



# Cantilever Racking

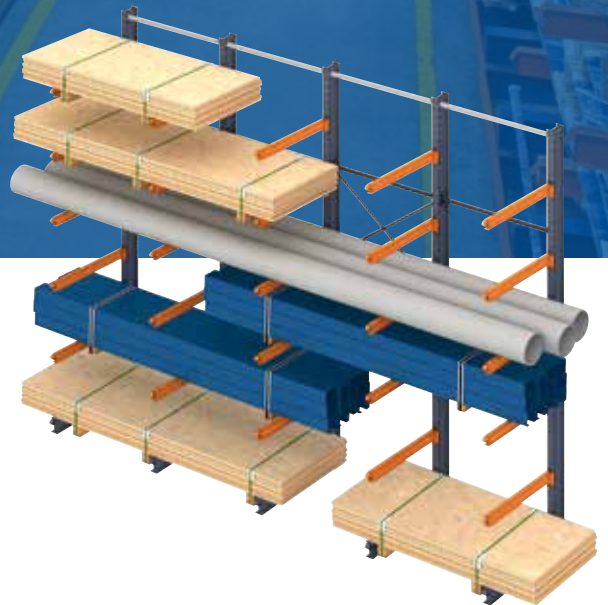
Storage system for long or variable-length loads







**An ideal handling and storage solution for very long products**



Cantilever racking is specially designed to house long or varied load units, such as metal profiles, pipes, mouldings, wooden boards, metal or plastic sheeting, etc.



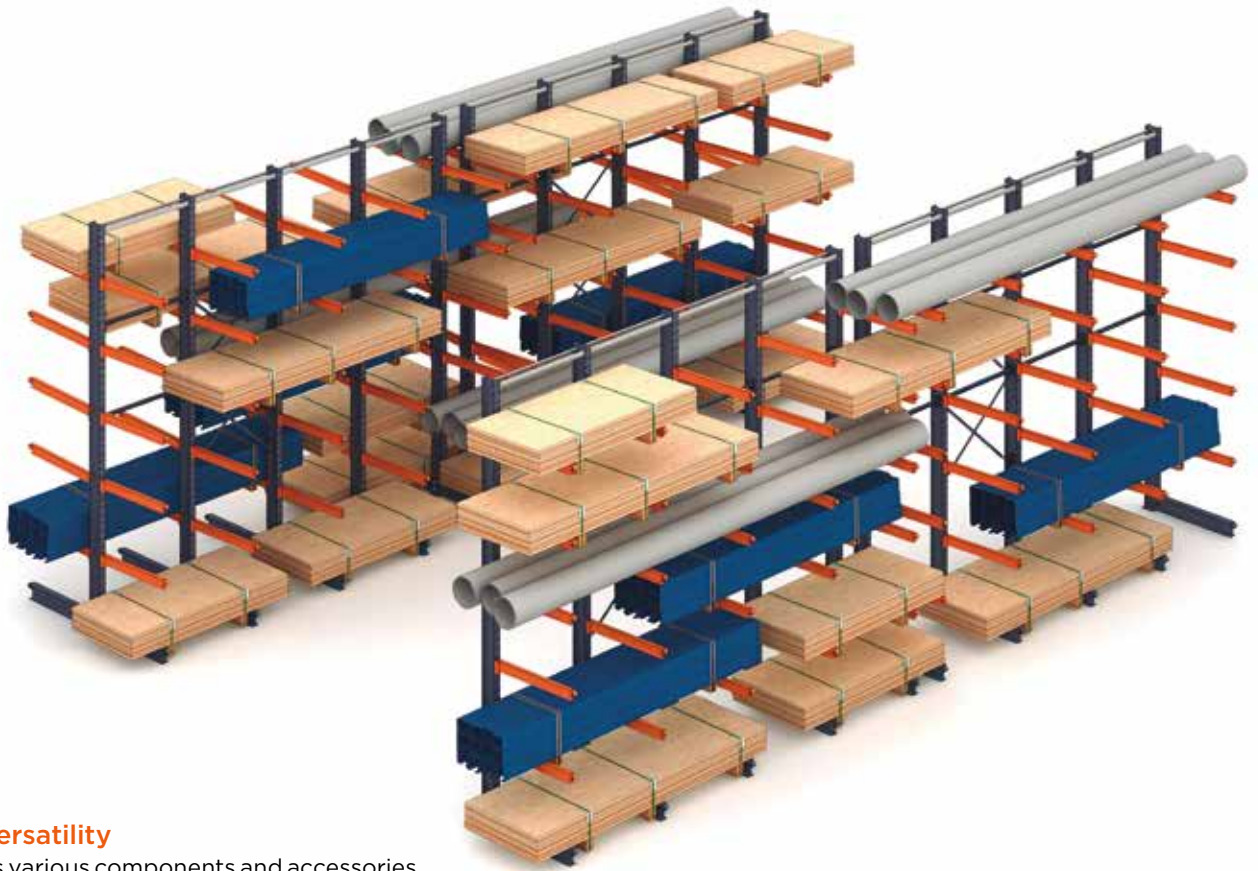
The system comprises vertical profiles (columns) and horizontal profiles strategically positioned to ensure stability. Additionally, overhanging arms are incorporated to support and hold the placed load.

Manual handling is suitable for lightweight loads, while forklifts or other appropriate lifting systems are employed when dealing with heavier items.



## Advantages

Maximum versatility to adapt to any warehouse type and unusually sized products



1

### Versatility

Its various components and accessories make the system adaptable to different types of long and bulky loads.

2

### Easy to assemble

Easily adjustable elements facilitate assembly and adaptation to future needs.

3

### Space savings

Option to install the cantilever rack on mobile bases to compact space without losing direct access to loads.

4

### Quality

Its basic components are made of hot-rolled profiles, which render great strength for loads and resistance against deformations due to impacts.

5

### Safety

The racking includes vertical braces, stops, safety pins, upright protectors, reinforcers, etc., which guarantee its stability and durability.



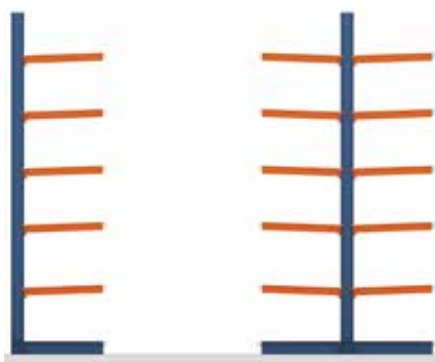


## Layout of the warehouse and loads

Distribution options that ensure the stability and safety of the installation

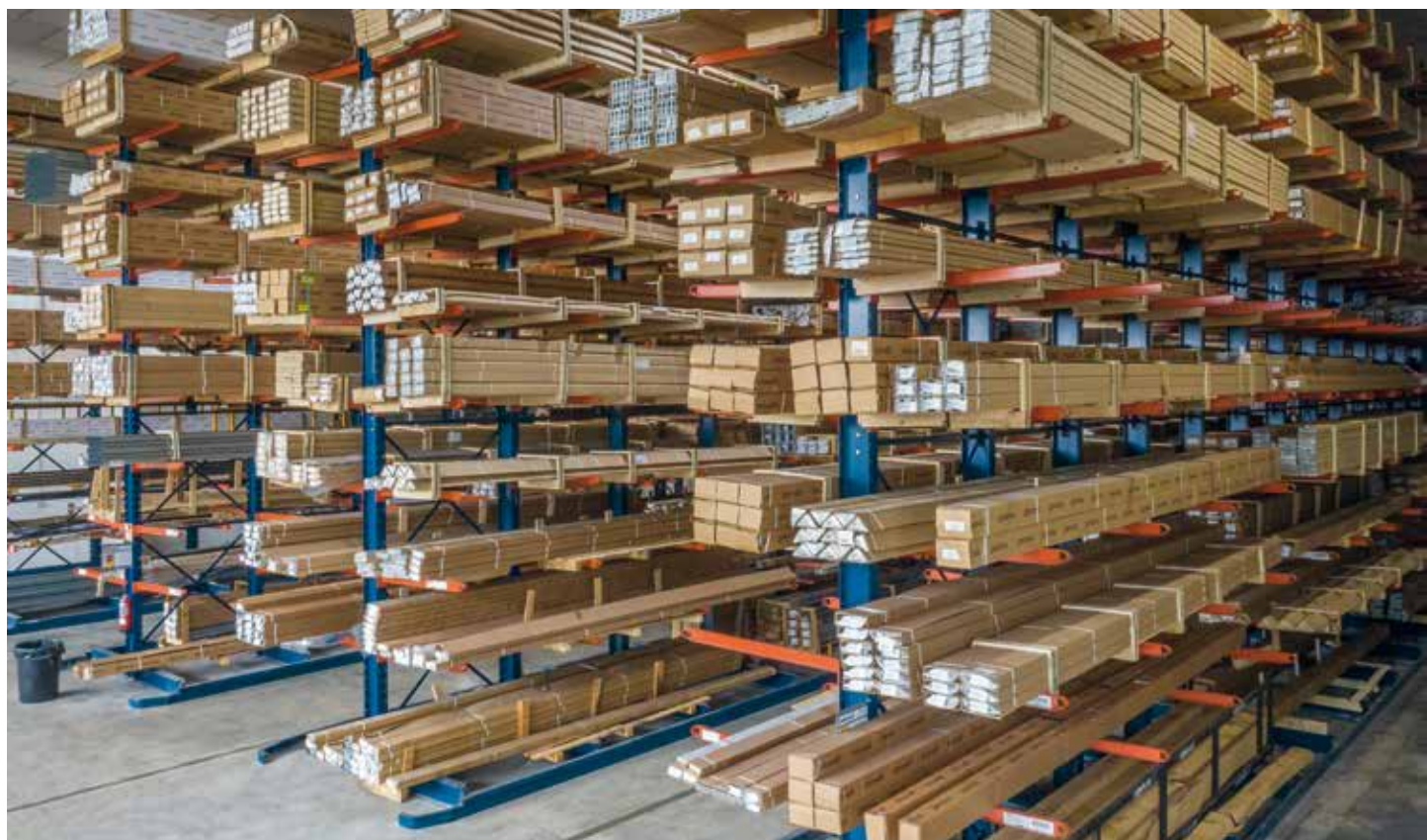
### Single or double racking

The warehouse is laid out with a combination of single-sided cantilever racks, normally placed against walls with access from one side only, and double-sided cantilever racking, which can be accessed from both sides.



Single

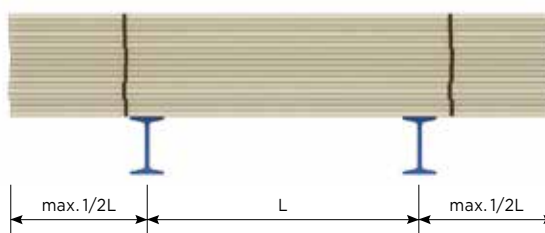
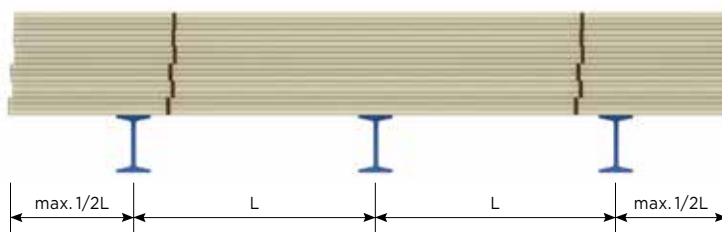
Double



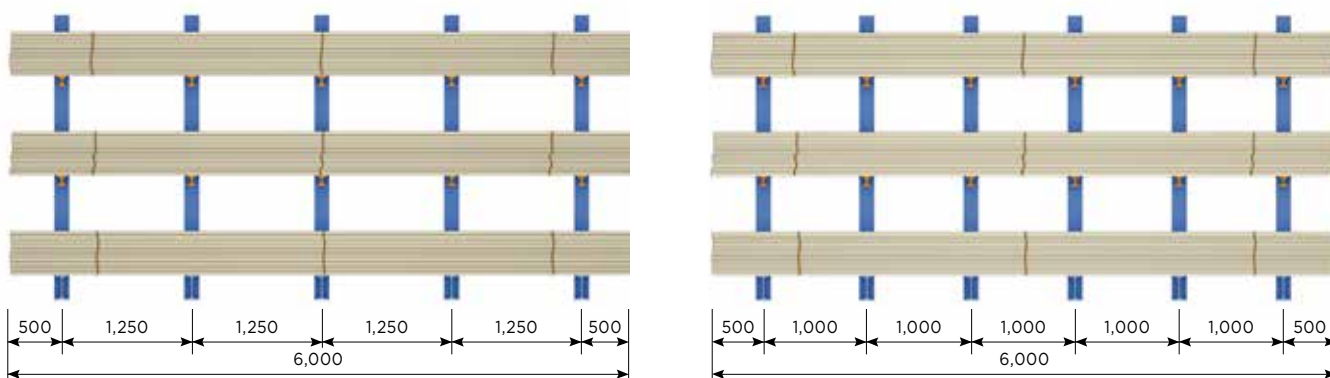
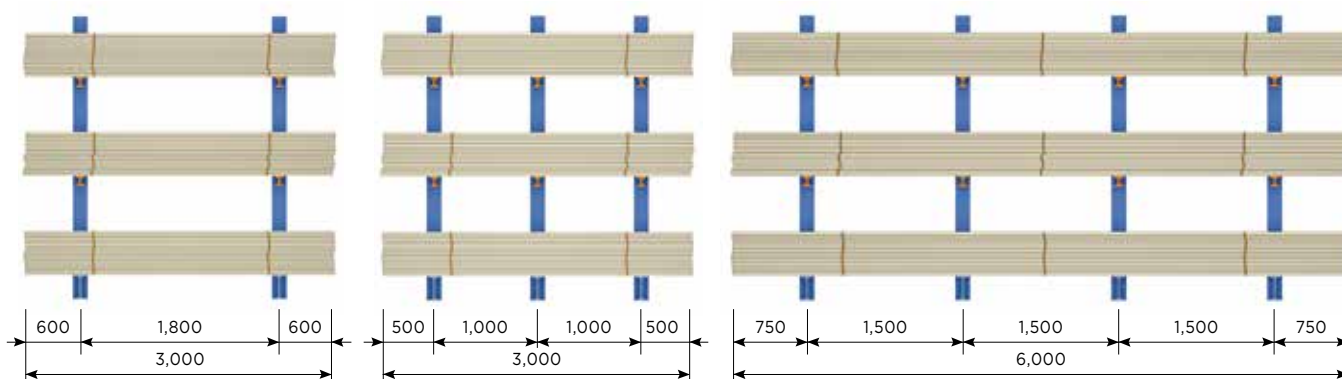
### Racking layout

In the distribution and calculation of these racks, it is necessary to take into account factors such as the size, weight and rigidity of the goods; the type of handling equipment used (typically forklifts); and tolerance, among other considerations.

Each load must be supported by at least two arms. Products may protrude from the sides of both arms by up to a maximum of 50% of the horizontal distance between adjacent arms. This ensures stable support and uniform load distribution.



### Examples of the most common distributions (dimensions in mm)



The optimal number of columns to guarantee the resistance and stability of the storage system can vary based on the weight and rigidity of the goods, although their length may be the same.



## Components

Columns and arms that offer customised support according to load type

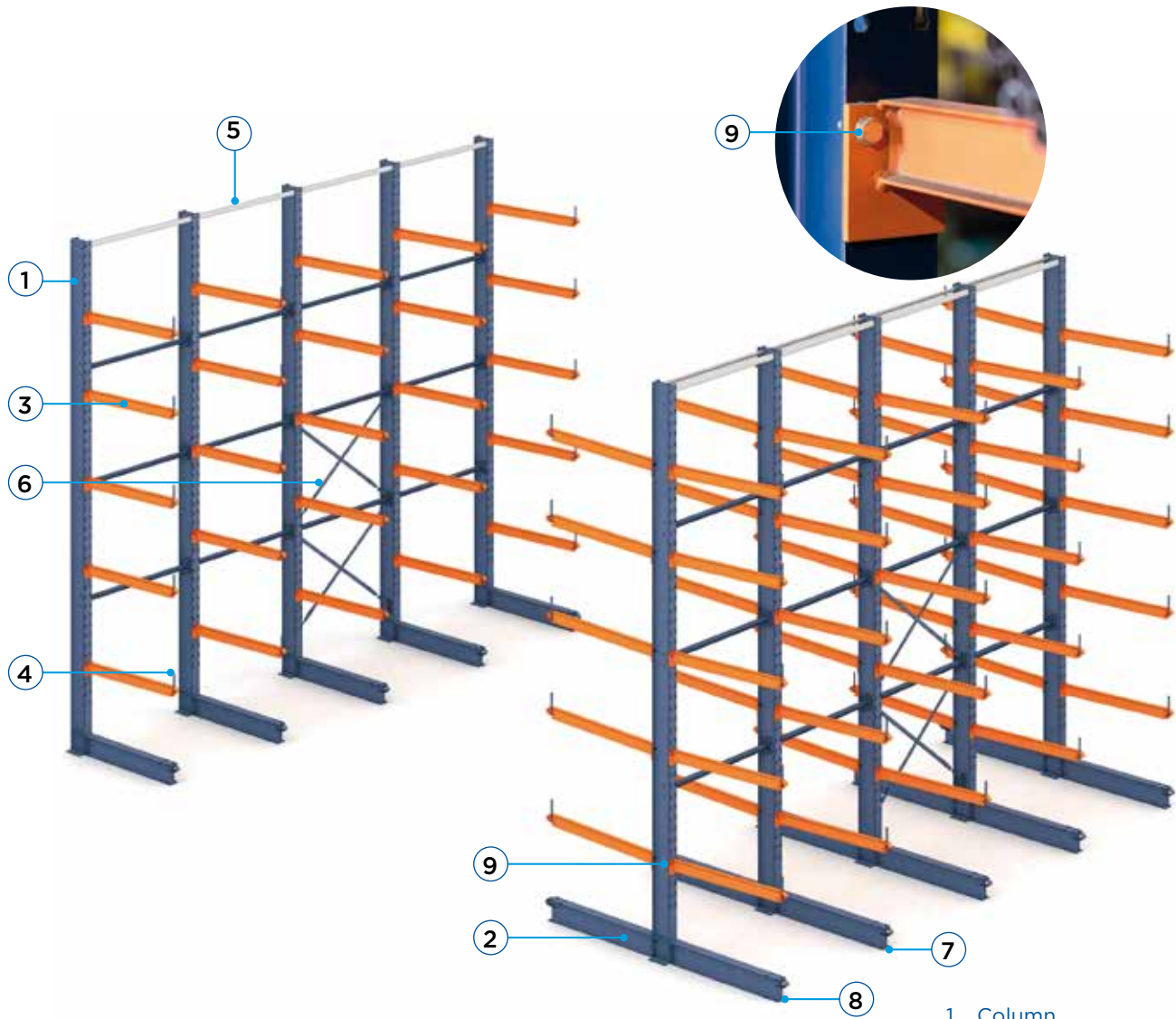


The cantilever racking system consists of different hot-rolled metal profiles developed by Mecalux, with thicknesses and sizes that encompass all market requirements. In order to choose the most suitable system, it is necessary to consider the load weight in addition to the size

of the goods and the height of the racking system.

Thus, the cantilever system is suitable both for manually handled loads and those that require the aid of mechanical or automatic equipment, from forklifts to bridge or stacker cranes.

All their components are modular and fit together easily, allowing quick assembly and great mobility. Longitudinal stability is obtained by means of bracing sets and joining all the columns of the same rack together.



1. Column
2. Base
3. Arm
4. Arm stop
5. Cross bracing
6. Bracing set
7. Shim plate
8. Anchoring
9. Safety pin

### Columns

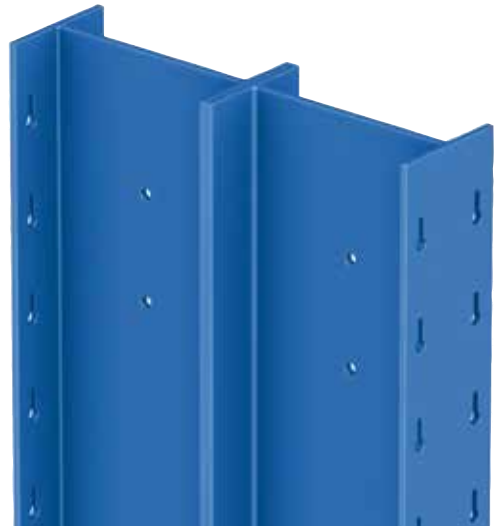
They are made of hot-rolled profiles, with thicknesses that vary depending on the load they must support. The columns are usually formed by single profiles. However, if needed, two profiles can be joined together, considerably increasing their load-bearing capacity.

The slots on the columns are designed to attach arms using either hooks or bolts, allowing for adjustable height settings. There are also attachment points for crossbars and braces.

The standard height of the columns ranges between 2 and 7.5 m, although it is possible to manufacture other sizes based on customer requirements.



Single column



Double column



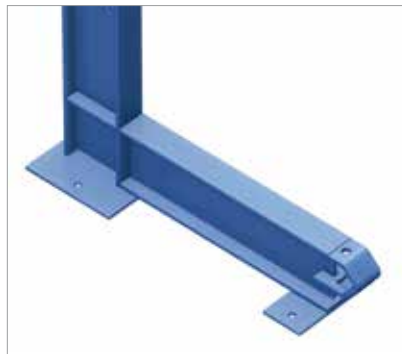
## Components



### Bases

They are joined to the columns via a fixing plate welded to the end of the base. This allows correct support and easy levelling of the racks.

In addition, bases have holes for the placement of floor anchors. The fronts of the bases include protectors and the possibility of adding stops when required to facilitate the placement of the load.





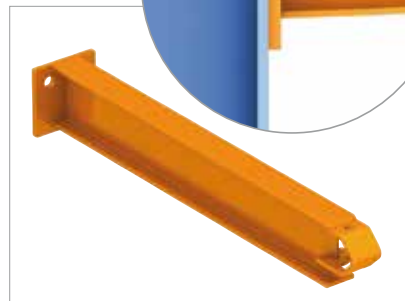


### Arms

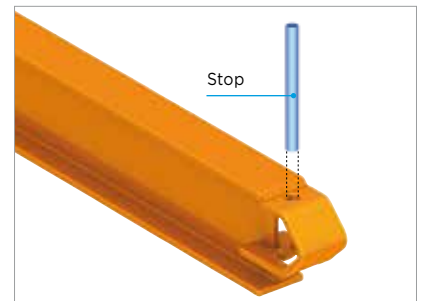
These are manufactured from hot-rolled profiles whose geometry and dimensions may vary based on the load which they must support.

Arms are attached to the column by means of bolts. The arms are positioned at a slight incline to prevent loads from falling.

These arms may be equipped with stops as an additional safety measure to prevent loose loads from falling, as well as cross-ties, which make it possible to set up shelves for a wide variety of load sizes.



Bolted arms



### Stops

These optional elements are especially useful for the storage of loose loads, preventing them from falling. Formed by a round tube and a plastic protective plug, stops are inserted into the upper hole, located at the ends of the arms, and fit into the lower tab.

### Stiffening elements

In order to stiffen the racks lengthwise, bracing sets with tensioners and column cross-braces are used. These join all the columns together, constituting a solid and stable structure.





## Accessories

Elements that increase storage system safety



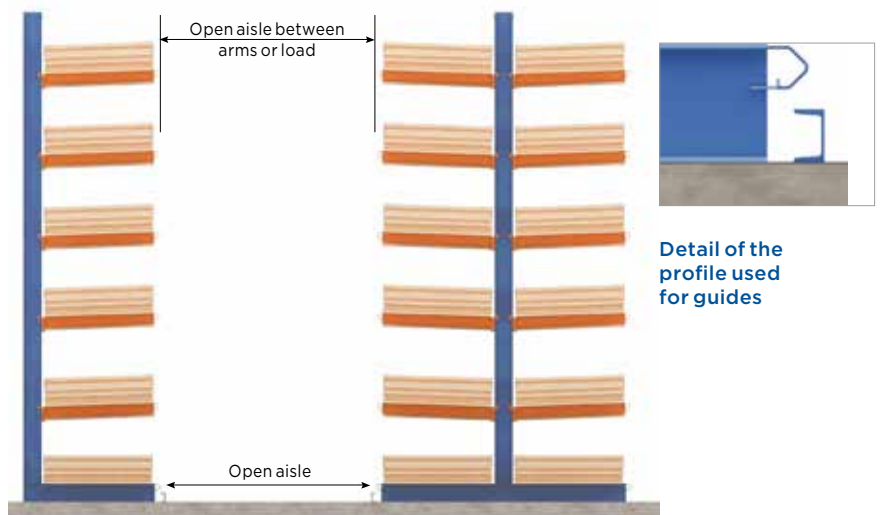
### Forklift guides

The most ideal forklifts for working with cantilever racking are four-way side-loading types, which can handle load packages up to 12 m long. These forklifts require lateral guides placed in the load aisles in order to safely circulate.

The distance between the guides and the loads depends on the forklift model.

### Guide entrances

The guides at the beginning of each aisle have entrances that facilitate the entry of the forklift.



### Protective elements

When there are no guides, protectors can be placed, saving the racks from possible blows.





### Continuous shelving

If one needs to store small and variable sized packages, the best solution is to install continuous shelving on top of the cantilever arms. This solution takes full advantage of the space and does not leave empty gaps.

Shelves can be made out of wood or metal panels according to the needs of each warehouse.



### Portal ties

When necessary, portal ties are installed to connect the racks vertically, enhancing their stability from top to bottom.



### Signalling plates

These signs list the technical characteristics of the storage system.

They are placed in visible areas at the far ends of the racking units.





## Uses

Companies that store timber boards, pipes, profiles and other types of long and/or bulky loads



Mecalux offers cantilever racking for loads moved by automatic and mechanical handling systems.

These images show the diverse types of unit loads that can be stored in cantilever systems. They are the best handling and storage choice for plastic tubes, wooden planks and wrapped metal profiles.







Example of automated cantilever racking with a bridge crane that connects the production and storage zones



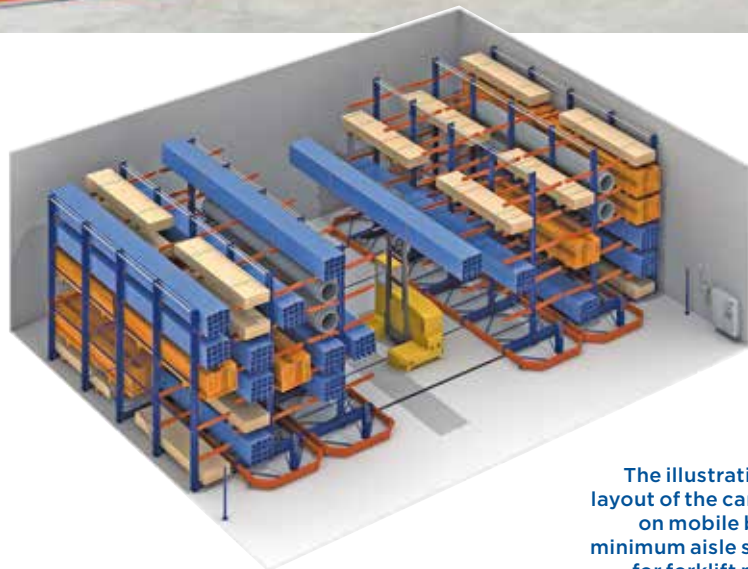




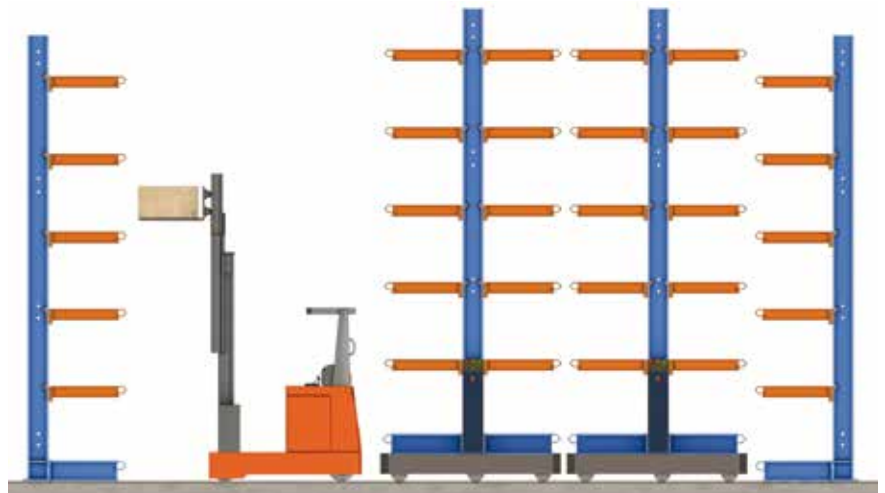
**Cantilever racking on mobile bases**

To increase the capacity of available space, cantilever racking can be installed on mobile bases.

The bases are wheeled structures, moved by integrated motors, which run along rails set into the floor. These bases include control and safety systems depending on the needs of each warehouse.



The illustrations show the layout of the cantilever racks on mobile bases and the minimum aisle space needed for forklift manoeuvring.





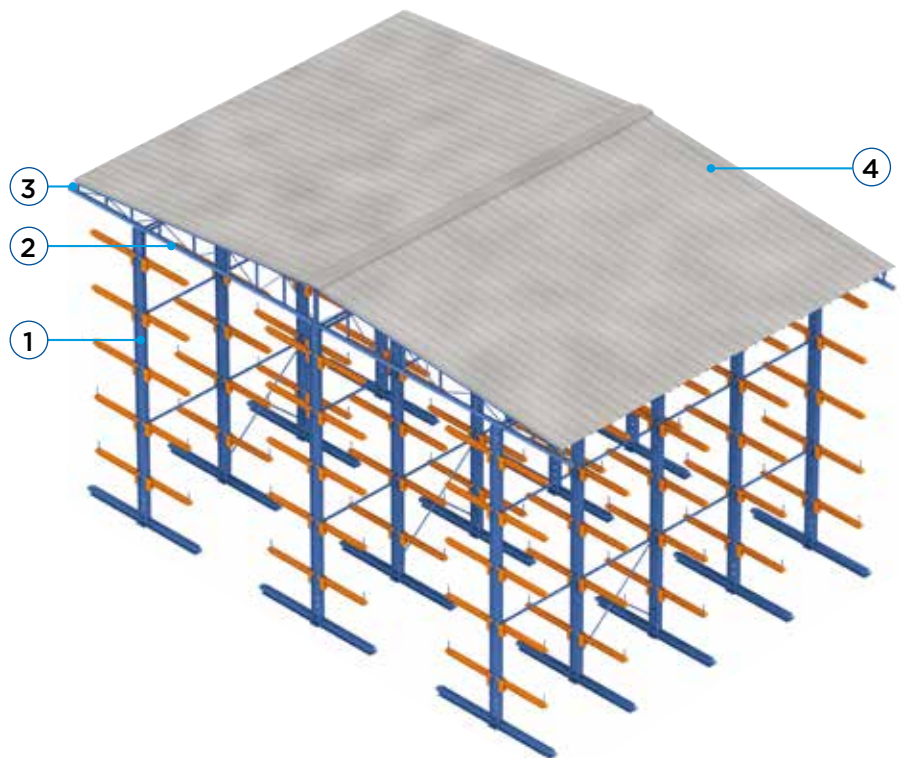
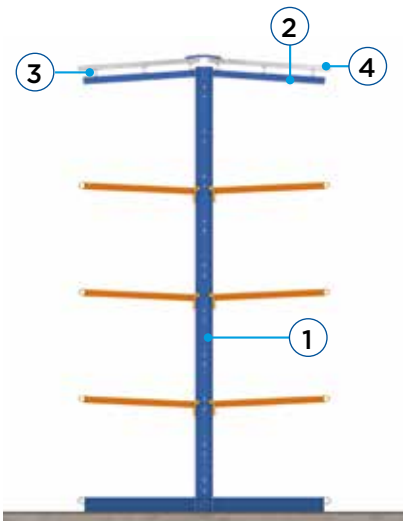




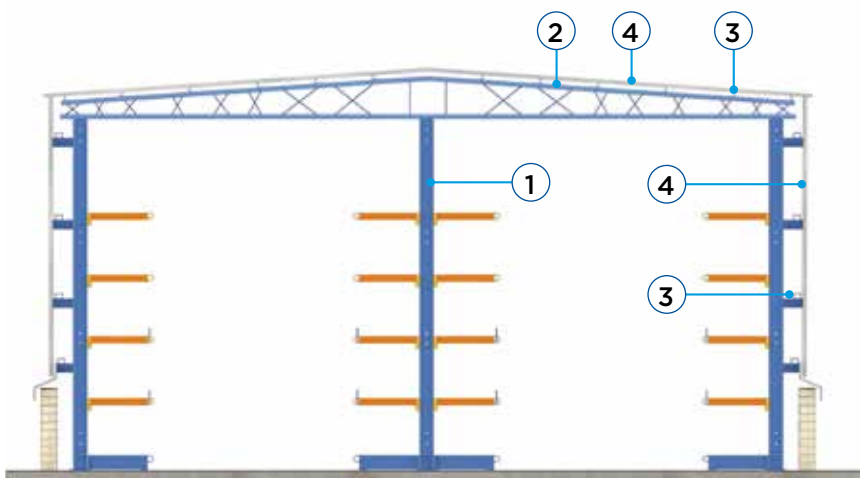


**Outdoor cantilever racking**

It is common to install cantilever racking in outdoor areas. In such cases, Mecalux has both the specific components to protect goods from adverse weather conditions, and various classes of light roofing.



- 1. Whole cantilever unit
- 2. Roof truss
- 3. Purlin
- 4. Cladding or roofing



1. Whole cantilever unit
2. Roof truss
3. Purlin
4. Cladding or roofing

### Clad-rack warehouse

For companies seeking to maximise surface area and vertical space, cantilever racking can be utilised to construct clad-rack warehouses.

In such cases, in addition to supporting the stored loads, the racks must also be designed to withstand the weight of the building, siding, roofing and the forces of the wind. It is essential to consider the seismic coefficient for the area where cantilever racks are installed.



## Quality principles

Durability, strength and accurate calculations



### Cantilever rack painting

The basic components of cantilever racking are manufactured from hot-rolled profiles, rendering great strength for loads and protection against deformations due to impacts.

During the rolling process, profiles are covered with calamine, a layer of impurities produced on the surface of steel from heating. This layer must be properly removed before painting to ensure that the paint adheres correctly, a basic requirement for rust prevention.

Chemical treatment is not sufficient to remove the calamine.

The complete process by which Mecalux treats these parts consists of three consecutive phases:

#### 1. Shot-blasting

Shot-blasting consists of removing the calamine mechanically, through the high-pressure impact of small steel balls. These balls break up the calamine and remove it from the surface. They also remove any layers between the calamine and the surface of the profile, consequently preventing rust from developing.

At the same time, all dirt and the lubricant used in the machining process are removed. This leaves the piece in perfect condition and ready to be painted, ensuring the paint will adhere properly.

#### 2. Painting

The automatic painting phase is carried out immediately after shot-blasting, thereby preventing rust from developing between phases.

#### 3. Polymerisation

Blue acrylic (RAL 5003) paint is used. It is 50 microns thick and polymerised in a drying oven.

Once the arms are shot-blasted, they are put through an automatic chemical descaling tunnel (to remove any possible oxidation that has formed between phases). Subsequently, they are painted with orange water-soluble paint (RAL 2001) and dried at high temperatures.

#### Calculation Standards

For the calculation of cantilever racking, international standards for steel racking systems have been considered, specifically EN 15620 and RAL RG614/5.

The joints between arms and columns have been previously tested in accredited laboratories to determine the degree of embedment, a necessary parameter for conducting strength calculations.

All materials and profiles used and manufacturing and assembly processes are carefully calculated and subjected to exhaustive checks and testing. This results in the highest levels of safety for the storage systems, the goods to be placed in them and, above all, the people working in the warehouses.





**Quality certifications**



**ISO 9001**

Mecalux has received the ISO 9001 quality management certificate, which is applied to the design, production, installation and after-sales service of metal racking. The ISO 9001 certificate has been awarded to the production centres in Spain, Poland, Mexico, Argentina and the US for all static, mobile, and live metal racking, light duty racking, mezzanines, changing room lockers and partitions.



**ISO 14001**

Mecalux is aware of the effects the activities carried out in its work centres may have on the environment. The application of an appropriate Environmental Management System to all our activities guarantees that organisational, production and technical tasks that affect the environment are planned, managed and controlled in order to comply with the requirements established in the ISO 14001 standard.



**ISO 45001**

The prevention of occupational risks has become a very important factor in the day-to-day management of companies. In order to prevent accidents and create a safer workplace, Mecalux has received the internationally recognised ISO 45001 certification, which specifies the requirements to follow for correct occupational health and safety management.





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