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Automation solutions
Along the textile value chain

From Melt to Yarn

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Automating the manmade fiber industry

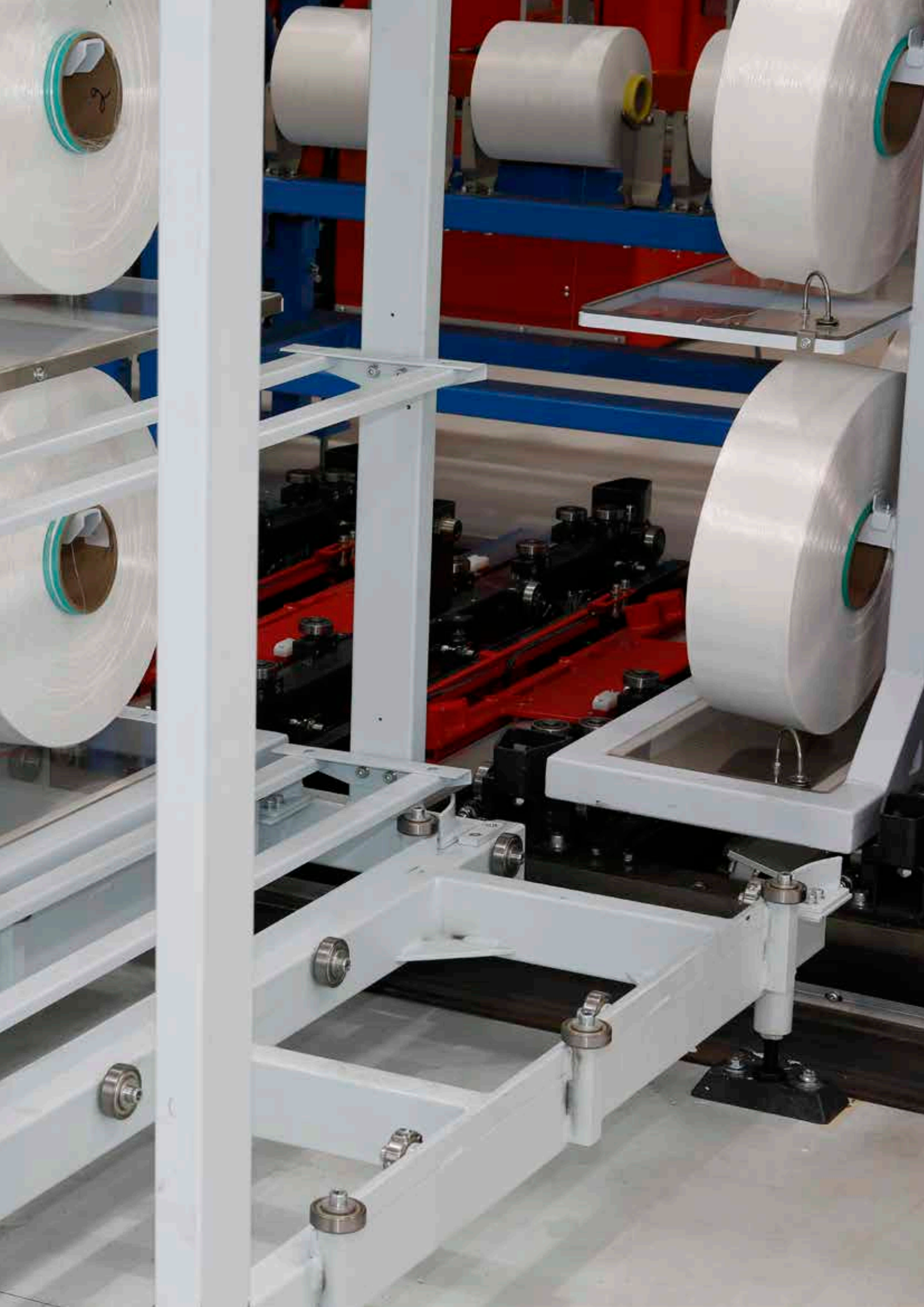
Oerlikon Barmag´s automation solutions have guaranteed since a very early stage turnkey supply to our customers, who are in need of a perfectly integrated production and logistic solution.

Highly sophisticated and proven robotized handling, packing, transportation and warehouse systems for the chemical fiber industry are combined with a state of the art OPC-UA communication platform with integrated MFC/MES systems.

Increase your process efficiency, through the advantages of automation.

In the recent years the main motivation for investing in filament automation was the independence from manual workforce with a consequential quality increase of the final product.

The latest tendency in industrial production and the next step in the development chain is the so-called Industry 4.0, which stands for complete cross-linking of information connection to the outside, e.g. the customer.



Wiping robot

The wiping robot guarantees outstanding yarn quality with a high degree of efficiency and optimized systems management.

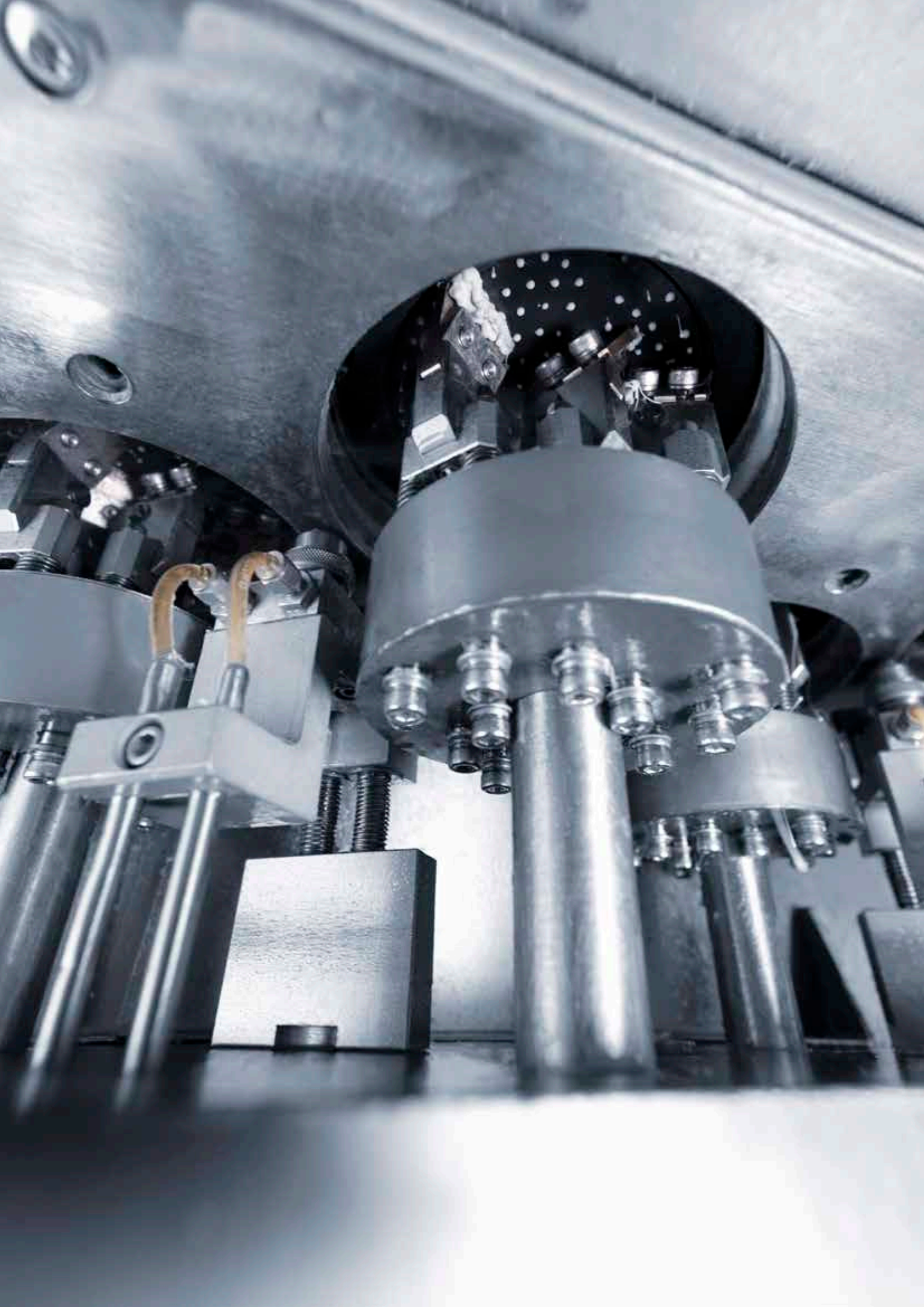
As a result, yarn manufacturers can minimize costs and maximize profits. How is this possible? It's really quite simple: conventionally, the wiping process is sweat-inducing work. By automating it, yarn manufacturers can not only increase the full package rate and reduce the yarn break rate – they can also minimize the deployment of staff at the spin packs and produce less waste, hence supporting their HSE (Health – Safety – Environment) initiatives.

Integration into the Oerlikon Barmag Smart Plant System, which is possible in most cases, optimizes shift and systems management. The wiping robot automatically moves to the correct position and carries out the wiping cycles in a fully-autonomous manner.

Key features

Greater efficiency and lower costs as a result of

- Higher full package rate;
- Lower yarn break rate;
- Up to 25 % longer wiping intervals;
- Less waste;
- Utilization of silicon oil from canisters; this dispenses with approx. 95 % of the spray cans normally used in manual wiping;
- A more pleasant and healthy working environment for the operating staff.



Doffing systems for spinning machines

Doffing the packages from the winder is the first handling step in modern automation systems.

Since the doffing system is directly connected to the production machines, its design must perfectly adapt to the operating surrounding conditions. Only this way maximum production efficiency can be achieved. This means matching the specific needs of different winder types as well as granting operator safety in the sensitive working areas.

Key features

- System availability > 99 %
- Laser scanner for maximum operator safety, as per European safety standards
- Unrestricted operator movement due to a comfortable clearance of more than 1m between doffer to winder
- Optional: empty tube handling (supply to winder)
- Interacting with further Oerlikon Barmag automation equipment (e.g. wiping robot, etc.) guarantees optimum task scheduling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Doffing systems for texturing machines

For the automatic doffing of modern automatic texturing machines Oerlikon Barmag offers the use of a floor based AGV (Automated Guided Vehicle) system.

Using state-of-the-art laser navigation these units do not require any mechanical rails or guiding, which would interfere with the remaining manual work in this area. Due to flexible navigation concepts and a system-based redundancy huge capacities can be covered with even a small number of AGVs.

By automating POY supply and DTY disposal/collection, texturing can thus also be easily connected (from Oerlikon Barmag) to POY production in terms of data technology via an intermediate storage facility.. This provides completely new options in regard of quality control for plants with POY production and downstream processes, using the advantage of non-stop product tracking starting from the raw material up to the DTY bobbin.

Key features

- Flexibility
- Independence
- Highly efficient transport,
  as with up to 54 coils capacity per cycle

Transportation systems

After doffing the bobbins are transported to the intermediate storage or in some applications directly to the packing system. Two different basic concepts cover this function.

BRS
Automatic overhead transport using the proven automation solution Bobbin Railway System (BRS). The Bobbin Railway System is an overhead monorail system which was especially adapted to the typical needs in a modern man-made fiber plant. (It is mainly used in combination with Oerlikon Barmag Doffer systems).

AGV
An alternative to the BRS is the use of floor based Automatic Guided Vehicles (AGV). The AGV system can apply a combined doffing and transportation function. AGV systems are of advantage especially in plants with low room heights, when it is not possible to install a suspended transport system safe for the personnel. Due to the independence from any fixed track or rail installation, this concept offers maximum flexibility and is therefore also ideal for a gradual expansion of systems.

Quality Control
Online bobbin inspection in the visual inspection station. All data is transferred online to the main server of the installation. Thus an immediate feedback signal can be submitted to the production area in case of quality fluctuations.

Bobbin Weigher
Precise weight determination of each bobbin in a doff by the fully automatic bobbin weigher including automatic calibration of weighing cells. The precise data allow for weight cross-checking to detect temporarily jumped filaments.

Key features
- Integrated inspection and laboratory
- Single platform for data and quality management
- Error free data and product tracking


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Multi-tray storage systems

The heart of a typical automatic filament handling system is the intermediate storage. Here, finished packages of the same lot, quality, etc. are collected until a sufficient and reasonable number is reached for packaging or further processing, such as texturing.

Since intermediate storage can be considered as one of the most important part of an automatic filament handling system, its design determines an essential part of the flexibility, efficiency and reliability of the entire installation. Based on the special requirements of a specific plant Oerlikon Barmag automation offers two different solutions:

Key Features multi-tray storage

- Compact intermediate storage for large bobbin quantities
- Fully automatic warehouse management
- Direct access to every single bobbin offers highest flexibility
- Fast access to each storage position through the usage of high-performance stacker cranes

Key Features AGV based rack storage

- Highest handling capacity due to usage of Pin-Container (6 doffs per container)
- Redundant access concept by storage servicing with AGVs
- Flexible and very cost-effective design

Today these successful systems, patented by Oerlikon Barmag, are operating in many spinning and texturing production plants around the globe.

Advanced packing systems

The packing line requires the highest degree of customization. Therefore it benefits most from Oerlikon Barmag´s general design concept.

The end-user's requirements regarding bobbin packing and box palletizing are extremely variable and can be fully adapted into the provided system. For "newcomers" in the field of automation also semi-automatic packing lines can be offered, which easily, at a later stage, can be extended to a fully automated plant.

Using well proven and intelligent strategies Oerlikon Barmag manages to accommodate all packing requirements with minimum hardware efforts. The packing concepts and the packing machines provide the key to the effective realization of these highly customized systems which often lead to a reduction in packaging material while reducing shipping costs.

Dense Packing System
The sensational Dense Packing System for DTY bobbins and similar products using a 6-axis jointed-arm robot, wellknown from the automobile industry and highly sophisticated software to place each single bobbin according to a pre-calculated pattern. Optimal usage of the available space guaranteed, regardless of the bobbins diameter.

Box Array Palletizing
Palletizing of small boxes onto a shipping pallet. Any pattern can be arranged on request due to the flexibility of the modular design concept.

Key Features
- No touch = no damage
- Perfectly built pallets
- Human error eliminated
- Also available as standalone package with packing from creel cart

Pallet finishing and warehousing

The pallets are finished and stored. With solutions from Oerlikon Barmag Automation

Pallet finishing

The packaged/built pallet is ready for dispatch in the end line i.e. closed, weighed, labeled and finally supplied to the commissioning via a delivery buffer. Open communication interfaces realize every packing suitable for automatic operation.

Common steps in the finishing line are:

- Carton covering of pallet
- Weighing
- Labeling
- Wrapping
- Plastic film strapping
- Shrink hooding
- Stretch hooding

Key Features

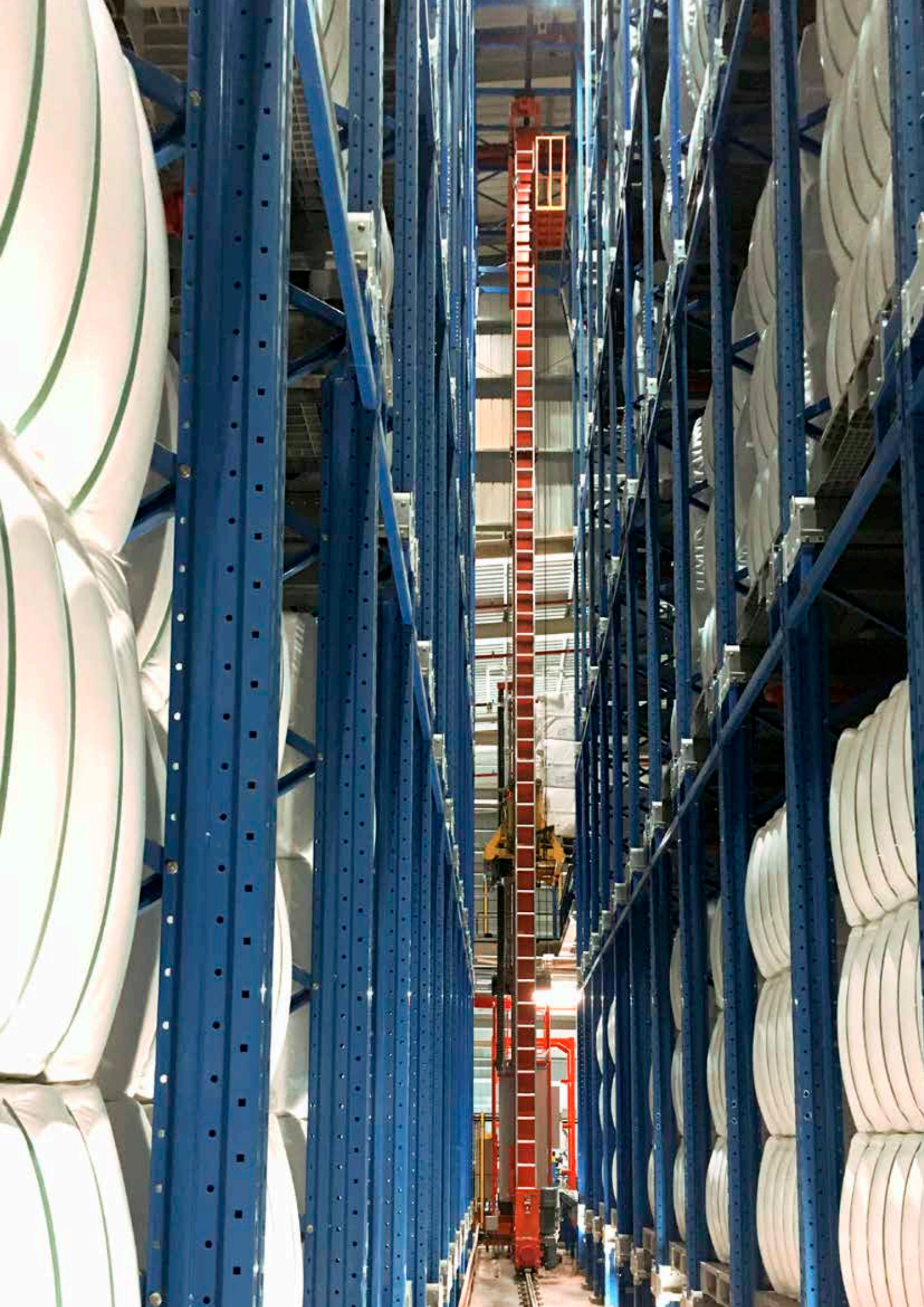
- No touch = no damage
- Perfectly identically build pallets
- Human error eliminated
- Also available as standalone module

Warehousing

In order to simplify warehousing, which is often very time and space consuming when effected manually, and to integrate the storage management into the automatic product flow the delivery range is completed by fully automatic high bay storage systems including all functionality for commissioning, route planning and truck loading.

Key Features

- Integration of local supplies possible, based on Oerlikon Barmag´s quality supervision
- Direct link to customer-side ERP system for ull system integration
- Solution from one source to avoid interface problems



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