



Spiral Freezers	Spiral Immersion System <sup>™</sup>		IQF Freezers		
Impingement Freezers		Carton Continuous Flow		Variable Retention MultiPass	



"We believe that through collaboration, we create value. When you enter into a partnership with us, you join our family. Together, we promise to set new standards."

Jeffrey Chang, President FPS Food Process Solutions

+ hygiene

- innovation

partnerships

efficiency -

#### WHO WE ARE

#### About FPS

FPS Food Process Solutions is a global leader in turn-key food freezing and cooling equipment. We provide innovative systems to ensure the highest efficiencies and to meet the most stringent sanitary demands. These factors transform into superior food quality, lowered total cost of ownership and maximized profits.







# Spiral Freezers

# Customization through Collaboration

We believe in building long term partnerships with our customers. We listen to each of your unique needs and concerns and incorporate these in your freezer and cooler design. From basic packaged products to sensitive, ready-to-eat foods, our custom designs ensure your equipment is optimized for each application.

### + Stainless Steel

Our robust fully welded enclosure is manufactured using heavy gauge stainless steel and high-density polyurethane insulation. This construction eliminates dangerous bacteria harborage points and the ongoing task of inspecting and caulking panel joints.

Our flexible panel joints have continuous TIG welds to ensure smooth food safe surfaces and to allow for expansion and contraction during temperature changes.

#### + Recirculating Clean-In-Place (CIP)

Our integrated CIP with compact skid provides repeatable and consistent full freezer cleaning with minimal consumables, manpower and energy. The dishwasher concept with recirculation and pasteurization maximizes freezer hygiene.



### EXTERIOR

The importance of hygienic design pushed us to think outside the box - literally. A specially engineered, welded wall and floor system incorporates an embedded support structure, allowing motors and gearboxes to be mounted on the outside of the enclosure. This not only protects components from the harsh internal environment, extending their service life, it eliminates many ancillary components such as conduit and junction boxes which greatly improves cleanability. This revolutionary design reduces the total cost of ownership by improving uptime while cutting maintenance and energy costs.



### INTERIOR

Our focus on hygiene can be seen in the details of FPS's assembly techniques, such as seamless welding to eliminate bolted support structures, removing hollow or angle shaped supports that are difficult to clean and elevating the internal structure off the floor to prevent debris getting trapped under support pads. We also strive to minimize total surface area and components inside the freezer. This creates easier and safer access for maintenance and inspection while improving airflow and cleaning performance. These small details create big savings for our customers. + SynchroSD<sup>™</sup> Defrost System

For extended operation, our sequential defrost system ensures seamless operation without impacting freezer performance and product quality. With precise airflow control, product always sees the same air temperature and velocity ensuring consistency throughout production. Elimination of dirty coil blocking louvers, enhances equipment energy efficiency and hygiene.

#### + Conveyor Belting

We offer a range of conveyor belting in stainless steel and acetal materials, in low tension and direct drive. From compact Intralox self-stacking solutions to the industry's first 72 inch DirectDrive Systems, FPS has the best solution for your application.

#### + High Performance Evaporator Coils

Our custom designed evaporators are offered in a range of fin materials including aluminum, stainless steel or anti-microbial Cupronickel. We match stainless steel tube to chosen refrigerant whether NH4, Freon or CO2. Variable fin spacing and heavy duty fins allow for frost accumulation and durability.



#### **External Motor & Drive Design**

With external directly coupled fan motors and drum drive systems, we eliminate the constant maintenance and hygienic concerns of internal electrical components. Supported by our innovative floating frame design, alignment between the drum and drive is always accurate, ensuring a smooth operating spiral.



Welded Stainless Steel Floor

Our bathtub design floor is insulated with polyurethane and shaped with compound slopes for effective drainage and to prevent water pooling. A non-slip surface provides safe access inside the unit. The floor structure integrates solid studs for welding to internal support structure.



#### IntelliSolutions Control Panel

Our PLC-based touch screen controls are easily navigated with customizable access levels and recipe programming. With various diagnostic tools and trend logging, problems can be easily addressed which can be furthered with our remote monitoring and troubleshooting services.



#### Internal Support Structure

With SS304 stainless steel construction, internal structure is designed to reduce horizontal flat surfaces and utilizes round non-hollow structures to prevent water pooling. CIP piping is integrated as part of the support structure reducing surfaces requiring cleaning and energy to cool excess material.



#### **Optimized Hygienic Design**

Achieved through focus on details. Smooth TIG welding, sloped surfaces, minimal lap joints and bolting, with spacers used when required. Hollow structures are completely eliminated with our innovatively designed frame. Unnecessary surfaces and components are eliminated from inside the equipment.



#### High Performance Airflow

Our horizontal airflow is designed with both performance and hygiene in mind. With minimized air baffles, an effective horizontal airflow is achieved with minimal pressure drop and efficient product cooling. With the latest software in 3D airflow modeling, the airflow designs are carefully fine-tuned.



# IQF Tunnels

Our range of Individual Quick Freeze (IQF) tunnels implement a combination of pneumatic and mechanical fluidization techniques for product separation. This ensures careful freezing for a wide variety of food products. For special applications, we offer a perforated Intralox acetal belt solution which ensures enhanced IQF performance for even the most difficult products. The combination of our IQF technologies and our hygienic design fundamentals ensures you have a high performance tunnel freezer with the highest in food safety standards.

Our robust fully welded enclosure is manufactured using heavy gauge stainless steel and high-density polyurethane insulation. This construction eliminates dangerous bacteria harborage points and the ongoing task of inspecting and caulking panel joints.

Our flexible panel joints have continuous TIG welds to ensure smooth food safe surfaces and to allow for expansion and contraction during temperature changes.

For extended operation without shutdown, our synchronized sequential hot gas defrost system ensures seamless operation without impacting freezer performance and product quality. With precise airflow control, product always sees the same air temperature and velocity ensuring consistency throughout production.

Our freezers can be raised for access for cleaning and inspection under the freezer. With specialized telescoping legs and articulating mounting plates the freezer can match all existing plant floors.





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+ Advanced Airflow + Circulation Fans The one-piece radial fans are designed for ease of cleaning and minimal maintenance. With options for aluminum or stainless steel construction, we can design for varying levels of chemical regimens. Equipped with VFDs, the high pressure fans located below the product zone allow precise control of air velocity ensuring excellent product separation with minimal blow-over and low energy consumption. Mechanical agitation further enhances the flow of product through the freezer.

#### + Recirculating Clean-In-Place (CIP)

Our integrated CIP with compact skid provides repeatable and consistent full freezer cleaning with minimal consumables, manpower and energy. The dishwasher concept with recirculation and pasteurization maximizes freezer hygiene.



Integrated Infeed Station

Incorporates a steam and water spray box and high-pressure drying system to remove ice and water from the belt during production. A CMP Fluid Removal System (FRS) can be integrated to increase product dewatering.



Fully Welded Stainless Steel Floor

Our bathtub design floor is insulated with polyurethane and shaped with compound slopes for effective drainage and to prevent water pooling. A non-slip surface provides safe access inside the unit. The floor structure integrates solid studs for welding to internal support structure.



**High Performance Evaporator Coils** 

Our custom designed evaporators are offered in a range of fin materials including aluminum, stainless steel or anti-microbial Cupronickel. We match stainless steel tube to chosen refrigerant whether NH4, Freon or CO2. Variable fin spacing and heavy duty fins allow for frost accumulation and durability.



Internal Support Structure

With SS304 stainless steel construction, internal structure is designed to reduce horizontal flat surfaces and utilizes round non-hollow structures to prevent water pooling. CIP piping is integrated as part of the support structure reducing surfaces requiring cleaning and energy to cool excess material.



#### **Optimized Hygienic Design**

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#### IntelliSolutions Control Panel

Our PLC-based touch screen controls are easily navigated with customizable access levels and recipe programming. With various diagnostic tools and trend logging, problems can be easily addressed which can be furthered with our remote monitoring and troubleshooting services.



## Impingement Freezers

Our impingement tunnels have been developed for a range of cooling and freezing requirements for a wide variety of specialty products to optimize efficiency and product yield. Our impingement tunnels incorporate a hygienic pressure duct system to deliver high velocity air that quickly cools and freezes products.

Our proprietary air slot design ensures efficiency even with products of varying geometries. Multiple belt pass/lane arrangements, belt widths and mesh/ surface options, our impingement tunnels are matched to your production needs.

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#### +SynchroSD<sup>™</sup> Defrost System

For extended operation, our sequential defrost system ensures seamless operation without impacting freezer performance and product quality. With precise airflow control, product always sees the same air temperature and velocity ensuring consistency throughout production. Elimination of dirty coil blocking louvers, enhances equipment energy efficiency and hygiene.

Offering a range of conveyor belting from stainless steel to plastic, we carefully evaluate the application of the food products to ensure the best solution is provided.



#### **Optimized Impingement Design**

Our air slot design functions as an air knife, directing high velocity jets of cold air from above and below the product. The highspeed air breaks the boundary layer of air on the product surface allowing faster heat removal, resulting in a quick freezing process. This reduces ice crystal formation, dehydration, and drip loss during thawing.



**Externally Mounted Fan Motors** 

With external directly coupled fan motors, we eliminate the constant maintenance and hygienic concerns of internal electrical components. We use centrifugal plug fans to generate high static pressure for effective impingement freezing.



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#### **Fully Welded Stainless Steel Floor**

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#### Hygienic Design

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#### Internal Support Structure

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# The FPS



#### **FPS RECIRCULATING CIP SYSTEM WITH** PASTEURIZATION

- + Dishwasher cleaning concept
- + Recirculation with filtering and automatic water heating
- + Multiple cleaning zones with individual scrubbing and soaking times
- + Compact skid with filter, heating and high volume pump
- + Balancing trough with rough filter and return pump
- + Full freezer pasteurization option

#### **ADVANTAGES OF THE FPS CIP SYSTEM**

- + Ability to clean with higher temperatures and more aggressive chemicals than manual cleaning
- + Maximum water impact with minimal consumption and time
- + Cleaning can start when production ends without defrosting saving valuable time
- + Efficient use of energy and chemicals reduces costs
- + Consistent and repeatable results with minimal labor improving safety
- + Full freezer cleaning and pasteurization ensures no bacterial contamination of food

### Carton Continuous Flow (CF)

Designed utilizing the latest technology and highest quality materials, the Carton Continuous Flow (CF) is low maintenance yet user friendly delivering maximum uptime and low operation and maintenance

### Variable Retention **MultiPass** (VRM)

Utilizing Single and Double-Shelf designs to suit each client's needs and space limitations, the VRM can chill and/or freeze multiple products with single or multiple retention times.



### Common Features

- + Structural and Mechanical Engineering
- + Remote Monitoring Service
- + Maintenance Access

- + External Fans
- Evaporators
- + Operation and Maintenance

### **MultiPass** Air Flow Technology

- + Provides true counter-flow heat transfer
- its shelf position

Ensures each carton exits at the same temperature irrespective of

- + Offers energy savings and reduces carbon footprint
- + Focuses on freezing consistency and energy usage

### Carton Continuous Flow (CF)

- + Up to 480,000lb or 220,000kg of production per day when applying a 24-hour retention
- + Single retention time, first in / first out
- + Product transported by "bookcase" style carriers





#### Product Flow / Product Load

The CF keeps air gaps between packages and they are continually moved within the unit ensuring even air distribution and heat removal. This minimizes holding time and temperature variation between products. Elimination of infeed and exit conveyors also maximizes plant productivity and increases capacity.



#### Carrier - First In / First Out

The carriers and shelves are designed specifically for each application. Transfer points are specially designed to ensure seamless transition from the structure to the primary and transfer elevators. This eliminates harmful shock loading on the elevator chains and drive system while minimizing movement of products on the carrier shelves.



#### **Elevators - Construction**

The elevator is servo driven allowing for exact indexing of the carriers for seamless transfer of product onto and off the carrier shelves. Our engineers take special care when specifying the elevator materials and components to ensure they can provide long life in the harsh environment.



#### Product Flow / Product Load

Various products requiring same/different retention times are channeled through each lane and pushed onto corresponding shelves with the required temperature.



Shelves / Platforms

more products.



### Variable Retention MultiPass (VRM)

- + Up to 1,300,000lb or 590,000kg of production per day when applying a 24-hour retention
- + Single or multiple retention times
- + Product transported by shelves to allocated levels within the system to suit production requirements

Product is loaded on to shelves that are similar to "platforms" that move through the system. Shelf construction is wider and able to accommodate

Elevators - Construction

Pairs of elevators are located at each end of the VRM – Primary and Transfer, working in tandem to carry product in/out of the VRM.

# **Spiral** Immersion System<sup>™</sup> (SIS)

"The SIS delivers energy savings, labor savings, higher yields, longer shelf life, safer and better quality food products. The FPS Spiral Immersion System<sup>™</sup> is a Game Changer, and it will forever change how we process food."

STEVE KELLEY DIRECTOR

SPIRAL IMMERSION SYSTEMS



# Freezing + Chilling

With conduction heat transfer at temperatures as low as -50°F, the SIS is an energy saving green machine. Using naturally anti-pathogenic brine, the SIS maximizes your processing time because it never needs defrosting and rarely needs to be shut down for cleaning.

20 to 70%

**FASTER HEAT** TRANSFER FOR THE SAME THROUGHPUT

WITH IN-PACKAGE

PROCESSING

SMALLER

50%

FOOTPRINT FOR THE SAME THROUGHPUT

**Cooking + Pasteurizing + Sous Vide** 

With gentle product handling and continuous flow processing in temperatures up to +210°F, the SIS is the most cost efficient sous vide system available.



WITH IN-PACKAGE PROCESSING

**KEY BENEFITS:** 



### LESS REFRIGERATION TONNAGE

FOR THE SAME THROUGHPUT



LESS ENERGY FOR THE SAME

THROUGHPUT

**KEY BENEFITS:** 

# 0%

#### NUTRIENT LOSS

WITH IN-PACKAGE PROCESSING



### LESS LABOUR

COMPARED TO BATCH PROCESSING 21



### Game-Changing Technology

The FPS Spiral Immersion System (SIS)<sup>™</sup> brings together the small footprint of spiral belting, the energy savings of conduction heat transfer and the labour savings of continuous processing. The SIS is basically a spiral conveyor in a tank of liquid, usually water or brine, that is designed to prevent the displacement of the product from the belt during processing.

The SIS's robust fully welded SS316 stainless steel enclosure contains over 1000 ft of Intralox's self-stacking modular plastic belt in 2 spiral stacks. 95% of the spiral belting is submerged in a sterile saline and SS316 stainless steel environment in temperatures ranging from -50°F to +210°F. The unique design of the SIS provides control over the product and achieves a better quality, safer product in less space, in less time and while consuming less energy.

#### + Durability

Weightlessness of the drum, belt and product in water means less friction, less wear and tear, and lower maintenance costs.

#### + Higher Throughput

Over 1000 ft of belt under water to offer longer processing times and higher throughput.

#### + Flexibility

The corrosion free SS316 stainless steel SIS can be filled with water, chemical treatments, nutrient treatment or brine.

#### + Functionality

Processing in temperatures from -50°F to +210°F.

#### + Continuous Processing

Achieves a dramatic reduction in labor costs.

#### + Gentle Handling

Patented technology contains the product and ensures no product or packaging damage.

#### + Longer Shelf Life

The SIS delivers a continuous pasteurization and rapid chill process to minimize post packaging bacterial growth and extend shelf life.

#### + Zero Yield Loss

Moisture is trapped inside the package with the product.



#### Intralox Belting

The Intralox self stacking plastic acetal belt allows the SIS to pack over 1000 feet of belting into a space half the size of an air freezer with the same throughput. **Top Drives** Encoder regulated direct drive Sew-Eurodrive motors and reducers with SS316 stainless steel shafts for precision control of twin belt stacks.



#### Stainless Steel

5" thick polyurethane insulation, fully TIG welded corrosion free enclosure with 16 gauge SS316 stainless steel walls and 14 gauge SS316 floor with the industry's best warranty to ensure maintenance free durability.



#### **Compact Size**

As heat is transferred in water 25 times faster than in air, the SIS is much more efficient than air chilling.





**Control Panel** 

SS304 stainless steel NEMA4X enclosure with state of the art control system, Allen-Bradley CompactLogix PLC and Allen-Bradley PanelView 1000 color touch screen.



#### **Product Stability**

With the patented technology of the SIS and Intralox's self-stacking belt, even floating food products are secured within the belt stack. This ensures food products are treated gently with no product or packaging damage.



#### **FPS CORPORATE HEADQUARTERS**

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