Automated handling and storing systems

Tire industry

PESMEL

Material Flow How® for tires

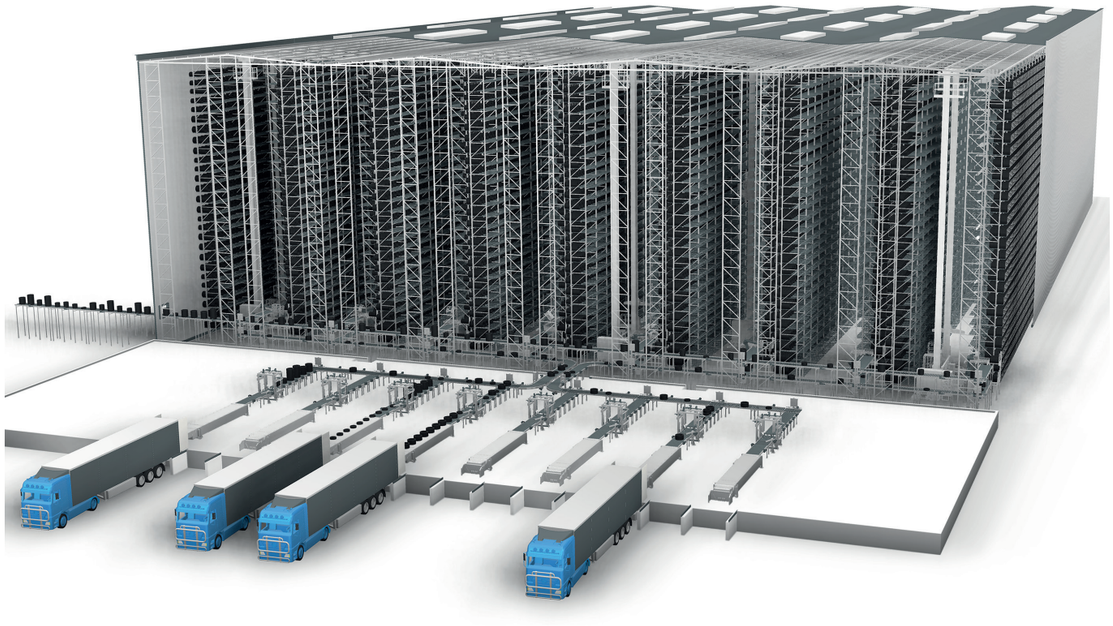
Pesmel Material Flow How® solution takes a completely new approach to the systems designed for tire logistics by innovating and applying the latest high-bay technology to warehouse and dispatch. The solution named TransTire™ integrates infeed logistics, warehousing and sorting, enabling entirely automated tire handling without pallets.

By completely removing pallets from finished tire logistics, the whole logistics chain is simplified, resulting in favourable total cost of ownership and accelerated payback on investment.

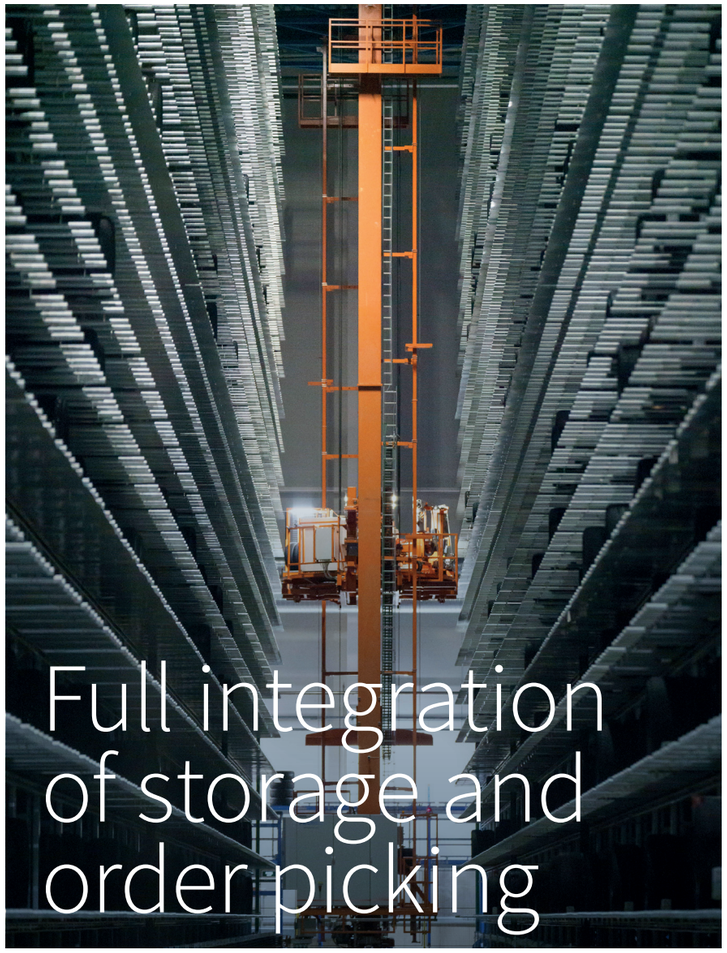
The TransTire high-bay warehouse is seamlessly connected to the tire plant's production function, or it can work as an independent tire distribution center. Whether a new tire plant or an existing one, the solution is tailored according to customer specific requirements and needs.

The elements that enhance the performance of Pesmel's solution are

- operation without pallets
- reduction of storage footprint with high storing density
- sorting at in-feed
- combination of storage, order picking and simple layout with minimum amount of equipment
- quick access to any combination or individual tires
- shortened turnaround time of tranportation vehicles



Customer reported results from Material Flow How® vs. traditional solutions:



45%
reduction of footprint with highest storing density

0
lost orders or handling errors

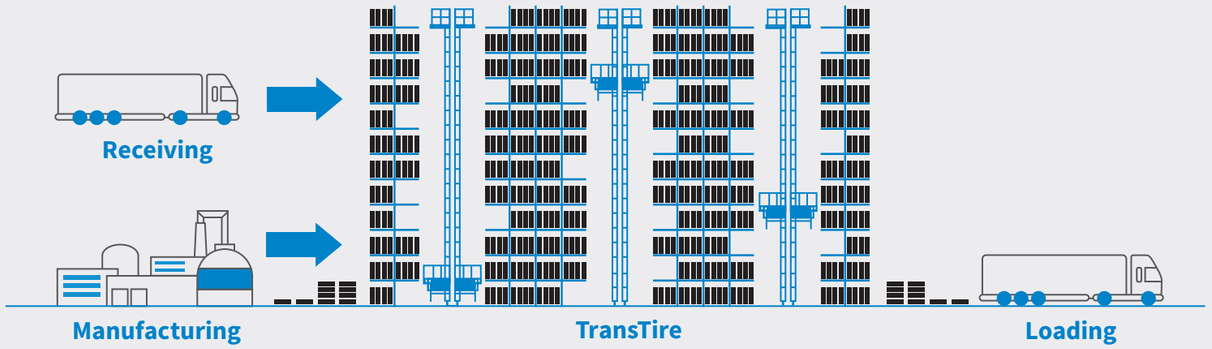
TOTAL
protection to products and services

Minimized
TCO

Manufacturing or distribution management
Production data
Order information

Warehouse Management System
Inventory management
Material flow management
Order picking
Shipment and loading plans

Logistics management
Identification
Waybills



Simplified and intelligent material flow – the Pesmel approach

In enhancing in-mill logistics, tire manufacturers and distributors look for reliability, flexibility and overall effectiveness. The key in providing competitive service for their customers lies with the ability to execute short delivery times with flexibility in size and number of order lines. And these are exactly the features characteristic of Pesmel's TransTire high bay warehouse and logistics concept.

The implementation of TransTire system starts by building a simulation model of the customer's tire warehouse, analyzing the material flows and potential bottlenecks. The process provides a model of seamless combination of all material and information flows. Simulation acts as guidance for implementing a fully functional and optimized system. It enables pre-construction testing and verifying of large and complex systems, and it is a systematic approach to design and implement solution functionality.

The simulated warehousing process gives detailed information for the TransTire concept engineering and rack structure design, covering all areas for mechanical, electrical, PLC and ICT competences.

Rethinking and redesigning the warehouse and logistics

Using pallets in tire warehouses is a costly but common procedure. Removing them totally from internal logistics not only simplifies but brings considerable savings in the entire logistics chain.

Palletless handling, being a key function of the TransTire automated high-bay warehouse, and well-planned automation reduce unnecessary handling and lifting, stages typical to manual storages using forklift trucks. Even if robots are introduced in place of trucks and operators, such solution does not take advantage of the real potential of totally renewing the process using automated palletless operation.

Last but not least, the TransTire high bay concept has a clear advantage over a manual warehouse related to the space required: It fits in an area of half the footprint of the manual solution.

Pesmel's solution for internal tire logistics has simplified the whole operation from feeding tires to the warehouse from production all the way to automatic order picking and loading of tires.

Using the Transtire high-bay warehouse together with dedicated conveyors requires much less equipment compared to other warehousing solutions. This, together with elimination of cost for pallets, result in significant economic benefits. The total savings in capital expenditure compared to traditional logistics solutions can be up to 10 million euros. In addition, operational and maintenance costs stay well under the levels of traditional warehousing and logistics solutions.

TransTire Automated Handling System – 3 in 1

✓ AS/RS* storing

✓ Order picking

✓ Shipping

✗ No Pallets

* Automated storage and retrieval system

Parameter analysis for warehouse with 600.000 tire capacity

In selecting the method of finished tire warehousing, there are three alternatives with significant differences in key characteristics. The chart below presents comparison of footprint, space and the elements of cost for two different versions of automated warehouses in comparison to a manual version.

Parameter	Manual	Automatic with pallets	Automatic without pallets
Footprint/floorspace	1	0,7	0,5
Number of tires/m²	1	1,4	2,2
CAPEX	1	1,8	1,4
OPEX	1	0,4	0,3

CAPEX: Civil works, racking, conveying, pallets and cages, forklift trucks, gantry robots, stacker cranes

OPEX: Manpower, upkeep and renewal of pallets and cages, other equipment renewal, electricity, maintenance and service

Source: Study on impact of automation in finished tire storage and logistics 2019, ©Pesmel

Major savings through straightforward warehouse logistics

The TransTire handling system configuration

Pesmel's TransTire fully automated tire handling, warehousing and logistics systems are tailored to meet the needs of the customers, whether tire plants or distribution centers. Regardless of configuration, they always comprise stacker cranes, integrated conveyors, warehouse racking and an aggregate control system running warehouse management software. Compared to other automated or semi-automated tire warehousing concepts, the TransTire solution requires much less equipment, even if it is a comprehensive process inclusive of automated handling, warehousing and order picking. The system is operated without forklift trucks and palletizing robots and, most importantly, the need of pallets is totally eliminated.

Warehouse Management System

The Warehouse Management System can be fully integrated into the tire plant's existing network and upper-level control systems. The main task for the Warehouse Management System is to control tire flow and optimise storage and logistics function in order to increase total handling capacity and bring down operating costs.

All tire movements are controlled by Pesmel proprietary software providing efficient storing and retrieval functions with optimal order handling. It features a wide range of reporting and diagnostics functions, to assist in maximising efficiency even further.

Simple layout with a minimal amount of equipment

Stacker cranes

All tire movements, both storing and order picking, are carried out by stacker cranes, linked to the conveyor lines with tire feeders or industrial robots.

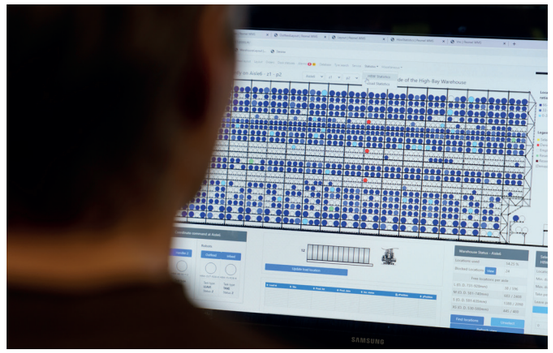
Conveyors

The warehouse includes a dedicated conveying system that integrates tire production lines with the warehouse and the transporting vehicles at the dispatch area.

Warehouse racking

Tires are stored without using pallets, an efficient way of handling through saving time, space and expenditure on equipment. The gentle tire storing method eliminates risk of tires deforming during storing.

Each free standing or rack supported building structure is specifically designed for local environmental conditions.



Control System

Pesmel's Warehouse Management System controls the operations of all warehouse equipment with detailed view and access to handling functions and tire positions. Continuous monitoring linked to system automation provides total control of the tire movements.

Support across the entire lifecycle

Maintenance

Regular maintenance guarantees high availability and extends the lifetime of the system. Preventive maintenance minimizes unexpected repairs and helps to keep total investment and operational costs in balance.

HelpDesk

Our HelpDesk service is there for our customers 24/7 ensuring reliable performance of the process and equipment. When you need assistance, our specialist will help you over the phone or establish remote access to your control system for immediate troubleshooting.

Spare parts

We provide comprehensive spare part services for material handling systems. Spare and wear part recommendations are made for every delivery project. Pesmel's spare part services guarantee the latest, best quality spare parts available.

Upgrades

Frequent upgrades help extend the lifetime and improve the profitability of your original investment. Our R&D regularly generates new innovations and cost-effective upgrade packages for improving e.g. system throughput and capacity, operational safety or the performance of the control system software.

FlowCare

FlowCare is a remote supervisory and preventive maintenance solution for production facilities. The custom-built solution monitors the performance of all Pesmel equipment. Important data is visualized in a web portal that can be easily viewed on a computer or any personal mobile device.

Rev. 01, 2022

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