NewsFlow

2016 • Metal

JSW – Rapidly scale productivity with high impact CRM2 mill technology

SSAB – An industry first in high-performance sheet packing

Material Flow How The Science of Material Flow

PESMEL

NewsFlow

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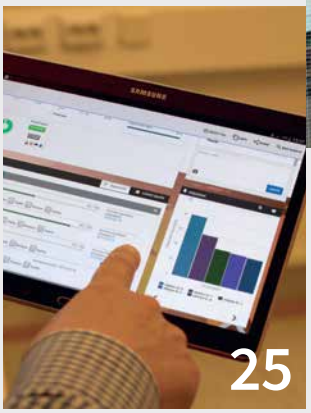
A strong cooperative development process helps JSW Steel achieve growth through its cutting edge CRM2 mill.

Pesmel and Outokumpu
Decades of cooperation in innovation have pushed both Pesmel and Outokumpu to new heights in mill logistics and production quality.



Pesmel FlowCare
Discover Pesmel's bespoke process for balancing better customer service with more efficient mill operations.

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PHOTO: PEKKA NIEMI

Tony Leikas,
President and CEO, Pesmel Oy

Smarter investment, smarter businesses

The recent history of both Pesmel and the metal industry as a whole has progressed through three distinct stages. In 2006 and 2007, I remember visiting customers when performing my role as head of sales for the Asian market. The majority of customers told me that while they would consider us when building new mills, they were so profitable that they didn't see the need to invest in their existing capacity.

The 2008 financial crisis deeply shocked the market, and many companies held off from investing for a significant period of time. Recently, the leading companies in the metal industry have adopted a new investment trend. By going back to basics, they have recognised the need to increase efficiency and profitability across their entire operations, as this is the most effective way to keep their companies healthy. However, this clearly-defined need for efficiency can only be delivered by smarter investment choices.

The past few years have been an enjoyable period for Pesmel, as we have been able to participate in helping our customers create efficient, focused investment plans. Our desire to serve each individual customer as efficiently as possible led to the development of our simulation studies, which in turn delivers investment insights and helps our customers make informed investment choices before a single piece of machinery is ordered.

Even so, our Material Flow How concept has pushed us even further in our efforts to help our customers achieve constant optimisation. After the simulation and realisation phases, our Flow Care software gives our customers real-time feedback on the performance of their systems, helping them to spot future bottlenecks and to constantly improve and develop their operational efficiency.

I am truly happy that we are able to help our customers grow and constantly improve. As this trend for optimisation develops in the future, Pesmel will be there to help along the way.

Tony


PHOTOS: PESMEL

JSW Steel: Indian steel pioneers improved quality and enhanced throughput with Pesmel YMS

A strong client relationship and detailed 3D simulations helped Pesmel deliver a cutting edge CRM2 mill for JSW Steel.

In 2013, Pesmel commissioned a modern, automated 'Material Flow How' concept-based Yard Management System (YMS) at JSW Steel's CRM2 plant in Karnataka, India. Aiming to produce 34 million tons of steel by 2020 through the construction of new mills, JSW Steel is the largest private sector steel manufacturer in India in terms of capacity. Pesmel joined the green field project at an early stage to assist JSW Steel in planning and executing a CRM2 mill that seamlessly integrates production with an internal logistics system that includes automated high bay storage control in 1 complete solution.

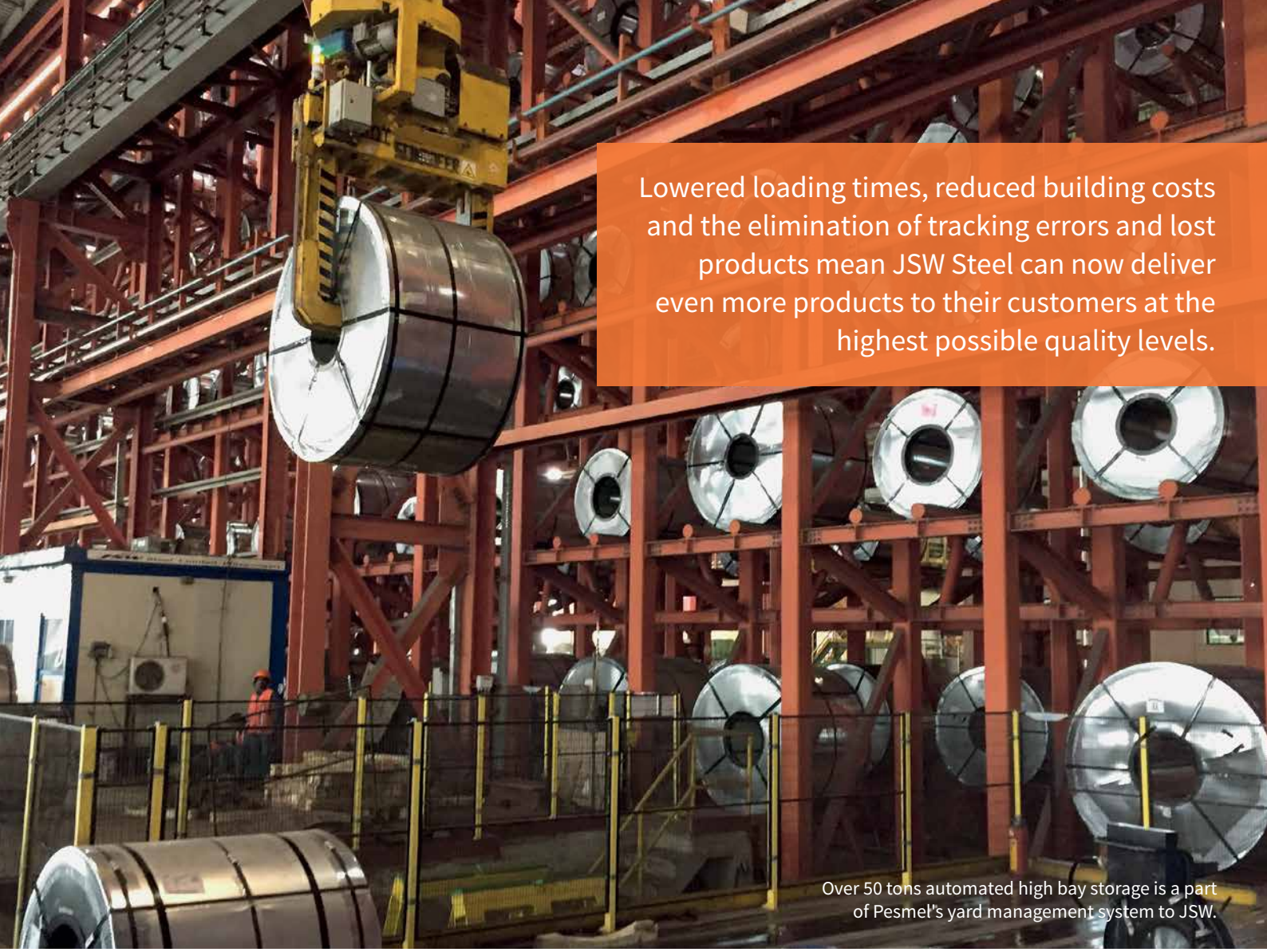
"As Logistics experts, it's always good to be involved in projects at an early phase, as normal practice for the customer is to focus on the production lines and not the logistics, packing and storage systems, which may lead to major complications at a later date", says **Juha Suksi**, Vice President of Sales and Marketing, Pesmel Oy. "We consider the project from a total logistics point of view, and a green field site is a good opportunity to optimise at an early date".

Pesmel's expertise in combining logistics and production requirements contributed towards the delivery of a CRM2 mill that enables intelligent material flows across the whole plant that can minimise distribution errors, lower costs and increase production efficiency. To achieve this, Pesmel conducted a comprehensive study of JSW Steel's mill requirements to produce a solution that meets their needs as efficiently as possible. "The Advanced Configuration and Simulation study rendered by Pesmel to advise the customer on the precise resources, building and storage requirements – including phase-wise installation options – makes it easier for such projects to be understood and adapted by the customer", quotes **Jagannathan Rajagopalan**, Managing Director of Pesmel South Asia.

One mill, one screen

As a result of this study, Pesmel created a comprehensive YMS for JSW Steel that integrated the various functions contained within the mill into 1 logistical entity. Now, the whole factory is accessible from a single screen, and all the functions within the yard are linked via an efficient high-speed coil car system working in support of Electric Overhead Travelling (EOT) cranes.

In practice, hot rolled coils enter the HR area on railway wagons. Semi-automated overhead cranes fitted with HMIs (Human Machine Interfaces) are supported by operators who scan coil barcodes and automatically



Lowered loading times, reduced building costs and the elimination of tracking errors and lost products mean JSW Steel can now deliver even more products to their customers at the highest possible quality levels.

Over 50 tons automated high bay storage is a part of Pesmel's yard management system to JSW.

generate task lists for the overhead cranes. A simple push of a button calls a crane into position, which in turn moves the coils to the correct storage area. Besides the operator manually controlling the lifts in the Z axis, the process is highly automated. Coil cars also feed the PLTCM line coil saddles, which then distribute coils throughout the factory. Systematic and sequential loading of the PLTCM at its entry is carried out by the four-way coil car with suitable interfacing with the PLTCM Walking beam conveyor**.** A coil car system then picks up the cold rolled coils from the PLTCM exit for CR storage. After storage, the coil car system delivers the coils to the annealing and galvanising lines. This four-way coil car system minimises overhead crane usage, greatly reducing their time investment and enabling the cranes to focus on working efficiently in one area for mainly the "pick and place" task and also assuring the least handling amount of damage to the coils. Similarly, the work in progress (WIP) coils are managed with a suitable automatic Yard Management System (YMS) for the finishing operations.

The mill also includes an automated high bay Finished Goods Storage (FGS) fitted with high speed stacker cranes. With over 50 000 tons of capacity, the rack-supported construction of the high bay warehouse uses only one third of the footprint of traditional floor storage solutions. "10 coils can be stored vertically and can be accessed immediately – gone are the days of moving 2 coils to access 1 at the bottom in a typical three-tier floor storage system. We help JSW Steel minimise the handling of the coils, thus saving time, reducing the risk of damage and the need for manpower," continues Juha.

All coil movements are tracked throughout the entire mill. The data is fed into the control system, which processes all mill material flows and automatically controls all logistical devices, 24/7. Pesmel's expertise in creating intelligent material flows has greatly influenced the effectiveness and productivity of the JSW Steel mill. Coil throughput rates are much higher than in traditional factories, as lowered loading times, reduced building costs and the elimination of tracking errors and lost products mean JSW Steel can now deliver even more products to their customers at the highest possible quality levels.

Continued support through Flow Care

In order to keep operations running smoothly, Pesmel provides JSW Steel with Annual Maintenance Contract (AMC) services, and is planning the delivery of a host of »

All yard functions are linked via an efficient high-speed coil car system.

With the help of Pesmel solutions, JSW CRM2 was able to ramp up the production level from around 50% in the first year of operation to beyond 75% in less than 20 months of operation.

smaller updates across the site in the near future. Pesmel's Indian subsidiary also stations engineers on the factory floor to insure smooth performance, assuring local and dedicated support by Pesmel India. In addition, a 24/7 helpdesk comprising Service/WMS experts can have remote access to the factory logistics system from Finland and solve potential problems that may occur, enabling JSW Steel to keep the mill running with maximum efficiency at all times.

Continued cooperation

As a major player on the Indian steel market, JSW is in initial discussions to roll out similar solutions across its other factories. "Feedback from the customer has been very positive," concludes Juha Suksi. "They now have plans to make investments in other JSW units as well, and we are discussing possible options for integrating our logistics system and high bay storage into their existing mill floor plan. They are extremely satisfied with our YMS and high bay storage concepts. After installing one of the most modern automated logistics systems, JSW Steel now understands how efficient this new technology is, and they will use similar solutions when building new factories and updating existing sites in the future."

Ashish Chandra, Chief of JSW CRM2, reflected this sentiment when giving feedback during discussions with Jagannathan Rajagopalan and Pesmel's Project team after their CRM2 mill had been in operation for two years. "Pesmel internal logistic solutions made material handling & storing at JSW highly effective. With the help of Pesmel solutions, we at JSW CRM2 could ramp up the production level from around 50% in the first year of operation to beyond 75% in less than 20 months of operation. Pesmel solutions not only became the backbone for processing of materials, but also strengthened the outbound deliveries in less stipulated time. Secondly, the customisation of solutions as per the requirement and support provided by Pesmel engineers to nurture & mature the solutions is appreciable. Having understood the benefits, JSW is keen to adapt modern logistics concept similar to CRM2 in other units and projects."

It is a fact that modern technology has become a significant force of change in Logistics, which in turn can be the deciding success factor in any industrial operation. Efficiency is no longer an option in the steel industry. It is a necessity. Pesmel's Material Flow How knowledge can help you find your path to success. •

PHOTOS: PESMEL

Coil packing, optimised:

Chalco takes aluminium coil packing to new levels

A compact mill and high performance parameters led to the delivery of a truly innovative coil packing line.

As an experienced provider of metal industry solutions to Chinese business, Pesmel CEO **Tony Leikas** reflects on his involvement in securing the company's first direct Chinese customer, Chalco, in 2011. At the time, Tony had been involved in sales to Asian markets.

"The solution that Chalco required had many compelling features. As a major manufacturer of aluminium, Chalco required an automatic, high capacity packing line that was capable of attaining 98% availability and packing 20 coils an hour.

"As our negotiations continued, we realised that Chalco would benefit from utilising our Through Eye Wrapping (TEW) technology. Aside from leaving the eye accessible for handling, Pesmel was at that time the only operator able to deliver TEW for aluminium coils wrapped on 400mm corrugated cores, as opposed to the larger 610mm and 700mm eyes used with other metal types".

Chalco also wanted to have excellent moisture protection. Each packaged coil had to remain airtight and watertight after staying outside for 2 days – during the rainy season. After working with Chalco to create solution parameters, Pesmel was able to deliver a packing line that met all requirements and paid for itself within 3 years.

Increased productivity with significant financial savings

"The biggest savings to be found in packing lines come from optimised material usage", continues Tony. "The cost of materials used by a packing line in 1 year alone is usually comparable to the total investment cost for the line. A 30% saving on materials means that the investment pays for itself within 3 years.

"Through eye wrapping uses less packing film than traditional axial wrapping. We combined our TEW technology with a mechanically-applied external protection system that automatically optimised for different coil sizes. As a result, Chalco is now benefiting from a highly efficient packing line that has already paid for itself".

A highly-satisfied Chalco is now looking to utilise Pesmel packing technology at its other sites. Through good communication, extensive experience, cross cultural understanding and excellent relationships with its customers, Pesmel aims to help the Chinese metal industry raise standards to new levels. •

Through Eye Wrapping using 400mm corrugated cores.

Pesmel Materi
– production and logistic

PHOTO: PESMEL

al Flow How s in harmony

Pesmel's unparalleled logistics expertise combines with world-class engineering to deliver industry-leading productivity and efficiency increases for new and existing mills.

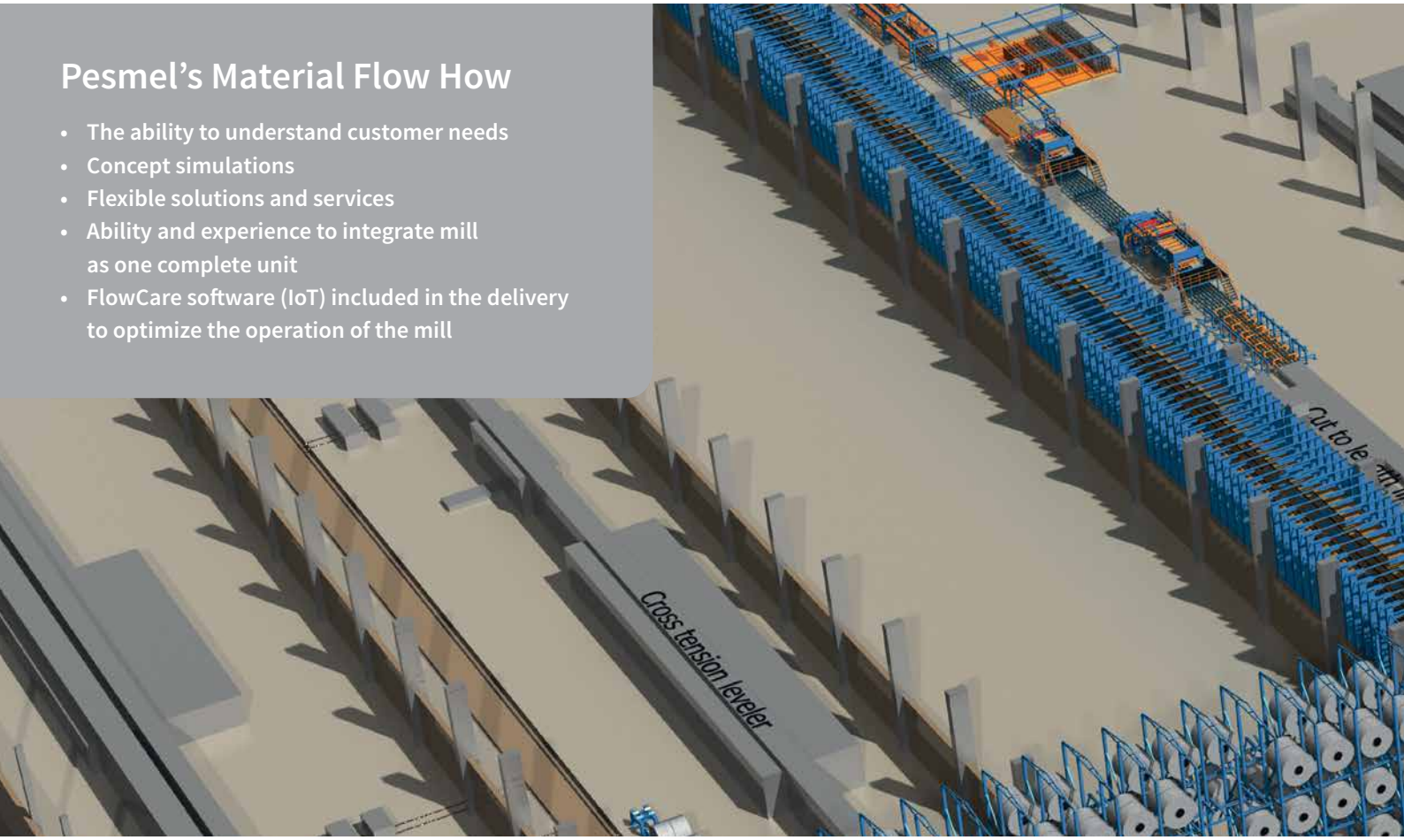
Traditional metal production can be said to be 20 years behind the paper industry in terms of technology and progress. Poorly connected production phases are subject to inefficiencies, bottlenecks and high WIP (Work In Progress). For more than 40 years, Pesmel has successfully applied its Material Flow How to a wide range of brown and green field mills. By balancing production and logistics, the material flows, buffering and storage are optimised, throughput is increased and lead times are significantly reduced.

In order to achieve high levels of mill efficiency, a true understanding of the big picture – what is really needed, and why – is essential. Once these needs are understood, finer details such as space-saving layouts that minimise material journeys and facilitate smooth material flows can be considered, along with other details such as optimal equipment choices and possible future expansion. As every mill is unique, so must be every solution by necessity. Pesmel's extensive knowledge of processes and engineering allows us to create layout concepts that dynamically map out internal logistics and materials flow through the mill.

As a full stack service provider, Pesmel delivers solutions that optimise mechanical, electrical PLC and ICT systems in a perfectly balanced, innovative offering. Whatever unique challenges a particular project may have, Pesmel has a proven track record of delivering material and information flows throughout seamlessly integrated production and logistics that raise overall mill efficiencies by up to 10% per annum. >>

Pesmel's Material Flow How

- The ability to understand customer needs
- Concept simulations
- Flexible solutions and services
- Ability and experience to integrate mill as one complete unit
- FlowCare software (IoT) included in the delivery to optimize the operation of the mill



Defining production and logistical needs

The main goal of any mill is to produce high quality products for customers. Internal logistics are therefore crucial to ensuring smooth material flows, avoiding production bottlenecks and eliminating errors. In order to do so, we begin by helping our customers to define the absolute necessities for internal logistics: specific grade-related handling requirements, the amount of buffering capacity needed between production and shipping, packing method selection based on the mill's actual needs, as well as the preferred automation level. Our solutions aim to deliver full, real time information and control of all materials and material flows in the mill, fast and accurate material transfers between processes, flexible buffering functions between processes, and seamless integration with production. We are able to deliver tailored solutions that optimise all aspects of a mill's material flow processes by forming strong relationships with our customers. These relationships help us to make the right decisions from an early stage that move projects along the right development paths.

Material Flow How solutions

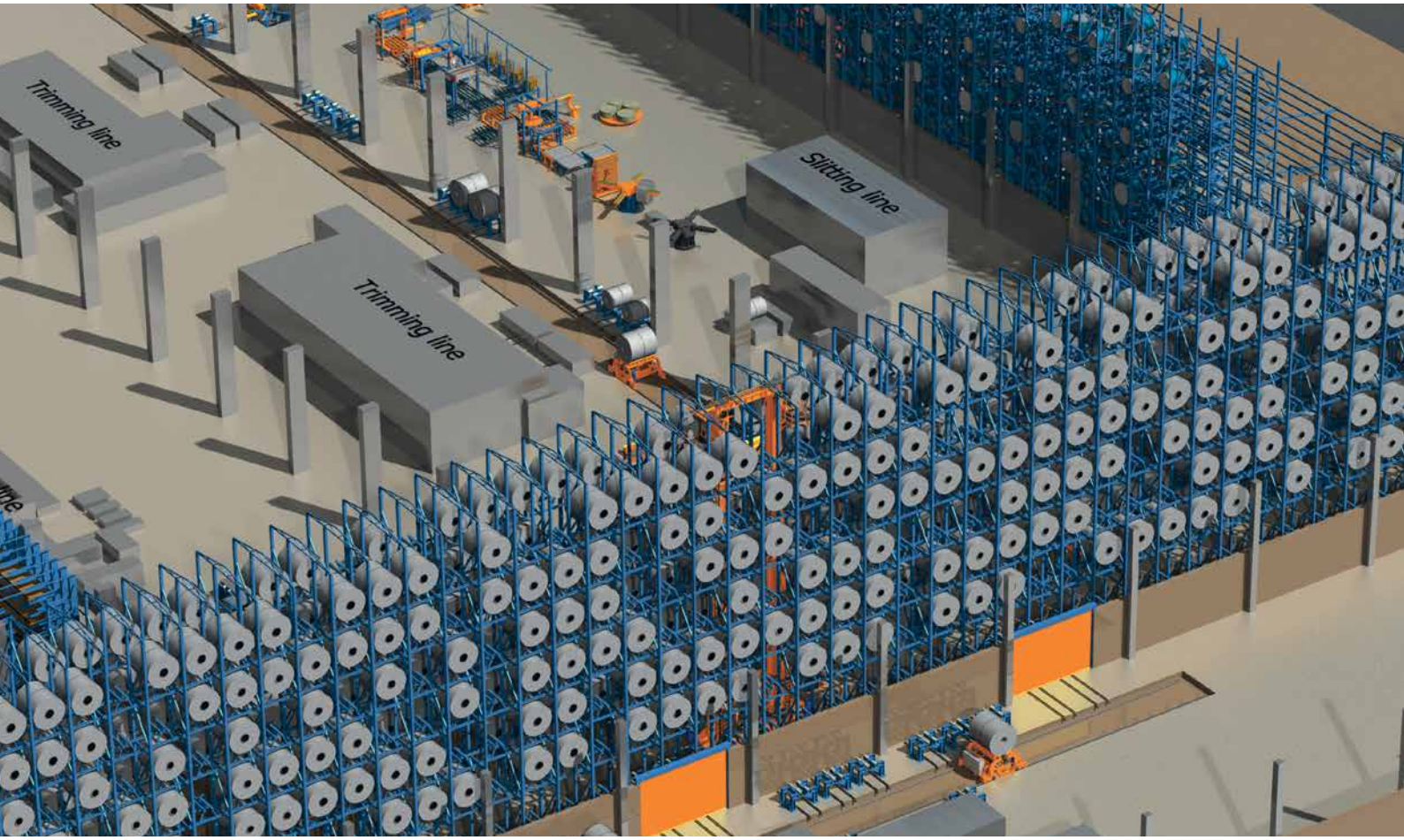
Pesmel separates itself from its competitors by offering dynamic 3D modelling of its mill architectures. By mapping out equipment types and layouts, Pesmel is able to demonstrate and test solutions in a tangible manner. Three-dimensional layout concepts give shape and context to possible solutions, and are the first steps along a path that can end with full-scale simulations with actual production data. In this way, multiple possible layouts can be tested, allowing us to help our customers optimise investment plans and make wise investment choices before breaking ground.

In practical terms, simulation studies accurately assess product measurements, capacities and equipment layouts, enabling our customers to analyse the total capacity of the mill. This information acts as guidance for deciding on the type of internal logistics, packing and dispatching system that should be built, as well as forming the basis of an upper-level control system for the entire process.

Total integrated solution provider

Pesmel has an unparalleled range of in-house experts that deliver fully-formed automation solutions that are more closely adapted to our customers' needs than our competitors. All the phases of the delivery, from system engineering, manufacturing and assembly of the machinery to the installation of the system are overseen by Pesmel personnel.

We utilise a range of innovative equipment to enable smooth material flows within the mill. Our automated



coil carriage systems provide a fast, accurate means of transporting coils between production lines and single layer buffer storages, enabling the continuous operation of production functions. We also employ automated high bay storages that can act as finished goods storage as well as intermediate storage for buffering and sorting functions. At 1 third of the footprint of regular storage warehouses and with 3 times more handling capacity than overhead crane storage solutions, our automated high bay storage eliminates delivery errors and damage caused by excessive handling.

A modern mill also needs a modern control structure. Pesmel is able to integrate all levels of production and logistics control, from electrification to automation, monitoring, factory planning & management and business planning and logistics into one full chain, comprehensive platform.

Our innovative, fluid engineering process delivers solutions that dovetail perfectly with all aspects of production. By using 1 supplier for all levels of automation, Pesmel can deliver high level feedback for all production processes.

Each delivery includes Pesmel's FlowCare software solution. FlowCare facilitates the collection and exchange of data between various objects on the mill, and also provides remote monitoring and control functionalities. The collected data can be refined through analysis into powerful insights that can in turn be used to create reports and other resources that help improve the mills' production and cost-efficiency, as well guiding the allocation of various maintenance needs.

Tangible results

In the face of stiff global competition, efficiency of operations is crucial to our customers' survival. Pesmel has a proven track record of delivering efficiency gains for both green and brown field sites. Our ability to understand our customers' needs, optimise mill layouts, simulate production and provide solutions that take in all aspects of a mill's material flows can help our customers achieve up to 10% raises in overall efficiency on an annual basis.

What our customers get in return is higher quality production as handling and damages are reduced, minimised errors in shipping and tracking due to the removal of human error, increased employee safety and full traceability. In one case, a customer was able to reduce invoicing times by an average of 7 days due to the increased efficiency provided by Pesmel's automated systems. Another customer managed to increase sales by 15% due to shorter delivery times and being able to fulfil order deadlines that other companies were unable to meet. Pesmel's philosophy is that there is a solution to every problem – nothing is impossible. •

Outokumpu and Pesmel – A logistics revolution 2 decades in

From constant mill improvements to innovative new technologies and field-leading R&D activities, Pesmel's cooperation with Outokumpu has a long history of delivering success.

As a company with a strong history of using the latest technology in its production activities, Finnish metal giant Outokumpu ordered some of the first high bay coil and sheet storages for its Tornio plant from AWA Warehouse in 1996. Prior to its merger with Pesmel in 2009, AWA Warehouse utilised Pesmel as a subcontractor to deliver the packing line coil and sheet transportation machinery components of the order. What followed is an ongoing cooperation between Pesmel and Outokumpu that has seen both companies drive each other's growth, productivity and quality to ever-higher levels.

The evolution of innovation

Outokumpu has historically maintained its market-leading reputation for quality by employing highly-automated, safe products and systems across all its production sites in an effort to deliver products of the highest quality. When Outokumpu decided to significantly increase their high-quality stainless steel production, Pesmel sought to surpass their quality requirements, and was there to assist in the planning process at the earliest stage.

Excellent communication, fluid cooperation, an innovative mind set and a constructive attitude towards compromise from both companies led to the successful delivery of this and many other projects, from the earliest days of the cooperation onwards. Both companies' personnel may have changed over the decades, but their track records for delivering projects have remained consistently excellent.

From individual components such as devices for hot coil handling, labeling robots and warehouse conveyors, to sheet and coil packing systems all the way up to fully-automated coil packing lines, automatic sorting, storing, packing and dispatch systems, and fully-automated logistics and intermediate storing system for entire mills, Pesmel have planned, designed delivered and maintained multiple industry-first logistics and production innovations for Outokumpu across multiple sites in Finland, Sweden and the Netherlands.

Breakout success

While all Outokumpu investments in Pesmel technology have delivered efficiency improvements and significant financial benefits, Pesmel's bespoke Through Eye Wrapping (TEW) machine and packing line – developed specifically at Outkumpu's request – has enabled Pesmel to penetrate the metal industry across the globe. With minimised waste, automated folding functionality and reduced packing material requirements, Pesmel's Outokumpu-developed sheet packing line has had a similar impact on a smaller scale.

"Our partnership with Pesmel has been effortless from the very beginning. We have realised our shared vision though seamless cooperation and the drive to achieve the best outcomes for both parties – without compromising on quality. Our Pesmel equipment has worked reliably for decades, allowing us to consistently deliver efficient, high-quality products to our customers."

Juha Lappeteläinen,
Development Manager – Cold Rolling Plant, Outokumpu

the making

R&D – past, present and future

The key to improvement is innovation – and Pesmel has helped Outokumpu innovate many different solutions to its production and logistics needs. Even in situations where clear solutions are not immediately evident, Pesmel's long history with Outokumpu has consistently delivered high quality solutions that best meet the needs of both parties. An example of this is when Outokumpu made a significant investment in Pesmel's high bay storage concept that acted as storage both for end products and as intermediate buffering between processes. Although a big investment, the end result was a highly-effective concept that is now being used in multiple locations across the world.

Outokumpu is also the pilot object for Pesmel's FlowCare industrial IoT solution. Beginning in 2015, FlowCare enables mills to collect technical usability data and produce reports that help optimise maintenance, plan future production, spot potential bottlenecks, and more. The success of the Outokumpu pilot had led to Pesmel adopting FlowCare as default for all large upcoming cases. As with many of Pesmel's innovations, FlowCare can be adopted to fit existing machinery, following the current industry trend of optimising existing installations rather than investing in new sites.

Immediate cooperation – long-lasting results

The projects developed in partnership with Outokumpu have boosted Pesmel's international standing in terms of logistics quality, whereas Outokumpu has maintained production excellence across global markets. This is how Pesmel approaches all of its projects. Our customer-centred methodology means we win by making your business more successful, as we thrive on our reputation for understanding your needs and not being driven by our own opinions. Constant innovation and development by our world class in-house engineering department means we form long-lasting relationships with our customers, allowing us to deliver long-term success instead of quick fixes. This also extends to the products we deliver, as our customers are able to deliver efficient, quality deliverable to their own customers over a period of decades. From Outokumpu to our next cooperation, Pesmel will work to make your business better. •

High Bay sheet storage, Tornio (1996)

Outokumpu's first automated packing line (1996)

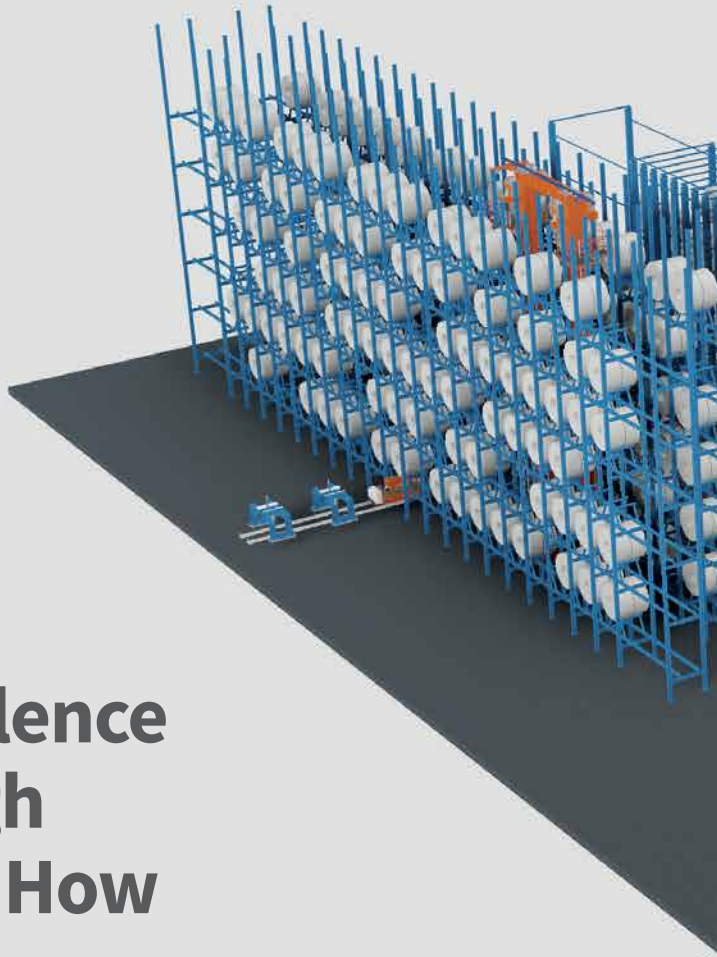
Sheet shipping

The first Through Eye Wrapping machine (2001)

Construction of the Tornio coil storage facility (2002)

Tornio coil storage interior, in-feed

PHOTOS: PESMEL



Wuxi Putian – Power transformer core production excellence to be achieved through Pesmel Material Flow How

Pesmel's automated high bay storage solutions offer flexibility and growth potential for Wuxi Putian.

Established in 2004 and with annual sales of over 800 million yuan, Wuxi Putian has been building an international reputation as China's largest producer of high quality power transformer core products for clients that include ABB, Siemens and Schneider and etc. Wuxi Putian approached Pesmel in autumn 2014 to design and deliver modern logistic system for its production facility located in Xibei Town, Wuxi, aiming to increase mill productivity by the beginning of 2018.The end result – an automated material flow management system that allows for future expansion across multiple phases.

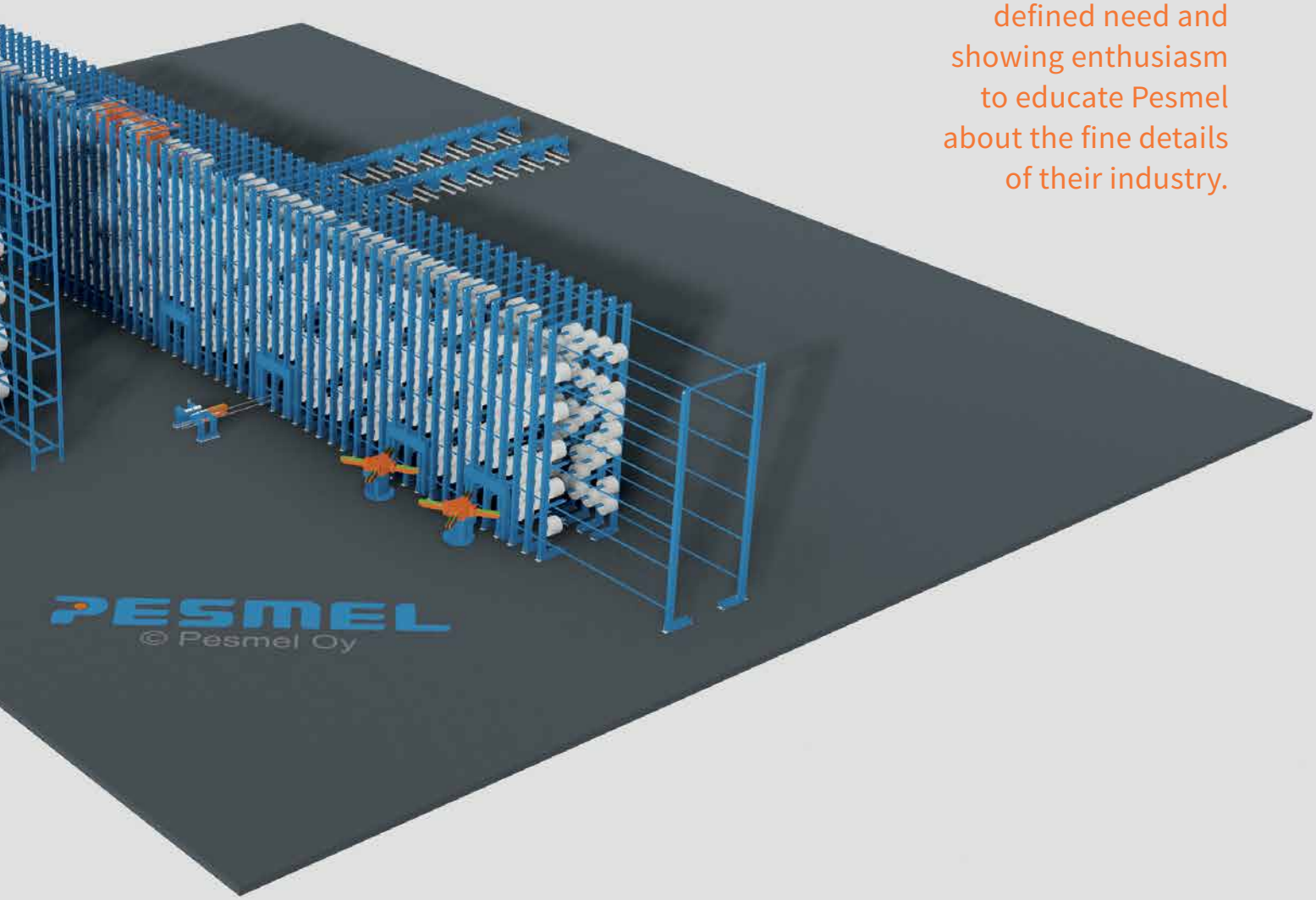
A defined need

As an innovative, young company with ambitions to expand its power transformer core business, Wuxi Putian needed a material flow solution that would allow for high quality, highly efficient coil management and storage and the possibility for seamless integration with future on-site expansion projects. Due to the fine tolerances involved in producing power transformer cores, Wuxi Putian required a solution that maintained – and even elevated – the quality of its final products whilst coping with constantly changing market demands.

A flexible solution with scope for further expansion

As planning progressed, it became apparent that raw material storage before the slitting lines and Cut To Length (CTL) lines would allow for material buffering and less frequent production breaks. In the new system, coils are unloaded in the truck unloading area, identified and placed onto a coil stand, from where they are moved via newly installed, Warehouse Management System (WMS) controlled coil carriage and stacker crane to Raw Material Storage. The coils then move to the slitters, where they are cut to a range of smaller widths. If needed, the coils can then be returned to the first warehouse for re-slitting to even smaller gauges.

The project's success is a result of Wuxi Putian having a defined need and showing enthusiasm to educate Pesmel about the fine details of their industry.



The strips are then sent for buffering and sorting to, Slit Coil Storage warehouse. This storage warehouse is crucial to the efficiency of the mill, as coils of many widths, thicknesses and materials need to be correctly sorted and distributed in the correct order for further processing. From the Slit Coil Warehouse, the coils can either be sent to the CTL lines or to packing areas, or alternatively they can be sent for processing in existing facility with a carriage.

The high efficiency, error-free material distribution offered by Pesmel's solution allows for all materials to be tracked throughout the system and clearly displayed on WMS terminal. The real-time inventory significantly supports production planning, a critical area in terms of cost savings.

A connected mill, a streamlined process

By moving away from individual processes to a connected, streamlined mill, Wuxi Putian has lowered operational costs by reducing the amount of people needed to transfer coils between processes, increasing the effectiveness and efficiency whilst also benefitting from the reliability a WMS brings. Real time storage inventory has also given Wuxi Putian the ability to plan purchasing and production according to upcoming orders. Human error in sorting and distribution has been eliminated, and handling with automated equipment ensures that products are not damaged by excessive handing. Less need for manual lifting and coil movements has also meant that operational safety has significantly increased.

The project's success is a result of Wuxi Putian having a defined need and showing enthusiasm to educate Pesmel about the fine details of their industry. As a result, Pesmel utilised its innovative approach to problem solving to deliver a bespoke solution that incorporates many feature and technologies unique to this mill. In return, Wuxi Putian can maintain its hard-won reputation as a quality manufacturer of power transformer cores as it grows into the future. •

Chairman Cai on how Pesmel helped Wuxi Putian future-proof their operations in today's volatile market.

Wuxi Putian and Pesmel – A Chairman's-eye view

What are the long term prospects of Wuxi Putian?
Wuxi Putian primarily focuses on iron core manufacturing for electricity transformers. With our current company-scale competitive advantages, including our technologies, equipment, R&D, product quality, market position, employees and management, Putian is continuously strengthening its position at the top of the Chinese market. Putian's overall target is to be the leading transformer manufacturer in the world.

What kind of challenges did you face at the start of this project?
How to dovetail equipment purchases with our product processes whilst achieving an optimal balance of invesment and performance.

What factors did you consider when choosing Pesmel?
We considered the advanced nature of the technology empolyed by the Pesmel system, as well as its stability, adaptability and redundant capacity for future expansion. Pesmel's system met all criteria.

Wuxi Putian and Pesmel have developed new ideas and technologies over the last two years in a drive to create a modern storage system concept. How do you see the fact that this delivery is the first of its kind in the world? Does being a pioneer bring any uncertainties with it?
Someone always needs to be the first to test new ideas, and often this role is taken by field-leading leading companies. Yes, there is always uncertainty and risk in any renewal project, which we fully understand. But we believe that we can always lower the risk of uncertainty by continously improving our working practices.

HelpDesk assists Pesmel's customers in sticky situations

A 24/7 HelpDesk is available to Pesmel's customers to guarantee undisturbed performance of the system.

Pesmel's HelpDesk offers technical support for our contract customers 24/7. Our trained duty officers are experts in the field of automation and thoroughly familiar with our systems. In questions related to mechanics or pneumatics, for example, they have the support of our entire organization. We have a guaranteed response time of one hour, and when needed, a remote connection will be created within two hours.

The HelpDesk has its own phone number and e-mail address; there is no telephone switchboard or other intermediary contacts. With the help of the HelpDesk service, our customers can secure continuous production and release their resources to other duties. A fixed monthly fee helps in budgeting costs, and contract customers also get affordable prices in possible extra maintenance work.

Customer satisfaction guaranteed

Marko Heikkinen, Pesmel Service's General Manager gives a good example of the effectiveness of the HelpDesk.

"One evening, a customer of ours had a problem with their equipment. They did not have a service contract, and attempted to fix the problem themselves several times. Six hours later, in the small hours, a bigger problem emerged when a part of the machinery broke. The customer tried to replace the part and run parameters, unsuccessfully."

The following day the customer decided to call their contact person at Pesmel. The call was directed to the HelpDesk, and 30 minutes later production was running normally again.

"The customer was so happy with the swift service that they wanted to make a service contract with us right away," says Heikkinen.

"They realized that Pesmel's service is an excellent way to prevent drawn out stoppages and the loss of income caused by them," Heikkinen concludes. •

Marko Heikkinen, General Manager, Service

PHOTO: SANNA RINTATALO

HelpDesk in a nutshell

- **Provides technical support and guidance to systems provided by Pesmel**
- **Available 24/7**
- **Service in English and Finnish**
- **Trained duty officers are thoroughly familiar with the systems and have the support of our entire organization**
- **Fixed monthly fee and service-charged phone calls**
- **Guaranteed response time for phone calls and e-mails: 1 hour**
- **Guaranteed response time for remote connection: 2 hours**
- **Own phone number and e-mail address**

In fall 2016, Pesmel will launch a new online store. First it will be piloted with a selected audience, after which it will be available for all Pesmel clientele.

PHOTOS: PESMEL

Pesmel automated coil packing lines:

the elimination of rust

Zero rust, no handling damage, minimised material wastage – all thanks to Pesmel coil packing solutions.

Rust is a considerable problem when it comes to the production of metal goods. Keeping product quality uniform from the production line to the end user represents a considerable challenge. Pesmel has developed a range of packing technologies that are unparalleled in their ability to keep metal coils watertight and rust free, whilst also considerably reducing the amount of packaging material used and speeding up the packing process.

In the production of metal, sudden temperature differences are common. As water is present in the atmosphere in practically every environment, condensation of water on metal surfaces is a common occurrence. If this happens inside a semi-sealed environment such as a packaged coil, the chance of rust formation drastically increases – if salt is also present, as might be the case when in close proximity to oceans or in polluted environments, the reaction is greatly accelerated.

The cost of manual labour

This is a significant problem for metal producers of all types, as storage and transportation in challenging environments is not always avoidable and customers demand high quality products. In short, packaging and moisture protection are essential to delivering rust-free products. Traditional, manually-applied packaging incorporates a VCI laminated sheet that is folded into the coil's eye, outer surface, headers and corners. However, it is impossible to


Automated body wrapping with board and steel


Outer edge protection machine


Automated outer edge protection


Inner edge protection machine

get an air-tight seal, as manually-folded paper cannot be perfectly seamed. This leads to external air coming into contact with the VCI sheet, thus diminishing its VCI effect within 6 months and losing its protection from oxidation.

VCI-laminated packing also poses an environmental concern due to difficulties separating the paper and plastic components. When this is coupled with the real risks to personnel posed by proportionally high numbers of workers manually packing extremely heavy objects on mill floors in close proximity to potentially hazardous materials, the need for a new system becomes clear.

Automated wrapping and mechanical protection

Pesmel utilises Through Eye Wrapping (TEW) machines that stretch PE film through the coil eye and form an air-tight seal. This drastically reduces the amount of air trapped inside packaging, limiting the potential for condensation. An additional crepe paper layer can be applied under the protective film. This low cost paper has excellent moisture absorbency properties, and it can also be treated with VCI for protection against particularly harsh external conditions or multiple handling situations. This duo of protective measures isolates water droplets from entering the package whilst locking residual humidity away from the metal in the packaging interior. The end result is packaging that can remain airtight for more than 2 years.

This method of packing can only be achieved by machine operation. However, 20 normal-sized coils can be wrapped in 1 hour at significantly lower operational costs than traditional wrapping methods. When a freely-adjustable packing material overlap is taken into account, material usage can be optimised without compromising on rust protection.

A second layer of mechanical protection can also be applied to products that face long delivery distances or significant storage periods. This lightweight, robust solution provides considerable protection during transportation and helps achieve balance between protection and cost optimisation. Any combination of packing materials can be used to deliver the highest returns on investment in any situation.

Pesmel's coil packing line can easily handle different packaging types and sizes without additional setup. One line can serve several slitter lines simultaneously and only requires manual material replenishing on average once per work shift. In addition, the line cuts and optimises materials according to coil size, eliminating the need for several pre-cut packaging material variants and storage. Typically, automated packing can reduce packing material costs by 30%.

Modular solutions

Pesmel has created a range of modular packing line components that can easily be arranged in optimal layouts for individual customers. Upon deciding the level of packing required and the degree of automation, Pesmel can easily integrate the packing line components and control systems with your existing mill. Our modular packing line can be expanded or automation can be increased in line with production requirements. Integrated automation means all packing line controls can be accessed via standard PCs, and a multilingual, user-friendly HMI offers advanced functionality and real-time packing line performance information.

Significant cost savings

Packaging materials, labour costs, maintenance and designated packing space all contribute to the operational costs associated with packaging. However, hidden costs such as compensation for damaged goods and intangible costs such as poorly visible branding on packaging, or visible branding on poor packaging, should also be taken into account. While initially higher in terms of investment costs, automated packaging lines increase packaging quality, lower the amounts of material used and lower labour costs, all located on a smaller factory footprint.

Protect your reputation

Mills can be optimised to produce the best quality coils in the world. However, this is irrelevant if your customer has to discard the first few layers of coil due to rust damage or dirt. Our TEW technology can be supported by a range of add-ons, such as Automatic Film Roll Changing (ARC) that further increases the reliability of your operations by allowing the machinery to run continuously without production breaks. From palletising to additional cardboard lids, Pesmel packing lines ensure your products arrive at your clients in the best possible condition. Reliability is equally as important as quality – Pesmel's packaging technology helps you deliver both.

SSAB and Pesmel:

Partners in high quality sheet packing solutions

PHOTOS: PESMEL

As a Swedish manufacturer of high-strength wear and structural steel, SSAB has enjoyed a long relationship with Pesmel. Upon witnessing pre-commissioning test runs of a coil packing line to be delivered to Bluescope Steel in China, Pesmel agreed on supplying 4 automated coil packing lines to SSAB's mill in Borlänge, Sweden in 2007.

The productivity and efficiency of the lines led to Pesmel being invited to tender bids for supplying 2 sheet packing lines. At the time, SSAB had a pre-existing sheet packing line that had been supplied by another company 10 years previously. However, the challenges and requirements SSAB faced to deliver new high performance steel worldwide meant that the development of their packing system was essential.

High quality, high performance

Pesmel was successful in securing both sheet packing line commissions and began working on the delivery in 2009, with the 1st line commissioned in 2010 and the 2nd following in 2011. SSAB had an extremely clear set of requirements for its packaging – alongside significant capacity and efficiency upgrades, SSAB required total airtightness, zero moisture present inside the packaging, accurate and robust edge protection and the option to create custom palettes for each package. Rust, returns and material wastage had all been significant issues associated with the previous packing line.

After a long pre-commissioning phase during which thousands of packages were tested, the result was 2

fully-automated packing lines that significantly reduced material wastage, offered greatly improved capacity and were pre-calibrated to perform effectively upon installation.

Automated total packing solution

In practice, longitudinal timber wood stacks and cross log stacks are loaded by an operator onto a roller conveyor by forklift. At the same time, sheets are stacked in an existing stacking unit and conveyed to the packing line receiving conveyor, or by crane. The width, height and weight of the package is automatically calculated before transfer to the packing machines. The package is then straightened and centralised.

A bonding machine then makes finger joints on the ends of the wood lengths, which are then jointed and secured by a staple that is "shot" into the finger joint positions. Saw machines then cut the wood into appropriately long lengths that correspond to the dimensions of the package. Longitudinal wood pieces and cross logs are then either conveyed to the pallet making area or to the strapping position.

After the package's ID is verified, the wrapping machine starts automatically reeling paper wrapping or plastic foil according to the length and height of the sheet package. The wrapping machine then raises the package and applies wrapping to both sides of the package, cutting and folding the material underneath the package when the end of the package arrives between conveyors.

The package is then brushed smooth and a wrapping head begins travelling forward along the package and applying a several passes of stretch film according to requirements. The film is then heat seamed to the package. Packages are then lifted and positioned onto the constructed pallet, and edge protection is automatically applied to upper and lower corners of the package before automatic strapping and labelling. Conveyors then transfer the packages to the storage hall prior to shipment. All wrapping materials and strapping are easily replaced by way of magazines.

Future-proof technology

Throughout the whole packaging process, no wastage occurs as every piece of packing material is cut to order. The lines are capable of delivering up to 40 packages an hour at 4 metre lengths, and manual oversight is now only required for observation and loading new packing materials. This means SSAB can safely expand production without worrying about extra packing capacity. SSAB has frequently expressed its satisfaction with the line, especially with the inclusion of potentially the 1st integrated automatic pallet maker on a sheet packing line. Other customers have also expressed great interest in this solution. The limiting factor is the availability of high quality wood outside of Scandinavia, but as ever, Pesmel is working on a solution! •

Cover sheet applied under and over the sheet absorbs internal moisture.

Waterproof stretch film protects the product from outside moisture.

Fully automated packing line needs only one operator.

Automation increases production efficiency and safety

Marko Nousiainen, Director of Engineering and R&D, talks about future developments in automation and how Pesmel's solutions respond to the needs they create.

Finnish Metal and Engineering Vision 2025, published by the Research Institute of the Finnish Economy, presents future trends in the engineering industry. Marko Nousiainen gives his view on how Pesmel's products are keeping up with these trends.

The utilization of information technology is ever increasing

"Since the 1980s, ICT has come into the picture along with automation systems: production control, production planning software, and the Internet of Things have become commonly used. Ten years ago, we had only one ICT designer at Pesmel. Now we have ten. The growth has been rapid, and there is no end to it," says Marko Nousiainen.

"The amount of data systems around hardware is increasing, which makes it easier to control and monitor the data that the system produces. You get so much more out of the machinery with the help of IT: operations are more controlled and systematic, production is more efficient, and the utilization rate and reliability can be improved," continues Nousiainen.

Marko Nousiainen is convinced of the benefits and bright future of information technology in engineering.

PHOTO: SANNA RINTATALO

The use of robotics is becoming more common

Industrial robots are becoming increasingly common in mill and storage solutions in order to minimize the amount of physical labor. Heavy, non-ergonomic labor is being transferred to robots. This is also utilized in Pesmel's solutions.

"A robot does not tire or go on strike. This is a way to replace manual labor. A future vision is that it is possible for people and robots to work safely together in the same space. First, a proper artificial intelligence – one that resembles human intelligence – is no longer a utopia. However, a lot of research is yet needed to achieve this," says Nousiainen.

PHOTO: PESMEL

The Industrial Revolution is still progressing

”The Industrial Revolution started in the 18th century along with the mechanization of production, which was made possible by the invention of water power and steam power,” explains Marko Nousiainen.

“Currently we are in the fourth stage of the revolution. This includes smart factories with production control systems that make production more adaptable. This means that production can be adjusted according to demand. This is facilitated by the possibility to forecast the consumption of goods and optimize production based on that. This also enables reduced consumption of energy and helps to minimize the carbon footprint,” continues Nousiainen.

The Internet of Things is creating new opportunities

Today, many companies, with Pesmel at the forefront, provide data collection software that collects information about the machinery’s operation.

”Pesmel FlowCare collects online and history data about machinery. The data is available to both the customer and Pesmel’s maintenance organization to analyze the performance and maintenance needs of the mill. With the help of FlowCare, we can serve our customers significantly better than before,” says Nousiainen.

New energy solutions on the rise

The high market price of electricity is spurring companies on to find ways to save energy. Rotary engines today are very energy-efficient, and alternative solutions for energy production are being taken into use.

"Only our imagination limits what we can do with IT."
– Marko Nousiainen

“Pesmel provides solar panel solutions for facilities that do not produce their own energy, such as high-bay storage facilities. Their roofs are an ideal location for the panels. The energy is collected when the sun is shining, and the stacker cranes utilize this energy in lifting goods during daytime. At night, there is no solar energy available, so stacker cranes bring goods down from the shelves, acting as generators and collecting energy from the braking force. This energy is also pushed to the mill’s electricity network. In practice, this is free electricity within the mill,” explains Nousiainen.

Machines become ever smarter

“The Internet of Things has brought new thinking. Previously, mills have been very local, but thanks to remote access, the operating field is now open. ICT is also bringing more science into understanding why something works or not. Information used to be inside people’s heads; now things are more transparent. Now the information is more easily available and unbiased, for all organization levels, from bottom to top,” says Marko Nousiainen.

Nousiainen is convinced of the benefits and bright future of information technology in engineering:

“Only our imagination limits what we can do with IT.” •

Pesmel MES boosts mill production planning and execution

The Pesmel MES manufacturing execution system is part of the Pesmel Control product family, which is used to automate and manage information flows at mills.

Pesmel Control is an integrated product suite that is part of the Pesmel Material Flow concept. Solutions for managing a mill's information flows are available at three different levels:

Level 1: Pesmel automation. This includes low-level software that controls the machinery.

Level 2: Pesmel WMS (warehouse management system) and Pesmel FlowCare. This includes software that enables production operators to monitor the production line and maintenance personnel to see equipment status in real time.

Level 3: Pesmel MES, which includes production planning and execution functions. It shows the current status of the processes in real time, and also an overview of the whole production process over a longer time frame.

Modular functionalities of Pesmel MES

Pesmel MES is used by production planners, warehouse managers and controllers to manage the different phases of the production process:

Production planning and execution is the area where MES shows its true benefit. By using MES, you can make the mill's operations more efficient by freeing staff from manual operations to more productive duties. Pesmel MES includes the following features:

- Detailed production scheduling: Plan timetables, assign resources. Includes simulations to see which plan works the best.
- Production dispatch: Automatically sends the detailed production plan to the right machines and people. Includes electronic work instructions.
- Production execution management: For supervising production execution.
- Production data collection: Includes feedback from the different work phases. This information is used for further processing and reporting.
- Production tracking: This feature is used to trace, for example, detailed production and quality information data back to products or vice versa.
- Production performance analysis: Reporting, including information such as production yield numbers and the utilization rate of equipment.

Warehouse management keeps track of the storage and enables the optimization of storage levels in parallel to production planning so that the amount of stock is always optimal. It controls the way the coils move and governs information flows in the storage system.

Maintenance management keeps track of the service needs of the machinery and equipment. It promotes preventive and predictive maintenance and minimizes the risk of bottlenecks.

Quality management includes automated data collection and reporting based on the mill's quality plan.

The benefits of Pesmel MES

Pesmel MES is a 24/7 electronic supervisor that improves production efficiency and safety. By utilizing Pesmel MES for production planning and execution, you can get immediate benefits:

- The amount of manual labor decreases, making operations and production more cost-efficient.
  - » Time savings: complex manual calculations could take 2–3 days, but automatic calculations are processed in only a couple of seconds, without human error.
  - » There's no longer a need to keep buffer storage as the stock is always in its optimal state.
  - » The amount of surplus material and waste is minimized.

Other benefits that are gained over a longer timeframe are in the agility and speed of production, which create a competitive advantage by reducing production cycle times and time-to-market. In addition, Pesmel MES provides the opportunity to improve the production process through continuous learning.

PHOTO: SANNA RINTATALO

Sauli Ketola, Tuomas Vuorenmaa, Antti Kuusisto and Markku Rissanen are ready to serve Pesmel's customers

The FlowCare team takes care of Pesmel's customers

Along with Pesmel's system delivery, you get the expertise of the whole FlowCare team to support the operations of your mill.

With the help of FlowCare, our personnel are able get closer to our customers and to serve them better. The team is able to collect and analyze data from the machinery to improve its operation and to monitor its condition. The application responds to our customers' need to monitor, improve and forecast maintenance.

What is exceptional about FlowCare is that it is always supplied as part of the system delivery, not as separate software. Our specialists are thoroughly familiar with our customers' needs and equipment, which are the starting point for the development of the software. The solutions offered by software houses are data-system-oriented, unable to provide similar level of expertise.

The development team consists of experts in their own fields

The development team consists of specialists from different fields: there are ICT designers, a system designer, an equipment designer, and a maintenance specialist. They combine their knowledge to provide an all-inclusive service that helps our customers to better understand their own equipment.

The system designer contributes their knowledge of the delivery as a whole and the Material Flow How. This includes information used in measuring the performance of the system, such as turnaround time, availability, and utilization.

The equipment designer brings their profound knowledge of individual machines, maintenance targets, and their lifetimes and maintenance intervals.

The maintenance specialist knows how the equipment is serviced in practice, bringing knowledge of what kind of information should be available to the maintenance personnel at the mill and instructions for them.

The ICT designer knows the ICT technology, collects the requirements from the other specialists and brings them into the software, and creates the analytics. The work of an ICT designer is to make compromises between the requirements set by the equipment and the customer, fitting different pieces of the puzzle together. The ICT designer is also an expert on usability and makes the software user-friendly and safe.

The future of FlowCare

The FlowCare team is dedicated to constantly developing the software. In the future, the level of customer service is being improved with an online store, which is going to be piloted this year. With the help of FlowCare and the customer-specific online store, customers can always stay up to speed on their maintenance needs, able to see the range of spare parts and their time of delivery and easily buy them. An online salesperson is available during office hours for personal service. Next year a ServiceDesk interface will also be piloted, which will make it easier to contact our service personnel. Thanks to FlowCare, Pesmel will be at the forefront when it comes to availability. •

FlowCare

- Data collection system
  - » Available now
  - » Finds bottlenecks in production
  - » Follows the operation of individual machines
  - » Follows the technical availability of the machinery
  - » Detects preventive maintenance needs for machinery
  - » Helps to plan on-time maintenance
- Online store for spare parts
  - » Piloted in 2016
  - » Always up to date
  - » Saves time in purchasing spare parts
  - » Online salesperson assists you during office hours
- ServiceDesk interface
  - » Helps you to communicate with Pesmel's service personnel
  - » Piloted in 2017

Pesmel's sales team is ready

Our sales team consists of professionals who have a long experience and excellent knowledge of material handling in the metal industry. We'd like you to meet them and find out about their fields of expertise.

Jouko Metsänranta
Key account Manager,
Service operations

I mainly work on bigger service projects with our key customers, including paper industry roll handling lines and steel industry coil handling solutions. I like to be the first point of contact for Pesmel customers.

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Timo Lehtonen
Sales Manager

My task is to listen to our customers' wishes and help them find value-added solutions for their material flow. If I'm not able to find a solution from our existing product range, I will work with our engineering department to find innovative solutions.

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Juha Suksi
Vice President

I am responsible for metal industry sales and projects, and for promoting the Pesmel Material Flow concept to our customers. We offer innovative, flexible and technically advanced solutions that meet our customers' needs.

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Jouni Piirto
Mechanical Engineer,
Concept Development

I work with our customers to develop material flow solutions that improve production efficiency and productivity. By working with our engineering department, I try to achieve the perfect balance between the number of devices used, efficiency and cost effectiveness.

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Esa Takala
Sales Manager

My main responsibility is the sales of packing lines and storage systems for the metal industry. I believe we are not just an equipment seller, we always try to find bottlenecks in our customers' process, and only after we are familiar with our customer needs do we offer a solution.

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to serve you

It is vital that our specialists are involved in your project as early in the process as possible, before any final decisions have been made. This enables us to serve our customers better.

Jagannathan Rajagopalan
Managing Director,
Pesmel South Asia

Sr. Consultant Sales and Marketing, Pesmel North America

II provide support to the sales team in developing concepts, planning offers and by acting at the customer interface. I also provide support in the project phase for the completion of projects as applicable.

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Marko Heikkinen
General Manager,
Service

I have overall responsibility for our Service unit, including sales, maintenance, rebuilds, spare parts, HelpDesk, and customer visits. In new projects, I come into the picture when discussions of maintenance or HelpDesk contracts start.

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Sami Koivuluoma
Product Engineer

My responsibilities include developing concepts, creating offers and working in the customer interface. I believe that innovative solutions and strong engineering are Pesmel's biggest strengths in business.

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Juha Mielonen
Account Manager

I help our customers to find solutions in their speciffic needs. I also work as an interface between the customer and Pesmel expertice and resources. My responsibilities include making offers and managing service projects.

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Mikko Mäki-Rahkola
Development Manager,
IT

I'm in charge of the development of Pesmel's so ware products and services business. For me, the ideal time to join a project is when the mill layout is starting to take shape and the information flow management discussions begin.

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Jouni Räisänen
Sales Manager

I develop concepts according customer needs, create layouts and discuss them with customers. I also balance the pricing and commercial offers with technical specifications to arrive at the most competitively-priced solution.

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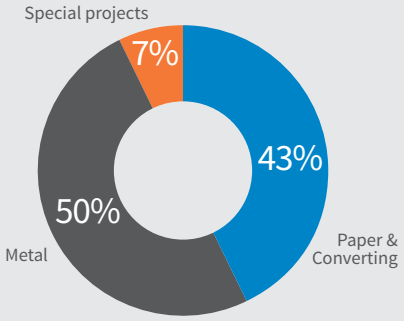
PHOTO: PEKKA NIEMI

PESMEL FACTS & FIGURES

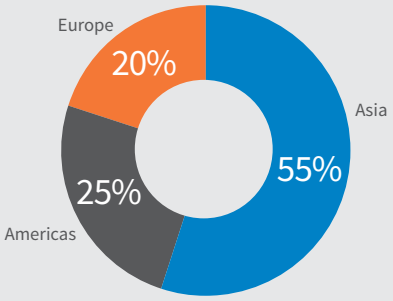
Pesmel is an international expert in material handling. The company's highly automated handling, packing and storage systems improve the mills' internal logistics as well as product quality. The company has two main customer groups, metal and paper industry.

Over the past four decades, Pesmel has delivered over 400 handling and packing projects and around 150 storage systems. The company employs over 180 professionals, of which approximately 110 are situated in Finland.

SALES BY BUSINESS AREAS 2011 – 2015



REVENUE BY MARKET AREAS 2015



DECADES OF DEVELOPMENT

Company established 1978

1980

Starting with conveyor systems development from standalone machines to total logistical systems, first packing line for paper industry

1990

Strong time of growth. New companies abroad, strenghtening the position in paper industry, first packing line for metal industry

2000

Growth continues with diversification into metal industry products. Ongoing globalisation process, new subsidiaries and agencies. Audited and certified quality system ISO 9001:2000

2010

Pesmel assumes increasing responsibility for customer logistics and packing functions. Integrated information technology solutions that compliment systems and equipment functions become more common

CUSTOMER FIGURES

15%
increase in sales
due to shorter delivery times and fulfilling orders others can't

7 day
reduction
in invocing times due to integrated software

Average
6-10%
increase
in mill efficiency

30%
savings
in packing materials

1/3
space utilisation
compared to traditional storage

0
lost orders, shipment and handling errors

LOCATIONS

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