN or LCO_2	480V
MP36x20	up to 18000	38	26	61	3	6.5	26	98	134	54	21	12000	LIN or LCO_2	480V
MP48x20	up to 20000	50	48	61	3	6.5	26	110	134	54	21	16000	LIN or LCO_2	480V

* Values listed for 20 ft length body design. Body sections come in 10' increments. Add approx. 6' for end blocks

** Overall width measures from edge of side motor to outside of electrical cabinet. Side-mount exhaust not included

*** Overall height may be altered slightly by adjusting legs

layout & **belt options**

Typical layout features odd number of tiers with entrance and exit at opposite ends. More than 3 tiers available. Maximum available body length is 16 meter. On multipass linear tunnels, the products move along three superimposed conveyor belts. The speed of each belt is independently controllable.

efficiency & cooling system

An optimum cold distrubution is obtained by the combination of the recirculation and side wall fans. This makes it possible to increase the belt loading density during the cooling and freezing processes. Cryogenic cooling is achieved through use of a refrigerant such as liquid carbon dioxide (LCO_2) or liquid nitrogen (LIN). We custom designs despersal systems based on product parameters.

* US specifications and build are different from the European one

multi-belt freezer

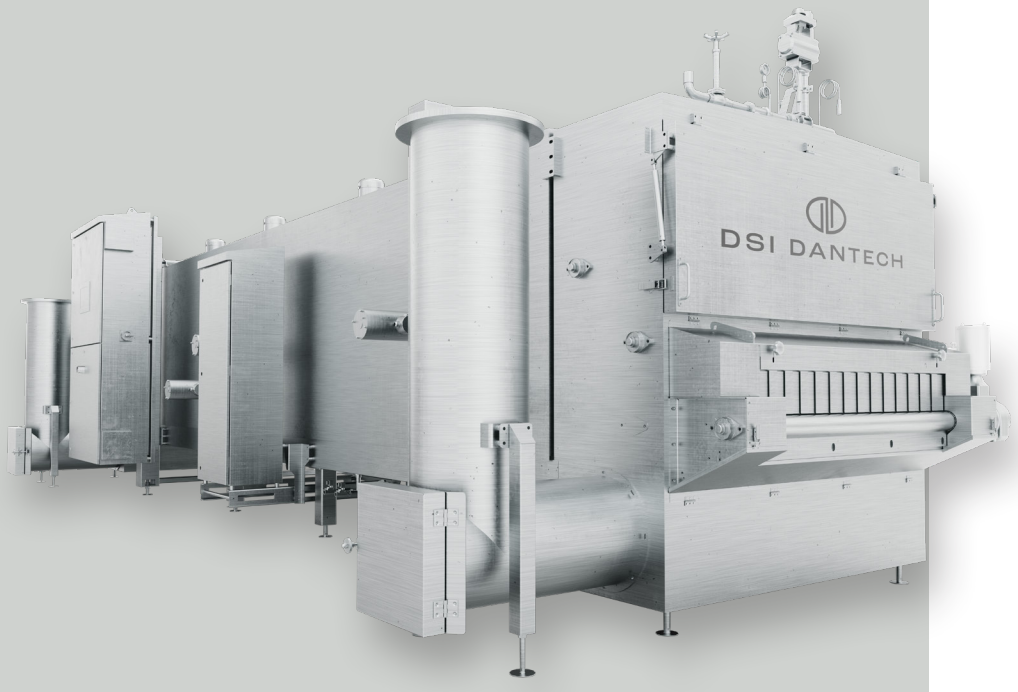
high production **capacity** and **efficiency**

Our Multibelt Tunnel Freezer is ideal for small IQF food products that tend to freeze together when they come in contact, as the individual pieces are kept in motion. The conveyor system is made up of two or three short, inclined belts that tumble the product from one flight to the next. By keeping the individual pieces of food in motion, large volumes of small products such as diced meats, berries, or vegetables can be IQF frozen.

The speed of each belt is independently controllable, and optimum cold distribution is obtained by the combination of recirculation and side wall fans. This makes it possible to increase the belt loading density.

ensuring high **product quality** and **yield**

- Variable belt speed for all belts
- Unique top-lifting design
- Wide configuration of spray and circulation fan arrangement
- High product yield
- Low capital investment
- Quick installation time
- Optimum cold distribution
- Top and side cooling
- Easy adapted for line expansion



industries

solutions **suitable** for

- fish & seafood
- meat & poultry
- fruit & vegetables
- liquids & fluids
- baked goods
- dairy
- further processing
- plant based food
- pet food
- non-food

tumbler freezer

flexible and **rotating** freezing in tumbler

Our tumbler freezer has a long, inclined, rotating tube. It uses gravity and its internal design to convey food and IQF freezes it. Tumbler freezers are most suited for the freezing or chilling of small bulk products such as vegetables, fruit, chopped meat, fish and poultry but also for industrial products in cooling processes or freezing before grinding, trimming, etc.

The freezer comes in three standard sizes: 5 m [16 ft], 7 m [23 ft], and 9 m [30 ft] usable tumbler lengths. The length is dependent on the required capacity. We customize the freezer tumblers to suit your product and product infeed systems.

customizable **design**

DSI Dantech can design and offer customized rotary freezers for customer's product or product infeed systems.

increasing **product quality** and **yield**

- Unique rotary system
- High product yield
- High cooling/freezing rate
- Flexible and easily combined with other solutions
- Operator-friendly
- Easy to clean
- Stainless steel housing
- Quick Installation

industries

solutions **suitable** for

- fish & seafood
- meat & poultry
- fruit & vegetables
- baked goods
- dairy
- further processing
- plant based food
- pet food
- non-food

batch freezer

flexible **batch** and **crust** freezing & chilling

Our batch freezer is suitable for deep freezing or very fast crust freezing and batch chilling for handling and packaging of delicate and soft IQF food.

Batch freezers are ideal for small to medium-sized businesses as they are designed to handle varying volumes of frozen food. A batch freezer has a low footprint, is easy to clean, and requires a relatively low capital investment. On top of that, it also ensures high and uniform food quality and improved yield.

Depending on your needs, the batch freezer is available in two versions. A single batch freezer and a double batch freezer with the capacity of two regular freezers.

freezing system

Batch freezing is an efficient freezing method that uses indirect spray for rapid freezing, and cold vapor is recirculated by means of recirculation fans. Nozzles are adjustable to cope with changing freezing requirements or items requiring slower freezing times to prevent surface fractures.

Freezer controls are arranged in a user friendly, easy to operate control panel. Cryogenic spray and batch cycle time are easily adjustable for any variety of food items.

low **investment** reducing **installation time**

- Perfect for short cycle times
- Adjustable for changing freezing requirements
- No external exhaust blower needed
- No gas purge required
- Compact and easy to clean
- Low capital investment
- Quick installation time
- Production flexibility
- Adapts easily to batch process

industries

solutions **suitable** for

- fish & seafood
- meat & poultry
- fruit & vegetables
- ready to eat
- liquids & fluids
- baked goods
- dairy
- further processing
- plant based food
- ice cream
- pet food
- non-food

technical data of cryogenic batch freezer*

punctuality is an indication of competence

EUROPEAN specifications

Model	Overall width		Overall depth		Overall height		Width, Internal Usable		Depth, Internal Usable		Height, Internal Usable		Weight		Cooling Medium	Power Supply
	mm	ft	mm	ft	mm	ft	mm	ft	mm	ft	mm	ft	kg	lbs		
15 x 15 x 24	2050	6.5'	1790	5' 9"	2450	8'	1045	3'	1400	4.5'	2180	7'	1250	2755	LIN or LCO_2	3x400V
12 x 12 x 21	1750	5.5'	1490	4' 9"	2350	7' 7"	745	2'	1100	3.5'	1980	6'	1000	2200	LIN or LCO_2	3x400V

US specifications

Model	Capacity Mobile Carts	Capacity Sheet Pans (18" x 26")	Depth, Enclosure "A"	Width, Enclosure "B"	Height, Enclosure "C"	Width, Internal Usable "D"	Depth, Internal Usable "E"	Height, Internal Usable "F"	Weight	Cooling Medium	Power Supply
			in	in	in	in	in	in	lbs		
BF100	3 GN 2/1	60	71	86	89	53	55	78	3000	LIN or LCO_2	480V
BF5	-	5	19	36	29	19	28	17	700	LIN or LCO_2	120V

flexibility of freezer

A Batch freezer is commonly referred to as a lab freezer or blast freezer. Typically, a cart with several trays of product on it is rolled into the freezer and shut inside for a certain amount of time. As this is a batch process, it is ideal for applications that do not require linear or continuous procession along a development line. This could include smaller companies or product lines, testing applications, or even schools and other buildings with cafeterias. While the DSI Dantech batch freezer offers flexibility in the amount of residence time, this method of blast freezing is commonly used for its ability to quickly and evenly freeze products.

gas system

A Batch freezer differs from other DSI Dantech cryogenic freezers in a couple of areas. Firstly, the over-pressure created in the batch freezer pushes the excess cryogen gas out of the freezer, a phenomenon referred to as 'passive exhaust'. Due to this, there is no need for an external exhaust blower. Additionally, during installation it is only necessary to include a liquid line, as there is no gas purge required.

* US specifications and build are different from the European one

immersion freezer

fast volume freezing with **liquid nitrogen**

Our Immersion Tunnel Freezer is designed for high-volume IQF freezing where the food is conveyed through a bath of liquid nitrogen. By immersing, the product is very quickly crusted, which eases further freezing of separate or individual products. This is the fastest heat transfer rate available in cryogenic freezing, but at the same time the process is characterized by lower cryogen efficiency rates due to high nitrogen usage.

The Immersion Tunnel Freezer is suitable for crust freezing as well as deep freezing, it can be a standalone machine, or it can be joint to our single belt linear tunnel freezer or our multi-pass tunnel freezer for postcooling or pre-cooling of quality food.

Immersion freezers are ideal for continuous food processors in the red meat, fish, poultry and fruit-vegetable industries. Specific units are also available for the Bio Pharmaceutical industry.

freezing **time**

Dependent on the nature of the product, on the size and the desired result (either crust freezing or deep freezing) the time varies from a few seconds up to one minute. An immersion freezer is used for processing assorted though chiefly small products.

increasing **product quality** and **yield**

- Customized solutions
- Unique freezing process
- Hygienic and flexible equipment
- Quick installation time
- Compact and easy to clean
- Extremely short freezing time
- Using “lost refrigerant” process
- Individual or joint equipment
- Low footprint
- Low capital investment

industries

solutions **suitable** for

- fish & seafood
- meat & poultry
- fruit & vegetables
- ready to eat
- liquids & fluids
- baked goods
- dairy
- further processing
- plant based food
- ice cream
- pet food
- non-food

treatment chamber

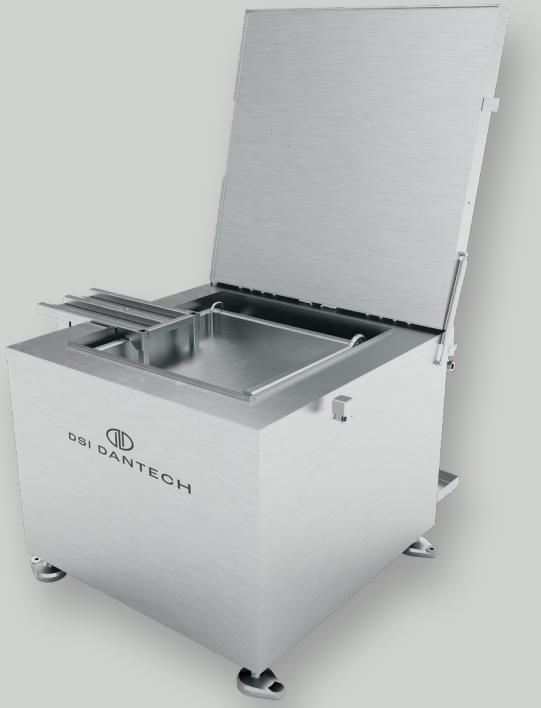
sub-zero treatment of metal and tools

Our cryogenic treatment chamber is developed for sub-zero treatment, and that results in improved hardness, dimensional stability, increased wear resistance, and extended part lifetime. It is highly relevant for industries such as auto, aviation, aerospace, and machine tooling. Additionally, it offers the benefit of full cryogenic freezing or rapid crust freezing and chilling for handling and packaging of delicate or soft products.

Depending on your needs, the Cryogenic Treatment Chamber is available in different versions, all designed to meet the highest standards of quality and safety (AMS2750-CQI9) and with features included to enable fully automatic temperature tracking and reporting capabilities that comply with the industry demands.

improved **hardness** and **wear resistance**

- Customized cycle timer
- Ramping capabilities
- 304 stainless steel – internal and external
- Tight temperature uniformity
- High density polyurethane
- Variation of sizes
- Customized temperature range available
- Quick installation
- Low footprint



industries

solutions **suitable** for

non-food

pelletizer

freezing pharmaceutical products without **loss**

Our pelletizer is operating in a class 100 clean room and meets the strict requirements demanded by the pharmaceutical industry. We have developed a custom made and patented solution, where products are dispensed in liquid nitrogen and a spherical pellet is created. This is done without having any mechanical moving parts in contact with the liquid nitrogen or dispensed solution. Eliminating product losses to extremely valuable pharmaceutical products.

unique equipment

During the development of our pelletizers, we have always put product quality and ease of operation first. This has resulted in high quality, sanitary equipment where each aspect of the pelletizing process can be flexibly controlled to ensure optimum compatibility of product, process and operator.

effective and **instantaneous** stability

- Customized solutions for individual needs
- Unique stabilization process
- Hygienic and flexible equipment
- Small batch processing (up to 300 lbs/hr)
- Uses very little space
- No product losses
- Low capital investment
- Quick installation time
- Compact and easy to clean

industries

solutions **suitable** for

- liquids & fluids
- dairy
- further processing
- ice cream
- non-food

technical data of cryogenic pelletizer*

punctuality is an indication of competence

US specifications

Model	Production Capacity	Width, Overall Belt "A"	Length, Bath* "B"	Width, Bath "C"	Depth, Bath "D"	Length, Drain Zone "E"	Length, Overall "F"	Width, Overall "G"	Height, Overall Open "H"	Height, Inlet** "J"	Height, Outlet** "K"	Weight	Cooling Medium	Power Supply
	lbs/hr	in	in	in	in	in	in	in	in	in	in	lbs		
IM15	1000	30	81	34	8	55	178	81	114	75	40	8000	LIN	480V
IM12	500	30	62	34	8	30	145	79	108	70	41	4000	LIN	480V
MP48x20	up to 20000	50	48	61	3	6.5	26	110	134	54	21	16000	LIN or LCO_2	480V

* Bath length listed is for bath depth of 8"

**Overall height may be altered slightly by adjusting legs

flexible product

Besides its advantages as a stand-alone unit, cryogenic pelletizers can play a key role in improving the efficiency of stabilization processes of products, such as tablets, capsules, inhalable drugs, etc. Since pelletizing enables you to process these products as bulk, it offers the opportunity to simplify your production process by eliminating redundant intermediate packaging. Specifically for lyophilisation and freeze/thaw processes, the unique properties of cryo-pellets will improve the efficiency of those processes and reduce overall cycle times.

constant **stability**

Liquids, semi-liquids or even solutions with a higher viscosity are introduced in droplet form into liquid nitrogen. These droplets are flash frozen and possible degradation processes are effectively stopped so that the product quality is preserved. Due to the use of this cryogen and the consistent, pre-determined size of the droplets, our cryogenic pelletizers are capable to produce uniform, round-shaped pellets with a typical distribution of 2-5mm in a reliable and repeatable manner.

* US specifications and build are different from the European one

upright freezer - metal

tempering process of **metal**

Upright freezers are designed for tempering process of metal. Through tempering process metal transforms its crystal lattice structure from body-centered cubic to face-centered cubic, resulting stronger and more durable material. Metallurgical changes, relieve residual stresses, normalizes and stabilizes metal, increases resistance and creates modified and uniform grain structure.

low **capital cost** with customized **cycle times**

- Customized cycle timer
- Ramping capabilities
- 304 stainless steel – internal and external
- Tight temperature uniformity
- High density polyurethane
- Variation of sizes
- Customized temperature range
- Low capital cost
- Quick installation
- Easy to clean

industries

solutions **suitable** for

non-food

upright freezer - pharmaceutical

freezing and tempering of **pharmaceutical** products

Upright freezers are specially designed for full freezing or rapid crust freezing and chilling mainly used for handling and packaging of delicate or soft products. Ideal and efficient solution that uses indirect spray for rapid freezing.

Adjustable for changing freezing requirements or items requiring slower freezing times to prevent surface fractures. Cryogenic spray and batch cycle times are easily adjustable for a variety of products.

long **cycle times** with high cooling and freezing

- Compact and easy to clean
- High cooling/freezing rate
- Production flexibility
- Quick installation time
- Low capital investment
- Ideal if product sampled during the cycle are required
- Perfect for long cycle times
- Adjustable for changing freezing requirements

industries

solutions **suitable** for

non-food

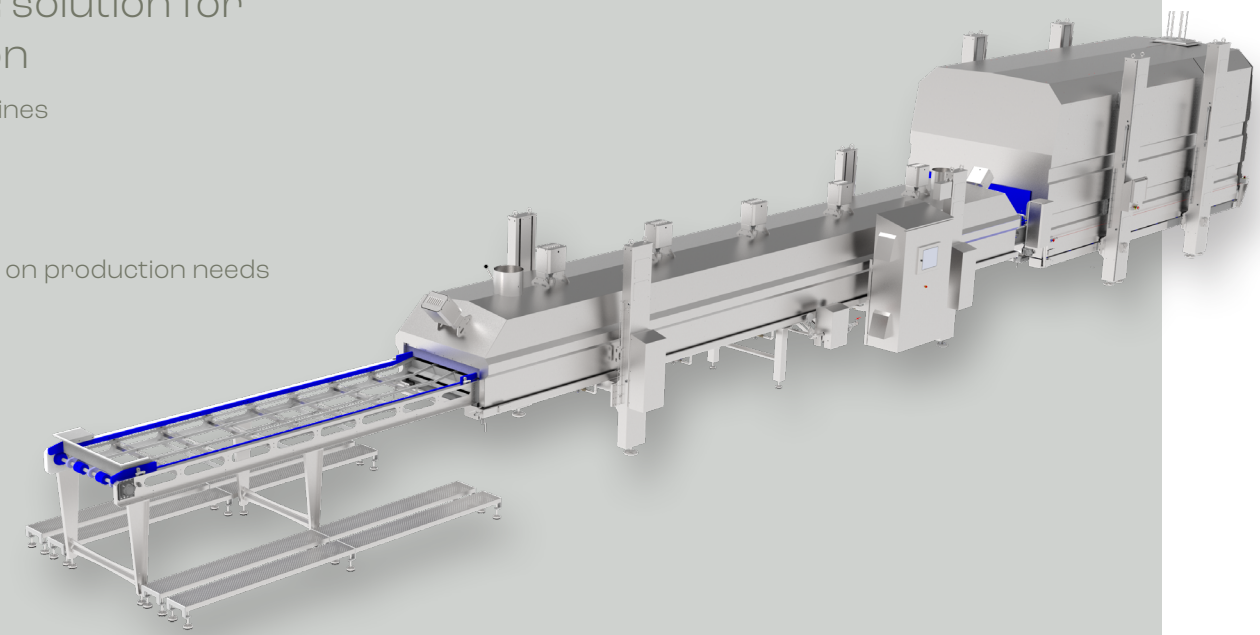
space saving equipment for **streamlined production**

Maximize production efficiency and minimize production costs with automatic auxiliary equipment and handling solutions. Automating your production will also have a positive effect on safety, hygiene, and labor costs.

Customized auxiliary equipment is designed to streamline your production in a highly hygienic and efficient manner. The range of equipment includes conveyers, vertical take-down conveyors, hoppers, feeders, coolers, dip glazers, chillers, and cleaning in place systems.

hygenic and **efficient** solution for streamlined production

- Can be integrated with existing lines
- Small carbon footprint
- Space saving
- Quick installation
- Easy to maintain and keep clean
- Wide range of equipment based on production needs
- Customized solutions



industries

solutions **suitable** for

- fish & seafood
- meat & poultry
- fruit & vegetables
- ready to eat
- liquids & fluids
- baked goods
- dairy
- further processing
- plant based food
- ice cream
- pet food
- non-food

customized solutions

flexible cryogenic freezing for your production

Cryogenic freezing is relevant for industries where food safety and food quality is of the essence, and it is widely used among manufacturers that add high value to their products. Examples are special baked goods, seafood, meat, poultry, and dairy products. It is also relevant in nonfood industries, such as pharma and metal.

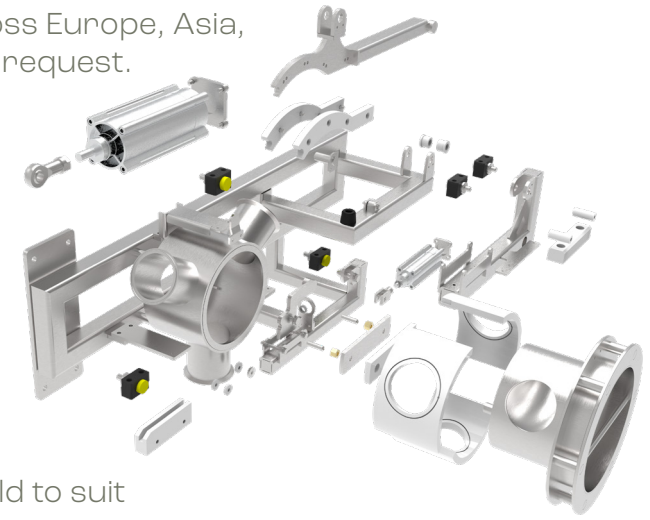
We recommend cryogenic freezing for new production lines, seasonal production, or small and medium productions of high-quality food. The investment in a cryogenic freezing solution is 2.5 times lower than in a mechanical solution, the initial start-up costs and operating costs are lower, dimensions are smaller, and cryogenic equipment is always ready to use and easy and fast to clean. However, as production grows, the operational costs of cryogenic freezing will exceed the costs of running a mechanical solution.

Not only is cryogenic equipment a low investment, but it is also an incredibly flexible solution that allows you to change product, vary batch volume, and change temperature from -180°C to +600°C in the same machine.

Cryogenic freezing systems are often used by manufacturers with limited space in their production or companies with products in the beginning of a product life cycle. But we also support customers who need a cryogenic solution for extremely fast crust freezing of food to maintain its shape and form, from burger patties and chicken breasts to foie gras before further freezing in a mechanical IQF freezer.

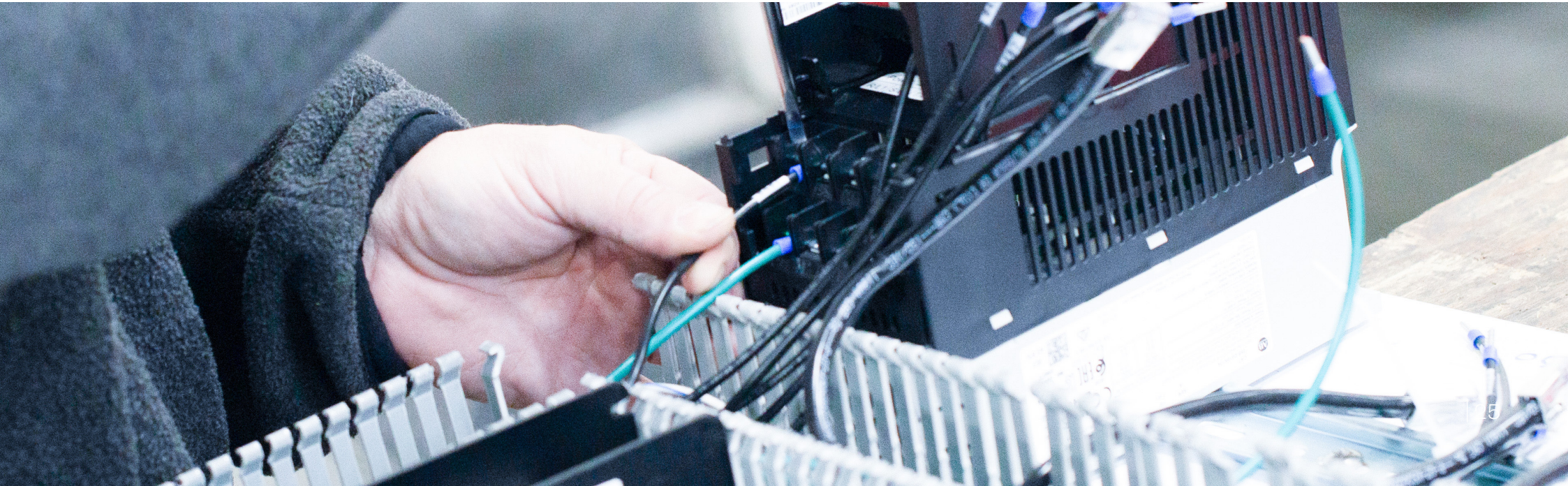
service on **demand**

We offer worldwide service and support to prevent and minimize downtime in your production. Our global setup across Europe, Asia, and the US allows us to respond very quickly to any request.



To keep your down time to a minimum, we offer worldwide 24/7 support. We provide continued support throughout the lifetime of your thermal solution, from technical maintenance and repair services to high-quality spare parts and tailor-made spare part kits as well as individual service contracts.

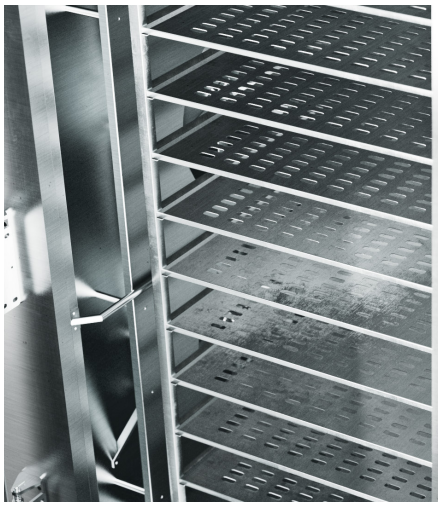
We can also help you optimize your solution to prolong its lifetime and usability. Whether your equipment need a renovation, expansion, or a rebuild to suit your needs, we can assist you.

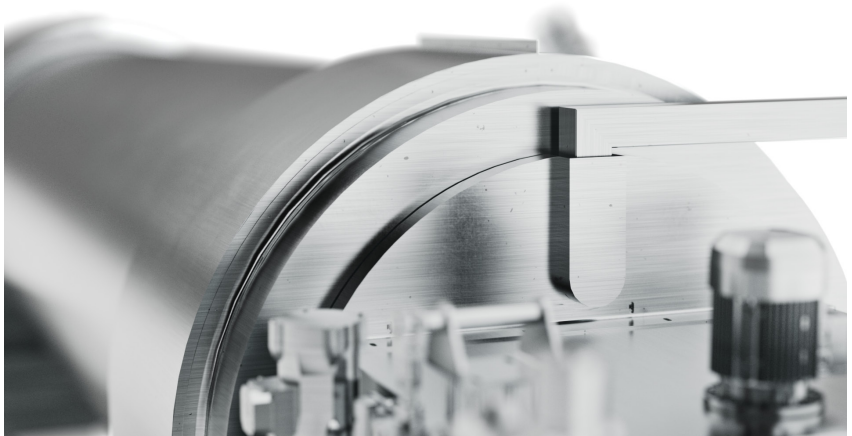


our role

quality, **safety** and **optimization**

We are only one part of the value chain, but we are a quite important one, and we are here to leave a mark on the food industry. We believe in food quality, we prioritize food safety, and we promise you honest guidance, so you can base your investment on real data and solid industry knowledge.





sustainability and savings

our **commitment**

We are committed to protecting our environment. We supply the food industry with thermal treatment that spares the environment. We collaborate with our customers to produce solutions that reduce their environmental footprint, minimize food waste, and sustain the quality of food.

We deliver mechanical, cryogenic, and plate solutions for freezing, cooling, and heating to the global food industry. As such, we are only one part of the value chain, but we are an important one. We play an active role in minimizing our customers' environmental footprint by reducing energy, water, and chemical consumption.

contact

let's talk about your **opportunities**

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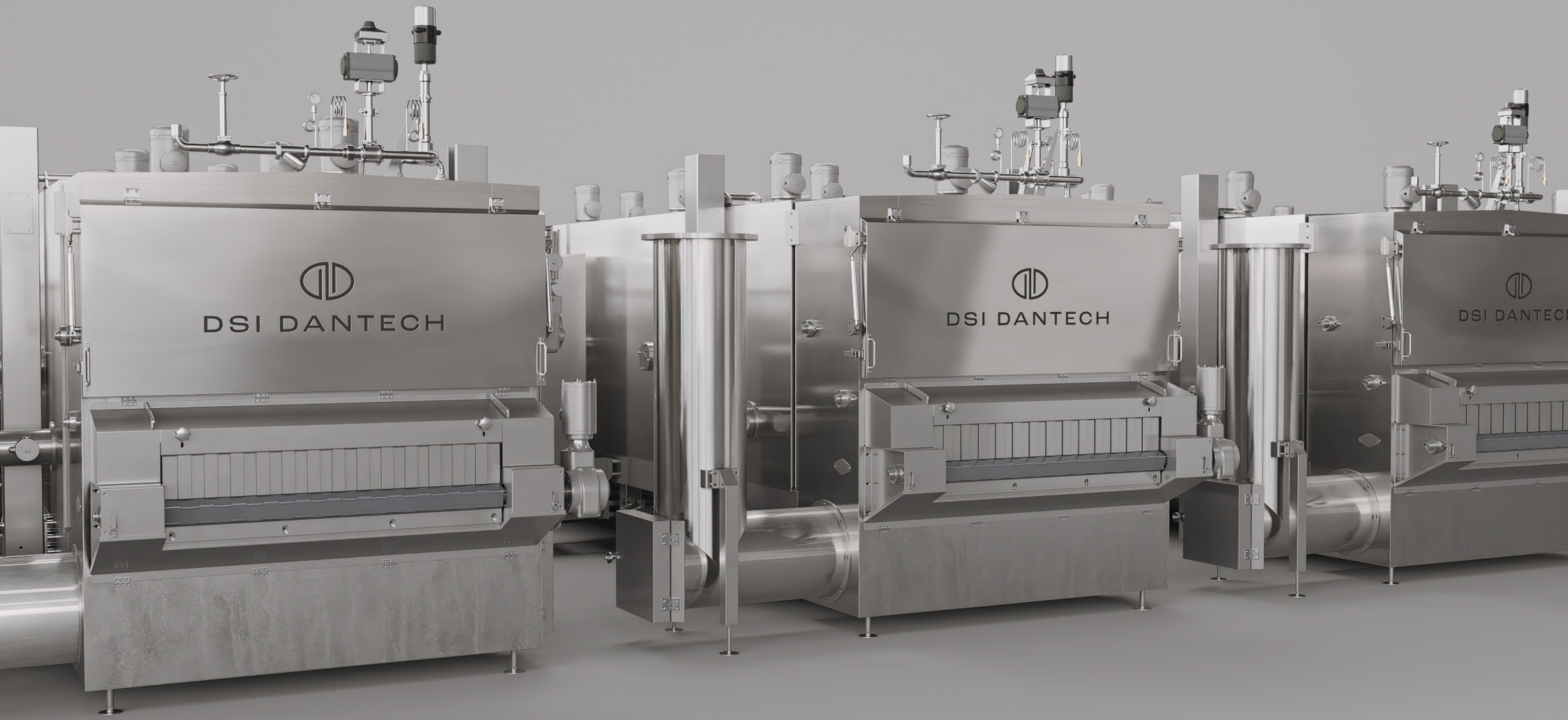
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freezing, cooling, and heating of quality food

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