**Efficient material flow with mobile robotics solution from DS Automotion at Karl Knauer**

**Karl Knauer has been a specialist in cardboard and corrugated cardboard packaging solutions for more than 80 years. With the ‘Kleben 2.0’ project, the company is responding to the ongoing shortage of skilled workers. The aim is to achieve end-to-end automation that optimizes material flow while improving ergonomics for employees. At the heart of the system are the AMADEUS driverless forklifts from DS AUTOMOTION. They take care of the flexible supply of the palletizing stations and internal transport. The system is designed for operation six days a week in two shifts.**

**Continuous material flow**

The process begins with the provision of outer cartons, which are ergonomically delivered to the workstations via a hub lift. After printing and automatic sealing, the products are sent to robotic palletizing. There, the packages are flexibly stacked on different types of pallets and intermediate layers. Finished pallets are automatically discharged and are ready for transport.

This is where DS AUTOMOTION’S mobile robots come into play. Equipped with an intelligent control system, they are directly connected to the palletizing cell software and receive their driving orders automatically. The vehicles navigate using contour-based localization (CBL) and move safely through the production hall at speeds of up to 1.5 meters per second. They transport pallets with unsecured cardboard boxes weighing up to one ton. Between driving orders, the mobile robots, which are equipped with fast-charging pure lead batteries, are automatically recharged. This enables continuous use in multi-shift operation.

**Efficient fleet control**

The algorithm integrated into the NAVIOS fleet manager coordinates transport so that empty runs are virtually eliminated and every trip is used optimally. This significantly increases transport efficiency and reduces the workload for employees.

Three additional pallet magazines from Palomat were integrated to supply the palletizing cells with empty pallets. The robots remove empty pallets directly from the magazine and deliver them to the stations with a positioning accuracy of around 20 millimeters. This ensures a continuous supply of material without manual intervention and minimizes delays in the production process.

After loading, the AMADEUS vehicles transport the pallets safely through hall areas and gates to the delivery point, where they are automatically deposited at the hood shrink wrapping machine. The NAVIOS fleet manager monitors the entire operation, prioritizes orders, plans routes and optimizes the fleet in real time. This ensures high vehicle availability.

**Practical benefits at Karl Knauer**

‘By integrating DS AUTOMOTION’S mobile robots into the material flow, we have achieved a significant increase in process reliability and productivity. Commissioning took around ten months from order to running solution,’ reports Sven Bühler, Head of Gluing at Karl Knauer.

Automation reduces the workload on employees, enables flexible adaptation to different pallet types and production volumes, and makes material flow more consistent. This shortens response times and improves delivery capability.

The decisive factor for Karl Knauer was that DS AUTOMOTION was able to offer a coherent, future-proof concept with a good price-performance ratio.

The ‘Bonding 2.0’ project is a prime example of how driverless transport systems can be used as part of a holistic automation solution to counteract the shortage of skilled workers and sustainably increase efficiency in packaging production.

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|  | **Image DS AUTOMOTION Fleet Control NAVIOS:**  **© DS AUTOMOTION**  System layout in the cockpit of the Navios fleet manager for controlling and monitoring automated processes |
|  | **Image DS AUTOMOTION High-lift forklift AMADEUS:**  **© DS AUTOMOTION**  Dynamic double play: independent delivery of an empty pallet and collection of stacked boxes from the palletizing cell |
|  | **Image DS AUTOMOTION High-lift forklift AMADEUS:**  **© DS AUTOMOTION**  The AMADEUS forklift trucks transport the pallets safely and reliably through hall areas and through gates to the hood shrink wrapping machine, where the pallets are automatically deposited. |
|  | **Image DS AUTOMOTION High-lift forklift AMADEUS:**  **© DS AUTOMOTION**  The material flow of the forklift trucks is designed in such a way that there are virtually no empty runs and efficiency is increased. |
|  | **Image DS AUTOMOTION High-lift forklift AMADEUS:**  **© DS AUTOMOTION**  Dynamic double play: independent delivery of an empty pallet and collection of stacked boxes from the palletizing cell |
|  | **Image DS AUTOMOTION High-lift forklift AMADEUS:**  **© DS AUTOMOTION**  The mobile robots take individual empty pallets from the magazines and deliver them precisely to the stations where they are needed. |

**About DS AUTOMOTION**

DS AUTOMOTIONis a global leader in mobile robotics for internal logistics and assembly applications. With over 40 years of experience, the company develops mobile robots and fleet management systems such as AGVs and AMRs. The company's core competencies are continuously being developed with a focus on state-of-the-art software solutions. Headquartered in Linz, Austria, with branches in Germany, France and the USA, the company employs over 300 people and is part of the SSI Schäfer Group.

Further information can be found at www.ds-automotion.com.