

CASE STUDY
LINEAGE LOGISTICS
SUNNYVALE, TX (USA)



POWERSTORE DRIVES HIGH THROUGHPUTS IN NEXT GENERATION COLD STORAGE FACILITY

THE CUSTOMER

Lineage Logistics, a global leader in cold storage, is not a company to wait for change to happen. They are committed to delivering increased value to customers through innovation driven by data analytics and enabled by market-leading automation.

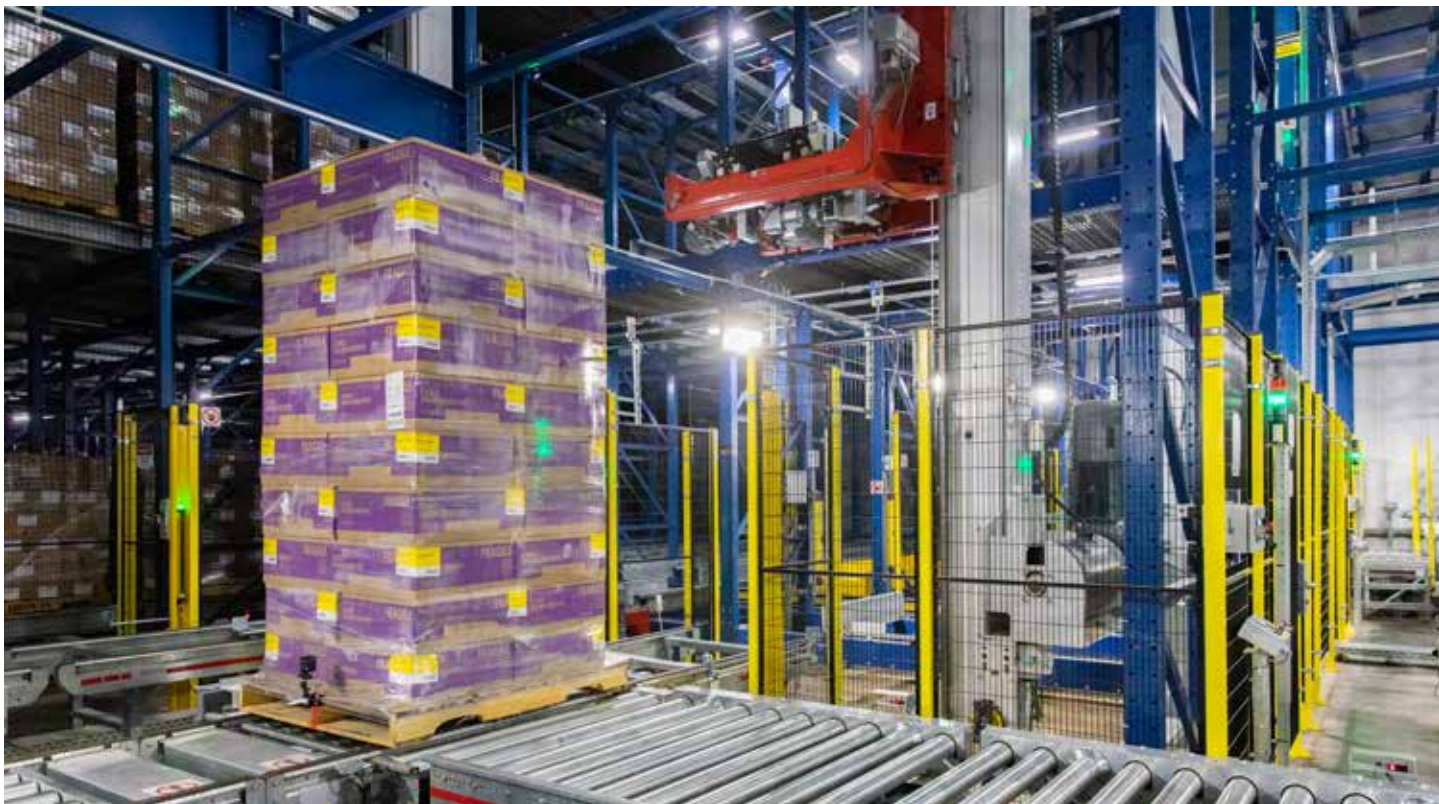
The latest example is the 96,000-square-foot expansion of the company's Sunnyvale, Texas,

cold storage facility. The expansion, powered by Swisslog's PowerStore automated storage and retrieval system, was Lineage's first fully automated cold storage facility in North America and was designed to serve as a template for the company's next generation cold storage warehouses.

"Our results have been very good. From the time we put in a truckload order to the time all the pallets arrive in the ready lane is just nine minutes—faster than the 12 minutes we had in our business case. We expect that to drop to six minutes as we gain more experience."

-Sudarsan Thattai
Chief Information Officer
Lineage Logistics





DEFINING THE FUTURE OF COLD STORAGE

Seeing changes in their retail customer requirements driven by omni-channel sales, Lineage acted proactively to expand the Sunnyvale facility. The facility is located in the Dallas distribution hub, which provides convenient distribution to retail customers in Texas and the surrounding states.

In line with the company's commitment to driving advances in cold storage speed and efficiency, the expansion was designed to harness the power of the world's most advanced automation and robotics warehouse technologies to achieve high throughputs and unprecedented turn times.

"Based on an analysis of movement data across our network, we decided to proactively build an automated expansion to a traditional facility in order to handle high turns without a dedicated customer," said Mike McClendon, President, International Operations & Executive VP, Network Optimization at Lineage Logistics. "We then worked with our partners to design an infrastructure and automated capabilities versatile

enough to handle more than 90% of anything that came through our global network."

"Our customers want to reduce inventory carrying costs, which means increased turns. So today's cold storage facilities have to support high throughputs," said Sudarsan Thattai, Chief Information Officer at Lineage Logistics. "To meet their requirements, we made a strategic decision to pursue full automation, and Sunnyvale represented one of the first opportunities to execute on that strategy."

Based on the analysis of movements and understanding of customer requirements, Lineage designed the Sunnyvale expansion for maximum flexibility and responsiveness. The 100-foot-tall warehouse has a small footprint to optimize efficiency while achieving the density to store up to 24,000 pallets. Most importantly, it was designed to maximize speed. Target throughput rates were 367 pallets an hour with turn times from truckload request to all pallets arriving in the ready lane within 12 minutes.



AUTOMATING COLD STORAGE DISTRIBUTION

At the heart of the Sunnyvale expansion is the PowerStore automated storage and retrieval system. PowerStore is a compact, high density pallet shuttle system capable of meeting high throughput requirements while minimizing worker exposure to the harsh conditions in cold storage facilities.

"PowerStore was the right choice for this application for a number of reasons," said Thattai. "Throughput was obviously the big issue, but we also wanted the redundancy to handle FIFO rotation without impacting throughput, and PowerStore provided that capability."

The PowerStore system at Sunnyvale is the largest ever deployed in a cold storage facility. It includes three modules stacked vertically to leverage the full height of the facility with nine aisle and row cart pairings per module. The system is supported by a full conveyor loop with six inbound lanes and 27 outbound lanes.

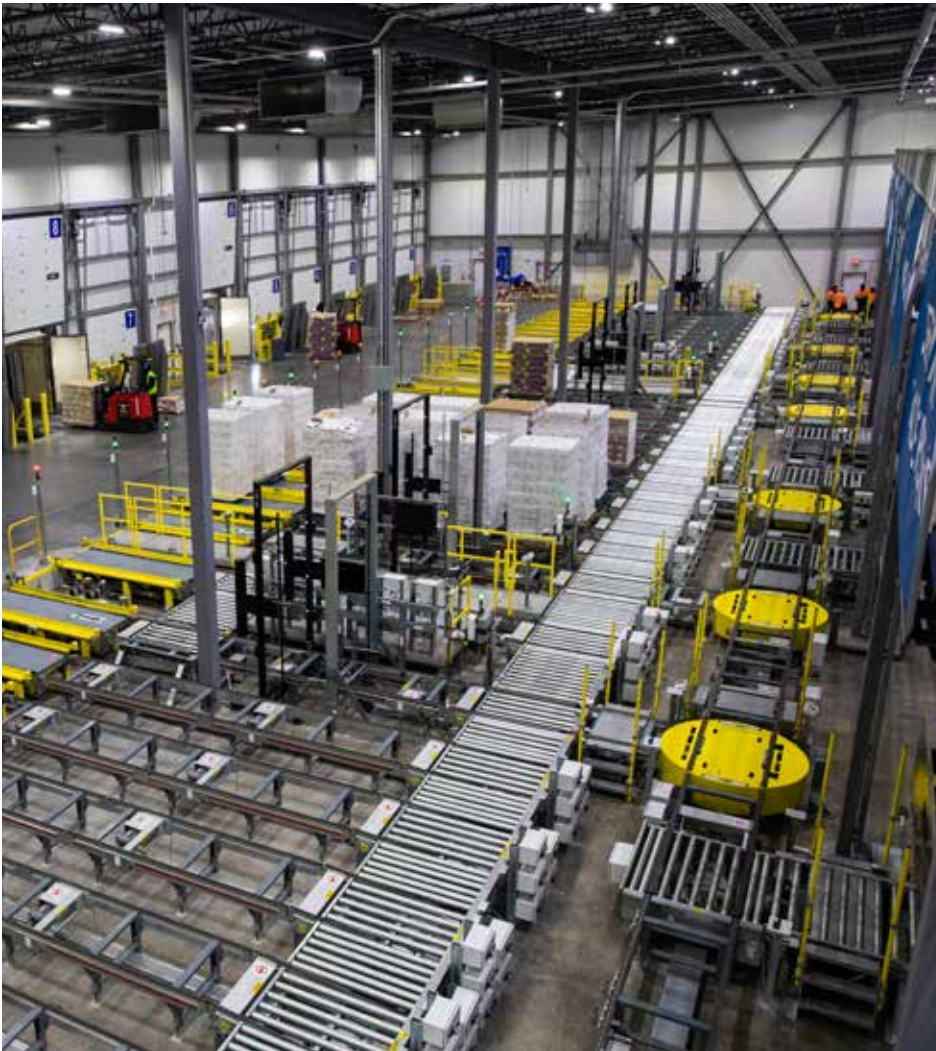
Three vertical lifts support each module: one primary inbound, one primary outbound and one that can be flexed between inbound and outbound depending on requirements. Pallets are stored in rack channels up to 17 deep within a 0° F environment. The PowerStore system is tailored for the cold storage environment with low viscosity lubricants, heated controls and the use of capacitors rather than batteries in the shuttles.

In addition to PowerStore, the Sunnyvale expansion integrates a variety of leading-edge technologies to achieve speed, efficiency and versatility. The facility employs Lineage's own WMS and proprietary control system with algorithms for put-away and pick. It also features a digital yard management system that works with Lineage's mobile driver app to enable full asset tracking and support the exceptionally fast turn times.

"This ability to bring multiple technologies together to work with our algorithms has been a triumph," said Thattai. "The result is we have been able to reimagine cold storage from the ground up and develop a very sophisticated template for future warehouses."

BUILT FOR HARSH CONDITIONS

The PowerStore system is tailored for the cold storage environment with low viscosity lubricants, heated controls and the use of capacitors rather than batteries in the shuttles.



SURPASSING EXPECTATIONS

The expanded facility was opened in January 2020, and through careful planning and continuous collaboration it has achieved design specifications for throughput and efficiency and exceeded expectations for speed.

"This was a very complex project that required integrating a variety of technologies," said McClendon. "In any project of this nature, it's critically important that you bring all the teams together to align on roles and responsibilities, the data that is driving decisions and the capabilities of the system."

"Our results have been very good," Thattai added. "What we are really excited about is the turn times we are achieving. From the time we put in a truckload order to the time all the pallets arrive in the ready lane is just nine minutes—faster than the 12 minutes we had in our business case. We expect that to drop to six minutes as we gain more experience. That's a phenomenal achievement that is made possible through the Swisslog PowerStore system and our algorithms working hand in hand to execute our vision of the next generation warehouse."



FACTS AND FIGURES AT A GLANCE

Building Size	96,000-square-feet	Storage Capacity	24,000 pallet positions
PowerStore Modules	3	Location	Sunnyvale, TX
AisleCarriers	27	Year of Commissioning	2020
RowCarriers	27	Operating Temperature	-20° C
Vertical Conveyors	9	Performance	367 pallets/hr in feed and out feed
ProMove Pallet Conveyor	825 meters	Truck Loading Turn Time	9 minutes

BENEFITS

- **High efficiency:** The small footprint enabled by the density of the PowerStore system means lower energy consumption, better efficiency and enhanced environmental sustainability.
- **Storage density:** The 96,000-square-foot warehouse has a storage capacity of 24,000 pallets.
- **Throughput:** The PowerStore system achieves a throughput of 367 pallets an hour, enabling Lineage to meet its customers' requirements to maintain smaller inventories.
- **Speed:** The PowerStore system is currently enabling turn times of just nine minutes from truckload order to all pallets ready for loading.

