

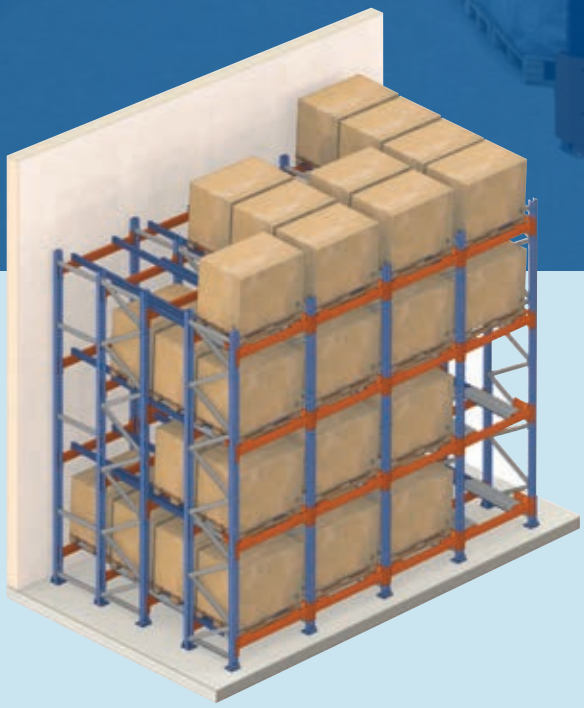
Push-back pallet racking

Accumulative storage system to locate up to four pallets in depth per channel

MECALUX



An ingenious solution to increase storage capacity and reduce handling times



The push-back rack is a compact storage system that allows for storage of 2, 3 or 4 pallets in depth and a different item in each storage channel. It works via accumulation, through a set of trolleys on which the pallets are deposited and which are pushed along a set of rolling rails.

All pallets on each level, except the last one in, are deposited on the set of trolleys. Meanwhile, the rolling rails upon which the trolleys move are mounted on the slightly inclined beams of the structure, with the front part being lower in height to allow gravity to move the subsequent pallets to the first exit point when a pallet removed.

This system is based on the LIFO load management principle, the last pallet to come in is the first out. Therefore, access to the stored goods is performed from a single work aisle, unlike live racking which needs one aisle for loading and another for unloading.

Advantages

Optimisation of space and speed in loading and unloading operations



1 Space saving

Increased storage capacity and minimal loss of upper warehouse spaces.

The trolleys on which the pallets move are designed to minimise the loss of space at upper levels and **only require one work aisle** for the loading and unloading of goods, since the LIFO load management principle is applied.

2 Time saving

Shorter loading and unloading times, since forklifts do not need to enter the storage aisles.

3 Versatility

Supports a different item for each storage channel, enabling product diversification.

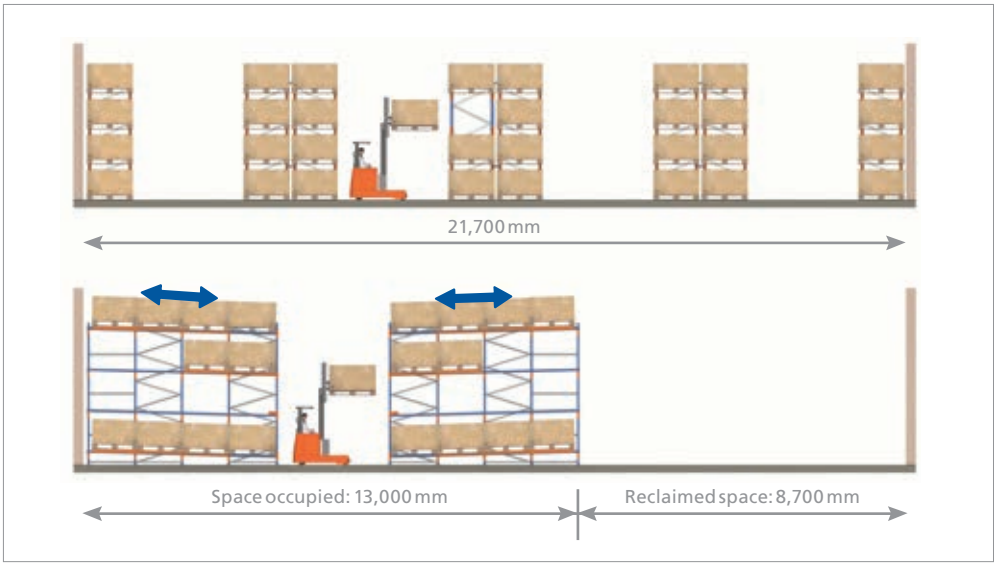
- In the push-back roller version, **storage capacity** can reach up to 6 pallets in depth.
- Its **easy installation and modification** enables it to be adapted to the ever-changing needs of the business.
- **Load capacity** per trolley of up to 1,500 kg.
- The trolleys are designed to **work in extreme temperatures** from -30 °C to more than +40 °C.

4 Safety

Push-back racks comply with international regulations in force , ensuring their durability, stability and strength.

The pallet centralisers, stops, locking devices and other elements allow **loading and unloading manoeuvres to be performed easily and safely**.

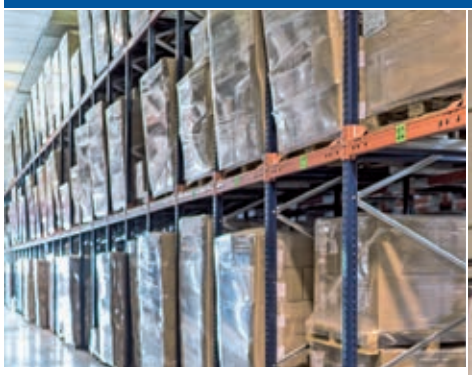
Since the forklifts do not circulate within the storage aisles, **this avoids possible blows to the structure of the racks**, increasing the safety of the installation and minimising maintenance.



Comparison of space between a conventional system and a push-back system (calculation made with pallets 1,200 x 1,200 mm in size).

Operation

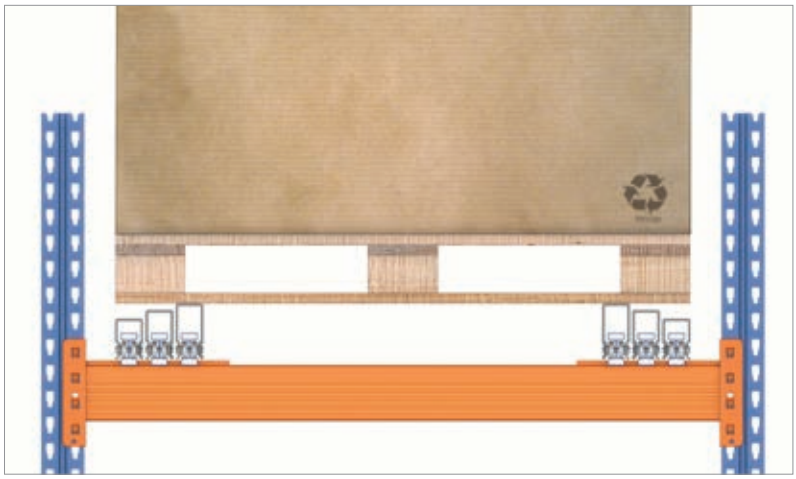
Trolleys and rails move the pallets smoothly and with minimal effort





In the push-back racks, the forklift handles the pallets with the lower skids arranged perpendicularly, so that they rest crossways on the trolleys and rails.

In each channel a pair of rails and a pair of trolleys are placed for each pallet that is to be stored, except for the last one, which is supported on the rails. Thus, if the pallets need to be placed four deep on the rack, six rails of three different lengths and six trolleys will be installed. The trolleys have different heights to allow the easy support and movement of each pallet.





Channel prepared to store 4 pallets, with 3 pairs of trolleys of different heights.

The operation of the push-back system is very simple:



1 The forklift deposits the first pallet on the highest set of parallel trolleys.



2 With the second pallet, the forklift pushes the first until it reaches the next pair of trolleys and deposits the pallet on them.



3 If the installation is designed to store four pallets, the operation is repeated with the third pallet and the last one is laid directly on the rolling rails, not on the trolleys.

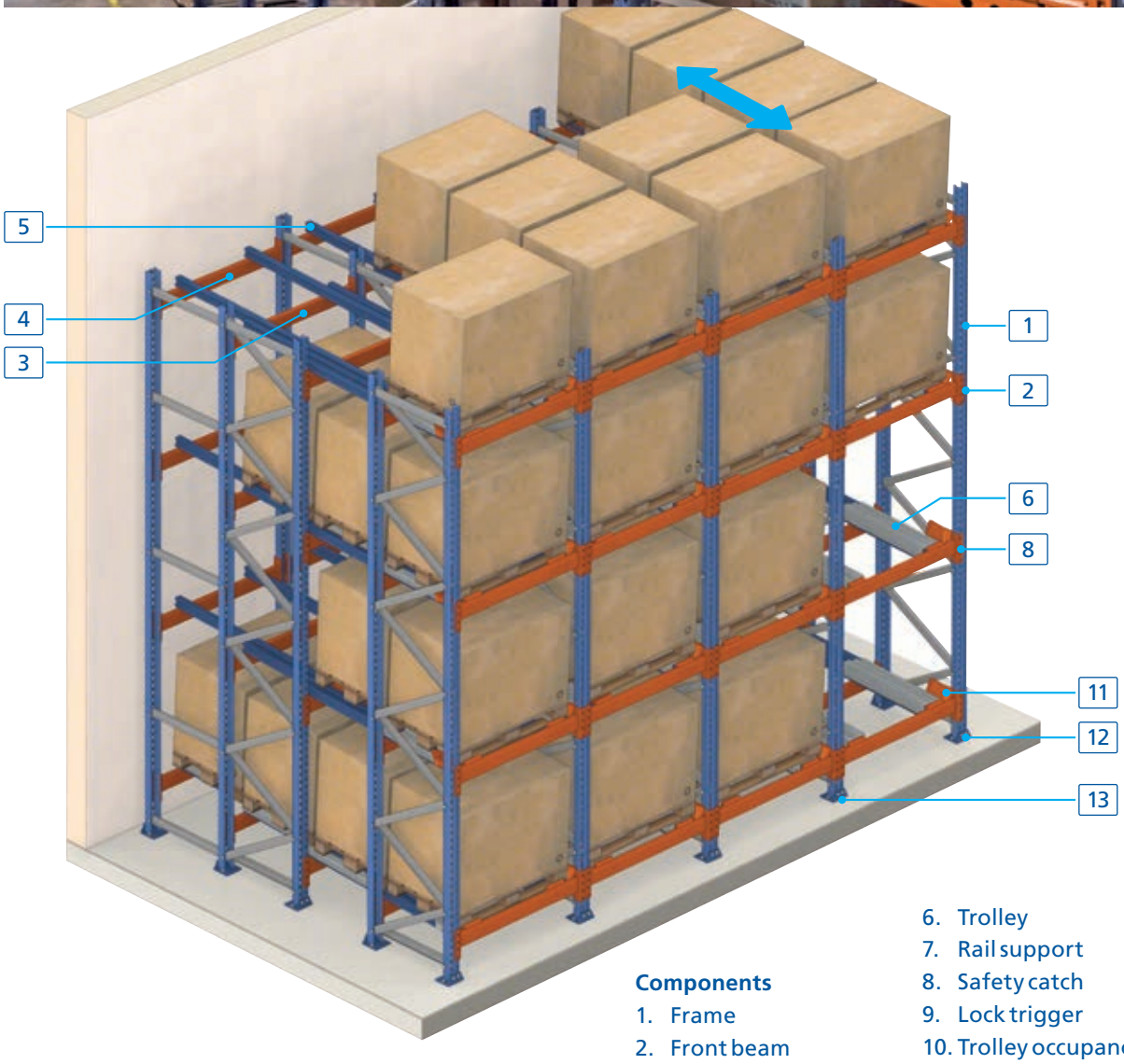


4 To remove the pallets the process is reversed, so that when removing the first pallet the others are moved one position towards the aisle by gravity until they fill the space created.

Basic components

Extremely simple to optimise the use of space





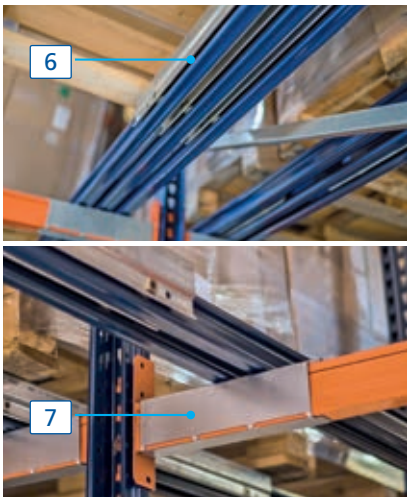
Components

1. Frame
2. Front beam
3. Intermediate beam
4. Top beam
5. Rail
6. Trolley
7. Rail support
8. Safety catch
9. Lock trigger
10. Trolley occupancy indicator
11. Pallet centraliser
12. Supplementary plate
13. Anchorage



In addition to the elements common to metal pallet racking (such as racks, beams, cross-ties, diagonals, anchorage, etc.), what distinguishes the push-back system are the rolling rails, trolleys and various safety devices:

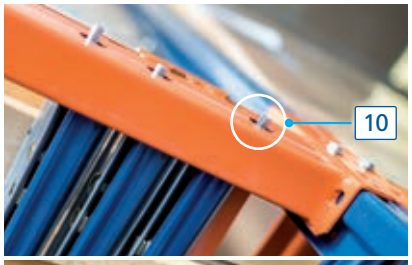
Rails (5)
"I" shaped metal profiles where the trolleys are housed and which allow the rolling elements to be slotted on both sides, ensuring proper movement and preventing any possibility of derailment. The length depends on the number of pallets to be placed and their depth. They are fastened onto the beams, which are mounted with the necessary incline for the proper movement of the pallet and which bear the load, while facilitating the placement of the pallets.



Trolleys (6)
There are four bearings on their corresponding shafts to allow movement along the rail. They are available in three heights for the placement of two, three or four pallets and in three different lengths to fit the width of the pallet.



Lock trigger (9)
Included in each trolley to prevent its displacement in case the pallet is not correctly supported.





Trolley occupancy indicator (10)
The front beams have support and fastening elements, as well as stops and drill holes, allowing an occupancy indicator to protrude signaling availability. It is especially useful at high levels, as the operator can quickly see from the aisle if there is a free space in a given channel, avoiding possible collisions.

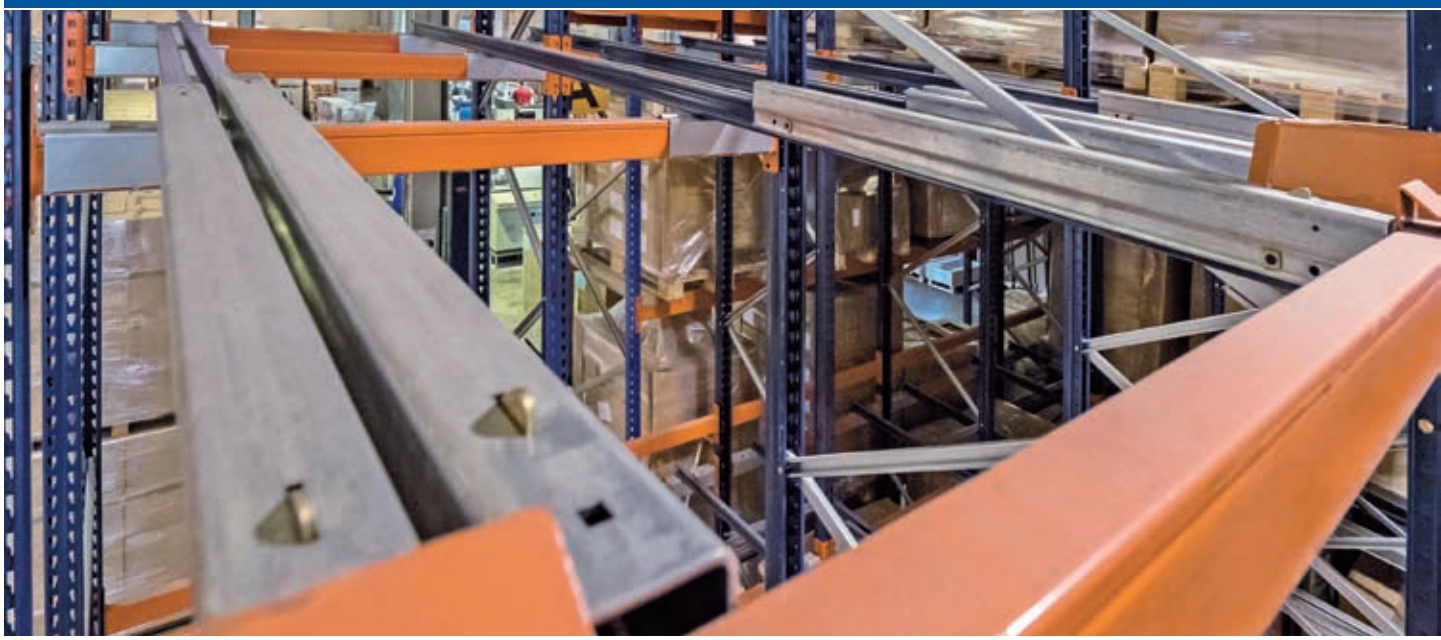




Pallet centralisers (11)
They are located on both sides of each channel to help correctly centre the pallet and to facilitate loading and unloading manoeuvres.

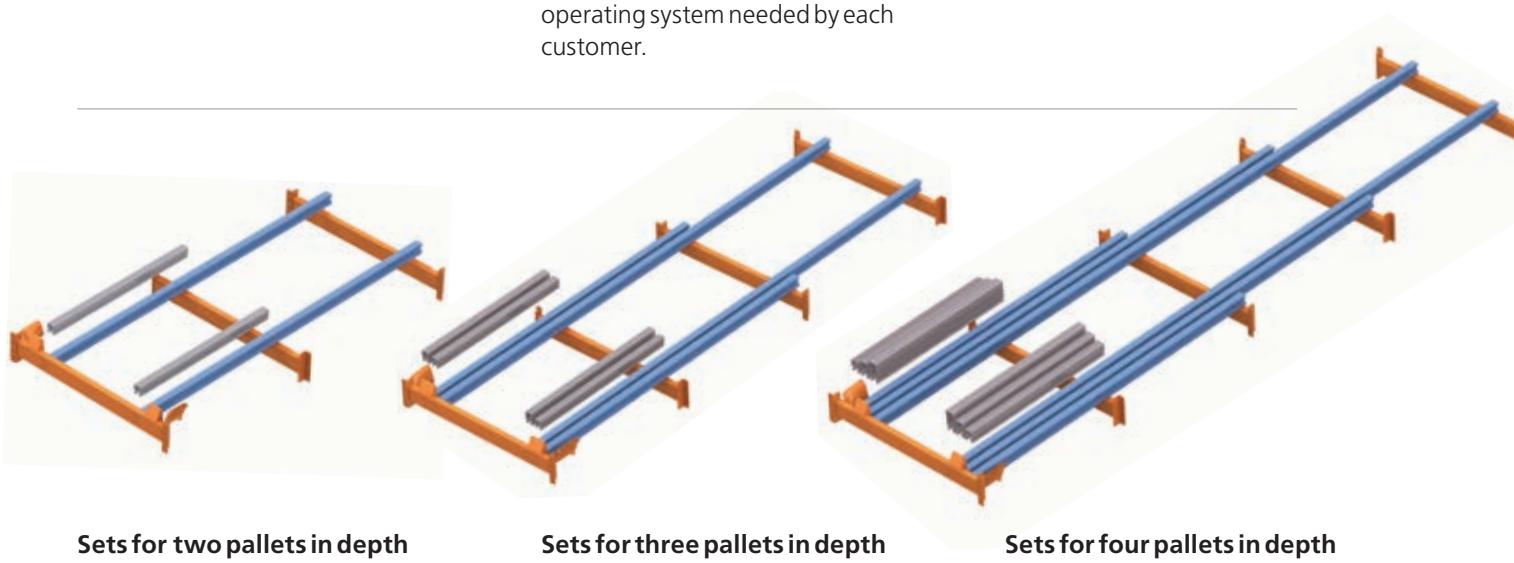
System variants

Trolleys or rollers to store up to 6 pallets in depth



The racking can be adapted to store two, three or four pallets in depth with the trolley system, or up to six pallets in depth with the roller system.

To choose the most appropriate variant in each case, it is necessary to analyse the characteristics in terms of capacity, number of items, model and size of the pallets, as well as the operating system needed by each customer.



Sets for two pallets in depth
This set has only two rails and two parallel trolleys. The first pallet rests on the trolleys and the second directly on the rails.

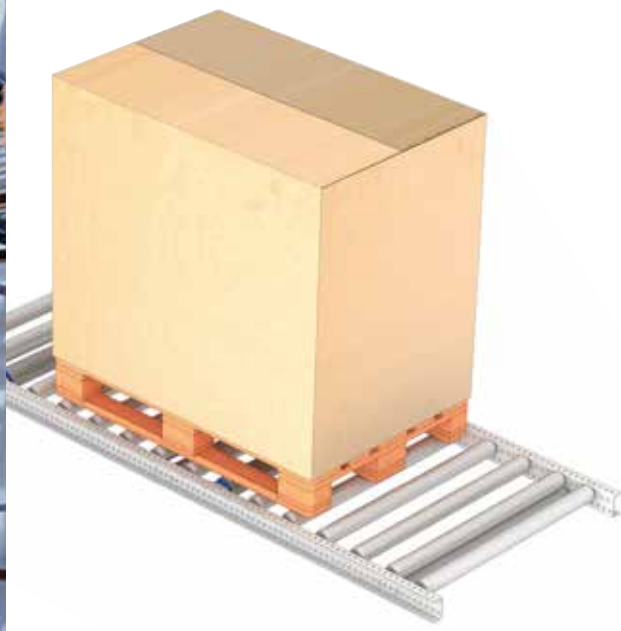
Sets for three pallets in depth
The system incorporates four rails and four trolleys (two rails are shorter). The first and second pallet are deposited on the trolleys and the third directly on the rails.

Sets for four pallets in depth
This set has six rails of three different measurements and six trolleys. The first, second and third pallets rest on the trolleys and the fourth directly on the rails.











Push-back with rollers

Another variation of the trolley system is made up of roller channels. The operation is similar to that of the trolleys, replacing the rails and trolleys with rollers.

The construction system is the same as in the live system, with the difference that the pallets are introduced and extracted from the same side.

With this system, the pallets must be handled by the narrower side, so its lower skids rest perpendicularly on the rollers and facilitate their movement.

Applications

A flexible system that adapts to many applications



- The push-back system is ideal for **storing all kinds of medium-turnover palletised goods** with two or more pallets per item, and it is managed using the LIFO system.

- It is also suitable for high consumption **goods thanks to the speed** of loading and unloading maneouvres.

- This is an optimal solution for **warehouses with many items and few pallets** per item.

- **In warehouses requiring picking tasks**, the push-back system can be combined with live levels for picking at the bottom, offering two types of solutions:

1. A **single level of live picking at the bottom**, where the pallets from the upper levels are introduced (Figure 1).

2. **Several levels of live picking on the lower level**, which can stock pallets both from the upper levels and from boxes previously extracted from these pallets (Figure 2).

- In addition, since only one work aisle is **needed for operations, push-back racks can be supported along the entire length of the wall**, occupying a space left unused by other systems and facilitating their combination with other storage solutions.

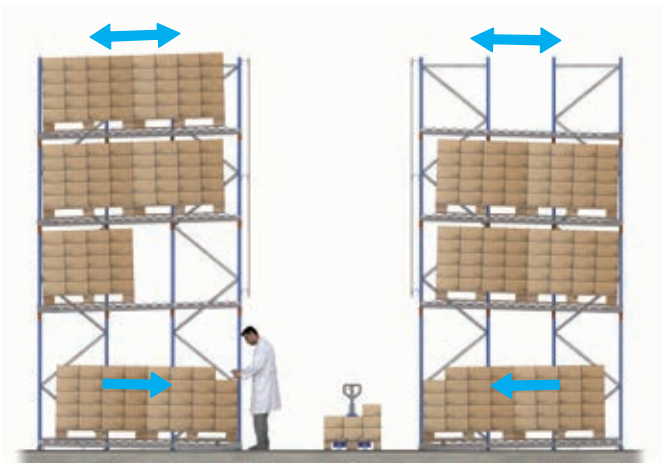


Figure 1



Figure 2







easy wms

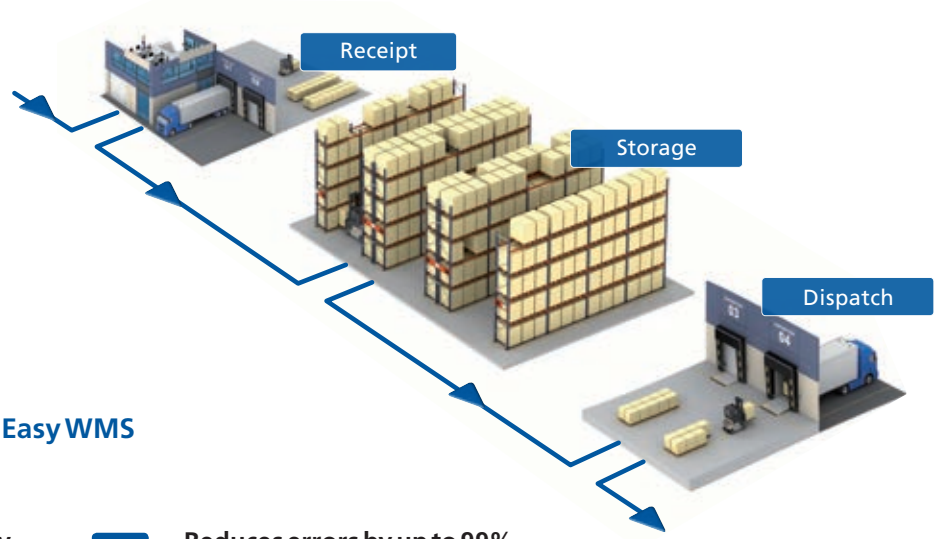
Warehouse Management Software

To maximise the profitability of a warehouse it is highly recommended to integrate warehouse management software, such as Easy WMS from Mecalux. Designed for warehouses of any size and type, it coordinates the goods from their point of origin to their destination, taking into account the specific criteria of each installation.

Easy WMS is a powerful, versatile and flexible software that controls and runs all the movements and processes of the warehouse at peak efficiency, including receipt of goods, storage, real-time inventory, picking and dispatch. This reduces costs and improves the quality of the service for the end customer.

Easy WMS offers different modules that simplify the integration of the software into any type of warehouse. The selection of these modules will depend on the specific requirements of each customer as well as the characteristics of their installation.

For more information, ask for the Easy WMS catalogue or contact the sales department for obligation-free advice from a qualified technician.



Main benefits obtained via Easy WMS implementation:

1. **Increases productivity** and lessens the number of operations.
2. **Increases storage capacity by up to 40%**, optimising the space occupied by goods in the warehouse.
3. **Increases picking and dispatch speeds.**
4. **Reduces errors by up to 99%** in the inbound and outbound processing of material.
5. **Controls and optimises stock**.
6. **Features real-time inventory** and tracking of goods.
7. **Reduces logistics costs**, optimising human resources and handling costs.
8. Provides **multi-proprietor, multi-warehouse** and **multilingual** features.
9. **It has the ability to adapt to emerging needs** or market trends, such as e-commerce.
10. **Offers better document management.**



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