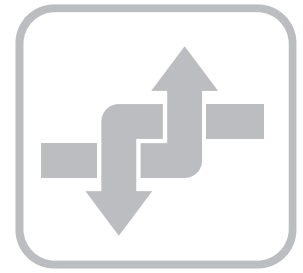


# FSP

**FLEXIBLE IN STORAGE AND PERFORMANCE**



## **FSP small parts warehouse shuttle system: A flexible system for all requirements**

### **A flexible system that's always the perfect fit...**

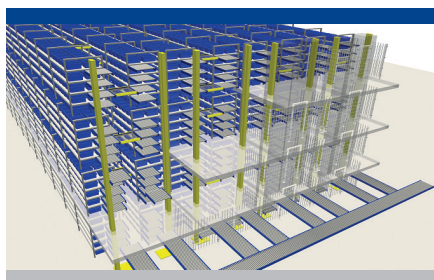
The FSP has been designed for a wide range of fields of applications and therefore enables use with a wide variety of carrier types and dimensions. Thanks to the flexible modular structure, the system can be freely designed in terms of storage capacity and overall performance. Furthermore, additional factors such as the shape of the building and ambient temperature are also considered.

### **Impressive overall package**

A tailor-made concept and proven system components guarantee a high level of reliability and availability.

### **... and if it no longer quite fits - we simply make it fit.**

Because the requirements for intralogistic systems change over the years, later modifications and extensions are essential. We took this into account during the development of FSP. It means you will still have the right system available for future requirements. Last but not least, this guarantees you a high level of investment security as well functionality.



### **FEATURES**

#### **Compatible**

*The FSP can be adapted to external framework conditions, such as carriers, buildings and temperature.*

#### **Modular**

*The system is designed to meet individual needs in terms of storage density and dynamic performance.*

#### **Available**

*Redundancy, interchangeability and fast accessibility ensure a high level of availability for your system.*

#### **Adaptive**

*Performance and storage capacity also can be adapted at a later stage.*

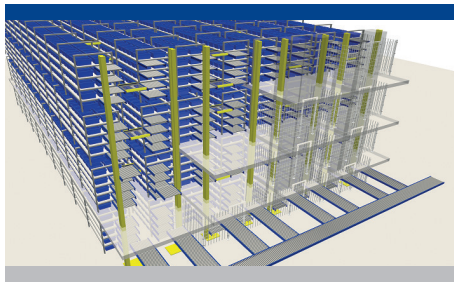
## Scalability

The lifter concept has a significant influence in terms of system structure on the dynamic performance. The aisle performance can also be adapted at a later stage via vehicle lifters, in addition to using container lifters. System designs "with" or "without" vehicle level changing can be mapped.

## Availability

- Use of proven and reliable technology reduces down time
- Fast accessibility for troubleshooting & maintenance
- Vehicles work in parallel and independently of one another
- Vehicles are interchangeable

Ongoing operation does not need to be interrupted in the event of a problem or because of maintenance.



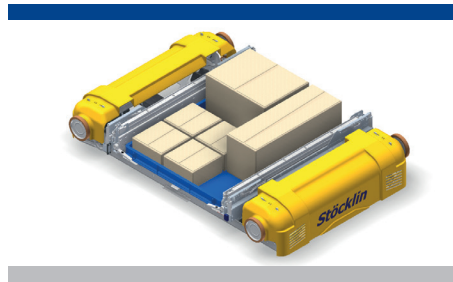
## Vehicle

The dynamic shuttle vehicles take on the storage/retrieval in the individual warehouse levels.

Different carriers are reliably handled with a load handling device that can have the width adjusted and are stored and retrieved at multiple depths on the shelves.

## Lifter concept

- The lifter concept comprises the vertical conveyors for carriers and the transfers per storage level.
- Depending on requirements, an additional lifter can be used for vehicle level changing.
- The technical design is based on the specific needs in terms of performance and sequencing.



## WMS solution

The embedded solution offers an extremely efficient strategy and functionality. Further subsystems can be linked in via interfaces. Visualization and statistical functions give a direct insight, thus enabling proactive maintenance. Faults can also be remedied in no down-time.

## Control software

- Integrated development from a single source: controlling the movements of lifts, conveyors and shuttle vehicles
- Executing transport orders, monitoring and control of processes and many other functions

This is how the optimum interplay of all the subsystems is guaranteed, and therefore a high level of system availability.



### System data and input dimensions

#### Carrier requirements

(containers/boxes/trays)

Weight

35 kg/50 kg

Dimensions (mixed multiple depth storage)

min. 200 x 200 x 50 mm

max. 860 x 660 x 500 mm

#### System limits

Dynamics - vehicle

$v_{\max} = 4 \text{ m/s}$  -  $a_{\max} = 2 \text{ m/s}^2$

Dynamics - lifter

$v_{\max} = 5 \text{ m/s}$  -  $a_{\max} = 7 \text{ m/s}^2$

System dimensions

$H_{\max} = 25 \text{ m}$  -  $L_{\max} = 130 \text{ m}$

Temperature ranges

-30°C to 40°C

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