# Case study: HAVI
Technology improves warehouse productivity, storage efficiency and energy consumption

Country: Portugal

HAVI has invested in a modern, high-tech logistics centre in Portugal that supplies its food service customers in the country. The center is divided into three areas that operate at different temperatures: -20°C, refrigerated and ambient. Mecalux has supplied all the storage systems, featuring two automated warehouses, pallet racks, drive-in racks and the Pallet Shuttle system. In addition, it has deployed the Easy WMS warehouse management system that has been interfaced with the HAVI WMS to align stock control and the goods dispatching sequence.

Storage systems and zones
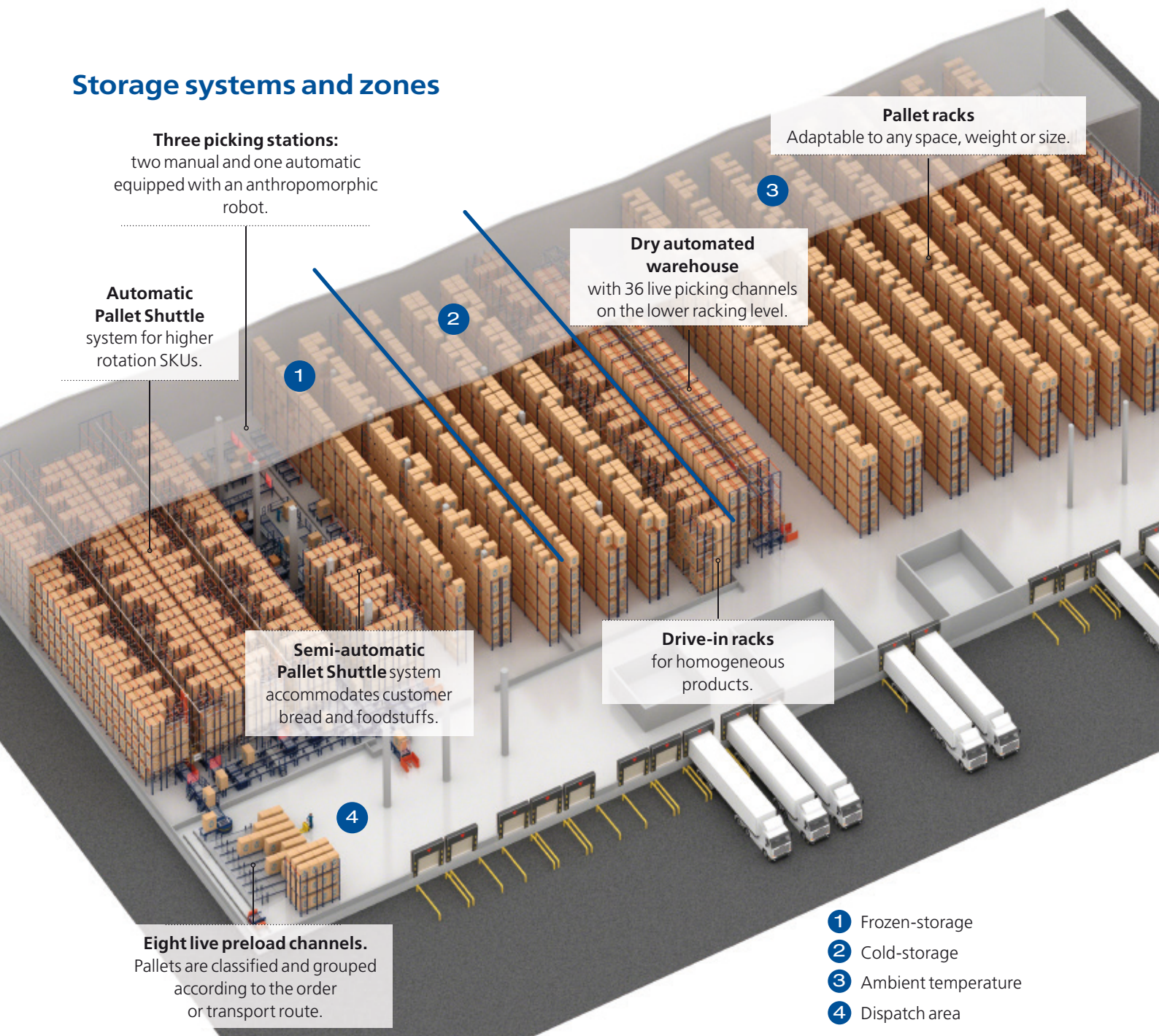
Three picking stations:
two manual and one automatic equipped with an anthropomorphic robot.

Automatic Pallet Shuttle system for higher rotation SKUs.

Pallet racks
Adaptable to any space, weight or size.

Dry automated warehouse
with 36 live picking channels on the lower racking level.

Semi-automatic Pallet Shuttle system accommodates customer bread and foodstuffs.

Drive-in racks
for homogeneous products.

Eight live preload channels.
Pallets are classified and grouped according to the order or transport route.

1 Frozen-storage
2 Cold-storage
3 Ambient temperature
4 Dispatch area

About HAVI

HAVI is a global, privately owned company that focuses on innovating, optimising and managing the supply chains of leading brands. Services range from analytics, logistics, supply chain management, and packaging. Founded in 1974, HAVI partners with customers in more than 100 countries. In Portugal, HAVI customers in the food service sector include global players such as McDonald's, and domestic brands such as Portugalia.

HAVI's strength is its operational excellence in service, safety and quality. It is a leader when it comes to ensuring restaurants have what they need, when they need it. To deliver this promise, HAVI's logistics centres must have fast, efficient operations, as well as a comprehensive control over all goods, with a focus on shelf life and quality standard.

A modern efficient and sustainable warehouse

Mecalux's technical department and HAVI joined forces to design, construct and commission a modern logistics centre in Vila Nova da Rainha, Portugal. This will be the distribution point for supplying HAVI's customers in the restaurant industry throughout the country. The two multinationals have already worked together on other projects, forming a solid team. For example, Mecalux installed an automated warehouse for HAVI in Moscow, Russia. Movirack mobile pallet racks were also set up in the centre that the company owns in Lodi, Italy.

The new logistics centre in Portugal, with a combined surface area of 10,000 m², has been split into three zones to store and manage goods according to their characteristics: frozen, refrigerated and ambient temperature. Each storage zone has a specific layout based on logistics needs. For this reason, Mecalux has installed both automatic and standard storage and picking solutions.

The common denominator between all these solutions is their operability and reliability when it comes to managing stock.

The speed they provide in storage and order preparation tasks stands out. Overall, the centre is a technological point of reference and a pioneer in automated -20°C logistics processes.

Pallet racks are the only storage system installed in all three areas. The system was chosen because of its adaptability to any type of load, weight and volume. In addition, the direct access it provides streamlines merchandise management.

Pallets are picked directly from the lower storage levels with the help of radio frequency (RF) devices. In contrast, the palletised reserve stock is placed on the upper levels of the racks.

Mecalux prioritised the safety of the goods and operators when designing each storage solution. It is essential to respect and not break the cold chain so that food reaches the customer at a controlled temperature. Accordingly, the access points to the frozen- and cold-storage chambers are insulated, preventing sudden changes in temperature, cold loss and condensation.

Automation also increases warehouse safety because 77% of the pallets in the freezer movements are handled totally automatically. What is more, ergonomics are enhanced when handling goods and physical effort is decreased. The system also means operators need to spend less time working in the low-temperature environments, simultaneously reducing energy consumption by 10% thanks to a lower number of freezer door openings and better insulation of the chamber.
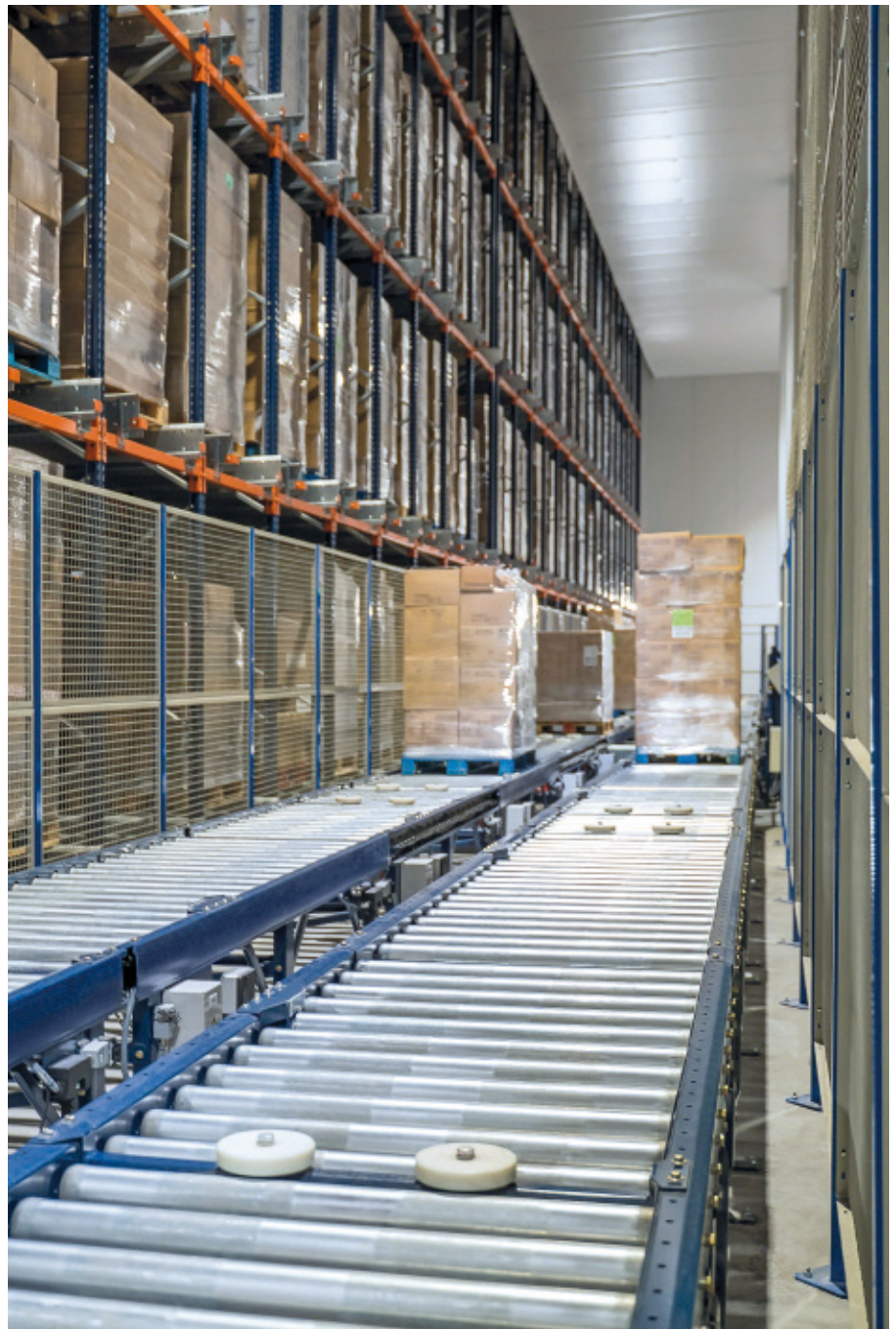
> **Havi spokesperson**
>
> *"We have greatly reduced the manual movements going on in the warehouse. Consequently, the risk of accidents is low. Plus, we have won hands down in volume fluctuation management, shelf life control and order reliability."*

The put-to-light device shows the number of SKUs to place on each pallet. Once the process has been completed, the operator presses the button to validate their picking. This system provides high operational agility, reduces errors in order preparation and enables real-time stock updates by transmitting all information to the WMS.

Frozen-storage installations

The frozen solution is equipped with a modern automatic Pallet Shuttle system operated by two stacker cranes and managed by Easy WMS software. Higher rotation SKUs with products such as hamburgers, chips, chicken products etc. are housed here. *"A big part of our total volume delivered to restaurants is prepared in the freezer,"* according to a HAVI representative. The warehouse, which operates at -20 °C, has twin aisles with two blocks of racks. Overall, the six-pallet-deep storage lanes provide capacity for 2,247 pallets with an increased occupancy of 75% compared to a normal racking system.

The automated Pallet Shuttle system optimises storage space and reduces the volume to be chilled. This not only maximises storage capacity but also saves on power costs for keeping the installation below zero. *"In addition, our vision was to improve the efficiency in that area and, at the same time improve the working conditions of our employees,"* a HAVI representative pointed out.

The warehouse operation is completely automatic. The two twin-mast stacker cranes that run here transport the goods between the in-warehouse entry and exit points to the storage channels. Meanwhile, the shuttle shifts the goods inside the channels. All this is managed and supervised by Easy WMS, which is responsible for providing full traceability of each product and controlling warehouse stock. An interface with the HAVI WMS also ensures full traceability from reception of goods up to customer delivery.

A conveyor circuit has been installed right next to the warehouse. It moves the goods to the picking area at a constant 20 m/min, all according to the 'goods to man' principle. *"We obtained better working conditions with two 'goods to man' stations,"* a HAVI spokesperson reported. Orders sequenced by Easy WMS are either prepared jointly or separately in two manual and one automatic picking stations, depending on each order's requirements. To do so, a shuttle connects the three picking stations, as well as the stretch wrapping and labelling area.

The automatic picking station is equipped with an anthropomorphic robot that handles full layers of high rotation products representing 40% of the total volume prepared in the freezer. The big advantage of this type of machine is their delivery speed, since they can prepare several orders simultaneously and handle many layers of

Easy WMS manages and sequences order preparation and sends the packages to the dispatch area, where they are sorted according to order or route

pressing the PTL device.

The transfer car then collects the finished orders and takes them to the stretch wrapper and labelling machine. Afterward, conveyors move these packages to the dispatch area. This zone, which is also kept at a controlled temperature to prevent cold chain breakage, comprises eight live preload channels. Here, pallets are classified and grouped according to the order or transport route. Keeping track of the sequence and pre-grouping into preload channels saves time and minimises errors when loading goods onto the lorries.

goods safely. Automatic picking delivers speed, safety and operational cost savings, even more so in the frozen-storage installations.

The two manual picking stations automatically receive the goods from the conveyors when they arrive from the warehouse, or with transfer cars from the anthropomorphic robot. In both cases, the goods to man principle means fewer trips and faster order preparation. In each station, which is equipped with pick-to-light (PTL) technology, the operator can prepare up to eight customer orders simultaneously in an ergonomic way. This results in higher productivity and work quality. Easy WMS tells operators on screen which tasks they must perform to keep the orders sequenced, what products to extract and in which order to place them, and so on. Once finished, the worker notifies the WMS by
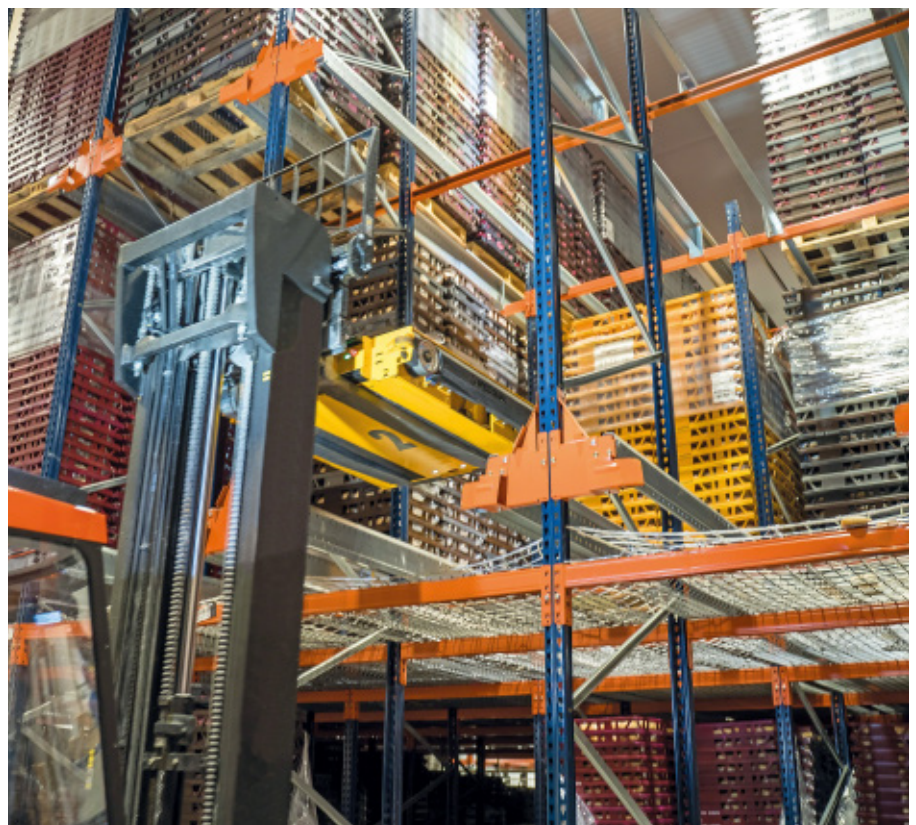
Goods kept safe. The dispatch area also works at a controlled temperature to not break the cold chain. Additionally, retainers, brake rollers and other devices installed in the preload channels automatically control pallet speeds and stops, without jamming or collisions.

A block of compact racks with the semi-automatic Pallet Shuttle system in the freezer store (with capacity for 237 pallets) accommodates customer bread and foodstuffs. This solution, which also optimises the storage area, has a motorised shuttle that moves the pallets inside the channels automatically. However, unlike the automated warehouse, the operators with reach trucks must place the shuttle and the goods in the corresponding channel.

Cold-storage installation

Apart from pallet racks, Mecalux has installed a block of 9 m-high drive-in racks that provide storage capacity for 1,996 pallets. The racks are mainly used to hold products, like tomatoes, as well as ready-made salads etc. It is an optimal solution for storing homogeneous products and a large number of pallets per SKU. The racks comprise a set of four high-level lanes. Meanwhile, each level has support rails on both sides where the pallets are placed. When managing the loads, operators use reach trucks to enter the storage lanes with the goods raised above the level where they are going to be deposited.

Ambient temperature installation

In this area – dedicated to products such as bottled water and other beverages, ketch-up, mayonnaise, toys, packaging etc. – there is an automated warehouse with capacity for 530 pallets. It consists of a single aisle with 10.2 m-high, double-deep racking on both sides. A twin-mast stacker crane is responsible for moving products down the aisle, from input conveyors to the locations assigned by the WMS.

On the lower racking level, 36 live picking channels that coincide with the working aisle have been installed. Each channel can hold four pallets of the same SKU: one for picking and the other three for reserve stock. The operators, using RF terminals, locate the SKUs that comprise each order and pick items off the pallet closest to them.

When a live channel runs out of the palletised goods, the WMS orders the stacker crane to replenish that channel with the corresponding merchandise. The advantage of this system is that the products for picking are always on-hand, preventing delays and stoppages in the order processing.
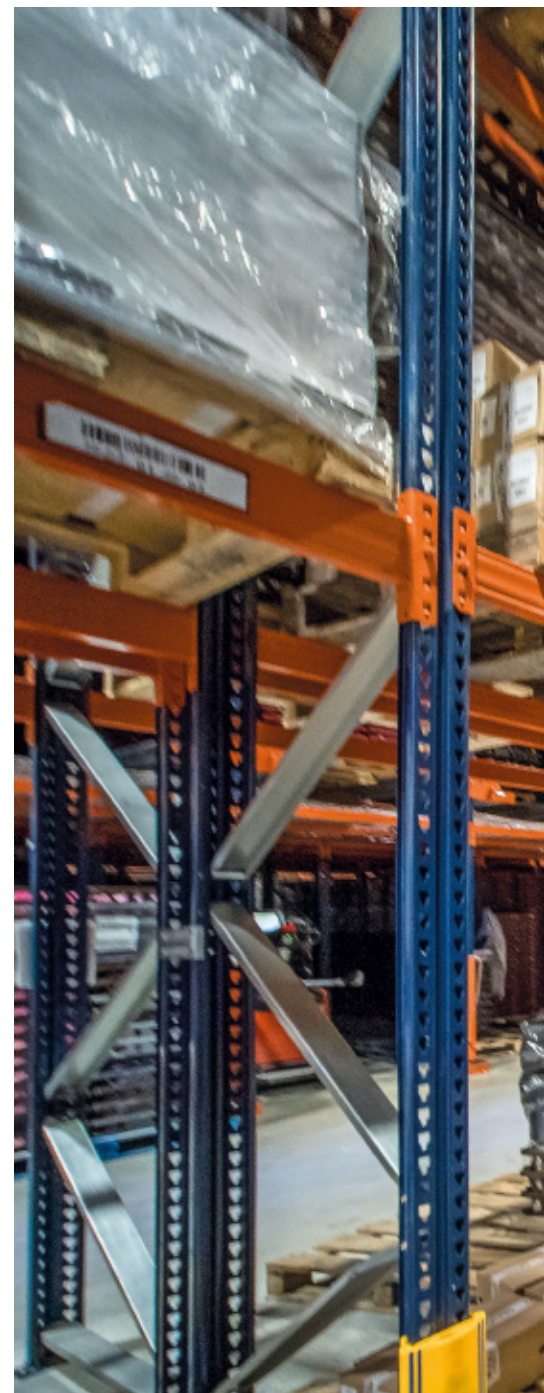
Easy WMS: sequencing and merchandise control

HAVI's two automated warehouses (the freezer store and the ambient installation) are run by Mecalux's Easy WMS warehouse management system.

In the automated warehouse with Pallet Shuttle, Easy WMS identifies items when they arrive at the warehouse. It then assigns them a location based on their stackability and typology. The system offers total traceability, knowing the exact location of all goods in real-time. The WMS also organises the order preparation. On the one hand, it instructs which SKUs to send to the picking stations and, on the other hand, it tells the operators which products comprise each order.

Easy WMS carries out all these tasks considering a key HAVI prerequisite: order sequencing. Grouping and sequencing the goods for dispatch avoids errors, speeds up operations and allows the company to offer a more efficient service.

Easy WMS executes the stacker crane movements in the ambient temperature installation. Its job is to supply the live picking channels with needed goods when they empty out.

Easy WMS is interfaced with the HAVI WMS that is responsible of the full stock control, traceability from supplier to customer and sequence of all distribution centre processes.

Technology to serve customers

In short, HAVI has invested in a modern, high-tech distribution centre with efficient operations. It is ready to supply restaurants promptly and on demand. Automation has not only streamlined warehouse flows, it has also reduced logistical costs and improved the working environment for operators. Importantly, the equipment also allows HAVI operators to learn new skills.
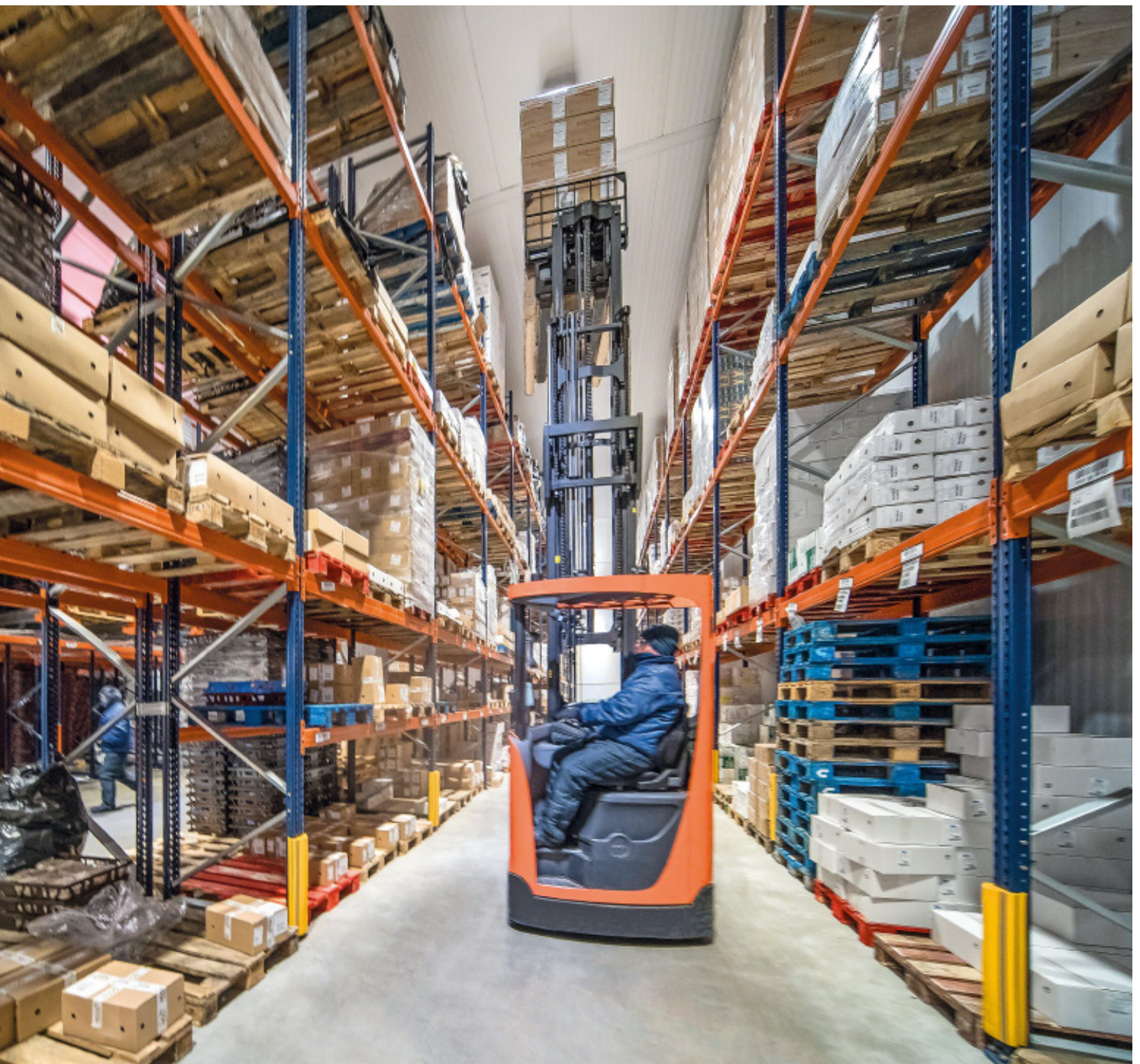
Advantages for HAVI

- **Sorting goods:** the warehouse has been designed in three zones, where different storage solutions have been enabled for efficient warehousing and management of goods.

- **Order sequence:** Easy WMS is responsible for sequencing the orders to be prepared and sending them to the preload area, where they are sorted by order or transport route.

- **Technology and safety:** all the technological elements installed here mean the warehouse complies with the highest safety standards both in terms of the goods and the operators.

- **Great place to work:** HAVI has modernised its working environment, making it a more attractive place to work for operators who can learn new skills when operating the technology and the installation.

Technical data

Pallet racks

Storage capacity	6,341 pallets
Pallet size	800 x 1,200 mm
Max. pallet weight	1,000 kg
Racking height	8.5 m

Automatic Pallet Shuttle

Storage capacity	2,247 pallets
Pallet size	800 x 1,200 mm
Max. pallet weight	1,000 kg
Racking height	10.3 m
Max. pallet depth	6
No. of shuttles	2

Semi-automatic Pallet Shuttle

Storage capacity	237 pallets
Pallet size	1,000 x 1,200 mm
Max. pallet weight	1,000 kg
Racking height	7 m
Pallet depth	5

Drive-in pallet racks

Storage capacity	864 pallets
Pallet size	800 x 1,200 mm
Max. pallet weight	1,000 kg
Racking height	8.5 m
Storage levels	4

DRY Automated warehouse

Storage capacity	530 pallets
Pallet size	800 x 1,200 mm
Max. pallet weight	1,000 kg
Racking height	10.2 m

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