



Mezzanines

Multiply useful surface area by adding one or more additional floors



GOLD WIND ENGINEERING (S) PTE LTD
ENGINEERING OF STORAGE SOLUTIONS

Industrial
STORAGE SYSTEMS
"Smart Space Smart Storage"





An ingenious, cost-effective storage solutions for fully using warehouse areas at height.

Sigma Mezzanines System offer a cost-effective storage solution for companies that need to increase their effective storage surface area without affecting their bottom line, or when it is not possible to expand a warehouse.

Adding on to the load bearing structure, sigma mezzanines offer the floor of the newly created surface, the handrails, the access stairs and sometimes the gates to access goods. Sigma has a wide variety of sizes and finishes to suit all needs, both for load capacity and space distribution.

In other words, Sigma Mezzanine offer a smart storage solution at minimal cost by installing a double or triples storage surface area.





Mezzanines have practically limitless applications. The range of sizes, as well as the numerous structural systems, add-ons, and finishes, result in customized solutions that are tailored to the space available and the needs of each customer.

1

Space Saving

The possibility of building one or several raised floors on the ground floor of an installation can double or triple its useful surface area.

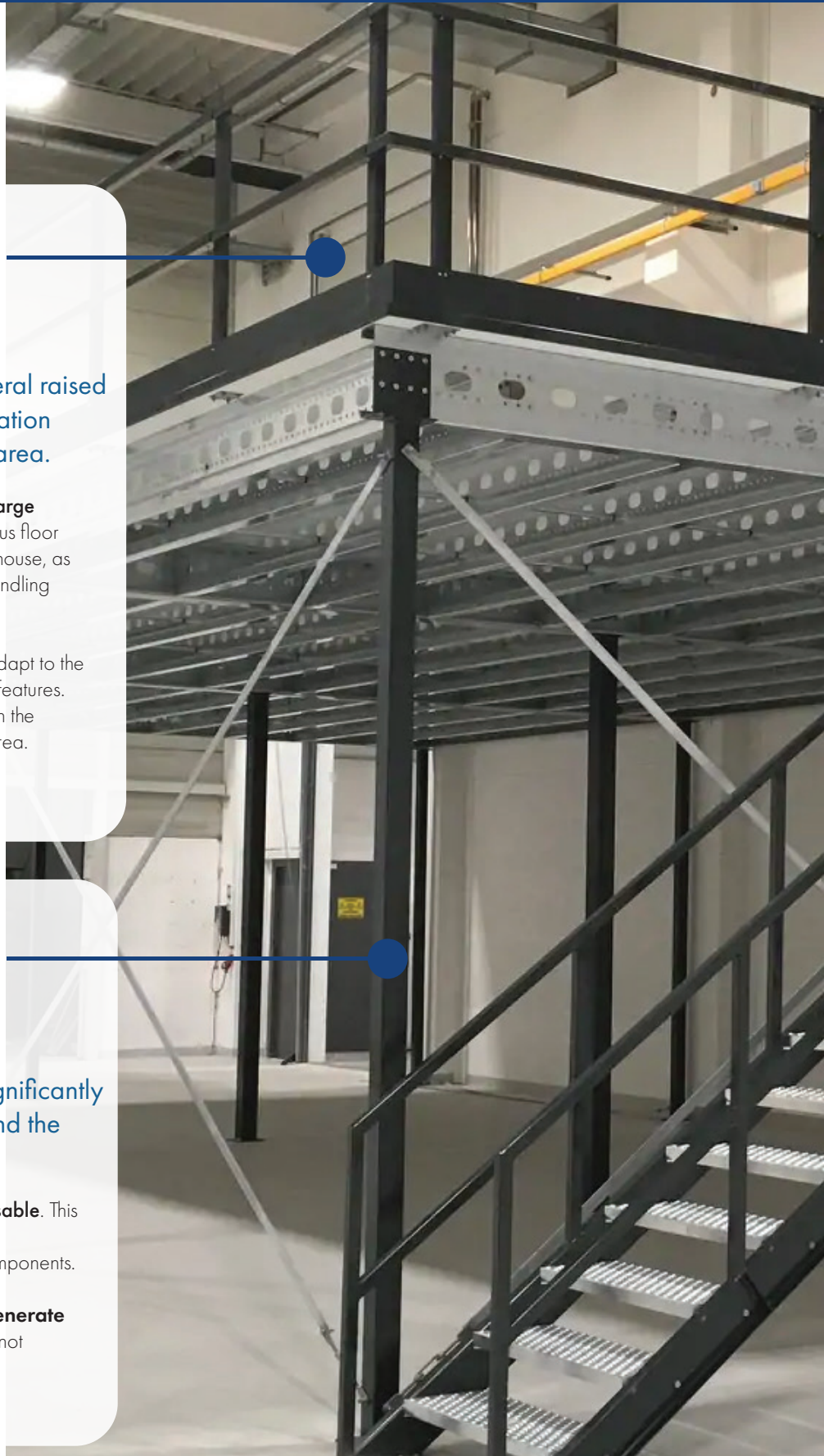
- Sigma systems allow **raising structures with large distances between columns** and a diaphanous floor space that increases the capacity of the warehouse, as well as improves the manoeuvrability of the handling equipment.
- Sigma **design custom project** that perfectly adapt to the space available in warehouses with complex features. They circumvent any potential constraints within the building, making full use of the entire surface area.

2

Cost Saving

The cost per sqm of a mezzanine is significantly lower than what it would cost to expand the main floor's surface area.

- Foundationless, so it is **removable and reusable**. This offers the possibility of modifying its structure, dimensions and location, reinstalling all its components.
- **Assembly is quick, easy and does not generate flith**, so the work cycle within the company is not interrupted



Versatility

The diversity of the profiles, sizes, floor type and finishes converts Sigma mezzanine into a system suitable for variety of uses within production centres, storage and industrial warehouses, workshops, etc.

- Any type of load capacity and space distribution requirement is perfectly outfitted by Sigma Systems.
- Platform and goods lifts can also be incorporated to facilitate the movement of goods from one level to another.

3

Safety

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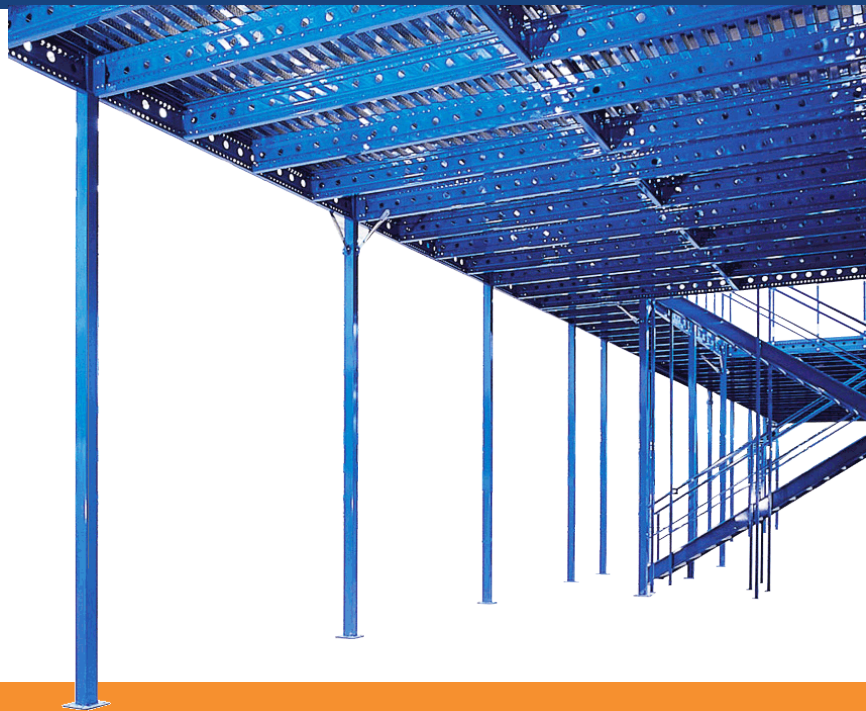
- To ensure the maximum resilience and stability of the structure, Mecalux uses calculation software that designs a layout and calculates the optimum features of the different mezzanine floor elements on a case to case basis, considering factors such as:
 - Use overload kg/m² (load requested by the customer).
 - Floor type to be used.
 - Height of the mezzanine floor. Overhanging main and secondary beams.
 - Adjacent spaces/obstacles. Live loads (pallet trucks, etc.).
 - Characteristics of the premises and additional specifications of the customer.
- In all projects, the rules of calculation, safety coefficients and permitted deflections are monitored. For example, to calculate structures that make up mezzanines, the Eurocode 3 guidelines of the European standard are taken into consideration.
- The storage or mezzanine floor structure is calculated in 3D using the finite element program, always applying a second order calculation to take into account the influence of the structure's deflection. Simultaneously, Sigma collaborates with external laboratories to perform tests on the connections between the different components.
- Fire protection: according to the intended end use of the mezzanines, the constructive system employed, and national and local regulations, structures can be protected against fire by applying intumescent paint making them heat-resistant.
- Sigma follows a comprehensive assembly safety protocol to prevent work related accidents.

4

Sigma Mezzanine

Three constructive system to suit all type of loads and needs.

In order to offer the ideal solution in each individual case, Sigma has three mezzanine constructive systems to choose from based on the load, the distances between columns and the use for which they are intended.

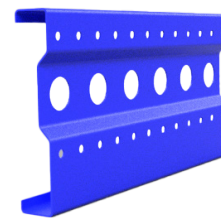


Mezzanines are frequently used in industrial operations such as warehousing, distribution, or manufacturing. These facilities have **high ceilings, allowing unused space to be utilized within the vertical cube.** Industrial mezzanine structures are typically either structural, roll-formed, rack-supported, or shelf supported, **allowing high-density storage within the mezzanine structure.**

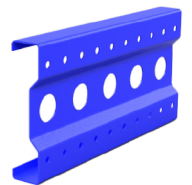


When designing a mezzanine floor with any of the mentioned constructive systems, the constraining factors within each case are taken into account. These include factors such as accesses, the work system, terrazzo are not suitable to bear the load of the posts).

Sigma System 1



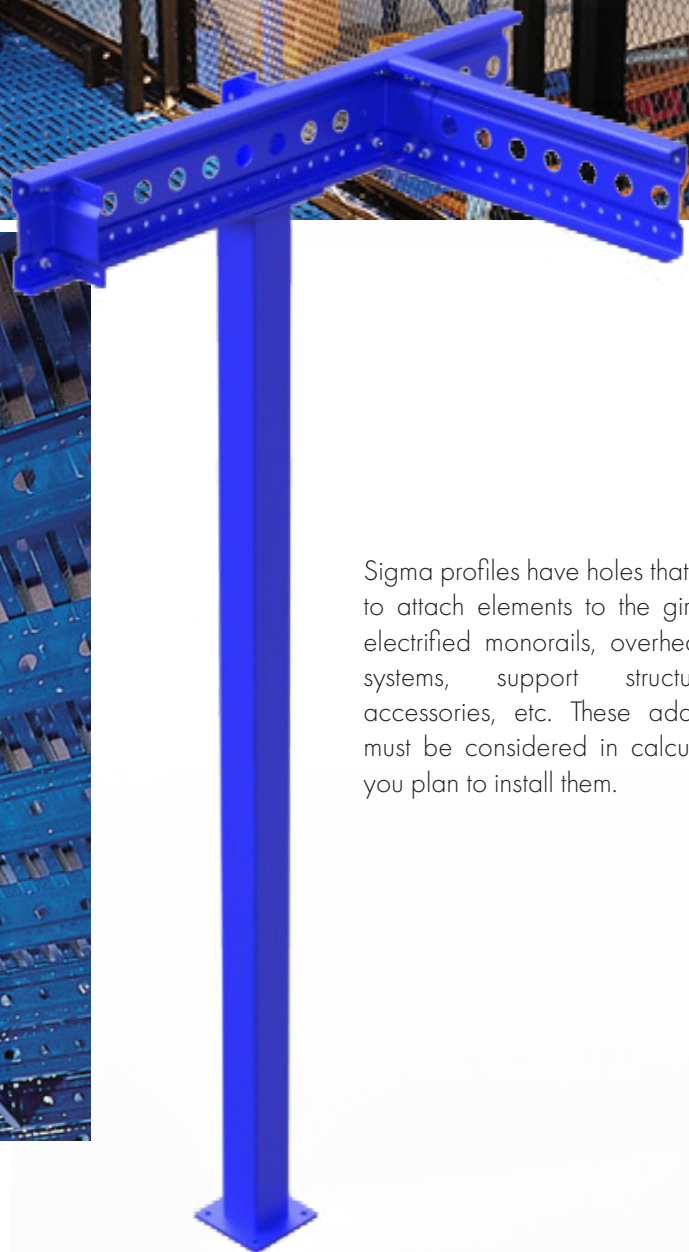
300 x 60 x 4.0T



250x60x3.0T

Diverse sigma profile to suit all loads and needs.

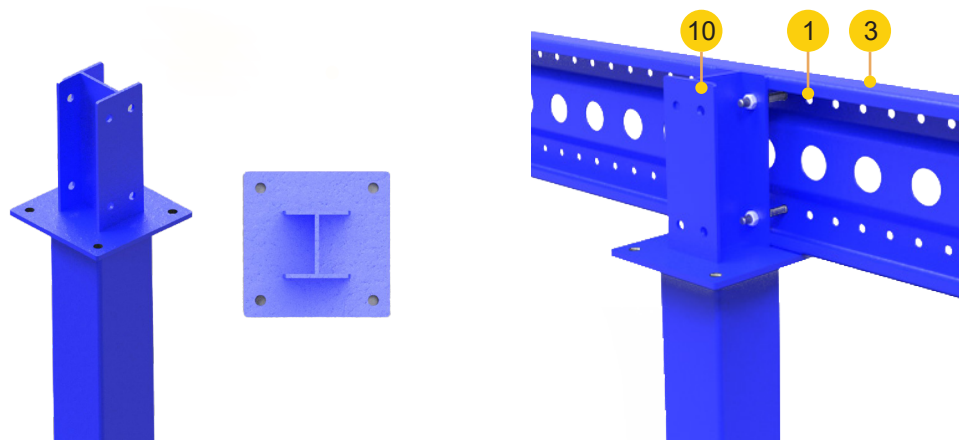
Sigma mezzanine floor systems are semi-permanent floor systems typically installed within buildings, built between two permanent original stories. These structures are usually free-standing and in most cases can be dismantled and relocated. Commercially sold mezzanine structures are generally constructed of three main components, Column, Beam, and Metal Deck. The decking or flooring of a mezzanine will vary by application but is generally composed of b-deck underlayment and wood product finished floor or a heavy-duty steel, aluminum.



Sigma profiles have holes that make it easy to attach elements to the girder, such as electrified monorails, overhead conveyor systems, support structures, work accessories, etc. These additional items must be considered in calculations when you plan to install them.

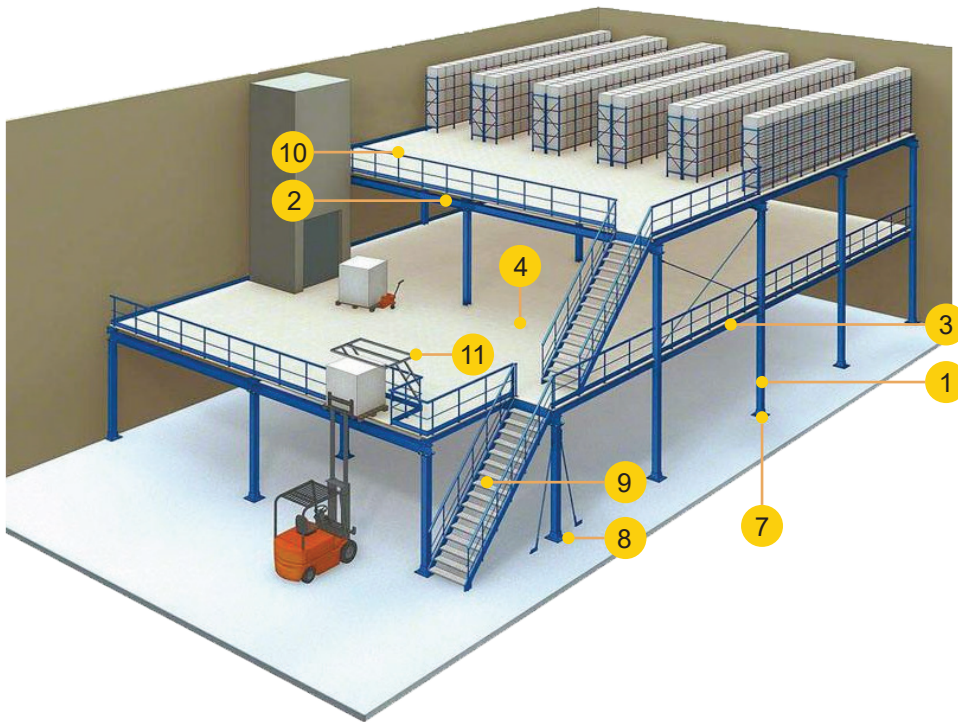


- 1 Column Upright
- 2 Main Beam
- 3 Beam
- 4 Sub Beam
- 5 Staircase
- 6 Floor Grating
- 7 Plywood
- 8 Handrail
- 9 Floor Grating
- 10 Double Column



Double Column

Sigma Mixed System 2

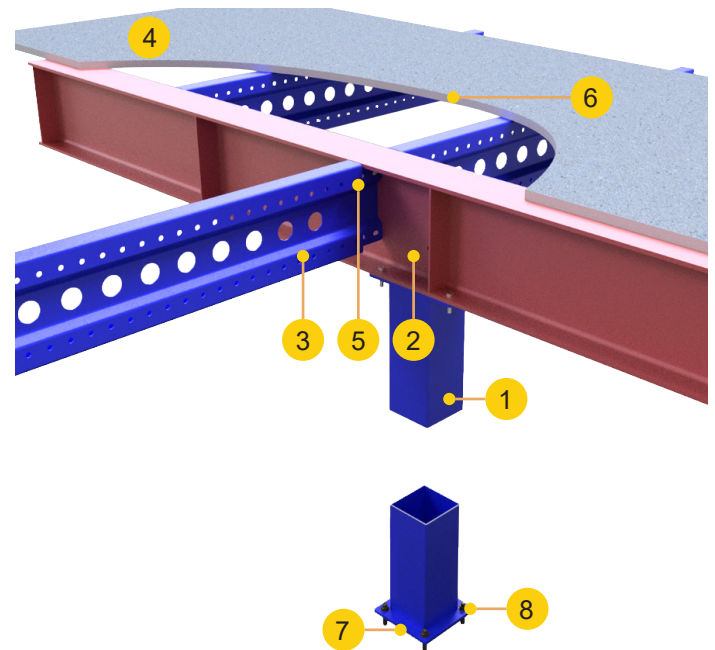


- 1 Column
- 2 Main Beam
- 3 Secondary Beam
- 4 Floor
- 5 Support Angle Bracket
- 6 Floor Attachment Clamp
- 7 Column Base Plate
- 8 Anchors
- 9 Staircase
- 10 Handrail
- 11 Up And Over Pallet Gate

The Sigma Mixed System is a reliable and sturdy solution for building mezzanine floors in commercial and industrial settings. The system combines H Beam 305 x 150 x 41.8kg/m main beams with 250mm x 60 x 3.0mm thick sub beams to provide a stable and durable structure that can support heavy loads.

The main beams are made from high-quality steel and have a hot-rolled finish for excellent durability and corrosion resistance. The sub beams are designed to work in conjunction with the main beams to provide additional support and stability.

Sigma Mezzanine is committed to quality and customer service, and their team of experienced engineers and technicians can design, install, and maintain the Sigma Mixed System to meet specific needs and requirements. Overall, the Sigma Mixed System is a cost-effective and reliable solution for building mezzanine floors in commercial and industrial settings.



The H Beam 305 x 150 x 41.8kg/m is a popular choice for mezzanine floors due to its high load-bearing capacity and excellent resistance to bending and buckling. The beam is made from high-quality steel, with a hot-rolled finish that provides excellent durability and resistance to corrosion.

Floor Types

Different options for a perfect finish that match the setting and use

There are different types of floors that adapt to different needs depending on: the load, the type of work, the movement of forklifts, the ventilation requirements, etc. They are made from standard sized and finished pieces that are fastened to the beams using flanges and clamps.



Solid Surface Decking

Our solid surface decking is the ideal choice for mezzanine flooring in commercial and industrial spaces. Crafted from high-quality materials, this decking provides exceptional strength, durability, and stability. The smooth surface and uniform thickness make installation a breeze, while the solid construction ensures long-lasting use. Choose our solid surface decking for a reliable and cost-effective solution for your mezzanine flooring needs.

Chipboard panel flooring



Available in both 18mm and 25mm thicknesses, provide exceptional strength and durability for a range of applications. Crafted from top-quality materials, these plywood sheets offer a smooth surface and uniform thickness, making them easy to install and cut to size.

Wooden flooring with sheet metal



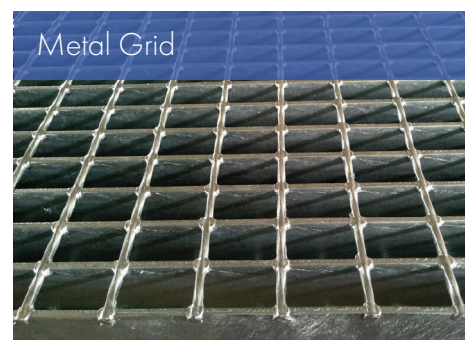
Conglomerate wood flooring can be covered with 1.5 mm thick galvanised steel when any sort of pallet truck or heavy trolley circulates on the mezzanine floor. Thus, wear and tear to the wood is avoided, and resulting noise levels are minimised.



Metal Floors

Metal floors are manufactured out of galvanized steel and have a high load capacity.

The different models come in a variety of slotted or perforated surfaces depending on the ventilation requirements and the water supply in fire protection systems.



Railings and staircases

Add-ins that are essential for the safety and accessibility of the mezzanine floor

Handrails

It is mandatory to install handrails around the perimeter of the mezzanine floor, which is not located directly up against walls. This is a safety element for the protection of staff working in the installation.

Its main components are the handrail, the handrail post (with a maximum separation between posts of between 1,100 and 1,500 mm depending on the constructive system), the intermediate rails and the kickboards (to prevent objects from falling).

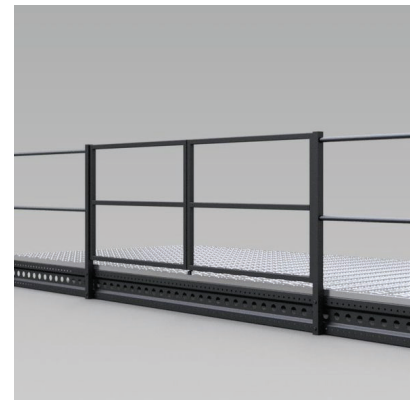
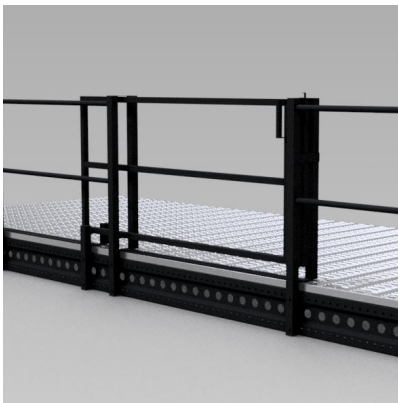


Accessories

In certain mezzanines, it may be necessary to set up an area to give access to pallets. To do this, a few openings in the handrails are made to install available gate models:

Swing Gate

It opens inward to facilitate the input of merchandise from the exterior. It incorporates a lower bumper and an upper hand-operated latch to close it securely. Two gates can be set up for a 1,500 mm wide access, or a single one for a 750 mm wide access.



Slide Gates

Running parallel to the installation, it slides manually to one side, leaving the passageway between the two handrail posts open. This facilitates the depositing of goods into the mezzanine floor from the ground level, usually by handling equipment.

Safety Pallet Gate

This kind of access offers maximum safety for operators loading and unloading pallets. The space is always protected because to access goods the opposite side of the railing must be pushed downwards. The height of the load to be handled may vary, depending on the sweep of the gate and the location of the pallet.

Swing Gate (Cont.)

This constitutes the railing itself, creating a space for depositing goods when a loading and unloading area is required. The number of chain guards to install, and the separation between them, will depend on the norms in vigour within each country.



Staircases

Preassembled Mecalux staircases are easy to set up, resilient, adaptable to different heights and comply with the constructive standards applicable on an international level. Normally 8, 10, 12 and 15 step staircases are installed, depending on the height to be filled. From 15 steps and upwards, several flights must be installed which incorporate intermediate landings.

The best type of staircase will be chosen on an individual basis depending on the number of steps, the staircase width (standardised sizes are 800 and 1,000 mm wide) and the number of railings (1 or 2, based on the location of the staircase).

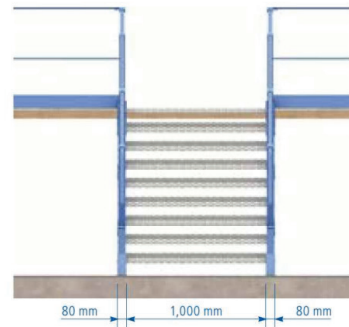
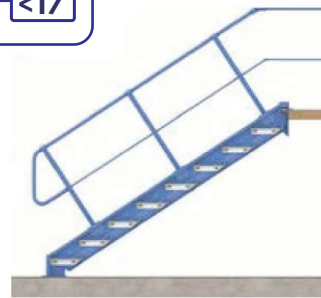
The configuration of the staircases vary according to the floor distribution and the space available.

Intermediate Landings

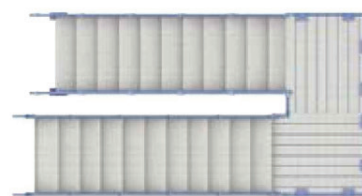
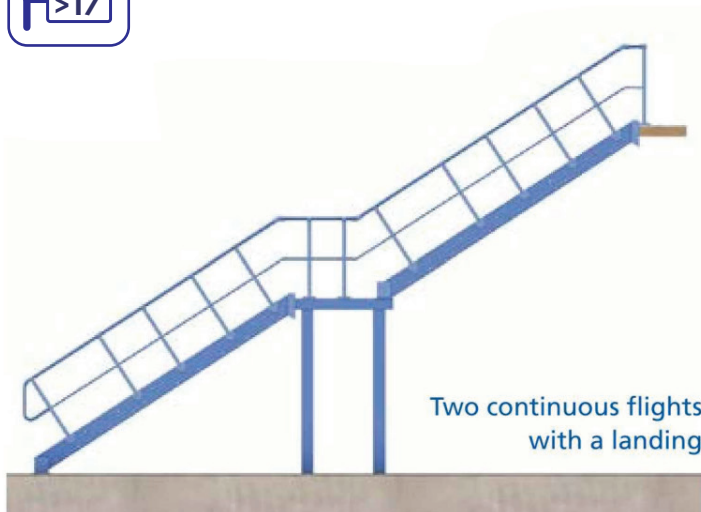
- The flights of stairs maintain the same direction (continuous staircase)
- The flights of the stairs form a 90°
- The flights of stairs turn at a 180°



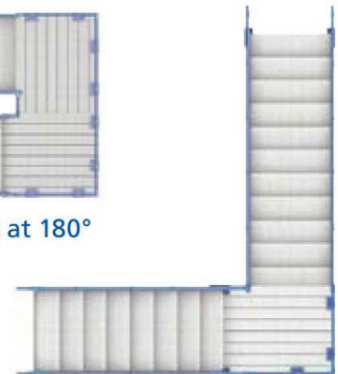
Staircases Without Landings



Staircases With Landings



Two flights of stairs at 180°



Two flights of stairs at 90°



Column Support

made from Square hollow section 125mm x 4.0mm thick welded top support H-Beam 100 x 100

Carrier Profile

Made of high-strength, cold profiled high quality steel, with system hole pattern for customized layouts

Platform Covering

Made of high-strength, cold profiled high quality steel, with system hole pattern for customized layouts

Bending

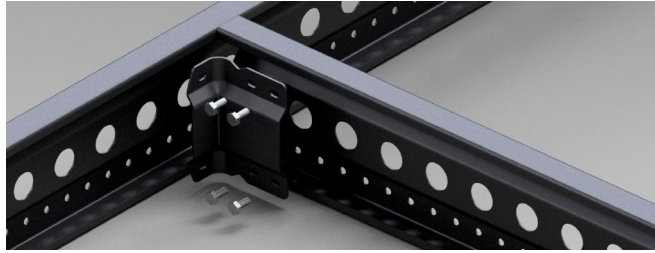
of the main supports max. 1/200

Calculated

as per the In-house load test and Singapore registered Professional Engineer Endorsement.

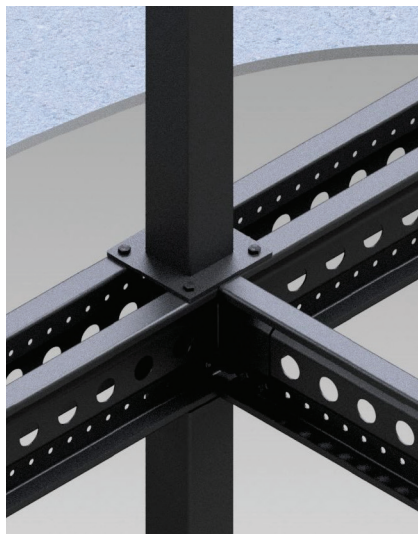
Railings

with knee rail and top rail.



Platform Supports

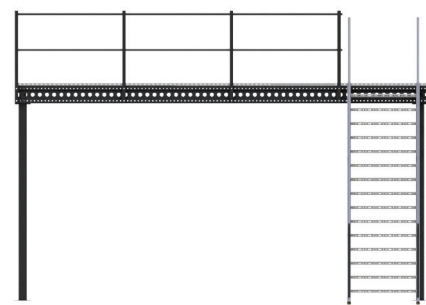
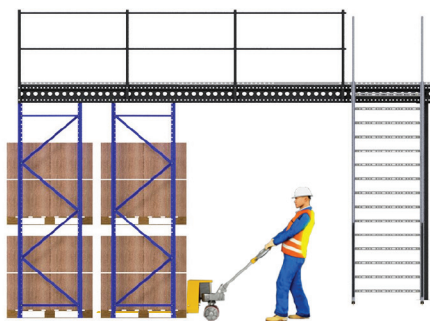
Three version are available, ensuring the optimum platform support selection.



Platform support made of system profile



Platform supports made of a combination of hot-rolled profiles and system profiles





Industrial STORAGE SYSTEMS

“Smart Space Smart Storage”



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