

KÖHL's automated high-bay warehouse combines three storage types in one.

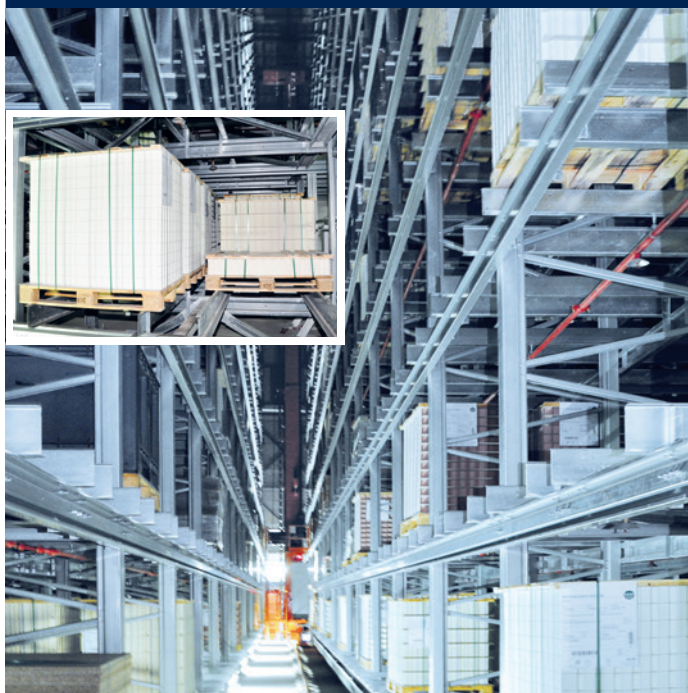
The Mayr-Melnhof Group (MM) is the world-leader in coated recycled cartonboard, as well as Europe's largest manufacturer of folding cartons and invests in the future by the construction of a fully automated high-bay warehouse. The really unique warehouse is separated into three different areas (semi-finished goods, production tools and finished goods) and each works self-sufficient.

The overall scope included the design and planning of the automatic system as well as the rack shelving, stacker cranes, conveyor system, fire protection and rapid action doors, PLC control system, visualization and WMS.

Intelligent und efficient systemintegration -

High-bay warehouse for production tools, semi-finished goods and finished goods.

Channel storage for finished goods: MULTI DEEP



Warehouse Area 1

All order related produced finished goods are stored on pallets in a **multi-deep satellite warehouse**. The pallet packaging line, equipped with strapping- and stretch-wrapping machine, is connected automatically to the entry of the high-bay warehouse.

After checking the weight and the contour as well as the readability of the pallet's ID, the pallets are automatically stored by the stacker crane into the high bay warehouse. A battery-powered shuttle vehicle is used as load handling device, which can place pallets to stock in a multi-deep storage.

The order compilation and sorting of pallets to the corresponding shipping order is organized automatically by the KÖHL Warehouse Management System. For all storage areas the KÖHL WMS communicates with the superior ERP system. The KÖHL WMS is responsible for the inventory management in the high-bay warehouse and makes decisions on all relevant events in the material flow.

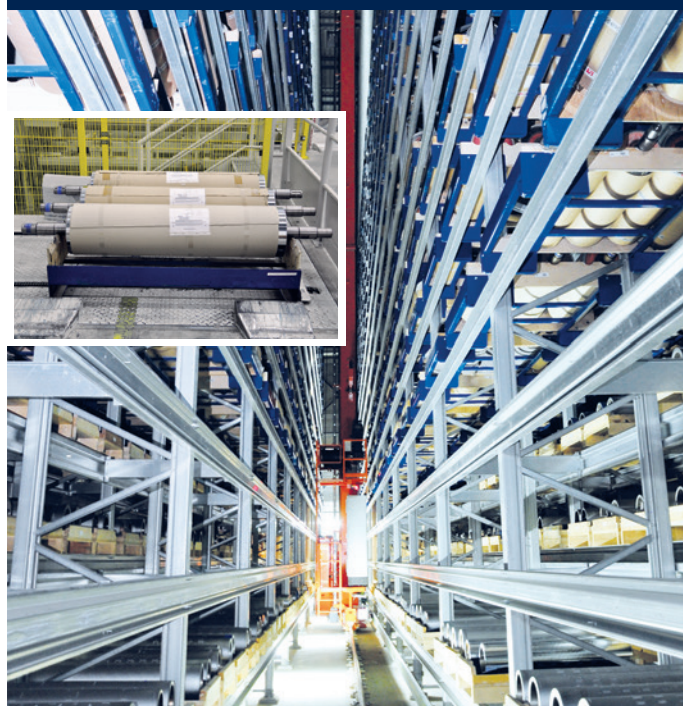
Storage for semi-finished paper rolls: SINGLE DEEP



Warehouse Area 2

In this warehouse area, raw- and semi-finished paper rolls are stored in a **single-deep storage system**. The rollers can reach up to 1.8m in diameter and about 2.0t in weight. The paper rolls are conveyed via an underfloor conveyor system, without using load carriers, and are placed onto special supports in the storage. The design of the supports as well of the telescopic forks ensure gentle and smooth handling of sensitive goods in an automatic system.

Pallet storage for production tools: DOUBLE DEEP



Warehouse Area 3

In this warehouse area, printing and embossing cylinders (production tools) are stored in a **double-deep storage system**. These high-quality tools for printing and embossing are placed and conveyed on special carriers in the automatic system. The KÖHL Warehouse Management System (WMS) communicates with the ERP system and is responsible for the time- and volume-based provision of appropriate tools to the support position. The storage system is designed for bay loads of more than 100 tons, achieved in 27 storage levels.