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Knorr-Bremse

Knorr-Bremse AG is the world's leading manufacturer of braking systems and supplier of additional sub-systems for rail and commercial vehicles. Across the globe, Knorr-Bremse's products play a major role in safety and energy efficiency on railways as well as on roads. Around 29,500 highly competent employees in more than 100 locations in over 30 countries are dedicated to keeping customers satisfied worldwide with their products and services.

Within the Knorr-Bremse group, Knorr-Bremse GmbH in Mödling, Austria is responsible for developing and manufacturing essential components for the braking systems of railway vehicles. The company has over 2,000 employees, 1,100 of which are working at the Austrian sites in Mödling, Kematen/Ybbs and Vienna.

KNORR-BREMSE

At a glance

Sector	Manufacturing
Location	Mödling, Austria
Application	World market leader, developer and manufacturer of braking systems and sub-systems for rail and commercial vehicles
Storage system	OSR Shuttle™ Evo with capacity for double-deep and triple-deep storage of various types of containers
Throughput	~800 double cycles/h
Storage locations	15,912 before expansion for 600*400*214 mm (24*16*8 in.) containers and 22,984 in full expansion
Work stations	4 Pick-it-Easy Flex
Software	KNAPP KiSoft One with web services interface to customer's SAP® WM, KiSoft SCADA visualization
Implementation	2021

"We had very specific requirements for this location so an off the rack solution would not be sufficient. We needed a tailor-made system, both in terms of the system performance and in terms of getting the most storage locations into the available existing space."

Jörg Branschädel
Managing Director of
Knorr-Bremse GmbH

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Challenges

Knorr-Bremse implemented a new automation strategy for the entire plant at their Mödling site in Austria to continue producing flexibly and economically. The primary goal of the project was to make more efficient use of existing space by storing small parts more space-effectively and picking goods according to the goods-to-person principle. Before the project was implemented, small parts were manually stored in floored racks, on pallets in high-bay racking and in paternoster systems. The new system was designed to provide higher storage density within the existing building, as well as to address several functions, such as picking, buffering and sequencing.

The solution was to fulfil the following requirements:

- **Picking performance of ~120 order lines / hour / person / station**
- **Buffering 80–90 % of the picked orders for up to 48 hours**
- **Interface with Knorr-Bremse's existing SAP® WM**
- **Conveyors mounted to the ceiling for clear transport paths**
- **Using the existing silo-type building**
- **Different aisle widths for the shuttle system**
- **Supply to various production islands**
- **Consolidating orders from the small parts and pallet warehouses**
- **Sufficient storage density and an expandable system for future growth**

Partnering up with KNAPP

Knorr-Bremse chose a solution from KNAPP that met these demands, with the following technical details:

OSR Shuttle™ with two rack line systems (one double-deep and one triple-deep), 18 levels at first and 26 when completed and 36 shuttles for containers weighing up to 50 kg (dimensions: 600*400 mm, 400*300 mm, height 214 mm) / weight up to 100 lb. (dimensions: 24*16 in., 16*12 in.; height 8 in.)

A ceiling-mounted conveyor system that connects to the existing goods-in area

4 Pick-it-Easy Flex picking work stations where several different picking processes can be done

Connection to the existing goods-out area

KNAPP KiSoft One with web service interface to the customer's system SAP® WM

The KNAPP solution at a glance

The software solution is a KiSoft One with web services interface with Knorr-Bremse's SAP WM. KiSoft is covering all levels of the software hierarchy from warehouse management and control through to machine control.

1 Goods-in

Before being placed into the OSR Shuttle™ Evo, the goods are identified at decanting workstations in SAP-WM, repacked into totes, which are labeled before being transferred to the conveyor system. On its way into the OSR Shuttle™ Evo, the tote is scanned and married to the order. During storage, a maximum load per channel is considered and an ABC storage strategy is followed.

2 Order Start

SAP® WM prioritizes orders which are then sorted through KiSoft One and forwarded to the warehouse control system. The multi-purpose shuttle system differentiates between various order types. These include picking, buffering and sequencing orders for in-house production supply, as well as orders for picking small parts for shipment.

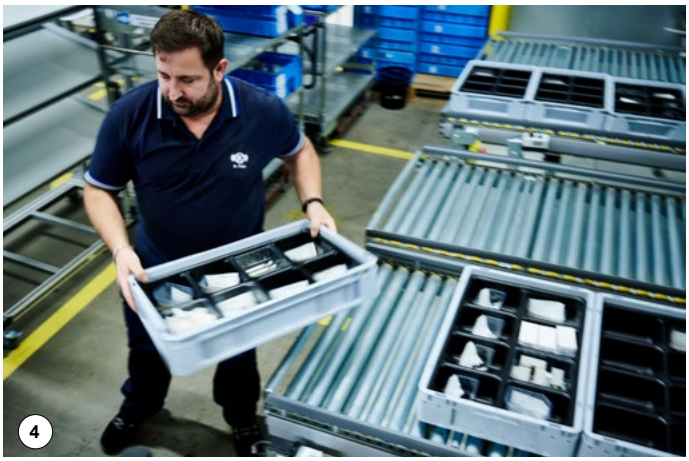
3 Goods-to-person picking

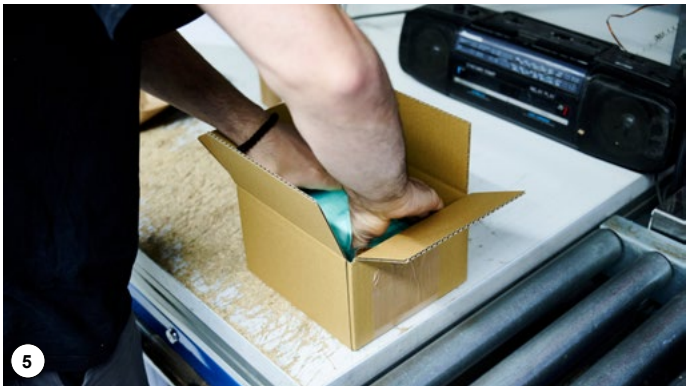
The picking area includes 4 work stations. Picking is perfor-med according to the goods-to-person principle: The containers with the required items are retrieved from the OSR Shuttle™ Evo and supplied to the work stations at an ergonomic height. The easyUse user interface and the Pick-to-Light system optimally support the employees during picking by providing visual indications. Empty containers are supplied to the work stations on a container conveyor line. Different processes are carried out at the same time at the work stations

1. Picking kits for in-house production: At the workstations, orders are assembled for in-house production. These so-called assembly kits are picked into containers, some of which are divided into eight parts. The pre-picked orders are automatically stored in the OSR Shuttle™ Evo and buffered there until needed for the just-in-time supply to production.

2. Picking small parts for other Knorr-Bremse locations: Knorr-Bremse has a global network. Each plant worldwide can access the small parts warehouse and request parts. With the new shuttle system, these orders can be pre-picked and buffered, which evens out the workload. The required items are brought to the work stations and picked into empty containers. The completed orders are either buffered in the OSR Shuttle™ Evo or they continue along the conveyor system until they reach the shipping area.

3. Picking spare part kits for end customers: Another process covered at the work stations is spare parts kitting. Standardized spare parts packages for customers are picked efficiently and conveyed to the shipping area where they are packed and sent out.





4 Sequenced preparation of production orders in the tugger train station

When mounting kits are required in the production cells, a demand is booked. The buffered kits are retrieved in sequence to the tugger train station and positioned on the tugger train (blue containers) or in the trolley (gray containers) in the correct order. The transport to the production cells is carried out either manually or a milk run is made.

5 Shipping small parts and spare part kits

As soon as picking has been completed, the orders are conveyed to the packing area. Here, small parts from the OSR Shuttle™ Evo are merged with larger parts from the high-bay racks and are prepared for shipping.

6 Increasing storage capacity through merging

Merging is carried out at the Pick-it-Easy work stations, which greatly increases storage capacity. During this process, containers with a small quantity of items are combined with containers having the same item. The empty containers generated are then put on the empty container conveyor.

7 Serial number registration

For some orders, serial numbers are required. The employees at the work stations are informed if that is the case. If this is the case, they must either scan a QR code or manually enter the serial number.

“Thanks to the new system, we could significantly improve the transit time between picking and shipping, increasing efficiency. Overall, we increased our performance in the small parts warehouse by a factor of three and significantly reduced costs.”

Jörg Branschädel
Managing Director of
Knorr-Bremse GmbH

Get insights into the solution in this video.

Main benefits of the solution

1. Simplicity
The new OSR Shuttle™ Evo handles standard size containers 600*400 mm (24*16 in.). The Pick-it-Easy work stations are identical, and the picking procedures also follow the same scheme, regardless of whether a spare parts kit or an assembly kit is prepared. In the future, generic goods-out ramps will connect to autonomous mobile robots or directly to a tugger train.

2. Expandability
The OSR Shuttle™ Evo is designed to accommodate future growth.

3.Flexibility
The flexible system can be adapted to changes in the entire value chain. Changing processes and orders is simple and adaptable in short time. The efficient empties management is also very flexible.

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