



## INDUSTRIAL APPLICATIONS

2nd edition | September 2023



**Polish producer**  
of intralogistic systems  
Since 2003

[mpltechma.pl](http://mpltechma.pl)

# techma



Welcome to the catalog of industrial applications of Techma intralogistics systems!

**We are a Polish technological company specialized in solving the most complex intralogistics problems for over 20 years.** Our mission is to deliver exceptional solutions that cater to individual customer needs and enable effective logistics management in the 21st century.

Using creative knowledge and rich experience in the fields of mechanics, automation, and electronics, **we design and manufacture unique systems of automated and robotic workstations** dedicated to industrial applications. Our solutions are innovative, modern, and tailored to the dynamic requirements of the contemporary market.

Understanding the specific nature of each client's business is of utmost importance to us. This allows us to identify, define, and effectively solve key design problems. **Flexibility and an individual approach to each project enable us to create dedicated intralogistics systems** that perfectly match the unique needs and requirements of our customers.

In addition to offering warehouses, we also provide comprehensive and dedicated solutions for transport and handling infrastructure, both before and after the warehouse.

**We are ready to take responsibility for the entire investment process, acting as the general contractor.** From analyzing needs and





developing concepts to the design phase, all the way to commissioning and implementation, we provide professional support at every step of the project.

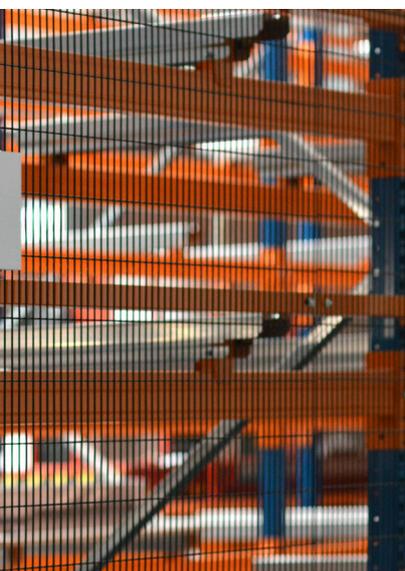
We invite you to explore our dedicated intralogistics systems and a wide range of technical solutions that can fully meet your requirements.

More information can be found on the website [www.mpltechma.pl](http://www.mpltechma.pl).

Join the ranks of satisfied customers and benefit from advanced technologies that will transform and optimize your logistics processes.

## Table of contents

Automatic transport and storage system for containers .....	4
Warehouse system with box conveyors and Euro pallet distribution .....	6
Transport and storage system for tires in an automatic warehouse .....	8
Automation of the seasoning trays warehouse with transport infrastructure .....	10
Automation of the mold warehouse for a new technological line in the sanitary industry .....	12
Spool storage system operated by AMR trolleys .....	13
Methodology of the design and implementation process .....	14





# 1. Automatic transport and storage system for containers



Our client, specializing in the import and distribution of automotive parts, faced **the challenge of efficiently managing returns and goods deliveries in their logistics center**. To address this, we designed and built an efficient and automated high-storage warehouse.

During the concept development phase, we received a specification for the technical solution, which we further refined to meet the investor's requirements and needs.

The result was **an automated system consisting of a high-storage warehouse housing nearly 11 thousand containers. The warehouse is served by 30 automated shuttle-type vehicles, 4 mini-loads, and 4 high-capacity vertical conveyors**. The system also includes **conveyor lines for transporting containers and two picking stations with triple slots**. Additionally, we implemented an error station with a weighing system to determine the filling percentage of the containers. **The project was complemented with areas for receiving new goods and zones for fast and efficient order picking**.

During the design phase, we used FlexSim software to **model the logistics processes of the warehouse**. We created a **communication interface between the client's Warehouse Management System (WMS) and Iconics SCADA**, which is responsible for the allocation and flow of containers within the warehouse system. Returned goods from the store network and new goods from manufacturers are registered in the system and placed in containers at the receiving area, where 30 inspection stations are located. Subsequently, they are transported via roller and belt conveyors to the warehouse. On different floors of the warehouse, the containers are distributed using vertical conveyors,





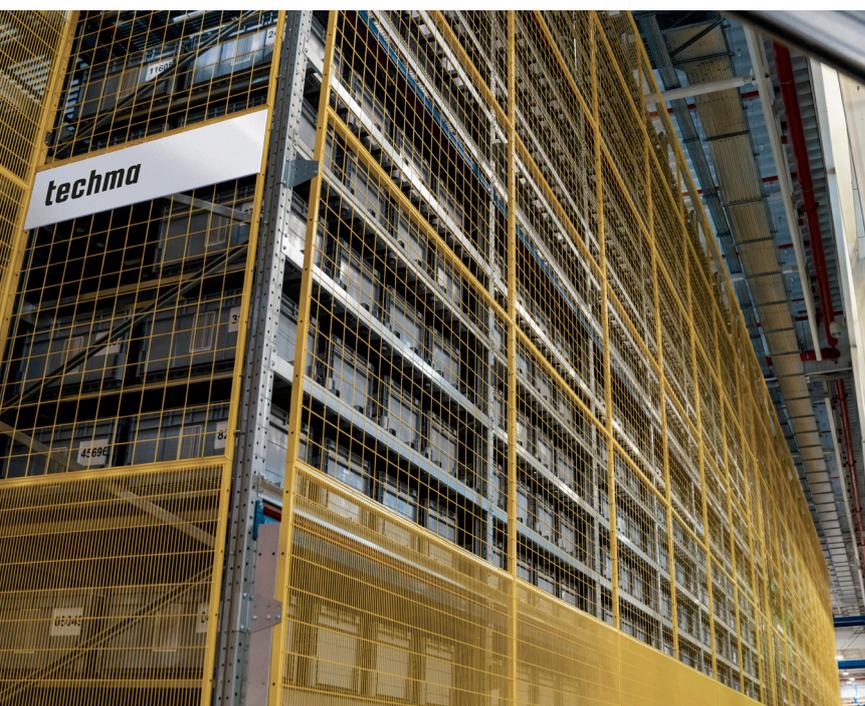
picked up by shuttle vehicles, and placed in free locations within the double-deep storage system. Finally, the containers are retrieved from the warehouse and transported to their respective stations.

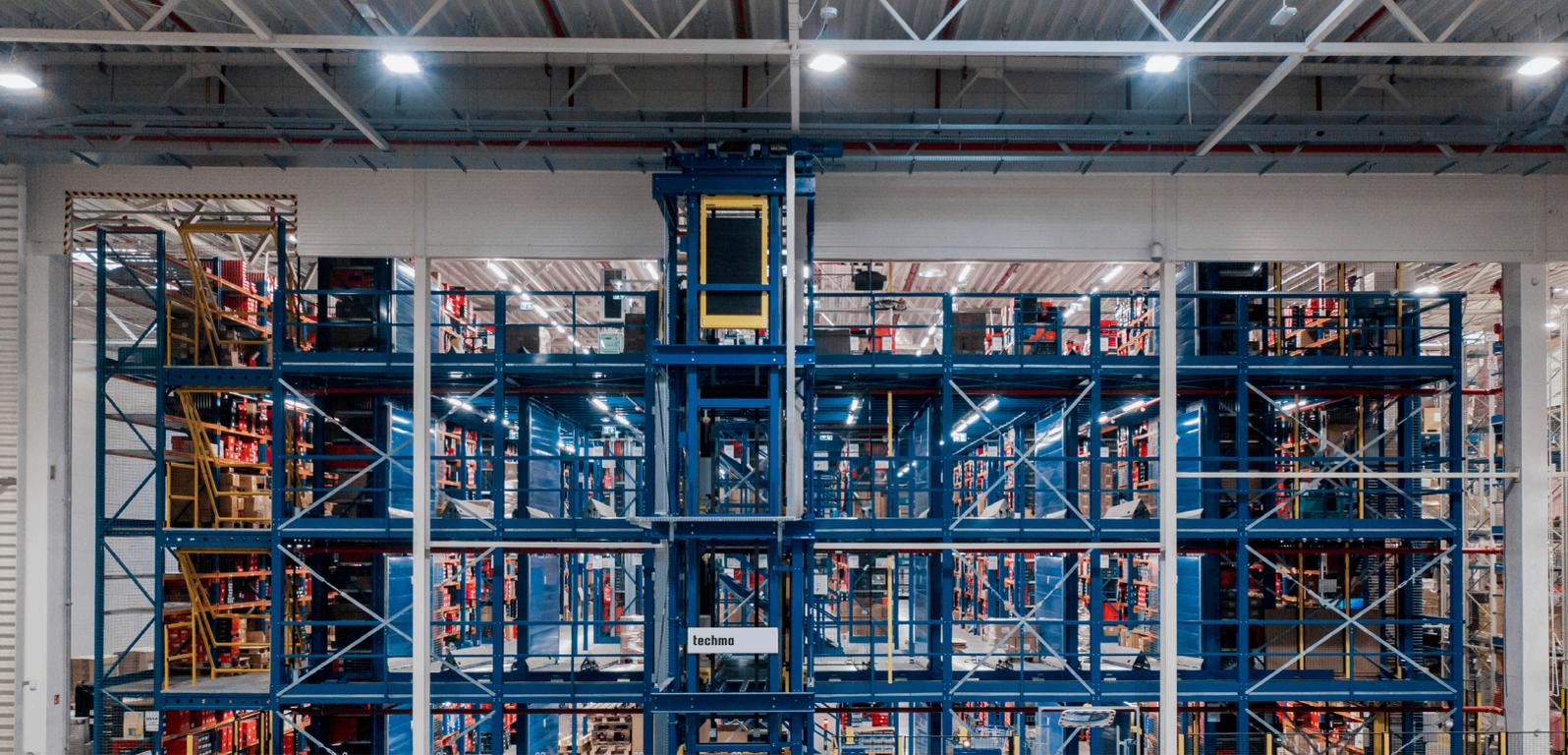
**The maximum measured throughput of the system is 1200 containers** entering and leaving the warehouse per hour. The investor can seamlessly continue using their WMS, with the high-storage warehouse appearing as a new location.



An essential feature for the client was the openness of the system and the use of commercially available components that are widely accessible on the market. Our solutions do not employ black-box-type control with dedicated electronics, enabling the client to diagnose and service the warehouse independently without long downtimes.

The main benefit the client received was a two to threefold increase in order picking efficiency. Employees handling order picking in the older parts of the warehouse could process 80 to 150 products per hour. **In our warehouse, a single worker completes 300 items per hour.**





## 2. Warehouse system with box conveyors and Euro pallet distribution

The main challenge presented to us by a company specializing in the distribution of automotive parts was the inefficiency of delivering and distributing pallets to the mezzanine level of their existing warehouse. Additionally, the client faced a lack of buffer areas on the mezzanine floors. Moreover, before automation, there was a need for close cooperation and full synchronization between the forklift operator and the personnel arranging the pallets within the warehouse structure.

To address these challenges, **we provided our client with two parts of the warehouse - the entrance and exit sections.** On the entrance side, we implemented a multi-level storage system, a buffering and pallet transport system both vertically and horizontally, along with automated shuttle vehicles. On the exit side, we installed a system for distributing goods in boxes and additional inspection stations.

**Our task was to develop and implement a system that would efficiently deliver pallets to each level of the warehouse.**

To achieve this, we introduced a buffer and transport system where the forklift operator's task is limited to placing the pallets in the entrance dock on level zero. From there, the pallets are transported through conveyor systems and lifts, as directed by the superior Warehouse Management System (WMS), to the appropriate levels of the warehouse. On each floor of the warehouse, we installed shuttle vehicles that distribute the pallets to buffer docks. On the exit side of the system, employees pick up the goods from the warehouse shelves according to the received orders. They place the items in boxes, which are then transported to designated inspection areas through our implemented transport system.

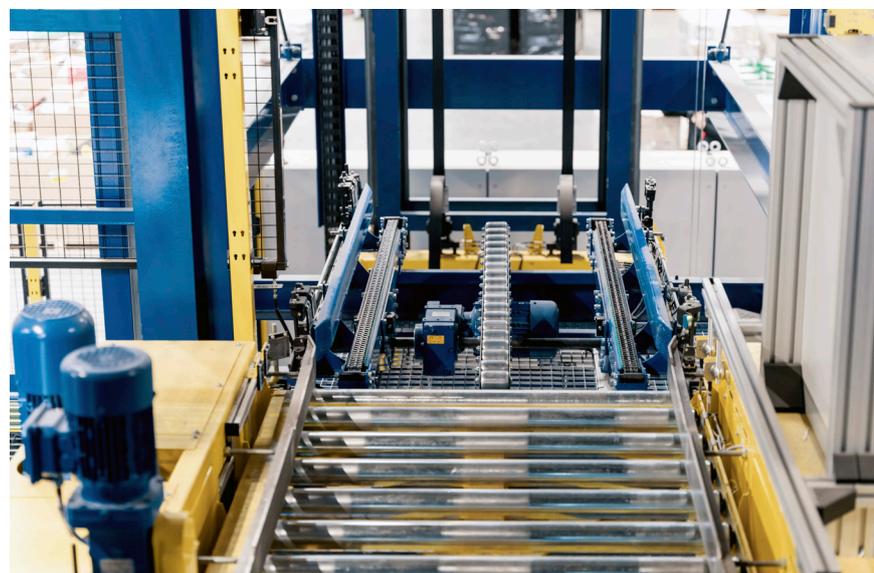
**By using scanners and exchanging data with the WMS, we continuously obtain information about the destination of each box,** enabling reliable and efficient movement to the correct locations.





To ensure the smooth operation of the system, empty boxes are returned to the warehouse, thus completing the cycle. **The warehouse transport system is fully automated.** This means that the operator places the box on the conveyor, and it reaches the designated inspection station without the need for intervention from other personnel.

By implementing this warehouse system, the client gained several benefits. **One of them is simplifying the process of delivering pallets to the appropriate warehouse level.** Additionally, we minimized delays and increased the loading efficiency of the warehouse system by using buffer elements. **We also reduced the involvement of employees in the handling process.** Previously, the forklift operator had to oversee the entire loading process constantly, but now our system handles the movement of goods to the correct locations. Furthermore, **we contributed to reducing the delivery time of goods from the warehouse to the inspection stations.**





### 3. Transport and storage system for tires in an automatic warehouse

A company in the tire industry entrusted MPL Techma with the design and construction of an intralogistics system for storing raw tires. The central component of this system is an automated high-storage warehouse.

The investor presented us with several challenges, including:

- ensuring a tire flow of **3200 units per day**,
- **integrating the system into the existing architecture of the production hall**,
- **coordinating with management and production systems**,
- planning the tire layout in the warehouse to maintain access to all tire types during preventive maintenance on one module,
- **improving energy efficiency** through the use of an energy return system,
- **automating the reception and dispatch processes** from the warehouse,
- **allowing for service works on specific parts of the warehouse without stopping the entire system.**

Furthermore, the arrangement of tires in the warehouse was expected to be planned in a way that access to all produced types of tires is maintained on one module during preventive works, and servicing works on parts of the warehouse can be performed without stopping the whole system.

As a result, **we implemented a system consisting of four sub-warehouses**, each served by an independent stacker crane. This layout allows for the selective shutdown of a chosen sub-warehouse for preventive maintenance on one machine, without halting the others.

**The warehouse accommodates tires on 1600 allocation positions in a single deep storage system.** The tires are stored on specially designed carriers or plastic pallets measuring 1200x1200x300mm. **In addition to the storage system, we provided a robotic tire loading system.**





This system retrieves a single tire from the assembly trolley, identifies it through barcode scanning, changes its orientation from vertical to horizontal, and transfers it to the technological socket. From there, the tire is placed on a storage pallet with a QR code and transported into the warehouse via roller conveyors.

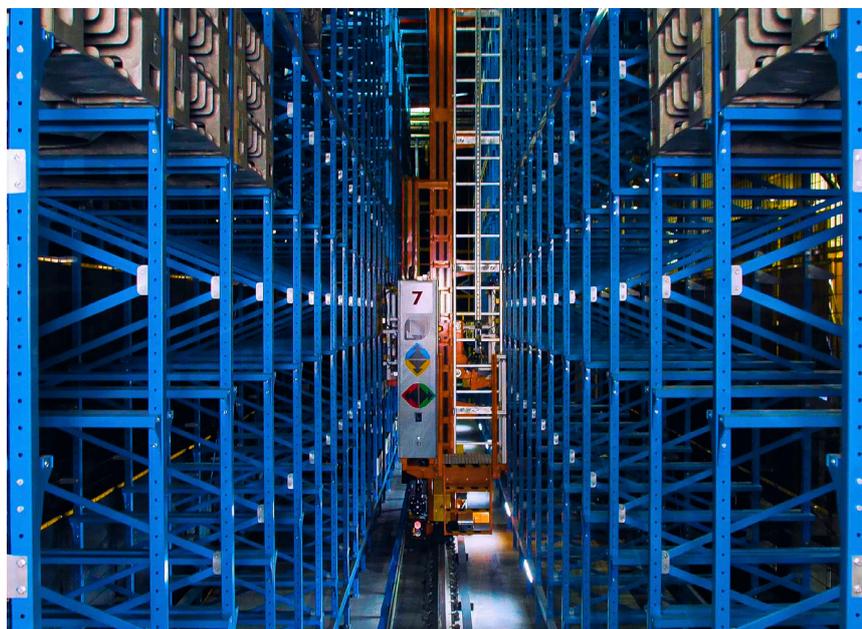
The warehouse serves two additional functions dictated by the subsequent technological process. Firstly, it acts as a buffer, pairs and lays tires flat. Secondly, it includes a robotic unloading system



at the warehouse's exit. Tires are transferred from storage pallets to the technological oven trolleys. Additionally, the unloading system collaborates with an automated queue and trolley shifting system.

**As part of this project, we executed, implemented, and integrated the entire control system, safety system, and WCS (Warehouse Control System) in cooperation with the production management database. As a result, the client received an efficient system entirely designed and executed by our company, tailored to their specific needs.**

Thanks to the open system and the use of commercial components, the client's maintenance services can independently diagnose and service the warehouse, minimizing downtime and maintenance costs.





## 4. Automation of a shower tray seasoning warehouse with transport infrastructure

MPL Techma was chosen by a company in the sanitary industry to automate their seasoning warehouse for a new shower tray production line. The project's goal was to provide optimal seasoning conditions for the shower trays and store them on a perfectly flat surface.

**The system we delivered consists of various components, including an automated high-storage warehouse, a shower tray supply system, issuing conveyor systems, final processing stations for shower trays, and inspection stations.**

Key elements of the project included **specially designed frames and the warehouse structure**. The entire system is controlled using MPL Techma's implemented Warehouse Control System (WCS), integrated with the client's Warehouse Management System (WMS).

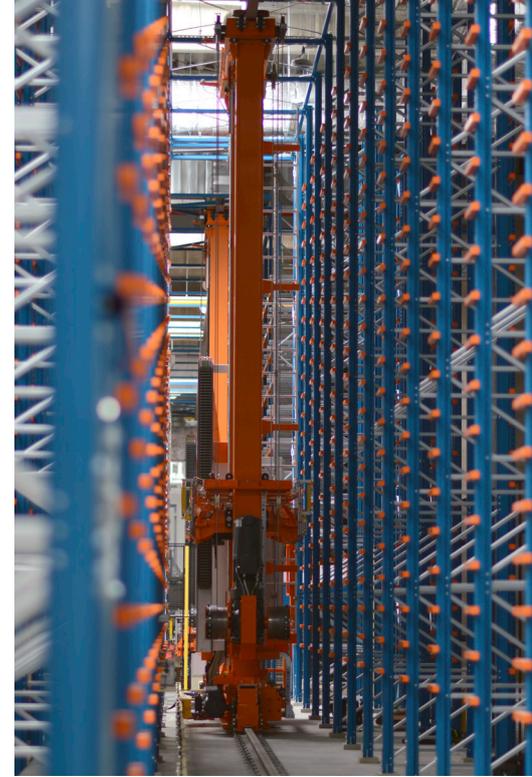
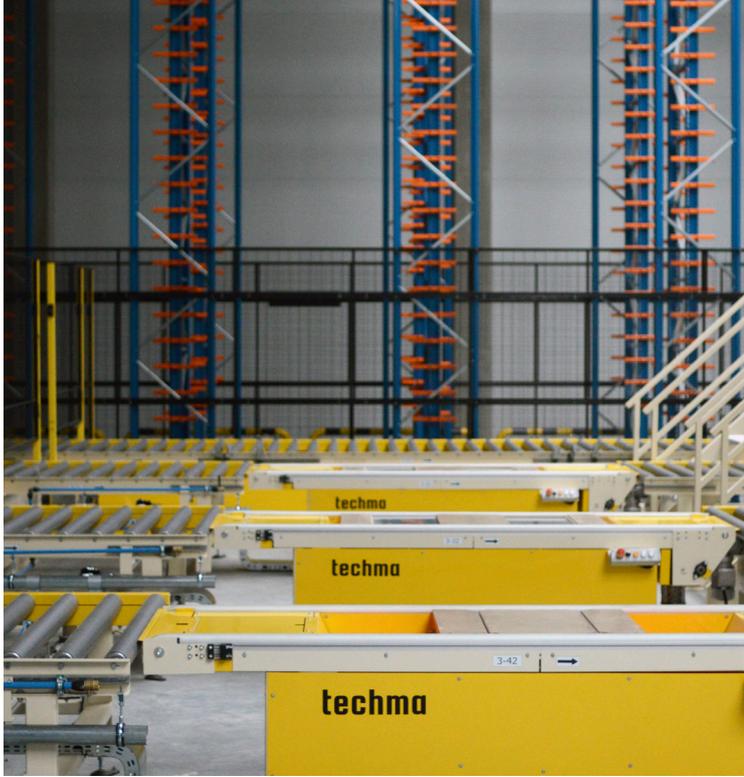
To meet the client's requirements, several technical solutions were applied. Special plates with precise support frames were developed, which are stored in the warehouse structure. These plates are universal and do not deform, regardless of the size and weight of the shower trays, ensuring a perfectly flat storage surface.

**The automatic warehouse is equipped with a stacker crane** for transferring plates with shower trays. The shower trays are loaded onto the plates at the warehouse entrance, and the cured shower trays are removed at the warehouse exit. **A conveyor system facilitates the smooth transportation of shower trays within the system.** The complex also includes inspection and final processing stations for shower trays.

The inspection process takes place on a lifting table, while the processing process occurs on lifting rotary tables integrated into the production lines.

**The entire process is managed by the control system**, which directs the transportation of shower trays to the appropriate locations within the system.





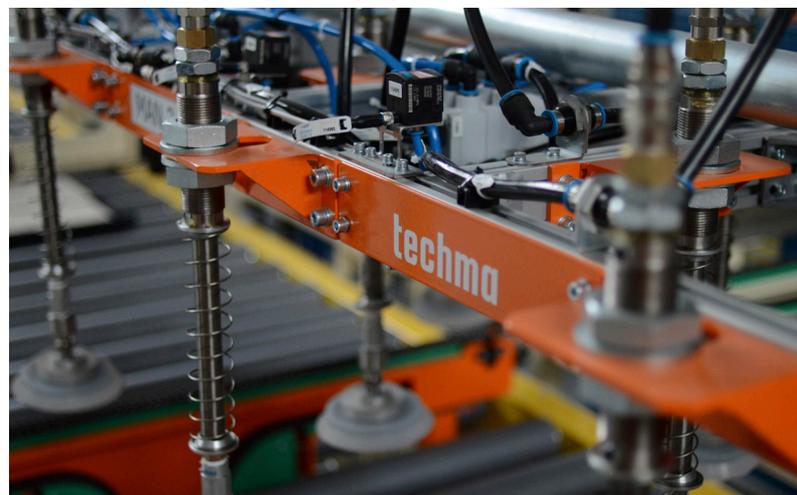
The WCS manages the location of shower trays in the warehouse, while the client's WMS oversees the entire production process.

Ensuring the proper protection of the shower tray surfaces was a crucial aspect of the project. Special material covers all conveyors to prevent damage to the shower tray's painted surface. The warehouse provides the appropriate seasoning conditions for each type of shower tray, tailored to individual requirements. The seasoning time for the shower trays is optimized, meeting the client's technological needs.

Thanks to the WCS system, access to each shower tray is possible in any sequence. The warehouse, serviced by the device for transferring shower trays, allows for flexible storage in any location, contributing to the smooth operation of the production process.

**Importantly, the project aligns with *Industry 4.0* capabilities**, where the entire process of moving shower trays is automated. This eliminates the need for manual involvement in repetitive tasks and provides full control over production.

Each shower tray is equipped with RFID tags, allowing for precise identification and marking. The entire process of moving the shower trays is controlled and supervised, ensuring high quality and process efficiency.





## 5. Automation of the mold warehouse for a new technological line in the sanitary industry



The MPL Techma project team developed a **dedicated automatic storage warehouse for a sanitary industry manufacturer**. Due to the specific dimensions and weight of the stored semi-finished products, it was decided to place them in standardized containers. **The warehouse structure was tailored to spatial requirements in the production hall and integrated with the production line, adjusted to dynamic production demands**. In addition, loading tools were developed, and the layout and its carriage were adapted to enable mold storage in the warehouse. Software for efficient management of storage and flow of molds was created and integrated with the production line management IT system.

The new solution allows for increased production flexibility, enabling the customer to easily adjust production to various orders, including short product series and individual items.

Another aspect is the optimization of storage flow. **The warehouse was designed to efficiently store and handle molds of various sizes and weights**. As a result, the mold storage process becomes more efficient, minimizing the risk of damages and delays in the production process.

**Managing production is also crucial. The developed software is fully integrated with the production line management IT system.**



## 6. Spool storage system operated by AMR trolleys

A tire manufacturer reported **an issue with storing semi-finished products placed on a non-standard carrier - large steel spools** used in various production sockets on the factory premises.

After analyzing the processes of receiving and issuing spools, we decided to develop and build a high storage production warehouse equipped with docks for automatic receiving and issuing of spools to and from the warehouse by autonomous trolleys. **A specific feature of the application is the adaptation of the warehouse structure, layout, and docks to the carrier - spools with a specific shape.**

**The warehouse complex is managed by dedicated WCS software** developed on the Scada AVEVA platform (formerly Wonderware) collaborating with a SQL Server database. To ensure the full functionality of the complex, **it was integrated with existing IT systems in the plant.** This challenge required the development and implementation of new interfaces for these systems in cooperation with the plant's IT services.

One of the essential aspects we worked on was user safety. **All warehouse docks are automated, so we developed special solutions to ensure their safe usage, protecting them from unauthorized access** in areas where machines operate in automatic mode.

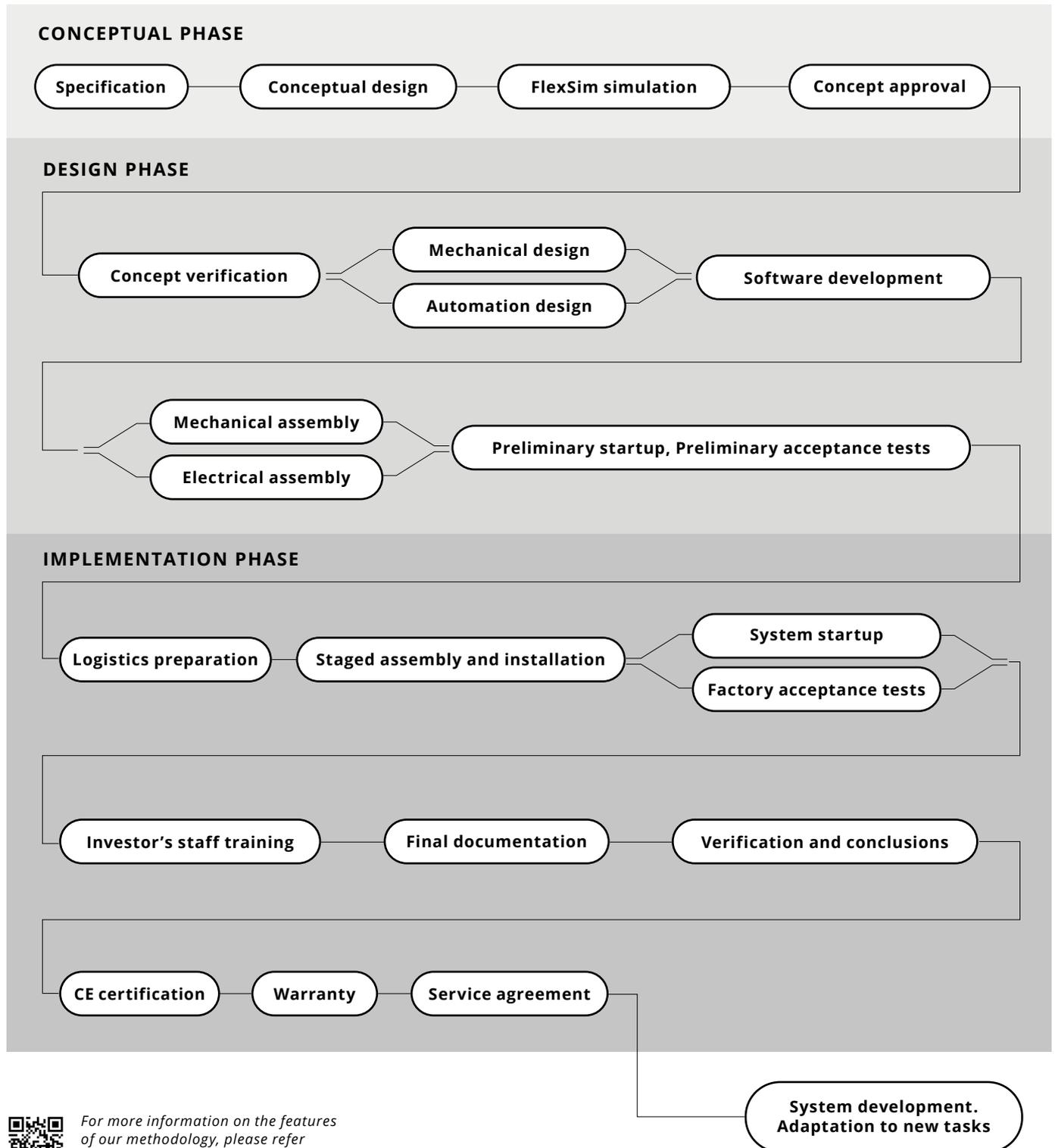
As a result, the customer received **a fully automated spool distribution system for production material, fully controlled by the IT system - without human intervention.**

This led to reduced production and storage costs through an automated location management, spool issuing, and production process. Additionally, **the plant reclaimed valuable space on its premises, which was previously occupied by spools.**

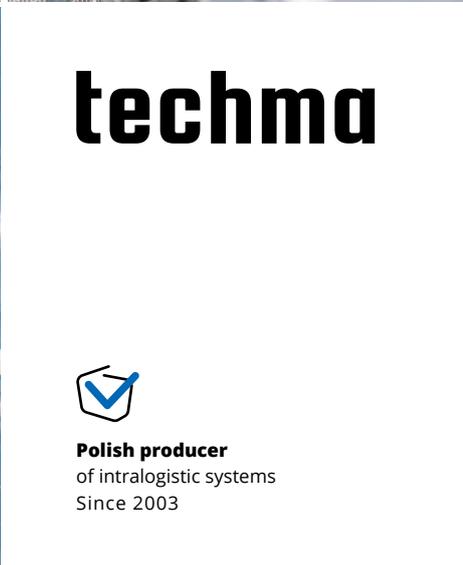
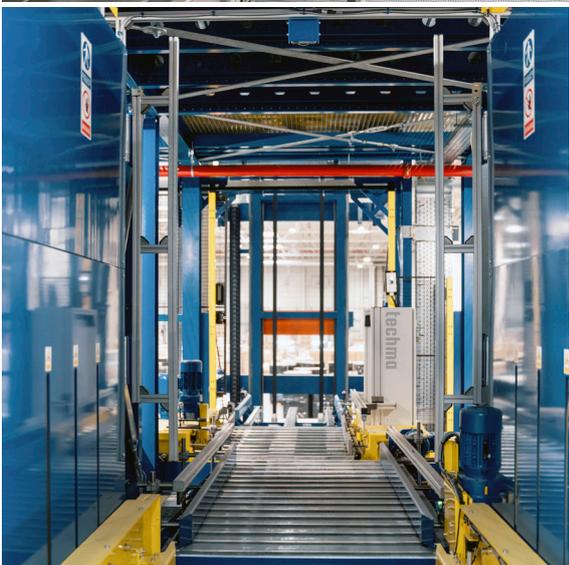
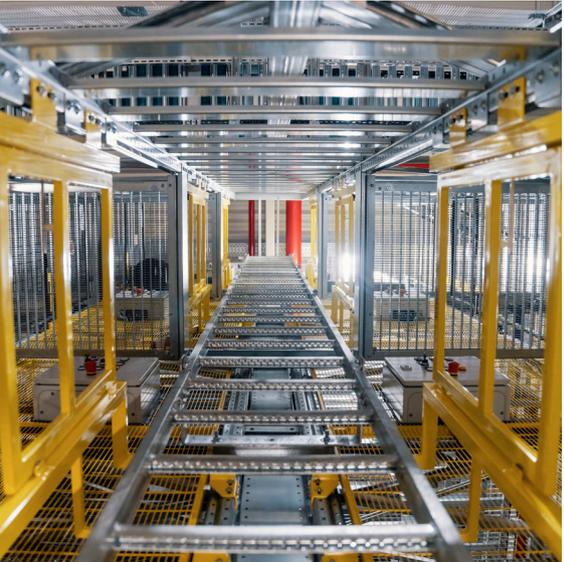
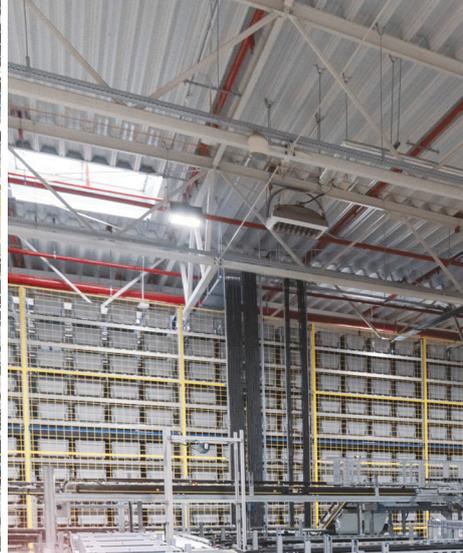


# Methodology of the design and implementation process

We conduct project implementation based on a proven methodology. Its distinctive features include: experience and efficiency, **openness to customer needs, close and personalized collaboration with the investor, ease of adapting existing components** (e.g., other production lines), **striving to create optimal and dedicated solutions**, as well as the inventive potential enabling **the creation of open and scalable solutions**.



For more information on the features of our methodology, please refer to the documentation.



# techma



**Polish producer**  
of intralogistic systems  
Since 2003



# techma<sup>®</sup>

---

dedicated  
intralogistics

[zapytania@mpltechma.pl](mailto:zapytania@mpltechma.pl)  
tel. (+ 48) 58 333 50 60

---

[mpltechma.pl](http://mpltechma.pl)



MPL Techma Sp. z o.o.  
ul. Telewizyjna 22  
80-209, Chwaszczyno, Poland

---

Registration data company  
ul. Wielkopolska 251,  
81-531, Gdynia, Poland

NIP: 958-14-35-996  
KRS: 0000162619



**Polish producer**  
of intralogistic systems  
Since 2003

