

ENHANCING PRODUCTION EFFICIENCY: COLMAC COIL BLAST FREEZER IMPROVES OPERATIONS AT VEGETARIAN FOOD PROCESSOR



Location: New Jersey

Type of System: Spiral freezer and spiral chill room for frozen food manufacturer

Product Frozen: Vegetarian frozen meals

Product Temperature: 65° F in/ 0° F out

Air Temperature: - 40° F

Results/Benefits Delivered:

- ◆ Shortened defrost cycle and improved defrost efficiency.
- ◆ Sequential defrost integrated into the system to allow continuous food production.
- ◆ Hygienic equipment design and wash down ready components.
- ◆ The air cooler solution fits the exact footprint required.

Executive Summary:

A vegetarian frozen foods manufacturer based in New Jersey, sought to improve its production efficiency by installing a new spiral freezing and pre-freezing room. The installing contractor collaborated with Colmac Coil to design and provide a customized blast freezer and pre-chilling system. The project aimed to overcome production interruptions caused by defrost cycles, meet stringent hygiene requirements, and fully utilize available space. Colmac Coil provided several customized A+Series® Industrial Air Coolers resulting in continuous production runtime, reduced defrost cycle time, and ensured a hygienic design of the evaporators.

Introduction

The food processor encountered production halts due to frequent defrost cycles in their legacy spiral freezing system. Meeting strict hygiene standards in the freezing and chilling room necessitated hygienic equipment and washdown capability. To address these challenges, the installing contractor partnered with Colmac Coil for a value-engineered blast freezer and chill room solution.

Equipment Design Constraints and Limited Production Run Time

- ◆ The existing spiral freezing system caused production interruptions due to the need for defrost cycles, preventing continuous food freezing.
- ◆ The refrigerant load posed equipment sizing restrictions for the load needed in the space.
- ◆ The high sanitary requirements in the spiral freezing room demanded equipment constructed with corrosion-resistant materials and a hygienic design.

Value Engineered Spiral Freezer and Chill Room Solution

- ◆ Colmac Coil collaborated closely with the installing contractor to develop a customized solution that would meet the refrigerant load and hygiene requirements while maximizing production capacity.
- ◆ To achieve continuous production, the blast freezing system was designed with sequential defrost, featuring three vertically stacked air units. This configuration allowed two evaporators to provide constant cooling while one underwent the defrost cycle. Louvers on the exiting air side, and fan tube heaters on the entering air side facilitated faster and more efficient defrosting. The louvers also prevent air from bypassing the refrigeration coils.
- ◆ The evaporators were designed and manufactured with materials resistant to corrosion and capable of withstanding the washdown cycle. Key features included stainless steel tubes, stainless steel drain pan, epoxy coated fins, washdown duty motors, and level 3 finish welds. Level 3 welds are a continuous weld that is cleaned of all surface contaminants and discoloration, is completely passivated for a bright appearance, and is considered a food grade weld.

SPIRAL FREEZER ROOM - A+SERIES® A+L AIR COOLERS



Fan tubes are tilted at a slight angle to increase air intake



Three individual evaporators allow sequential defrost



Factory wired UL listed panel, motors wired to individual disconnect.

Enhanced Production Efficiency and Hygienic Blast Freezer Design

- ◆ Continuous production: The installation of the blast freezer eliminated interruptions caused by defrost cycles due to sequential defrost, allowing the food processor to achieve uninterrupted and continuous food freezing operations.
- ◆ Shortened defrost cycles: The sequential defrost system significantly reduced the time required for defrosting, resulting in increased production efficiency.
- ◆ Equipment is provided with hygienic features: Epoxy coated aluminum fins, stainless steel tubes, stainless steel drain pan cover, stainless steel housing, and washdown duty motors.
- ◆ Solution fit the footprint: The blast freezing solution fits perfectly inside the required space, due to Colmac Coil A+Pro Selection Software.

SPIRAL FREEZER ROOM - A+SERIES® A+L AIR COOLERS



Louvers automatically close during defrost cycle – Epoxy coated fin material



Custom circuiting: 48 feet 6 pass
-Stainless steel materials



Defrost Hoods that trap defrost heat to shorten defrost cycle

CHILL ROOM – A+SERIES® A+S AIR COOLERS



Washdown duty motors



Tube covers



Electric defrost

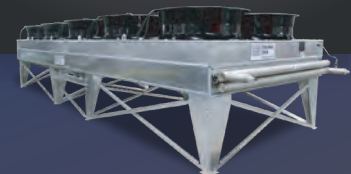
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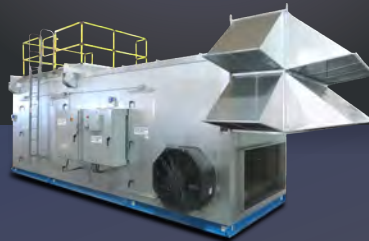
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