CASE STUDY

Reference ZF Foton Automated Transmission (Jiaxing) Co., Ltd. China: Semi-automated storage facility for the Automotive Industry

ssi-schaefer.com

SSI SCHÄFER

ZF FOTON ON A ROLL

The demand for commercial vehicles in China is on an upward trajectory. As the economy grows, sales have gained year on year. There was no let-up even in 2020 when Covid-19 was at its height.

According to the Economist Intelligence Unit (EIU), commercial vehicle sales in China jumped 18.7% to an all-time record of 5.1 million units in 2020 while sales worldwide tanked 15.7% to 23.1 million units on low interest rates, attractive financing deals and higher government-led infrastructure spending. China's economy was not as severely affected by the pandemic, in fact it was the only major economy to post an economic growth with a GDP of 2.3%.

Plant in Jiaxing, south of Shanghai

EIU expects 2021 to be yet another stellar year as the factors that spurred sales in China in 2020 will remain. The robust growth is a boon for ZF Foton Automated Transmission (Jiaxing) Co., Ltd., manufacturer of fully automatic transmission system for heavy commercial vehicles for the Chinese market. Jointly owned by ZF Friedrichshafen AG (51%), one of the biggest automotive suppliers worldwide, and Foton (49%), a Chinese commercial vehicle manufacturer, the company produces ZF's TraXon 12-speed transmission at its plant in Jiaxing, south of Shanghai.

The TraXon is the most efficient commercial vehicle transmission on the market with an efficiency factor of 99.7%. The system is integrated into commercial vehicles produced by Foton, a member of the BAIC Group, a Fortune 500 company.

In a statement issued at the opening of the joint venture in 2019, Mr Heyi Xu, CEO of BAIC Group, said: "This joint venture sees the joined hands of two industry leaders. It speaks for the product innovation and business capabilities of BAIC and ZF global leadership in transmission products and manufacturing. Both parties will leverage on their respective technology and strengths, form a modular and standard production platform, in order to produce cutting-edge, efficient and intelligent transmission products for the world. We will provide Chinese customers of commercial vehicles the desired world-class products, leading the development of the sector."

Source: https://press.zf.com/press/en/releases/release_7048.html

Teams at discussion

ZF FOTON FACTORY SPUN AUTOMATED WAREHOUSE

Occupying over 250,000 m², the plant is developed under a two-phase program at the cost of 5 billion yuan (~641 million Euros). With the completion of phase 1 on January 1st 2020, the plant can produce 115,000 units of automatic transmission and 20,000 units of retarder annually. Phase 2, which will be completed in 2022/2023 will expand its production to heavy-duty gearboxes with 190,000 units per year and raise the annual production of Intarders by another 40,000 units.

A second joint venture, Foton ZF LCV Automated Transmissions, in which ZF holds a 40% share, produces transmissions for light commercial vehicles also in Jiaxing for the Chinese market.

OPTIMAL USE OF SPACE WITH SSI SCHAEFER STORAGE SYSTEM

ZF Foton's warehouse is an ideal combination of an integrated semi and fully automated warehouse. A well-thought concept that stretches the warehouse footprint vertically and horizontally, the SSI SCHAEFER's Very Narrow Aisle (VNA) – a variant of selective pallet racking that provides higher density with 100% selectivity and the SSI Miniload (an ideal storage and picking system) configuration together, delivered a guaranteed space-performance ratio.

SSI SCHAEFER was selected to make the pitch as "ZF Foton already learnt that SSI SCHAEFER is a world leading system integrator and has a wealth of project experience in the industrial field". Case studies of successfully projects completed in China and beyond underscored SSI SCHAEFER's "leading technology, professional capabilities and high-quality service".

Warehouse located side by side with the production area

SSI Miniload Automated Storage and Retrieval System (ASRS)

CHALLENGE

Customized racks optimally designed to meet your specific requirements - discover more information about pallet rack systems

https://pages.ssi-schaefer.com/en-sg/zf-foton_palletrack

Very Narrow Aisle (VNA)

CHALLENGES FOR AN ULTRA-DENSE FACILITY

To turn a factory into an automated warehouse was one of the goals for the ultra-dense facility. Located side by side in the factory facility, the storage and handling of automotive spare parts must be strategically designed to store different sizes of components and respond to the production area goods-out request.

ZF Foton's spares come in different sizes, therefore, two different type of racking systems are required to handle the storage capacity and density. The Very Narrow Aisle (VNA) for the storage of pallets and bulky items, and the SSI Miniload for small parts components. Both systems are designed to make efficient use of available space and to improve picking efficiency.

CHALLENGES FOR AN ULTRA-DENSE FACILITY

- To provide storage for 65,000 SKUs using the 7,800 m^2 space in the 15,900 m^2 warehouse
- To improve the company's production efficiency. Once the production line triggers a demand, the warehouse response must be able to respond in the shortest time to provide the production line with requisite spare parts needed for production

SSI Miniload and VNA

The SSI Miniload Automated Storage and Retrieval System (ASRS) is a high-speed, high-density storage system. Towering seven metres high, the 4-aisle installation provides the warehouse with 56,400 bin storage locations with a throughput of 430 totes per hour.

With the aisles marginally wider than the load, the VNA is ideal for tight spaces with high ceilings. The 19-aisle high bay storage at ZF Foton is serviced by 12 VNA forklift trucks to provide 12,812 pallet storage locations. The VNA can achieve a throughput of 110 per hour.

Together, these two storage systems provide the warehouse a combined storage capacity for 69,212 stock keeping units (SKUs), exceeding ZF Foton's requirements. In the tender brief, storage suppliers were asked to provide at least 65,000 SKUs in the 7,800 m^2 space.

MAXIMIZING STORAGE DENSITY OF THE MINILOAD USING THE RIGHT CHOICE OF MATERIALS AND CONSTRUCTION METHOD.

Regular uprights provided by rack suppliers in China are measured 75 mm to 90 mm in width, however SSI SCHAEFER manufactures its own customized version for the ZF Foton installation. Made in its Malaysia factory, the high-grade material uprights are measured at 60 mm, and are smaller and stronger. While the post may cost more upfront, it provided added storage capacity, hence was more effective.

SSI SCHAEFER was able to expand the storage density vertically by using customizable punching uprights. Rather than punch holes on the uprights evenly, the holes were punched selectively to accommodate different product sizes, thereby creating more storage locations. By stretching storage space horizontally and vertically, SSI SCHAEFER was able to create additional storage space.

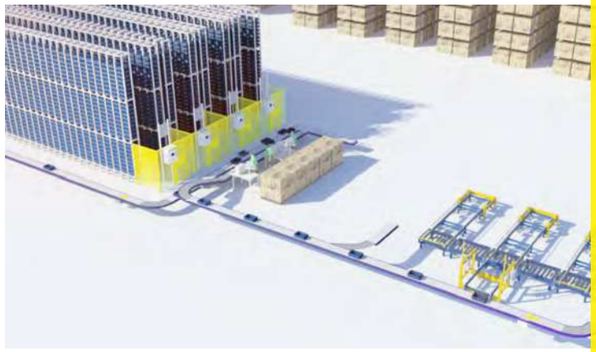
60mm customized high-grade material uprights

IN LINE WITH PRODUCTION REQUIREMENTS

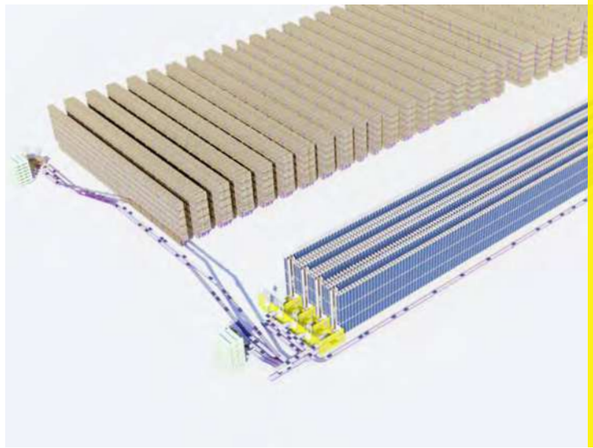
The storage system is in sync with ZF Foton's production requirements. When components used for production arrived at the plant, they are received at the incoming area before being sent to the repacking area to be sorted. Bigger parts are placed on pallets and transported to the VNA storage area by forklifts, while the small parts are put into bins to be palletized manually.

The full pallets are then transported to the workstation by forklifts or pallet trucks. At the workstation, these bins are depalletized by robots and put on the bin conveying system to be transported to the automated miniload system (AMS) for storage.

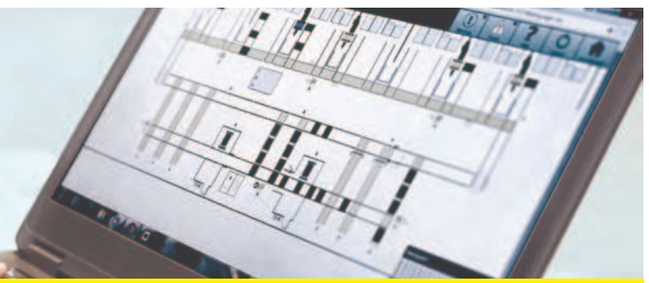
Once the production line triggers a demand, the warehouse system is prompt in providing the production line with requisite parts. On receiving instructions from the production line, the SAP enterprise software which manages ZF Foton's operations processes the goods-out orders, which is then relayed to the WAMAS®, a SSI SCHAEFER warehouse management software which controls and monitors warehouse operations. On receiving instructions from WAMAS®, totes with the requisite parts are retrieved automatically from the AMS. They are then transported to the workstation before being sent to the production line manually.



Small parts components sortation before storage in SSI Miniload



Components retrieval from pallets in VNA or bins in SSI Miniload



Integrated performance and optimization functions – discover more information about logistics software

https://pages.ssi-schaefer.com/en-sg/zf-foton_wamas

Modular conveying solutions for any load carrier to optimize material flow – discover more information about conveying system

https://pages.ssi-schaefer.com/en-sg/zf-foton_carton-and-bin-conveying-system

CUSTOMER: SATISFACTION, SERVICE AND SUPPORT

Provisioning intralogistics solutions doesn't stop at the delivery of the hardware or software. To ensure ZF Foton's production and logistics operation executes seamlessly after the project handover, a line-up of after-sales services that include targeted software training, on-site personnel monitoring of operation status (early stage of handover), a 24/7 technical online support and a bi-annual hardware inspection and maintenance service were provided to support the team at ZF Foton, this way, they can confidently operate the hardware and software like the way SSI SCHAEFER China team did during the transition period.

ZF Foton has given SSI SCHAEFER storage system its stamp of approval.

"In this project, the cooperation with SSI SCHAEFER is very smooth and effective. In the course of more than two years of use, this set of automation system has almost no failures, which provides a strong guarantee for the efficient operation of the logistics department,"

Mr. Huang Rui,
Logistics Manager, ZF Foton

Reliable picking of containers, cartons, and trays - discover more information about SSI Miniload

https://pages.ssi-schaefer.com/en-sg/zf-foton_ssi-miniload

FACTS AND FIGURES

System Key Figures

Warehouse area	15,900 m² (of which 7,800 m² is planned by SSI SCHAEFER)
SKUs	69,212
Working hours / day	24 hours / day
Shifts / day	2 shifts / day

Scope of Supply and Services by SSI SCHAEFER

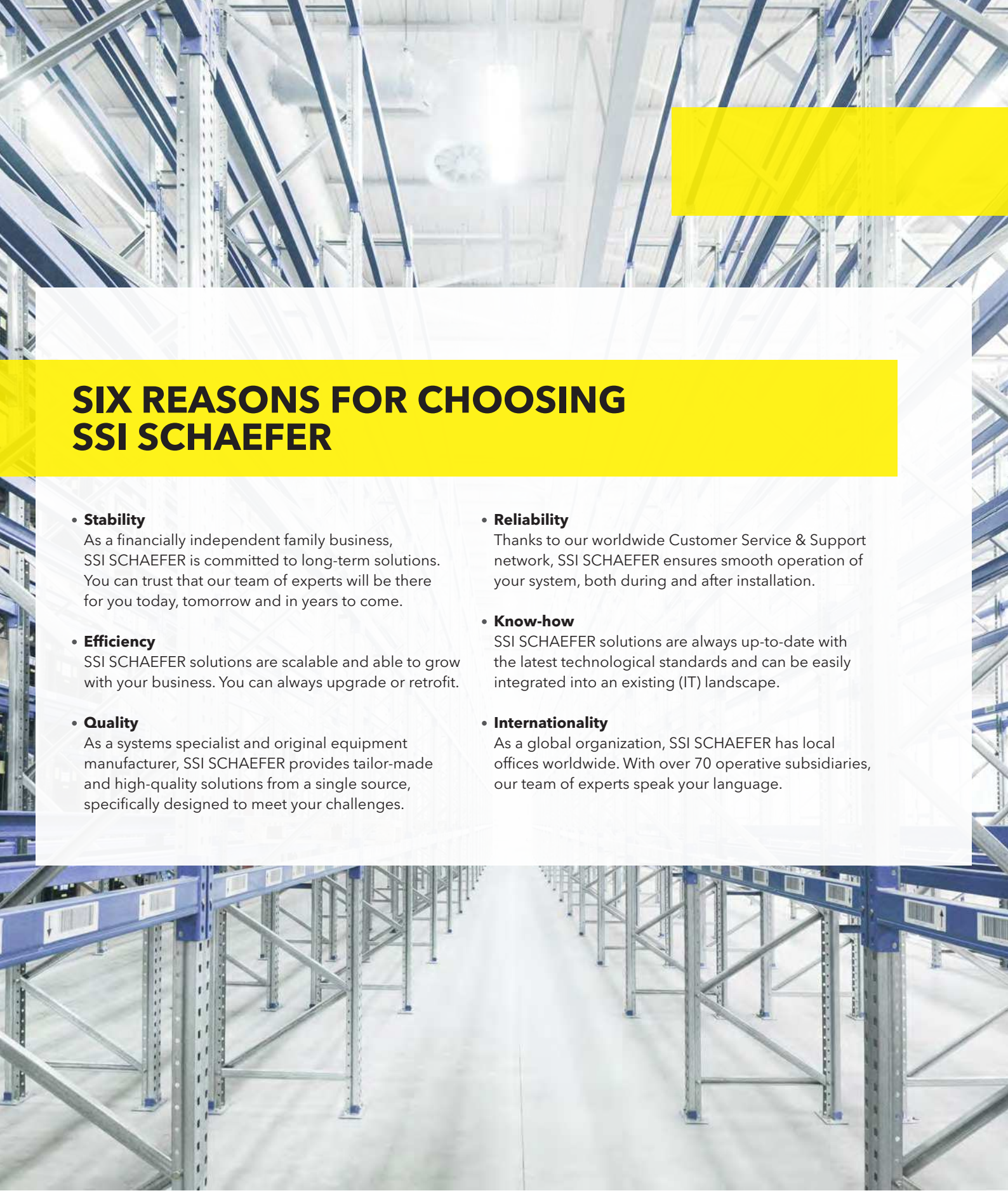
Conveying System	
Bin conveying system	250 m

Storage and Retrieval System	
SSI MINILOAD	4 aisles, 56,400 bin storage locations, single-deep storage, height: 7 m, 430 movements / hour
VNA Racking	19 aisles, 12,812 storage locations, 118 movements / hour

Software	
Logistics Software	WAMAS®

Case study:
Semi-automated storage facility for the Automotive Industry

https://pages.ssi-schaefer.com/en-sg/zf-foton_case-study



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.

ssi-schaefer.com

SSI SCHÄFER