

KEEPING YOUR PRODUCTION LINE MOVING

Comprehensive material flow concepts
for warehouse and production logistics

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SSI SCHÄFER

INTELLIGENT SOLUTIONS FOR THE INTERNAL SUPPLY CHAIN



Integrated solutions are becoming increasingly important within the complex material flow processes between storage and production. These solutions encompass manual, semi-automated and fully automated processes.



Raw materials and production materials are accepted into incoming goods, buffered, prepared and delivered to the production location or assembly work station just-in-time or just-in-sequence. Complete orders are often sequenced and sent to outgoing goods, where they are prepared for dispatch. It is important that all products can be trace across the entire supply chain.

Challenges for Industry market sector:

- **Automotive:** Special solutions for production and assembly supply, and spare parts handling for just-in-time and just-in-sequence along with precise delivery to production lines
- **Chemical industry:** Storage and transport of hazardous substances across different temperature ranges
- **Pulp and Paper:** Space-optimized storage and safe transport of heavy duty loads and large volumes
- **Electronics:** Special environmental conditions for storage such as clean rooms or specific temperature conditions
- **Mechanical engineering:** Complex processes, demanding workplace designs and ergonomics



SOLUTIONS FROM SSI SCHAEFER

- Static and dynamic rack systems
- Modular bin systems
- Scalable pallet storage and miniload systems
- Dynamic storage and retrieval machines and shuttles
- Flexible picking systems
- High-performance sequencing systems
- Automatic palletizing and depalletizing with robots
- Perfectly matching conveying systems and automated guided vehicles
- Ergonomic work station systems
- Efficient mobile racks and storage lifts
- Performant WAMAS® and SAP software solutions

For many years, our solutions have supported the intelligent networking of people, machines, systems and products that form the focus of industry 4.0. Because as we all know, IT plays a central role in intralogistics.

SSI SCHAEFER develops the right solution based on our WAMAS® logistics software or SAP. These solutions cover the complete spectrum from material flow control to warehouse management and they include both consulting and implementation. The WAMAS® Lighthouse Logistics cockpit from SSI SCHAEFER combines classic visualization capabilities with a display of logistics performance indicators. You can view and analyze the heartbeat of your system, enables you to make effective decisions.

LEAN solutions from SSI SCHAEFER

Wasted time and resources need to be minimized in order to cost effectively produce high-quality products. Lean management is also the key within intralogistics. Solutions from SSI SCHAEFER ensure the intelligent use of employees and machines together with short paths and time savings.

SSI SCHAEFER – WE OPTIMIZE YOUR SUPPLY CHAIN

Future-proof logistics solutions must fit seamlessly into your operational processes, be infinitely expandable, and adapt flexibly to new conditions. This requires specialists: Experts who do not think in terms of individual solutions but in terms of systems.

Complete solutions from a single source

Our extensive portfolio of solutions and products covers the entire spectrum of intra-company material flow. This portfolio forms the foundation for industry-specific solutions, which are designed to meet the unique requirements of your business. Our customers profit from the fact that we design, manufacture and implement all of the components within the SSI SCHAEFER Group. With our local branches operating around the world and more than 10,000 employees, SSI SCHAEFER is an effective and reliable partner.

At SSI SCHAEFER, this integrated approach has been the basis of our success for decades. As a globally active general contractor, we implement complete logistics systems. Our services range from comprehensive system planning and consulting to IPMA certified project management and turnkey systems, which include customer services and maintenance agreements. SSI SCHAEFER offers planning and construction services. We have in-house construction department that can assist you throughout your entire project.

Dedication and commitment

Those who know SSI SCHAEFER, know that we are exceptionally committed to our customers.

This includes

- ✓ Commitment to provide the best solution
- ✓ Commitment to be there for our customers
- ✓ Commitment to keep our word at all times

That is why you can always expect absolute dedication from us. We support you worldwide with employees available to assist you, with development of new technological solutions and provision of complete service through the entire life-cycle of your systems. Not only today, but also tomorrow and in the future. As a family company, we think and plan for the long term.

Experienced specialists for the Industry market sector



SSI SCHAEFER has established its own team of experts that focus on addressing the challenges of the industrial market sector. Our experts develop forward-thinking solutions for industrial companies and help you to implement more efficient and sustainable intralogistics.

We support you with modular and scalable system solutions combined with our own WAMAS® logistics software. These one-stop solutions are designed specifically for your entire value chain. They range from connecting the automated warehouse to the production and assembly systems to picking, retrieval and shipping staging.



SCALABLE, PRECISE AND VARIABLE AUTOMATED MINILOAD SYSTEMS

Logistics processes play an increasingly important role in value creation within the automotive industry but due to their complexity, they now pose a major challenge. SSI SCHAEFER Automated Miniload systems represent on solution. These systems provide space-saving storage for a diverse range of articles in bins, cartons or on trays. The warehouse is connected to the production facility via conveyor systems or automated guided vehicles.

SSI SCHAEFER is one of the few specialists that can provide complete solutions including storage systems for special tools, process optimized solution for storage of wheels tires, and parts warehouse concepts based on the locator system in addition to the rack constructions, storage machines and load carriers. This allows us to create solutions tailored to your specific needs. The Schäfer Miniload Crane is one

example for storing and picking bins, cartons and trays. The storage and retrieval machine enables high throughput and makes optimum use of the available space, even in small warehouses. The diverse range of load handling devices means that there are almost no limits to the shapes, sizes and surfaces of the goods which can be stored or buffered.

Schaeffler Group: European distribution center with state-of-the-art logistics solutions

The automotive and industry supplier commissioned SSI SCHAEFER as the general contractor for the intra-logistics of its new European distribution center (EDC Mitte) in Kitzingen. The solution consists of an automated high bay warehouse and a miniload system combined with innovative robot technology, and is one of the most modern logistics facilities in Europe.

SSI SCHAEFER constructed a 7-aisle high bay warehouse, installed extensive pallet and bin conveyor systems along with an electric floor track. The 28,000 spaces for euro pallets and 56,000 spaces for Düsseldorfer pallets are served by seven

energy-efficient and high-performance Exyz double-boom storage and retrieval machines. These are each equipped with two load handling devices for the corresponding pallet types. The miniload storage consists of a 6-aisle automated miniload system. Twelve Schäfer Miniload Cranes work on two levels. The entire system will include 100,000 LTB type bins from SSI SCHAEFER.

The WAMAS® logistics software from SSI SCHAEFER controls the storage and conveying systems. This software is connected to the SAP EWM.





Brose: intelligent material flow concept for fully automated production supply

SSI SCHAEFER developed an innovative material flow concept for highly dynamic and sequenced production supply for a logistics center in the Czech city of Ostrava. Supported by a precisely tailored SAP EWM system, this logistics center is now a key resource for the Brose Group, the world's fifth largest family-owned automotive supplier.

The 7-aisle automated miniload system is capable of storing 23,520 bins dynamically in a single or double-depth system.

The system includes four tigger train stations where the bins are loaded in sequence for the production supply. A tigger train with four trailers arrives at the corresponding station in accordance with the loading schedule. When a tigger train reaches the loading position, the corresponding bins are released and automatically roll onto the trailer spaces.

"The new solution allows for minimal manual handling, direct, optimized material provision, reduced effort by staff and improved ergonomics. Thanks to the system automation, the material flow changeover and the consistent SAP solution, we have simplified and streamlined processes and made them more transparent, thereby increasing performance. This is an intelligent solution for fully automated production supply and we are very happy with it."

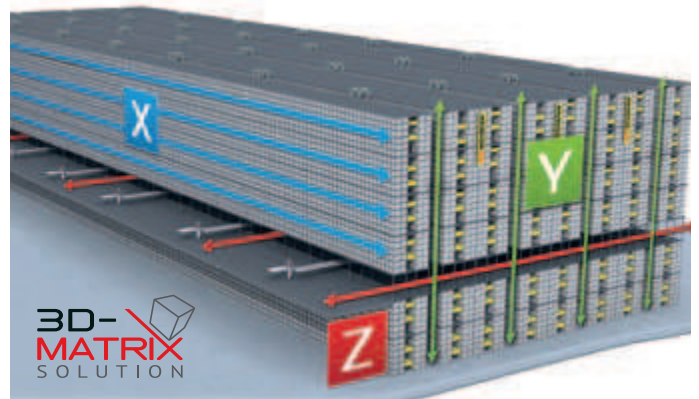


Claudia Vogel-Daniel, Project Coordinator Brose Fahrzeugteile GmbH & Co. KG

EFFICIENT AND MODULAR HIGH DYNAMIC SHUTTLE WAREHOUSE

Shuttle systems from SSI SCHAEFER are a critical element of a cost-optimized logistics chain.

The increasing demand for mini or specialized series represents a major challenge for logistics, especially in the machinery industry. SSI SCHAEFER's shuttle systems provide a solution. They provide efficient processes wherever optimized storage is combined with rapid material transport and short access times. The flexible capacities and high-performance of the shuttle systems are key elements. Combined with the 3D-MATRIX Solution®, a highly dynamic solution for storage and picking of bins, cartons and trays along with entire tray layers and pallets, this enables unmatched throughput.



Navette: efficient storage and sequenced picking

The Navette is a multi-level shuttle and the ideal solution for efficient storage and sequenced picking of trays, bins and cartons in fully automated warehouses. The matrix concept is consistently implemented in the logistics system.

The modular Navette system can be precisely configured to match the order volume, the required throughput and the individual article structure. The decoupled system components can be flexibly configured, expanded, replaced, and renewed while the system is in operation thanks to the maintenance-friendly, unrestricted access. This creates maximum availability together with high process efficiency and flexibility.



Cuby is the high-performance solution for maximum storage density

The Cuby is a single-level shuttle and the ideal solution for the fully automated storage of bins and cartons weighing up to 35 kg. The highly-efficient and dynamic solution sized 600 mm x 400 mm guarantees high availability and energy

efficiency. A scalable lifting system with double-deck load handling devices combined with a compact facility layout ensures high performance and optimum material flow.



Automotive suppliers: miniload system with 120 Cuby shuttles

SSI SCHAEFER set up a new distribution center in France for a leading player in the automotive spare parts market. The system is designed to ship 60,000 vehicle parts per day. The facility stores 120,000 different articles. In order to ensure efficient order processing, SSI SCHAEFER constructed a 5-aisle shuttle warehouse with 81,600 bin storage spaces for double-deep storage along with a 2-aisle miniload storage system with Schäfer Miniload storage and retrieval machines for

15,000 storage spaces. The shuttle warehouse was designed using the goods-to-person system and includes 120 Cuby shuttles and ten integrated lifts. The installed bin conveyor system serves four Pick to Tote picking stations, enabling up to seven orders to be processed simultaneously.

Klingspor: shuttle warehouse for abrasives

SSI SCHAEFER constructed a distribution center in Haiger for Klingspor AG, an abrasive technologies specialist. Every day, the company ships more than 200 tonnes of adhesive to 80 countries worldwide. The solution consists of a 3-aisle double-deep pallet rack with approximately 13,400 spaces as well as a shuttle warehouse with more than 36,000 spaces designed according to the 3D-MATRIX Solution®.

Three energy-efficient Exyz storage and retrieval machines form the foundation for efficient processes in the pallet rack

system with 2 x 120 flow storage locations. The 26-meter-high facility is connected to three picking locations as well as the goods-in and goods-out areas via pallet conveyors with a PLC control system. In addition, 21 Navette vehicles and nine Navette lifts also serve the 26-meter-high shuttle warehouse.

SSI SCHAEFER also installed the SAP EWM warehouse management system.

A HIGH BAY WAREHOUSE, CONVEYOR SYSTEMS AND INNOVATIVE SOFTWARE PROVIDE MAXIMUM EFFICIENCY FOR HEAVY GOODS

Pulp and paper is often a heavy-weight industry. These heavy duty, heavy-weight goods of every type need special handling. They also require space-optimized storage and safe transport. To meet these demanding needs, SSI SCHAEFER's experts develop tailored solutions. These combine efficient rack storage technology with innovative conveying systems and the WAMAS® logistics software.



“With the new high-bay warehouse and optimized processes we were able to meet our objectives exactly as planned. SSI SCHAEFER displayed high flexibility, exact work methods, and consequent customer orientation in this project. We are really entirely satisfied.”

Dariusz Drzazga,
Logistics Manager, ICT

“We are absolutely satisfied. Already within the shortest startup period, the fully automatic pallet handling could be put into full operation. Re-controlling was hardly required. Our objectives with regard to efficiency and cost minimization have been more than just achieved.”

Gabor Izay,
Material Management Manager CEE Region,
Beiersdorf AG

ICT: automated high bay warehouse for enhanced efficiency

The Italian company Industrie Cartarie Tronchetti S.p.A. (ICT) is a leading hygiene paper manufacturer in Europe. SSI SCHAEFER was commissioned to plan and construct a logistics facility in Poland. A silo-design high bay warehouse with 60,000 spaces, single and double-deep storage, two kilometers of innovative pallet conveying systems along with nine storage and retrieval machines form the foundation of the warehouse. The WAMAS® logistics software controls the entire goods-in and goods-out process, the picking along with production disposal. In addition, it also handles the specifically tailored yard management.

In a second expansion, SSI SCHAEFER was assigned the task of delivering five additional storage aisles for 30,000 pallet spaces together with the conveying systems and control integration into the material flows.

Beiersdorf AG: Logistics center in Vienna

As the general contractor, SSI SCHAEFER handled the construction and equipment of the Vienna site for Beiersdorf AG. This location serves as the logistics hub for Central and Eastern Europe. The computer-controlled high bay warehouse is the heart of the facility and one of the most modern within the group. Three storage and retrieval machines serve 2,700 square meters of storage space along with six aisles with 10,100 pallet spaces, providing the fully automated storage and retrieval of 100 pallets per hour.

Exyz ensures the highest energy and cost efficiency in pallet warehouses

The Exyz pallet rack storage and retrieval machine from SSI SCHAEFER is the ideal solution for fully automated pallet storage in high bay warehouse from eight to 45 meters high. Exyz convinces with the highest flexibility. SSI SCHAEFER's storage and retrieval machine can be utilized as a single-boom or twin-boom machine with one or two load handling devices. It is suitable for single-deep, double-deep, and multi-deep

storage as well as retrieval, and also includes an ORBITER® shuttle version. Counterweights integrated into the boom enable energy savings of up to 25% in comparison to conventional machines with the lifting alone. This is why Exyz also forms part of our Green Logistics Strategy with which we consistently integrate environmentally-friendly logistics into the development of innovative logistics concepts.



FLEXIBLE AND EFFICIENT MATERIAL FLOWS WITH AUTOMATED GUIDED VEHICLES

How to ensure an intelligent material flow from the warehouse to the production or assembly and from there to goods-out? This is a key issue especially for operations with limited space or where maximum flexibility is essential. Auto-guided transport systems from SSI SCHAEFER for large and small load carriers provide the solution. They economically and reliably supply production and assembly around the clock.



Automated guided vehicles are efficient, flexible, and scalable

Auto-guided transport systems become an integral part of the solution portfolio for fully automated intralogistics systems. The fleet for large load carriers from SSI SCHAEFER features a diverse range of solutions that are capable of creating a logistics network, encompassing various warehouse and working areas. The solution can be configured and also flexibly expanded to keep up with the pace with your specific requirements.

ALPLA ensures flexible transport to and from production

ALPLA Werke Alwin Lehner GmbH & Co. KG are one of the world's leading manufacturers of packaging solutions. Auto-guided transport systems safeguard the supply and disposal at Toluca in Mexico. They automatically collect the

output from the production machines and transport them to the warehouse or shipping area, carrying out up to 850 runs per day. In addition, the automated vehicles also supply the machine with empty pallets.



WEASEL® always on track even without a driver

Whether bins, cartons, trays or hanging goods - the WEASEL® can handle almost any transport task, delivering the goods gently and safely to the desired destination. The product is also distinguished by its exceptionally rapid ROI. So it is no surprise that the WEASEL® received the "International Forklift of the Year 2016" (IFOY) award in the Intralogistics Solution category.

- Loads of up to 35 kg
- Standardized control software
- Easy integration into the existing material flow system
- Barrier-free transport solution with low space requirements
- Simple scalability
- Diverse constructions for the best ergonomics
- Personnel safety without extensive sensor equipment
- Freely accessible transport paths

BACHMANN achieves agile shipping with the WEASEL®

When automating its in-house transport, Bachmann Forming AG, a specialist for developing customized plastic packaging, relies on the WEASEL® auto-guided transport vehicles from SSI SCHAEFER. These vehicles handle the in-house transport

between the production stations and the existing conveying systems that link production with the shipping area. The conversion provides the company with time savings, resulting in a return on investment of less than one year.

INTRALOGISTIC 4.0: IT SOLUTIONS FOR INTEGRATED PLANNING, CONTROLLING, VERIFICATION, AND COMMUNICATION



Today more than ever, effective intralogistics operations require close integrations between IT software and intralogistics technologies. Modular software systems are required and need to adapt to communicate with ERP systems. Plus, analyzing material flows in real-time in order to detect problems at an early stage is a must.

WAMAS® logistics software

WAMAS®, the proprietary logistics software from SSI SCHAEFER, fulfills these requirements and more. WAMAS® represents the vital link between goods-in, storage, picking, and outbound delivery, as well as all interconnected process steps. Efficient warehouse operation is ensured thanks to clear visualizations and comprehensive tools for managing processes, resources, and inventory. From the first consultation, right through to the go-live date, we offer an extensive, first-class service wherever you need it.

Certified SAP expertise

As a certified SAP Silver Partner, we can support you in selecting, introducing, and running SAP solutions. With our comprehensive expertise, we ensure the implementation of SAP Extended Warehouse Management (EWM) to your requirements. With us, you have an experienced, SAP-certified implementation partner on your side.

WAMAS® is the standard software that combines all of the logistics components into one single intelligent system featuring warehouse management, material flow control, sequencing, and all essential picking methods.

RETROFIT

OPTIMIZING PROCESSES AND SAVING COSTS WHILE INCREASING PERFORMANCE THROUGH MODERNIZATION

Just as some forgotten products are making a comeback as a retro variant with new technology, your warehouse performance can be increased considerably using new storage technologies and software releases.

Storage and picking processes are easily updated and optimized while costs are reduced. Plus, earlier investments are upgraded with standards that meet current market requirements.

Even if your system is not from SSI SCHAEFER, our team of experts can help bring your current equipment and technologies up-to-date.

BASED ON A COST-BENEFIT CALCULATION, WE OFFER YOU THE FOLLOWING:

- Optimization for all warehouse processes
- Implementation of new picking methods
- Addition of new warehouse areas
- Expansion/modernization of equipment, electrical engineering, and controls
- Software and hardware upgrading

CUSTOMER SERVICE & SUPPORT: INNOVATIVE SERVICE PORTFOLIO FOR MAXIMUM AVAILABILITY OF ALL SYSTEMS

Even after your installation has been commissioned and is operational, our experienced experts will be on hand to support you with a comprehensive service portfolio, offering a suitable solution for any requirement.

PREVENTIVE SERVICES

- Maintenance
- Inspection
- Safety Inspection
- Rack Inspection
- Training and Certification
- System Monitoring

REACTIVE SERVICES

- 24/7 Technical Support
- Technicians on Call
- SSI Augmented Support

LIFE CYCLE MANAGEMENT

- Retrofit
- SMP
- Global Spare Parts Service

SSI SCHAEFER Maintenance Philosophy (SMP)

With our improved SSI Resident Maintenance® solution, we offer our customers "more than just service".

The SSI SCHAEFER Maintenance Philosophy is based on three core elements:

- ✓ Expert employees (SSI Resident Maintenance® Team)
- ✓ Best-practice processes for technical maintenance and repair work
- ✓ Integrated service tools and systems





SIX REASONS FOR CHOOSING SSI SCHAEFER:

- **Stability:**

As a financially independent family business, SSI SCHAEFER is committed to long-term solutions. You can trust that our team of experts will be there for you today, tomorrow and in years to come.

- **Efficiency:**

SSI SCHAEFER solutions are scalable and able to grow with your business. You can always upgrade or retrofit.

- **Quality:**

As a systems specialist and original equipment manufacturer, SSI SCHAEFER provides tailor-made and high-quality solutions from a single source, specifically designed to meet your challenges.

- **Reliability:**

Thanks to our worldwide Customer Service & Support network, SSI SCHAEFER ensures smooth operation of your system, both during and after installation.

- **Know-how:**

SSI SCHAEFER solutions are always up-to-date with the latest technological standards and can be easily integrated into an existing (IT) landscape.

- **Internationality:**

As a global organization, SSI SCHAEFER has local offices worldwide. With over 70 operative subsidiaries, our team of experts speak your language.

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