Warehouse safety manual

Operation, use, inspection and maintenance of picking shelves

MECALUX

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MANUAL FOR THE USE AND MAINTENANCE OF PICKING SHELVES

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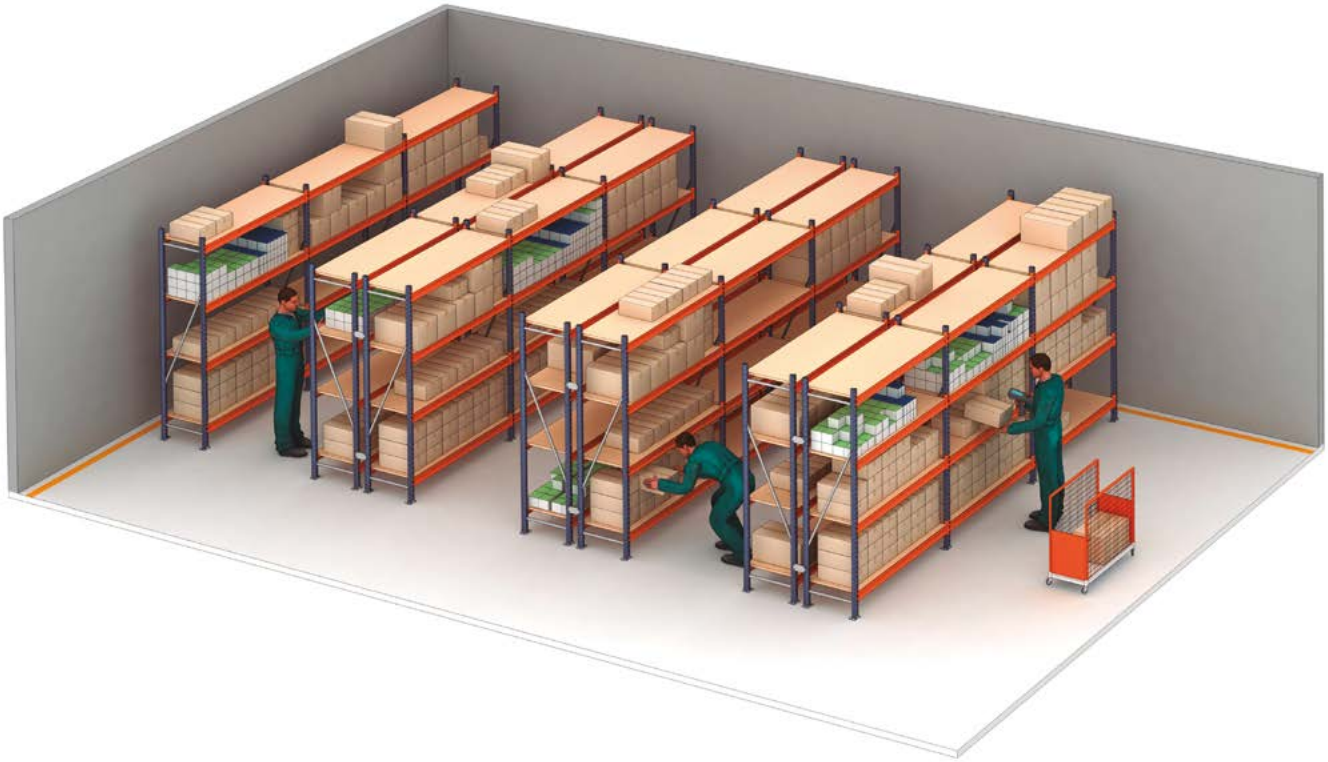


INTRODUCTION

All warehouses in operation hold productivity and work conditions as universally important concepts. Therefore, it is essential that safety is strictly and rigorously reinforced when handling loads stored on the shelving units. This minimises the exposure to risk of the staff charged with performing these tasks.

A well-maintained warehouse facilitates all work carried out in it. However, misuse of any part of the storage system may result in accidents.

The basic elements found in a warehouse include:

- Floor slab.
- Unit load.
- Handling equipment.
- Shelving (and/or racking).

To avoid situations involving the potential risk of personal injury, costly interruptions to service or damage to the facility or the goods, the following measures should be taken:

- **Prevention:** personnel must be trained to use the facility and equipment properly.
- **Inspection:** staff should continuously check that all optimal conditions of use are met.
- **Maintenance:** any defective or malfunctioning warehouse element should be immediately attended to or corrected.

A facility is used safely and rationally through the collaboration between the users and the manufacturers of the shelving units and handling equipment.

VERY IMPORTANT:

Responsibility for the surveillance, use and the condition of the installation lies with the customer. The customer must convey the content of this manual to warehouse managers and users.

This manual is based on the guidelines found in the EN 15635 standard.

Users must also comply with the specific standards in force for this type of installation in each country.

The Mecalux Group has prepared this manual to provide its customers with guidance on the correct use of the shelving units. It was drafted taking into account several recommendations from European bodies in the sector (European Materials Handling Federation – FEM, French National Research and Safety Institute – INRS), the EN 15635 European standard (Steel static storage systems. Application and maintenance of storage equipment), technical notes on prevention from the Spanish National Institute for Safety and Health at Work, as well as the Mecalux Group's 50 plus years of experience in the warehousing sector.

Therefore, this manual should be read carefully and its recommendations applied. The Mecalux Group is available to answer any queries that users of the installation may have on the subject.

This manual is limited to warehouses in which unit loads are handled manually; therefore, it excludes risks arising from loading with handling equipment.

This manual does not include extensive information on ergonomics or working environment conditions (lighting, temperature, etc.), nor does it address safety measures to protect warehouse operators (clothing, footwear, etc.).

WAREHOUSE ELEMENTS

In a warehouse with manual loading operations, the user deposits and extracts the goods directly from the shelves.

FLOOR SLAB

This comprises a basic structural element for the operation of the warehouse. Its definition and construction must take into account the following:

- Its **stability and strength characteristics** must be appropriate to withstand the force exerted by the loads, the shelves and the handling equipment. The concrete must be at least type C20/25 (according to 2008 Spanish Structural Concrete Code or the standard superseding it) with a minimum strength of 20 N/mm^2.

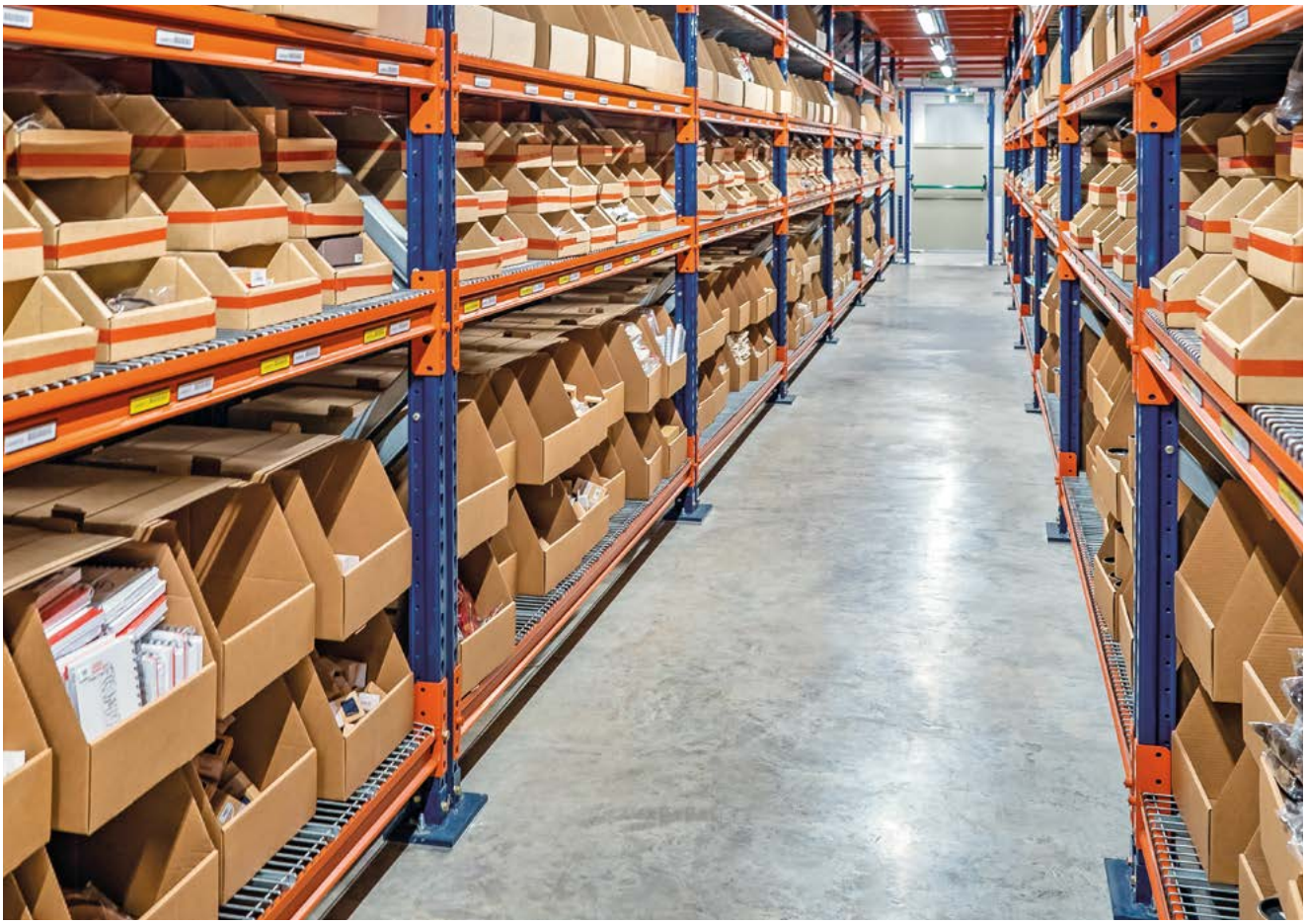
- The **levelness or flatness of the floor slab** is carried out as specified in the EN 15620 standard.

The floor slab can have different finishes (concrete, bituminous material, etc.). If bituminous material is used, special attention should be given to the design of the shelving.

The thickness of the floor slab and its geometric characteristics must be suitable for anchoring the bases of the shelving units.

VERY IMPORTANT:

Before installing a hand loaded warehousing solution, the customer should be sure that the floor slab has sufficient load-bearing capacity.



UNIT LOAD

Generally, operators handle small, lightweight units comprising packages or boxes, which they place on the shelves. They can consist of different types: cardboard boxes, plastic containers or loose products. If the goods are deposited into boxes, they should be sufficiently strong.

The unit loads used must not exceed the maximum size or weight laid down in the design of the installation and those prescribed in national legislation. The maximum safe handling weight is 25 kg.

Full boxes

Individual products stored in open boxes for easy access

Stackable plastic bins

Open cardboard boxes and bins

HANDLING EQUIPMENT

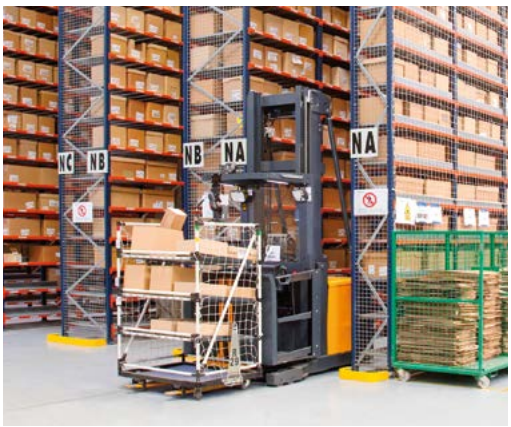
Warehouses with manual loading operations sometimes use handling equipment such as:

- Manually operated trolleys
- Mechanically driven trolleys
- Pallet trucks
- Stackers
- Order pickers

For all this equipment, it is necessary to take into account the measurements, the necessary aisle space and the maximum lift height.

Manually operated trolleys

Mechanically driven trolleys



Pallet trucks

Stackers

Order pickers

SHELVING

This comprises various different storage systems. The choice between one or another will depend on the weight, sizes of the loads and the investment to be made, among other factors.

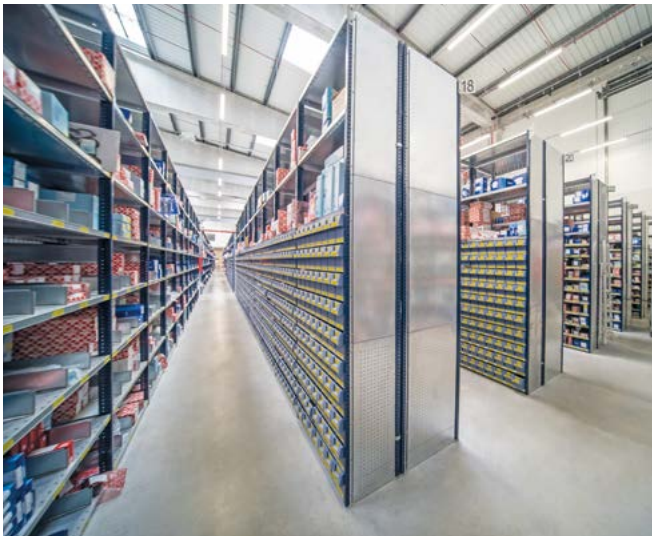
1. M3 light and medium duty shelving
2. M7 medium and heavy duty shelving

M3 light and medium duty shelving

M7 medium and heavy duty shelving

Anchorage

The EN 15635 standard states that:



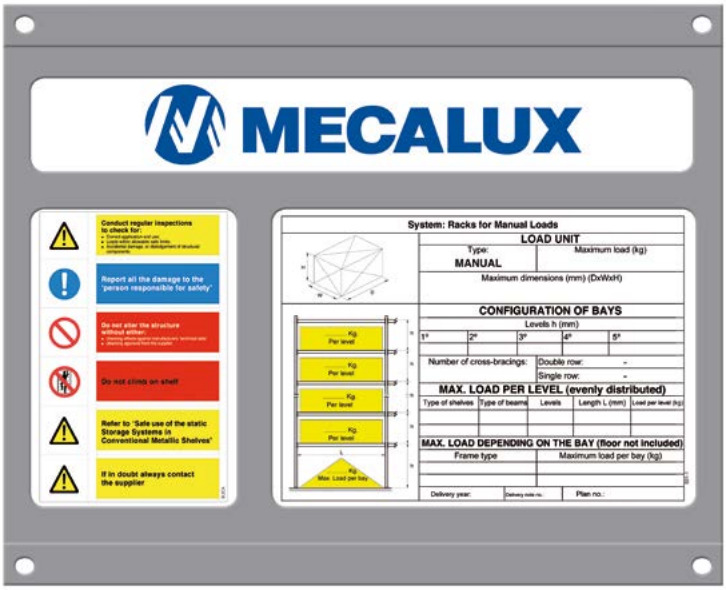
• Single shelves without removable drawers and with a height of less than 2.5 m and double shelves with a height of less than 4 m need not be anchored to the floor if the following condition is met:

(height to the last level/shelf depth) < 4

All other shelving units must be fixed to the floor.

Safe load warning notice

This must be prominently displayed on or adjacent to the storage equipment so that it is clearly visible and the permissible loads per level and per module are known.



ERGONOMICS

This is a key factor for avoiding accidents and reaching optimal throughput in the warehouse. Not only is it necessary for protecting the health of the workers, but also for the safety of the goods stored.

Load handling
It is essential to train operators in the correct handling of loads.

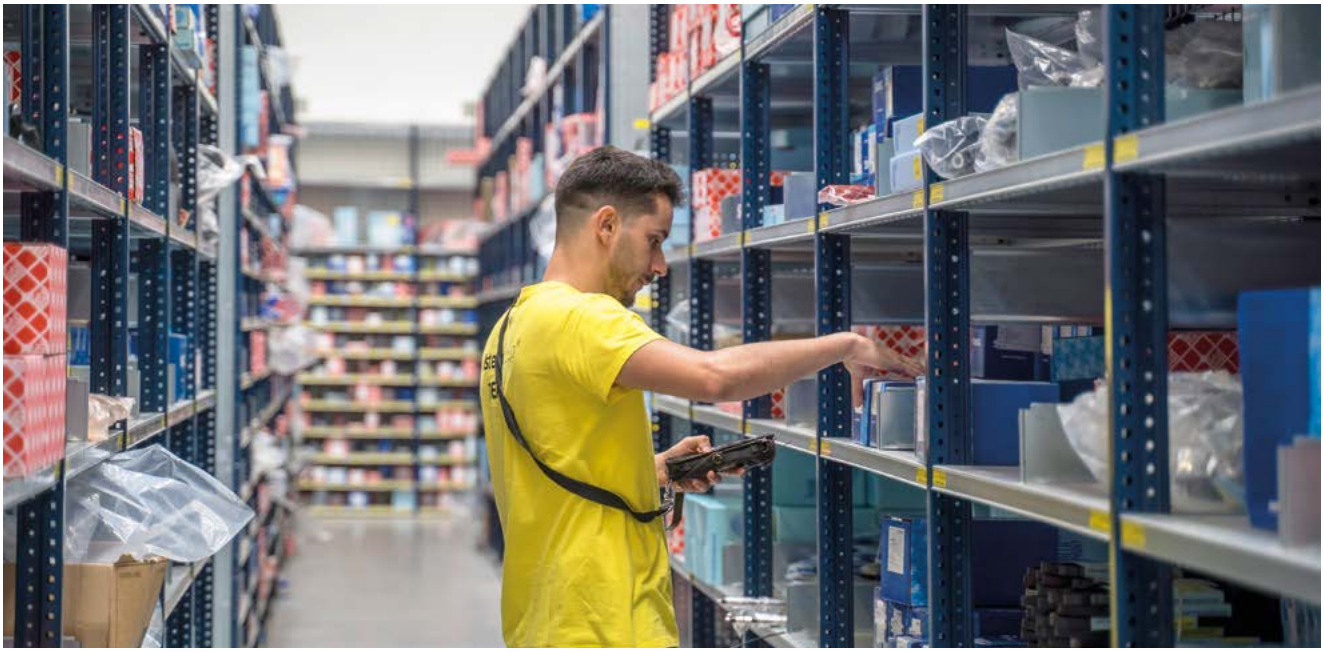
- Balance yourself properly.
- Use your leg strength.

- Bend your legs when picking up the load.
- Handle the heavy load as close to your body as possible.

- Keep your back straight.

- Carry the load with your arms close to your body.

It is best to adapt the work to the abilities of the employees and facilitate their access to the goods. To do so, the working height should be optimal: the product should be placed at a height suitable for handling.



This illustration shows a table with the theoretical weight that a person can move depending on the height and the distance between the object and the body.

Likewise, proper arrangement of the items on the shelves will avoid awkward postures.

USE OF THE SHELVES

These instructions must be followed when using picking shelves:

1. It is forbidden to climb on the shelving or use inappropriate means to reach higher levels.

2. The shelving configuration must not be changed without consulting the Mecalux technical department. Thus, it is expressly forbidden to:

- Remove or add levels
- Exceed the maximum permissible load
- Change the height between levels

3. Loads should be distributed in a proportionate and uniform manner, avoiding any asymmetrical distribution that could destabilise the shelves.

Additionally, the loads should not overhang the shelves or protrude into the working aisle, as this could cause them to fall.

4. The structure of the shelves must not be changed or modified without first consulting Mecalux.

It is also prohibited to:
- modify the shelving components,
- use the shelves with parts that are broken or damaged,
- use the shelves when a component is missing, or
- use the shelves if buckling is observed.

INSPECTION AND MAINTENANCE

According to the EN 15635 standard:
A person responsible for storage equipment safety (PRSES) must be present in the facility. The racks and all the areas surrounding the storage system must be regularly and specifically inspected for signs of damage.

A thorough maintenance programme must be carried out for the entire facility, with the recommendation that this be executed by or in accordance with the manufacturer of the shelves or racks. These programmes must include the following aspects, among others:

A. When establishing preventive maintenance programs, checklists should be created to easily and effectively carry out inspections and report any irregularities detected.

B. A regular inspection plan should be devised in order to detect, report and record plainly visible irregularities, such as lack of order and cleanliness in storage areas and traffic paths, deformation of components, lack of vertical alignment, flooring inadequacies, missing locking components, damaged loads, etc., to ensure their immediate repair.

C. If the degree of goods turnover and the working hours in the warehouse are both quite high, a specific plan for regular inspection and recording of damage must be established. At the very least, this plan shall include the following:

• **Daily visual inspection**, carried out by warehouse personnel to detect plainly visible irregularities such as: deformed beams and/or frames, lack of vertical alignment of the installation (in any direction), cracks in the floor, absence of shim plates, breakage of anchor bolts, missing locking components, damaged unit loads, absence of safe load warning notice, damage to the floor slab, etc. Consequently, any anomalies should be immediately repaired or replaced.

• **Weekly inspection**, carried out by the warehouse manager or the person responsible for storage equipment safety (PRSES), to check the vertical alignment of the structure and of all elements of the lower levels (1st and 2nd). Any damage identified is to be duly communicated, evaluated and reported.

• **Monthly inspection**, carried out by the warehouse manager or the person responsible for storage equipment safety (PRSES), which includes checking the vertical alignment of the installation at all levels and general aspects of order and cleanliness in the warehouse. Any damage identified is to be duly communicated, evaluated and reported.

• **Annual inspection**, carried out by a competent expert with experience in this activity. A report communicating, evaluating and reporting any damage must be submitted.

All repairs and modifications that are deemed necessary as a result of the shelving unit status reports must be carried out by qualified personnel from the manufacturer or supplier and on empty racks, unless prior analysis indicates that no risk is posed by completing work on partially or fully loaded shelving.

After an impact, depending on the level of damage, any deformed element will be replaced, and the verticality of the structure checked. The replacement part must be identical to the damaged part, and heat (welding) must never be applied, since this would alter the mechanical properties of the steel. In any case, until the replacement is made, the shelving should be unloaded and taken out of service, with proper signage in place.

All potential causes of any form of damage must be investigated so as to reduce or eliminate the possibility of the problem arising and prevent the damage from recurring.

Any observation relating to the condition of the structures and the flooring shall be recorded in a register that shall include: the date it was observed, the nature of the irregularity detected, the type of repair work done and the date thereof. Information relating to the loads should also be included.

The resulting assessment of damage or safety issues must constitute the basis for the establishment of damage prevention measures.

Immediate notification
Any damage to the shelving units will reduce the resistance capacity and the factor of safety considered in the calculation. Therefore, damage to the installation observed by any warehouse employee must be reported immediately to the personal responsible for storage equipment safety (PRSES).

For this reason, all warehouse employees will receive formal instruction on the safe operation of the system, ensuring their safety and that of others.

IMPORTANT NOTE ON CUSTOMER/USER RESPONSIBILITY ACCORDING TO EN 15635:

The customer/user is responsible for the safety of people and for maintaining the equipment (racking units, stackers, etc.) in safe working order.

Therefore, this person is responsible for ensuring that the inspections specified above are performed and that the information stated in the standard is observed; this includes, particularly, the designation of a person responsible for storage equipment safety (PRSES) and the preparation of a risk prevention plan for the facility.

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Mecalux offers its customers a Technical Inspection Service on completion of an installation, as well as yearly inspections, advice and consultancy on damages, modification or expansion of storage systems.

If an accident occurs at your installation, please notify our technical inspection department immediately. We will respond quickly and will properly inspect, identify damages and/or provide repairs to your installation.

We are always in pursuit of the highest quality controls, which has been a cornerstone of how we do business and how we offer better customer care.