



PESMEL MATERIAL FLOW HOW

Handling Systems for Paper and Converting

PESMEL

Material Flow How® -Concept

The idea behind the Material Flow How® -concept is to arrange production and material flows so that production efficiency is maximized and needed equipment minimized.

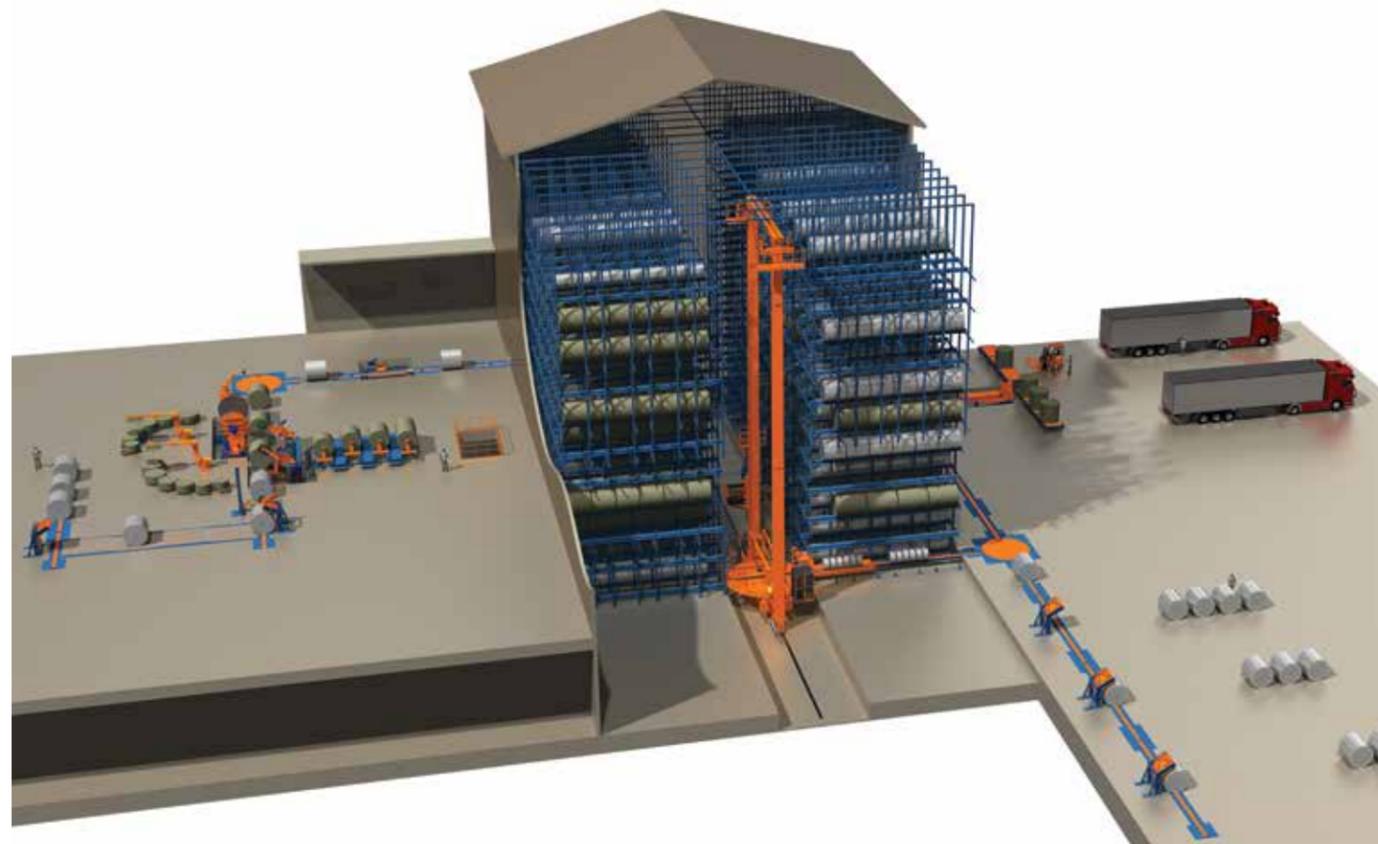
The implementation of Material Flow How starts by building a simulation model, by which different production procedures and material flows are examined and bottlenecks analyzed.

The main components of the concept are automated TransRoll® storage, roll handling and packing systems, all fully integrated to Pesimal Control MOM (manufacturing operations management) system.

Our concept is completely engineered in-house, including mechanical, electrical, PLC and ICT engineering. This process results in one functional system that is easy to operate and maintain.

Material Flow How® -concept includes all roll handling operations after the winders:

- Handling
- Storing
- Packing
- Dispatching
- Loading



Due to the system and design flexibility, the concept is suitable for new as well as existing mills, and can accommodate all volume needs.

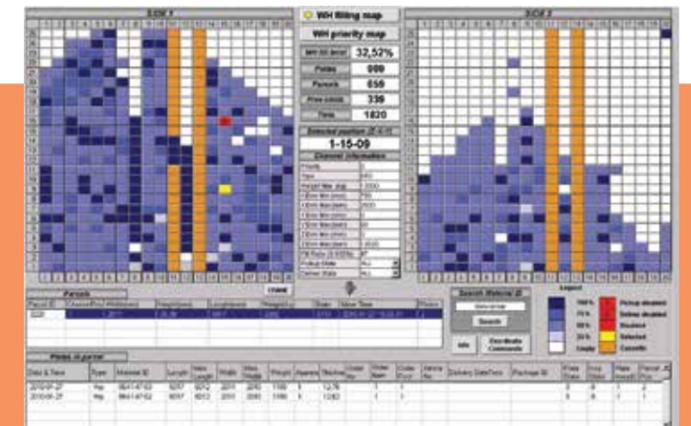
WMS (Warehouse Management System)

Pesimal WMS integrates and controls material flows between production, storage, roll handling, and shipping.

Computer control system is controlling the storage and logistic functions and can be fully integrated with the mill's existing network and upper level control systems. The control system receives internal orders for different processes or customer orders for shipment.

Main task for WMS is to control the material flows between different processes and optimize the storage and logistical functions.

This increases the total capacity of the system and decreases the operating costs. Wide range reporting and diagnostical functions are included into the system.



Pesimal storage systems are controlled automatically and unmanned by Pesimal's own server PC-based WMS with the necessary number of client PCs for operator terminals.

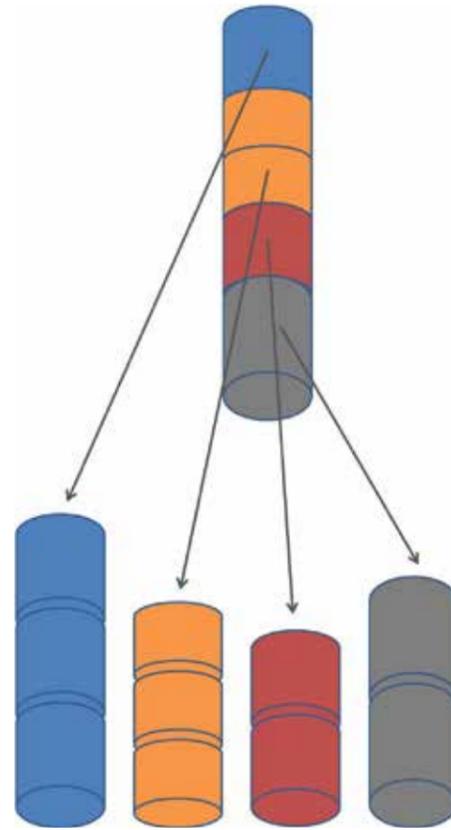
Paper industry solutions

In paper mills, we have focused on the challenge of how to connect paper machines, converting and shipping in a way that each of these processes can be freely and individually optimized and maintained.

A smartly integrated Pesmel TransRoll® storage located between the main processes breaks a rigid production line down into smaller, individually more manageable processes with minimal amount of connecting conveyors.

TransRoll® storage is based on horizontal deep lane technology, which is extremely suitable for big storage volumes and high capacities. Storage can handle rolls or roll sets without limitations related to roll dimensions or packing variants. Rolls can be unwrapped, partially wrapped, or fully wrapped. It is also possible to store rolls and pallets in the same shared rack structure.

The almost limitless handling and sorting capacity separates TransRoll® storages from the other alternatives. With a stacker crane's normal handling capacity of 40-50 cycles per hour, and six to eight rolls per set handled by the channel vehicle, the roll stream in and out can be up to 400 rolls per hour, per stacker crane. This also equates to plenty of sorting ability within the storage as well during off-peak hours.



The incoming roll stream is sorted by channel vehicle in the storage.

Pesmel TransRoll storing gives operational efficiency and cost savings with the following main features:

- Simplified layout with minimal number of integrated conveyors.
- Adjustable storage in all three axis, length, width and height.
- Smallest storage footprint compared to other alternatives.
- Minimised storage building costs by rack, supported walls and roof elements.
- Fire safety with zone divided sprinkler system.

TransRoll storage works like a big sieve. Mills roll stream in and out can be done freely from multiple points and levels along the rack structure sides. Rolls are moved in and out in a horizontal position directly from standard conveyors.

Secret for the high sorting and handling capacities is multi-roll handling without limitations related to roll dimensions of packing variants.

Paper roll packing methods can be divided to two main categories: kraft and stretch film wrapping.

Suitable packing method is evaluated case by case taking into account available space, needed product protection level and total investment and operating costs.

Pesmel packing lines are based on module structure, which makes them easy to adjust to each customer's specific need, such as space, capacity, and packing code requirements. Roll stream can be handled by conveyors, transfer shuttles or roll ramps.

For existing mills with ongoing production, we understand that short installation and commissioning is a must. Our shop-tested line, built on base frames with quick connectors for wiring and piping, can be put on full production in a few days window.



Over-lap wrapping method offers a cost efficient and space saving solution to wrap wide rolls.



Fully automated multi-station StreamLine for all capacity needs.

Kraft paper wrapping

Kraft wrapping has strong corner and end protections specially against mechanical stresses in over-sea deliveries. This packing method is recommended especially for paper and board grades, which require the strongest protection.

As a contract supplier of Valmet, we provide kraft wrapping systems according to StreamLine product family.

StreamLine offers innovative and cost efficient wrapping solutions for all capacities, ranging from a flow of 30 rolls up to 180 rolls per hour.

Stretch film wrapping

Stretch film wrapping is ideal for rolls with short transportation chain and mills with limited space. With less equipment and packing materials needed, stretch wrapping system has relatively small investment and operations costs.

Stretch film as a packing material has excellent qualities. It gives complete protection against moisture and dirt, and the material itself is fully recyclable. The film folding function gives extended protection to roll corners.



Above: Axial wrapping with two cams and two 80 kgs material rolls ensure continuous packing and high capacity.

Middle: Radial wrapping with film folding function strengthens the roll edges without any additional packing materials.

Below: Fully automated Pesmel packing systems have user-friendly HMIs.

Packing line features:

- Fully automated packing functions.
- High capacity packing machines, capacities up to 180 rolls/hour/line.
- Automated wrapping material changing, allowing unmanned continuous packing for 24 hours.
- Big material rolls for example, in axial wrapping stretch film rolls up to 80 kgs/cam and in radial wrapping up to 500 kgs.

Converting industry solutions

In converting plants, Pesimal systems solve challenges related to handling and sorting of various sizes and types of products smoothly without bottlenecks and without compromising on efficiency and customer service.

Product sorting plays a big role in operational efficiency. Depending on production volumes and plant space limitations, the sorting can be done by traditional sorting bins, fully automated high bay storages, or a combination of different handling methods.

Versatility is the word for Pesimal packing and handling systems designed for converters. Different roll sizes with different packing codes can be applied semi or fully automated. In addition to traditional stretch film wrapping, products can be wrapped into materials like crepe paper, foam, bubble etc.

Palletizing horizontally or vertically gives the mechanical protection during transportation.

Material Flow How -concept for converting industry is always customized according to each individual project's needs. Pesimal products include all the following functions:

- Sorting and buffering
- Roll wrapping
- Stacking
- Palletizing
- Pallet wrapping or strapping
- Roll and/or pallet storing
- Dispatching and loading



Customer stacks are collected from sorting bins to packing.



Narrow roll handling for packing is done by sorting carriage.



Automated axial wrapping is tying the rolls into a stack.



Plate palletizer for vertical palletizing can be used for single or multi-stacks.

Tissue handling and packing

The Pesmel tissue handling and packing systems are designed keeping the soft and sensitive paper quality in mind to ensure damage-free handling.

We have a complete product family developed and tested for tissue rolls. As an example of our R&D work is a patented roll turning cradle used in axial and radial wrapping and a Twin Servo, film tension control system. The handling of unpacked tissue rolls is done with belt conveyors and cradle carriages to ensure the quality of handling.

Due to the sensitivity of tissue paper, the packing is very important. Stretch film is proven to be an excellent packing material for tissue rolls due to it being waterproof. Stretch film makes the package air tight and thus protects the roll against outside moisture, dirt and impurities.

The packing systems are available in two different configurations, the rotating arm construction for high capacities, and turning cradle construction for smaller capacity needs.



High capacity tissue packing system with patented roll turning cradle.



Automated film roll changing magazine allows 24 hours continuous operations.

Dispatching & Loading

With sophisticated dispatching system customer satisfaction and selling efficiency can be increased. Key elements when designing dispatching system are automation, selection of storing technology, and usage of market and customer information.

By combining the customer and market information with WMS controlled TransRoll® or TransPallet storage, our customers have been able to increase their selling up to 15 percent.

Automated loading system is an excellent solution for the products and high volumes of paper industry. The key issue of the system is fast loading with gentle product handling.

One of the most ideal purpose of use is in short distance and continuous transportation; for example, inside the mill area, in harbours, or at customer.

Automated loading systems consist of both dockside and loading equipment. In our applications we use belt, chain, and lamella conveyors, as well as fork and plate loaders. A docking system is used to ease and ensure the precise positioning of the cargo space during loading.

Pesmel loading systems have a control system with optimal load and transport documentation functions. The user interface is designed so that even non-frequent users, such as drivers, can operate it easily.



Automated truck loading or unloading procedure takes only five minutes and is done without any clamb truck handling.



Tissue roll separating and handling with belt conveyors.



Tissue roll wrapping with turning cradle.



Lamella conveyor with core slot.



Load forming and sorting is done automatically by TransRoll® stacker crane.



Sea cassette load forming and loading is done automatically in six minutes.

Material Flow How®

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