

Frazier Industrial Company

Frazier's Pallet Mole® provides the right mix of automation technology with racking application to enable top efficiency at new facility



Project Highlights

- State-of-the-art bottling facility & distribution center
- 175,000 square foot building
- 4,720 pallet position Pallet Mole® System
- 9 Pallet Mole shuttles
- Design Goal: To create the most modern, 'lowest cost per bottle' facility in the United States

This National Bottled Water Manufacturer supplies many of the country's largest grocery and warehouse chains with bottled water under 300 different labels from bottling plants across the US. Having enjoyed tremendous success since launching in the 90's, their growing volume created a major capacity challenge at their Midwestern facility. With immediate expansion plans underway, they established an ambitious goal for the new turnkey processing and distribution center operation; to create the most modern, state-of-art, 'lowest cost per bottle' facility in the US.

This impressive goal would steer each and every facility planning decision, including the selection of the material handling system. The company needed

a cost-efficient, high-throughput system that offered storage density, optimal selectivity and maximum productivity, all in a condensed footprint.

Design Goals

The company's plans for their highest velocity processing operation created some unique material handling demands. According to their Vice President, "It really forced the team to think outside the box – With the high speed bottling line queuing a pallet for staging every 1 minute, 45 seconds, the system would have to quickly retrieve the pallet, deliver it to the rack system and return for the next pallet within this narrow time frame, without slowing or shutting down the line or adding additional labor. Every second of pallet handling and travel time was critical."

No stranger to warehousing automation, the company had embraced practically every level of material handling and storage technology throughout their distribution network, from Drive-In rack to highly sophisticated AS/RS systems; each with their own successes and challenges. In order to meet their cost per unit goal, they had to strike just the right balance between technology driven productivity and cost. They evaluated a number of high density, deep lane storage alternatives to find a system that accommodates SKU selectivity, with fast and efficient throughput, at the right cost per pallet position.

The manufacturer produces large batches of 100+ pallets per SKU at a time. The high speed bottling line fills 900 bottles per minute & queues a pallet for staging every 1 minute, 45 seconds.

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Storage Evolution

- **Drive-Thru Racking** was an early choice at the company's distribution centers. It provided a cost effective option for storage density, but couldn't accommodate the required number of SKUs without adding substantial square footage. It was quickly ruled out for this project because of limited selectivity and lower productivity due to additional travel time within the racking.
- Selectivity and throughput were attainable with **Pallet Flow**, but at a cost premium and resulted in an additional 5 ft of building height required on the load-side to achieve the needed pitch. This was not an option since the company would lose the top storage level elevation entirely due to ceiling limitations.
- A **Fully Automated AS/RS Solution** was an option implemented at another of the company's facility. As a business that embraces technology in their operations, they had nonetheless determined that the initial cost and anticipated benefits of a fully automated system were not the optimal fit for their needs.
- A **Semi-Automated, Deep-Lane Shuttle System** proved a good match for another of their facility's processing and distribution model, offering density, SKU selectivity and enhanced productivity with all pallets accessible at the aisle

face. The implementation of a competitive solution resulted in performance issues. This only demonstrated the additional need for a mole type system which would provide a clean, reliable shuttle to minimize downtime and repair costs.

The Ideal Solution – Just the Right Mix of Automation & Application

The choice for this project was narrowed down to two unique high density, high throughput systems – Frazier's 2-wide Pallet Mole System versus a Dual Pallet Drive-In System.

The company had firsthand experience with the advantages of a deep lane shuttle system, but were tempted by possible productivity benefits achieved with a Dual Pallet Drive-In System by handling 2 pallets per move in a high density system. Ultimately, they decided it wasn't the right fit - The system could not accommodate their SKU requirement without the addition of rack bays which would increase travel time and decrease productivity significantly. The project's proposed Dual Pallet Drive-In could potentially store a maximum of 20 SKUs in the provided footprint versus Frazier's Pallet Mole System at up to 160 SKUs.

“What really drove the decision was how fast we could effectively load the system and offload to the truck with a limited number of operators. With a 25-deep, 40-wide Pallet Mole System only feet from the bottling line and the loading dock, we are extremely confident that we'll reach our goal of 20 minutes per truck load”.

- Vice President, National Bottled Water Manufacturer

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Frazier's Pallet Mole System – The Best of Both Worlds

A versatile 1 to 2-wide Pallet Mole System utilizing a 2-wide Cascade forklift attachment offered maximum density, 100% SKU selectivity and optimal productivity. Pallet selection at the aisle face combined with the flexibility to select 2 pallets as needed, all within a fast and reliable pallet shuttle system.

With the Pallet Mole's many reliable components being widely used in the material handling industry, including Curtis AC/DC inverters, motor controllers and brushless AC motors, the Frazier system guarantees ready access to cost effective and readily available replacement components when needed. As the company had learned through their previous experience with competitive products, some mole-type systems utilize a high number of proprietary components which are specific to their products and are both expensive and difficult to obtain.

Implementing the Frazier Pallet Mole Solution

The company's extensive experience with multiple storage and material handling solutions at all levels of automation, allowed them a unique opportunity for firsthand evaluation of long term results to drive their decision. The Pallet Mole System is running efficiently at their new facility, providing just the right

mix of automation technology to help make their 'lowest cost per bottle plant' goal a reality. As an immediate follow up, the company has another facility, and will again implement the Frazier Pallet Mole System, with a 3400 pallet position 2 wide system modeled on this project's design.

The Pallet Mole – How it Works

The Pallet Mole runs underneath the pallet loads on rails, delivering and extracting pallets within a deep lane rack system. Working in either FIFO or LIFO applications, the Pallet Mole significantly improves throughput by indexing loads directly to the first pallet position at the aisle face. Using the RF controller, the operator instructs the electro-mechanical platform to lift, lower, or shuttle pallets to the desired position; or program the system to run various predetermined functions.

The Pallet Mole is an ideal storage solution for a variety of storage, distribution and manufacturing applications:

- Any high volume – low SKU operation
- Food processing & beverage distribution
- Freezer & cooler facilities – high cost per cubic foot
- Production staging areas
- Deep lane FIFO or LIFO systems

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Product System Details

- 4720 pallet position Pallet Mole System
 - 4000 pallet position system for 85 SKUs of bottled water
 - 25 deep, 40 pallets wide (20 bays)
 - 720 pallet position system for gallon line - 10 deep, 18 pallets wide (9 bays)
- Flexible single or 2-wide pick with 2-wide forklift attachment
- 9 Pallet Mole shuttles
- Single Deep Selective racking for storage of stretch wrapping supplies, etc.
- 5-Deep Push-back racking for storage of high volume packaging materials.

Retrofit Frazier Pallet Mole Puts An Existing Facility's Shuttle System Back on Track

Convinced that the simple, rugged design of the Pallet Mole® would exceed their performance requirements, Frazier offered to retrofit a single Pallet Mole shuttle within an existing system at another facility to conduct extensive comparison testing. The Pallet Mole exceeded all expectations - It was faster (at over 300 ft per minute empty travel speed), far more reliable with little to no downtime and ultimately helped the company get back to anticipated productivity levels - Just in time for their new project!

SKU Comparison by System Type

Both single and dual Drive-In systems provide needed density, but limited SKU selectivity (one SKU per bay). With the Pallet Mole System, faster SKUs can be stored/selected 2-wide with flexibility for up to 12 SKUs stored single wide.

