

BITO PROmotion Shuttle

Shuttle assisted deep lane pallet storage



BITO
...or how do you store?



Winfried Schmuck
General Manager

Dear customers & friends,

Compact, lean and flexible. These are the keywords when it comes to describing the essential requirements for efficient internal supply chain management. Goods have to be stored in ever smaller spaces and staffing levels are decreasing. Nevertheless, warehouse operators have to keep response time to supplier and customer demands as short as possible.

Without compromising on storage density, the lift truck serviced PROMotion system increases flexibility and reduces in-feeding time. This brochure will show the various fields of application of the BITO PROMotion system, all illustrated with photos and diagrams to present the benefits in a clear and compact way.

■ **Benefit from our experience and contact us!**

About us – »Made in Germany«

BITO is a Germany based company with more than 800 employees that specialises in storage & order picking systems and workshop equipment. On a plant surface totalling 140,000 sqm in Meisenheim and Lauterecken (Germany), BITO manufactures a customer-oriented and innovative product range meeting highest user demands.

BITO is one of the few single source suppliers in the intralogistics sector. With one focus on direct sales, we ensure fast track product delivery to our customers. Products can be ordered from our print catalogues, through our online shop or by calling our sales teams. As a full service provider of storage and order picking solutions, our second focus is on providing our customers a concept-to-completion service for any project size.

Plant in
Lauterecken

Plant in
Meisenheim



BITO – more than 50 years of experience in project business

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Customer focus & support are top priorities at BITO! We offer a full service package including on-site visits, fast quotes, precision in-house manufacturing, on-time assembly & start-up and a reliable after sales service. More than 100 sales representatives throughout Europe assist our customers in planning and realising the optimum storage solution.

Technical advice

Each project is accompanied from the start by an experienced area manager who keeps close contact with the assigned project manager at the BITO main office.

Project coordination

We think that reliable time management and competent support are key to the success of a project. In order to ensure a continuous workflow, we take charge of all phases of a project. Our customers can count on exact site measuring, true-to-size product manufacturing, an extensive quality assurance program and assembly coordination – in short, we provide an all-inclusive project package!

After sales service

As stipulated by DIN standard EN 15636, operators of shelving and racking installations are legally obligated to have their facilities inspected at least once a year by a qualified person. BITO provides this inspection service. Our inspectors are trained and authorised to conduct all mandatory tests and to initiate all measures necessary for repair.

For live storage and for electronic installations, BITO recommends their customers to conclude a maintenance contract and have their storage and order picking installation regularly checked for proper functioning and operational safety to prevent disruptions and troublesome consequences.



Customer-oriented and reliable project monitoring

A person wearing a red long-sleeved shirt is seen from the back, holding a BITO handheld device. The device has a small screen and a numeric keypad. The background is a blurred industrial or warehouse setting with shelves and equipment.

»BITO PROmotion can accommodate any existing facility space ...«

BITO PROMotion – Shuttle assisted deep lane pallet storage by BITO

The BITO PROMotion pallet shuttle racking is a deep lane storage and retrieval system. Providing highest levels of storage density, it is a smart option compared to traditional drive-in racking, push-back racking and pallet live storage. Pallet shuttle vehicles are battery powered and remote-controlled. They automatically store and retrieve pallets into and out of deep storage lanes. For shuttle relocation from one lane to the next, a standard forklift truck can be used. This pallet shuttle storage system allows FIFO as well as LIFO inventory management and can be used in ambient temperature, cooler or freezer environments. A technically mature safety concept has been developed in cooperation with the BGHW Mannheim in Germany (Institute for statutory accident insurance and prevention in distributive trades) giving customers the peace of mind of investing into a safe solution.



BITO



A shuttle is relocated from one lane into the next with a forklift truck.

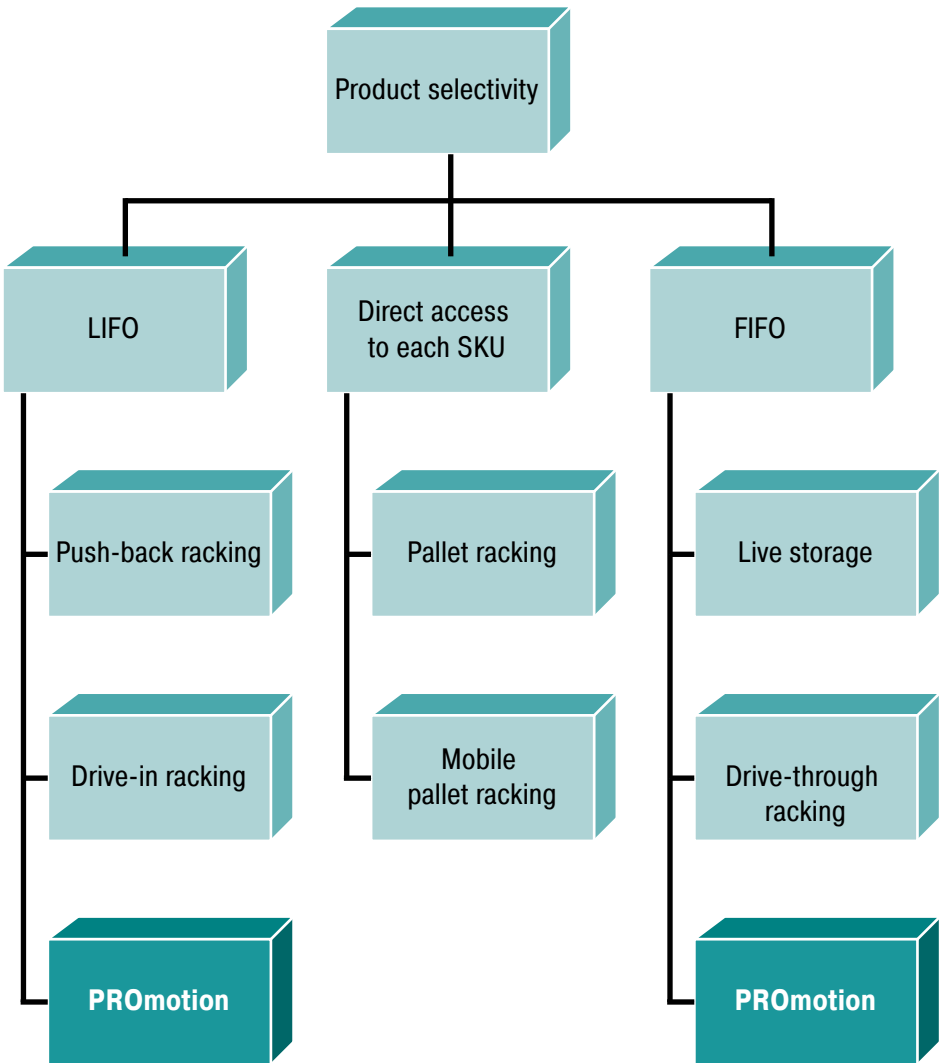
BITO PROMotion shuttle storage comes with a comprehensive service plan to ensure highest levels of system availability to the operator.

Shuttle with guide rails, pallet seats, PRO Twintop beam

BITO PROmotion – The efficient storage system

PROmotion shuttle storage offers highest levels of storage density.

This diagram places PROmotion into the group of high density storage systems which are classified by product selectivity.



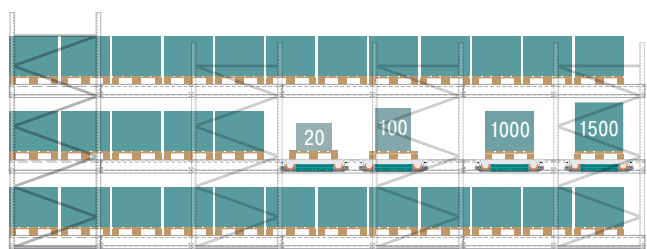
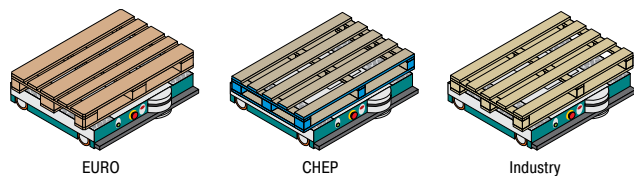
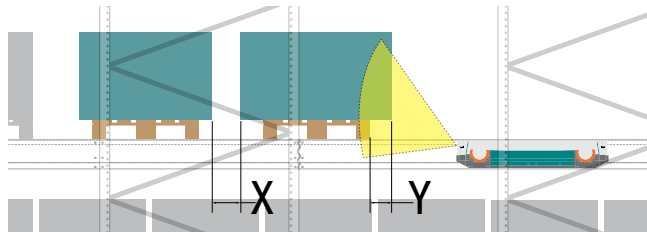
BITO PROMotion – Customer benefits

BITO

Shuttle racking is the modern variation on drive-in racking.

Your benefits at a glance:

- The shuttle drives into the lane instead of the truck driver. This reduces handling times and prevents racking damage.
- Each lane can be accessed individually (as compared to drive-in racking where only entire bays can be accessed).
- You can switch from a FIFO (First in, First out) system to a LIFO (Last in, First out) system at the push of a button without racking modification.
- PROMotion picking performance is scalable – pallet throughput can be accelerated by increasing the number of shuttles. This means that the system can be introduced at low investment cost.
- Maximum storage density – The system operates without lane incline enabling you to really maximise cubed space utilisation.
- No damage to load carriers and products as the shuttle is able to recognise overhanging pallet loads and consequently prevents collisions. Moreover, the shuttle can be programmed to maintain a specified distance between pallets within the lane, thus avoiding damage to the racking structure, product damage or bodily harm.
- The system accommodates multiple pallet types and sizes in the same lane.
- No minimum or maximum weight limits – Loads weighing anything between 0 and 1,500 kg can be fed into the same lane.



BITO PROmotion –

Optimum utilisation of storage volume

Customer requirements

- > Make maximum use of existing space while increasing storage capacity.
- > Easier access to storage units.
- > Product characteristics do not allow very high stacking.

Solution

PROmotion shuttle racking provides multi-level storage – PROmotion blocks can be built as deep as the facility needs to be.

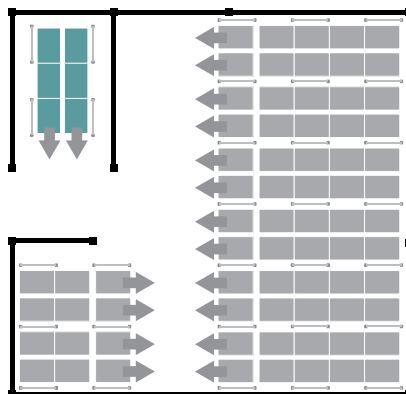
Alternatives

Drive-in racking
Push-back racking

PROmotion benefits

- > **Better utilisation of warehouse height increases storage density as compared to floor stacking.**
- > **PROmotion can accommodate more SKUs than drive-in racking, as every lane can stock a different SKU.**
- > **The pallet shuttle transports loads to and from the racking face – this minimises forklift travel distances.**
- > **Almost unlimited lane depths can be realised.**

Optimum utilisation of storage volume



Full use of available warehouse space increases storage capacity.

BITO PROmotion – Integrated storage of production supplies and finished goods

BITO

Customer requirements

- > Efficient supply of goods to production area.
- > Before undergoing further processing, incoming goods must be allowed to rest for a certain time (f. ex. plastic materials).
- > Finished goods must be stocked nearby.
- > Varying proportions of goods-in and goods-out.

Solution

PROmotion shuttle racking allows to build very deep lanes and ensures FIFO stock rotation which gives sufficient rest time for goods-in. Each side of the storage installation is serviced by at least one shuttle (parallel service).

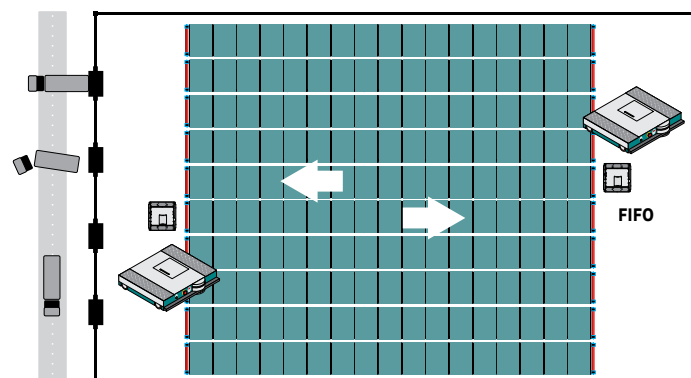
Alternatives

Pallet live storage, lanes inclined in opposite directions
Drive-through racking
Bulk storage

PROmotion benefits

- > **PROmotion racking makes optimum use of the available cubic space – no lane incline is needed.**
- > **Lanes can be used as goods-in and as goods-out storage tunnel without modifications to the shuttle or to the racking.**
- > **No forklift truck rides necessary within the drive-in rack – this saves time and reduces repair costs.**

Flexible storage capacities



FIFO picking allows to observe product rest times before further processing.



»BITO PROMotion – ideally suited for pressure sensitive goods«



BITO PROMotion –

Provides more storage capacity than bulk storage

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Customer requirements

- > Pallet capacity of existing block storage area has become too small
- > Products are pressure sensitive, hence not stackable
- > The lanes of the new storage solution will exceed a depth of 15 metres

Solution

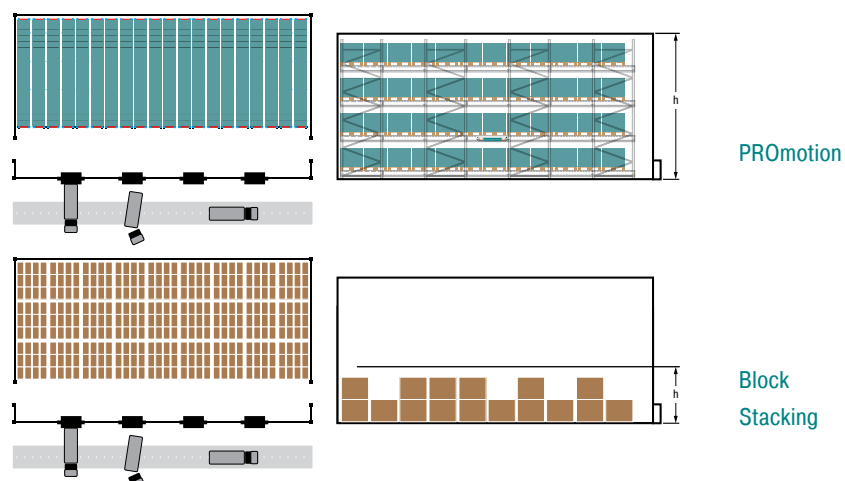
PROMotion lanes allow to make full use of the available warehouse depth and height.

Alternatives

Drive-in racking

Why should you opt for PROMotion?

- > Optimum utilisation of storage volume
- > Loads and load carriers are protected against collision damage



BITO PROMotion –

Allows the use of long lanes as product buffer

Customer requirements

- > Make optimum use of long and narrow-width spaces for buffer storage
- > Products need to be moved over a distance of more than 50 metres

Solution

Deep lane PROMotion block in which one lane is used as transport lane. The other deep lanes are used as buffer lanes for slow movers such as plastic granulate.

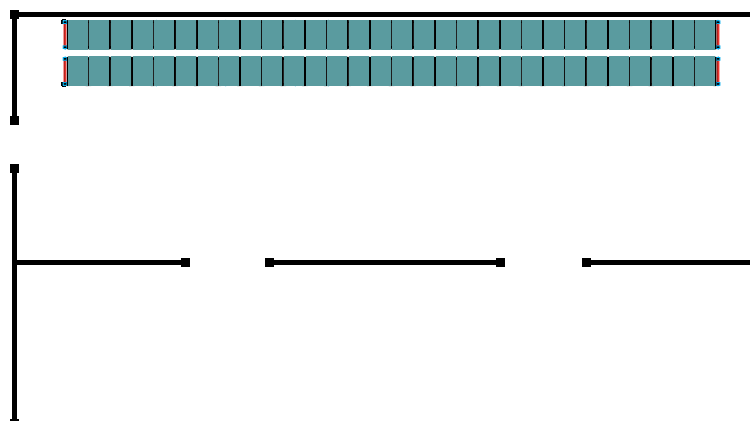
Alternatives

Continuous conveyor
Block stacking with lift truck servicing

Why should you opt for PROMotion?

- > **PROMotion is the most economic solution combining regular but not continuous product transport and buffer storage at the same time**
- > **There is almost no limit to lane depth**

Optimum use of long and narrow-width spaces for buffer storage



BITO PROmotion –

Adapts to seasonal peaks

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Customer requirements

- > Stock quantities vary a lot due to seasonal demand peaks, one of products storage and product buffering.

Solution

PROmotion racking in which goods are supplied in FIFO order. Easy-to-mount dividers subdivide some lanes to create two LIFO serviced lanes.

Benefits of this solution: large quantities coming directly from the production area are stocked in long FIFO lanes. Smaller quantities can be stocked in the shorter LIFO lanes.

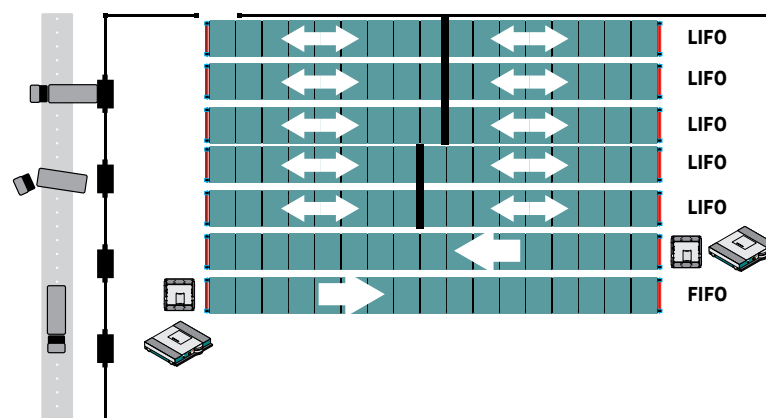
Alternatives

Drive-through racking

Why should you opt for PROmotion?

- > Each lane can take a different SKU
- > Racking bays can now stock several reference lines
- > System can be adapted to changing requirements.

Flexible inventory management





»BITO PROmotion shuttle storage – a very cost efficient solution«



BITO PROMotion

A, B and C items in one racking block

Integrated solution: Pallet live + shuttle

BITO

Customer requirements

- > Small storage space for products with high, medium and low stock rotation frequency need to be stocked
- > FIFO stock rotation is required

Solution

Racking block with a minimum of 3 storage levels – Pallet live storage at floor level height is ideal for fast loading and retrieval of A-items (high stock rotation) – PROMotion lanes on the other levels to be used for B and C items.

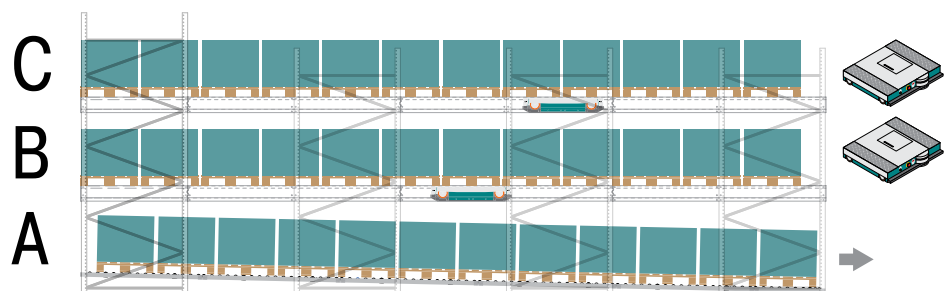
Alternatives

- Pallet live storage as only solution
- BITO PROMotion shuttle storage as only solution
- Drive-through racking

Why should you opt for PROMotion?

- > **This solution combines the high stock rotation potential of pallet live storage and economic efficiency of PROMotion shuttle storage – Investment cost can be 50% lower as compared to a pallet live-only solution.**

A, B and C items stocked in same racking block



BITO PROmotion

Order picking & Buffering

Integrated solution: Pallet live + picking tunnel + shuttle

Customer requirements

- > Manual order picking directly off the pallet – Minimise travel distances for order pickers – Buffer space needed for palletised loads

Solution

At floor level, goods are picked in a picking tunnel in which goods are supplied from pallet-live lanes on either side of the tunnel – Individual goods or storage units can be picked directly off the pallets – The lanes on top are configured as PROmotion shuttle lanes for palletised C items and are also used as buffer space.

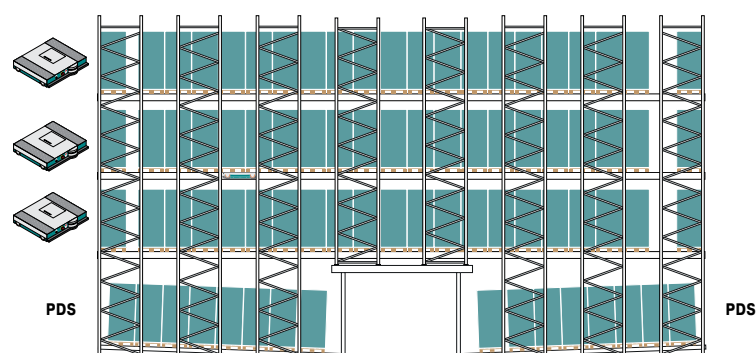
Alternatives

- PROMotion shuttle storage as only solution
- Pallet live storage as only solution

Why should you opt for PROMotion?

- > The live storage lanes at floor level height provide direct product accessibility in the picking tunnel.
- > The PROMotion shuttle lanes on top allow space saving and cost efficient storage of C items and buffer products.

Clever combination



BITO PROMotion –

Storage of oversized or irregularly shaped loads

Integrated solution: Drive-in racking + shuttle

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Customer requirements

- > Make optimum use of warehouse volume – Stock European standard pallets and customer specific load carriers in the same racking block (for example pallets weighing more than 1,500 kg)

Solution

The racking block is equipped with PROMotion shuttle lanes from the second level upwards –
The floor level accommodates irregularly shaped load carriers block-stacked directly on the floor.

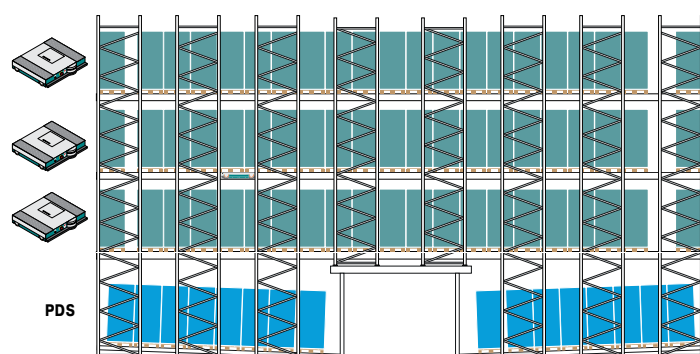
Alternatives

Pallet live storage
Drive-through racking

Why should you opt for PROMotion?

- > **PROMotion lanes operate without incline and each can take a different reference line – The system allows to store varying pallet weights from 0 to 1,500 kg – in the same lane!**

Mixed load carriers





Case study: BITO PROmotion > WURZENER

The company

Wurzener is one of the most successful flour and cereals producers in former East Germany. Their product range comprises 50 product lines for healthy nutrition.

Customer requirements

- > Increase warehouse storage capacity.
- > Careful handling of pressure sensitive products / Products are not suited for stacking.
- > Pallet handling volume is 250 a day.



Alternatives

- > Drive-in racking

A pallet is moved to the picking face by a PROmotion shuttle vehicle.

Solution

- > PROmotion shuttle racking (LIFO stock rotation)
- > Storage facility with 34 bays, each three levels high, to make maximum use of cubic space.
- > 16 m deep lanes
- > 3 PROmotion shuttle vehicles in operation

BITO PROmotion – the ideal solution for gentle product handling



PROmotion benefits

- Maximum use of space
- Pallets do not need to be stacked on top of each other.
- A larger number of SKUs can be stored as only lanes and not entire bays must accommodate the same SKU.
- There is no need to light the whole storage facility – only workplaces at the beginning or the end of a lane must be equipped with a lighting system.
- Faster product handling, as only the shuttle and not the truck drives into in the rack.

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LEIFHEIT



Case study: BITO PROMotion > LEIFHEIT

The company

Leifheit counts among the leading European providers of non-electronic household products. The large product range includes high quality cleaning and laundry equipment for homes as well as kitchenware.



Customer requirements

- > Make more efficient use of the existing warehouse space – before, products were floor stacked or supplied in mobile or static pallet racking
- > Rebuilding has to be done while warehouse operations continue

Alternatives

- > Drive-in racking, push-back racking

A shuttle is being transferred into another lane

Solution

- > PROMotion storage facility with approximately 9500 pallet positions and 6 PROMotion shuttle vehicles
- > Lanes are between 10 and 16 metres deep

PROMotion benefits

- Very cost efficient solution
- Each lane can be accessed individually
- Optimum use of warehouse building height

The PROMotion installation has been adapted to the constructional features of the ceiling



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ROSSMANN



Case study: BITO PROMotion > ROSSMANN

The company

Rossmann GmbH is one of Germany's biggest discount health and beauty retailer. Growing progressively since the first shop was opened in 1972, Rossmann operates today more than 1,850 stores in Germany as well as several distribution centres with a floor surface totalling almost 240,000 m².

Customer requirements

- > Goods are to be picked manually directly off the pallet, pallet buffering is required, pallet weights between 80 and 1,500 kg.
- > Facility must be equipped with sprinklers.

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Alternatives

- > PROMotion shuttle storage as only solution
- > Pallet live storage as only solution

Combined PROMotion pallet shuttle and pallet live installation

Solution

- > 88 pallet live storage lanes at floor level height
- > 176 PROMotion shuttle lanes on the 2 levels on top used as pallet buffer
- > 10 m deep lanes
- > 5 PROMotion shuttle vehicles in operation

PROMotion benefits

- PROMotion shuttle storage combines excellently with pallet live storage uniting maximum storage density for cost efficient pallet buffering and convenient manual order picking.



Two out of three storage blocks in operation at the logistics centre in Cologne

The BITO PROmotion shuttle vehicle operates with state of the art WiFi technology



maschinen@bito.de



Remote control communication

- easy handling
- tough design for everyday use
- manages up to 4 shuttles at a time



Perfect seating

- anti-slip surface ensures safe seat on lift truck forks
- guide rails prevent dislodging



Load sensor

- detects overhanging loads
- prevents damage





Lithium ion battery

- weighs only 10.5 kg
- can be recharged at least 800 times



Battery charger

- charging status is clearly indicated
- long life battery



The expert committee on storage and handling issues from the German Institute for statutory accident insurance and prevention confirms that the BITO PROMotion shuttle system complies in every respect with the relevant safety requirements.



Emergency stop button

- hazard prevention
- located at the front and rear side of the shuttle vehicle



Safety laser scanner

- 2 scanners per shuttle
- reliable protection of persons in the work area
- no-touch detection; complies with the latest safety regulations



Proximity sensor

- 2 sensors per shuttle vehicle, located in the corner areas
- identifies mechanical stop at the end of a lane and determines shuttle location within the lane by communicating with the safety laser scanner

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BITO PROMotion – Functions

Continuous loading/retrieval

At the push of a button, the shuttle takes the pallet from or to the off-loading side.

Custom distance setting

The shuttle software allows distance programming from 20 to 350 mm between two load carriers. This function allows to handle pallets with overhanging loads and pressure sensitive products, as well as improving air circulation in cold stores.

Continuous retrieval

At the push of a button, pallet unloading continues until all load carriers have been removed from the lane. As soon as a load carrier has been placed at the picking face, the shuttle moves back into the lane to fetch the next load carrier. If the first storage position at the picking face is still occupied because the load carrier has not yet been retrieved, the shuttle will wait until it has been picked and then place the next load carrier on this position. This reduces handling time.



Manual commands

The shuttle can be operated by four push-buttons (forward, back, lift and drop).

Stock control function

The shuttle also has a count-function and indicates the number of load carriers in a lane. All information is shown on the display: Ideal for stock counting.

Stock management

In FIFO operated PROMotion installations the necessity for reorganising loads within a lane can occur. The pallets to be reorganised are located at the opposite end of the loading / picking face. This situation can be handled conveniently by communicating via remote control to the stock management software that the loads in that lane need to be moved to the picking side for unloading which clears the space for new loads.



Anti-collision protection

It is possible to operate several shuttles in the same lane simultaneously.

Handling of multiple pallet types

Shuttles moving 1,200 mm deep load carriers can also be used for load carriers with a depth of 1,000 mm or 800 mm.

BITO PROMotion – Technical data

PROMotion shuttle vehicle			
Types	PROMotion 800	PROMotion 1,000	PROMotion 1,200
Height [mm]	175	175	175
Width [mm]	955	955	955
Depth [mm]	900	1,100	1,300
Lifting height [mm]	45	45	45
Weight [kg]	220	230	230
Maximum load of storage unit [kg]	1,500	1,500	1,500
Temperature resistance [°C]	-30 to +45 °C	-30 to +45 °C	-30 to +45 °C
Speed with load / unloaded [m/min]	35 / 70	35 / 70	35 / 70
Lift speed [s]	1.5	1.5	1.5
Drop speed [s]	1.5	1.5	1.5
Running motor [W]	600	600	600
Lifting motor [W]	540	540	540
Operational noise [dB]	60	60	60

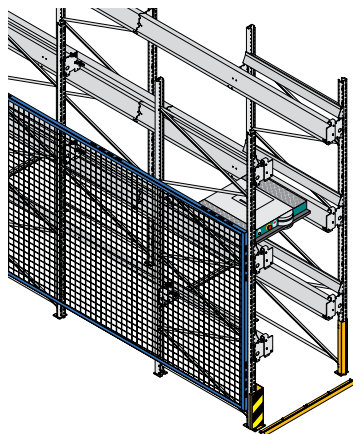
PROMotion battery			
Battery type	Lithium ion battery	Lithium ion battery	Lithium ion battery
Weight [kg]	10.5	10.5	10.5
Dimensions [mm] Height x Depth x	175 x 325 x 150 mm	175 x 325 x 150 mm	175 x 325 x 150 mm
Capacity [Ah]	20	20	20
Voltage [V]	48	48	48
Battery duration > 5 °C [h]	8-10	8-10	8-10
Battery duration < 5 °C [h]	6	6	6
Battery life [charges]	800	800	800

PROMotion remote control			
Battery type	rechargeable	rechargeable	rechargeable
Frequency [MHz]	433	433	433
Protection rating	IP65	IP65	IP65
Display	LED	LED	LED
Temperature resistance	-30 to +45 °C	-30 to +45 °C	-30 to +45 °C
Languages	German, English, French, Spanish, Czech, Polish, Russian. Other languages upon request.		

PROMotion racking	
Clear bay width	1,350 to 1,500 mm
Upright width [mm]	100 – 120
Minimum floor clearance > Upper edge of guide rail	300 mm
Maximum deflection of load carrier	25 mm

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BITO helps you improve safety at work



The BITO service programme has been developed in close cooperation with the relevant statutory employer's liability accident insurance association. This association confirmed in writing that BITO shuttle vehicles comply with all safety regulations set up for semi-automatic channel robots.

The BITO safety concept is based on 4 pillars:

Shelving & racking safety



- Safety cladding
- Truck wheel stopper
- Upright protectors
- Column guards
- In-feed guides
- Head protection

Shuttle safety



- Safety laser scanner for detecting persons
- Pallet detector
- Load sensor
- Load control sensor adjustable for pallets with extremely overhanging loads

Operator safety



- Access and maintenance platform
 - > Used to clear lanes from obstacles and to pull shuttles back to the lane front in case of disruptions
- Acoustic warning signal
 - > Gives a sound at every shuttle start.
 - > Increases safety by giving advance warning.
 - > A low battery status is announced by a special signal.

Service & training



- Start-up assistance and staff training sessions at beginning of operations
- Shuttle vehicles and lanes/channels are checked for functionality and safety
- Operators are trained in theory and practice
- Regular service (optional) to extend service life and increase safety

Aftersales – Our service

Maintenance & Inspection

Health and safety requirements stipulate an annual check of shelving & racking as well as of (semi-) automated storage equipment to ensure safety at all times. Our service teams provide a combined racking inspection & maintenance programme for all types of racking and storage environments/premises.

Service

Competent support over the phone, on-site repairs and services. Call us!

Inspection & maintenance training

BITO has a trained inspection & maintenance team and is also able to provide training for your staff members.

**BITO**

Operator training

Depending on group size, BITO also provides operator training.



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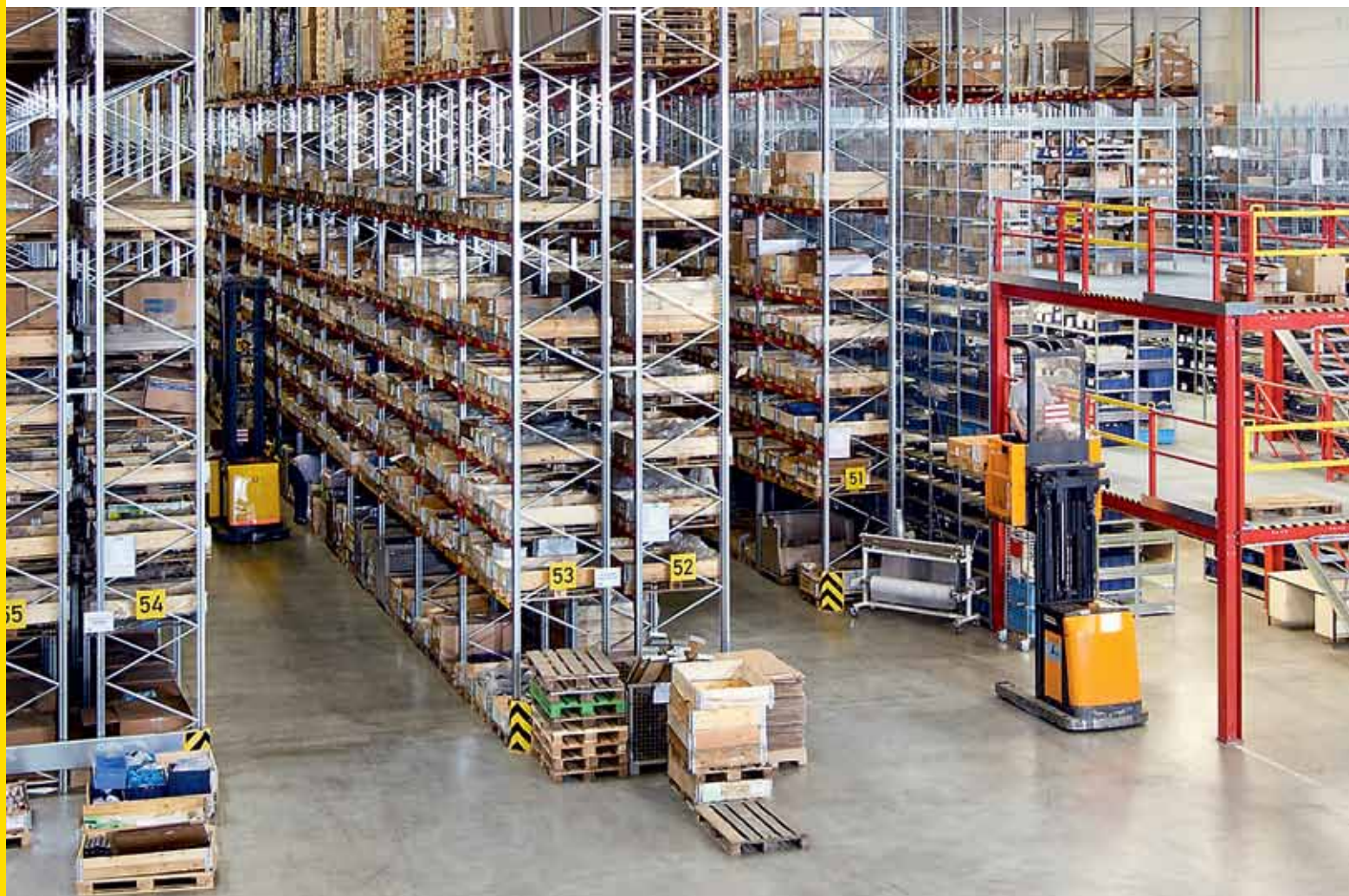
FAQ:

Some basics

Is it possible to load pallets short side facing?	> No , pallets can only be loaded long side facing. BITO provides a pallet turntable to conveniently turn your pallets by 90° - without the need for electricity.
Can I add additional bays to my racking installation?	> Yes, this is possible. The rails are a modular component. Expansions can be made whenever required.
Does the system accommodate pallets half the size of European standard pallets (Dusseldorf pallet)?	> No , Dusseldorf pallets must be stacked on a European standard size pallet first.
Is the system suited for plastic and stainless steel pallets?	> Yes , modern sensor technology can detect both load carrier types.
Can I also use the shuttle in areas with a splash water risk?	> The shuttle can be supplied with IP44 equipment. However, a water film on the rails is critical.
Are there applications that allow to use shuttle vehicles without detector for persons?	> Yes , no operator detector is required in facilities with shuttle lanes fitted at a height of 2.5 metres minimum and higher. However, protective cladding towards the lane underneath is a must.



»Your single source product and service supplier: from bins to high bay racking – from planning to installation start-up.«



BITO invites you to the world of storage and handling

BITO

BITO shelving & racking

Our shelving & racking range includes boltless and bolted shelving, shelving with extra large shelves, wide span and heavy duty shelving, pallet racking, cantilever racking, mobile shelving and racking, multi-tier facilities, carton and pallet live storage as well as automated storage installations. Whether you opt for a conventional solution or an automated live storage installation – the BITO team will be pleased to assist you in making the right choice for your application.

BITO bins & containers

BITO provides a huge range of bins and containers in any size and for any application. Discover our bins for storage, handling and order picking, our stacking containers in European standard sizes and our successful distribution container series. In addition, we offer bins and trays for automated small parts storage and containers in pallet size.

A broad range of accessories ...

... workbenches, transport dollies, order picking and shelf trolleys, bins and cupboards, steps, labels, label holders and safety equipment tops off our product range.

**> Whatever you need for efficient storage –
you can rely on BITO as your single source supplier!**





»More than 5,000 products direct from the manufacturer.«



We are at your service!

Fast track ordering



Catalogue and online shopping, a varied selection of special offers, instant advice provided on the phone by skilled staff, quick quotations, an attractive price performance ratio, short delivery times, and, if things should not be the way you want, the ability to handle claims fast and professionally – all this contributes to the success of a direct sales business. As a manufacturer of storage, order picking and handling equipment ‘Made in Germany’ for more than 50 years offering a range of more than 5,000 products, we know our business and are happy to share our know-how with our customers. On-going product and market research help us to continuously extend our range and our services to provide you with everything you would expect from your single source supplier.

Support & Planning



Fast material flow and lean procedures – these factors are key to any intralogistics process. They will only make their full impact if combined with storage and order picking systems that are perfectly adapted to the requirements of a specific project. When it comes to realising such systems, BITO has a clear advantage over other suppliers. At BITO, we design and manufacture all products in our own plants. On top of this, we assume all project-related tasks from layout planning to system commissioning. This ensures highest levels of transparency and efficiency. Even tight time schedules can be realised because there are no delays in the flow of information between the departments involved and there is no loss of information due to additional interfaces.



BITO
LAGERTECHNIK

» We're wherever you are! «



Hauptverwaltung
Headquarters

The BITO group



Our subsidiaries:

- > Belgium
- > Bulgaria
- > Denmark
- > Dubai (Middle East)
- > France
- > United Kingdom
- > Italy
- > The Netherlands
- > Austria
- > Poland
- > Russia
- > Switzerland
- > Slovakia
- > Spain
- > Czech Republic
- > Ukraine
- > Hungary

Partners:

BITO maintains multiple sales partnerships worldwide.

Plants:

- > Meisenheim and Lauterecken
- > India

Plant
in India



BITO
Storage Systems
in the UK



BITO SYSTEMES
in France



BITO Lagertechnik
in Denmark



BITO Systems
in Belgium



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