CIM LOGISTICS SOFTWARE SPECIALISTS

Whitepaper

WMS and Production

Unleashing the power of logistics

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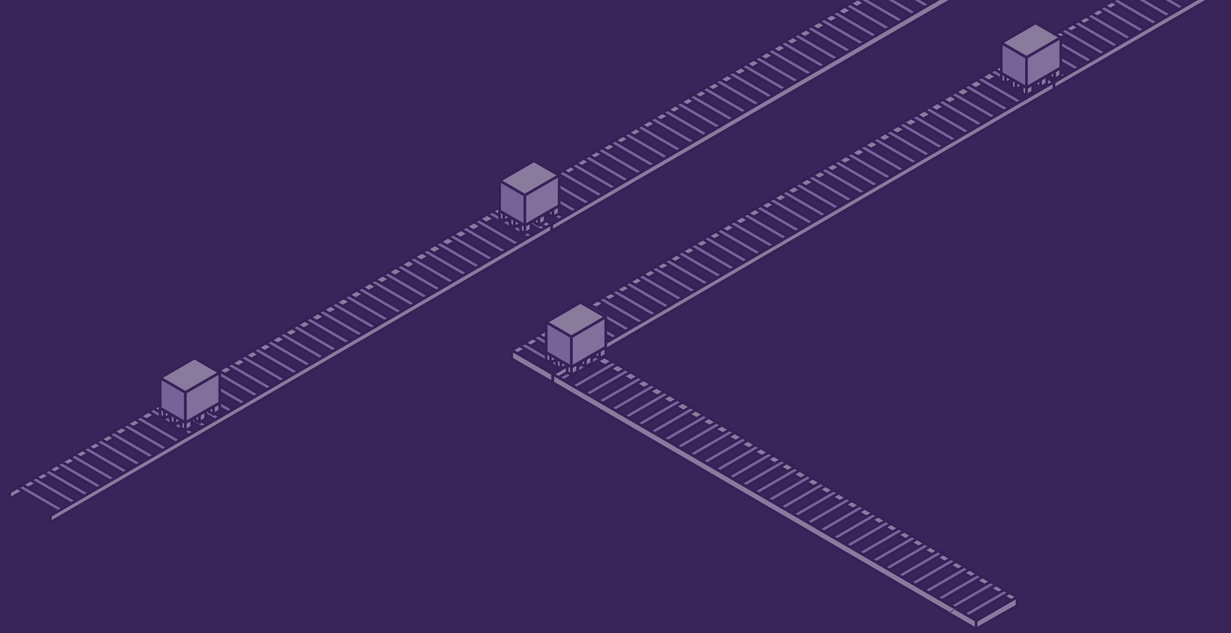


Integration of production logistics in WMS environments for multiple benefits

CIM is revolutionizing production for companies across multiple sectors thanks to integrated production logistics in its warehouse management system **PROLAG World**. Integration of production functionality represents a further step in the evolution of logistics systems, offering considerable advantages over conventional solutions.

Material flows achieve 100 % transparency along the entire intralogistics chain, hidden data relevant to production can be extracted and applied, and efficiency is significantly optimized thanks to the global WMS solution offered.

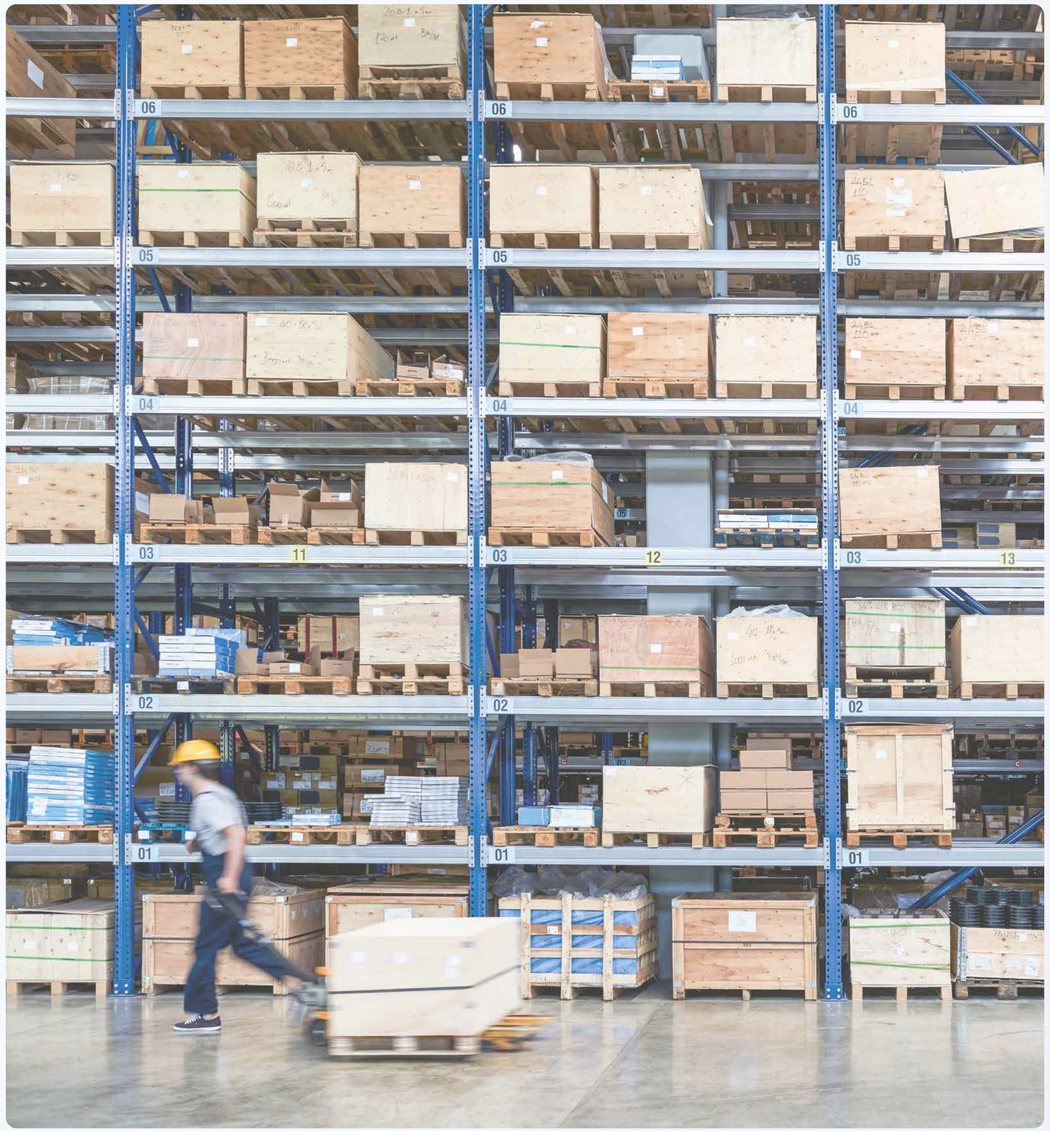
In this white paper, we'll be taking a look at the interplay between production logistics and intralogistics, and explaining why warehouse management systems will be playing a bigger role in production in the medium term. Using a real-life case study, the paper provides an in-depth look at how **PROLAG World** Production is implemented, showcasing its practical application and tangible benefits.

The paper clearly demonstrates how the seamless integration of intralogistics and production logistics creates optimal synergy effects. Production capacities can operate at a higher speed, more effectively and with enhanced efficiency, while simultaneously maintaining an overview of stocks and remaining quantities. In this context, global warehouse management with integrated production capabilities represents the next logical evolution in WMS solutions.

Production logistics versus intralogistics

The flow of materials within production and production planning is traditionally managed by ERP systems. In addition to planning and steering the qualitative production of goods, ERP systems are responsible for ensuring timely supply of the requisite raw materials. Logistics processes such as transportation, transfer, storage and picking are the basis on which these operations are implemented.

Production and logistics are inherently interconnected, which is why the term production logistics is often used. However, this term can create the impression that production logistics is distinct from the broader scope of intralogistics for manufacturing companies. A closer examination of commonly accepted definitions reveals that a clear distinction is, in fact, challenging to establish. Both production logistics and intralogistics largely encompass the same processes within warehouse environments. This theoretical insight carries significant implications for practical warehouse and production planning, potentially influencing strategic decisions and operational efficiency.



Filling the gap

ERP system providers with production modules assume that the procurement of raw and working materials falls within the scope of production logistics, and that their systems are equipped to reflect this adequately. In practice, however, the situation is different. First, the ERP system notifies the WMS which raw materials are required for production. Then the relevant stock is delivered to the materials warehouse, representing a shift from intralogistics to production logistics. This is the point at which the WMS loses sight of the stock, resulting in a significant blind spot.

In this way, an artificial barrier is created based on the perceived distinction between production logistics and intralogistics. Since the ERP system does not steer internal warehouse processes, nor does the software allow any insight into them, material flows cannot be fully tracked. Because the ERP system is inherently unable to provide a complete overview, supply chain management experiences disruptions within the production environment.

The consequences: data loss and costs

Due to the inherent blindness of the ERP, important data and processes are not fully understood. Since intralogistics and production logistics are seen as different areas, production planning cannot map how machine operators gain access to the required raw materials or where specific raw materials and finished products are located within the production environment. The WMS logbook merely records that materials have been transferred to production, effectively marking them as having been dispatched to internal goods issue. They have essentially "disappeared" from the warehouse. The ERP system, on the other hand, merely registers that new materials are available in production or are already being used in production.

This mismatch can have severe consequences, particularly in batch management. Once materials have been received in the production materials warehouse, batches are no longer mapped. Production cannot tell which batch has been used in which finished product. In the event of defective batches, a lack of traceability can lead to significant costs, as entire production lines may have to be taken out of circulation.

Goods transformation – a black hole in the supply chain

Another major challenge arising from the functional separation of intralogistics and production logistics is the goods transformation process – the conversion of raw materials and finished components into final products. Looking at goods transformation from the point of view of the warehouse management system, the following happens: Raw materials go to the picking station and, once picked, are transported to production, where they effectively ‘disappear’ and are no longer mapped in the WMS. A certain amount of time elapses, during which goods are transformed. The goods then reappear in the system as a new goods receipt, ready for storage or dispatch.

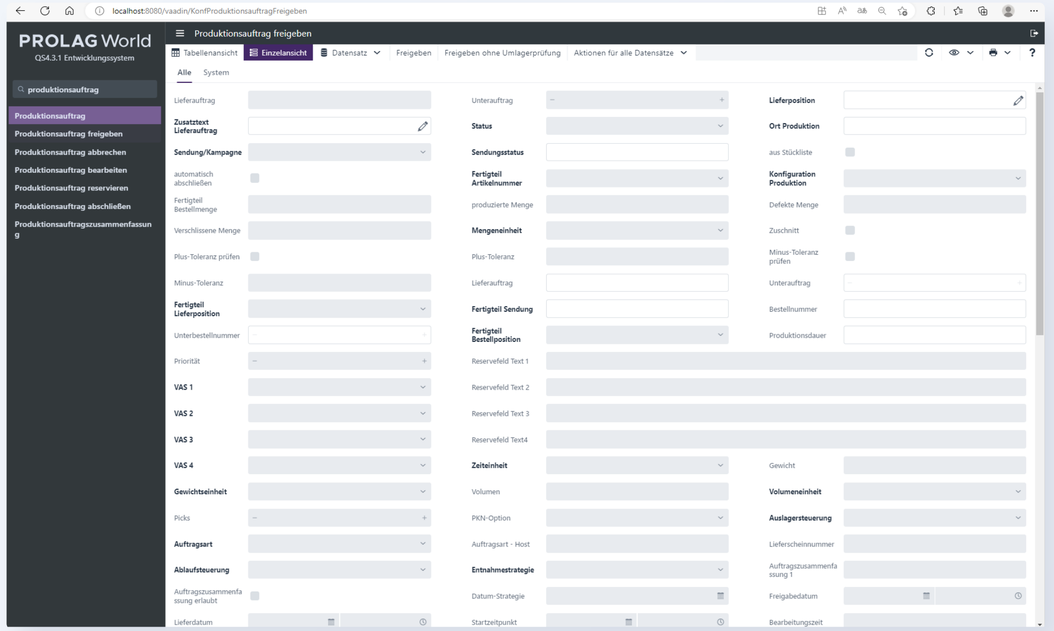
The ERP system does not track the original storage locations of raw materials and therefore cannot identify which specific materials were used to create the finished product. While a warehouse management system is inherently designed to track and manage such information, this capability is foreign to ERP systems, which focus on production planning rather than warehouse operations. As a result, crucial data regarding the origin and composition of products is lost.

A global approach to intralogistics

To achieve seamless operations, it is essential to consider production logistics and intralogistics in a unified system. The challenges outlined can only be effectively addressed by a solution that not only manages pallets and containers within the warehouse but also extends its capabilities to track them at production machinery. When electronic mapping reaches this level, digitalization of both warehouse and production processes has been achieved.

With **PROLAG World**, CIM has successfully created a warehouse management system that integrates these critical functionalities. The software shows how warehouse workers access the requisite raw materials, tracking the precise location of raw materials and finished products at each machine, and ensuring full traceability of batch usage. **PROLAG World** seamlessly transports the materials on pallets or in containers from the warehouse to production and back, including leftover materials.

By adding the ERP system's production planning functionality, **PROLAG World**'s Production module can map all production processes. Complete transparency is provided across the supply chain and material flow within the warehouse, allowing streamlined control of production. **PROLAG World** supports all work processes, using predefined bills of material to minimize errors and improve efficiency.



PROLAG World tracks processes accurately and also immediately makes raw materials available for other orders, ensuring a smooth and continuous workflow.

Thanks to integrated planning of production logistics and intralogistics, the gap between warehousing and production can now be entirely eliminated. The system not only manages the replenishment and supply of raw materials but also accommodates tolerances, tracks circulating remnants and monitors error rates. The digitalization of work and business processes fosters sustainable, future-proof production planning, ensuring optimal use of existing resources while minimizing waste.

Case study:
PROLAG World Production in action

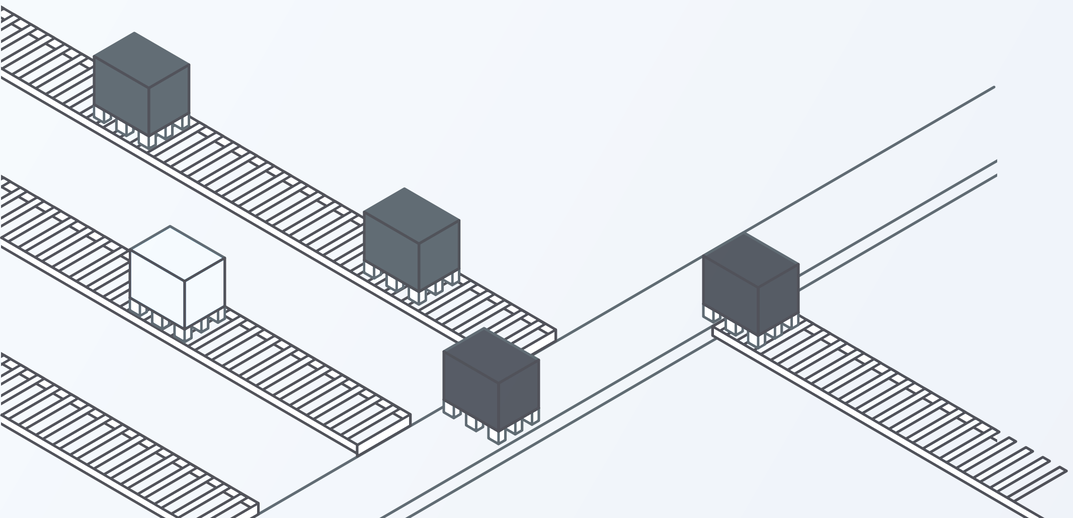
With the Production module, **PROLAG World** extends its capabilities beyond intralogistics to encompass production logistics. This is particularly valuable for companies that operate their own production facilities as well as selling and distributing externally purchased goods. The WMS not only maps stock in the warehouse but also tracks the available production resources at individual machines. It monitors material supply, standardizes work processes and defines bills of material. As a result, goods in production and stock from the warehouse can be picked and shipped together, even though they belong to different operational areas. This seamless interplay between production and warehousing streamlines processes and leads to measurable improvements in production efficiency.

The following case study highlights the integration of **PROLAG World** Production at a Dutch company. One of CIM's most recent success stories, this case demonstrates the significant potential of integrating warehouse management and production systems.

How it started

The Dutch market has a long tradition in logistics and production. Thanks to its history, the Netherlands has developed a deep understanding of how to trade and handle imported goods, and today can use this expertise in the production and distribution of Dutch products. Dutch businesses recognize the potential and synergies within their own distribution networks, strategically integrating goods from their own production alongside their traded goods. The company featured in our case study exemplifies this strategic approach.

The **Cleantrade GmbH** (name changed for confidentiality) operates primarily as a commercial enterprise, offering products across three distinct segments. These are: Combination and leisure products for holiday homes, cleaning products designed for bulk buyers with tailored cleaning concepts, and cleaning cloths for retailers, specifically fleece and microfibre products.



The company differentiates its logistics processes by goods flow:

- **Transit:** Purchased goods are sold and delivered without any modifications.
- **In-house production:** Fleece fabrics on rolls are printed, folded, cut and packaged in-house. A distinction is made between "cleaning pads" and "cleaning cloths". Processed goods are either added to the stock range, delivered as entirely new products or sent on for further processing elsewhere.
- **External production:** Purchased goods and/or processed fleece fabrics go to external sites for further processing.

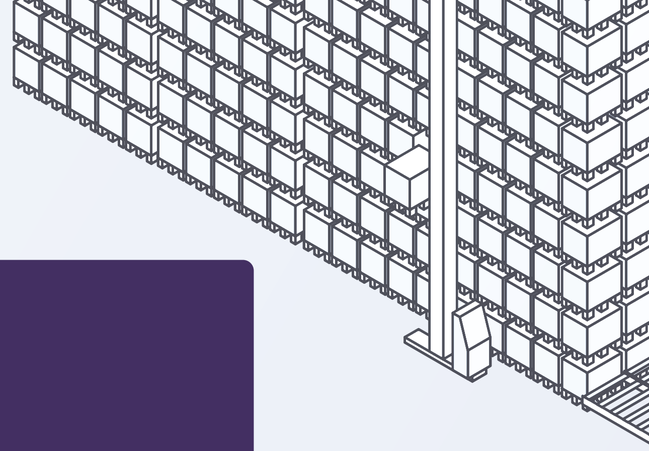
As Cleantrade continues to grow, the company is expanding its storage capacity by adding a new warehouse to complement the existing facility. Additionally, it aims to accelerate digitalization efforts.

The primary objectives of the project are to minimize search times, reduce errors in warehouse management, implement a barcode system, allow early bookings and optimize transaction processes. While external production will not be directly controlled by the software, it must still be mapped in the logistics and production workflows. ›

› By implementing **PROLAG World**, Cleantrade GmbH has chosen a comprehensive logistics solution to handle all processes from goods receipt to goods issue. **PROLAG World** can communicate with the existing ERP, receiving master data for stored articles as well as bills of materials for products manufactured in the production area.

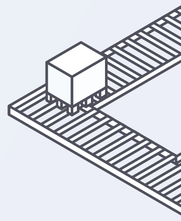
Thanks to Cleantrade's warehouse expansion, the production area is fully integrated into the broader intralogistics system. A new storage facility with sliding racks is being added to the existing high-bay warehouse, specifically to support production operations. **PROLAG World** supports automatic replenishment and picking with restorage for raw materials, with all required processes readily mapped within the system's standard features and eliminating the need for additional development efforts. Furthermore, Cleantrade's proprietary barcoding system is easily accommodated within **PROLAG World** using the customer location barcode module 205-32.

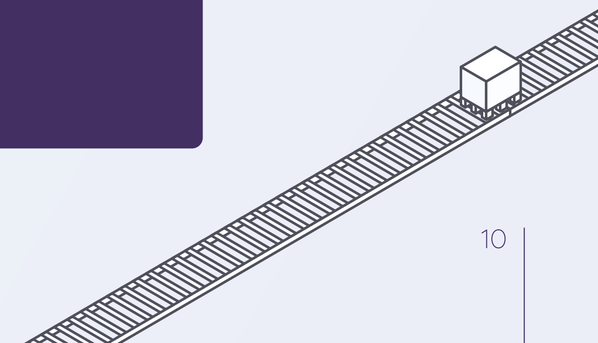
Some article groups (for instance brooms, knives and forks, buckets) have special requirements since they come from different suppliers. These article groups are stored in designated storage areas within the warehouse to ensure efficient storage and retrieval. The storage strategies module addresses this issue effectively.



Warehouse and production layout

- Number of articles: approx. 13,000
- Number of different article groups: 15
- Warehouse layout: Pallet storage locations in high-bay warehouse and sliding racks for production supply
- ERP interface to InforLN
- Integrated **PROLAG World** modules
  Production series overview:
  - Production supply and manufacturing
  - Extension of production supply and manufacturing – tolerances
  - Extension of production supply and manufacturing – entering weight in production
  - Extension of production supply – production planning with campaign building
  - Picking with return to storage
  - All mobile processes using **PROLAG Go**





Logistics processes in production

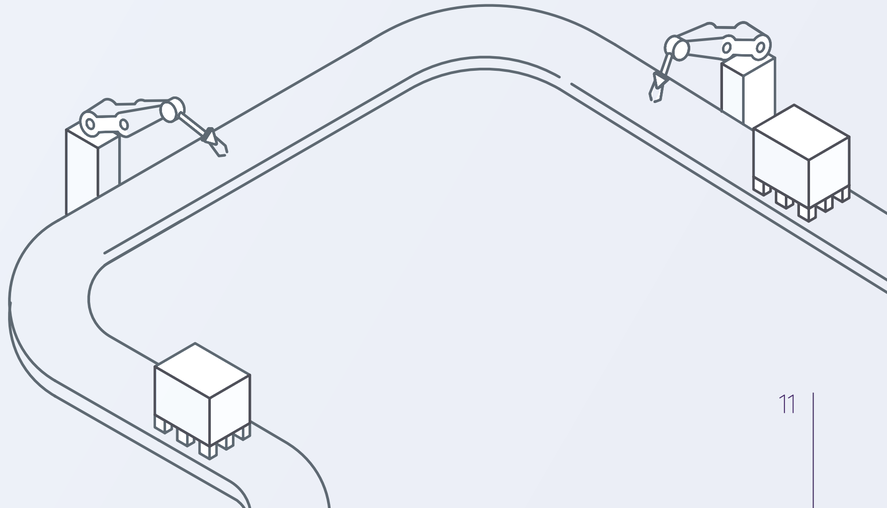
In this case study, **PROLAG World** manages two distinct production systems, one dedicated to producing cleaning cloths and the other to manufacturing cleaning pads.

Each production area is seamlessly connected through the production circulation process (picking with return to storage), which allows **PROLAG World** to efficiently control the delivery of raw materials to the production areas. A unique challenge in the production of cleaning pads is the handling of rolled bands of fabric. **PROLAG World** effortlessly manages this through its built-in capabilities for managing remaining quantities. Entire rolls or pallets can be retrieved for production, and, once a production order has been completed, any remaining material is recorded and returned to the warehouse.

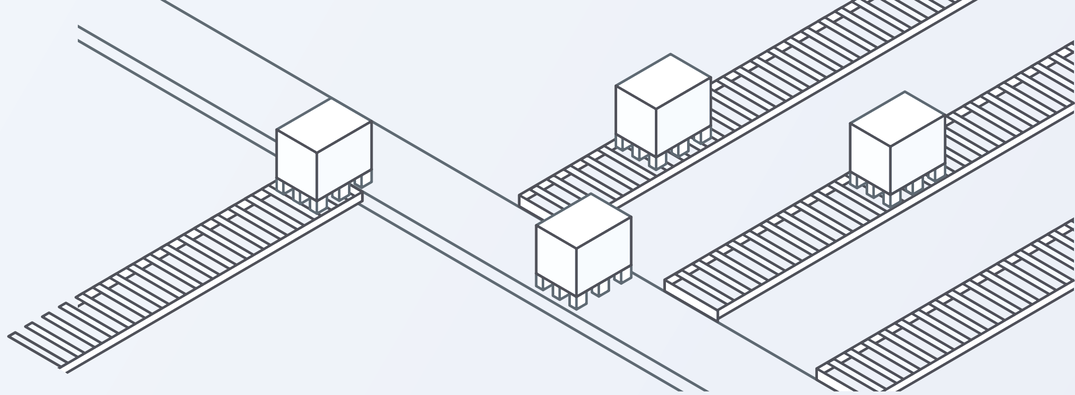
The retrieval strategy is an essential component in optimizing raw material management. Since **PROLAG World** has real-time access to production orders, bills of materials and the quantity of raw materials at each machine, it ensures that materials remain at the production area until all production orders have been fulfilled. For example, if a total of 10 meters of fabric is required for several production orders, the entire roll is delivered and retained at the production area until processing is complete. The remaining fabric is not returned to storage until all orders have been fulfilled.

In the production system focussing solely on cleaning cloths, an entirely different strategy is employed for remaining quantities management. Pallets already used in production can be transferred to a dedicated group for returns to storage within the system interface. This specialized group consolidates pallets with remaining quantities and stores them separately so that they can be accessed quickly for retrievals. To optimize raw material utilization and reduce unnecessary costs, **PROLAG World** prioritizes raw material reservations from the returns to storage group. If the required quantities are not available, the system then resorts to warehouse stock to fulfill production needs.

For items such as screws or yarn that do not require transport orders, a dedicated supply area is utilized. These items are stored in labelled cartons and transported as needed. The supply area is continuously replenished through the system's automatic replenishment feature, ensuring a steady supply of essential production materials.



Production orders and manufacturing processes in PROLAG World



Production orders

Each new production order is seamlessly transmitted to the warehouse management system using the ERP system Infor. Along with the order, crucial information such as the optimal shipment quantity, the raw materials used and the associated items is also transferred. The production areas are supplied according to the defined logistics processes, ensuring full traceability of raw materials from warehouse to production and allowing precise tracking of individual production lines. This level of traceability is particularly beneficial in the event of quality issues or complaints related to defective batches.

Campaign planning

At Cleantrade, production is organized in campaigns, requiring extensive planning to ensure efficiency and resource optimization. Since the ERP system lacks the capability to plan production based on current stock levels, **PROLAG World** bridges this gap by offering a platform for campaign planning. Using the "plan production" feature, new campaigns can be efficiently planned. Delivery orders are consolidated into multiple production orders, with one active production order assigned to each campaign. A key feature of the system is its reservation process, which is optimized to ensure that all production orders are gathered before the raw materials (rolls) are retrieved from storage. This strategic approach helps save valuable time during the order-picking process.

The sequence of production orders can be configured in the system interface. However, for campaigns, reservations are handled within the production process rather than in the order control centre. All reservations are assigned to an order once it is active. The second order does not begin until the first has been fully completed.

Special features

In make-to-order scenarios, where just-in-time production is mapped, production time plays a crucial role. PROLAG World tracks the start and completion of production for each product and communicates the required time to the ERP system. Additionally, weight recording is integrated into the system upon completion of the production order.

External production

For Cleantrade, external production sites are customers. Deliveries of raw materials and missing parts are handled in the same way as goods deliveries to other customers. Delivery orders are transmitted to **PROLAG World** through the ERP system.

Conclusion:
A global approach to intralogistics

The case study demonstrates that integrating **PROLAG World** Production into an existing warehouse alongside an established ERP system is a seamless process.

PROLAG World efficiently communicates the necessary information to the ERP system, allowing it to maintain a clear overview of inventory at all times. As a result, information about production times and the individual weights of produced goods is available to the ERP system, which can then ensure that internal material flows run smoothly.

In our case study, Cleantrade GmbH effortlessly connects production with warehouse operations, unlocking hidden synergies through its efficient picking with restorage functionality. **PROLAG World** leverages remaining stock as a valuable resource, readily available to machine operators, while automatic replenishment plays a crucial role in sustaining production flow. Additionally, the batch management feature integrated within the WMS is indispensable for streamlined and professional production processes.

PROLAG World takes full control of resource planning once it has received production orders from the ERP system, meticulously tracking which raw material batch is used for which production order. Defective products can then be swiftly identified and removed from circulation to minimize potential disruptions.

External production sites can be integrated into the system by treating them as customers. This practical, straightforward approach supports extended production capabilities without having to move away from the standard process.

Cleantrade relies on campaign-based production as its preferred planning strategy – an approach effortlessly supported by **PROLAG World**. With this feature fully included as standard, the system efficiently collates and consolidates production orders. The requisite supply of raw materials is managed in the background, ensuring a smooth and nearly invisible process for the user.

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