

Lieken bread and bakery company, Lüdersdorf (Germany)

Deep-freeze warehouse -24°C for baked goods



For the baked goods producer Lieken, Körber produced a new high-bay deep-freeze high-bay warehouse. Holistically networked IT processes, universally automated flows of goods between production and dispatch, and the sequenced preparation of goods dispatch has increased the efficiency and throughput of the manufacturer considerably.

Customer

It was its spirit of innovation which guided the traditional baker's trade into the modern world: Fritz Lieken succeeded in using pasteurization to prolong the shelf life of bread dough. He also introduced steel belt ovens to Germany. These are used for baking large quantities of bread with uniform quality. Today Lieken is one of the leading producers of bread and baked goods in Germany. But progress does not stop.

Features and benefits

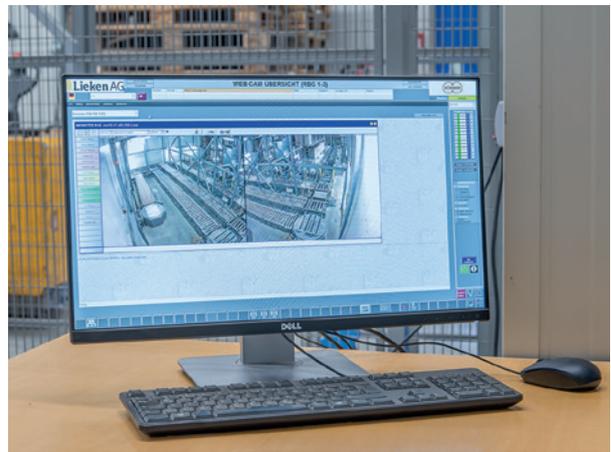
- **Throughput:**
80 pallets/h storage and
100 pallets/h retrieval
- **3-aisles high-bay warehouse with
6,000 storing positions**
- **Ambient temperature:**
-24°C/ -11.2°F
- **Shelving system in silo
construction**



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Customer requirements

Changing market conditions and new baked goods concepts within the business make it necessary to constantly adjust production and logistics. With that in mind, the group launched an extensive restructuring program. In addition to moving the administrative center from Düsseldorf to Dortmund and constructing a new building for the group's production site in Lutherstadt, Wittenberg, special emphasis was placed on an investment package for the production locations in Brehna, Lünen, and Lüdersdorf. In Lüdersdorf the production lines were expanded, and the necessary storage capacities increased by constructing a new high-bay deep-freeze warehouse.

**Special features / benefits**

Within a few months Körber had constructed the high-bay warehouse in a design resembling a silo. All components of this solution were designed for a surrounding temperature well below -24°C / -11.2°F . In this design the struts of the shelving system are simultaneously both the load-bearing elements for the hall roof and the attachment for the side walls. The result is a compact high-bay warehouse with three aisles and 6,000 pallet storage areas for single and double-deep storage. When it comes to deep-freeze warehouses, every cubic meter of enclosed space incurs high maintenance costs. For this reason, the entire facility is designed for optimal use of space, fast processes, and minimal temperature loss. 330 tons of bread and baked goods are produced daily at Lieken's site in Lüdersdorf. With the new high-bay warehouse, the processes between production and dispatch are now completely automated.

It all comes together in an efficient solution with an intelligent material flow concept and an efficient storage and conveyor system. The new high-bay deep-freeze warehouse is now an integrated intralogistics component in Lüdersdorf. The comprehensive interconnection of the processes to the conveyor system control through the IT interfaces, the completely automated flow of goods, and the sequenced provision of goods dispatch via loop and pallet buffer, have increased efficiency and throughput at this location considerably.



Solution

Körber realized a fully automated solution with a high-bay deep-freeze warehouse, new front zones for goods receiving and dispatch, a direct conveyor system connection to production and the inventory warehouse, as well as IT interfaces for the system controls using the warehouse management system installed by the customer and the material flow computer.

Narrow, space-saving storage and retrieval machines with energy-saving recovery systems make for narrow aisles and contribute to the warehouse's energy efficiency. For storage, the HBW has two goods receiving points – one transfer point from the old warehouse and a manual handover point at the refrigeration tunnel in production. For the fully automated handling of the pallets arriving from the inventory warehouse, the pallets are first taken to an installed pallet control position via the new conveyor system.

As they pass through this position, light barriers and grids scan the pallets for any deviations in width, length, and height. Here the pallet weight is determined as well, and its running surfaces checked by controlling the lower boards. The results are transferred to the material flow computer (MFC). In the event of irregularities, pallets are rejected and sent to a manual NOK point where they are then reworked. For all other storable-pallets, both acceptance and storage place assignment are performed by scanning the production label and the appropriate transport request via the MFC. It communicates directly with the SPS controls of the conveyor system components, and provides quick transport of the frozen goods to the HBW.

The same procedure is carried out for the pallets that are sent to the manual handover point. A traffic light indicator signals to employees whether pallets may be placed on the conveyor system or not if the system is occupied. From the handover point, a conveyor section transfers the pallets to the control station; inspection, recording, acceptance, transport request and storage unit.

Integrated components

With the installed roller and chain conveyors, and turn and lifting tables, Aberle designed an efficient material flow solution for Lieken that connects the new HBW with production and the inventory warehouse. Before reaching the HBW, the pallets pass through a conveyor system loop.

This ensures a multiple distribution of the pallets in the warehouse and controls a congestion free transfer to the three storage units of the HBW. Using the same loop, the retrievals from the HBW are



carried out in parallel. During this process, the control system automatically generates additional transports, making priorities - such as fast and direct retrievals during the normal operational processes - possible. For goods dispatch, the MFC calculates the transport times of the conveyor system. The SRMs retrieve the source pallets and transfer them to the conveyor system loop. From there, the MFC sends the correctly sequenced retrieval order of the deep-freeze pallets to two buffer tracks. There, the retrieved pallets are pre-buffered for goods dispatch so that the removal stations can continually supply the truck loading process without waiting times. This guarantees quick retrieval and loading processes and maintains a consistent cold-chain.

Once all the truckload pallets are in the buffer, the MFC issues a transport request to the handover point. The conveyor system directs the retrieval pallets from the buffer tracks to one of two installed removal points, where the pallets can then be manually removed and loaded. After their removal from the conveyor system the controls send a "vacancy" notification or a "discharge receipt" to the MFC, which then records the appropriate pallet as a goods dispatch.

In addition, a visualization of the facilities with the tried-and-tested process management system K.Sight PMS-V provides for continuous transparency of the facility's utilization and processes.





Facts and figures

Industry

Food

Product range

Baked goods

Special features

Deep-freeze high bay warehouse with -24°C / -11,2°F

General contractor scope of delivery

- Shelving system
- Stacker cranes
- Conveyor system
- Automation
- Plant visualization

High-bay warehouse

L x W x H	89 m x 22 m x 17.5 m
Load units	EURO pallets
Storage positions	6,000
Weight	max. 650 kg
Type of storage	single and double depth
Ambient temperature	-24°C / -11.2°F

Stacker cranes (SRM)

Aisles / SRM	3 aisles / 3 SRM
Load handling device:	double depth telescoping
Throughput	31 double cycles/h / SRM

Pallet conveyor system components

- Roller and chain conveyors
- Turntable and lifting table
- 2 layer palletizer
- Automated palletizing

Throughput

- 80 storage and 100 retrieval/h / SRM
- 4,296 pallet movements/day

IT-base

K.Sight PMS-V

Körber Supply Chain Automation

Our impartial consultants will advise on, and help you select, the right automation solution for your organization. We have our own range of competitive products, but we are equally willing to procure and implement other products if they are better suited to your needs.

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