RETROTECH INCORPORATED
610 Fishers Run • P.O. Box 586 • Fishers, NY 14453-0586 • Phone (585)924-6333 • Fax (585)924-6334 • www.retrotech.com

Blast Freezer Handling Technology that Reduces Freeze Time Requires Less Space & Lower Operating Costs.

Project Benefits

- Reduced labor costs.
- Exact freezing control.
- Optimal storage efficiency.
- Reduced product damage.
- Low maintenance cost.

Company Description

One of the top three 3 PL Refrigerated Services companies is increasing the amount of product that goes through the facility. They were looking for a way to transfer product through the blast freezer during a 24-hour period. The product needed to stay in each temperature zone for a specific amount of time before moving to the next zone to ensure a proper freeze. The customer asked to be able to input over 140 pallets in two hours and also be able to move the 140+ pallets from zone to zone within 15 minutes. The product is tracked through the system in batches and outputs batches together for storage or shipment.

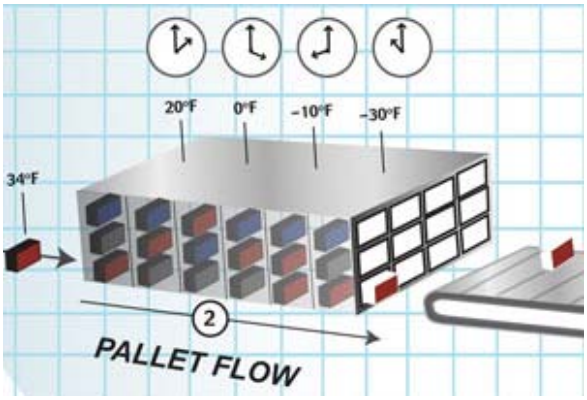
The Challenge

To design, build, and install a product material flow system in a blast freezer environment. The blast tunnel will consist of five zones, four blast zones and one unloading zone. This requires simple mechanical systems operate in the blast zones at high reliability and near zero downtime. Multi-level conveyors were feasible but motors, reducers, and other mechanical components would not withstand the conditions very well. Maintenance for conveyors would also be a challenge.

Major Functional Elements of the Automated Warehouse

- Receive and store 140+ pallets in two hours.
- Control and absolutely track product pallets through the blast tunnel.
- Unload/reload zones in twenty minutes.
- Retrieve and stage 140+ pallets from the unloading zone in five hours.

The system must manage and track hundreds of pallets at once, moving them through a range of blast temperature zones that incorporate different angles of –30 air blasts until they reach the controlled freeze point for all of the product.



The Solution

Overview

The process is unique as it uses Retrotech's ACTIV System high-density dynamic storage technology to continuously move the pallets of spatially arranged cases moving through the progressive temperature zones, all under computer control.

ACTIV systems have been used by a number of Fortune 500 food and consumer goods companies to support high turn distribution, however this system is the first high turn blast freezer built in the USA using a modified ACTIV System design.

This system does not operate like typical ACTIV systems that sort products for storage or shipment & staging. The ACTIV system Blast Freezer computer allows pallets to be placed adjacent to each other with appropriate pallet spacing between to allow for proper airflow. The system moves product down lanes to maximize the storage capacity of the area available while minimizing the amount of equipment inside. As product is stored in the lanes, cold air will be blasted across the system. Depending on where the pallets are in the system, the air will be coming from different directions. The product will move from one zone to the next until it reaches the last zone and will be ready for removal. The product will stay in each zone for a specific time period before moving to the next zone. The system will maintain the lot integrity as the loads travel from zone to zone and through the whole blast freeze process.

At this customer location, there are five physical zones in the ACTIV system, each at a different temperature. The pallets stay in each zone, except Zone Five, for a specified amount of time. Each zone is separated by swinging doors that the loads move through. The system is four levels high and four lanes across, with about 700 pallet locations.

ACTIV Design

The ACTIV system is designed to be high-density, high-throughput and fully automatic system. Its core portion is a rack structure, and is typically connected to outside areas with input/output conveyors, as it is for this project.

The fundamental components in the ACTIV system are VTLs (Vertical Transfer Lift), DLTs (Deep Lane Transfer) and CATs (Cross Aisle Transfer). Together, they can move the pallets three-dimensionally to any position in the warehouse.

Software Approach

While the overall system behavior is defined by a set of ACTIV parameters and customized site-specific software, ACTIV software also gives certified operators the tools needed to manipulate the system at different levels.

The core ACTIV software runs on a Linux operating system. A third party database is provided to complete the functionality required for the project. The database is used to keep and track information internal to ACTIV, such as pallet location and moves. Windows users are connected to Linux through Exceed, which is third party software.

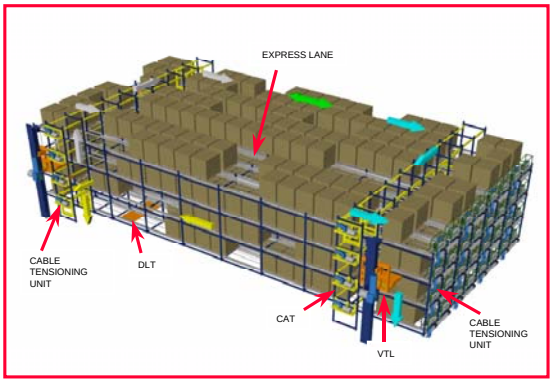
ACTIV software also provides several levels of data access and system access security. User Screens as required are part of the software delivery, such as standard ACTIV maintenance screens. These screens include tools to move a DLT, CAT, or VTL; setting a drive off line; and menus for event and error reporting.

Description of Operation

The system will control the flow of product through the blast freezer. The blast freezer environment will range from -30F to -10F plus a defrost cycle. The base premise of the operation is that product will be processed and moved from zone to zone by lot with the potential of multiple lots being in each zone at the same time.

The ACTIV software keeps track any 'out of lot' load. The ACTIV software manages pallets through the zones by lot. Lot integrity must be maintained when moving from zone to zone. Each lot's dwell time in each zone determines when the load moves to the next zone. If two or more lots are stored into Zone One, then the dwell time of all lots in Zone One is determined based on the induction of the last pallet of the last lot. The time in each zone can be adjusted through a user interface. All automated pallet movement from zone to zone is one-way, (i.e. towards zone 5 at the output end of the system).

Intelligent Product Movement



The Retrotech Advantage

In 2005, Retrotech built its first high volume ACTIV System for supporting palletized blast freezing. The system was designed to suit an application for a 3PL who was looking to increase freezing capability for processed chicken at high rates, in a small area suited to the operation, with low labor requirements, and with full control over the temperature and time of exposure. The project's success, attests to a new way to look at freezer processes being managed by automated storage and retrieval technology in-lieu of roller or chain conveyors.