



## PRO Pallet racking

Despite modern technologies which are increasingly adopted in warehousing and order picking, the “classic” pallet racking is most commonly used in this field.

The pallet racking system allows convenient access to every pallet. Moreover, the racking configuration can be easily modified and extended. Relatively low investment costs and flexibility have made this system essential for storage and order picking.

The most common configuration is multi-position storage with 2 - 4 pallets per bay. If pallets are buffered or if complete pallet loads are to be handled, pallets are stored short side facing. For order picking, however, pallets are generally stored long side facing in order to facilitate access.

With useful and practice-proven accessories, the BITO pallet racking system allows optimum storage of all kinds of palletised loads.

# BITO

[www.bito.com](http://www.bito.com)



**Product information**

**Frequent application**

- buffer and order picking stores

**Service options**

- manual order picking at floor level height
- hand pallet trucks, electric lift trucks, reach trucks
- all current forklift truck types available on the market
- automated servicing

**Storage options**

- long/short side facing
- vertical storage
- one or two pallet deep storage

**Surface/volume utilisation**

- can be increased considerably by highbay storage



Highbay pallet racking



**Storage units**

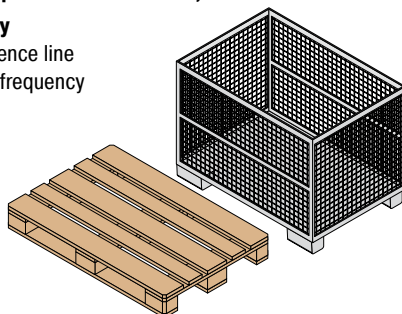
All currently used pallet types, wire-mesh box pallets, special size pallets, customer specific load carriers, etc.

**Stock rotation frequency**

- large quantities per reference line
- medium to high turnover frequency

**Stock characteristics**

- bulky storage units
- heavy-weight loads



Extractable first pallet position

**Safety**



The German quality mark **RAL-RG 614/2** guarantees the highest levels of quality for structural safety, load capacity and sufficient rigidity both lengthwise and front to back.



All components fully comply with the latest safety regulations.



Automated pallet racking with single position storage



**Information material**

For more information on this product, please contact us on  
Tel.: +49 (0) 67 53 / 1 22-1 64

or ask for our DVD  
“**Dynamic storage**“

Our **PRODUCT CATALOGUE** provides detailed information on our entire delivery programme.

Ask for your free copy!

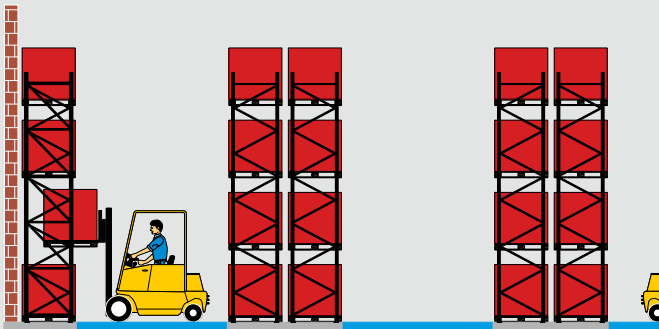


Identification and safety equipment

## System specific advantages of BITO pallet racking systems

- assembled frames = faster overall assembly, or, depending on the project, unassembled frames to save on freight costs
- bolted frames = lower repair costs if damaged by a lift truck
- fast and boltless assembly of basic components
- high corrosion resistance by galvanising or epoxy coating
- long and short side pallet handling as well as multi- and single position storage
- broad range of accessories and safety equipment
- all racking components comply with the latest safety regulations
- level decking can be ordered in many variations
- particularly hard-wearing components for a long service life

### 1 Broad aisle installation



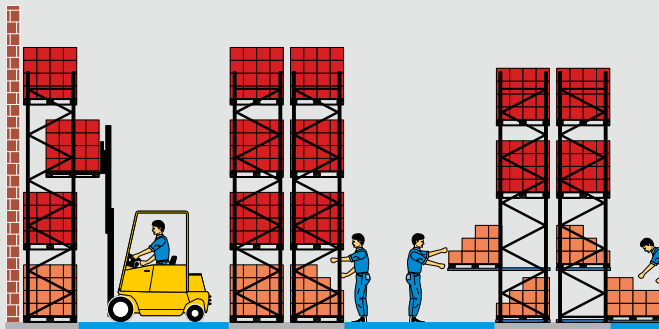
- buffer store
- low to medium turnover frequency
- low cost pallet position

The standard solution for pallet racking is a configuration with **broad aisles**. Servicing is generally done with front stackers, reach trucks or man-up stacker cranes. The floor level can be conveniently serviced with a hand pallet truck or an electric lift truck.

**Your advantages:**

- low cost storage
- easy servicing with front stackers
- manual order picking at floor level height

### 2 Extractable first pallet position



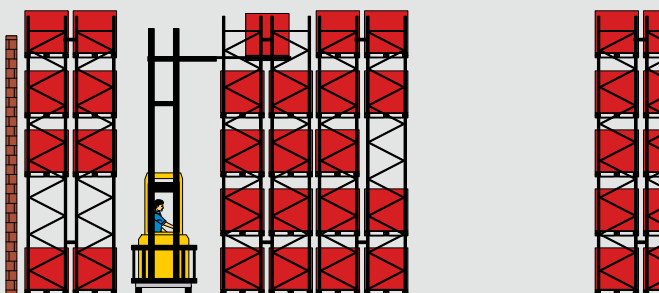
- ergonomically favourable order picking from 3 sides
- very good access, even if pallets are stored short side facing
- can be retro-fitted into existing pallet racking installations

As a rule, smaller unit loads are directly picked off the pallet. Manual order picking is done on the floor level and sometimes also on the level above, depending on the reach height. Extractable first pallet positions facilitate order picking as pallets can be accessed from 3 sides.

**Your advantages:**

- ideal, strain-free order picking from 3 sides
- prevents injuries – no head bumping on the beam of the level on top

### 3 Double deep storage



- good alternative to narrow aisle storage with rail-guided service vehicles

Double deep storage requires a service vehicle with telescopic forks. As a rule, the truck is equipped with a camera at the forks and a control monitor in the operator cabin to give view onto the second pallet in the lane.

**Your advantage:**

- less floor space required

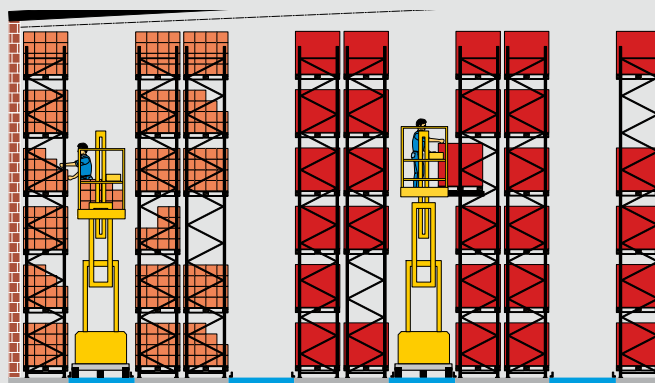
## 4 Narrow aisle installation

- highbay construction with narrow aisles and order picking trucks
- individual unit loads can be picked from all levels

Narrow aisle installations allow a very good floor space utilisation. Man-operated stacker cranes or order picking trucks lift the operator into the ideal picking position to allow manual picking on all levels. Guide rails or inductive steering ensures that service vehicles always keep the ideal distance to the installation.

### Your advantages:

- very good utilisation of available floor space and headroom
- ideal for stock items in huge quantities with a medium to high turnover
- no relocation of picking stock required
- safe working environment, as there are no persons in the aisles

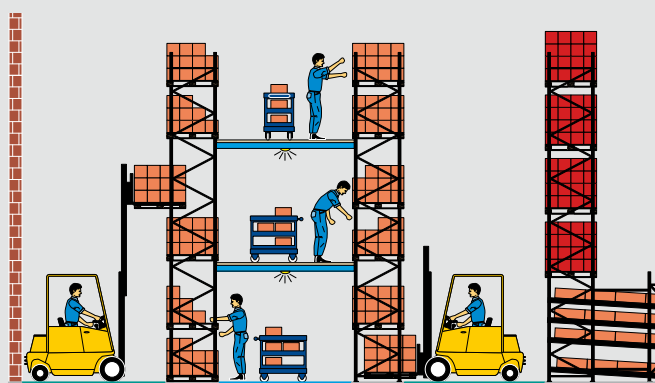


## 5 Multi-tier installation

In multi-tier installations, items can be picked simultaneously by several order pickers. This means that a higher number of orders can be picked. The BITO pallet racking system can **ideally be combined with other shelving and racking systems**, such as live storage, to the benefit of warehouse workflow.

### Your advantages:

- fast order processing due to simultaneous order picking
- good utilisation of available headroom
- random storage ensures that all storage locations are addressed as often as possible
- immediate replenishment from the buffer on top
- suited for pallet long and short side handling

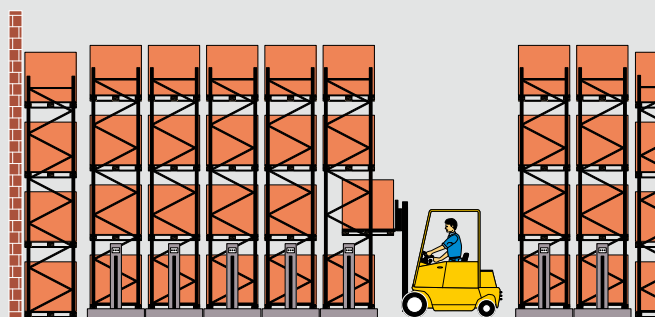


## 6 Mobile pallet racking

The elimination of several aisles leads to an optimum utilisation of floor surface. The gain in space is substantial and can amount to 100 %. As aisles can be opened where required, all pallets can always be directly accessed.

### Your advantages:

- optimum utilisation of storage volume results in a very high storage density
- instead of one broad aisle wide enough for truck circulation, it is also possible to open several smaller aisles

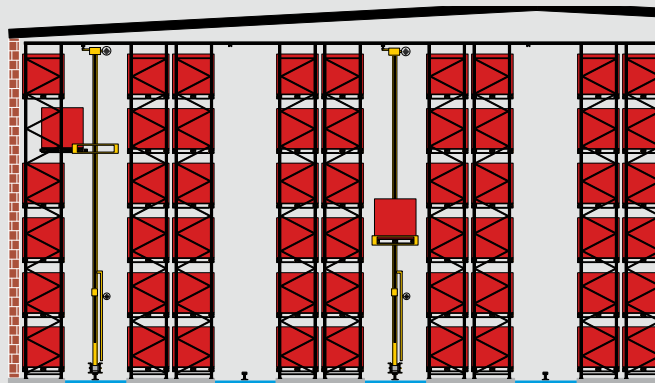


## 7 Automated installation

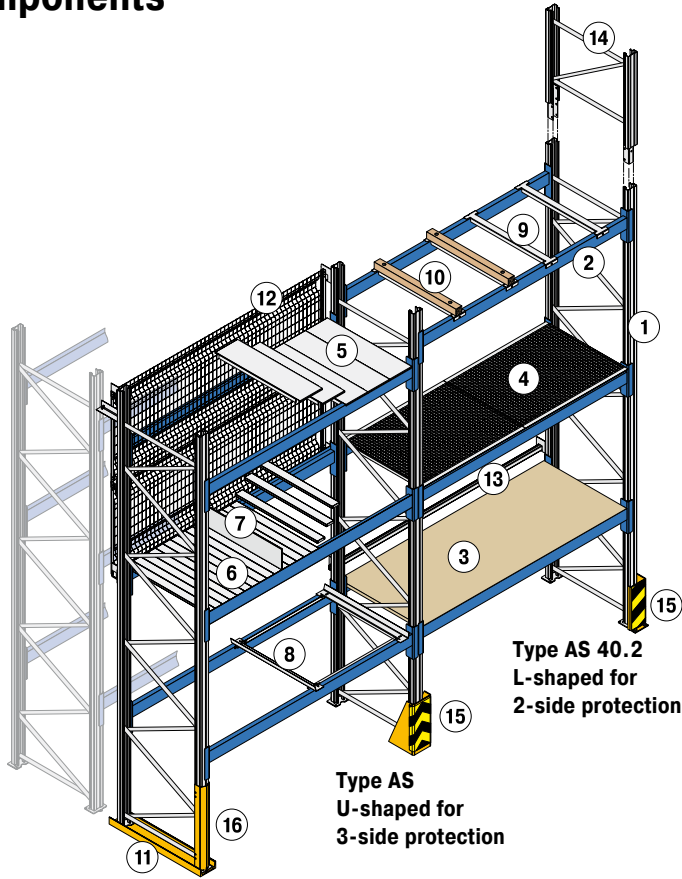
Although "classic" pallet handling with lift trucks is widely spread, automated installations are on the rise. Higher investment costs are quickly overcompensated by shorter order picking times which in turn reduces lead times.

### Your advantages:

- closed system provides safe working environment
- optimised travel routes improve efficiency
- short order throughput and delivery times
- very good availability of goods
- computer-controlled warehouse administration
- continuous work flow

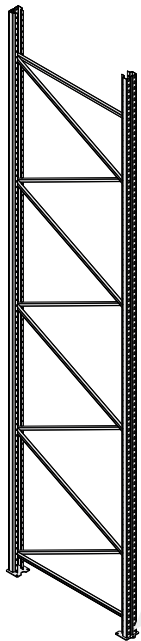


### Components



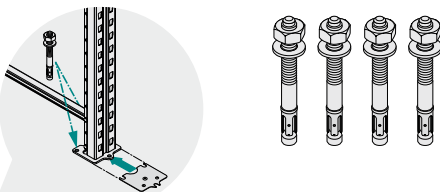
- 1 Frame
- 2 Beam
- 3 Chipboard shelf decking
- 4 Wire-mesh shelf decking
- 5 Drop-on steel panels for box-type beams
- 6 Drop-in steel panels for stepped beams
- 7 Dividers for steel panel levels
- 8 Support tray
- 9 Pallet support bar
- 10 Pallet support bar with squared timber block
- 11 Load spreader
- 12 Wire-mesh back cladding
- 13 Back stop
- 14 Frame extension  
prevents goods from falling sideways, can be retro-fitted
- 15 Column guard
- 16 Upright protector

#### Frames

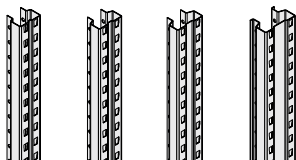


Frames are delivered unassembled. All parts are galvanised to prevent corrosion. Sturdy bolt anchors provide excellent stability. The bolt-together construction allows to easily exchange damaged components.

High-quality bolt anchors provide excellent stability.



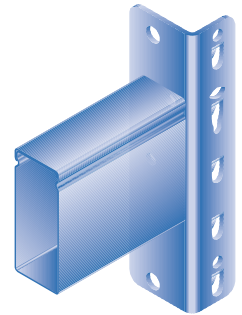
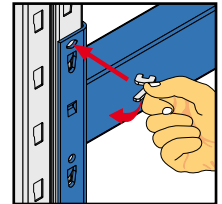
Profiles are available in various width, depth and material thickness options.



#### Beams

The easy-to-handle boltless system allows **fast and cost-effective assembly**. **Solid safety hooks** which are secured against loss by a 90° turn prevent accidental lifting of the beams to avoid work accidents.

- high load capacity
- excellent lengthwise rigidity of the racking construction



Profiles are available in various height and material thickness options.



## Components - Safety equipment

### Column guard

Available in two types for 2-side or for 3-side protection of uprights in corner areas and passageways. This particularly robust component is floor-anchored directly in front of an upright. Height 400 mm (100 mm more than stipulated by most safety regulations).

Type AS 40.2  
L-shaped for  
2-side protection



Type AS, U-shaped  
for 3-side protection

### Upright protector

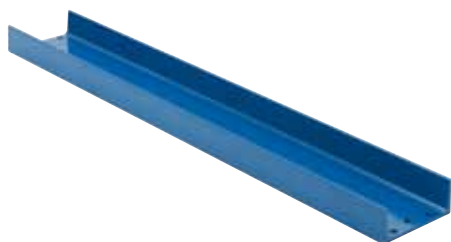
Protects uprights over a length of 700 mm. It is bolted to the upright and can be mounted at any racking level.



### Load spreader

Distributes loads from the uprights on a larger surface of low quality flooring.

Hot-rolled U-shaped profile.



### Fencing

Provides short side protection for racking rows. A steel sheet plank is bolted to robust corner protection elements which are floor-anchored in front of the short side of a racking row.

A second steel sheet plank can be added to fill the room between floor and upper plank.



### Wire-mesh back cladding

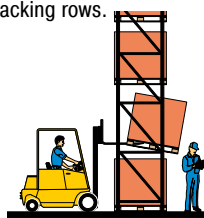
Protection of trafficways and work areas located behind single sided racking installations. A robust frame with a wire-mesh infill of 50 x 100 mm and additional stiffening corrugation prevents goods from falling.



### Back stop

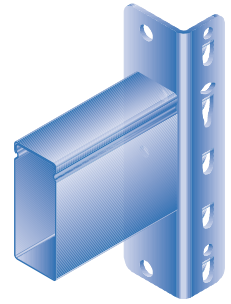
Prevents that pallets are pushed too far back or that palletised storage units fall onto passageways and work areas which are located behind single sided racking rows.

It can be equally used to maintain the required safety distance between pallets stored in double sided racking rows.



### Components - Drop-on level decking

- drop-on fitting on beam type PT
- easy retro-fitting of an open-type level into a decked level
- later-on adjustment possible at any time



#### Chipboard decking fitted on support bars

Drop-over support bars increase the load capacity of chipboard shelves. The support bar dimensions have been adapted to the panel height in order to ensure that the shelves sit flush with the upper edge of the box-type beams.

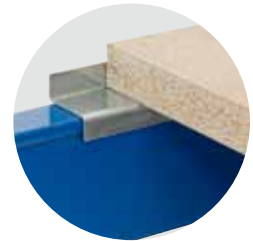


- chipboard panel quality V20 E1
- easy retro-fitting of an open-type level into a decked level



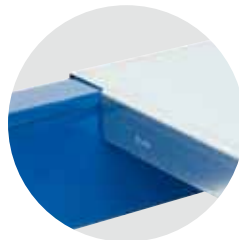
#### Chipboard decking fitted with 4 positioning angles

On box-type beams, level decking is held by 4 Z-shaped drop-on positioning angles which keep the decking segments in place.

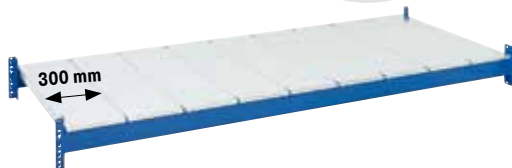


#### Steel panel decking

The 300 mm wide, galvanised drop-on steel panels are simply placed next to each other onto the beams. This makes a flat surface which does not add to the beam height.

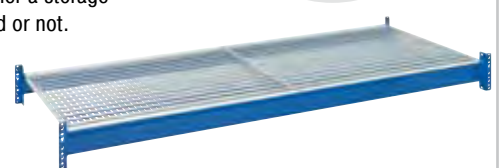
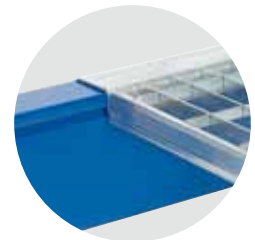


- very robust panels
- high load capacity



#### Wire-mesh segments

With their angled sides, the wire-mesh segments sit safely on the box-type beams. Suited for high load capacities – surface loads as well as point loads. Water permeability makes the segments ideal for warehouses with a sprinkler system. Moreover, it is easy to view from beneath whether a storage location is occupied or not.

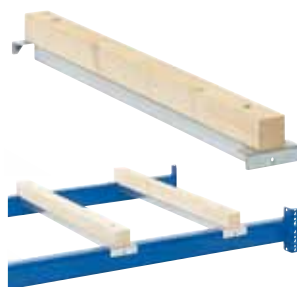


#### Loads stored on pallet support bars

Pallet support bars provide additional front-to-back support to any load carrier, in particular to storage units handled long side facing.



Pallet support bars



Pallet support bar w/ squared timber

#### Loads stored on support trays

Bolted construction, optionally with back stop. The angular sides allow safe in-feeding and out-feeding of wire-mesh box pallets and flat pallets.

Options:



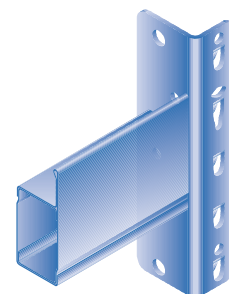
without back stop



with back stop

## Components - Drop-in level decking

- drop-in fitting on beam type PS
- easy retro-fitting of an open-type level into a decked level
- 2 step heights: 23 mm and 38 mm



### Chipboard decking fitted into stepped beams

The robust upstand of the stepped beams protect the cut edges of the **chipboard panels** from potential damage during loading and retrieval. Chipboard panel quality **V20 E1**.

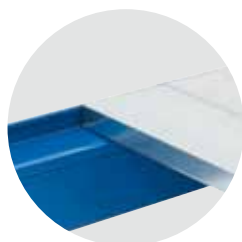
- **continuous, flat storage surface**
- **high-quality chipboard shelf**



### Drop-in steel panel decking

The low-weight steel panels are simply placed next to each other and form a flat and smooth storage surface which is easy to clean.

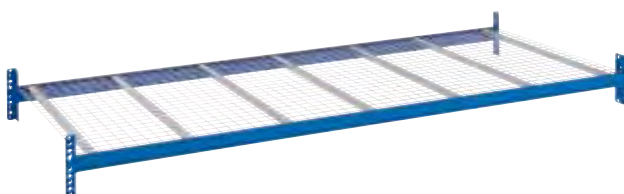
The panels sit flush with the upper edge of the beam step so that optimum protection from damage is ensured during loading and retrieval.



### Wire-mesh decking

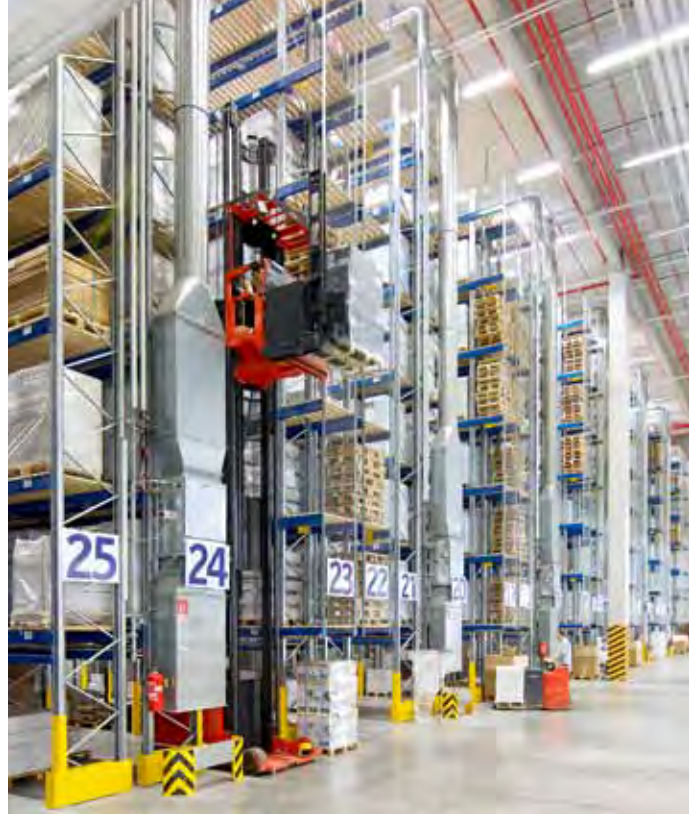
The wire-mesh infill has two benefits: it is easy to see from beneath whether a storage position is occupied or not. Water permeability helps you meet fire protection requirements, i.e. wire-mesh segments are ideal for warehouses with a sprinkler system.

- **light-transmissive**
- **water permeable for fire protection**





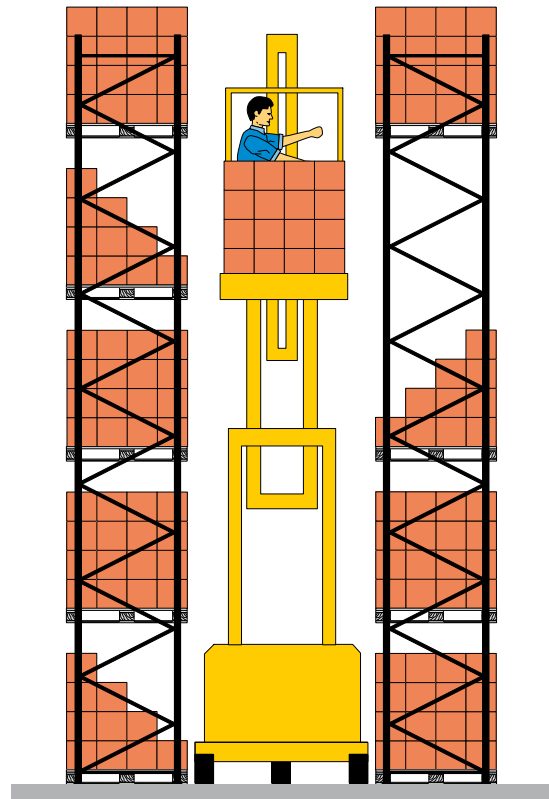
## Narrow aisle racking



### Storage in narrow aisle installations

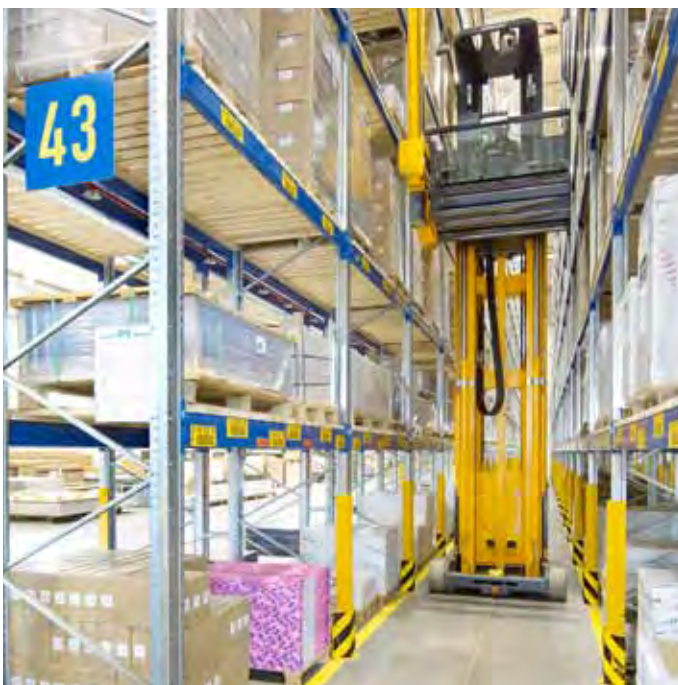
Narrow aisle highbay storage allows a very good surface utilisation. As a rule, these facilities are serviced with man-operated stacker cranes or order picking trucks. This allows picking of smaller unit loads from all racking levels. Guide rails and inductive steering ensure that service vehicles always keep the ideal distance to the installation.

Narrow aisle facilities also allow to make optimum use of the available headroom, even if a broad product range with a medium to high picking frequency has to be stocked. With stacker crane servicing, there is no need to relocate fast movers to lower levels. On top of this, the warehouse operator benefits from a safe working environment, as there are no persons in the aisles.





**IGEPA**  
Paper wholesaler



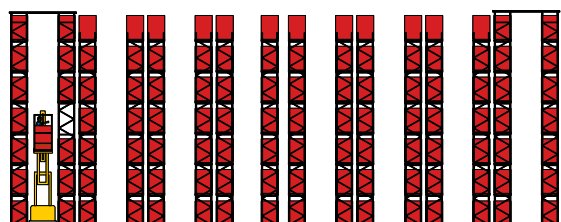
**Features**

- pallet store with man-up narrow aisle trucks
- floor level order picking with buffer stock on top
- special pallets for cut paper
- fitted with special-size, drop-on wooden grating conforming to the latest fire prevention regulations

**Function**

The Igepa Group is one of the leading paper wholesalers in Europe with more than 40000 customers. Their distribution warehouse in Hemmingen accommodates pallet storage facilities serviced by man-up narrow aisle trucks with inductive steering. All pallets are fed in as fully loaded pallets. For major orders, full pallet loads are retrieved and dispatched from all levels. In most cases, however, order picking vehicles take out goods from the floor level or the first beam level.

With guard railing at the short sides, floor-anchored U-shaped column guards posted in front of every upright and walk-through barriers within back-to-back installations, the Igepa facilities comply with the strictest safety standards.



**Benefits**

- many pallet positions in a limited warehouse space
- safe working environment despite free range narrow aisle trucks
- levels decked with high-load capacity wooden grating allow to feed in different size pallets

## Order picking from the floor level

### Pallet extraction units

Pallet extraction units allow to pull out individual pallets from a static pallet racking installation into the aisle. Goods can then be picked conveniently and without straining the back from three sides. This special equipment item is particularly useful when relatively heavy or bulky goods are to be picked.

Another advantage of pallet extraction units is that pallets can always be stored short side facing due to the improved access provided by the system. This also has a positive effect on the required length of picking aisles.

For system-related reasons, only some of the storage positions on each level can be equipped with an extraction unit.

Depending on the pallet height or the optimum picking height, floor level and first level picking positions can be realised as extractable unit.

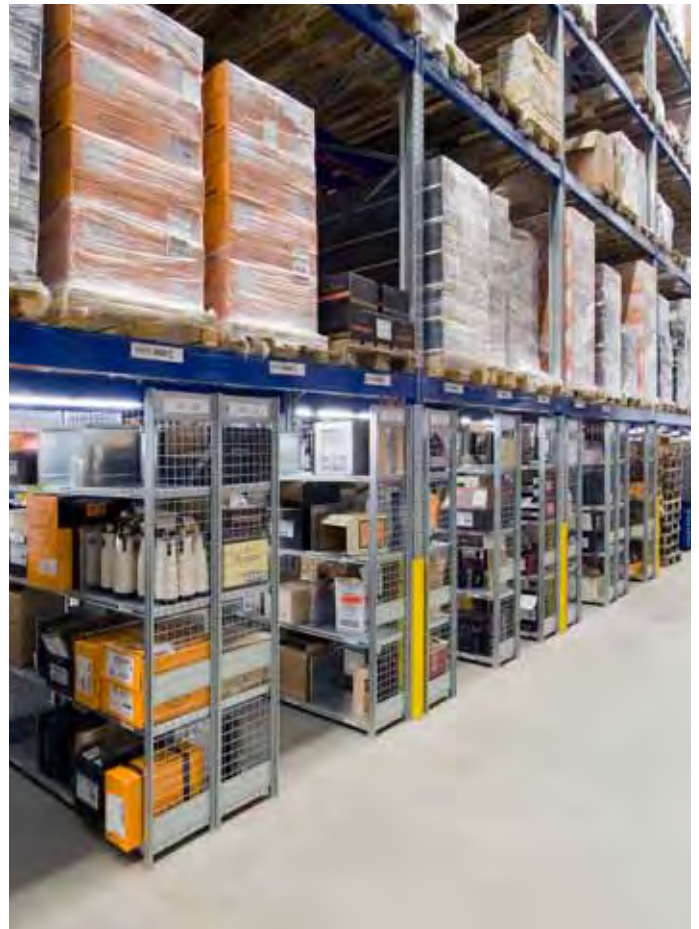


### Pallet extraction unit on the floor level



### Floor mounted and beam mounted extraction units





### Retro-fitting static racking into live storage racking / Floor level order picking aided by various solutions

Order collation of palletised goods is often done on the floor level, i.e. underneath the first beam level of a pallet racking. This is particularly common in warehouses which stock a small range of reference lines in huge quantities with a medium picking frequency. As a rule, the picking pallet is placed on the floor level for easy access by the picking staff.

Depending on the type of goods to be picked, a pallet racking facility can be combined with push-back or flow shelves for bins or cartons on the floor level – with the pallet buffer levels on top. With the help of upright adapters, the floor level of pallet racking can be equipped at low cost with flow shelves or with BITO Adapta-Flow modules, thus transforming a static racking level into a highly flexible live storage level.

If goods with difficult travel characteristics are to be stored, roller tracks are the ideal solution. In the case of short access routes and for compact storage, classic shelving is appropriate. The levels on top are suited as supply buffer for the stock items below. As the buffer stock is kept close to the picking places, relocation of stock to the floor level is fast and easy.

# RIEGER

Willkommen daheim.

**Möbel Rieger**  
Furniture retailer



### Features

- narrow aisle storage facility serviced by stacker cranes with inductive steering for roll pallets and containers of various sizes
- high-rise construction
- frames are in part supplied with X-strutting
- furniture depots with dispatch terminal
- tunneled stacker crane transfer aisles

### Function

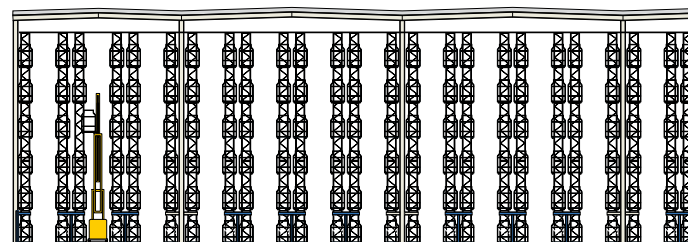
The third generation, family owned furniture retailer Möbel Rieger GmbH & Co. KG is headquartered in Göppingen and has several branch stores in Germany.

The newly constructed distribution warehouse accommodates roll pallets and containers of different dimensions. The goods-out department collates 70% of their merchandise into ready-to-dispatch orders on roll pallets which can be pushed conveniently and safely into freight vehicles. This makes loading particularly efficient.



### Benefits

- safe transport of goods
- fast lorry loading
- space-saving storage





**Soennecken**  
KRAFT GEMEINSAMEN HANDELNS

**Soennecken**  
Office supplies, stationery



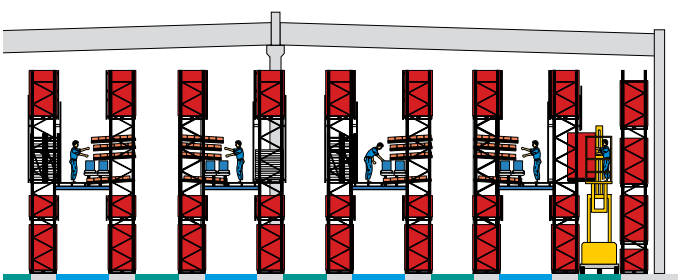
### Features

- highbay store
- 6000 pallet positions on levels with three different beam spacing options
- 3 fully automated aisles
- order picking from 24000 storage positions in total: on pallets, in live storage lanes and in shelving installations

### Function

Soennecken eG is the leading cooperation for medium-sized office supply traders and related industries. In their central depot in Overath, narrow aisle service trucks transport office supplies from the highbay store to the order picking area where the goods are stocked in static shelving, on flow shelves or as complete pallet loads.

In order to save time, smaller unit loads are fed out onto pallet sized trays which allows to transport several reference lines at the same time. Mesh-clad hatches between the narrow aisle and the order picking areas ensure operator safety. Products are classified into A-, B-, C- and D-items.



### Benefits

- no accumulation of dirt between narrow aisle and order picking area
- time efficient relocation of smaller sized units onto modular pallets
- pick-by-voice: hands free, improved concentration, low error rate

# Broad aisle racking

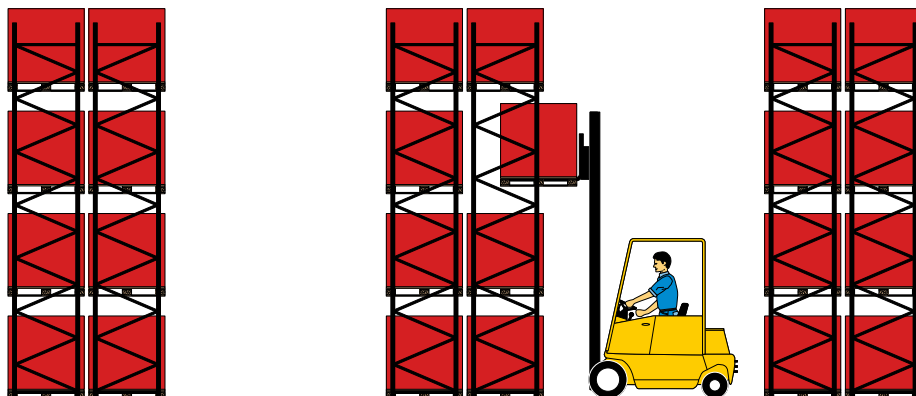


## Broad aisle racking

Broad aisle racking is a standard solution for pallet racking facilities. Servicing is effected by front stackers, reach trucks and order picking trucks.

Aisle width depends on the dimensions of the service vehicle. The advantages of this solution are bottom-of-the-line technology and cost-efficient storage. The service vehicles can be used for replenishment as well as for order picking.

The floor level and the first level can be conveniently serviced with hand pallet trucks or electric stackers. Compared to narrow aisle stores, the disadvantage of this solution is that it occupies more floor space.





**VAN EUPEN**  
IHR LOGISTIK-DIENSTLEISTER

**Van Eupen**  
Full service logistics provider



### Features

- pallet racking facility as supply and buffer stock
- three-tier shelving installation to supply small parts
- manual order picking

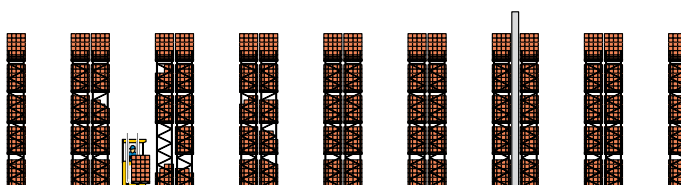
### Function

At 17 sites in Germany, Van Eupen provides 100000 m<sup>2</sup> of storage surface in total, offering state-of-the-art equipment for the full array of logistics services. In their hub in Unna, reach trucks stock complete pallet loads into pallet racking and relocate pallets into the order picking area as required. In this area, unit loads are picked manually from pallets stocked on the floor level whereas loads from pallets stocked on higher levels are retrieved with mid-level order pickers.

Small parts are stocked in a three-tier shelving installation and picked manually.

### Benefits

- all reference lines are directly accessible
- high flexibility in case of product range modifications
- fast order processing as staff levels can be adapted to actual needs
- many storage positions on a small surface
- optimum utilisation of headroom





# Single position storage



**i** **Single position storage systems**

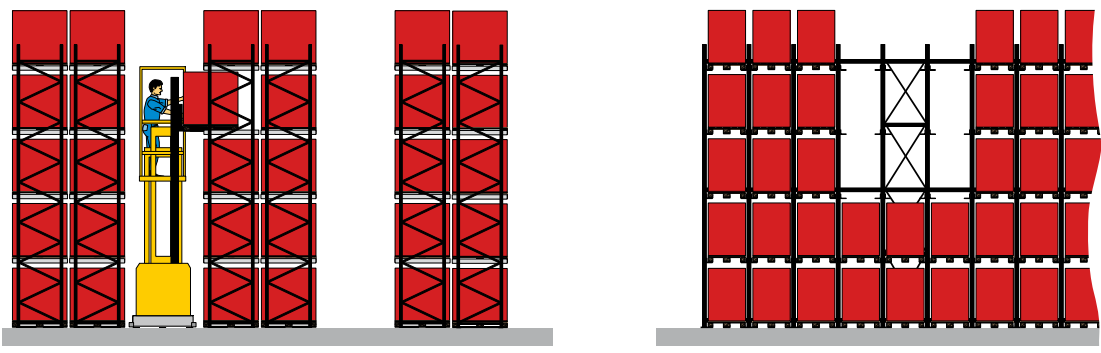
Single position storage systems combine features of pallet racking and of automated bin or tray storage (BITO-type AKL). Their configuration is similar to automated bin or tray storage systems.

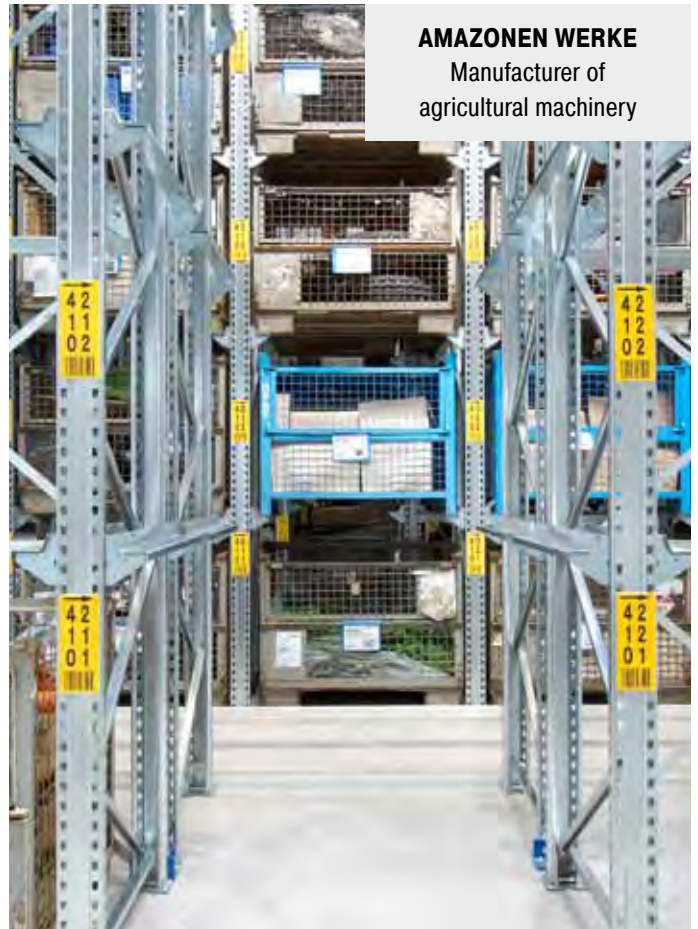
The installations accommodate f. ex. compact wire-mesh pallet boxes with Euro-norm deck dimensions, however not on beams, but on angled profiles such as used in automated bin storage.

As a rule, single storage position systems consist of a racking facility with one or several

aisles, one rail-guided service vehicle per aisle, order picking stations, conveyors, a goods-in area and a bus system connected to the warehouse management system.

Single position storage systems can also be serviced manually with reach trucks. Operators receive all necessary information by radio data transmission or from order picking lists.





**AMAZONEN WERKE**  
Manufacturer of  
agricultural machinery



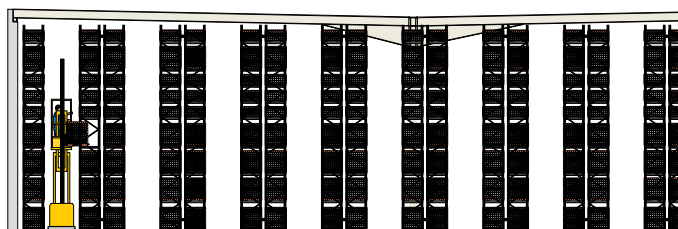
### Features

- pallet racking facility used for order picking
- servicing with rail-guided narrow aisle trucks
- single position storage

### Function

The Amazonen-Werke in Hasbergen supply equipment and machinery for use in agriculture, landscaping as well as snow clearing and gritting. In order to ensure fast delivery of all products, all local depots have been merged into one central depot.

This central depot provides the supplies for the production plant and speeds up order picking to allow faster customer supply. 90% of the supplies are stocked in wire-mesh box pallets and 10% on standard size Euro-pallets.



### Benefits

- shorter response times to customer orders (a must in this industry)
- shorter in-house travel routes and order throughput times
- the use of angled profiles in single position storage leaves more space in height between the box pallet levels, thus facilitating product access
- narrow aisle construction allows to accommodate a higher number of storage positions on the same surface