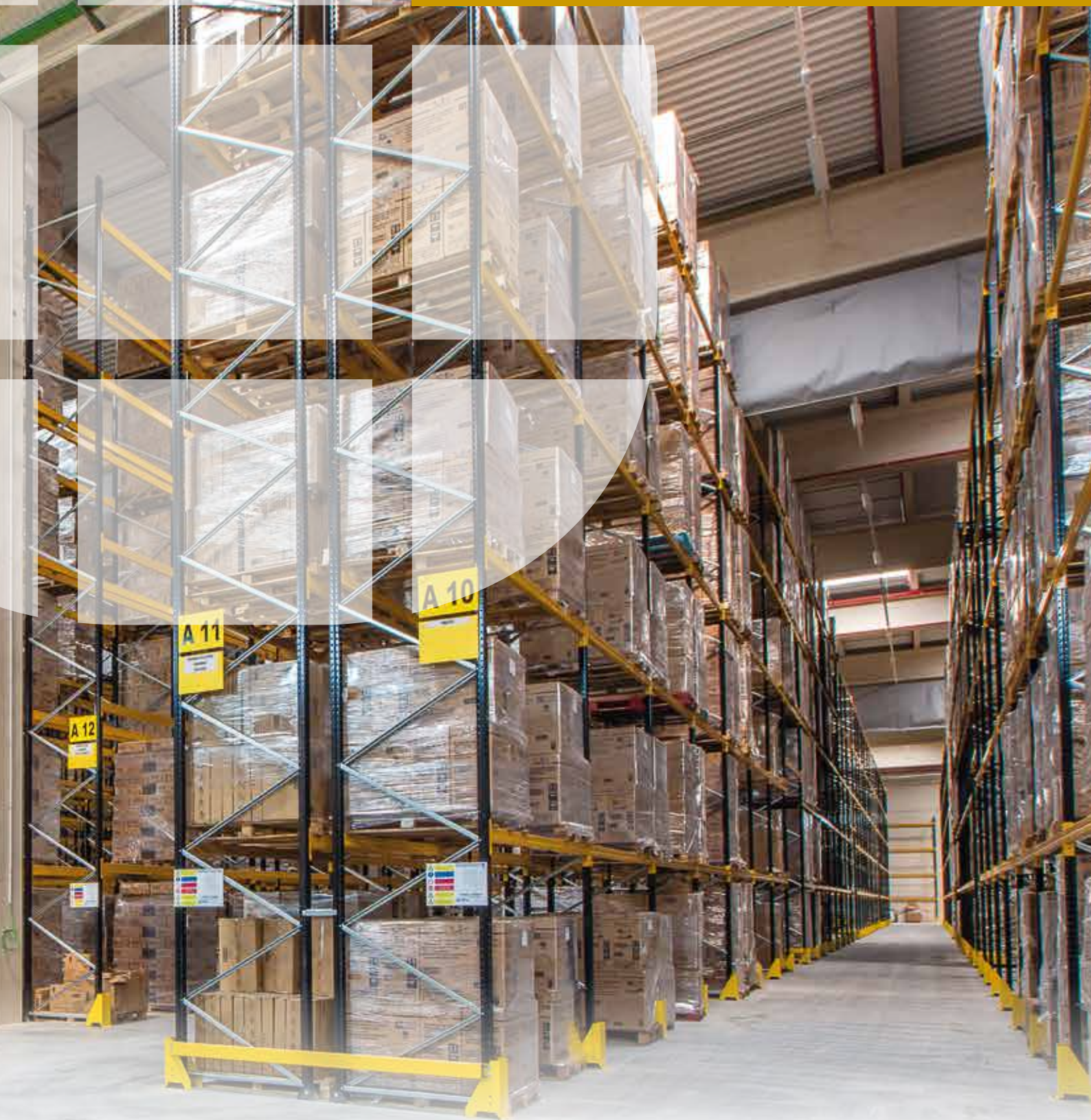


pallet racking

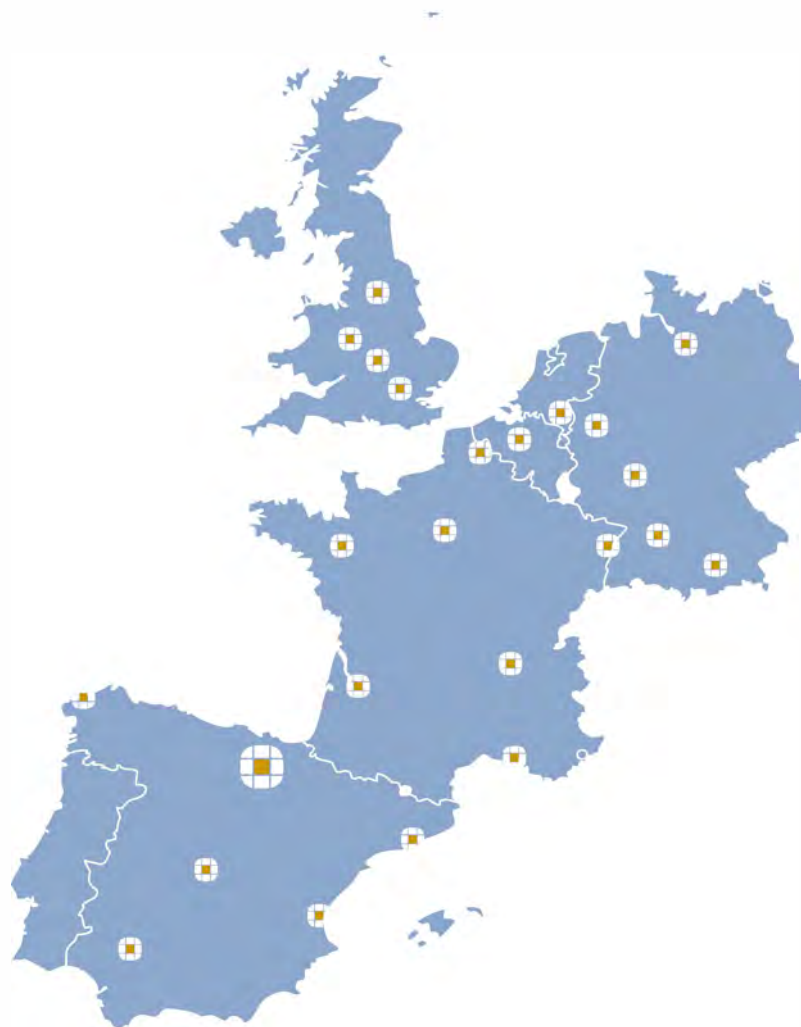


The Whittan group

POLYPAL is a subsidiary of the Whittan Storage Systems Group, based in the UK, the leading European supplier of top-quality storage systems with customers in more than 30 countries. Whittan Group consists of a network of companies, which design, manufacture and install a wide range of storage solutions across Europe.



GROUP OF COMPANIES



Polypal factory in Iurreta (Biscay, Spain)

Polypal

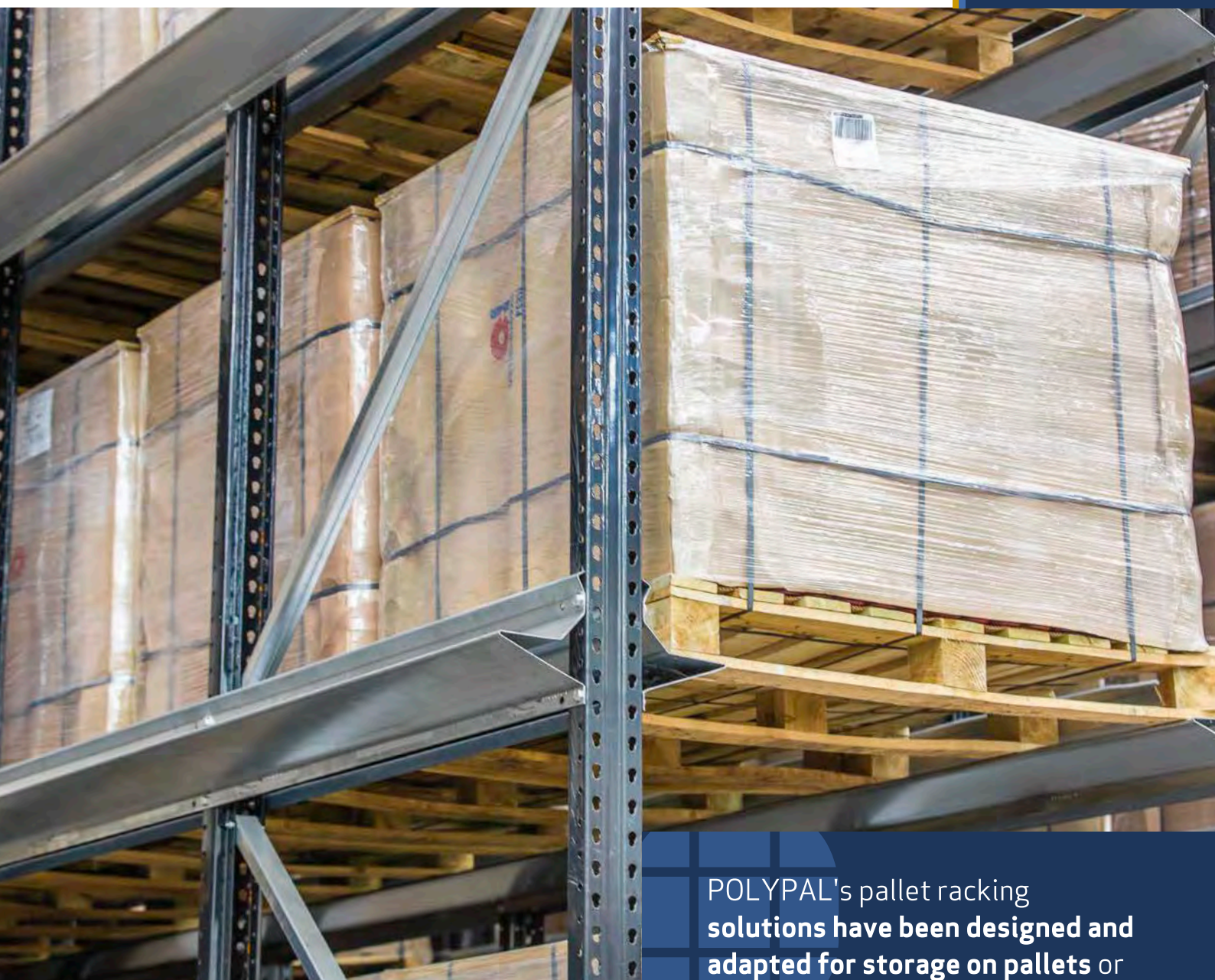
With more than 100 years of experience in this industrial sector, POLYPAL STORAGE SYSTEMS S.A. specialises in the design, manufacturing and installation of a wide range of storage solutions.

POLYPAL has subsidiaries in Germany, Belgium, France and the Netherlands, in addition to five offices in Spain.

POLYPAL's production facility is located in Iurreta (Biscay-Spain), only 30 km away from Bilbao, 25 km away from the international airport and 30 km away from the Port of Bilbao. The factory has a gross floor area of 10,000 m², in which modern equipment and technical resources are used by a team with vast experience, under a strict quality system with certifications by the ISO 9001, ISO 3834 and UNE-EN 1090 standards.

POLYPAL and the Whittan Group are members of different maintenance organisations:





POLYPAL's pallet racking solutions have been designed and adapted for storage on pallets or other elements, such as containers and big-bags.

Pallet racking

POLYPAL offers different **storage systems for palletised goods**, which can be adapted to the needs of any company following criteria of stocktaking, stock rotation, pallet accessibility, organisational and other warehouse management methods.

Nowadays, industrial pallet racking solutions are key in **logistics management and the warehouses** of companies.

The standardised handling of goods on pallets allows for storage systems designed and adapted to the needs of the industry and logistics.

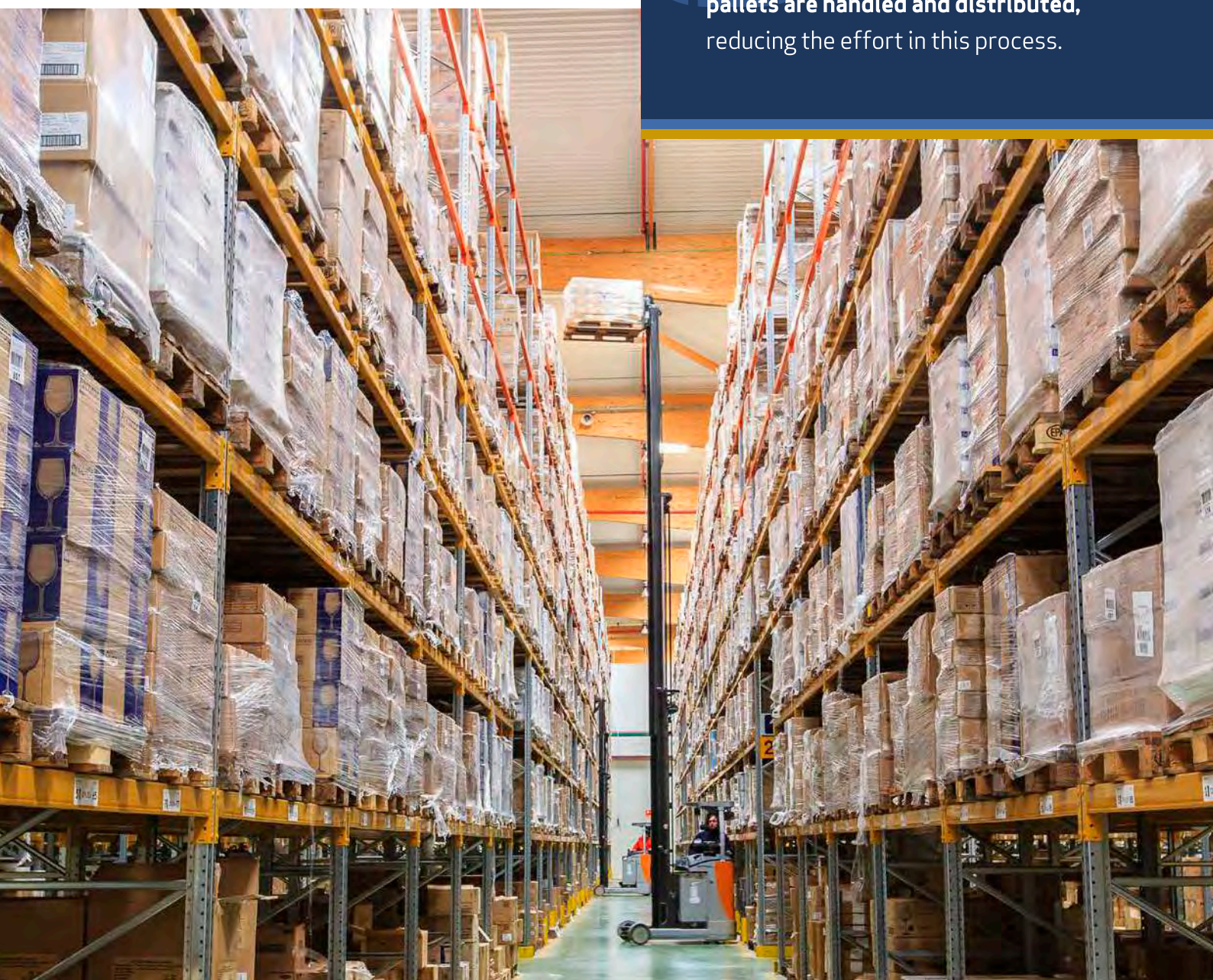
POLYPAL specialises in the design, manufacturing and assembly of storage solutions for goods transported on pallets, helping your company to:

- ☐ **Increase its storage availability and optimise the space utilization.**
- ☐ Improve its profitability, **increasing productivity** and the safety of the stored goods.
- ☐ **Reduce damage** and loss of stored goods.
- ☐ **Increase its workforce safety levels.**

With a proven history in the sector, **POLYPAL**'s teams manage the entire process, from the initial sales for contracts to the final assembly and installation of the pallet racking solution. **The company takes on all design and manufacturing challenges directly to build optimized, profitable and safe warehouses.**

POLYPAL offers a wide range of storage solutions for palletised loads, from adjustable pallet racking systems, compact storage systems, live storage racking and mobile bases to the construction of cladrack warehouses.

A pallet is the main unit load in most warehouses. A correct pallet storage system (classified by type) **improves how pallets are handled and distributed,** reducing the effort in this process.



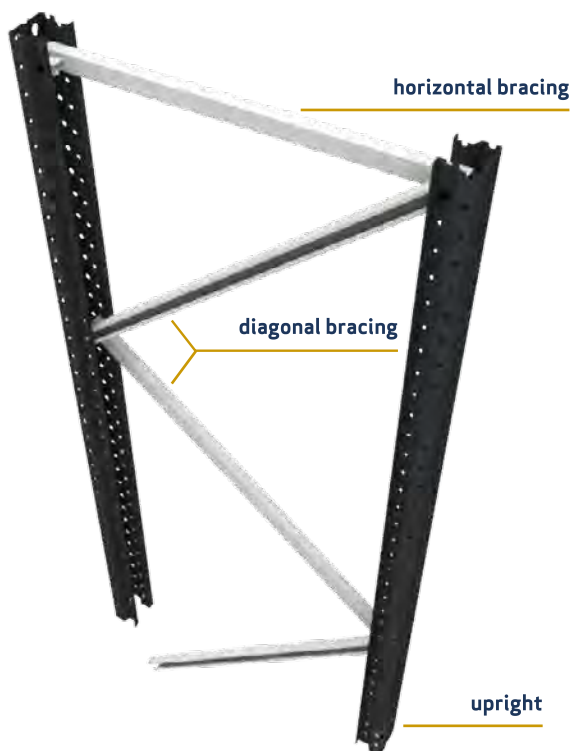


Pallet racking systems along with **material handling equipment** are the core of all palletised goods storage and processing operations.

Structural components

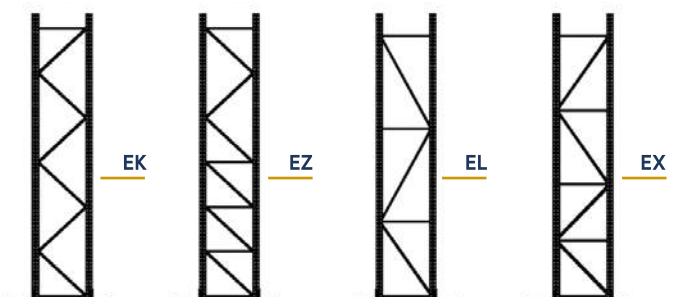
frames

The **frame** is the vertical structure made up of two or more perforated uprights, braced with a lattice of horizontal and diagonal bars. **These are the load elements of all pallet racking systems.**



frame lattices

The **upright bracing lattices** are made of bolted elements to increase the rigidity and stability of the system. POLYPAL uses its specific calculation methods to optimise the design of frames, resulting in lattice systems built with tested elements and adapted to the structure required by the project specifications.





load support elements

Depending on the specified pallet racking system, different elements are used **to directly support the loads**. The main components are:

- **Beams:** horizontal elements lodged to the frames, **on which the pallets are placed**; they are also used for the duties on bracing in compact storage, depending on the storage equipment.
- **Rails:** horizontal load supports, profiled of various continuous sections that **transfer the pallet load to the frames**, in Drive-In/Drive-Through or Shuttle **compact systems**.

In compact storage systems, the pallets are placed on continuous profiles.

These profiles, specific to accumulation systems, run along the lanes of the racking block.

Its design is POLYPAL's own and can be fixed directly to the frames or support beams depending on the system used, such as in the case of storage with shuttles.

Generally, they are manufactured in sendzimir galvanised steel, which increases the protection against wear.



POLYPAL's own **R+D department** allows the company to develop and manufacture specific steel sections. For certain projects, this department can evaluate different steel quality grades to suit **the needs of a wide range of sectors**.

uprights

The upright is the **vertical element** of the frame structure **onto which the beams are attached, supporting the loads** transmitted to it.

P

PROFILED UPRIGHT

Omega geometry profiled upright.

Side perforations used to attach the bracing lattices to form the frame structure.

Side perforations for additional uses, rails or accessories.

MAIN PERFORATION PITCH

50 mm pitch. Beam position easily adjustable.



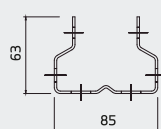
MAIN PERFORATION

Double cylinder lock-shaped perforations along the upright, used to attach the beams in their load position. **The lower cylinder is slightly angled towards the axis** of the upright **front to increase the rigidity of the beam connexion and avoid it from being dislodged out of its position** accidentally.

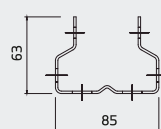
upright S

Different thickness, steel grade qualities and types of profiled structures can be combined, according to the specific load and structural rigidity requirements.

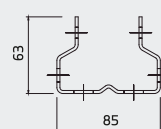
S320



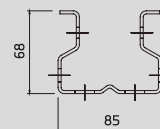
S520



S525



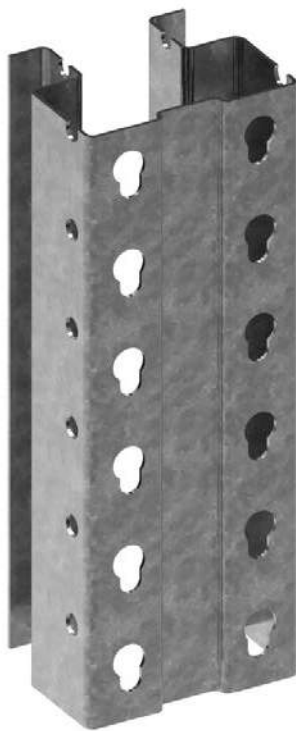
S52R



REINFORCED UPRIGHT

Reinforced profiled upright, with additional rear wings.

R



PAINT

Standard **graphite finish**.
Optional: any RAL colour.



FINISH

Standard version finish. Optional:
sendzimir plated or **hot dip galvanised**.

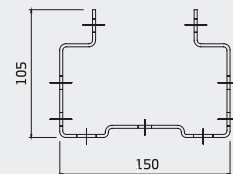


STEEL

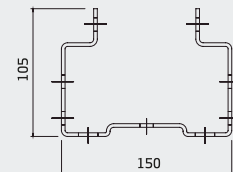
High-resistance hot rolled **structural steel**.
2, 2.5 and 3 mm thickness.

upright T

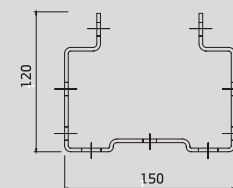
TR20



TR25

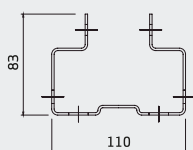


TR30

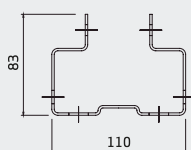


upright M

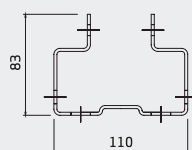
M320



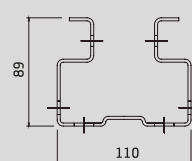
M520



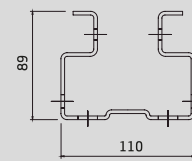
M525



M52R



M53R



beams

The beam is the **horizontal element** that **supports the load units** on each level, logged to the frames with connectors on the ends. They are installed in pairs and at equal heights.



SAFETY PIN

Prevents the beam from being **accidentally pushed out** of its position.



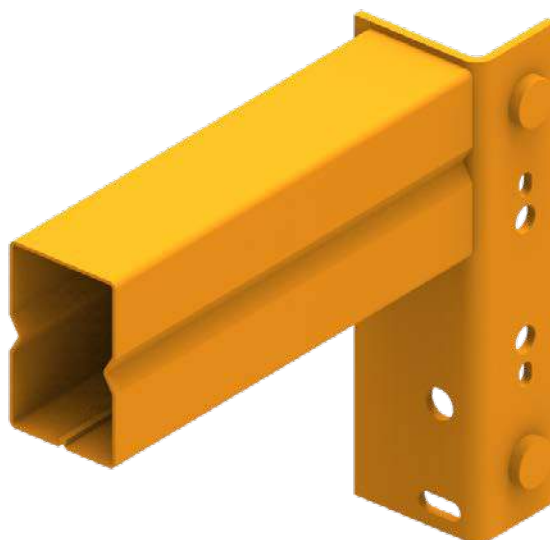
BOLTS

Press embedded steel cylinder. More resistant than tab clips or hooks.



CONNECTORS

Joint between the frame and beam, so it can be fitted to the uprights. With 2 or 3 bolts, according to the load requirements and based on stability criteria.

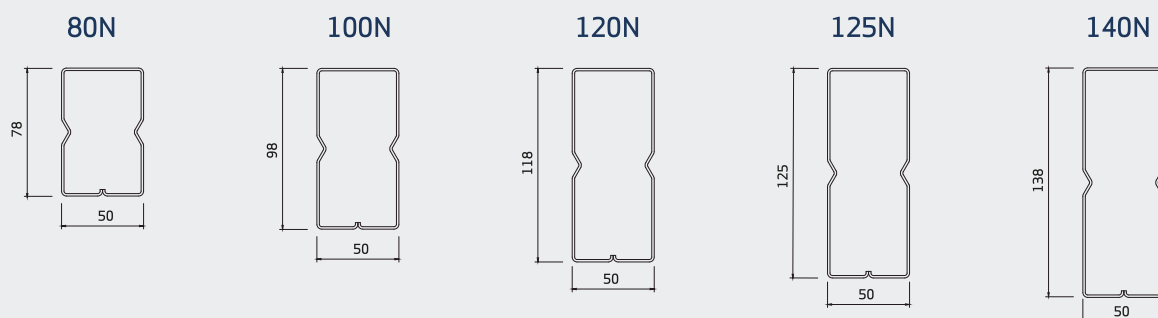


N

TUBE CROSS-SECTION

A **single** tube-shape **profiled strap**.

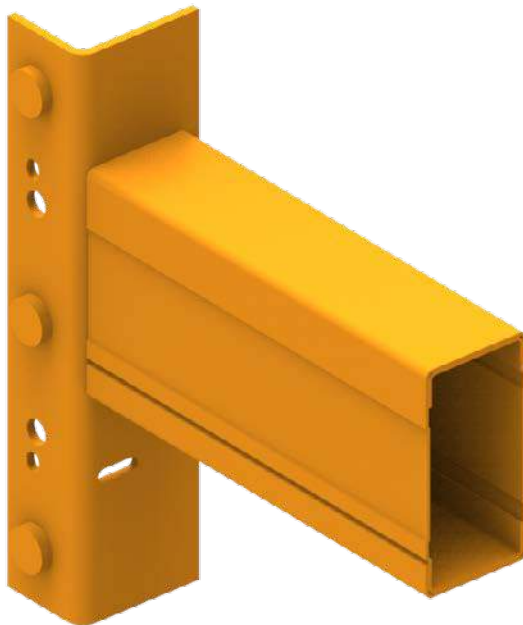
beam N



DOUBLE-C CROSS-SECTION

2 embedded C-shaped profiles to create a **closed tube**.

C



WELD

MIG weld to joining the connector to the beam at a 90° angle.



FINISH

Standard version finish.
Optional: **zinc plated** or **hot dip galvanised**.



STEEL

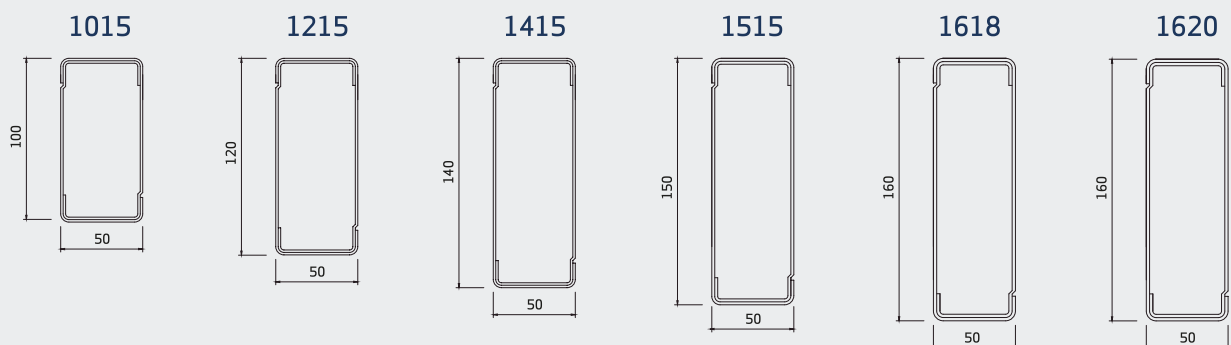
High-resistance hot rolled **structural steel**. 1.5, 1.8 and 2 mm thickness.



PAINT

Standard **epoxy-polyester finish, ochre colour** for a greater visibility. Optional: any RAL colour.

beam C



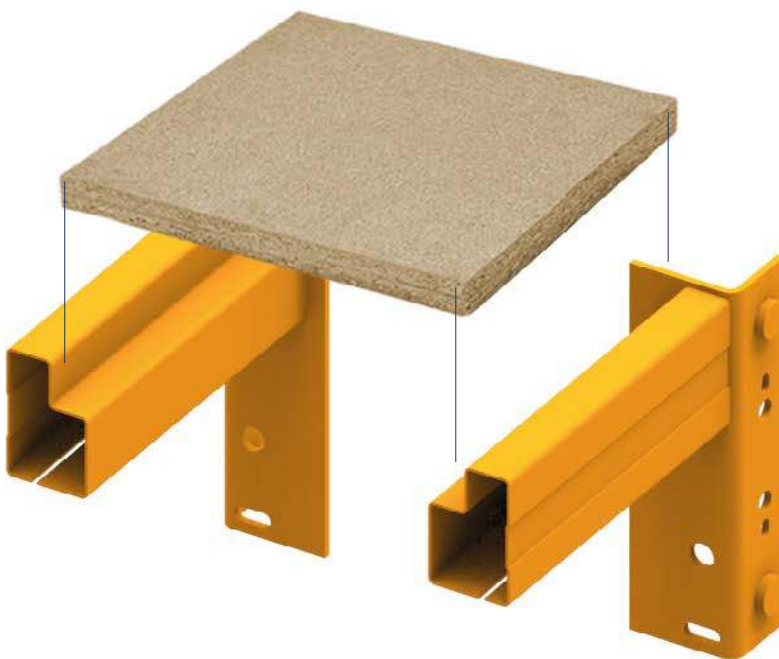
picking beam

Function as for pallet beam, their design is specific for picking duties, profiled with an L-shape so as to allow for the addition of chipboard or steel decking.

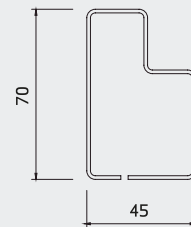
VE

STEPPED SECTION
L-shape profiled strap

CHIPBOARD



VE2



L-shaped structure for the panel or mesh. Recessed support of the shelf increases the usable height of the load level, while protecting the chipboard against impacts.

In some cases, orders must be prepared manually on the same aisles as those in which pallets are stored. Therefore, the lower levels of the pallet racking structure **are used for the picking tasks**.

STEEL MESH

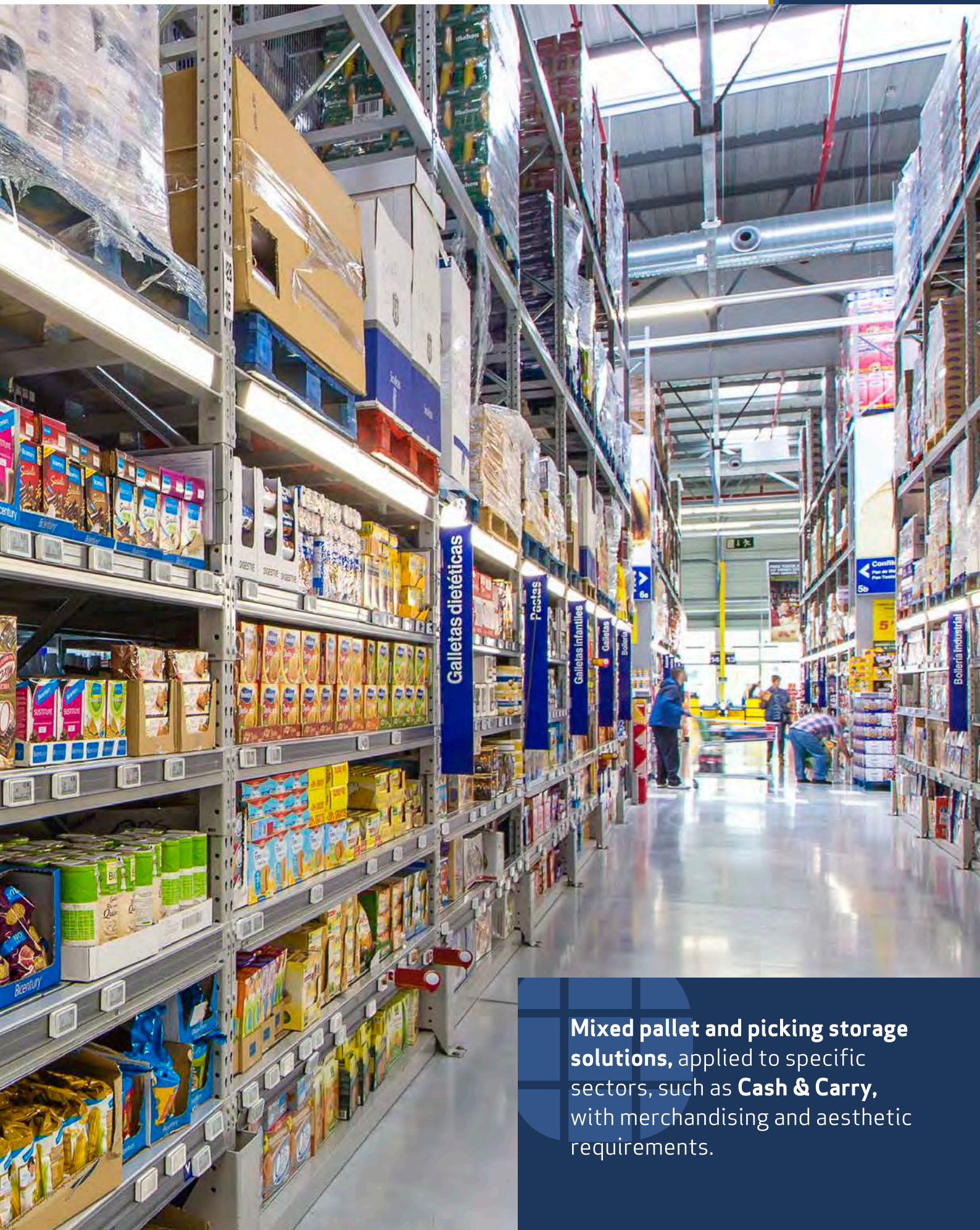


STEEL PANEL



STEEL GRATING





Mixed pallet and picking storage solutions, applied to specific sectors, such as **Cash & Carry**, with merchandising and aesthetic requirements.

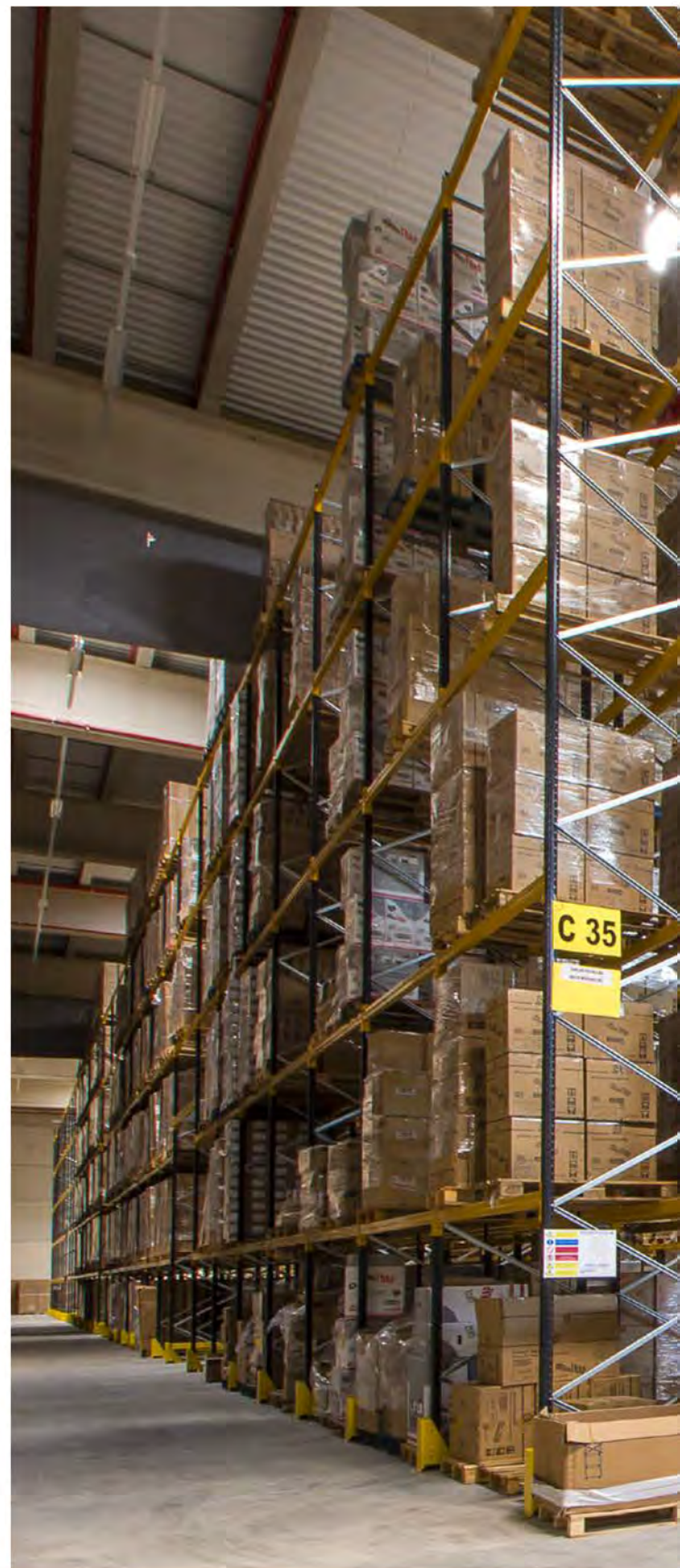
Adjustable racking

This system has been **specially designed to store pallets or containers**. This is the most common storage system, thanks to its **ease of assembly, competitive cost and versatility**. It allows **direct and unitary access to each individual stored pallet**. In general, a random or empty space system is used, i.e., "a space for any pallet".

The system is made up of two base elements: **frames and beams**, used for the racking structure, which can be fully disassembled and reassembled very easily, creating a very **robust and stable system** that allows for modifications of the load level arrangement.

Aisles are used to access the goods with different types of forklifts, therefore their dimensions are defined according to these. POLYPAL adapts the storage solution according to the handling equipment already available at the warehouse, so there is no need for further investment in new equipment.

	LOW	MEDIUM	OPTIMUM
Surface use			
Volume use			
Load accessibility			
Load rotation			
Inventory control			
Ease of performing manoeuvres			
Ease of relocating goods			
Ease of applying modifications			



The distribution, height and, in general, design of the racking will be based on load volume, weight, handling requirements and available space utilization criteria.



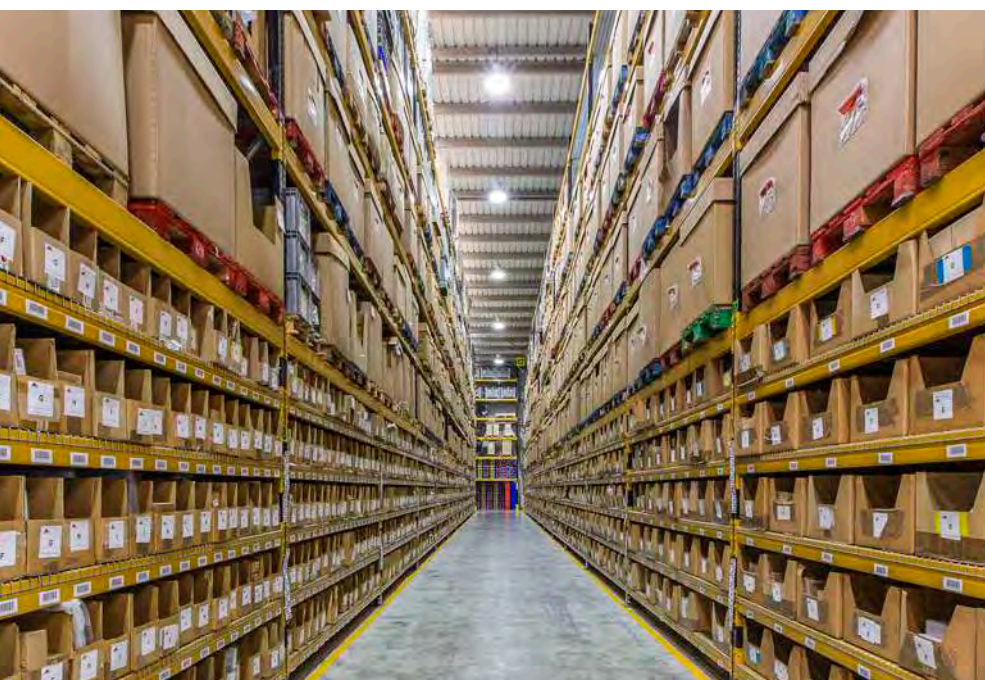
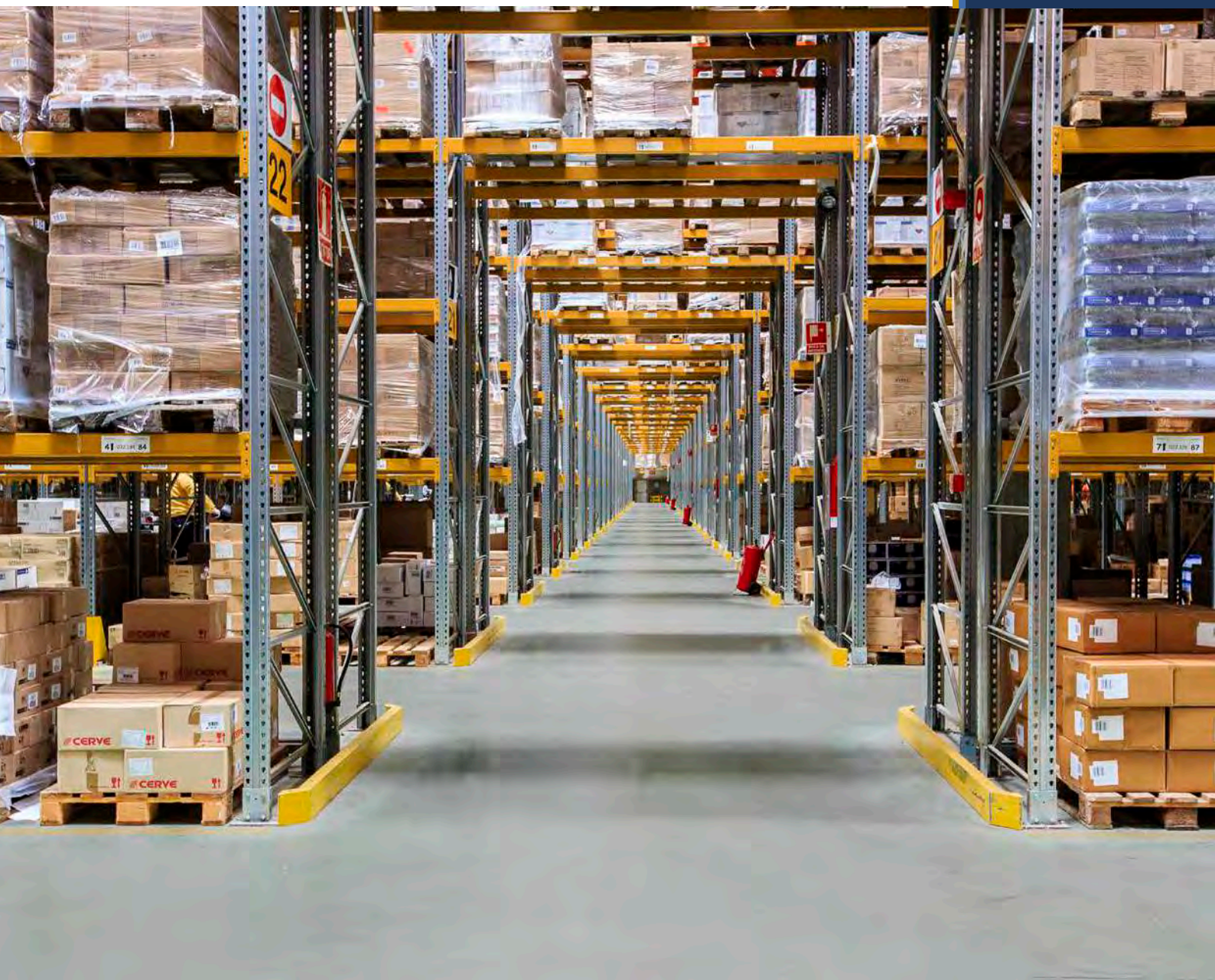


Conventional pallet racking systems **allow direct access** to any stored pallets.

The ongoing development and refinement of POLYPAL's upright and beams, together with the vast combination options, allow our technical department to design a **fully operational and safe storage option** for each project at the lowest possible investment cost.

We are in **permanent contact** with the customer, so we can project the structures following the load volume, weight, accessibility, handling and space usage needs, based on the calculations **established in the corresponding European Standards and regulations**.





The adjustable **pallet racking system** can be **combined with lower shelves for picking** operations if the warehouse requires orders to be prepared on the same aisles.

Adjustable double depth racking

This double depth pallet racking system **is a variation of conventional pallet racking systems**; as its name suggests, it can be used to store two pallets in depth, which **will be accessible from the same aisle**.

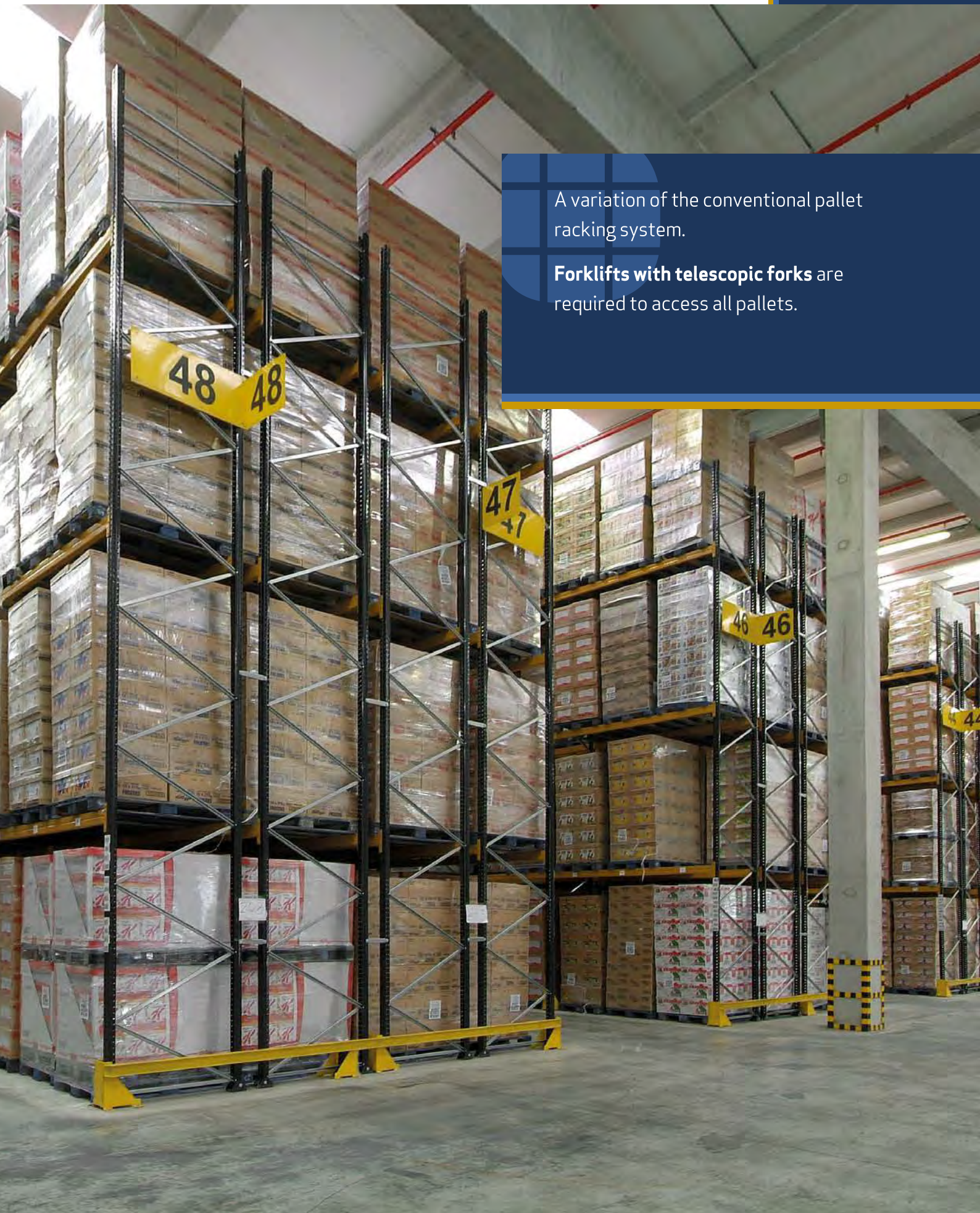
This system **reduces the number of access aisles** required, using the space that is saved to increase the number of additional bays or to use less area with the same capacity.

A double depth configuration offers a very effective storage system that saves space, but which restricts quick and easy access to all pallets stored. An efficient stock management system can compensate for these limitations and help the company benefit from the advantages of a higher storage capacity.

	LOW	MEDIUM	OPTIMUM
Surface use	■	■	■
Volume use	■	■	■
Load accessibility	■	■	■
Load rotation	■	■	■
Inventory control	■	■	■
Ease of performing manoeuvres	■	■	■
Ease of relocating goods	■	■	■
Ease of applying modifications	■	■	■



The double depth pallet racking system can be used to store two pallets using the same bay, which can be **simultaneously accessed from the aisle**.



A variation of the conventional pallet racking system.

Forklifts with telescopic forks are required to access all pallets.

Adjustable racking narrow aisle

POLYPAL's narrow aisle adjustable pallet racking system allows the storage of pallets **while saving space and maximising the use of the warehouse's height.**

This racking system has been designed **based on conventional pallet racking systems, reducing the space required for each aisle.**

The forklifts used with this system have a greater technical operational height capacity than retractable forklifts. This is why **POLYPAL develops larger structures with a height of up to 17 metres.**

POLYPAL and its technology can be adapted to all existing stacker forklift models available in the market **with full technical guarantees**, i.e., cab forklifts lifted with loads for positioning or picking purposes, and forklifts with programmable positioning systems in which the operator works at floor level.

These racking structures require the use of guiding systems.

- ☐ Rails anchored to the base slab, which can be supplied by Polypal.
- ☐ Electronic detection or automated guided systems installed by the forklift supplier.

	LOW	MEDIUM	OPTIMUM
Surface use			
Volume use			
Load accessibility			
Load rotation			
Inventory control			
Ease of performing manoeuvres			
Ease of relocating goods			
Ease of applying modifications			



POLYPAL's narrow aisle conventional racking systems can be used to store pallets at heights of up to 17 metres.



The load handling equipments are a determining factor in warehouse design processes. **If loads are handled with stacker forklifts, the racking structures can be designed accordingly so the machines reach very high heights and in narrow aisles.**

Adjustable mobile racking

POLYPAL's mobile racking system is based on a series of rows installed on **mobile motorised platforms**, which move on rails recessed in the floor slab. The system allows for **access to all pallets** or loads with the use of opening aisles, which are selected by the operator when needed.

The **lateral movement of the racking structure** allows the work aisle to be opened to the correct position with a remote control or with the push-buttons found on the front panel.

The structure is geared with synchronised electric motors, so the racking moves smoothly with no interruptions. The structure is accelerated and braked progressively, preventing sudden starts or stops.

This racking structure is supplied with conventional or retractable counterweighted forklifts, of the standard type, and **require no specialised handling equipment**.

It has been designed to optimise the use of the warehouse's volume, making it the perfect solution for facilities in which the cost of land is high, or which require the storage capacity to be increased in the same facility. It is also **very useful for cold stores due to the high consumption of electricity required and its cost**.

The mobile system can be applied to **conventional racking solutions**, which is the most common scenario, and also to other systems in which the loads need to be accessed directly, such as cantilever racking.



The whelded platform is designed with a motorised chassis and hot rolled beam profiles, offering a **high resistance to impacts and stresses**.

	LOW	MEDIUM	OPTIMUM
Surface use			
Volume use			
Load accessibility			
Load rotation			
Inventory control			
Ease of performing manoeuvres			
Ease of relocating goods			
Ease of applying modifications			



Each chassis features an additional individual safety component which, when added to the general safety systems of the facility and the central computer processing system, prevents accidents during the warehouse operations.

Optional components

Loading accessories

Additional accessories used to store loose materials, non-standardised pallets, containers or other types of load units.

POLYPAL has its own specific designs to resolve any situation.



Support cross-members for special pallets or cross-ways positioning of pallets.

Metal grating deck, supported on the beams, with a profile embedded onto the level.



Container supports.

Chipboard shelves with reinforcement cross-members.



Safety for the pallet and the load

Back stops for pallets (safety or positioning), according to the facility requirements.



Back stop, for single or double rows.

Back stop with omega profile for a pallet position.



Welded back stop.

Safety for racking elements

In some cases the regulations recommend or establish as compulsory the installation of upright protection

elements to absorb the energy of accidental impacts caused by forklifts or other handling equipment.



Upright protection elements designed in compliance with the EN 15512 Standard.

Frame protection, with side steel guard, designed in compliance with the EN 15512 Standard. Optional: double guard.



Frame protection with wood board side guard.
Optional: double board.

Load fall prevention systems

The vertical rear mesh cladding on racking structures prevent goods from being accidentally dropped, increasing workforce safety.

Depending on local standards, it is recommended/ compulsory for these to be installed on the rear of single rows when there are work, transit or evacuation areas on the side opposite to the load handling aisle.

Load fall prevention system with electro welded mesh panels and steel frames. Prevents the pallet and load from being falling.



Load fall prevention system with electro-welded mesh fixed to the back stop. These prevent pallets and loose goods from falling.



Fall prevention protective mesh in
worker/operator access areas.



Protection with side guards in areas of
forklift truck transit.

High-density systems

The high-density systems are mainly based on the **storage of goods in the form of compact blocks** inside the warehouse.

A **maximum level of compactness** is achieved for the same area, **increasing the storage capacity as compared with conventional racking systems**.

POLYPAL designs different block accumulation systems, according to the purpose of the logistics system:

- ☐ **Compact Drive-in or Drive-Through** racking.
- ☐ Blocks based on the use of **shuttles**.
- ☐ **Live-storage racking systems**.

FIFO

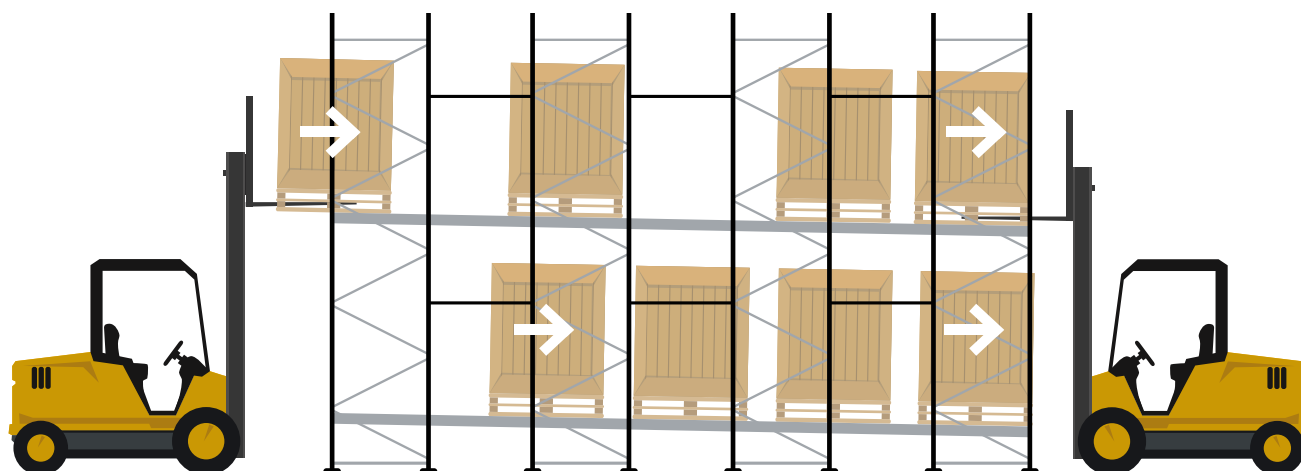
First In, First Out.

Goods are **loaded on one end of the racking and removed on the other end**.

Two access aisles, one to load the pallets and the opposite one to unload them.

It guarantees the rotation of goods, since the first pallet loaded onto a channel is the first pallet available in the unloading front section.

This is the perfect system **to store products with strict expiry date control** and also as a conveyor to production/order/delivery areas.



FIFO System

POLYPAL can design all of its load accumulation block systems according to two main goods management criteria: FIFO and LIFO.

LIFO

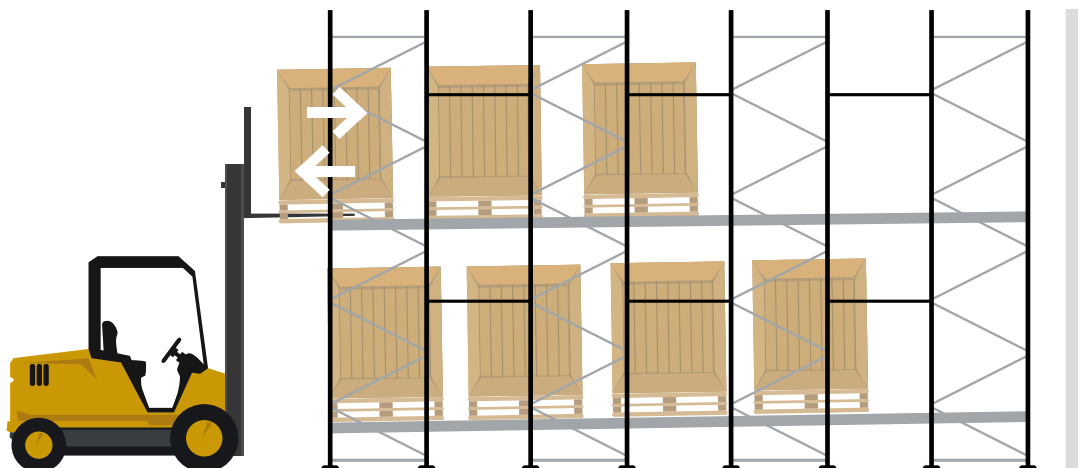
Last In, First Out

Goods are deposited and removed on the same end of the racking.

A single access aisle is used to load and unload the pallets.

It is used to store **homogeneous loads, in which rotation is not a determining factor**, or as storage of deposit goods.

This is the perfect system **to store products that do not require strict expiry control** or non-perishable goods.



Compact racking

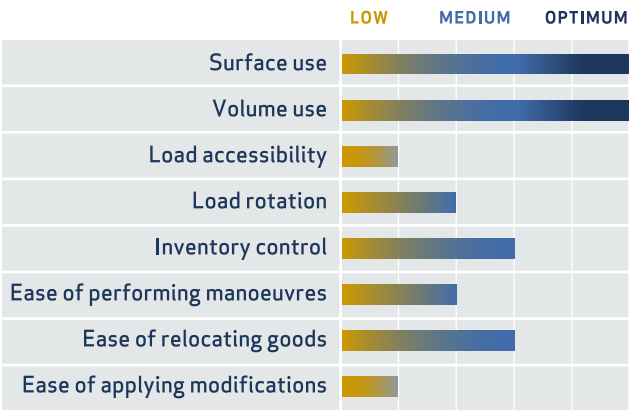
This system has been designed with racking blocks and inner load lanes, **with rails on which the pallets are supported.**

The forklift enters the lanes of the compact block, with the load raised over the level on which it will be placed.

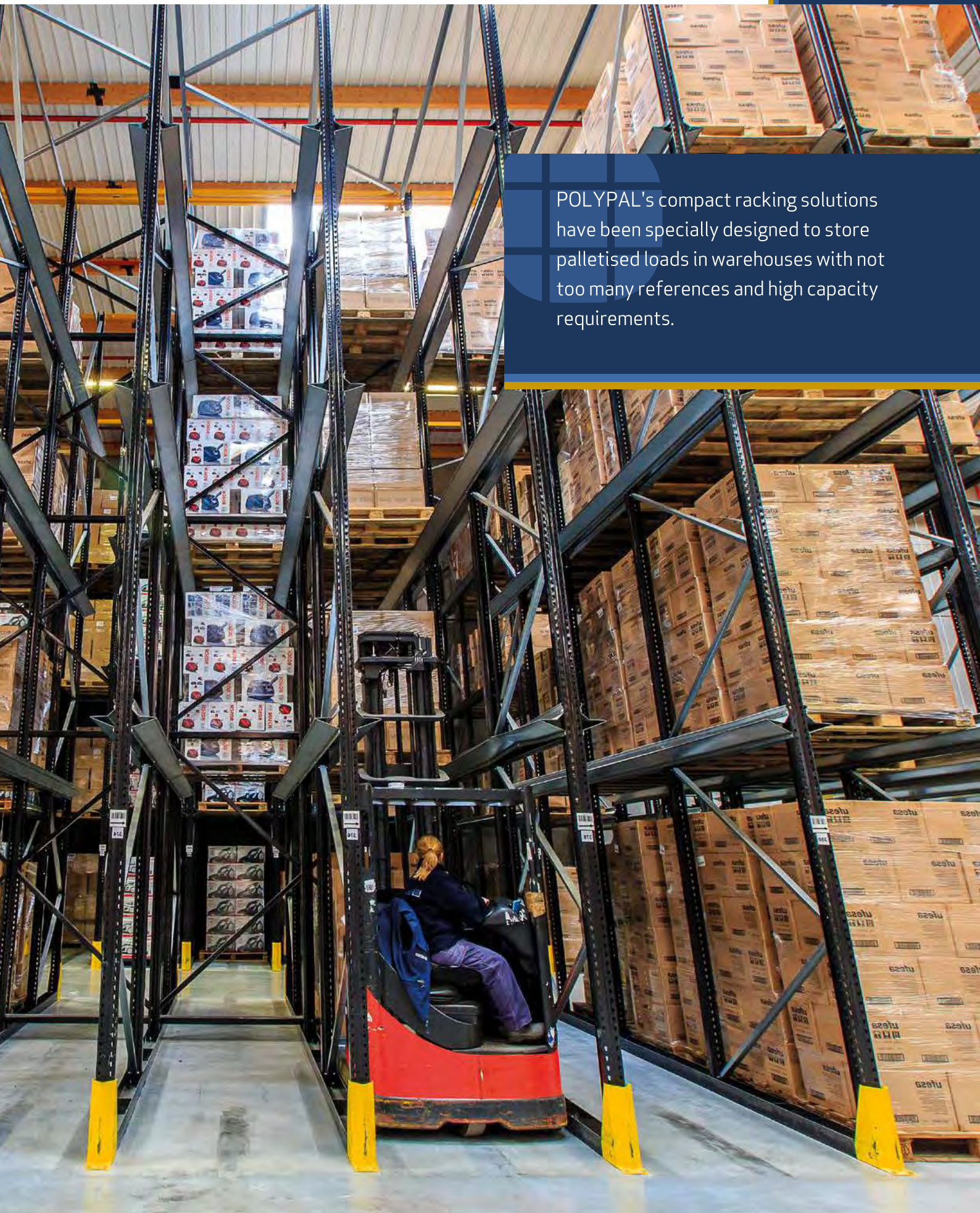
The **number of access aisles** required by the system is **minimal** and, therefore, **available space is maximised.**

POLYPAL's compact racking solution is the most cost-effective block storage system. Its simple structure does not feature mechanical or electrical systems, with the purpose of achieving the highest levels of compactness.

Moreover, it requires minimal maintenance, since parts of the structure are less exposed to accidental impacts of the maintenance equipment.



With very few access aisles, POLYPAL's compact storage system optimises the available space.



POLYPAL's compact racking solutions have been specially designed to store palletised loads in warehouses with not too many references and high capacity requirements.



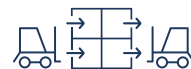
Drive-In



The forklift enters the lane to deposit/collect the pallet and exits the lane in the opposite direction:

- Pallets are **accessed from the front** of the racking.
- The stocked range is restricted, being this system suitable for homogeneous loads or storing loads with the same dispatch date, achieving **very high storage volumes**.
- **A single access aisle** is required.

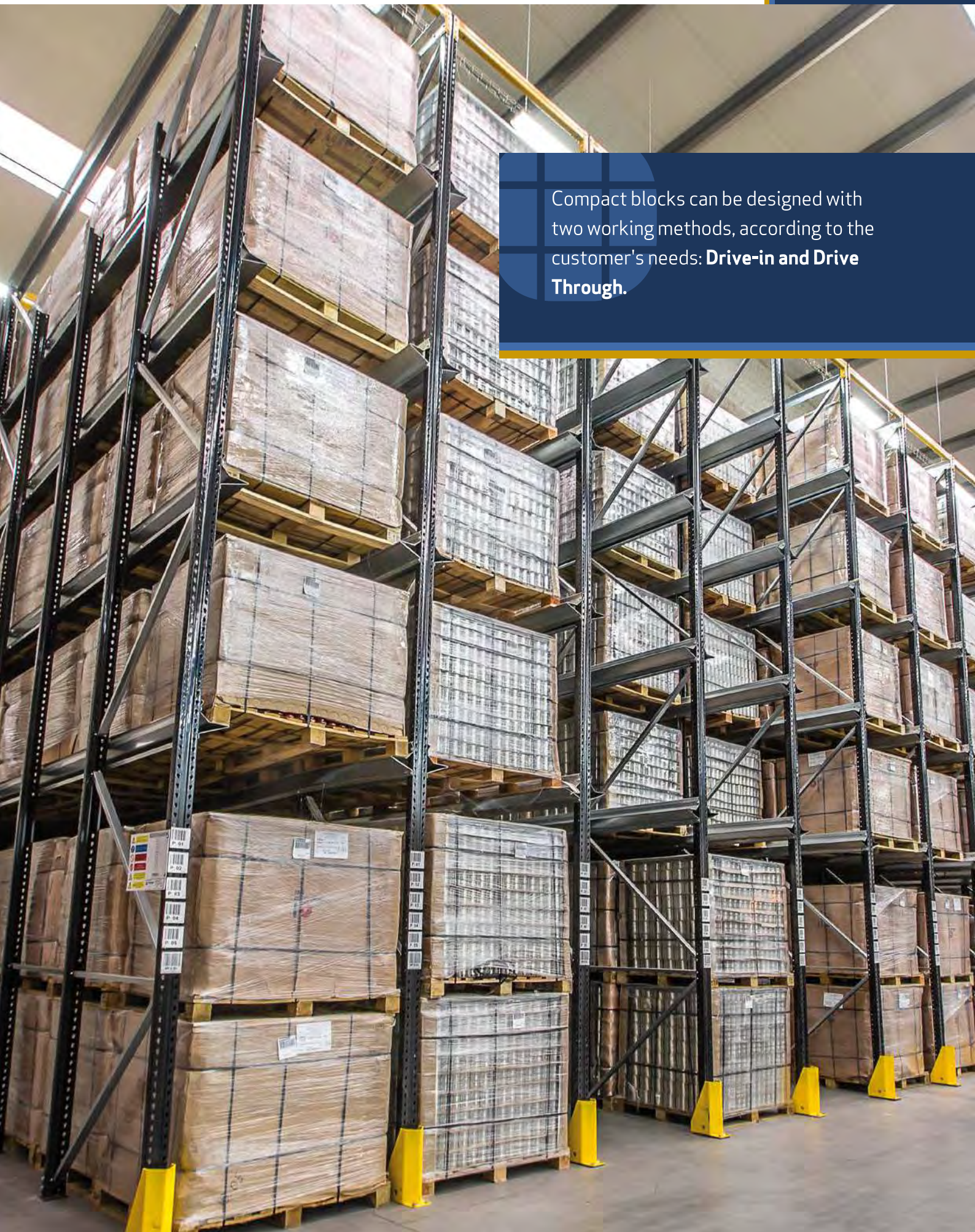
Drive-Through



Pallets stored from on one of the faces of the compact block can be removed through the opposite side.

- Pallets are **accessed from both sides** of the racking.
- **Improved performance** of the compact system in **dispatch operations**.
- **Two access aisles** are required.





Compact blocks can be designed with two working methods, according to the customer's needs: **Drive-in and Drive Through.**

Compact racking components

Compact lanes are designed for all types of pallets, entering the structure through their longest section (cross-ways).

The different methods used to attach the RP-20 rail to the upright structure allows the modification of the access lane dimensions.

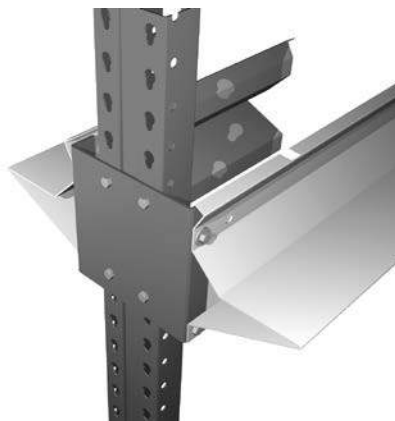


Support rail and standard guide. Rail on which the pallets are supported; it is also used to centre the load unit visually at the lane reception point.

Rail spacer. It is used to move each support rail 25 mm closer to the pallet when the front of the load is 50mm larger than the front of the pallet (load verhang).



Rail arm spacer. It is used to move each support rail closer to the pallet when the front of the load is more than 50mm larger than the front of the pallet (load overhang).



Load guard and guide. Made up of folded plates to provide additional safety when placing pallets.

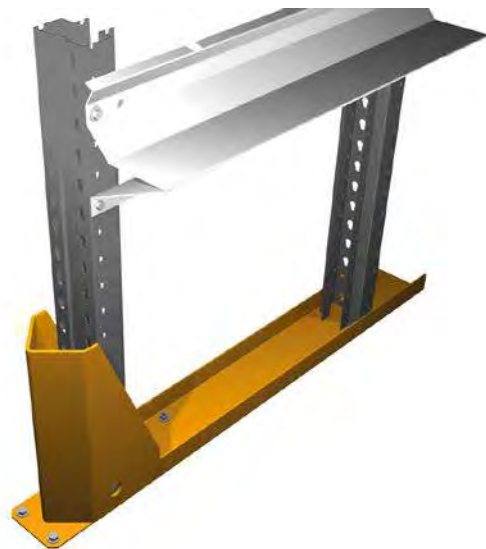


The system features all protection elements required to maximise safety inside the facilities and speed up the pallet positioning procedures.



Upright guard. Prevents accidental impacts on the first upright exposed to the aisle.

Forklift guide rail with built-in guard. The assembly is used to help positioning the pallets inside the block and prevent accidental impacts to the first upright exposed to the aisle.



Pallet guide. Provides additional safety, helping to centre the pallet on the lane.

Pallet racking system with shuttle

This pallet racking system offers a **specialised compact storage solution**, in which pallets are moved away from the loading front area with no need for the forklift to enter the racking structure.

The load is placed from the end of the racking by the forklift **on the stationary shuttle** and, the shuttle being activated by a remote control, it is then moved to the hearest free position.

The shuttle is used to **achieve fully automatic pallet movements, reducing the operating times** of a standard compact system.

The **number of aisles** this system requires is **minimal, optimising the use of space**, both in terms of area and volume.

The system has many different operating modes, according to the configuration of the racking (LIFO, FIFO) and optional functions (pallet compacting, multi-pallet system, stocktacking function, etc.)

It allows the transformation of standard drive-in racking blocks into shuttle blocks, with the corresponding restrictions.

	LOW	MEDIUM	OPTIMUM
Surface use	■	■	■
Volume use	■	■	■
Load accessibility	■	■	■
Load rotation	■	■	■
Inventory control	■	■	■
Ease of performing manoeuvres	■	■	■
Ease of relocating goods	■	■	■
Ease of applying modifications	■	■	■

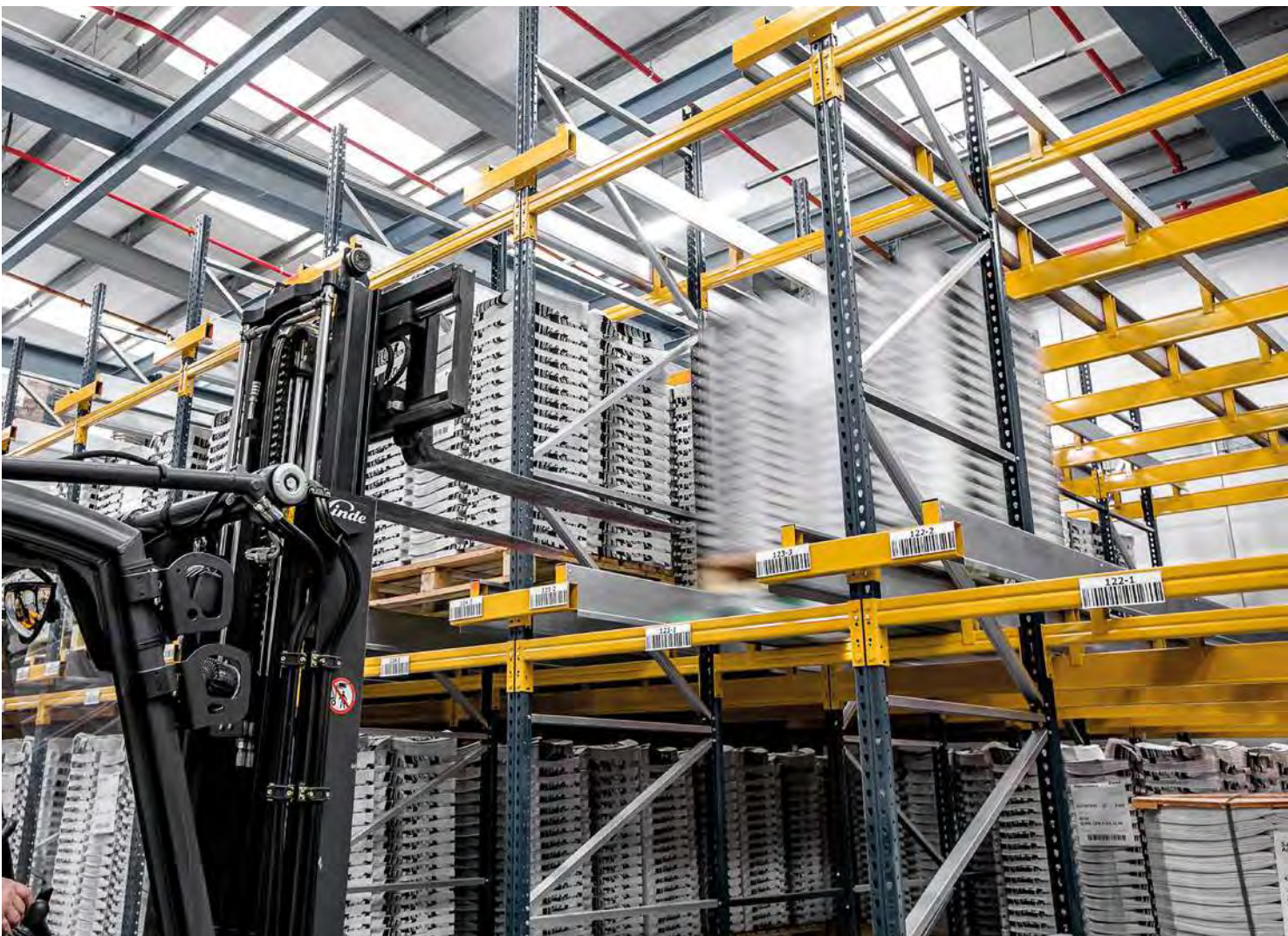


Pallets are **moved automatically, reducing the working times** of a standard compact system.



the system

- ❑ Reduces the storage, load and unload times.
- ❑ Operators move along the front of the racking structure, not inside it.
- ❑ **Pallets can be deposited and removed with no risk of impacts.**
- ❑ No risks to forklift operators.
- ❑ Allows for the handling of different references on each channel.
- ❑ Perfect integration with different warehouse management systems.
- ❑ **The system requires a minimal number of aisles, optimising the use of space, both in terms of area and volume.**



the shuttle

- ❑ Minimum maintenance requirements.
- ❑ **Powered with rechargeable ion-lithium battery**, low weight easily and quickly replaceable.
- ❑ **The battery is charged** in only **5 hours**.
- ❑ **Quick and silent movement**.
- ❑ Efficient self-locking system at raised positions withonboard load, both while waiting and when moving.
- ❑ Braking and end of rail **stop sensors**.
- ❑ **Real-time operating data on the control panel**.
- ❑ Suitable for **ambient temperature and also for coldstore down to -30°C**.



A shuttle is a **device with electrical traction, operated automatically from an external control station**.

It is **transported by a handling unit** and used to store loads at depth. It is guided on each load level by two rails.

racking solutions with a shuttle offer a semi-automatic accumulation storage solution. Operators manually activate the operation of the shuttle and guide the forklifts to transport the pallets, however, the shuttle operation inside the racking is fully automatic.

Live-storage racking (F.I.F.O.)



These high-density **storage** structures **in blocks** feature roller transporters, **with a slight slope to make pallets slide down the lane.**

By increasing the use of the floor area and volume, POLYPAL's live-storage racking solutions are perfect for the storage of products that require an optimal stock rotation.

Pallets are loaded onto the gravity channels through the entry side and **the slope makes them to slide down at controlled speed, from the loading to the unloading point.** When a pallet is unloaded, the next pallet moves into its space, making it ready for unloading.

Main characteristics of POLYPAL's dynamic system:

- ☐ Maximum capacity, thanks to its compact design.
- ☐ **Optimum load rotation**, with no need for additional stock control systems.
- ☐ Low maintenance and no consumption of energy.
- ☐ **Low operating costs**, lower labour requirements and fewer forklifts used.

	LOW	MEDIUM	OPTIMUM
Surface use			
Volume use			
Load accessibility			
Load rotation			
Inventory control			
Ease of performing manoeuvres			
Ease of relocating goods			
Ease of applying modifications			





Pallets are placed on the top of the roller tables and **gravity moves them to the opposite end at a controlled speed**, where they will be ready to be collected.

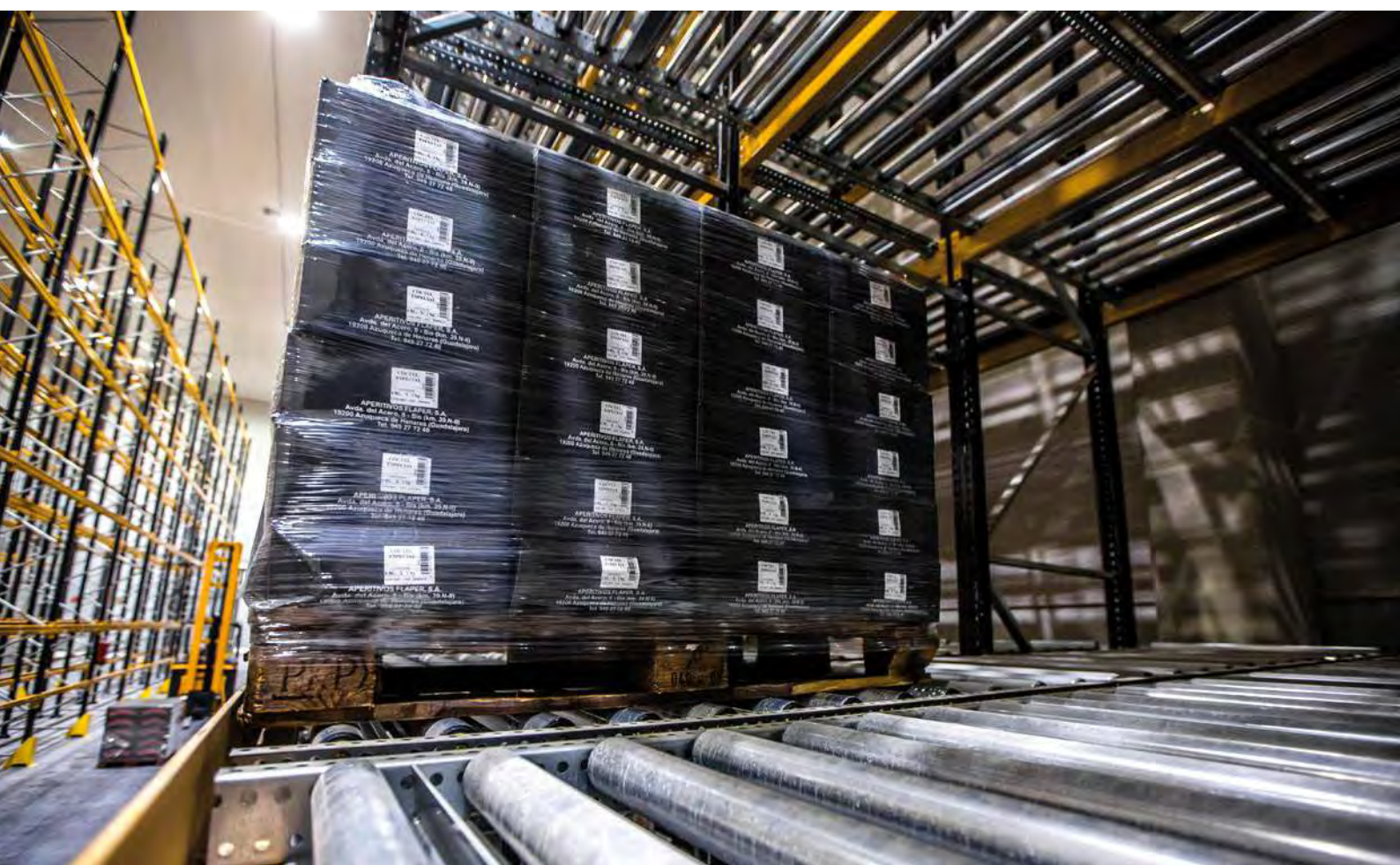
Pushback live-storage racking (L.I.F.O)



With similar construction characteristics to the traditional dynamic systems, **compact L.I.F.O. storage** structures can be built as the **perfect solution for storage areas in which stock control is not a determining factor**.

Pallets are loaded onto the different levels; they are loaded and unloaded **from the same aisle**, until the entire depth of the lane is used up.

After placing the first pallet is placed on the loading channel, the second pallet pushes it with the action of the forklift, until the lane is loaded to its maximum capacity. This forces **the first pallet loaded to be the last one to be removed from the racking**. When the first pallet is removed, accumulated pallets behind move forwards to the frontal position in a controlled procedure.



Push back on rollers

The push back system can be designed with roller transporters or connected platforms, according to the position of the pallet or its dimensions.

This is a very practical system, in which **the amount of references is a priority over the reference volume**, with fewer aisles, since the same aisle to load and unload the pallets is used.

Dynamic L.I.F.O. systems can be designed with a roller transporter in general for standard load pallets, or with connected carts for pallets stored in cross-ways positions.



Push back on platforms

The **push back platform system** is built with robust carts that feature steel wheels.

They are designed **for all types of pallets**, with a loading **capacity of up to 1,400 kg** per unit and with **a storage capacity of 6 pallets (depth) per lane**.

It features a **safety system** to help load the goods and control the utilization of the lane with full lane indicators.

Dynamic racking components

The type of loading/unloading module depends on the handling method.

Pallets of different sizes and weights can be combined.

A

Free rollers of the dynamic system

Steel roller with head and bearing designed for high dynamic loading capacity applications.

- ☐ Low rolling resistance, facilitating the descending of the load.
- ☐ The polyamide head absorbs the impacts, protecting the bearing and lengthening the service life of the roller.
- ☐ The roller cap design prevents the entry of dust and liquids.



B

Speed regulators

- ☐ They help control the speed of the descending pallets.
- ☐ They minimise the impacts between loads, improving the stability of the load on the pallet.

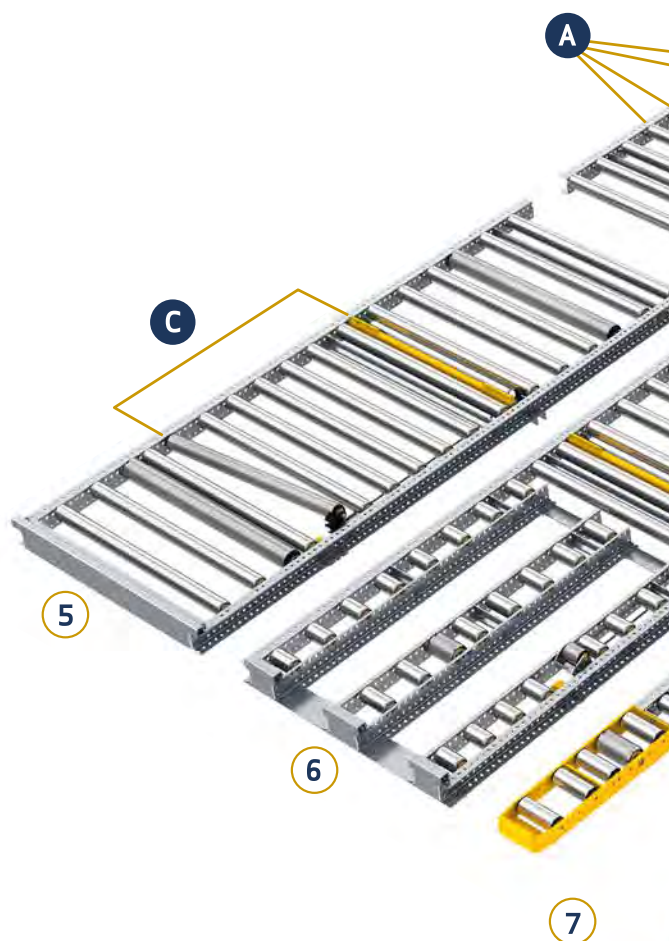


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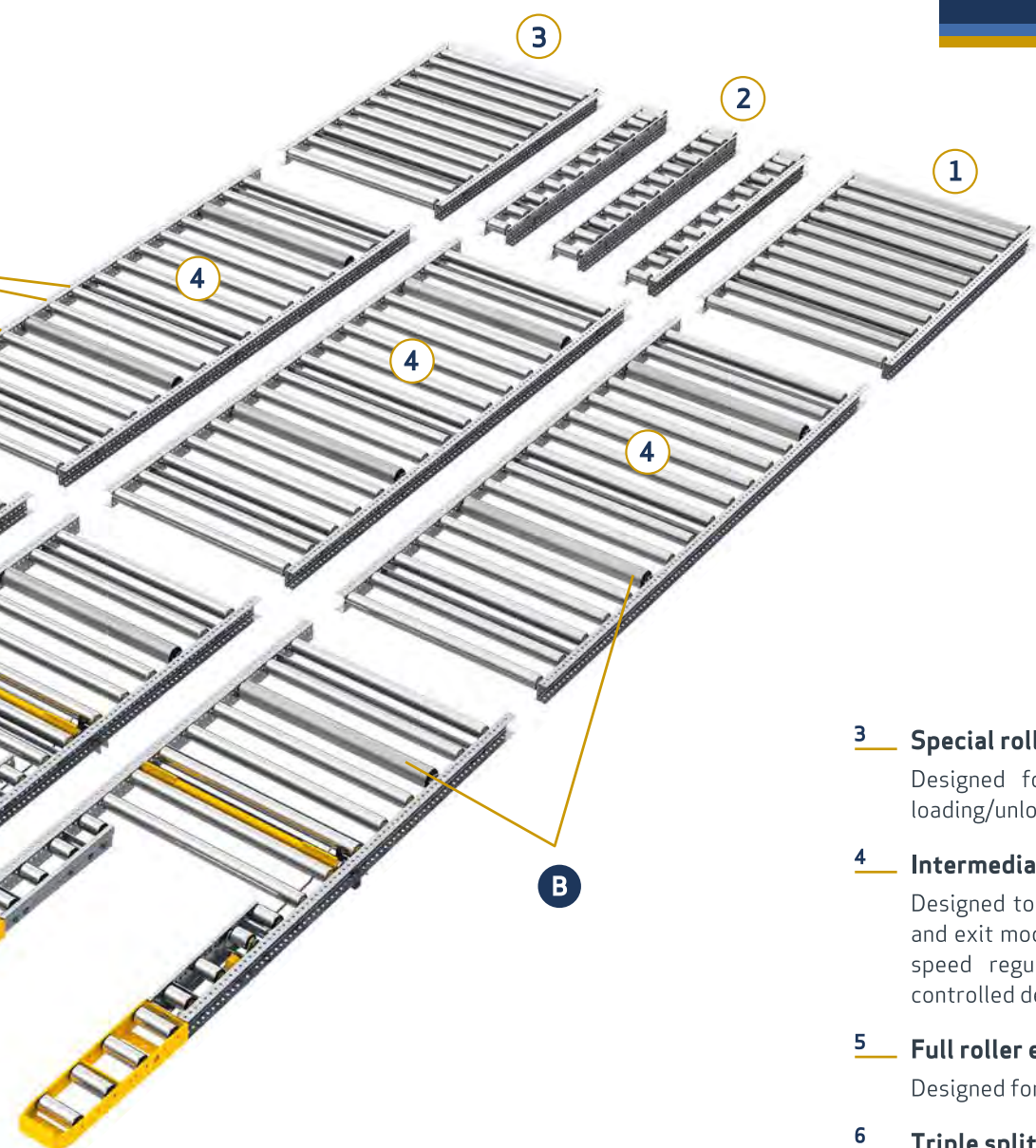
Safety spacer device

Made up of two main parts, a protruding activating roller and a load holder.

- ☐ Activated by the protruding roller, ensuring that accumulated pallets do not descend any further until the first pallet has been removed.
- ☐ Standard and heavy duty holders, according to the requirements.
- ☐ 20-second delay function; the 2nd pallet is released after this time lapse.



POLYPAL's dynamic storage systems can be used to store many different pallet dimensions and weights.



- 1 Full roller entry module.**
Designed for forklifts with tilting mast/fork.
- 2 Triple split roller entry module.**
Designed for forklifts with non-tilting mast/fork.

- 3 Special roller entry module.**
Designed for AS/RS systems (automated loading/unloading operations).
- 4 Intermediate module.**
Designed to store pallets between the entry and exit modules. The flow is controlled with speed regulator rollers (B) to guarantee controlled descend of pallets.
- 5 Full roller exit module.**
Designed for forklifts with tilting mast/fork.
- 6 Triple split roller exit module.**
Designed for forklifts with non-tilting mast/fork.
- 7 Exit module for unloading pallets with a manual pallet jack.**
Designed to use manual pallet jacks at the floor level.

Clad-rack warehouse

A clad-rack warehouse is a design that requires **no industrial building to be constructed**.

With this system, racking structures are not only used to **store goods** but also **to support the structure of the cladding**, forming an industrial unit.

It only requires a base slab to support the loads it will receive, which will be transmitted through the racking elements and the loads by the elements of an industrial unit: overloads caused by wind (pressure and suction), overloads caused by snow and rain, etc.

The clad-rack warehouse is made up of the following elements: racking, trusses, side joists to fix the cladding, metal plate cladding of different types (simple, sandwich, etc.), corner guards and ridges, water collection channels, access doors of all types and dimensions.

The height of these structures is only limited by the handling equipment and local regulations. **Very high heights allow the optimisation of available space and areas.**

This solution reduces the industrial unit construction times and achieves a significant reduction in costs.



Clad-rack warehouses greatly **reduce** the industrial unit construction **times** and **costs**.



The perfect solution for premises that are mainly used to store as many load units as possible.

The pallets can be stored using manually operated forklifts or using automatic cranes.



POLYPAL works in coordination with integrators, engineering firms and the main mini-load and stacker crane manufacturers to build efficient **automatic warehouses.**



Pallet racking



Medium duty shelving



Light duty shelving



Mobile bases shelving



Mezzanine floors



Cantilever storage



Slotted angle



Racking technical inspection



Lockers

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