

ZERO ZONE SETS NEW STANDARDS IN THE INDUSTRIAL SECTOR

CLIENT

Our client is a major food producer in the central United States. They required refrigeration for a 824,000 ft² food processing facility in Arkansas.

CHALLENGES

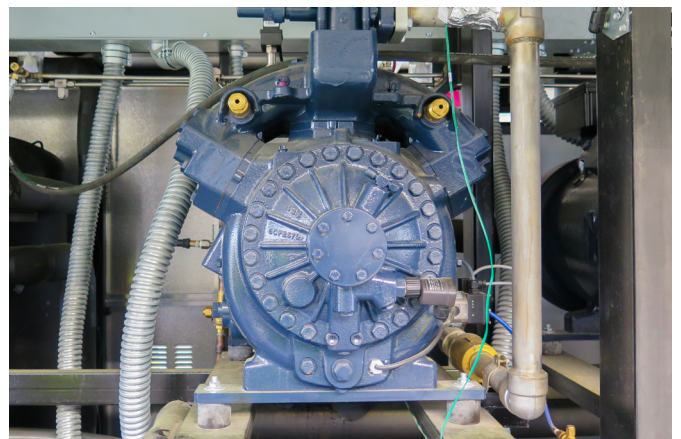
Food processing is any of a variety of operations to transform raw foodstuffs into safe-for-consumption foods or ingredients. Today, canning and freezing are two common methods of food processing. Canning involves heating a sealed container to destroy any microorganisms, which can cause a deterioration of flavor, texture, and nutrition. Freezing food kills parasites and slows physical, chemical, and microbiological activity that cause food deterioration. Freezing foods also preserves vitamin content, color, flavor, and texture.

Food processing is not a modern concept; it has been around for millennia. In fact, evidence indicates food processing started about 2 million years ago, when prehistoric humans learned to control fire. During that time, cooking, smoking, and drying were the methods used to process food. This knowledge did not become widespread until 400,000 years ago.

Modern processing requires frozen food to be kept a temperature between 0 and -30°F. Our customer needed to keep 120,000 ft² at this temperature to protect their product. The loading dock at our customer's facility also needed to be cooled to prevent the frozen food from thawing while loading and unloading. To make all this happen, Zero Zone needed to coordinate delivery and installation with its vendors and the customer.

REQUIREMENTS

- Freezer spaces with a temperature of -10°F
- Refrigerated dock section to prevent the thawing of foods during loading and unloading
 - A system that could operate in a humid subtropical climate.
 - Hot, wet summers
 - Cold, damp winters



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SOLUTIONS



This project required two Zero Zone Genesys™ outdoor packaged racks. One rack is to keep the dock cool and has a refrigerant capacity to provide 60 tons of cooling. Half the capacity of the dock rack, along with another full rack with a capacity of 200 tons, were needed to cool the 120,000 ft² facility.

Our customer chose Zero Zone Genesys™ CO₂ to meet their sustainability goals and comply with the phase-down of HFC refrigerants. Genesys™ Natural Refrigeration Systems use CO₂, an inexpensive and environmentally friendly refrigerant. Since Fort Smith has a warm climate, this new installation needed to be a transcritical CO₂ system. This system is also equipped with

stainless steel piping to handle a high-side pressure of 120 bar and a low side pressure of 90 bar.

Support from multiple teams is needed for a project of this size. The precise coordination between Zero Zone, its vendors, and the customer was paramount to the successful installation of this system.

SYSTEM COMPONENTS

- **Fully Integrated Controls** allow individual components of the system to respond to system demand.
- An **Electric Defrost** was used for a simplistic design.
- A single Oil Reservoir was custom-designed to save valuable space.
- **Distributed Controls** provide real-time data and instant adjustments.
- Capacity is modulated through demand by VFD control of compressors.
- **Stainless Steel** piping allows higher pressures to exist in the system, preventing the need to blow a charge if a rack loses power.
- **Variable-Speed Fans** provide the gas cooler with the ability to operate in the most efficient mode.



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ZERO ZONE IS AN EXEMPLARY COLLABORATOR

Collaboration is the foundation for innovation. Bringing different perspectives and years of diverse experience together, Zero Zone and Coolsys were able to bring a state-of-the-art Genesys™ system online. The integration of components marks a significant advancement in the industry and adds to the legacy of reliability that Zero Zone has built. Zero Zone is at the forefront of innovation in natural refrigeration solutions, and is setting the standard for industrial transcritical CO₂ systems.

For more information about this Case Study, contact:

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