

Logistics Solutions for Advanced Cold Storage

MECALUX



The refrigerated logistics sector is increasingly looking for ways to implement and optimise industrial freezer storage units that require temperatures bellow 0 ˚C.

The optimal solution for these storage units would be to fully automate them, requiring no human personnel. Due to the chamber size of many of these units, full automation is not always affordable or possible.

In addition to conventional storage solutions, as outlined on pages 54-55, other advanced solutions applied to cold storage units are:

- **Maximise room capacity**, optimising the freezer space to achieve efficient energy use and profit growth.

- An easy **accessibility to goods**, depending on product rotation.

- **Removing human personnel from storage spaces** or reducing the number to just the essential.

- **Proper control of the stored product**, which ensures an accurate inventory, despite an increased rotation and demand on traceability.

To help facilitate operations in industrial freezer units, the following improvements can be made:

- Robots may relocate freezer pallets to a warmer space that is more inhabitable for employees.

- Maintain and organise a high rotation of goods using an automated rack capable of preparing single or multiple box storage in low-temperature environments unsuitable for employees.



- Use voice-order preparation equipment (pick to voice) that allow for the hands-free handling of goods.

It is essential to remain agile and minimize handling time when loading orders into transport trucks. The ability to move products waiting to be loaded instead of having trucks load in a different location is important. Having preloading areas where orders are held and moved according to the period in which they are to be delivered is also important.

To do this, rollers or chain conveyors best facilitate moving goods in or out of the industrial freezer units.

When designing a freezer space, the management software used to monitor and organise the unit is just as important as the shelves themselves. Easy WMS is a powerful tool that Mecalux offers to customers working with both simple storage and picking solutions to the most complex warehouse automation.

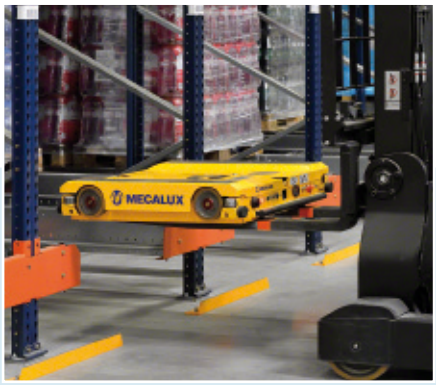
The solutions presented in this catalogue are taken from actual facilities and should be used only as examples. With individual cases, a number of optimisation factors are taken into consideration when designing the freezer space.

Mecalux's technical team feature extensive logistical and cold storage experience and have been dedicated for over 50 years to creating the perfect solution to your freezer space.

Index of Logistics Solutions



Movirack Mobile Pallet Racking
Page 6



Drive-in Pallet Shuttle
Page 10



Automated Drive-in Pallet Shuttle
Page 14



Self-Supporting High-Capacity
Page 28



Picking Operations
Page 30



Automated Picking Depalletizer
Page 34



Single-Mast and Double-Mast Automatic Stacker Cranes
Page 18



Automatic Internal Transport
Page 22



Self-Supporting
Page 26



Combination of Different Systems. Case Studies
Page 38



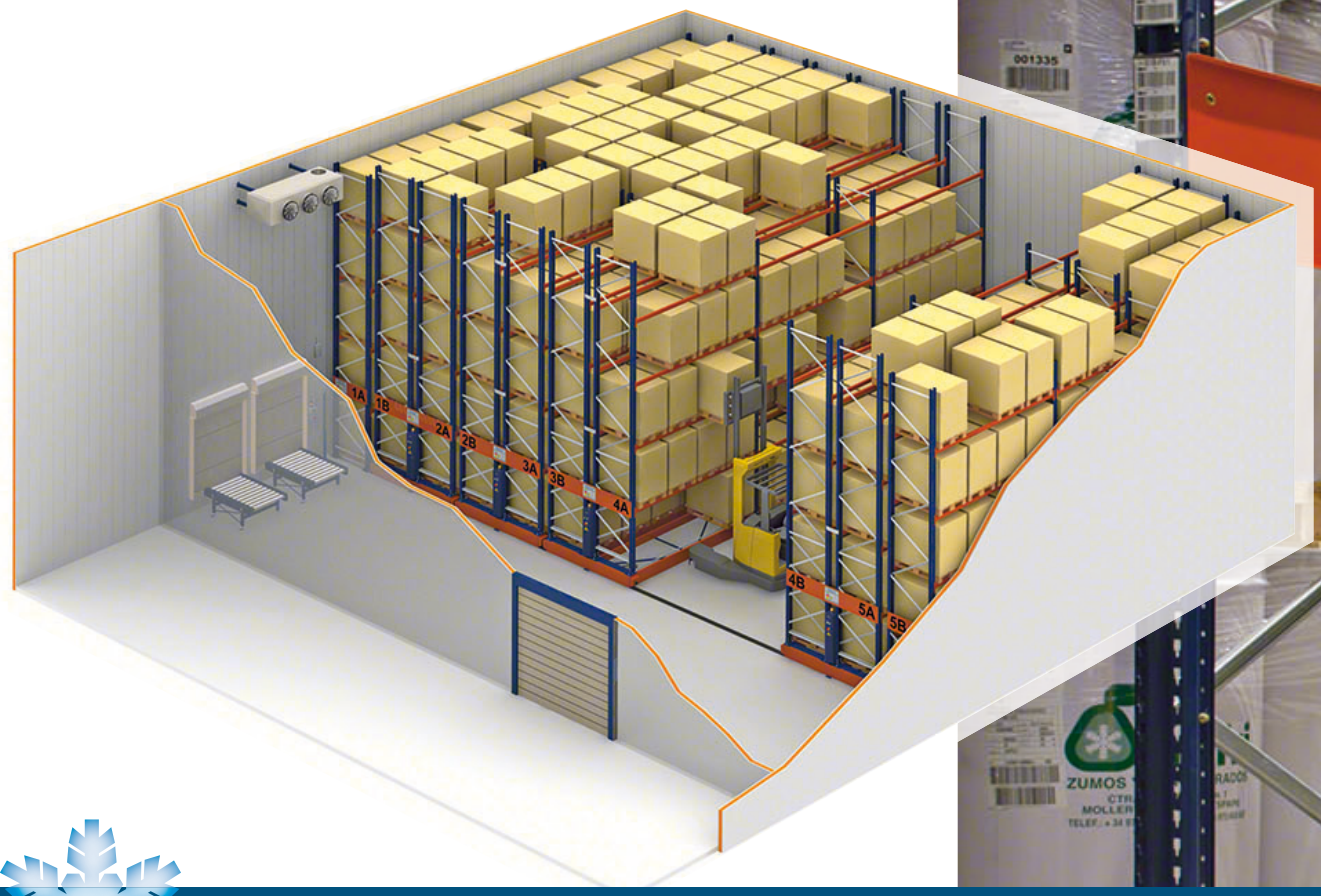
Automated Warehouse for Boxes
Page 52



Conventional Systems
Page 54

easy wms

Easy WMS, Warehouse Management Software
Page 56



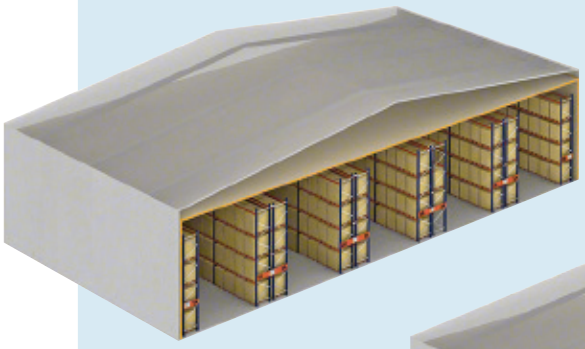


Movirack Mobile Pallet Racking

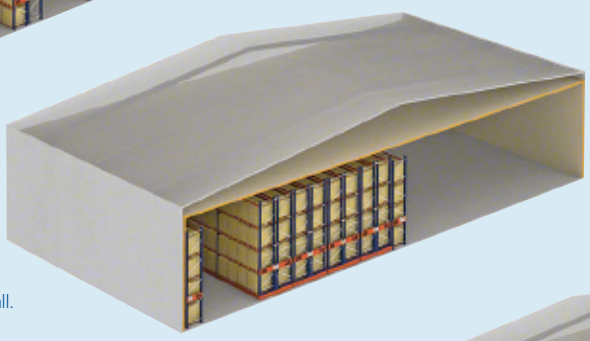
The Movirack system is suitable for refrigerator or freezer shelving installations.

This system is characterized by:

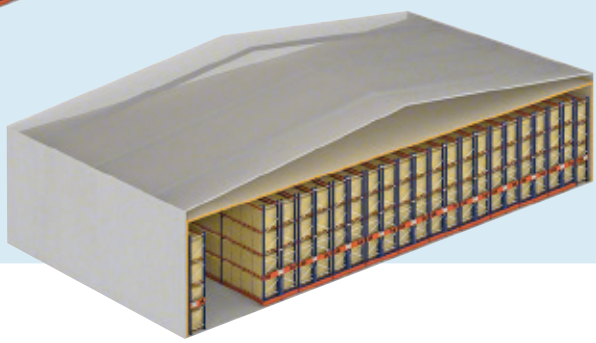
- Being a **compact system** with a quick return on investment.
- **Maximising the capacity** of your cold storage space. The shelves are mobile and need a working corridor.
- Have **direct access to each pallet**; suitable if there are only a few pallets per SKU.



1) **Cold storage with conventional pallet racking.**



2) **Cold storage with mobile bases.** Occupies less space within one hall.



3) **Warehouse mobile bases.**
Takes advantage of all space, increases significant storage capacity (80 to 120% more than with conventional pallet racking).



- **Consume less energy** or distribute the same amount of energy over a larger number of stored pallets, thereby reducing the per-pallet energy cost.

- **Improved air circulation in the downtime** with the parking option. Maintain shelf separation and create equidistant spaces between each shelf.

- **Use conventional trucks**, which will allow direct access from storage front to the different locations on the shelf.







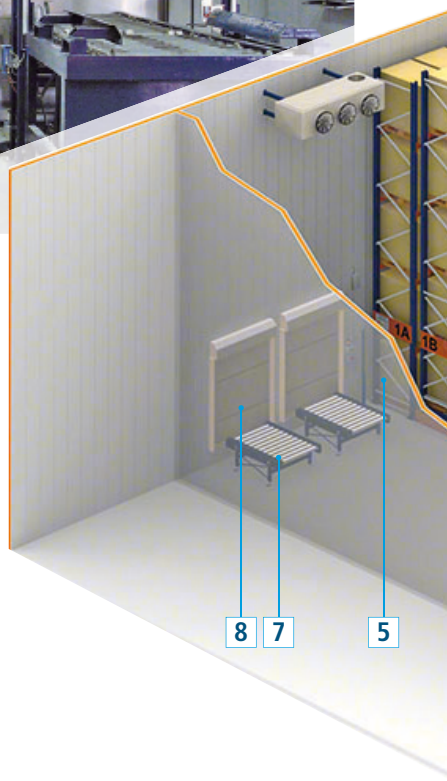




The bases are placed on rails moving laterally closing off the aisles.

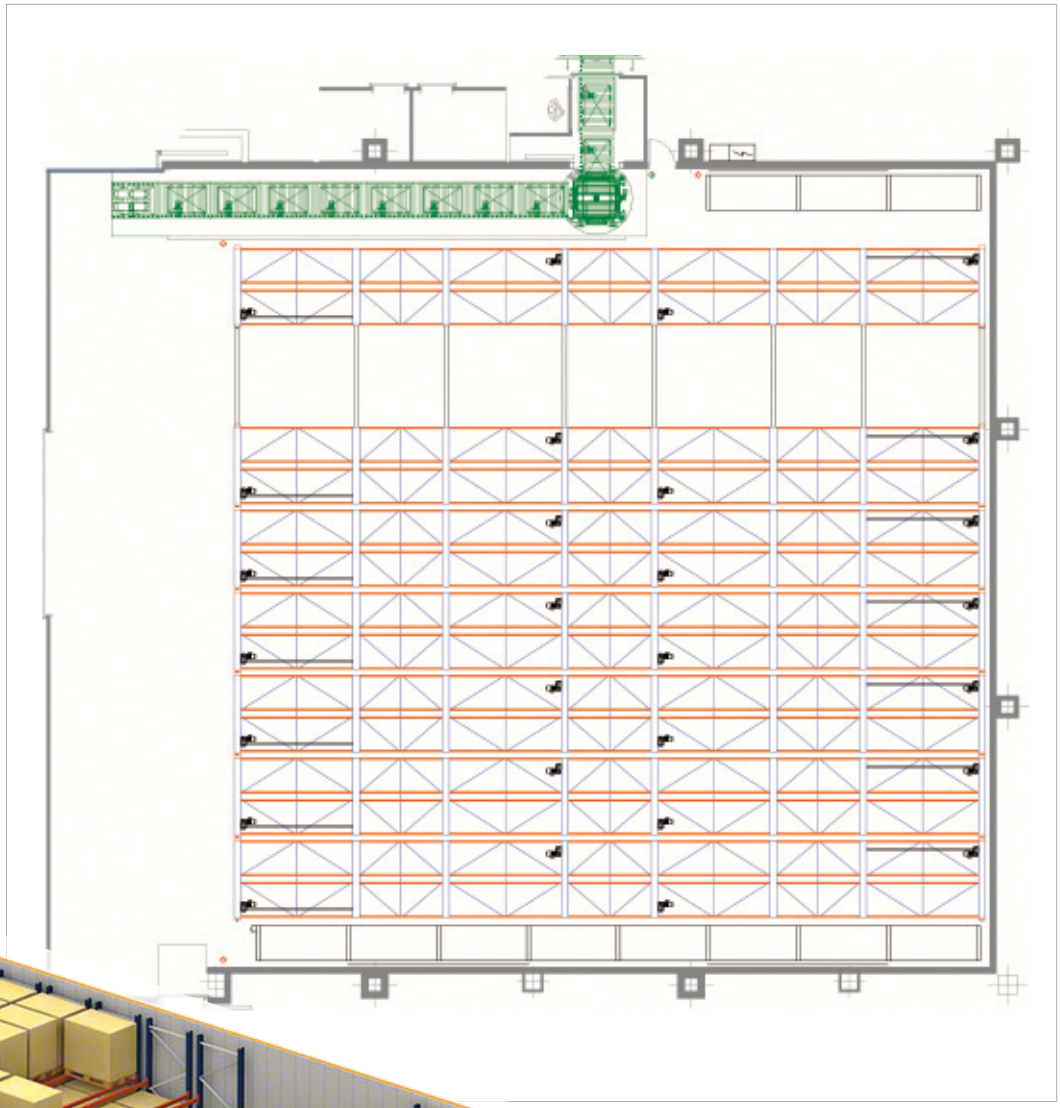
The operator may control the signal either by remote control or by a manual switch.

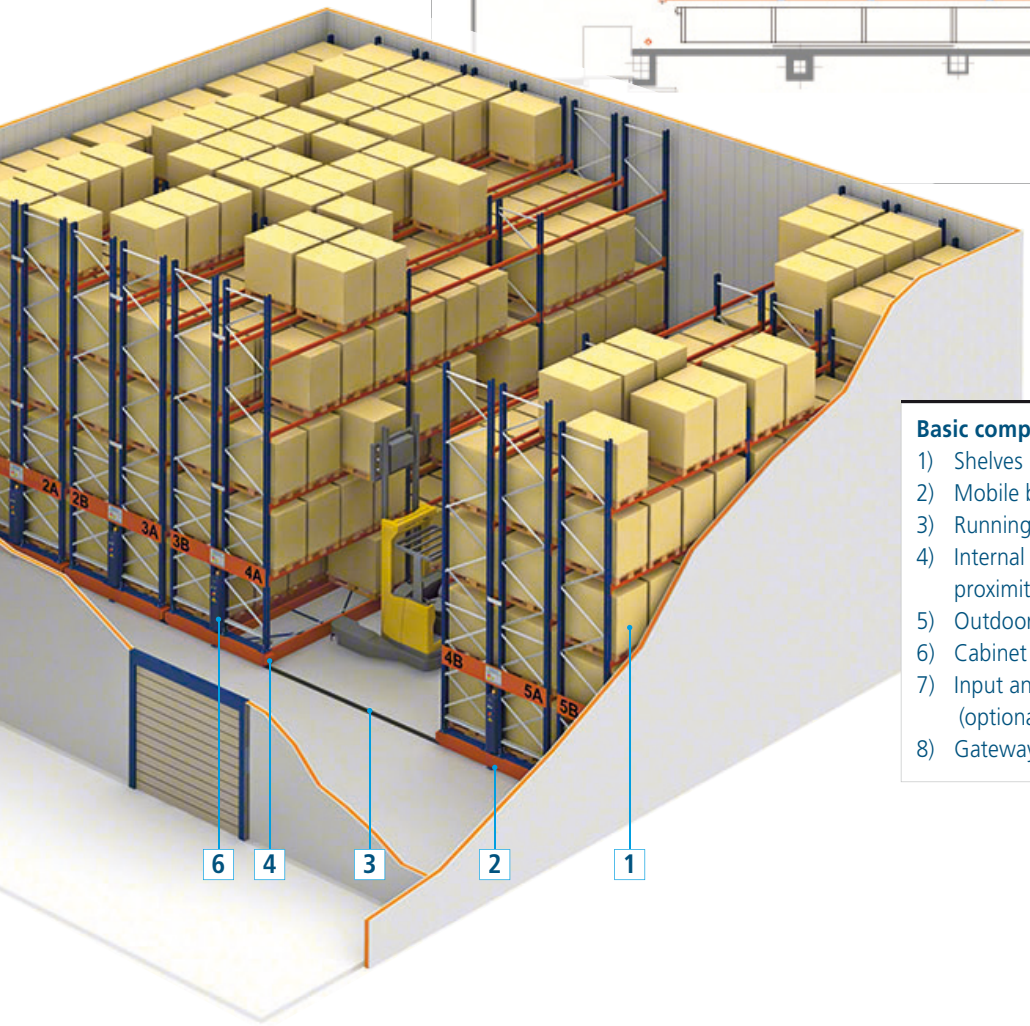
The mobile bases have other elements of travel, electronic equipment and various security systems that guarantee safety and effectiveness.



Palletizing on mobile bases illustrates the significant increase in capacity achieved with this system, although the type of truck, the size of the installation and the necessary number of open aisles is unique to each installation.

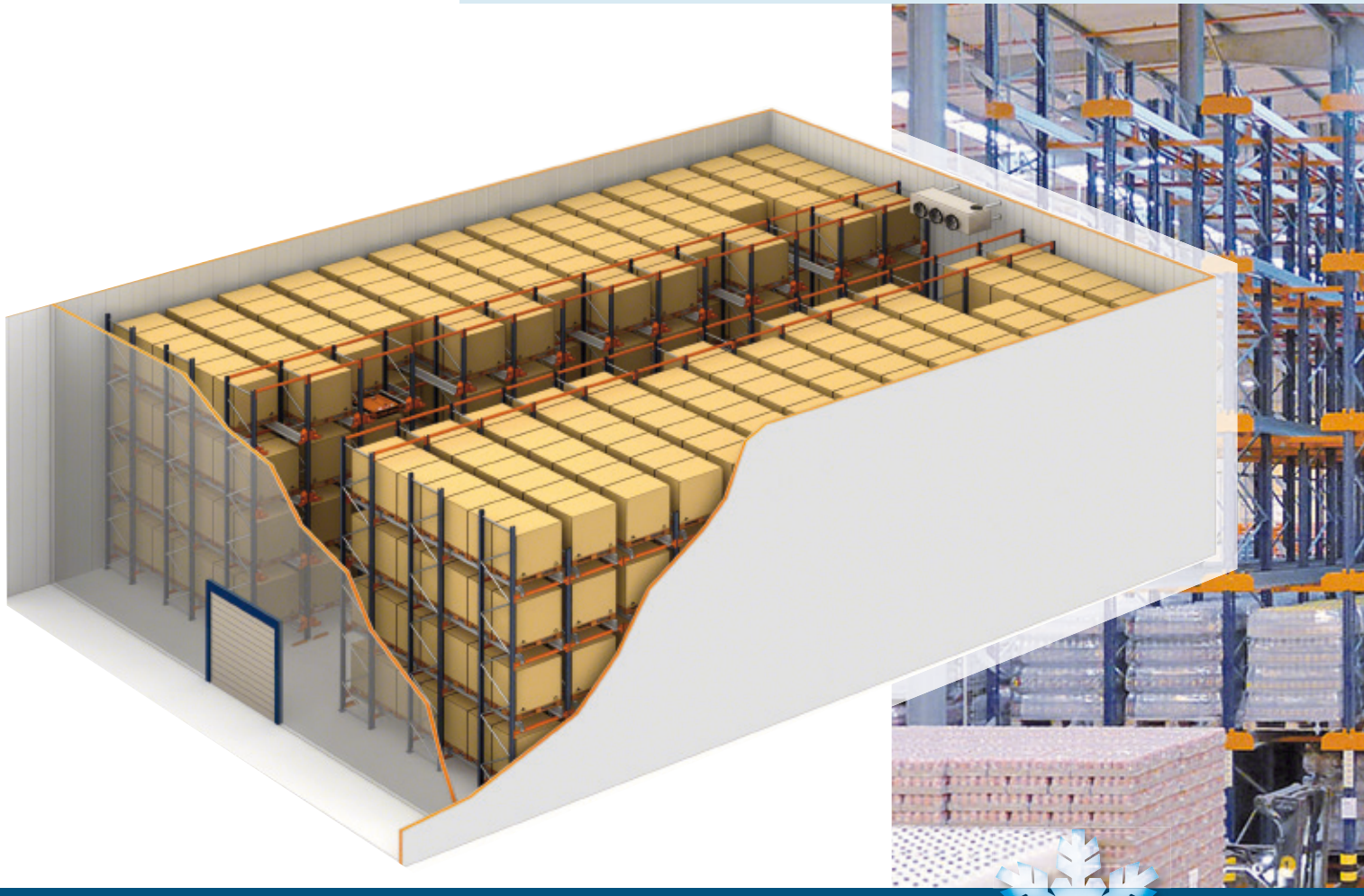
A cost effective that many moving storage units utilise is to use conveyors to insert and remove the pallets from the storage space. This reduces the time and energy spent maneuvering trucks.





Basic components

1) Shelves
2) Mobile base
3) Running track / guide rail
4) Internal security barrier proximity photocell
5) Outdoor safety barrier
6) Cabinet embarked
7) Input and output conveyors (optional)
8) Gateway: SAS (optional)



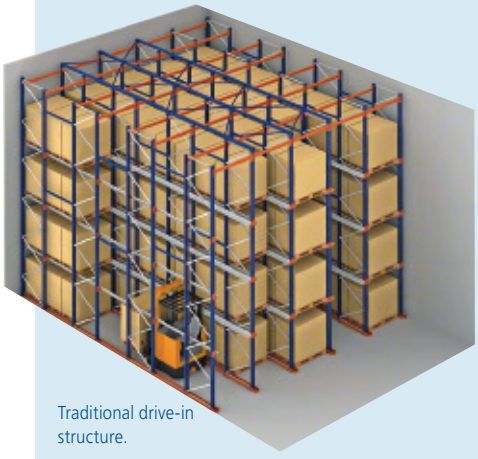
Drive-in Pallet Shuttle

This is a semi-automated pallet storage system that uses a small Pallet Shuttle to move between shelves independently and load pallets in storage aisles without the use of a forklift.

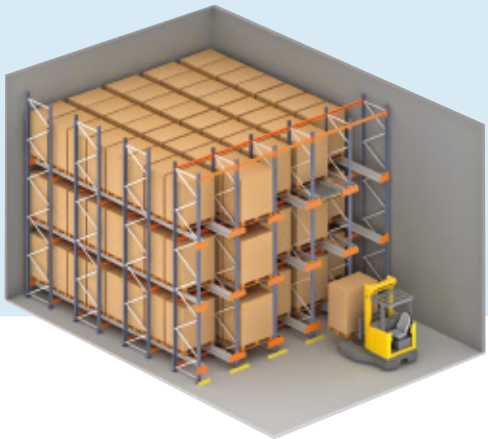
Its structure and operation make this system ideal for use in refrigerator or freezer units or storage spaces with low ceilings.

Its characteristics are:

- Increased **maximum capacity** within a drive-in storage system.
- **Reduced time** to load pallets. The Pallet Shuttle retrieves pallets, thereby reducing the truck's necessity to go into the aisle.
- **Increased number of references stored**. Allows different references stored for each module (each corresponds to a reference level).
- **Reduced risk** of accidents.



Traditional drive-in structure.



Drive-in Pallet Shuttle structure.



- **Decreased shelf damage**. By not having to enter trucks, shelf damage such as scratches, dents or general metal damage, is greatly decreased.

- **Future growth**. Input and output flow increases rapidly with each car added.

- **Increased productivity**. While Pallet Shuttle runs a command, the operator searches for another palette, creating a smooth and continuous process.

- **Compatible with various sizes of pallets**. Optimise the drive-in space in the different size pallet aisles, but always with the same width.



Automated operating systems combined with Pallet Shuttles enable fast and accurate loading and unloading of storage. The truck leaves the load on the rails and the Pallet Shuttle moves over them, independently, depositing it in your location.
The operator directs the movement and transfer of loads through a remote control.





Safety and Control

The Pallet Shuttle is able to move independently, powered by inbuilt electronic elements (PLC, batteries, antenna, etc.). Advanced safety systems have been built in, in compliance with current regulations.



Control System

The semi-automated system with Pallet Shuttle is very simple to use, since the operator only has to select the desired work mode using a WiFi control tablet.

The tablet incorporates intuitive, easy-to-use software, through which advanced functions can be controlled for up to 18 shuttles.

There is also another, simpler version which is radio-controlled. In this case each shuttle only receives orders from the corresponding controller.

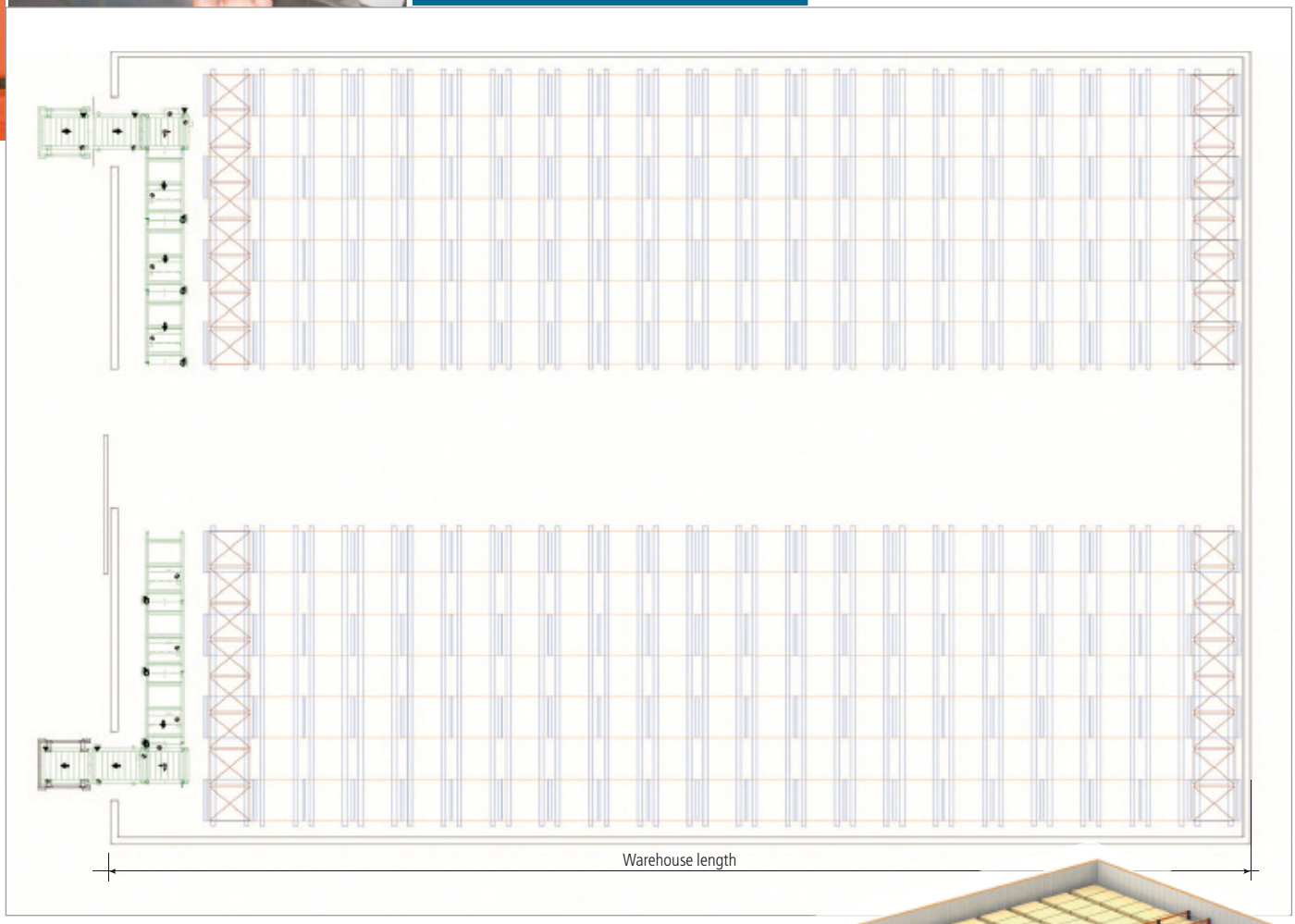


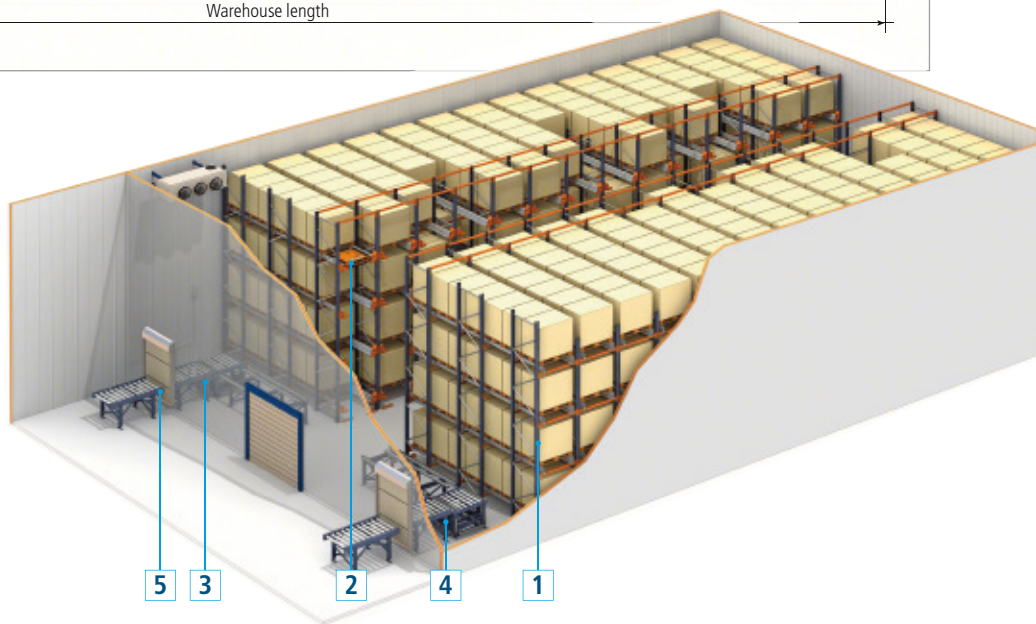






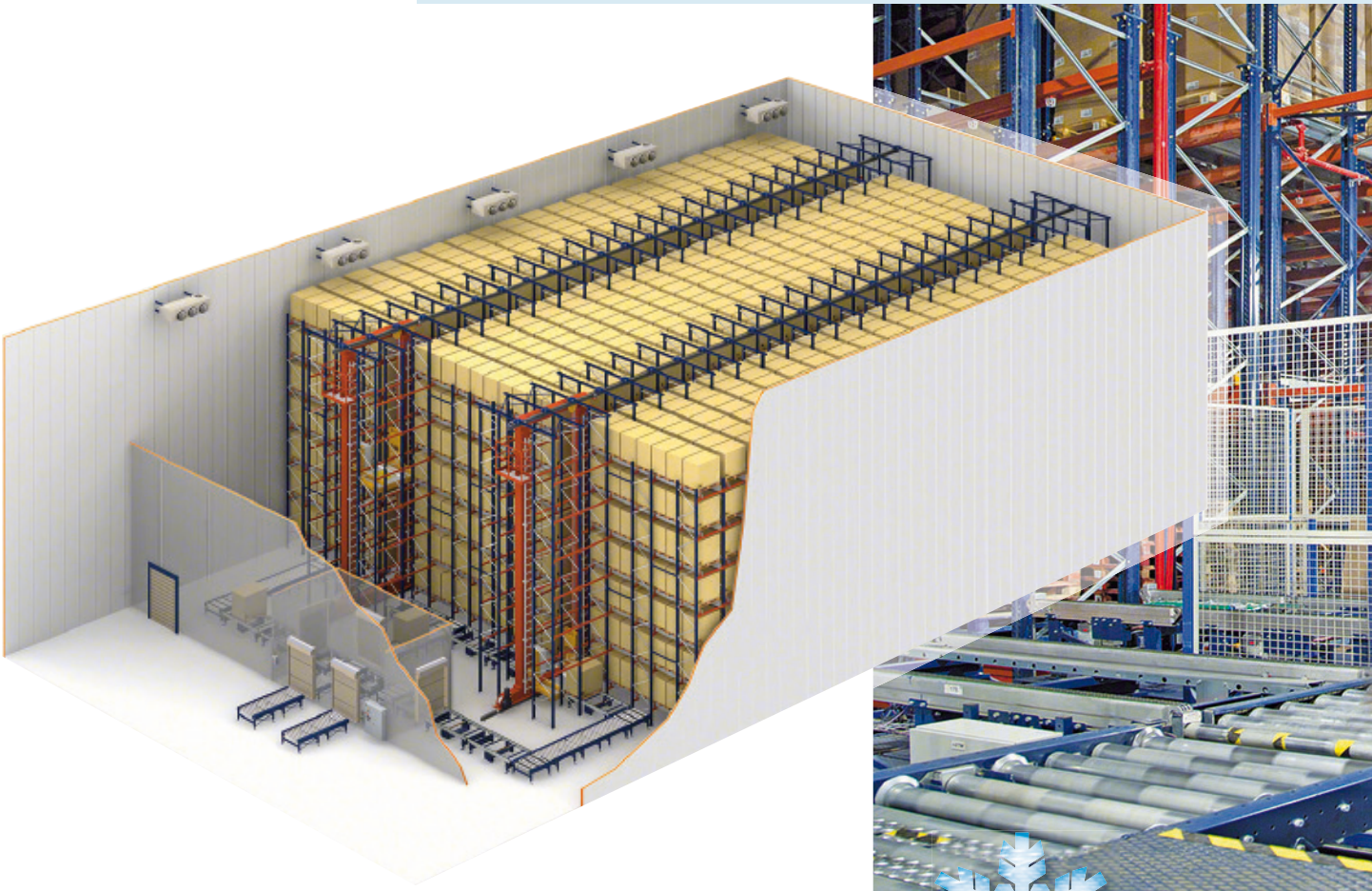
Application example
of a storage area with two
Pallet Shuttle conveyors, one
input and one output.
This will optimise operator
execution times.





Basic components

1) Pallet Shuttle system
2) Pallet Shuttle
3) Input conveyor (optional)
4) Output conveyor (optional)
5) Gateway: SAS (optional)



Automated Drive-in Pallet Shuttle

This is a compact crane for an automated warehouse, which includes a Pallet Shuttle to organise the pallets within a storage aisle.

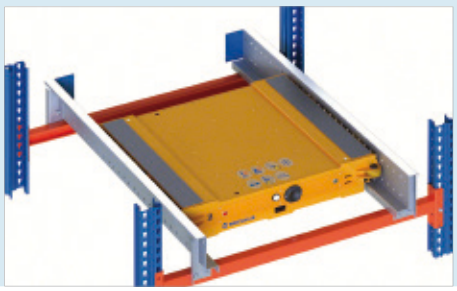
This mobile cart is equipped with a lifting system that moves under the loads inside the shelf on runners, allowing loading and unloading pallets at locations up to 12 m deep.

The system is ideal for high storage spaces or storage spaces with a high volume of pallets per SKU.

System advantages:

- **Minimizes** unused storage space.
- **No staff** inside of the storage space.
- The Pallet Shuttle transport **supports special pallets** of different widths.
- The **direct power** prevents battery recharge.
- **High productivity**.
- An **appropriate system** for recording large numbers of pallets.
- Automated movement increases **maximum safety**.
- **Build up** to 40 m high.

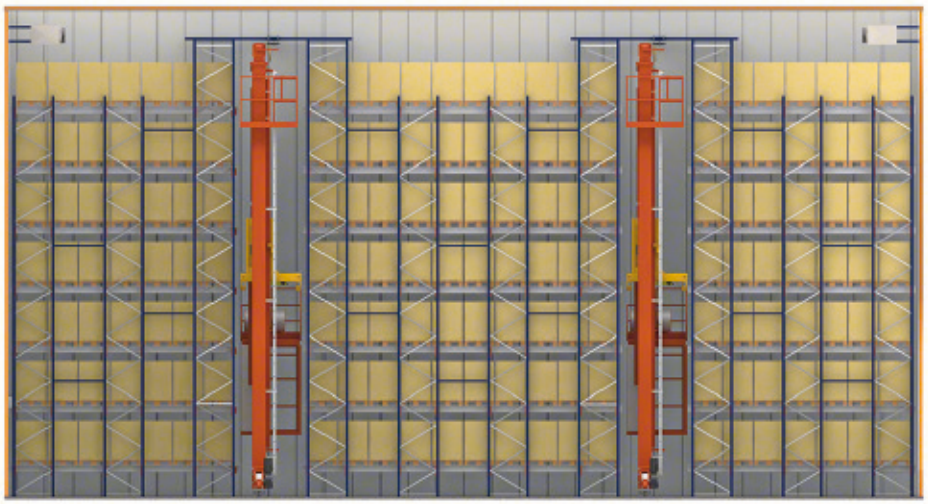












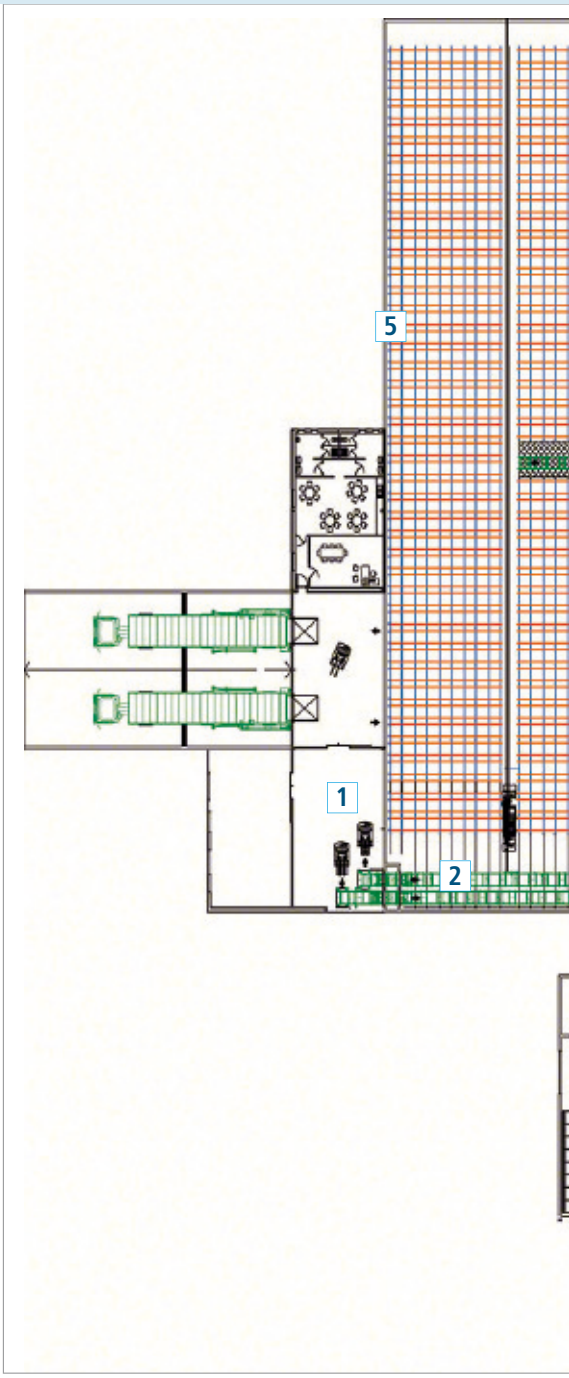
This system facilitates a dense storage block of pallets, containers or cages of various widths.

Drive-in storage systems with Pallet Shuttles are typical of systems which require very high yields, a high turnover of products and where it is essential that space is maximised.

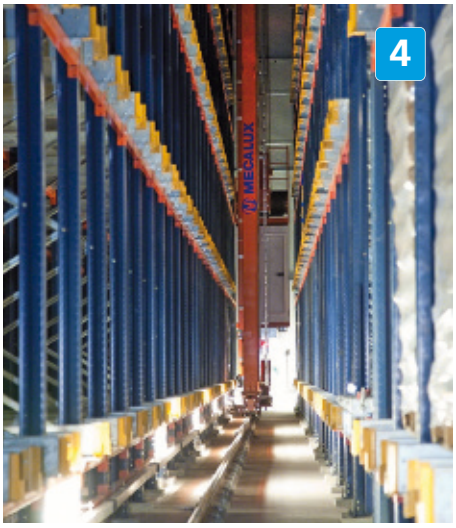
Here is an example of a cold storage space dedicated to freezing food.



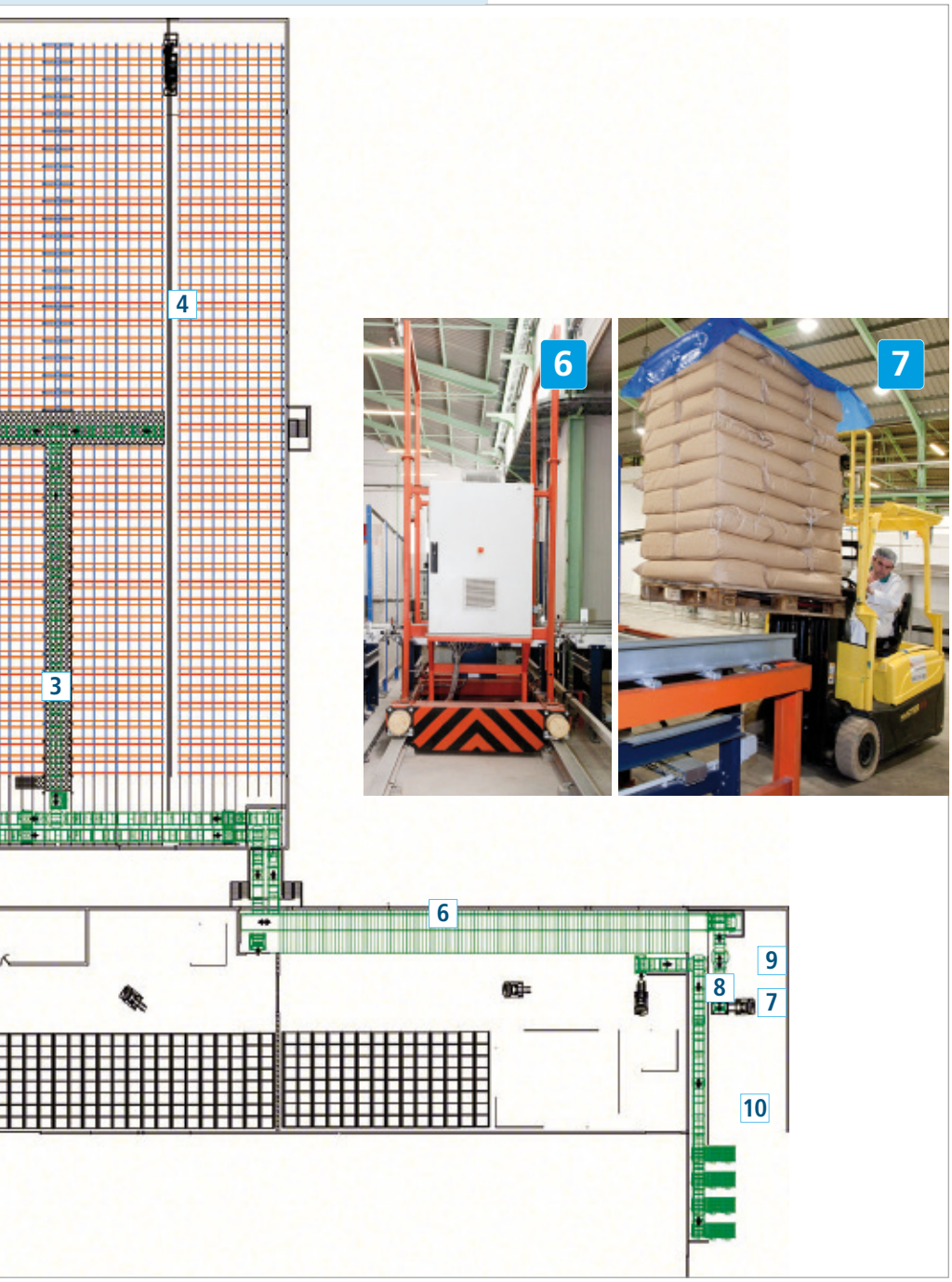












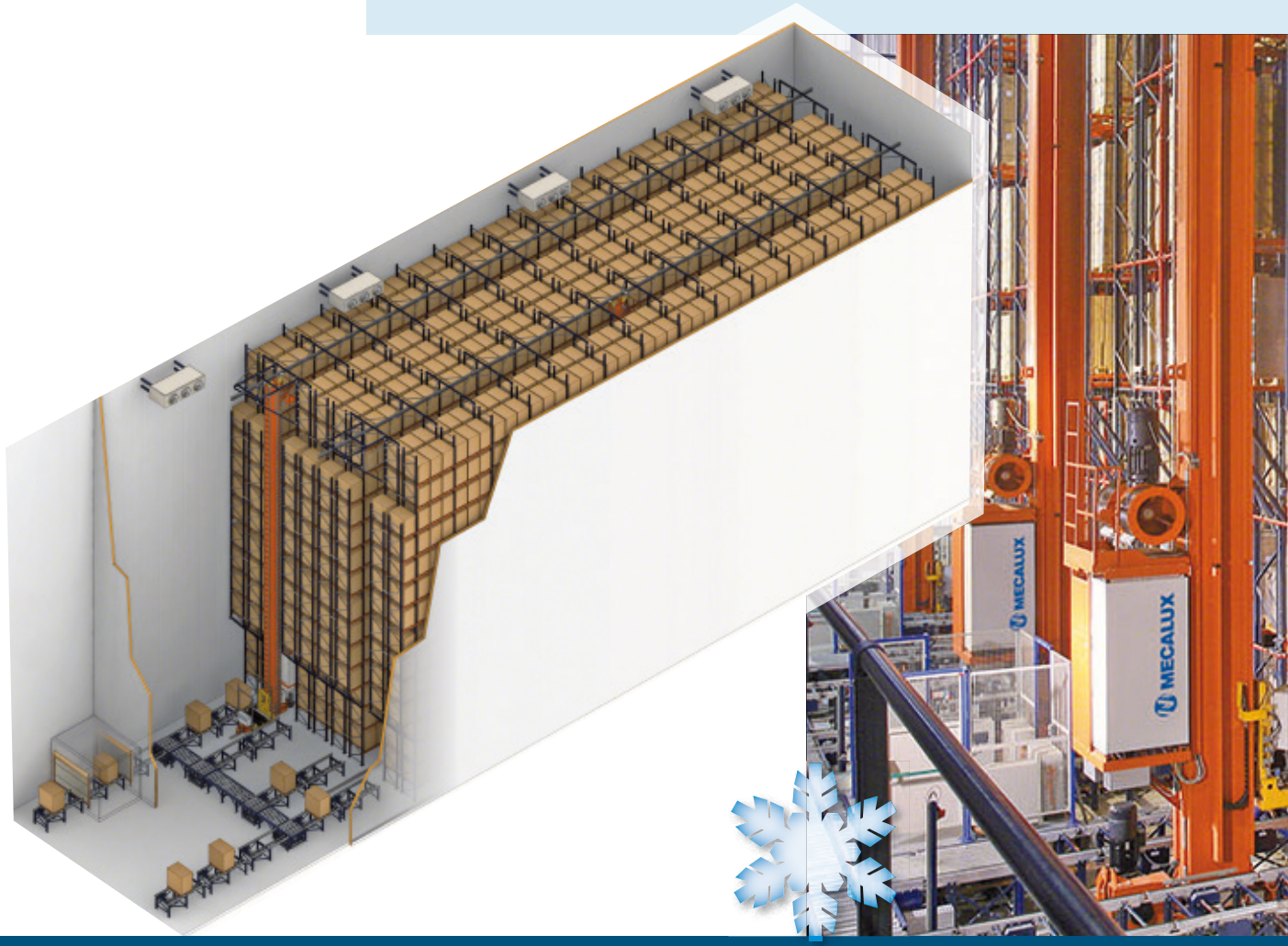




Pallet Shuttle components

1) Inputs / outputs from the docks
2) Carriers within the storage space
3) Transporters that make up the communication tunnel (two levels)
4) Shelving served by truck cranes with Pallet Shuttle
5) Camera self-supporting
6) Shuttle transport
7) Input from production
8) Baler
9) Control checkpoint
10) Communication carriers





Single-Mast and Double-Mast Automatic Stacker Cranes

The cranes are machines created for the storage of materials by mechanical automatic movements. The inputs and outputs of the product run on a single movement (combined cycle).

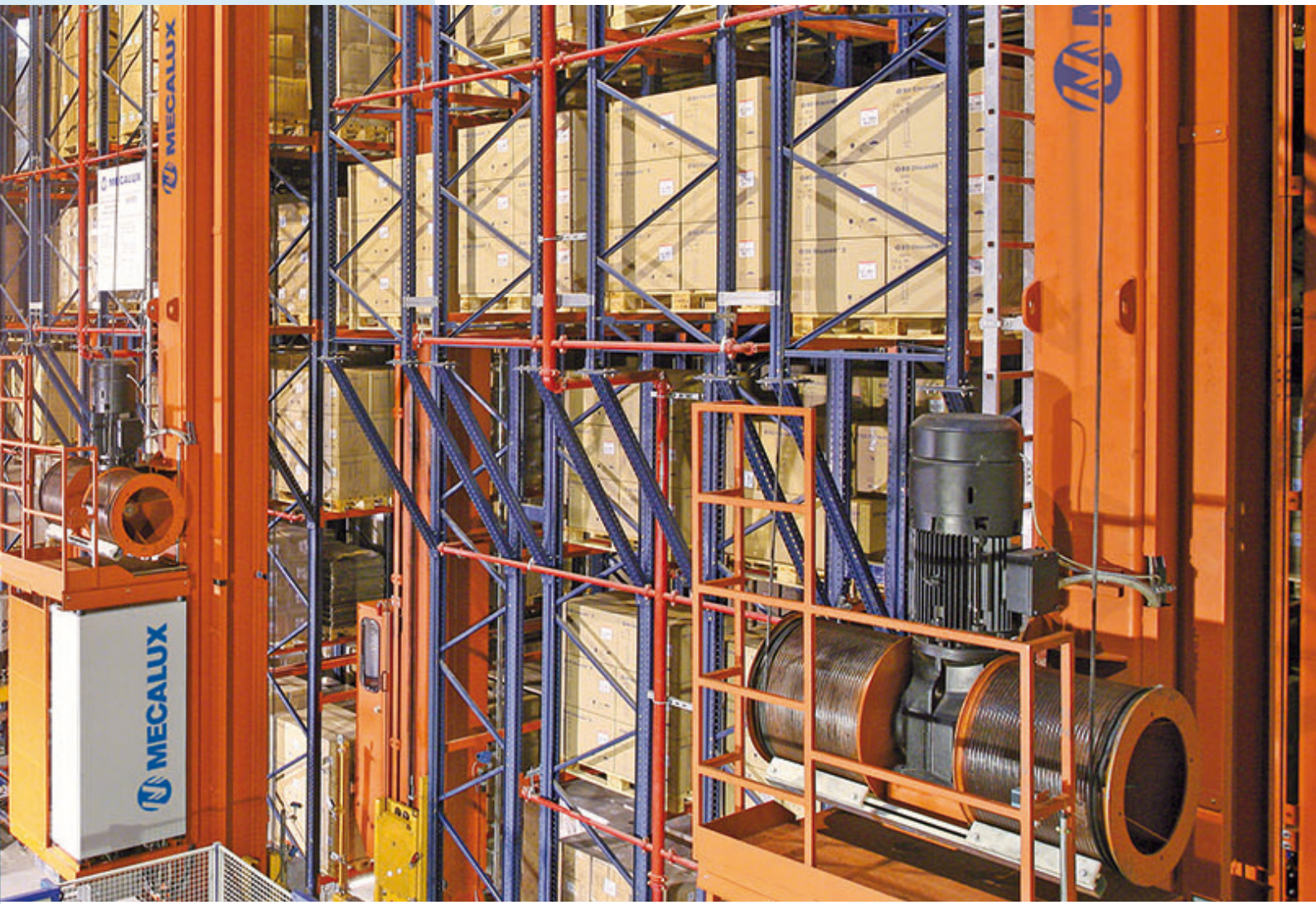
The need for maximum utilisation of the available space has led to the development of cranes; machines designed to work in warehouses with narrow aisles and at heights that can exceed 40 m.

The speed of movement, both horizontally and vertically, and automation multiplies the capacity of handling and removal of pallets.

These storages can be double- or single-mast. The dual tracks allow storage two levels deep, for every location on the shelf, maximising storage capacity.

The implementation of this system in cold storage with the option of single-mast is appropriate when you need to increase the height of your storage capacity and direct access to any pallet.

With double-mast units will yield a 60 percent higher capacity than the single-mast. This is a preferable option in freezers that generally have several pallets of the same reference. In addition to software management and location criteria A, B, C, it automatically selects the appropriate storage position, with the possibility of relocating the pallets if necessary.

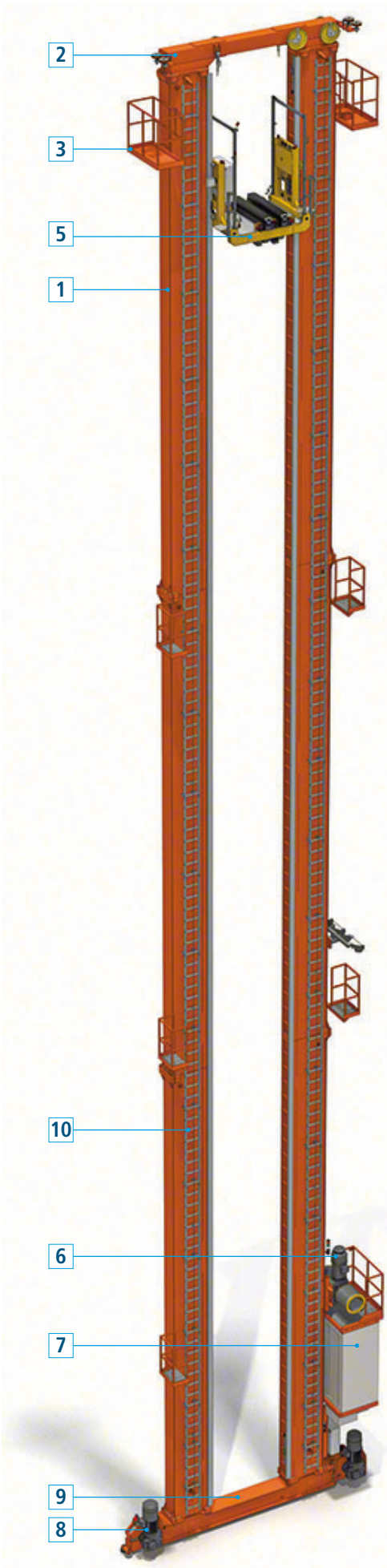


Among the most relevant issues surrounding the design of this type of refrigeration system is the storage temperature, the type of goods to be stored, the weight that will go on the shelves, the input or output flows, and automated equipment available in the warehouse space.

The use of automated solutions allows for reductions in heat and subsequently, savings on energy costs. It also reduces the need for workers to work in low temperature environments, and whose work would be restricted to maintenance only.

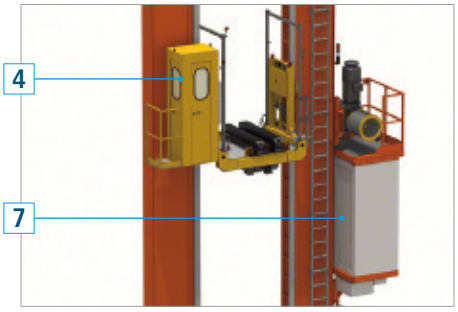


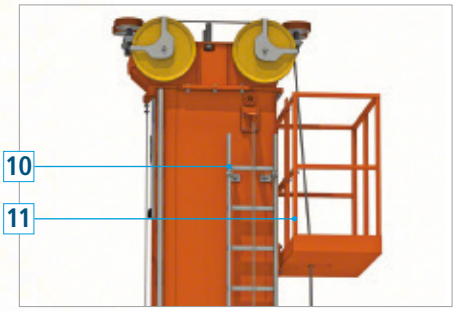
The entry of the goods from the docks or from production is done by automatic conveyor rollers or chains.

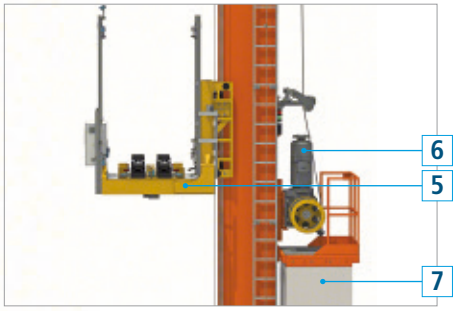


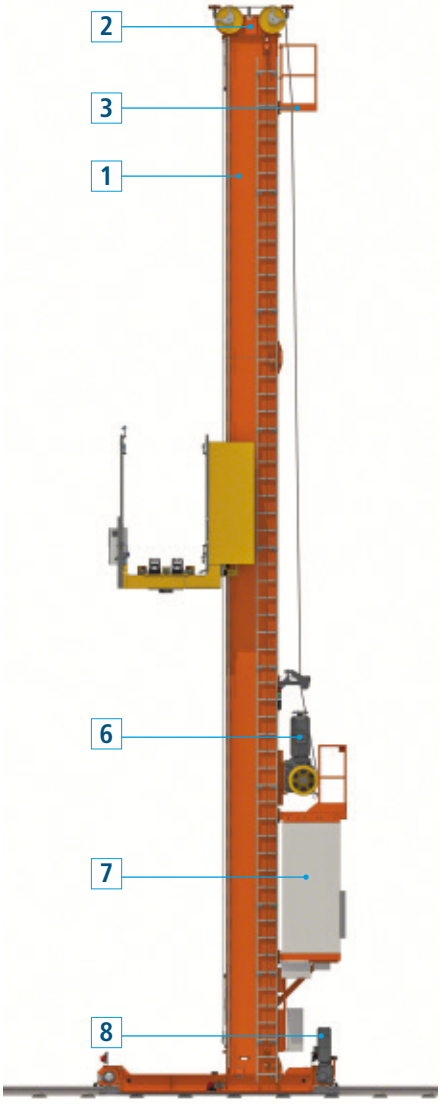
The stacker cranes are created for use in conjunction with the automatic pallet's automated movements. They move through the aisles of the warehouse according to the location of the goods they've been programmed to locate and pick.





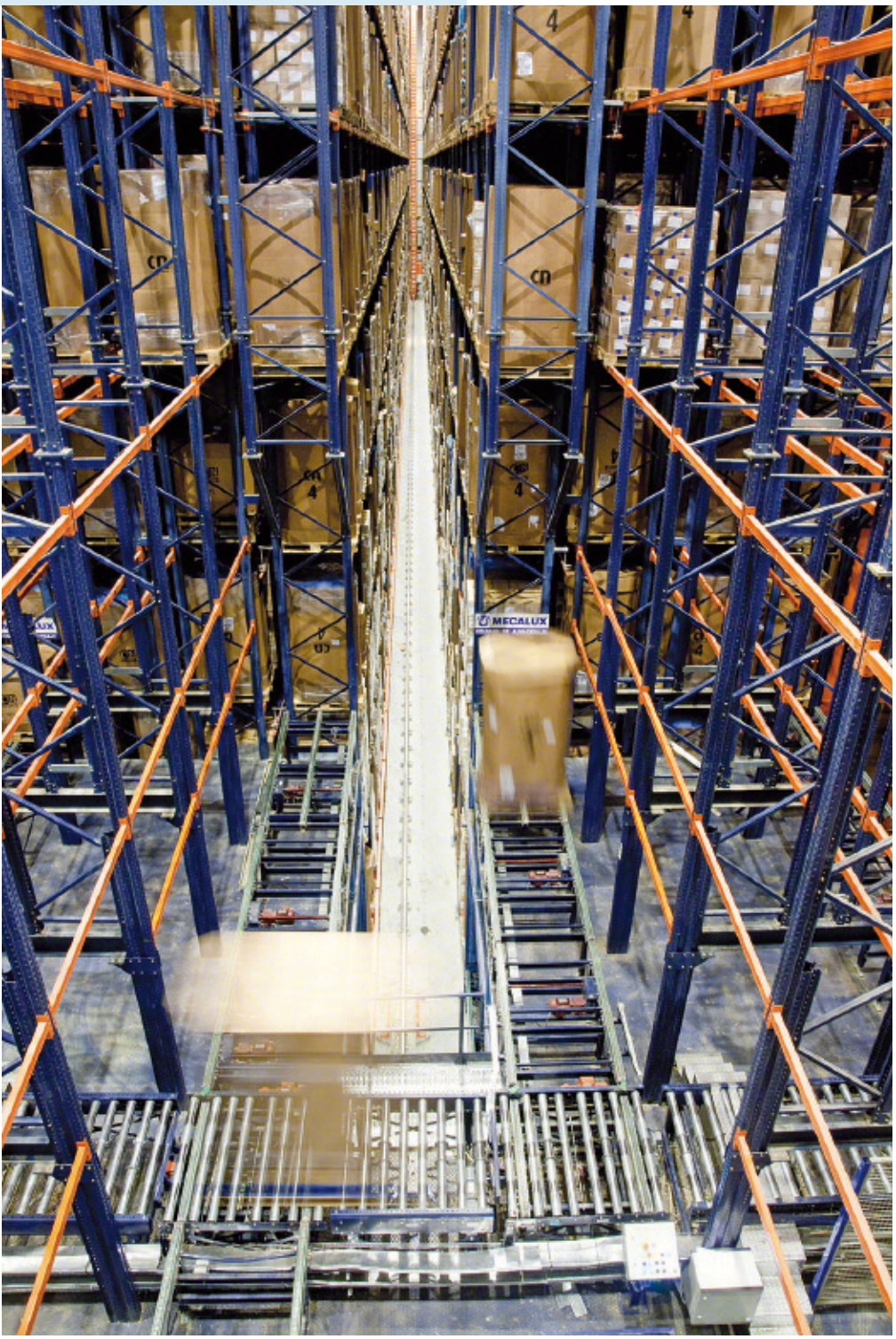






Basic components

1) Column
2) Top guide base
3) Maintenance platform
4) Mounted cabin (optional)
5) Lifting cradle
6) Lifting engine
7) Electric box
8) Drive engine
9) Bottom guide base
10) Ladder
11) Safety railing



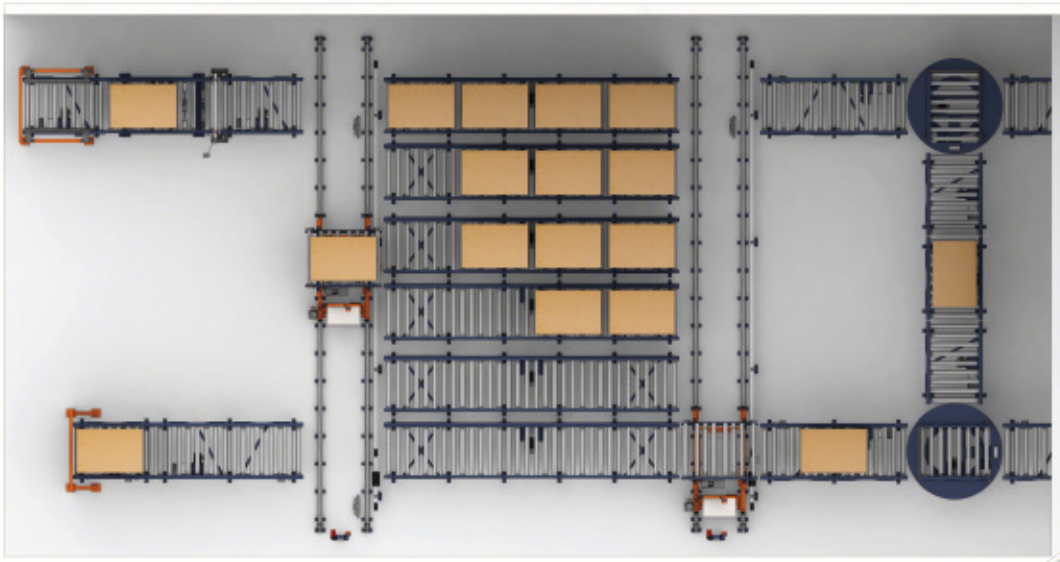








Stacker cranes bring pallets in from the docks or production areas, and then move those pallets to the warehouse aisle the software has designated those pallets to be placed.





Automatic Internal Transport

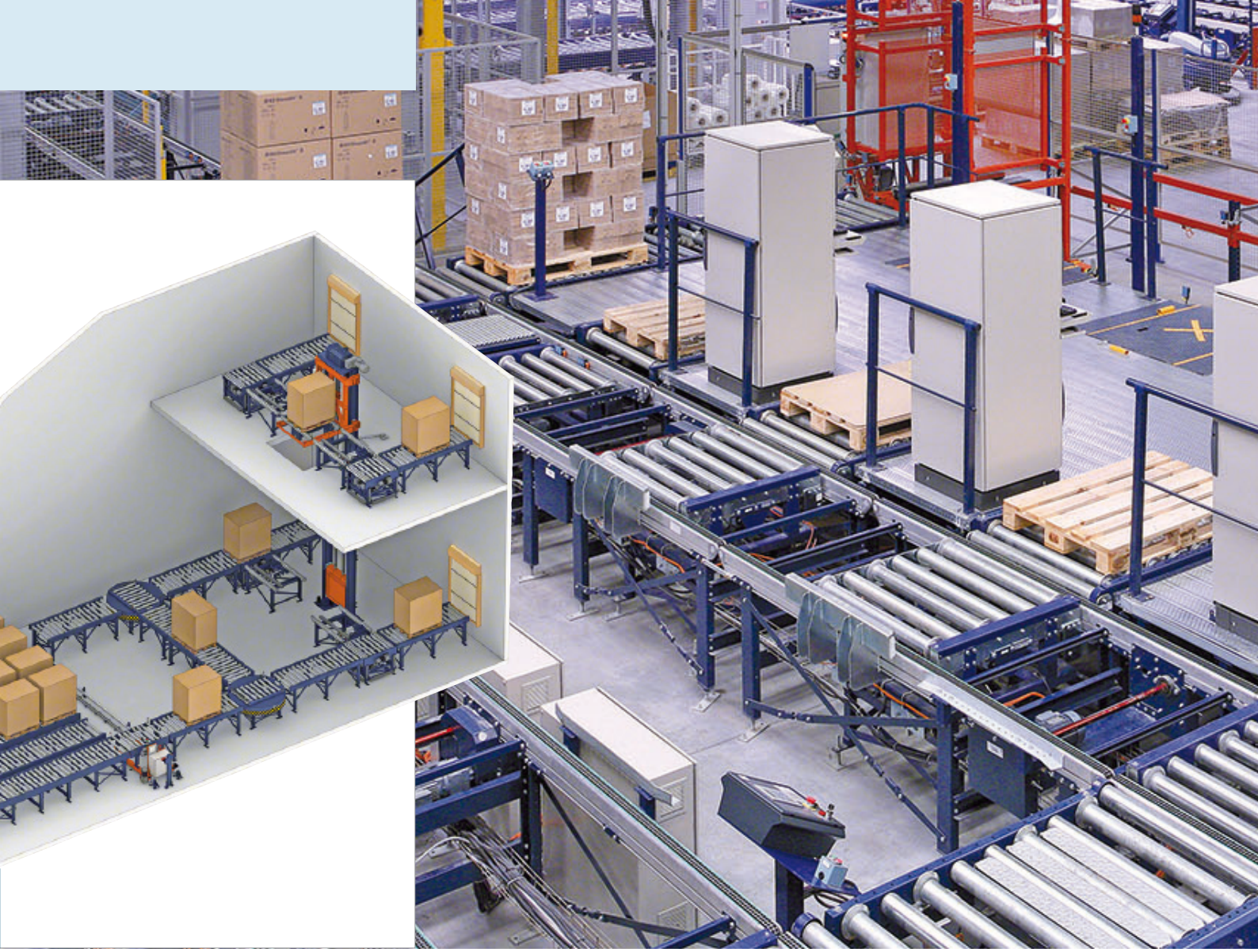
This transport system represents an ideal combination of storage efficiency and input processing, shipping and handling of cargo units. This is a set of elements designed to transfer, accumulate and/or distribute goods to the specific positions requiring operational logistics. The various elements combine to form a transport circuit. All are adaptable to temperatures between -30 °C and 40 °C.

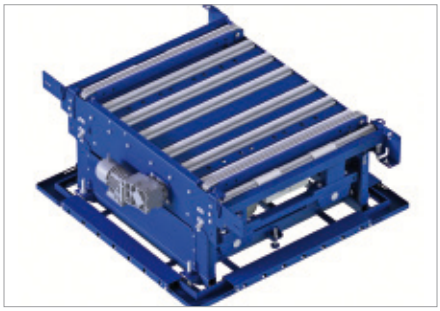


Roller conveyor. Allows long distance pallet transfer in the longitudinal direction of the runners.



Chains conveyor. For transverse movements on the runners. This roller conveyor allows 90° or 180° turns, facilitating the creation of recirculated and transportation routes.





Mixed transfer with rollers and chains. Has the capability to change functionality by 90° to be compatible with entry and exit loader units. To carry out this operation, a roller conveyor combines a fixed base and a chain conveyor on a lifting frame.



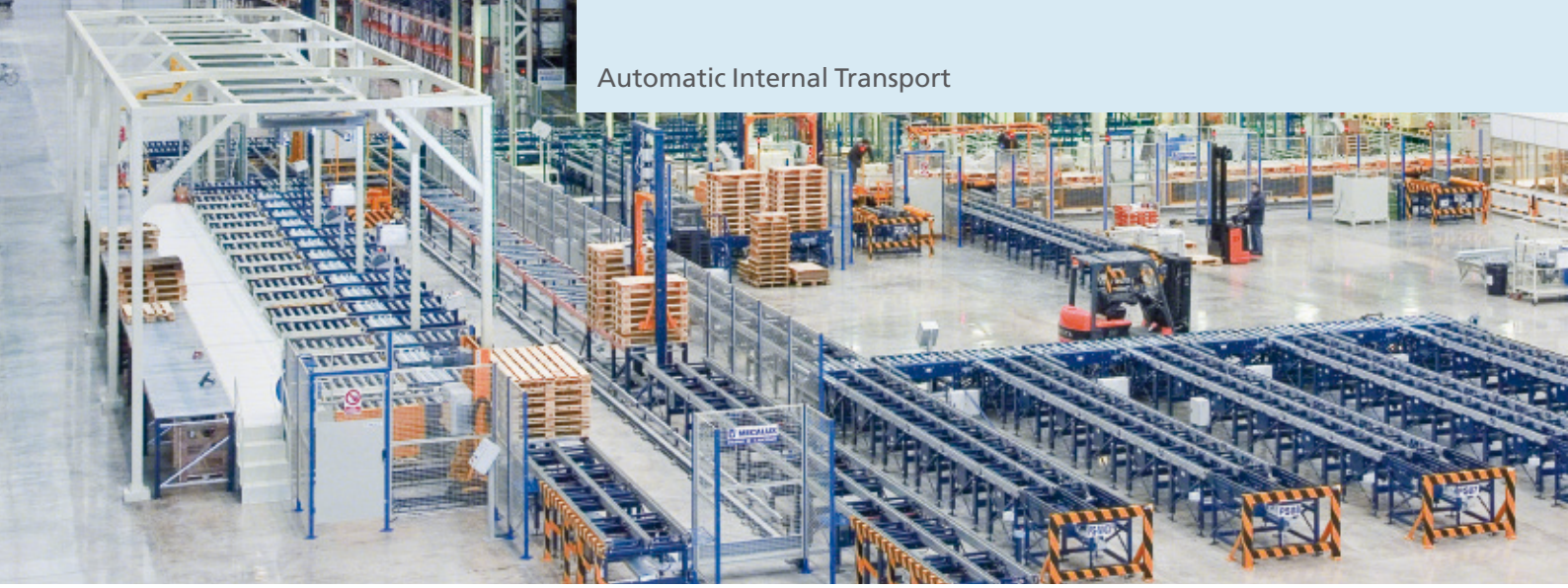
Turntable conveyor with rollers or chains. A turntable with rollers or chains lets the pallet's direction be changed, while keeping the load facing the same way between separate but similar type conveyor strands (rollers or chains).

It can send the pallet towards an entry point at any angle.Moving 800, 1,000 and 1,200 mm wide pallets is possible. There is also a conveyor module specifically for half pallets, which comes with rollers or chains.



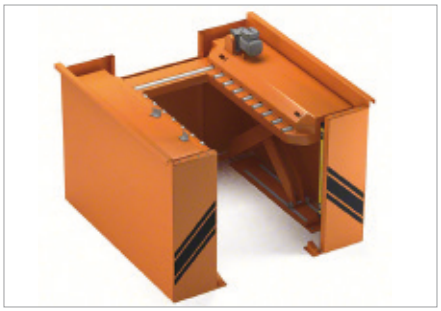
Pallet checkpoints. A checkpoint and input control are installed in cases where pallet dimensions, weights and conditions must be verified to fulfil installation specifications, especially when the transport system is used to insert pallets into an automated warehouse.

The first control of the transport unit scans barcode labels for product identification and subsequent registration in the Easy WMS.

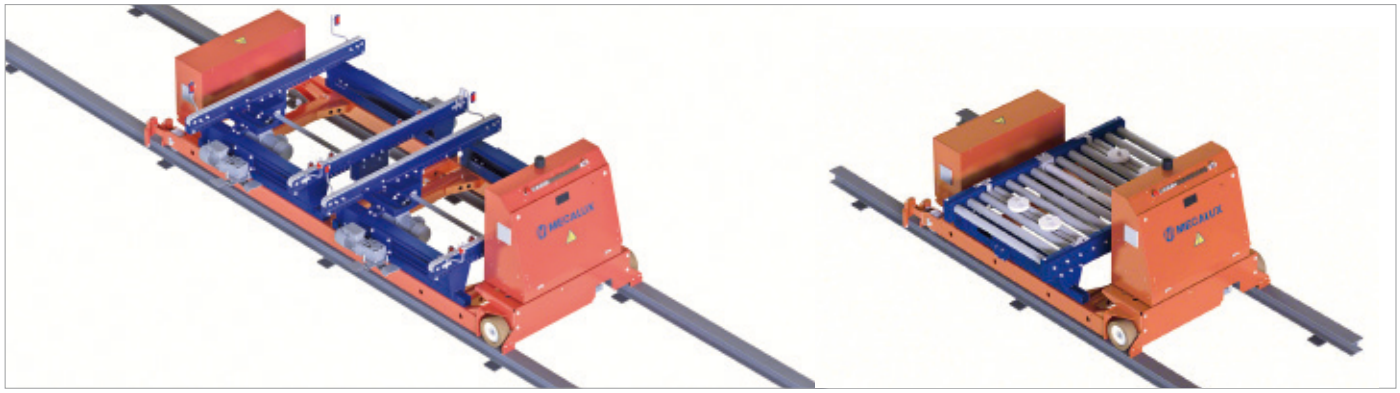




Roller conveyors with entry/exit guide rails. Located in both entry and exit positions of the conveyor, loads slide underneath the conveyor's truck, which starting at level 0, elevates about 80 mm to match the level of the rest of the transport system.



Hydraulic scissor table with rollers. This equipment lifts the unit load from the ground level to the circuit's height, through a hydraulic lift system.



Transfer car. A non-continuous unit load conveyor system. It comprises a shuttle that moves along guide rails in a straight line and joins several points in between. Its length is adapted to bridge the gap, since it is mounted on embedded or floor level stand-alone guide rails.

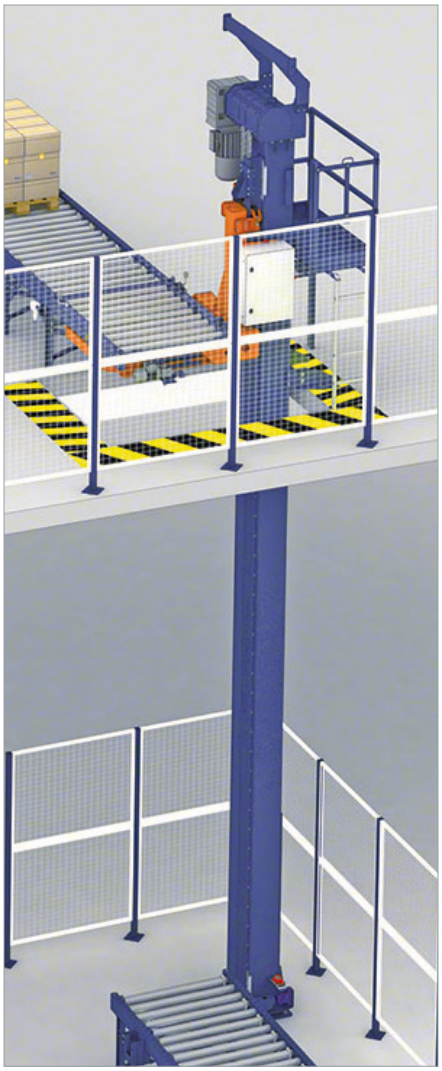
At least two additional roller or chain conveyors are needed, placed in a perpendicular direction to the workflows, such as loading and unloading stations.

Either for single or double loads (with a capacity to move one or two pallets), its top facet can include both forks, as well as roller or chain conveyors. Installations that require average workflows will find this an ideal solution.





The electric overheads are a good alternative transport for vehicles with individual controls that move along a track in the form of "I". The rail is suspended from the ceiling or fixed to the ground by gantry structures. It is very useful when connecting distant points; requires rapid transport flows.



Pallet lift. An automated transport system to move palletised loads of up to 1,500 kg vertically. They provide fast fluid pallet flows between different floors or levels in an installation, by hoisting and lowering the goods.

Thanks to a counterbalance traction system, loads ascend and descend to the desired level.





Pallet stacker/unstacker. Equipment added to automated conveyor systems to easily store empty pallets or to insert them into a circuit.

This machine stacks and unstacks empty pallets one at a time. It creates piles of pallets to supply different picking stations or full pallet stackers with empty pallets as needed and can also feed production lines.





Vane traced. Combined with stacking and de-stacking pallets, these allow placer paddles to be set on sturdy pallets to avoid incidents in the transport and storage.







Self-Supporting

The warehouse has such a great number of self-supporting shelves that they serve as the building's structural integrity in addition to the support structure for that warehouse's goods.

The height of these freestanding spaces is limited by local regulations or by the height of forklift trucks or cranes. Warehouses can be built more than 40 m.

They are designed to work both at room and cold temperatures (refrigerating or freezing).

And thanks to its structure, enables the storage of various goods in different formats (pallets, containers, large packages, etc.).













Advantages

- Less runtime.
- Increased building height.
- Better use of volume (no pillars or shelf replacement).
- Lower cost.

Freestanding shelving units support the evaporators, cooling equipment, maintenance walkways, access stairways, fire systems, stacker cranes, conveyors gateways and other similar items. All these aspects constitute an integral structure formed by shelves on which the pallets are stored and are calculated to support the structural integrity of the building.

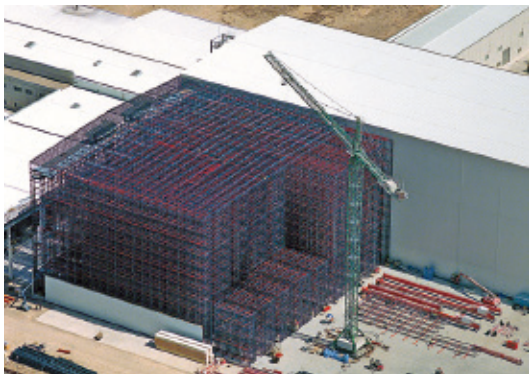




Self-Supporting High-Capacity



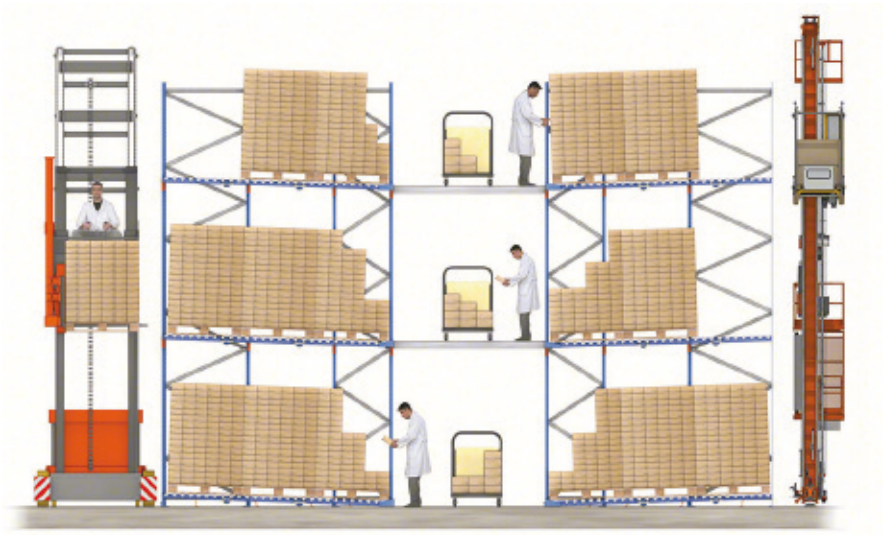




The construction is very simple. On a concrete foundation, each shelf is anchored to the concrete foundation and given the proper amount of insulation. The structure is shaped by pre-assembled structures of variable height and strength that are then constructed together to make the larger completed structure. On the structure placed the trusses and roof straps are placed and the profiles of the facade, for fixing the insulation panels.

It is the ideal system for warehouses in high altitude spaces.







Picking Operations

Picking operations at negative temperature require specific treatment, because the operator has to work comfortably and efficiently in adverse conditions.

Picking operations can be carried out through manual or automatic handling of the product, or a combination of both.

In this section you can view different picking solutions, all valid, but each case will need special treatment.

In the case of manual picking, the operator extracts the stored goods from the pallets.

By contrast, ground level picking on conventional pallet racking requires operators to travel the aisles using a pallet truck and order picker machines to pick up entire pallets instead of single items. In the market order picker that can be drawn from the goods 10 m high.

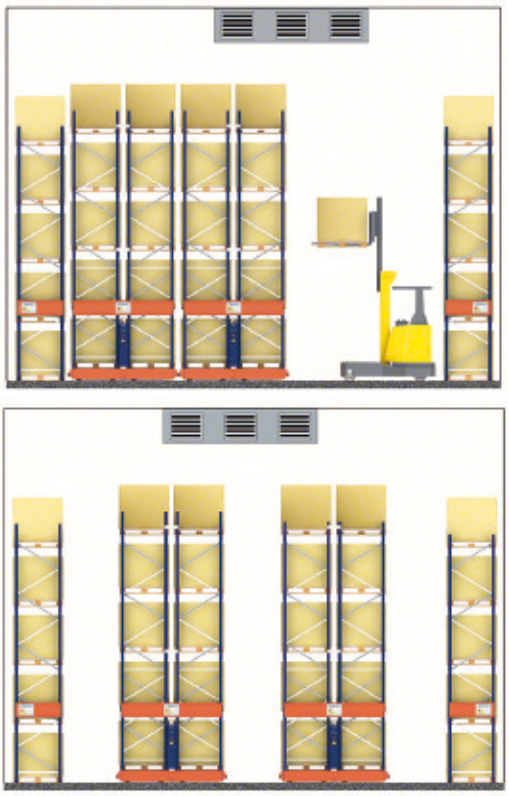






Mounted shelves on Movirack mobile bases give customers the option to separate each aisle just enough to do the picking.

To increase the height of the warehouse space and make it easier to access pallets on upper levels, elevated walkways can be installed. The photo above shows a warehouse with walkways and pallet racking dynamic fed trucks or cranes. The dynamics of pallets can be subject to the same reference to avoid running out of stock picking areas.









Picking operations at the front of an automated warehouse.



Picking operations on conventional pallet racking.

If the warehouse goods are able to be relocated automatically into areas that are not freezing, it isn't necessary to make picking operators endure the freezing conditions.







Computer aids
Although the employees provide elements to help them handle the merchandise, streamlining picking operations requires a good warehouse management system like Easy WMS.

The most useful aid elements are:

- **Radio frequency (RF).** Computer terminals with barcode readers that direct operators without using paper.

- **Equipment for voice picking.** Computer terminals with voice synthesizers to issue instructions and confirmations of accepted orders.

The use of voice picking at negative temperatures is a very valid option as it leaves your hands completely free to handle the goods, facilitating and increasing the performance of operators.





When the number of pallets to be handled is too high, picking can be done automatically by using WMS to do the picking, Guided by the warehouse management system, prepare well ordered layers or box to box.

Automated Picking Depalletizer

The depalletizer robot picks up the merchandise from a pallet or point of origin and deposits in another destination. The pallets are powered by roller conveyors, chain or shuttles.

There are three robot picking systems:

- Anthropomorphic
- Two-axis gantry
- Three-axis gantry

The use of one or the other depends mainly on the cycles that are needed and the combined orders.

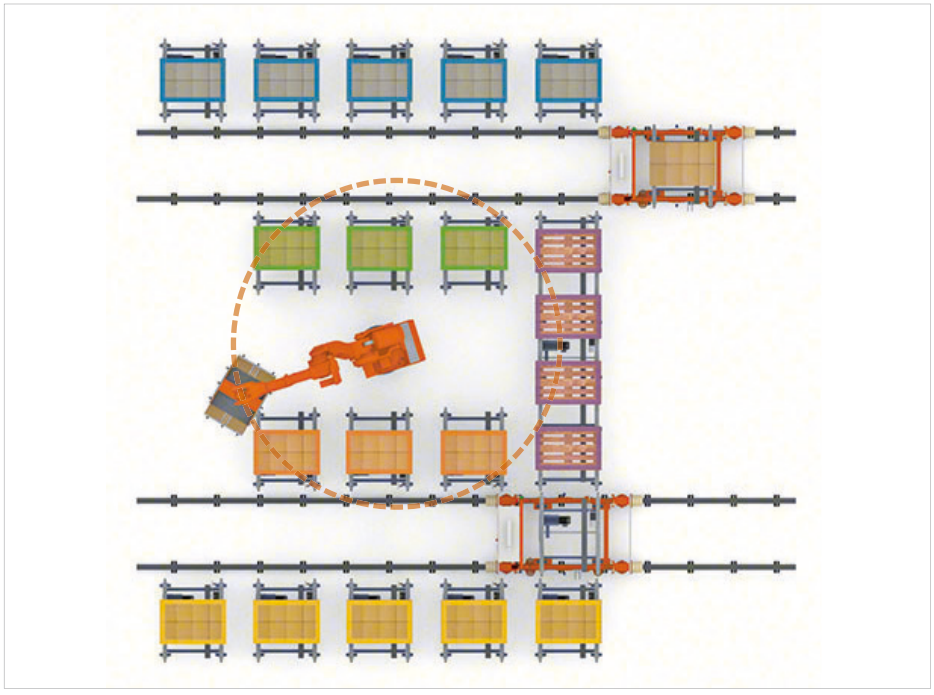
Anthropomorphic robot
Rotates 360º and has an articulated arm that combines different movements allowing access to the boxes or layers of any item in range. The operation order is similar to the illustration in the following image.







Automatic picking system depalletizer robot operation outline.



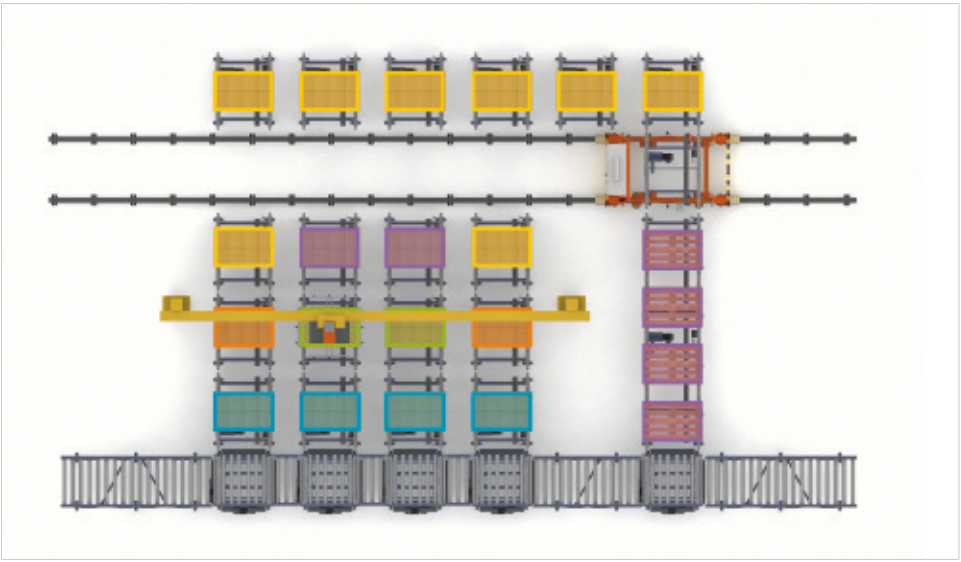




Two-axis platform robot
The manipulator arm is rigid and only moves vertically. The cart moves horizontally on the gate, having access to any point that is in the same alignment. You can access various pallets, usually placed in 4 or 5 positions, two home and rest stations.

The production typically is as follows:

- Completed pallets
- Source pallet
- Pallet destination
- Full pallet waiting area
- Empty pallet waiting area
- Two-axis platform robot

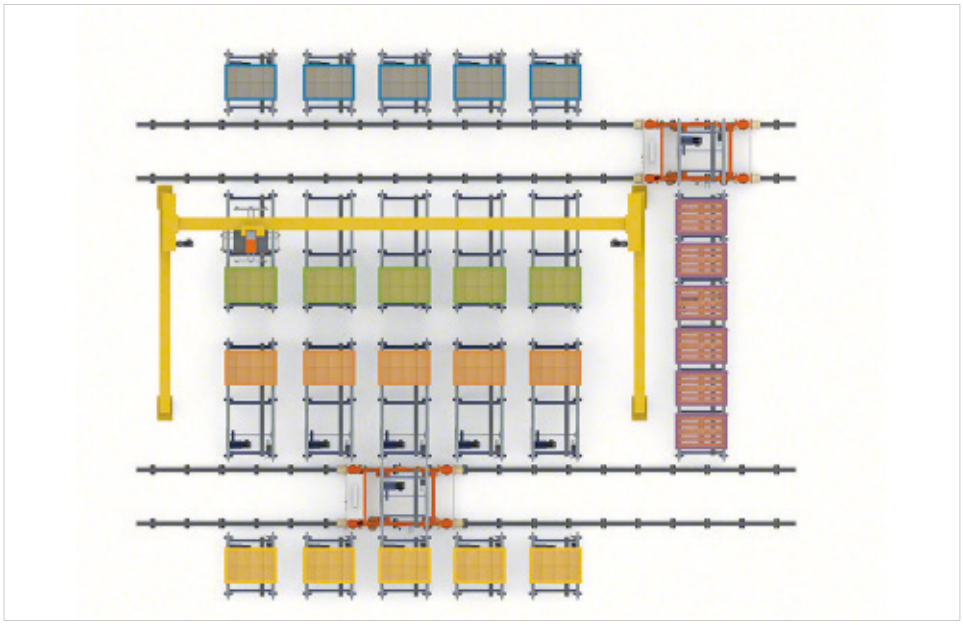






Three-axis platform robot
The three-axis platform robot is similar to the two axes, but also moves laterally on the other axis. In this way, you can access two different pallet alignments, assigning each to original positions or destinations. This allows a greater diversification of orders and, in turn, a greater number of orders.

The production operation typically is as follows:



- Incomplete order pallets
- Product pallet origin
- Product pallet destination
- Pallets waiting origin
- Empty pallets
- Three-axis platform robot

Combination of different systems.
Frozen products factory

The automatic transport of goods between different production areas or from production areas to storage spaces helps maintain low staff and resources costs, eliminates risk of accidents, while also maintaining great agility.

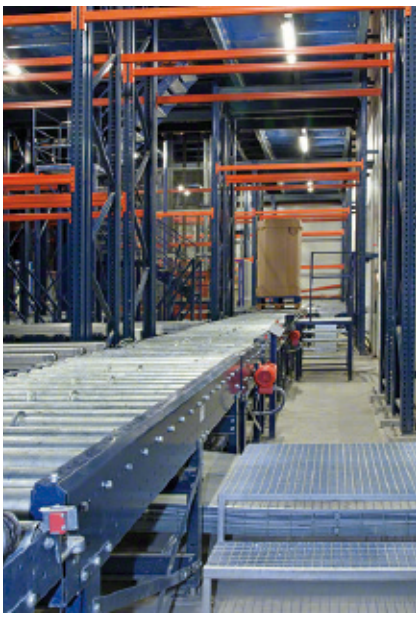
Below is a frozen vegetable company with fully automated internal transport, which communicates throughout seven production areas combined in two warehouse spaces. The production space combines transport roller and chain lifting machines with an electric overhead transport. The electrified track communicates quickly and allows distant connection points and high flows.

Only truck loading and unloading is done conventionally.





Input from loading docks.

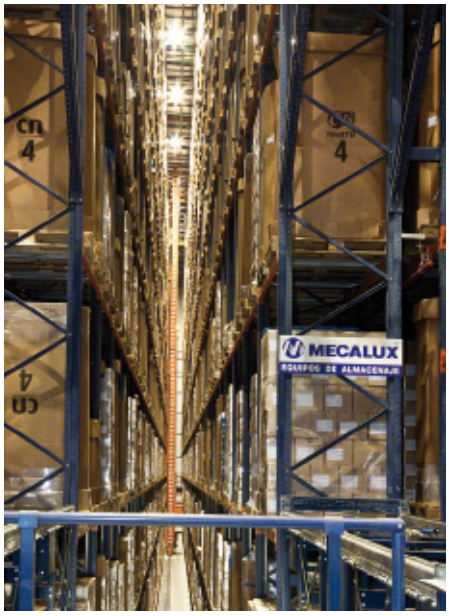


Conveyor system inside the warehouse.



Aisle storage conveyors.





Warehouse with stacker crane.

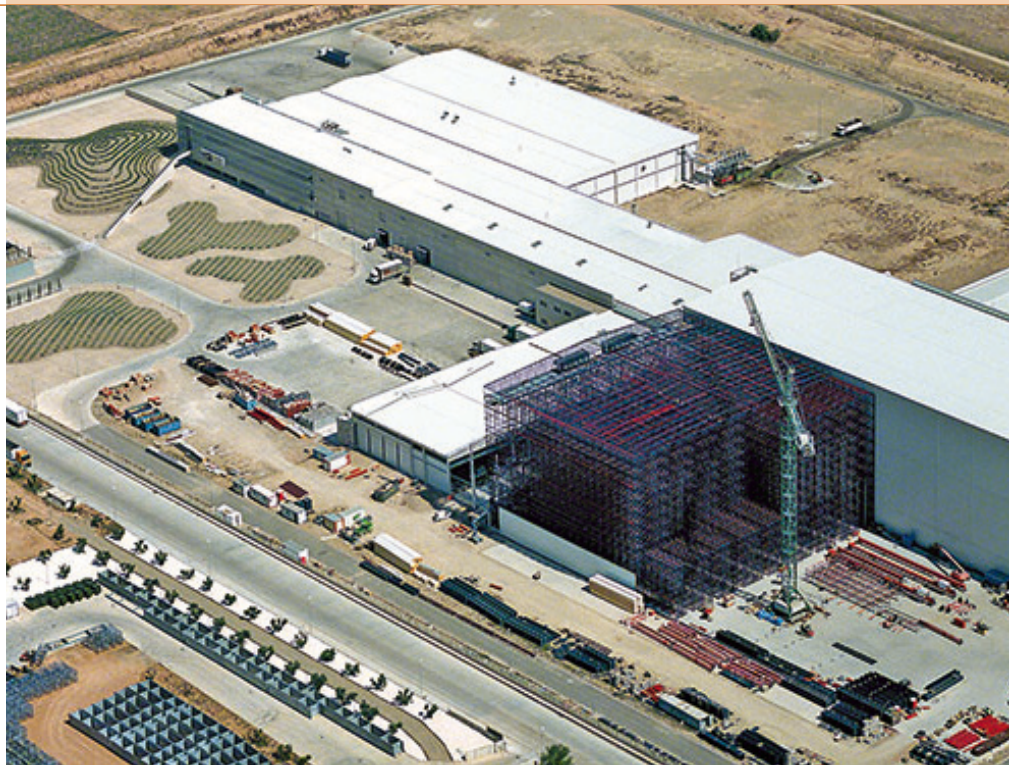


Conveyors zone preload.



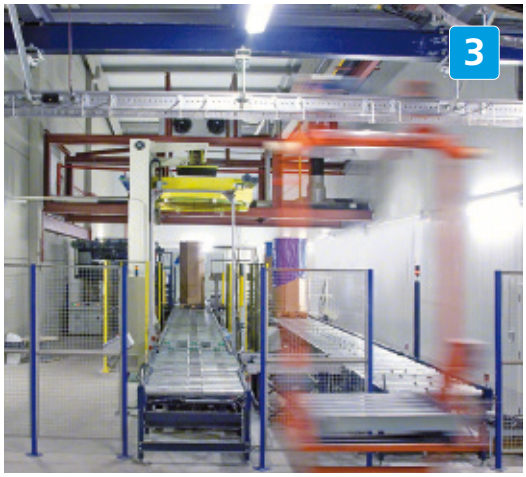
Departure docks.

Internal transportation production areas starting with the entrance and control area wrapping, packaging preparation area, and the area used for packaging and mixing.



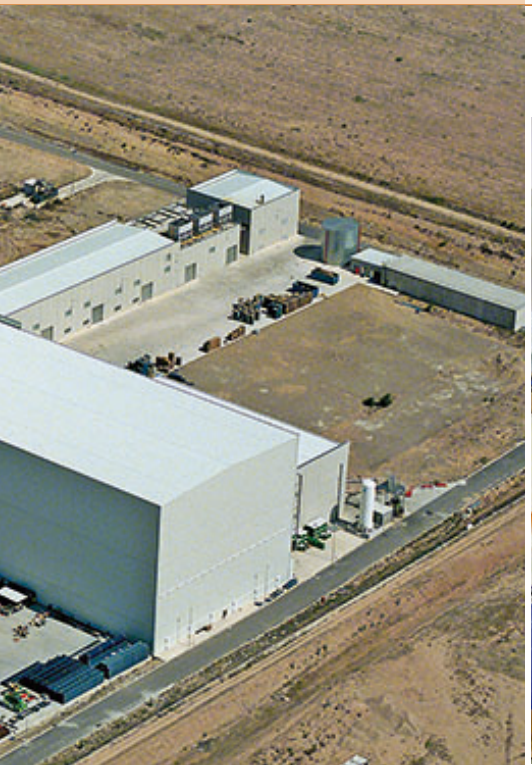
















Production areas

1) Calibrated freezer exit
2) Conveyor and lift to the upper floor
3) Area of wrapping and control
4) Electric overhead communication, entrance to the mixing and packaging area
5) Warehouse space input/output
6) Area of preparing packaging
7) Entry and exit of the packaging area
8) Conveyor bins for packaging and mixing
9) Out of the mixing area
10) Control panels
11) Warehouse miscellaneous









Combining different systems.
Freezing solutions for a bread factory's dough supply

Example of a highly automated frozen bread storage and distribution logistics center.

The variety and capacity of orders has necessitated the introduction of automatic and manual picking using voice picking technology.





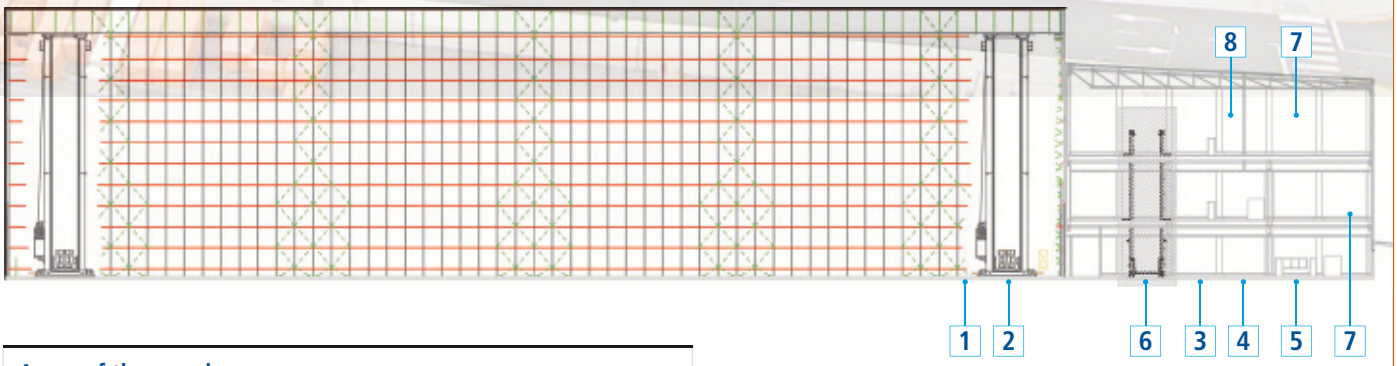






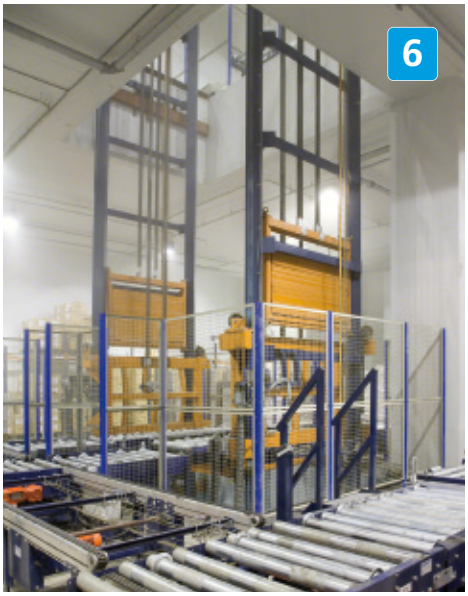






Areas of the warehouse

1) Warehouse interior
2) Area pallet recirculated
3) Area of preload
4) Control input
5) Input / output springs
6) Area lifting
7) Picking manual (voice picking)
8) Automatic picking layers







All operations were performed at negative temperature and completely automatic. Easy WMS, warehouse management software for high performance, directs the entire logistics center operation.

The trucks that handle the goods between conveyors and the loading docks hold three pallets simultaneously.

Both lifts raise two pallets simultaneously, communicating to the main building.

The automatic picking robot is able to manipulate and access 10 complex layers of picking positions, five at the beginning and five at the end.

The lower power picking is done manually by using *voice picking* devices.

The checkpoint automatically verifies the 160 pallet per hour entered and verified in the system. In the future, this capacity is likely to increase through an entrance on an upper floor.







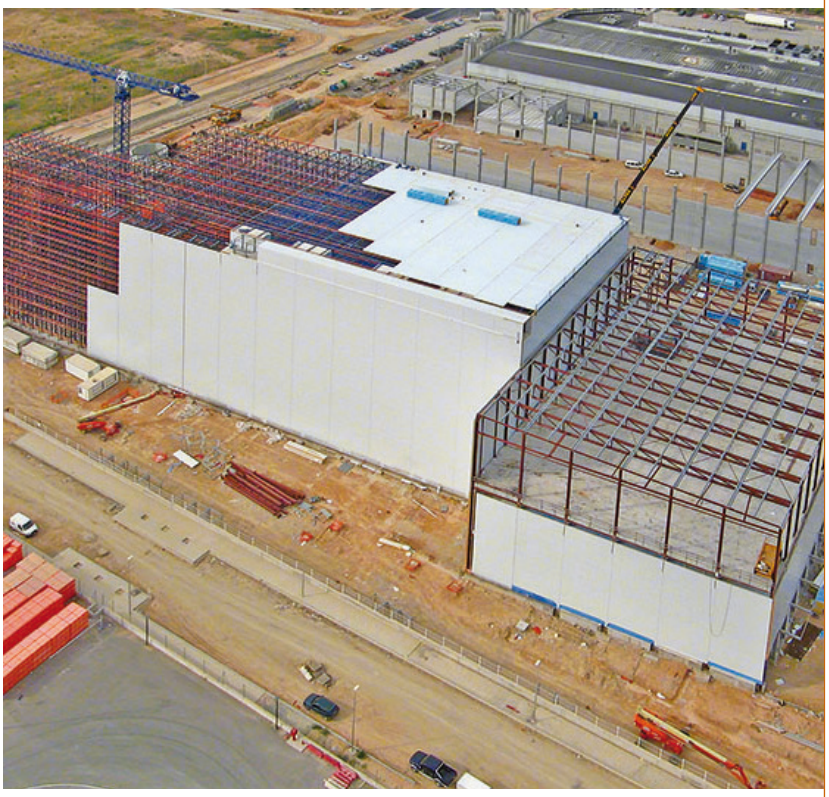


1) Warehouse interior
2) SAS
3) Recirculated pallet area
4) Preload area





The warehouse's construction system is self-supporting, i.e., the shelves inside the warehouse space also support the building.



The eight storage cranes are capable of handling two pallets at once, providing a very high flow.

The SAS' door-opening device is controlled elsewhere in the warehouse.

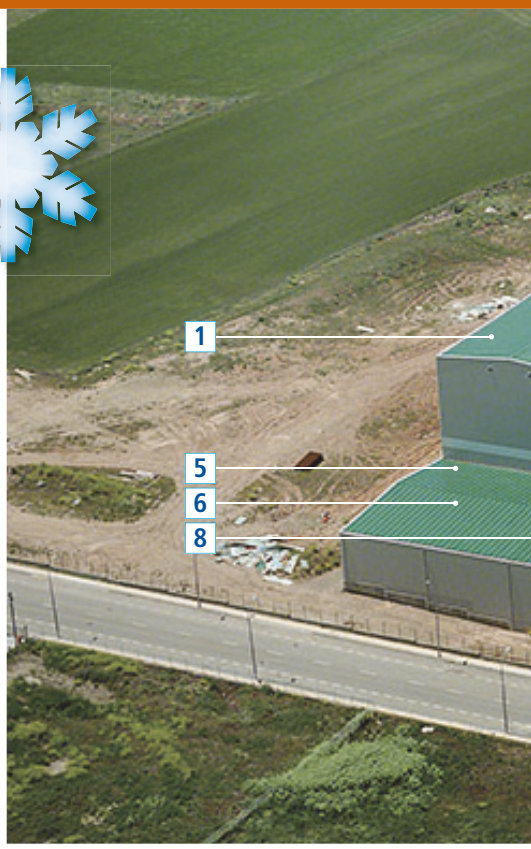
The preload can be prepared with full or partial pallets for up to five different routes in order to be issued quickly and reduce truck loading times.

Combining different systems.
Cold logistics center

This facility, possibly one of the coldest logistics centers in Europe, combines the following systems of storage and order preparation:

- Automatic stacker cranes
- Mobile bases
- Buffer picking
- Preparation of orders by automation
- Standard picking
- Automatic transport mass

This combination makes it a highly flexible storage option.





More products can be stored in the automatic conveyor rotation.



Half rotation orders or variable-sized pallets are stored on mobile bases.



Freezer racking can store goods and single products for a long time.



The automatic buffer allows prepared orders waiting to be sent on shipments. A pallet stacker handles the temporarily stored pallets in this area.

1) Automated warehouse
2) Mobile bases facility
3) Compact warehouse
4) Buffer output
5) Robot automated picking
6) Interior conveyors warehouse
7) Automated input / output docks
8) Compactors and lifts
9) Warehouse communication





The automated picking robot can prepare high turnover products in small multiples instead of larger groupings. The pallets are fed by the stacker cranes and automated warehouse containers.

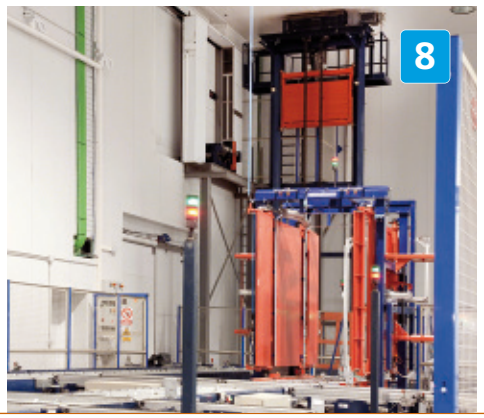


Goods are handled automatically in the receiving and shipment areas.



Warehouse movement of goods through the SAS are governed by the management and control of Mecalux (Easy WMS and Galileo).

The roller or chain conveyors, automatic control station, compactor, lifts and security features all ensure an automatic, secure and high-capacity transport control.















1) Entry pallet
2) Self overview
3) Superior recirculated
4) Stacker crane
5) Lift
6) Automated picking
7) Lower recirculated
8) Manual picking area



Automated warehouse interior
The storage area consists of five aisles of single and double depth with two levels of pallet entrances and exits.

The five stacker cranes offer large cycle capacity due to its ability to maintain a continuous and timely flow of operation.

Additionally, it coordinates with different picking zones in the main warehouse space.

- Automated picking
- Manual picking - ground floor
- Manual picking - top floor





To achieve the required flow, the automated picking area provides a two-axis platform robot, shuttles and conveyor systems.

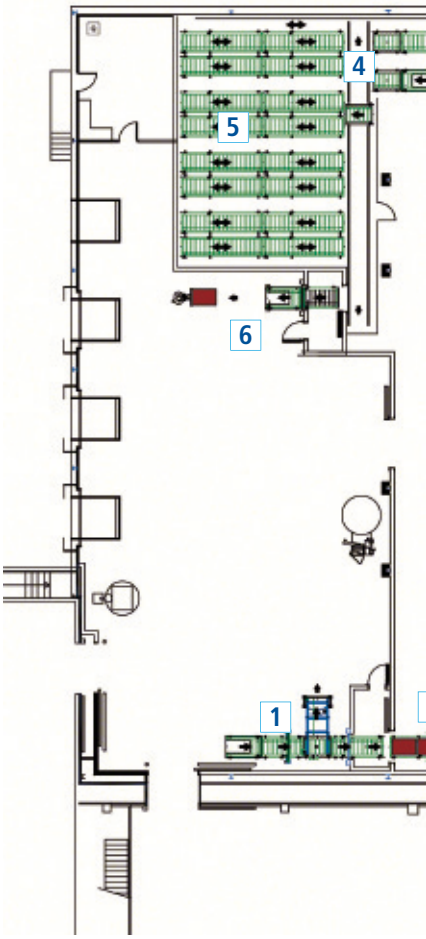
Lift tables descend to lower level pallets down to floor level to be handled with pallet outside the automated operation.



Combination of different systems.
Solutions for a frozen food factory

Various conveyors can be combined with conventional storage systems and even help in the process of entry, shipping and handling of cargo units.

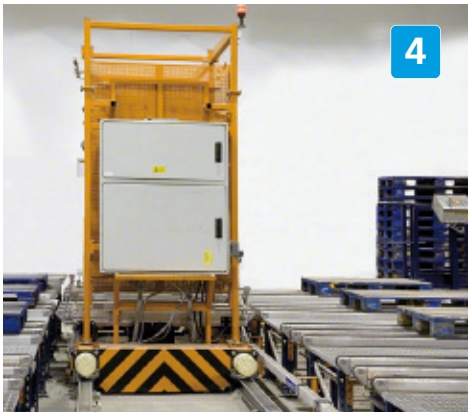
As an example of a conventional warehouse with diverse stacker crane systems, this industrial freezer composed of mobile bases and gravitationally live pallet.



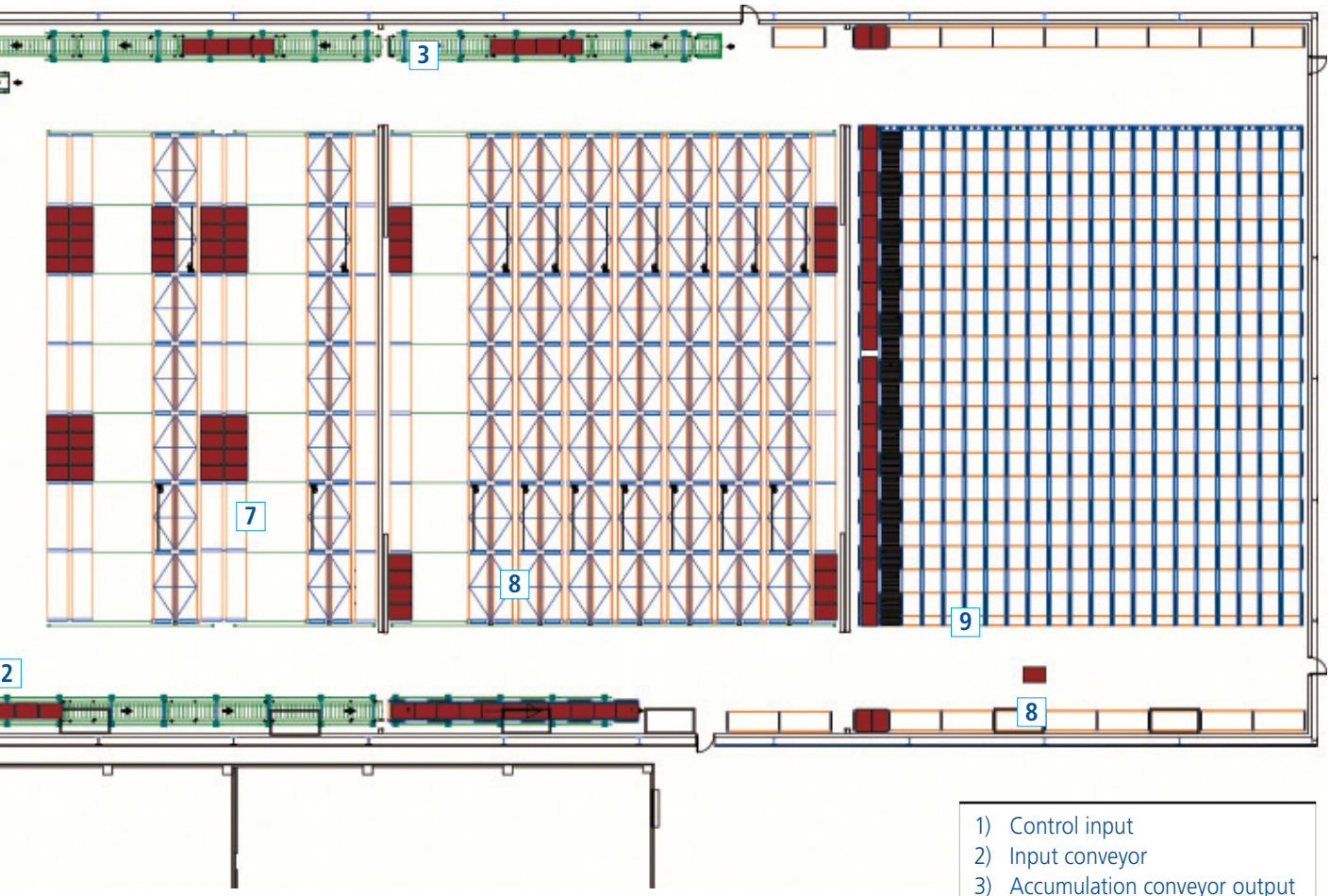












1) Control input
2) Input conveyor
3) Accumulation conveyor output
4) Shuttle
5) Preload
6) Output conveyors
7) Picking on mobile bases
8) Mobile bases
9) Gravity live pallet



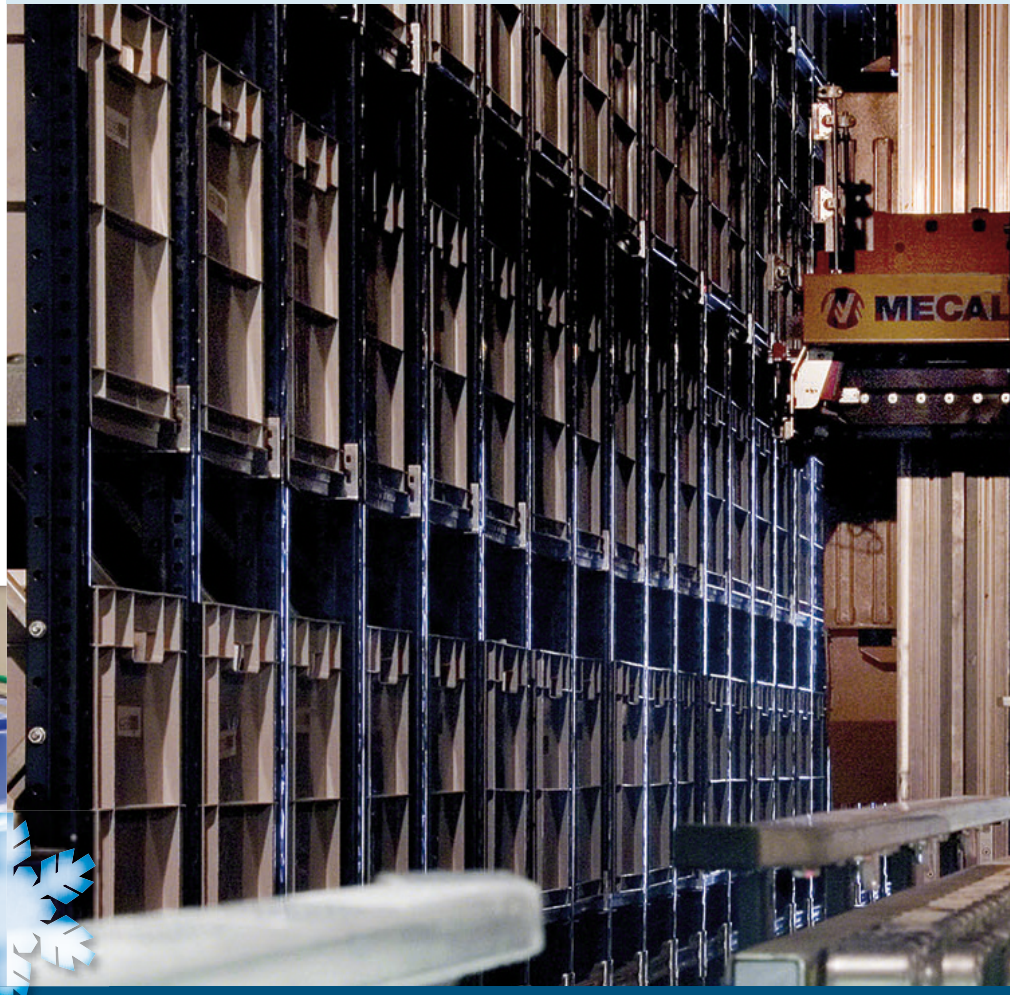




Standard automated box or tray storage systems integrate the racking, machinery and warehouse management software.

Its extraordinary adaptability makes it possible to integrate in any production or storage.





Automated Warehouse for Boxes

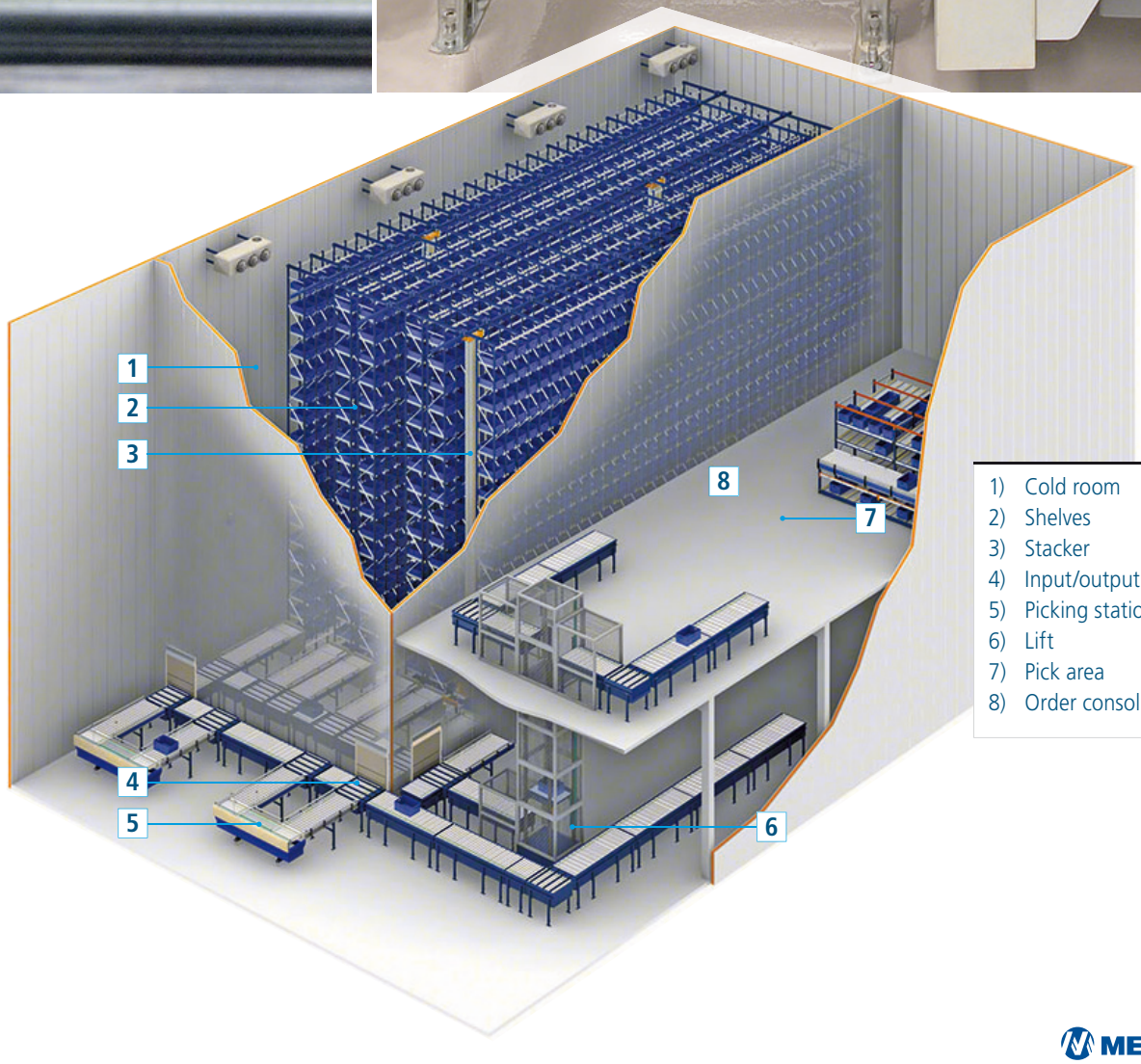
Miniload automated warehouses boxes consist of aisles through which circulating cranes and shelving on both sides to store boxes or trays. At one end or side of the shelf is the picking and handling area, consisting of conveyors where the IN A BOX stacker crane deposits the load extracted from the shelf. Transporters close the box to the operator and, after completing their work, return to the stacker crane to place it on the shelves.

Key features:

- Optimal use of space due to its high storage density.
- Excellent load accessibility.
- Permanent inventory through its state-of-the-art computer system.
- Increased productivity for conventional management.
- Total security for the processes of cargo handling, and you do not need the presence of operators inside the storage area.
- Protection of cargo and removing shrink drastically.
- Reliability and ease of use.
- Low maintenance cost.
- Especially effective for companies with intensive picking process.
- Ideal for storing small or medium, temperature-controlled products such as foodstuffs or pharmaceuticals.
- Reduced preparation and dispatch time for orders.
- Fast return on investment.







1) Cold room
2) Shelves
3) Stacker
4) Input/output conveyors
5) Picking stations
6) Lift
7) Pick area
8) Order consolidation area

Conventional Systems



Standard palletizing
The conventional pallet racking from Mecalux represents the best solution for warehouses needing to store wide varieties of palletized products while maintaining direct access to each pallet, or to optimise the space of the wider aisles.



Drive-in pallet racking
This storage system is widely used in both refrigerator and freezer spaces, which often requires efficient use of space. This is the optimal solution for small or moderately sized warehouses with low or medium heights serviced by conventional forklifts.

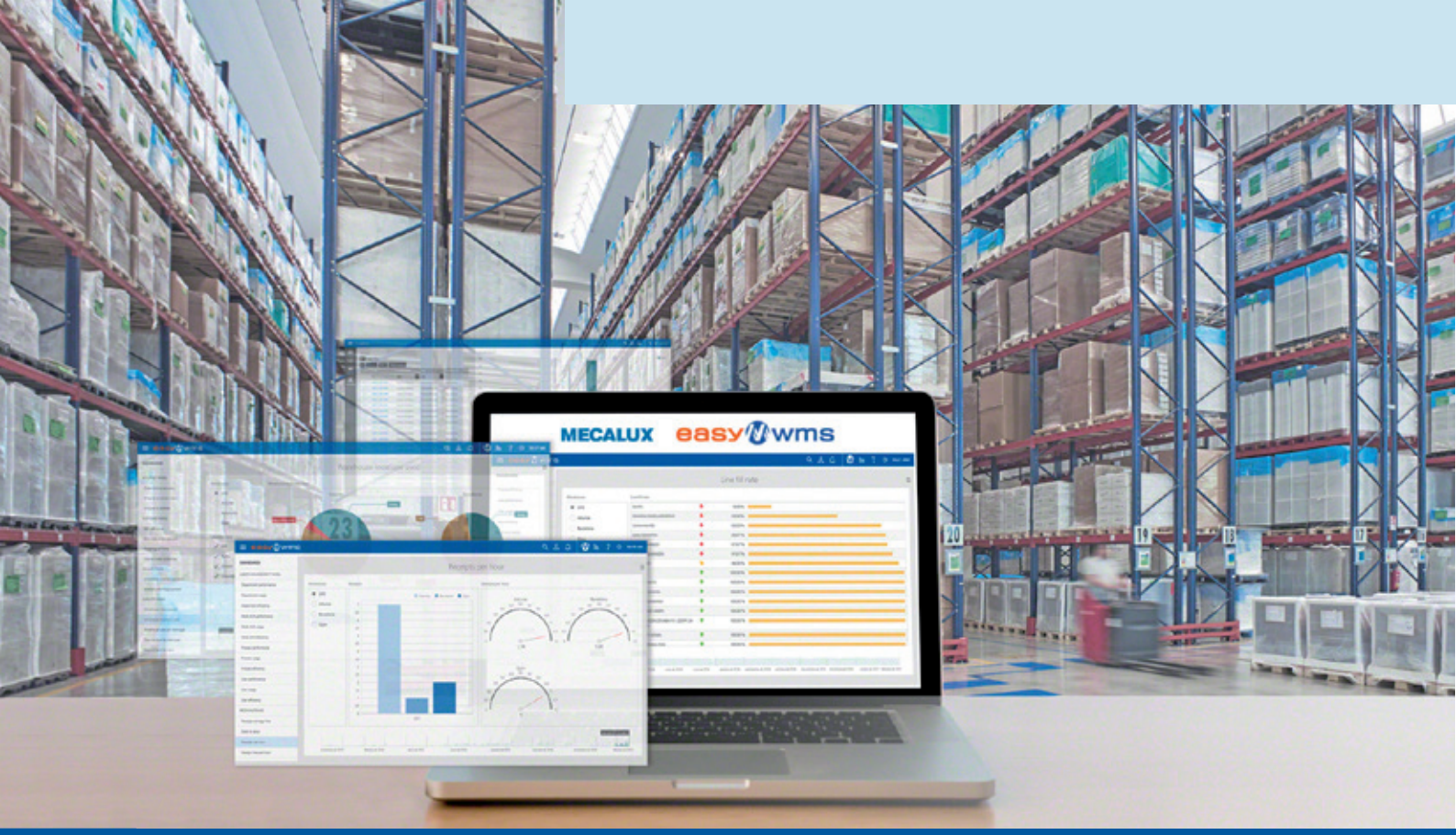




Dynamic gravity
This compact "first-in, first-out" structure incorporates roller tables and is set with a decline to enable movement of pallets. It's suitable for cold climates with a large number of pallets where accumulation and turnover are important.



Push-back
This system allows users to store up to four pallets deep per channel. In addition, this system utilises the most height and considerably increases warehouse storage capacity, while maintaining the normal turnover rate, of two or more pallets per SKU. With this system, each level can correspond to a single pallet.



Easy WMS warehouse management system

The brain of the facility

Easy WMS is a powerful, versatile, scalable and flexible software program that can manage a manually operated warehouse (paper- or radiofrequency-device-run), a mixed facility or a large automated warehouse with the same efficiency.

Use it to streamline physical product flows and document management, from warehouse inputs to dispatches, for guaranteed, full end-to-end traceability.



Advantages

- Real-time stock control
- Lower logistics costs
- Increased storage capacity
- Reduced handling tasks
- Error elimination
- Accurate, high-speed picking
- Adaptation to new e-commerce needs
- Management of omnichannel operations
- Fast ROI (in 12-18 months)

Mecalux works with leading suppliers that attest to the quality, reliability and technical level of the Easy WMS platform:

ORACLE Partner · SAP Partner · Microsoft Partner · ZEBRA TECHNOLOGIES

Interconnected solutions for your supply chain



Multi Carrier Shipping Software

Automates product packaging, labelling and shipping. Coordinates direct communication between the warehouse and the various transport agencies.



Store Fulfillment

Synchronises inventory and workflows to ensure optimal stock management between the central warehouse and the network of brick-and-mortar shops.



Marketplaces & Ecommerce Platforms Integration

Synchronises the stock in the warehouse with the online catalogue in real time.
Easy WMS automatically connects to the main digital sales platforms and marketplaces, e.g., **Amazon, eBay** and **PrestaShop.**



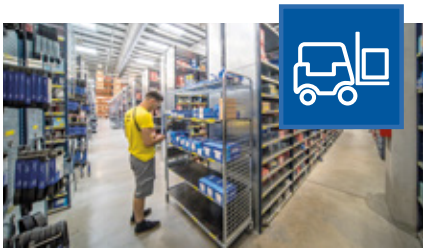
WMS for Manufacturing

Facilitates traceability in manufacturing processes. Guarantees the continuous supply of raw materials to the production lines.



Supply Chain Analytics Software

Analyses the thousands of pieces of data generated daily in a warehouse, allowing managers to make strategic decisions based on the real throughput of operations.



3PL Warehouse Managemment Software

Manages billing between a 3PL and its customers. A dedicated access platform provides information on stock condition and how to place orders or request customised shipments.



Yard Management System

Supervises the movement of vehicles in the yard at the warehouse or distribution centre. Optimises loading dock operations to improve vehicle flow and avoid bottlenecks with inbound and outbound goods.



Labor Management System (LMS)

Maximises operational productivity. It objectively measures operator throughput, detecting opportunities for improvement for the company.



Warehouse de Slotting Software

Optimises slotting management in the warehouse.
It determines the optimal slotting for each SKU based on a set of predetermined rules and criteria (historic, current and future demand).

Easy WMS in the cloud

- **Lower initial investment** since in-house servers are not needed.
- Faster, simpler **implementation**.
- Easier, more affordable **technical support and maintenance**. Total security with Microsoft Azure.
- Software **version up-to-date** at all times.
- **Maximum availability** to guarantee business continuity.
- **Fees adapted** to the needs of each business.

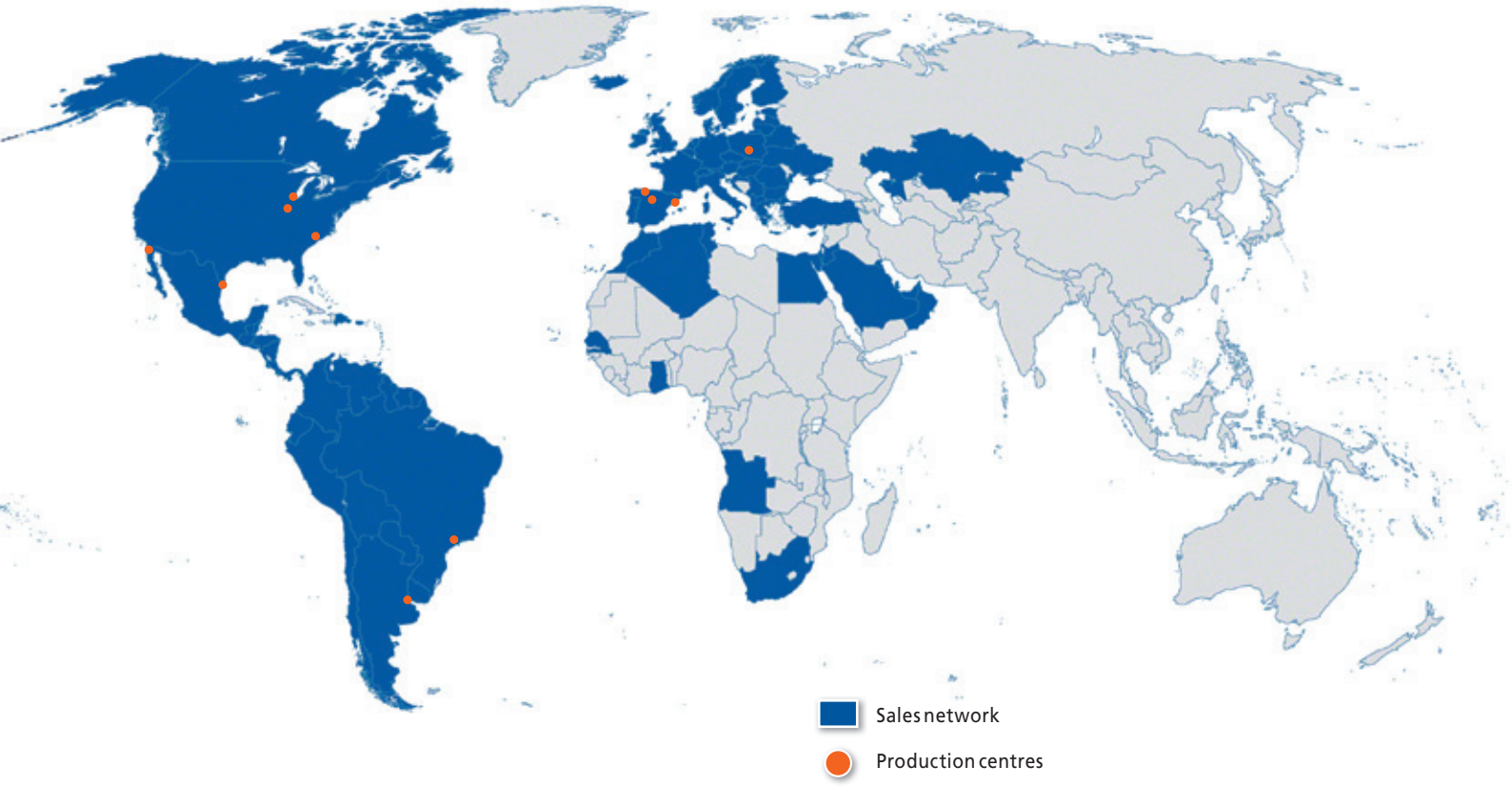
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