

Benchmark Briefing

Secure Raw Materials Replenishment





Error-Free with RFID

High-bay warehouse and extensive conveying technology secure replenishment supplies.

Bridgestone Europe (BSEU) is an important regional subsidiary of the Tokyo-based Bridgestone Corporation, the world's largest manufacturer of tires and other rubber products. Bridgestone Corporation and its subsidiaries employ more than 140,000 people worldwide, it operates 178 plants in 25 countries, and markets products in more than 150 countries. In addition to tires, Bridgestone develops and produces conveyor belts, hydraulic hoses, rubber sheets, bicycle tires, and golf equipment.

For the Polish production plant in Posen, Kardex Mlog constructed a racking structure for double-deep storage of customized customer pallets with raw materials for the production of car tires.

**Error-free
workflows
with RFID**

**Integrated
quality check
stations**

**Transfer to
AGV and
forklift
trucks**

At a glance

Location

Posen (Poland)

Case

Automated raw materials warehouse for production of car tires

Solution

Automated high-bay warehouse with three stacker cranes of type Kardex MSingle B including conveying technology and service concept



Implementation of automation

Kardex Mlog constructed a racking structure for double-deep storage of customer pallets with raw materials for the production of car tires. Each of these pallets can weigh up to 1.4 metric tons. The steel load carriers, with a floor area of 1,700 × 1,100 mm, weigh 100 kg. The rubber compounds stored on these carriers mean that the load units are up to 1,500 mm high. The highly flammable nature of the material called for an NFPA-certified sprinkler system (National Fire Protection Association).

The scope of supply also included the conveyor system with 98 drives for three floors of the building. The automated storage and retrieval take place on the lower two floors via six conveyor spurs. Whereas the two lower storage levels serve the production area, the upper level with three further conveyor spurs is reserved for quality assurance. The material for inspection can be conveyed to special quality-check stations.

Increased capacity

Bridgestone, the world's largest tire maker, has significantly increased its storage and handling capacity for raw materials at its production plant in Posen, Poland. As a full-service provider, Kardex Mlog supplied an automated high-bay warehouse for customized customer pallets with extensive conveying technology and overlaid warehouse management software. In June 2021, the warehouse solution began productive operation right on schedule.

The structural conditions at the site were challenging. The 31-meter high stacker cranes, each weighing 13 metric tons, had to be maneuvered in one piece through extremely tight spaces and a hole in the roof into the 35-meter high warehouse building. The meticulously prepared operation was one of the final acts in the warehouse extension, which Kardex Mlog carried out for Bridgestone at its Polish production location in Posen between January 2020 and June 2021.

- Tailored technology for customized customer pallets
- Tight spaces during delivery of stacker cranes
- On-time completion in June 2021



3 stacker cranes of type Kardex MSingle B with a height of 31 m each



Conveyor system with 98 drives for three floors of the building



Kardex Control Center control software and Kardex MVisu visualization system



Service package including hotline, maintenance and spare parts supply from the Life Cycle Service business area

Features and background

Barcodes are not a long-term solution in tough production environments. Against this background, Kardex Mlog and Bridgestone opted for RFID-chips to ensure error-free identification of the pallets.

The three stacker cranes of type MSingle B engineered by Kardex Mlog allow a drive speed of up to 240 m/min, which was optimized for the project in accordance with the operating conditions. The single-mast SRMs are designed for loads of up to 1.4 metric tons and they achieve lift speeds of up to 100 m/min. Another feature of the plant is the identification technology in use: At Bridgestone, two RFID chips integrated into the pallet runners ensure trouble-free processes.

"A barcode solution was not feasible because readability of the barcodes could not be guaranteed over several years in the tough production environment," says Manuel Engel from Kardex Mlog Sales. The redundancy of the RFID chips, in contrast, guarantees one hundred percent readability even in the event of failure of one of the two tags, and this would not otherwise be possible in the environment of the metal pallet.



Maximum transparency

The article data stored on the chips is read on storage and transferred to the Kardex Control Center software, which was also supplied by Kardex Mlog, and there it is checked for plausibility against previously received data. Kardex Control Center is a modular warehouse management system, which handles warehouse management and material flow control for raw materials at Bridgestone. Kardex Control Center calculates the optimal retrieval sequence, for example, depending on the use-by date or on the different rubber compounds.

With Kardex MVisu plant visualization, which is an integral module of the Kardex Control Center, the automated conveying technology, including the storage and retrieval spurs and the transfer conveyors integrated into the steel racking, are illustrated graphically.

These transfer conveyors enable transport of the pallets between the individual aisles, which optimizes utilization of the warehouse and makes storage and retrieval extremely flexible. This enables balanced deployment of the stacker cranes and effective load distribution during peak times.

Visualization enables interactive contact with the material flow system – from context-related processing of location data to the information required in the event of a plant malfunction. The warehouse management system is connected with the automation devices of the controls via a standardized interface, which ensures permanent exchange of data between the systems.

Jointly used database

Flexible transfer stations enable connection of the high-bay warehouse to driverless transport systems and to forklift trucks.

The operational connection between production and high-bay warehouse is implemented automatically via automated guided vehicles (AGVs), whose higher-level material flow control is connected to the Kardex Control Center via an interface. Inventory levels are entered in a jointly used database by the Kardex Control Center. Alternatively, driver-operated floor vehicles can be deployed. To enable this flexibility, the transfer stations in the conveying technology were equipped with lifting turntables. This means that the pallets can be lifted lengthways (for forklift trucks) or sideways (for AGVs).

The automated high-bay warehouse was completed by a service package tailored to Bridgestone, which includes a hotline, maintenance, and spare parts supply from the Life Cycle Service business area. In the event of technical problems that cannot be solved remotely, the service technicians from Kardex Mlog's Polish subsidiary (established in 2021) can be on site within four hours. Experience shows, however, that in more than 96 percent of the rare occasions where service is required, remote maintenance is successful. The Life Cycle Service supports logistics plants during their entire lifetime, it ensures maximum operational security, and maintains state-of-the-art technology.