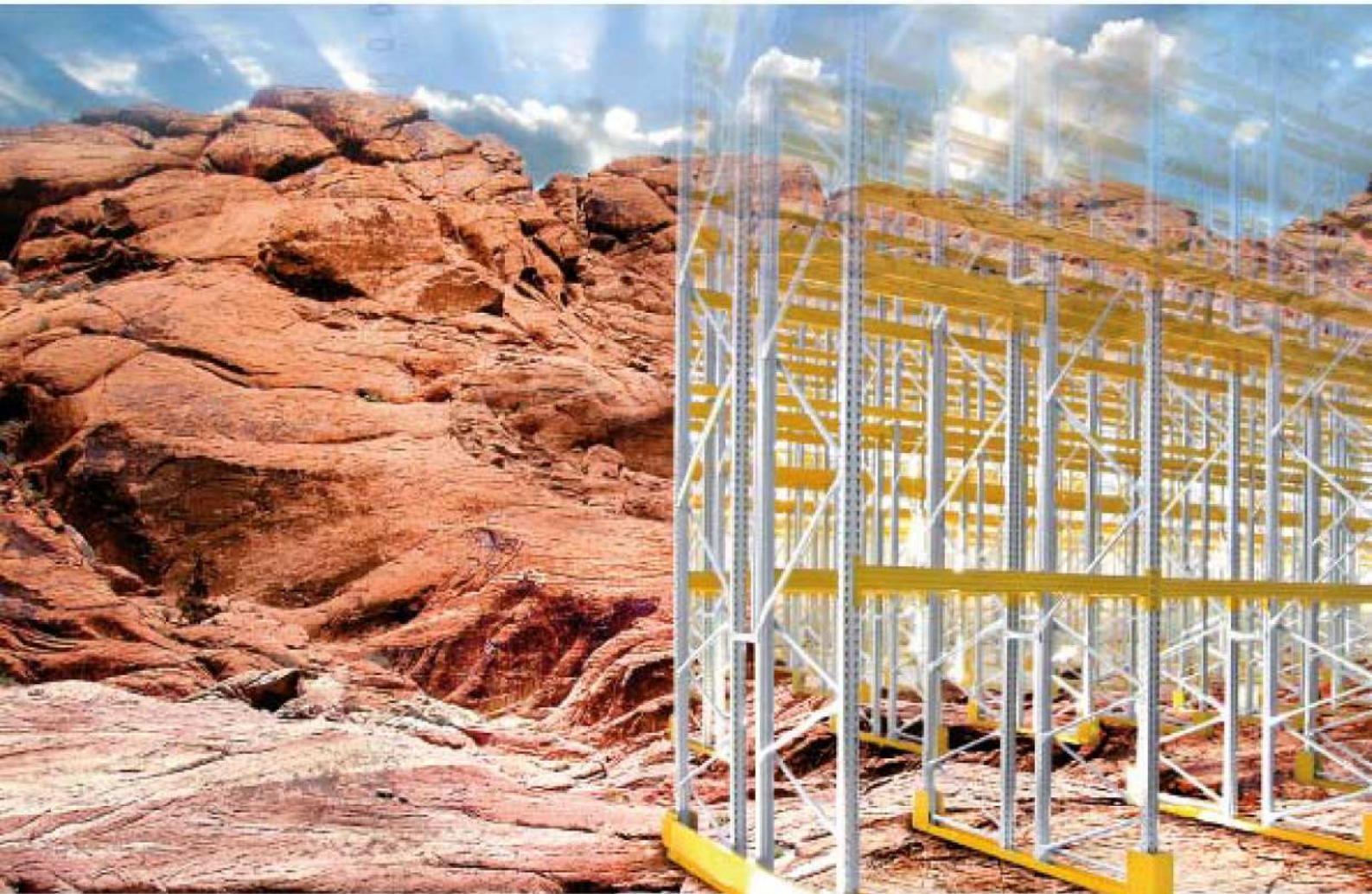


MODULAR STEEL STORAGE SYSTEMS

# SUPERBO

MODULAR STORAGE SYSTEMS



TERMINO MODULAR



**METALSISTEM**

SISTEMI E STRUTTURE PER IL MAGAZZINO



## THE GROUP



Founded in 1968, METALSISTEM commenced its activities specialising in the design and production of machinery for the cold profiling of metals.

The experience gathered, numerous highly innovative patents resulting from intense research and development and the considerable market success of the first range of cold form zinc coated profiles quickly channelled METALSISTEM into the production of the latter of its activities.

Today the METALSISTEM Group is an articulated network of companies with its head office and main production facility in Rovereto, Italy.

The Group has consolidated its position as one of the major industries within the Material Handling Sector.

Through products and services aimed at providing complete assistance for all warehousing, product showcasing and sales outlet requirements, the companies of the METALSISTEM Group are able to offer their customers a wide range of products of the highest quality, highly competitively priced, with very rapid delivery times and a first class back up service, as well as tailor made solutions providing efficient and rational use of internal storage areas and material handling environments.

Lightness, strength and modular form, coupled with the ease of integrating and expanding already existing structures are but a few of the successful features of the METALSISTEM storage and shelving systems.

The success of the METALSISTEM Group is the result of a precise managerial choice based on research of new production technologies and continuous development and innovation of its product range. A direction which has produced numerous international patents (testament to the uniqueness of the METALSISTEM product), continuing improvements in safety, quality and versatility.

METALSISTEM's company strategy is to offer

products of the highest quality, very competitively priced, with rapid delivery times backed up by a first class service.

The numerous product lines are conceived and designed by METALSISTEM's internal Research and Development Centre, as are the profiling lines and equipment required for their manufacture.

The automated production facilities for the cold profiling of metals have enabled METALSISTEM to achieve one of the highest levels of productivity in the world, today.

Rigorous laboratory tests are conducted on the prime material entering production, and on the final product, thus ensuring the continuing evolution of efficiency and quality standards.

All products have elevated structural characteristics and ensure high quality standards recognised by the most important European certification bodies, such as Germany's TÜV Product Service GmbH, Austria's Ö-NORM, Rome's I.S.P.E.S.L. ACAI/CISI (Associazione Costruttori Acciaio Italiani - Sezione Costruttori Italiani di Scaffalatura Industriale), the latter of which METALSISTEM has membership, and others.

The company's ISO 9001 quality assurance system as well as its environmental management system ISO14001 are certified by RINA.

With an annual turnover of exceeding 260 Million Euro, the METALSISTEM Group premises occupy a total area of 230.000 m<sup>2</sup>, 125.000 of which are dedicated to production.

The METALSISTEM Group affiliated companies and distributors provide a world wide commercial network covering the domestic market and the industrialised nations of the world, able to satisfy the most demanding needs.

We value greatly the high level of trust that is placed in us by our customers and feel that it is proof of the quality and reliability of our products.





# SAFETY STANDARDS AND CALCULATION ASSUMPTIONS

The correct use of a product, distinguishes both the Customer and the Manufacturer. METALSISTEM recommends that Customers make use of their product in strict conformity with the design characteristics given and standards of best practice.

The design and assembly of the racking systems must be carried out by qualified personnel. METALSISTEM is not responsible for any improper or inappropriate use of its product.

## a) Floor slab loading

Prior to installation of the product, check that the floor slab is of adequate load capacity.

Ref. N°:	<b>SBO 5</b>
System:	<b>2011</b>
Year of Construction:	<b>10800 Kg</b>
Frame Load Capacity (U.D.L.):	<b>2700 Kg</b>
Load Capacity of Beams (U.D.L.):	<b>900 kg</b>
Unit Load:	<b>1m</b> N° levels: <b>4</b>
Distance between ground and first level:	

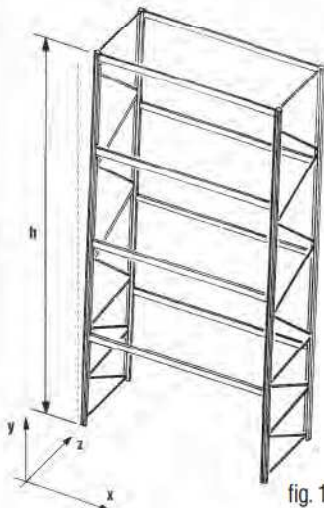
fig. 2

## b) Site installation

The site installation of racking systems must be carried out by expert personnel following the assembly criteria and specifications tabled in the Technical Handbook of the SUPERBO 4-5-6 series (Doc. MT12). Site personnel must ensure that all frame bolts have been tightened and all safety elements have been installed.

## c) Rack alignment

While assembling the racking system, the verticality of the frames must be checked for both the "X" and "Z" directions. Unless more restrictive standards have been specified, the deviation of both the "X" and "Z" planes must not exceed  $\pm 10$  mm or  $1/350$  of the height (i.e. max deviation =  $H/350$ ), whichever is greater (fig. 1). For more detailed information on verticality tolerances refer to the Technical Handbook SUPERBO 4-5-6 (Doc. MT12).



## d) Load bearing capacity plate

Load bearing capacity plates must be fastened in a clearly visible position model type, year of assembly, load bearing capacity of the frames, load bearing capacity per pair of beams or per shelf (expressed as a uniformly distributed load), the load unit applied, the height of the first level from ground and the total number of levels (fig. 2).

## e) Rack safety standard

Rack structures must be fastened to the floor slab via two anchor bolts for every upright.

In case where the height of the frame is:

- more than 5 times the depth, for single entry racking;
- more than 10 times the depth, for double entry racking.

That structure must be connected via top ties.

The racking structure must also be supplied complete with column and/or frame protectors.

## f) Reference standards

The theoretical calculation is based on the following reference standards:

- C.N.R.10011:1988
- C.N.R.10022:1984

Reference standards for the materials are:

- UNI EN 10346:2009
- UNI EN 10204:2009

## g) Software references

The theoretical calculations of finished elements were elaborated with the SICS program. Guide lines followed as the basis for the calculations are those of the organization CISI (Costruttori Italiani Scaffalature Industriali).

## h) Frame load heating capacity

The frame load bearing capacity graph in the Technical Handbook of the SUPERBO 4-5-6 series (Doc. MT12) shows the load bearing capacity of frames used for pallet racking systems. The load capacity is expressed as a function of the height, from ground, of the first pair of beams. The following underlying assumptions apply when interpreting the graph. The racking has:

- a minimum of 4 consecutive bays of equal length;
- a minimum of 3 levels divided equally in height;
- an equal and uniformly distributed load has been applied to all levels.

Given that the load bearing capacity of the rack may depend on other elements such as, the number of levels, the proportion between height and depth, installation in seismic areas etc., contact the METALSISTEM Technical Department for consultation should there be doubts about any aspects of the installation.

## i) Load bearing capacity of beam pairs

The load bearing capacities of the beam pairs indicated in the Technical Handbook of SUPERBO 4-5-6 series (Doc. MT12) were calculated with the following assumptions:

- loads are uniformly distributed;
- admissible tensile stress of the material;
- deflection  $1/200$  of the beam length.

It is mandatory to place beam retaining security clips on either side of all beams.

## l) Custom built applications

The METALSISTEM Technical Department is at the disposal of its customers for any specific calculations or custom built applications.

METALSISTEM reserves the right to modify the technical characteristics of its products at any time as it sees fit.

Technical data, dimensions and characteristics given in this document are indicative only.





SUPERBO series are made from high tensile steel, certified according to EN 10204 3.1 and carry the approval mark of TÜV PRODUCT SERVICE GmbH.





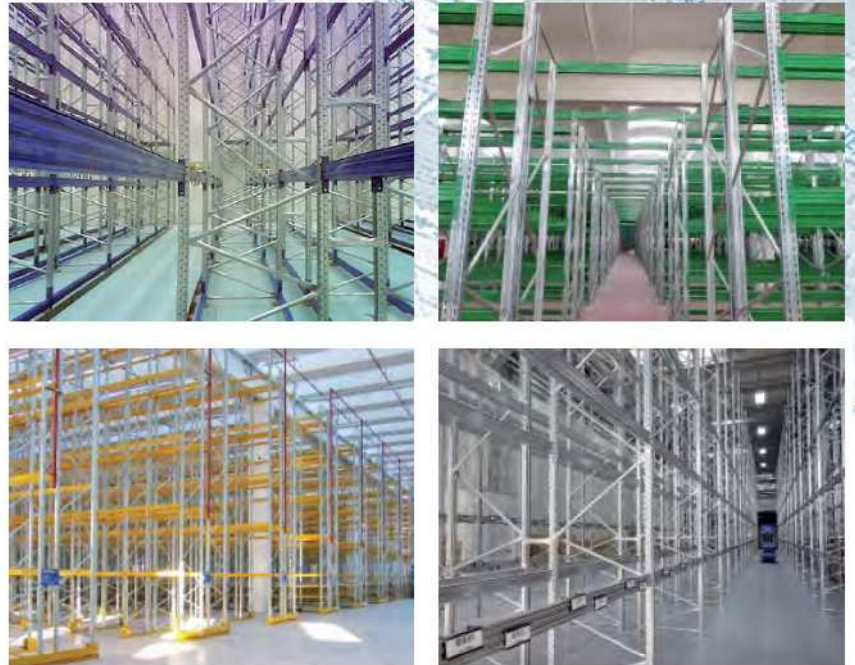
# THE COMPANY TODAY

METALSISTEM products are now in use in a great many installations throughout the world, and after more than 40 years production, we value greatly the high level of trust that is placed in us by our customers and feel that it is proof of the quality of our products.

The racking components are produced on fully automated production lines. The folding and cold processing techniques developed by METALSISTEM are designed to obtain light and extremely strong components.

Lightness, strength and modular form, coupled with the ease of integrating and expanding already existing structures are but a few of the successful features of the METALSISTEM Industrial Storage Systems. Ideal storage solutions for a whole host of products supplied worldwide are created here thanks to a total commitment to research and development.

The METALSISTEM Technical Department is at the complete disposal of its customers, to study their individual needs and to propose the most effective solutions.



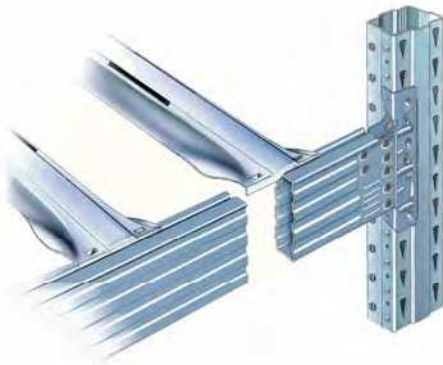
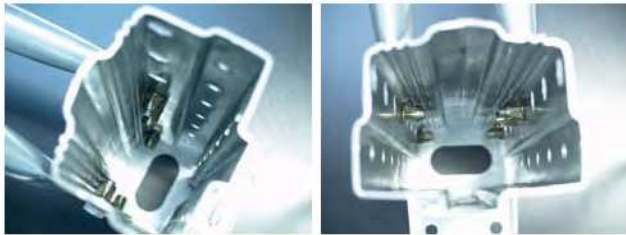
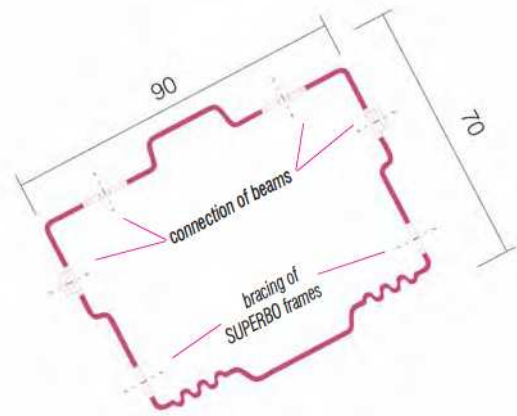






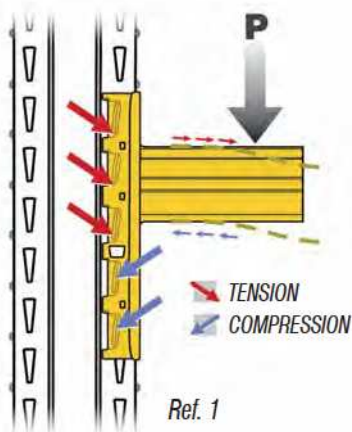






**The unique beam-upright connection has a series of distinctive features, including:**

- Each beam connector has 5 anchor points; 3 of them operating in tension and 2 in compression (Ref.1).
- The connection between beam and upright is made via tapered slots in the upright section, providing an improved connection with increased load.
- The specific design features of the end connector prevent rotation of the connector in the upright section and improve the load bearing capacity of the beams.
- Optimised performance through double faced upright connection.



Ref. 1



Ref. 2

Galvanised beams with riveted, double sided beam connectors

## THE PRODUCT

SUPERBO 4-5-6 series are interchangeable with the SUPERBUILD and UNIBUILD heavy duty pallet racking series and have been designed to satisfy all requirements of medium to heavy duty pallet storage.

SUPERBO series are available in three different frame load options, up to 14 tons.

The SUPERBO series are well known for their utmost performance in terms of resistance against torsional deflection, thanks to the closed box section of the uprights.

Thanks to the rigidity of the frame, SUPERBO provides significant resistance against rupture and deformation and good performance in case of accidental impact.

The frames are made from prime quality, certified, high tensile, hot dipped galvanised steels (procedure SENDZIMIR), thus ensuring a high level of durability. All structural components are made from high tensile steels, certified according to EN 10204 3.1. The frames are assembled using threaded rivets and screws, allowing for an easy and quick assembly and providing utmost rigidity of the connection between uprights and frame bracing components.

The beams are profiled sections with quadruple gauges at points of maximum stress for high loading capability. A channel running along the top face of the beam provides a lip within which a variety of components may be inserted, such as shelf panels, secondary beams, drum cradles and a.o. (see next pages). Beams with riveted, double sided beam connectors distinguish themselves by an optimised upright/beam connection, featuring utmost mechanical precision regarding beam length and position of the connector (Ref.2).

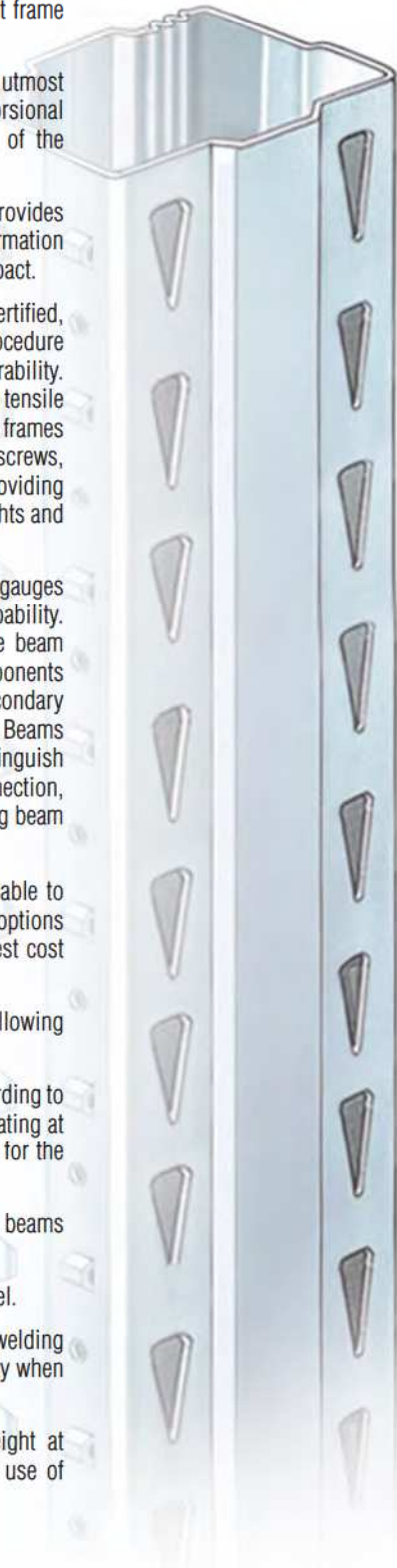
A wide range of load capacity options is available to provide the best possible beam load bearing options for each application, thus ensuring the very best cost efficiency.

As far as the beam surface is concerned, the following options are available:

- entirely zinc coated beams, zinc coating according to the SENDZIMIR procedure, featuring zinc coating at the inside and outside of the beam profiles for the best cost&quality ratio;
- zinc coated and additionally powder coated beams for utmost protection;
- powder coated beams made from pickled steel.

Zinc coated beams, thanks to the absence of welding seams, are less subject to oxidation and fragility when used in cooling rooms.

All SUPERBO beams can be adjusted in height at intervals of 50 mm, thus facilitating the best use of available space.

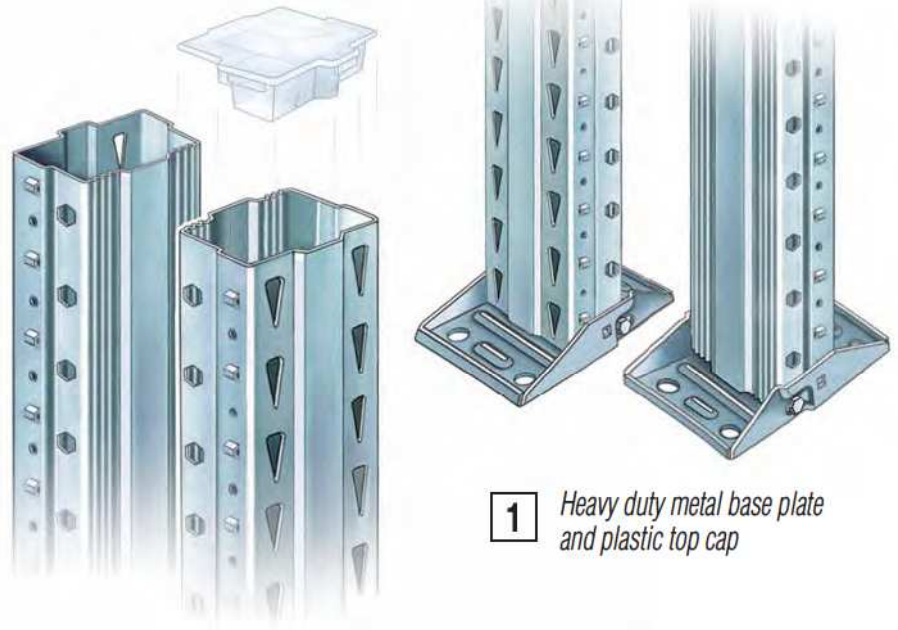




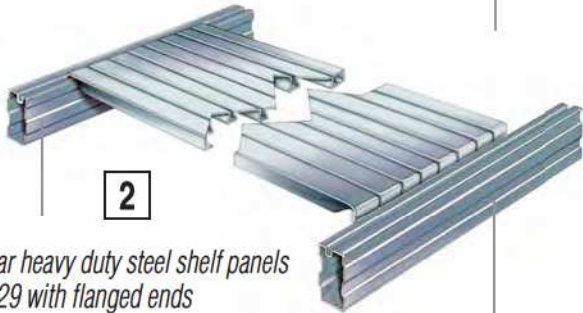
# MAIN STRUCTURAL COMPONENTS

The design of the various components is the result of rigorous technical testing and the highly specialised knowledge developed over years of experience in the field of metal processing.

This experience has enabled METALSISTEM to offer innovative products of the highest quality, highly competitively priced, and to provide a highly technical solution to the most important storage problems, such as rapid assembly, stability, low cost and load bearing capacity.

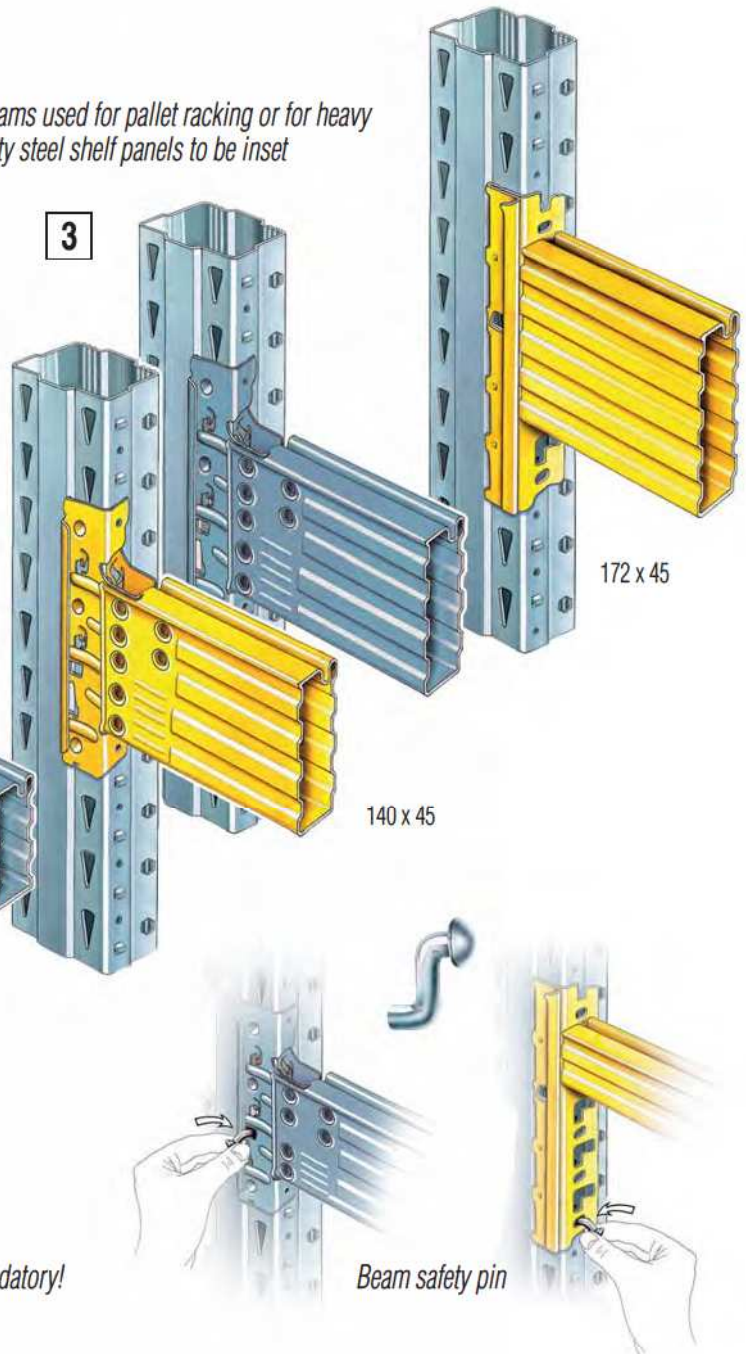


**1** Heavy duty metal base plate and plastic top cap



**2** Modular heavy duty steel shelf panels H25/H29 with flanged ends

Beams used for pallet racking or for heavy duty steel shelf panels to be inset

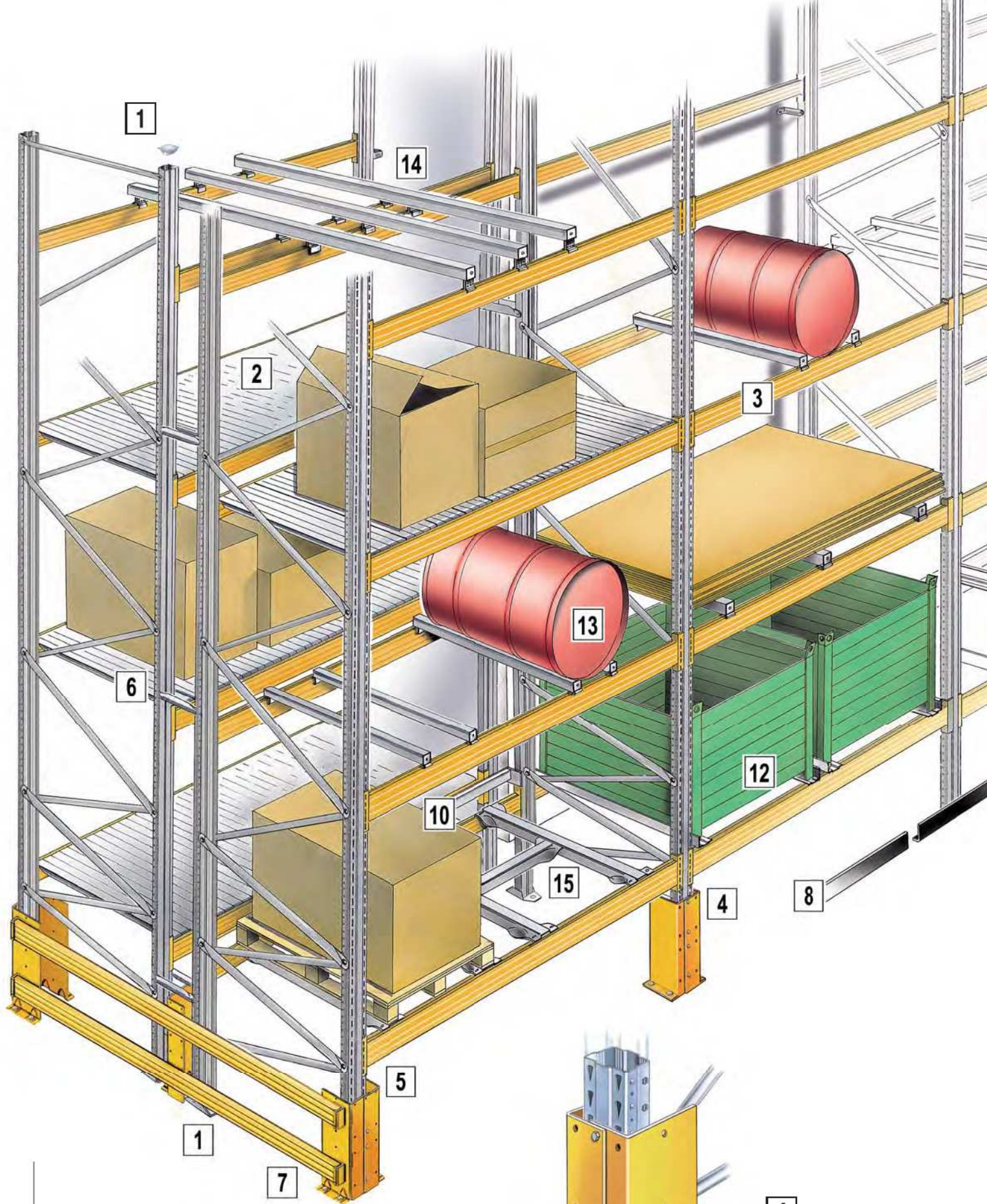


**3**

The use of safety pins is mandatory!

Beam safety pin





**POWDER COATING FINISH OF THE BEAMS**  
 Standard colour: yellow, RAL 1004.

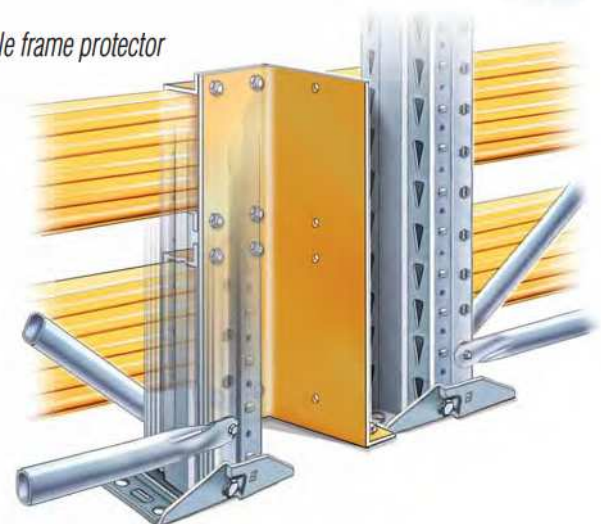
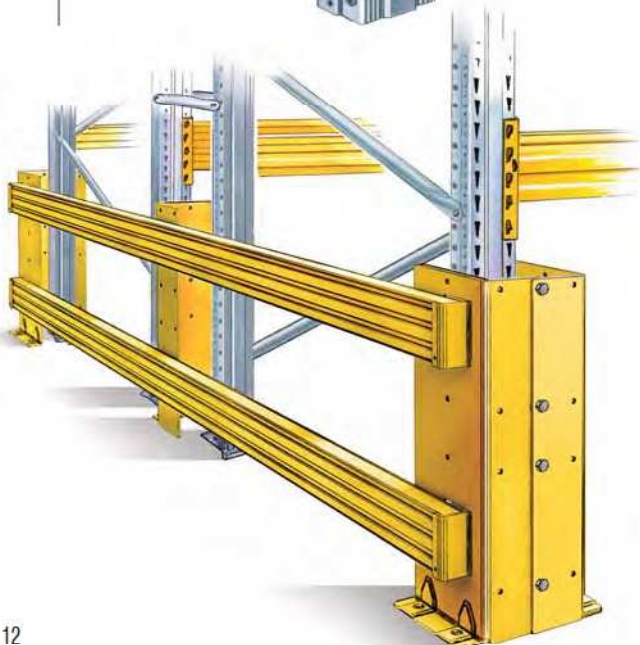
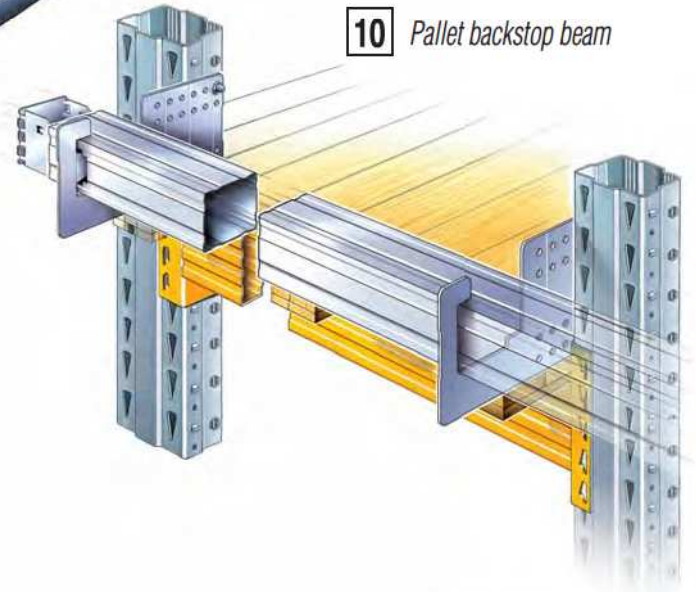
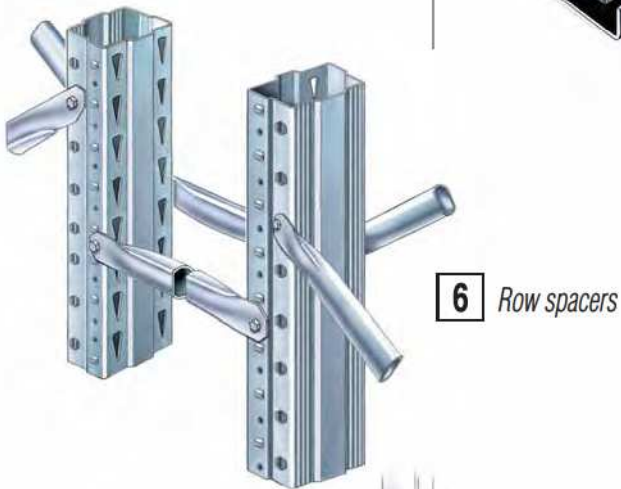
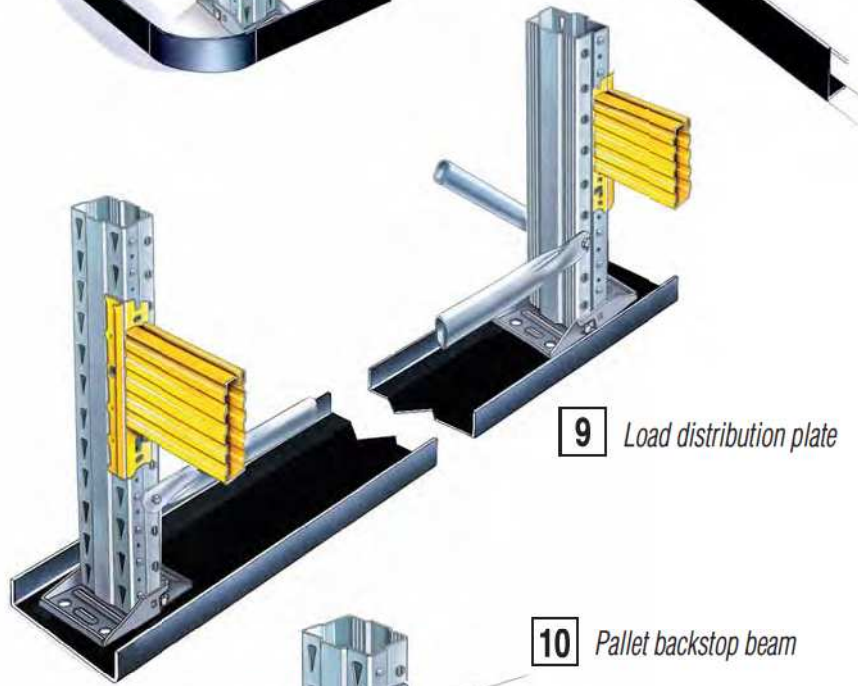
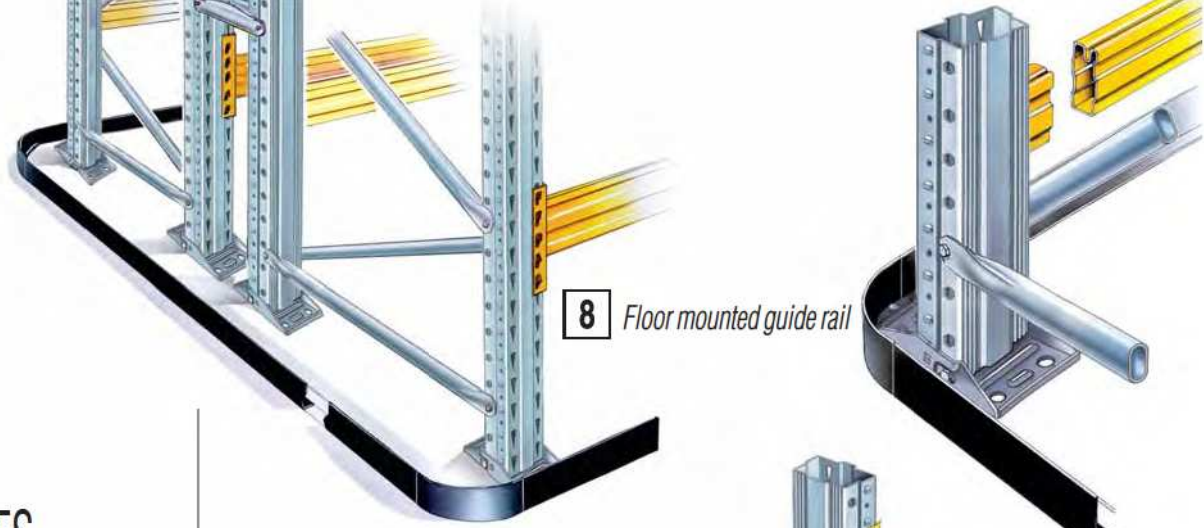
- Hot wash degreasing and iron phosphate pre treatment.
- Application of thermosetting powder paint.
- Curing at temperature of approx. 240° C in a force ventilated air circulation oven.

**4**  
*Column protector*

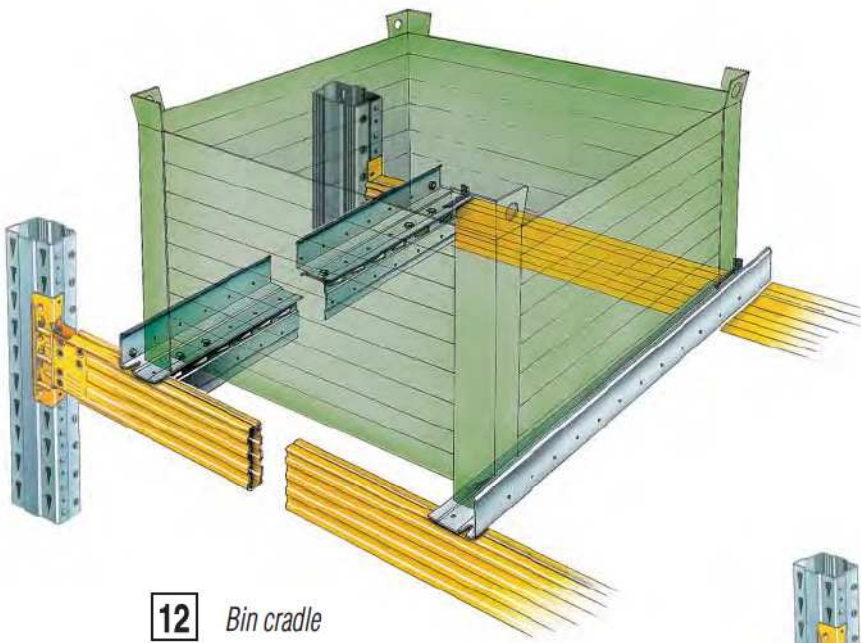


## ACCESSORIES

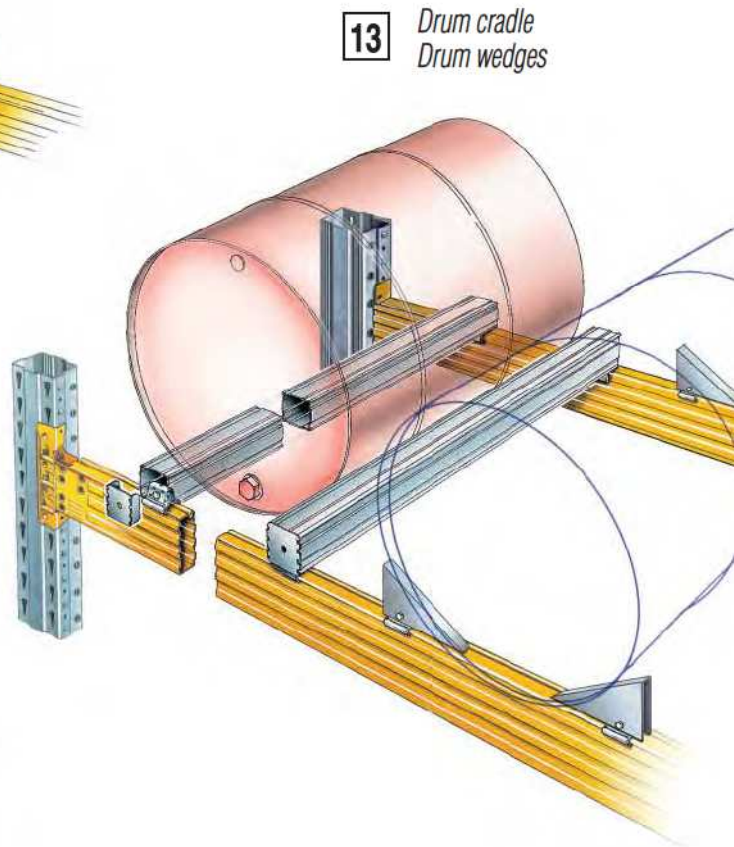
Regarding technical data, characteristics and dimensions, customers should refer to the Technical Reference Book of the SUPERBO series (Doc. MT12) as well as to the Technical Manual of Accessories (Doc. MT07).



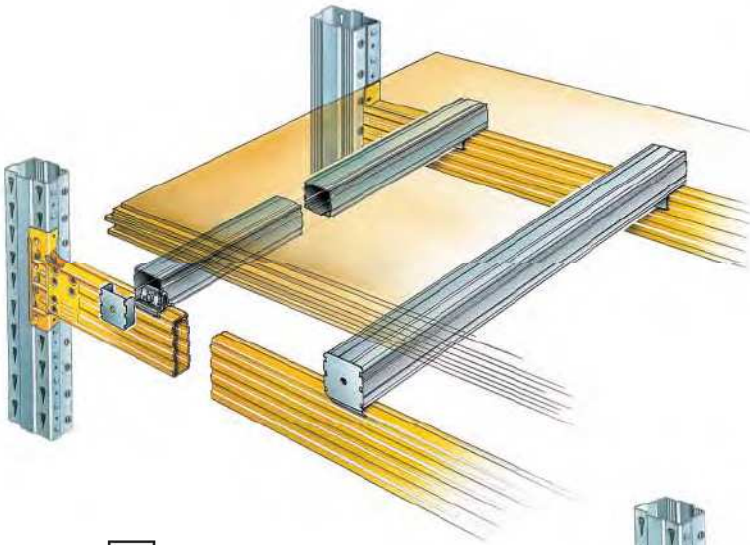




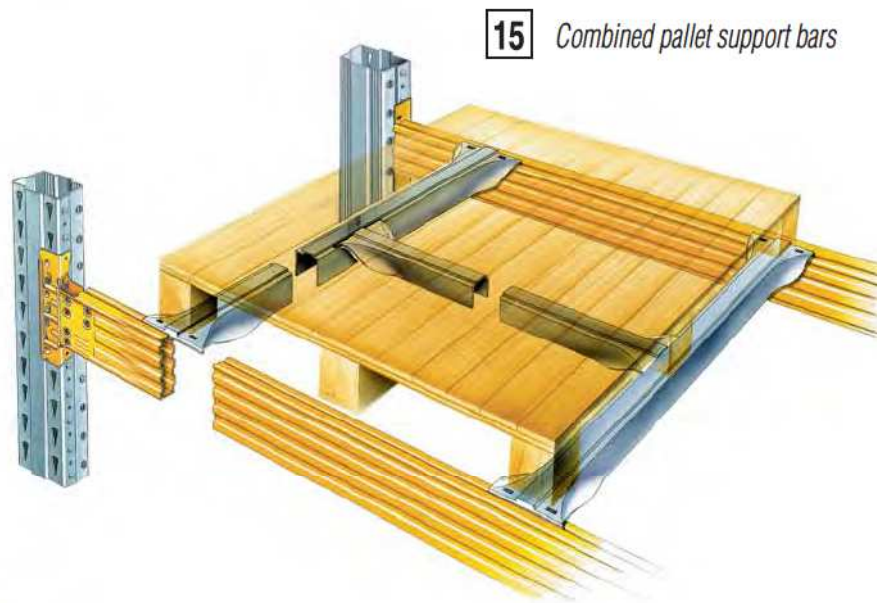
**12** Bin cradle



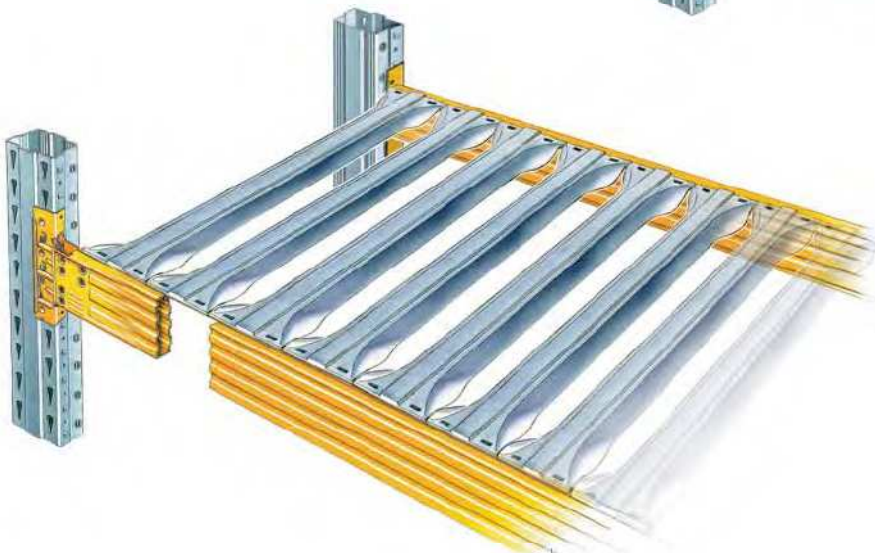
**13** Drum cradle  
Drum wedges



**14** Raised pallet support bar



**15** Combined pallet support bars



**16** Lightened secondary beams

For use in installations equipped with sprinkler systems  
(shelf surface with < 50% coverage)





**18** Entrance crescent for DRIVE IN guide rail

## DRIVE - IN

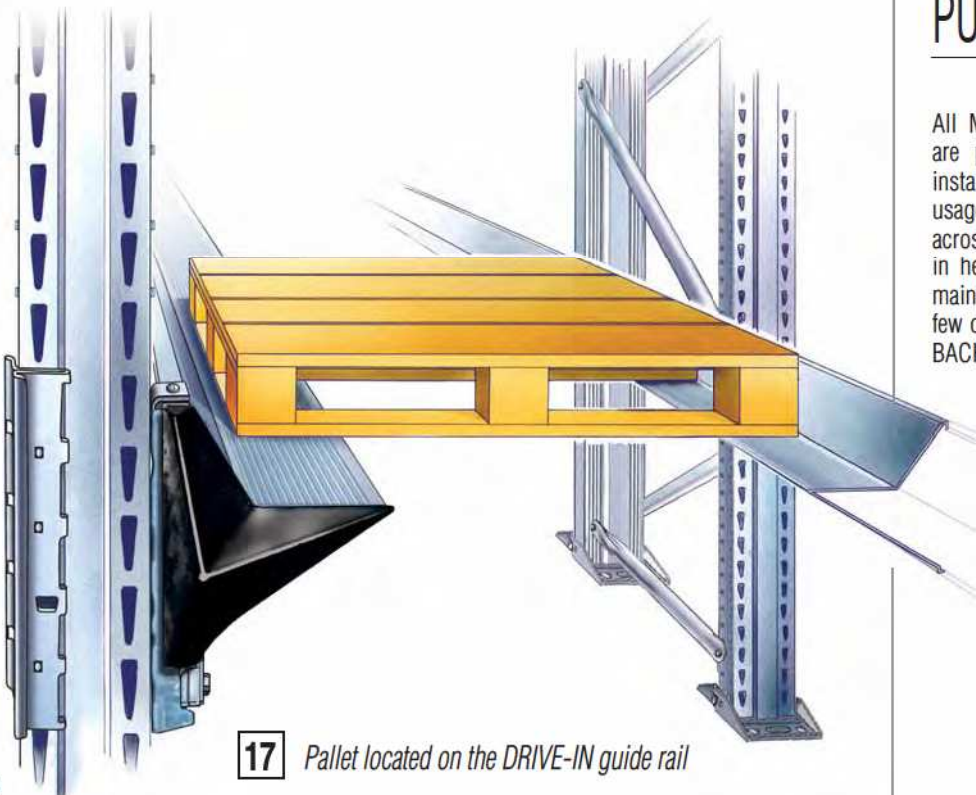
The DRIVE-IN racking system allows the maximum use of space, and volume due to the elimination of access aisles. The storage volume is therefore more than doubled compared with standard pallet racking.

Two kinds of installation are possible: DRIVE-IN or DRIVE-THROUGH.



## PUSH BACK

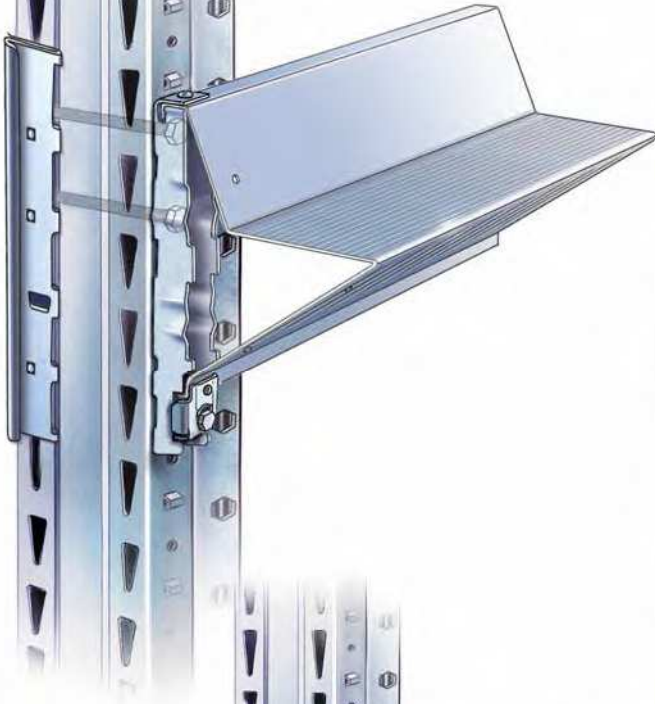
All METALSISTEM pallet racking series are perfectly suitable for PUSH-BACK installations, providing increased usage flexibility and pallet accessibility across both tunnels and storage levels in height. Stability, storage density, low maintenance cost, ease of use, are but a few of the outstanding features of PUSH-BACK installations.



**17** Pallet located on the DRIVE-IN guide rail



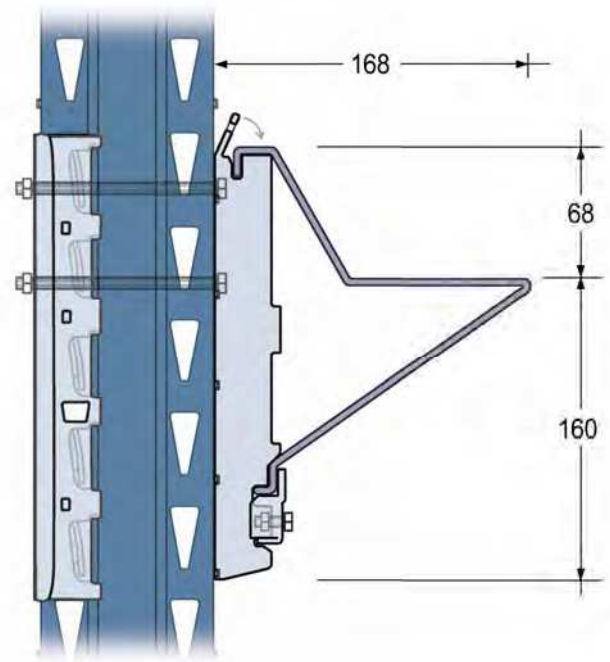
**20** *DRIVE-IN guide rail located on a single bracket*



**19** *DRIVE-IN guide rail located on a double bracket*



**21** *Entrance crescent for DRIVE-IN guide rail*



**22** *Double sided DRIVE-IN guide rails located on single brackets*



**METALSISTEM®**



FEM section X



SUPERBO



MODULAR STORAGE SYSTEMS



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