DEMATIC

CASE STUDY

Specialised solution for automated order picking of fresh fruit & vegetables

Netto

Køge, Denmark

For Danish supermarket chain Netto Dematic has integrated an unique system design using completely new developed logistics technology components and high-performance robots, for automated, store-based palletisation of fruit and vegetable crates and cartons: One-touch handling that protects goods, produces high productivity and rapid amortization making the innovative design a specialist solution for automated fresh goods handling.

ORDER STRUCTURE

For the central distribution centre of Netto, Dematic has implemented an innovative solution for automated order picking and palletising of fruit and vegetables in Køge, Denmark, around 30 kilometres south of Copenhagen. More than 70 percent of the order pallets are now picked and packed entirely automatic using the new solution in the central fresh goods handling warehouse for the Danish supermarket chain.

Dematic, as general contractor has equipped the new Netto warehouse with technological innovations, based on the latest robot technology and new material flow components, and with integrated, intelligent material flow control.

TARGETS

- **Higher performance and through-put**
- **Automated handling of fresh goods**
- **Fast, optimised handling processes**
- **Rapid turnaround**
- **Meeting local safety regulations**

THE CHALLENGE

Since setting up the distribution centres in 2003, Netto had been looking for a solution which with a minimum of goods handling permitted a high level of throughput and a high automation level.

In the fresh goods sector of the food trade, an efficient supply chain and an one-touch handling are the primary objectives. Demands from the Danish working Environment authority regarding daily lifting initiated the process of this project. The concept represents particular challenges to intralogistics. This is because process automation, a proven method of crate/ carton handling, had not been feasible in light of the delicate nature of the goods.

THE SOLUTION

The central Netto fresh goods handling centre is one of the most technologically advanced logistics centres in Denmark. At the same time, Denmark has some of the strictest work safety regulations. These regulate, among other things, how much weight an employee can lift in total per shift, and up to what height goods can be accessed. Scissor lift tables used to raise and lower pallets are therefore a typical feature of Danish logistics centres. When handling fruit and vegetables in particular, this meant that it was hard to change anything. The delicate goods needs to be packed manually.

The new Dematic integrated solution is different, however. Dematic initially designed the goods flows for three types of handling units:

- banana-boxes
- fruit and vegetables in open plastic crates
- carton boxes with base 600 x 400 mm

All delivered on pallets loaded up to 2.30 metres high each day in the Køge fresh goods distribution centre. Specific loading gates are assigned to suppliers in collaboration between the Warehouse Management System (WMS) used at Netto and the Warehouse Control System (WCS) installed by Dematic as the interface. After docking, the incoming goods pallets are transferred to a roller conveyor or for allocation to the manual Pick-by-Voice order picking area.

IMPLEMENTATION

The conveyor system distributes the incoming goods pallets onto a conveyor line. It starts with four in-feed conveyor points that leads the pallets to one of the robot cells. The conveyor lanes are both feed and return paths and each lane only carries pallets of just one product. Palletising/depalletising robots operates in the robot cell. When the goods pallets are fed into one side of the cell, the robots picks up one or two of the handlings units, according to the settings in the IT system, so in one operation, it's a quarter or half pallet layer that the robot takes, and puts them onto order pallets.

In this process, the Dematic WCS specifies restrictions for pallet formation such as weight and optimum volume utilisation. A separate empty pallet circulation system was installed for the required empty pallets. This pool consists largely of the empty incoming goods pallets positioned or removed by the robots on the circulation system. The grippers are equipped with an integrated pallet lifting device for this purpose.

There are 15 of these robot cells set up in Køge, meaning that 75 product groups can be picked at the same time. With buffer capacity at each lane there was no need for circulation or overflow paths for in-feed sequencing. This means that the orders can be picked in batches in the robot cells positioned one after the other. This is because the pallet rack circulates to the required robot cells in sequence.

TECHNICAL DATA

- **15 robot palletising cells**
- **Handling or cartons, crates and boxes**
- **Picking of 75 product groups at the same time**
- **Up to 28 different packs per pallet**
- **Robot picks / day: approx. 75 SKU's**
- **Manual picks / day: approx. 50 SKU's**
- **Order processing time: less than 30 minutes**

Pallets are always packed on the basis of a maximum of 28 different packs – in the worst case scenario, this means four stops between the empty pallet and completed shipping pallet to the robot cells. With the new developed and unique gripper head technology it's possible to handle the three basis handling units on all 15 robot cells and by placing fast movers on more robot cells Netto also has achieved redundancy.

The Warehouse Control System (WCS) controls the inward goods deliveries and the shop palletizing on the 15 robot cells and gives an optimized route on the conveyor line.

The store pallets picked automatically in the robot cells are ultimately removed automatically in the pallet stacking guide systems via one of the two driven roller tracks connected at multiple points in the outgoing goods handling direction. In this process, the twin-track conveyor line is used both for loading and unloading the robot cells. The emptied incoming goods pallets are picked up by the robot arms and transferred to the empty pallet conveyor line for ongoing use.

The final highlight of the innovative system design is the outgoing goods handling system. This is located on the second level. Here the picked store pallets are fed in their pallet stacking guides on the roller tracks.

In an exact, predefined position underneath the outgoing goods handling system, the lift pushes the store pallets from underneath out of the pallet stacking guides and onto the second level. This is carried out under precisely one wrapper. To the extent that the pallet is raised and pushed out of the pallet stacking guide, the process of wrapping the pallet with stretch film begins automatically, from top to bottom. The fully wrapped pallet secured for transport is then directed to the outgoing goods area.

RESULT

Since the handover of the system in Køge, 2700 order pallets with fruit and vegetables are assembled for deliveries to around 275 stores each day. The innovative Dematic integrated solution for the automated, priority-led pallet formation, the order processing time the automated fruit and vegetables is designed so that the order can be ready in less than 30 minutes.

A further maximum of approx. 50 SKU's are handled by staff in the manual picking area, completed with order pallets or the order processing is finalised by the feeding in individual packs. For the manual picking area, Dematic has supplied a Pick-by-Voice solution providing the entire communication structure and connected to the WMS, and – in addition to the IT hardware such as the application and database servers – providing the equipment for operative handling with headsets, scanners, radio data terminals and PCs.

Another factor for the success of the solution is the software. The complex operative processes can only be optimised in this way via the range of algorithms used by the software.

The Dematic IT system covers more than just optimal provision with minimal effort for store-based picking or stored settings for safe and stable pallet assembly. The software also automatically handles empty pallet management, calculates the order processing priorities and more in real-time, provides the optimum load equalisation between automated and manual picking by order profile or supplies the label stations on the stretchers with the necessary label printing information.

SCOPE OF SUPPLY

- **Integration of high-performance palletising robots with special gripper systems for fully automized pallet picking and packing**
- **Conveyor systems**
- **Manual Pick-by-Voice order picking area**
- **Integration of Dematic Warehouse Control System**
- **Resident service contract**

Proven low-maintenance conveyor technology components, the latest technologies for automated processes and a powerful IT system designed to meet all requirements and a two year resident service contract make the Netto system prepared for the future.

In addition to the fast, optimised handling processes, the system design from Dematic has provided Netto with additional free space for dispatch preparation and also leaves options for further increases in incoming goods and throughput.

With the system now installed in Køge, Dematic has implemented a comprehensive total concept for automated, store-based order picking of compiled ranges of fruit and vegetables, that is the only system of its type worldwide.

ABOUT THE CUSTOMER

Netto is a Danish discount supermarket operating in several European countries and is owned by Dansk Supermarked Group. The first Netto store opened in Copenhagen, Denmark, in 1981. At first the items sat in boxes and on pallets, but the chain quickly expanded, and the service level increased as well. Today there are 430 stores across the country.

CUSTOMER BENEFITS

- **Order pallets with fruits and vegetables are automatically assembled for deliveries to stores each day**
- **Approx. 75 SKU's are processed each day in the robot cells**
- **Approx. 50 SKU's are handled by staff in the manual picking area each day**
- **Integrated solution for the automated, priority-led pallet formation**
- **Optimum weight and volume utilisation through Dematic WCS specifications for pallet formation**
- **Order processing time of less than 3 minutes**
- **Compact system design provides additional free space for dispatch preparation and also gives options for further increases in incoming goods and throughput**
- **Design, supply of components, innovations and IT from a single source**
- **Two year resident service contract**
- **Ergonomic design meets Danish safety reglations**

Power the Future of Commerce.

If you are interested in learning more about this topic and how we can help, please contact us.

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