

NewsFlow

2017 • Paper

Metsä Board Husum
Showcasing TransRoll's
flexibility

M-Files
Keeping projects
flowing smoothly

Owens Corning
A satisfied customer
returns

International Paper
A partnership built
on cooperation



NewsFlow

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International Paper

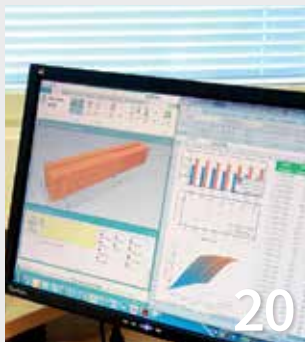
Pesmel's flexible approach and cooperative attitude have given rise to a profitable partnership.



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RAPP

After 10 years, the TransRoll system delivered to RAPP in Indonesia keeps on rolling.



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Simulation

Using intelligent simulation helps to get the maximum benefit from complex systems.



Tony Leikas,
President and CEO,
Pespel Oy

Editorial

Our Material Flow How is much more than just products, it is a tailored concept that creates individual, customized solutions. This means that we listen carefully to what our customers actually want, and we are eager to solve their problems. It's music to our ears when our customers tell us exactly what problems they are struggling with or what challenges they are facing, as this means we can get started on helping them to solve those issues.

As a solution provider, we never give up. It's quite common for new issues to come up during a project, and we always work with our customers to solve them. We always persevere until we find a solution.

This is exactly how a solution provider should operate. It's also a very rewarding way to operate, as we can really see the results of our hard work and its significance for our customers. It gives our work more meaning.

We've also made great strides recently with our TransRoll and TransBale solutions. These automated warehouse solutions for paper rolls and pulp bales offer our customers increased efficiency and flexibility in distribution, meaning they can provide better service to their customers. Interest in these systems is increasing rapidly, and we're receiving new orders – and we're also learning new things about our own solutions.

For example, we already knew that TransRoll is an excellent choice for greenfield projects. What has been educational for us – and a little surprising – is how effective it is for existing facilities. Even when the height available is only six meters, TransRoll is an efficient way to handle and store paper rolls, as it can flexibly utilize all the available space. The growing interest in TransRoll led us to consider how we could develop it to help the pulp industry, too. The result is TransBale, which brings the same benefits to handling pulp bales.

These new concepts, combined with our focus on continuous R&D and our FlowCare software solution, mean that we'll be able to serve our customers even better in the future.

Tony

The systems and solutions that Pesmel produces are complex – and the projects themselves are complex, too. Good project management is essential in making sure that everything proceeds according to plan and without hiccups. *NewsFlow* spoke to **Teemu Kolkka**, general manager of the project department, about Pesmel's new project management tool, M-Files, and how it is improving things for Pesmel – and its customers.

Complex projects need top-class project management



What kinds of projects are your team involved with?

My team work on delivery projects. We are divided between two sectors, paper and metal, and our customers are paper producers, converters and metal producers. Our delivery projects can be greenfield or brownfield projects, or revamps. My department deals with all the green- and brownfield projects, but some revamp projects are handled by the service team. All our greenfield and brownfield projects follow a standardised project model.

Can you describe how your project model works?

Projects all start with an internal kick-off meeting where the sales manager hands over the contract and concept to the project manager. We have a rule that this has to happen within seven days of the contract being signed or permission to start project being received.

Next is the pre-engineering phase, which lasts about six weeks. In the first three weeks, we fix the general arrangement layout, start-up information and the scope of supply for the detailed design as a list of deliverables in M-Files. This also involves a customer kick-off meeting, where we visit the customer with the project team, we show them our project model, we agree on how we will communicate and exchange documents, and we settle the plan and schedule. After our own acceptance meetings for the scope, documentation and budget, we move to the design phase.

Then is the detailed engineering phase, which is divided into mechanical, electrical, and automation and ICT. From there it goes to purchasing, and after that comes manufacturing, monitored in M-Files by Deliverables and Works, with their progress and milestones in relation to the project

schedule. There, we cut the steel and do the welding and so on, and that happens mainly in Estonia. We try to make our systems so they are modules, so that you can easily install and transport them. All systems from Pesmel are machine-tested, and we have a protocol for that. We can do full layout tests as well, depending on the customer need and complexity of the system.

Then we dismantle it, put it into containers or trucks, and ship it to the customer. That's basically the phases at our end. We can do the installation as well, or we can supervise the installation. Then we have the commissioning phase, and after that we can basically say, "Now you can start production." The whole process up to delivery can take from six months to two years.

Can you give us some examples of what a typical project is like?

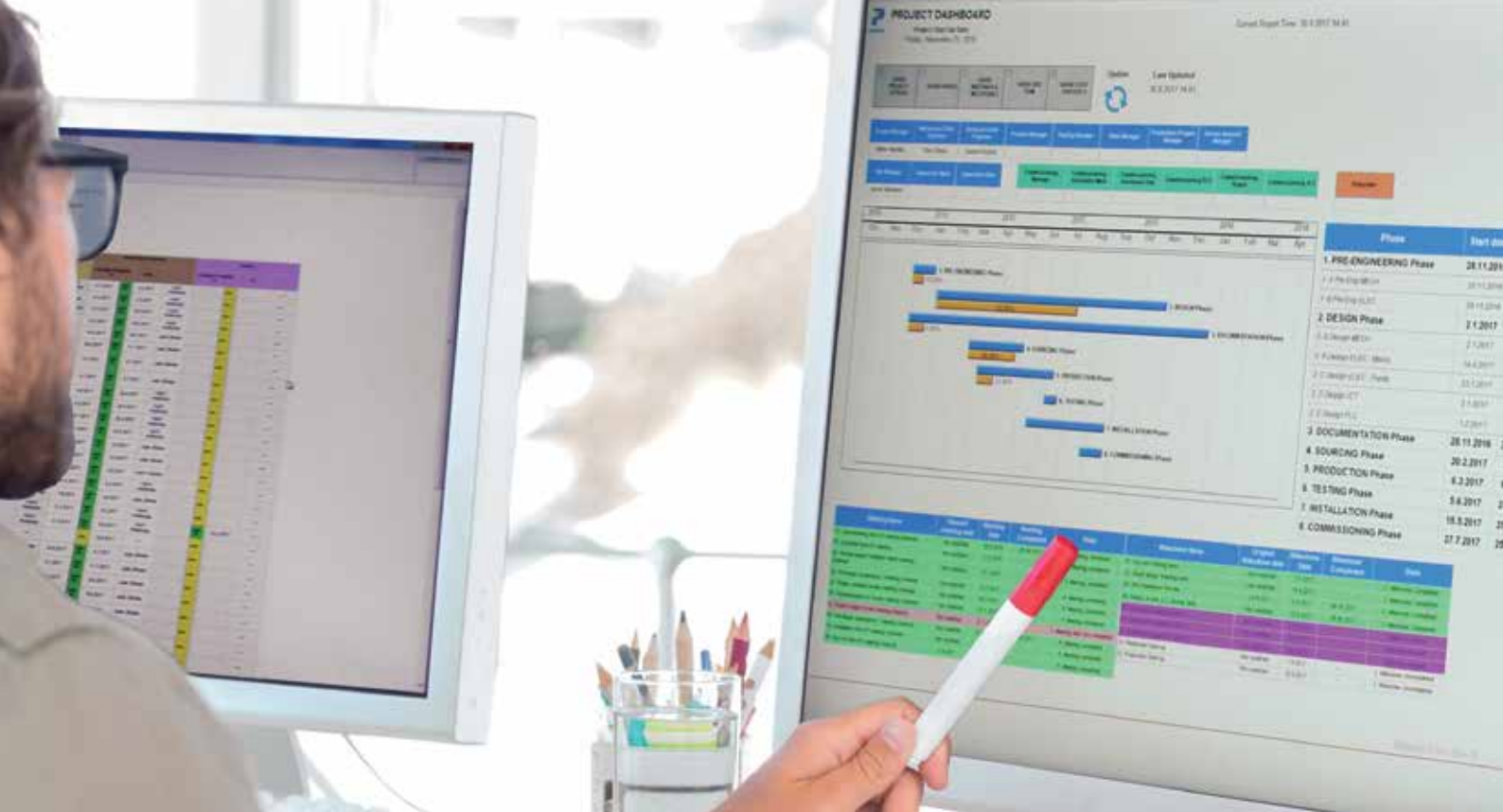
Our two main types are packing lines and storage systems. Packing lines are typically the internal packing lines in mills. Customers usually want to improve quality and safety, speed up their packaging process, increase capacity, and find savings.

Storage systems are bigger investments, with more focus on construction. Storage can be intermediate, or for finished goods. They are automated warehouses that use conveyors or



We can see the current status of every element of every project, which really helps with keeping projects flowing.

– Teemu Kolkka



overhead cranes to move the goods. We've done systems for roll, bales, coils, and pallets, as well as some products from other industries. For storage systems, the idea is to minimise the footprint, so we build high, and we make it fully automatic and minimise handling. We can build single-lane, multi-lane and deep-lane systems. The project management for storage systems is also more complicated, keeping track of all the construction aspects.

Can you tell us something about your new project management tool?

We can have dozens of projects on-going at a time, and our projects are complex, so excellent project management is essential. To manage all this and to handle all the documentation, schedules and workload, we need a good system. We noticed some years back that the way we were handling documentation was old-fashioned. We examined different documentation handling systems and did some studies and benchmarking, and we concluded that M-Files was the best choice.

We changed our documentation storage system to M-Files, which took a year and a half. And then we started to look at what else we could do with it. We ended up changing our CRM tool to M-Files, and then our project management. We started to implement all our different documents and

schedules, which had all been static, so for example, a change made in the workshop didn't automatically come to here. We found that M-Files could do all of it for us.

M-Files has been customised for us a bit to fit our project model. We can see every phase of every project. It's all implemented here according to our process, with every checkpoint and milestone. In the first stage of a project, the project manager uses M-Files to build a project plan. First we put the main phases there, and then each phase has the work that needs to be done to complete deliverables, which are things we supply to the customer, along with the milestones and meetings, as a schedule. It is also possible to use offline and portable devices, which means you can take your key data with you when you travel to customer sites that don't have internet access. This lets customers see in reality how the project execution is built up, what the actual progress is, or where open issues need to be agreed in order to move forward.

It can generate tasks automatically, and it also shows us who is doing what for every step. For example, who is doing the electrical and automation design, and how far they've got. Other nice features are that you can set alarms and the reporting features for different levels and needs.

What benefits has M-Files brought for you and for customers?

For us, the main benefits are visibility and automation. It centralises all the information in one place. It improves visibility in the entire project, right down to task level. We can see the current status of every element of every project, which really helps with keeping projects flowing. The automation means that information gets sent and moved automatically. Tasks can also be set automatically, which helps a lot with resourcing. And all the documents are connected to the system, so we can jump straight to the right design documents, maintenance manual, or spare parts list of that particular design (deliverable), for example.

For customers, it means that we don't need to reinvent the wheel. Everything stored in the system has metadata attached. We can create reports for customers easily by pulling metadata about any aspect of the project. So it's easier and quicker to keep them fully informed about the status of projects as well.

We've been using it like this for around eight months now, and we're really happy with it. It's really helping us move towards where we want to be as a company to improve our own project delivery chain for our customers. •

International Paper and Pesmel

A PARTNERSHIP BUILT ON COOPERATION

On a crisp April morning in Kauhajoki, northern Finland, **Stan Merrill** from International Paper and Pesmel's **Kaj Fahlund** are thrashing out the details of implementing IP's latest roll packing line project. Over the past few years, International Paper has entrusted Pesmel with around €20 million in packing system deliveries. NewsFlow caught up with them during a break in the talks in order to find out why Pesmel keeps winning their trust.

International Paper has been operating for over a century. Headquartered in Memphis, Tennessee, it is the largest papermaker in the world, with over 55,000 employees in 24 countries. It produces a wide variety of containerboard, paperboard, paper, and pulp at over 40 mills globally. Pulp and paper mills are enormous capital investments. These investments obviously need to make a return, so there is pressure to continuously work on improving productivity. Even a 1% improvement in production output every year for 20 years means that, sooner or later, the packing part of the line becomes a bottleneck. IP seldom builds new mills, so it focuses on incremental improvements to the operations and efficiency of its existing mills.

Recent years have seen a seismic strategic shift in the industry, too. The rise of the internet has led to changes in how people get their information, and especially in how they consume news. The shift to online news has led to a collapse in the newsprint market. There has been a less dramatic, but still significant, change in the printing paper market too, so papermakers have had to adapt and change their production output. International Paper was one of the first companies to recognize these changes and shift its production towards board and pulp. This change in production means that the packing requirements at IP's mills have changed as well.

The combination of the change in production and the improved machine efficiency means that many of the existing packaging solutions are no longer up to the task. And these

packing systems are not minor investments, either. A single packing system can cost millions, and in just the last three years, International Paper has ordered systems like this from Pesmel for six mills in three different countries.

Packing systems – from kraft to stretch film

Traditionally, packing systems used laminated kraft paper to wrap paper and pulp rolls. "Kraft wrapping was a synonym for packaging in the paper industry," Fahlund explains. "Stretch film wrapping was something peculiar and strange. But the thinking has changed, and stretch film has started to spread." International Paper used to use kraft paper, too, but it is migrating to stretch film for most of its new systems.

"From a capital point of view, stretch wrapping systems are lower cost, equipment-wise," says Merrill. "From a maintenance point of view, you have fewer machine parts. It's less maintenance cost, it's less energy cost. It's just fewer things to maintain." As IP can't afford to shut down its mills to install new systems, it has to fit the new system into the existing mill while everything is still running, so the size of the system is a vital consideration. The footprint of stretch film wrapping systems is much smaller than for kraft wrapping systems.

Customers, especially European ones, also want to have less waste to deal with, and plastic also recycles well. Kraft wrappers are laminated with a layer of plastic for moisture protection, which makes them harder to recycle. With a >>



Stan Merrill and Jessica Oates from IP conducting a full acceptance test at the Pesmel workshop.



The quality of the pulp or paper defines the packing materials needed.

well-designed system, the right equipment and the right materials, stretch packaging can also offer more appropriate packing quality. “That’s been learned the hard way,” says Merrill. “You have to have equipment that’s designed specifically to wrap rolls.” The equipment and the films themselves have evolved a lot over the years.

To an observer, there wouldn’t be much visible difference between the stretch film systems at IP’s mills, but the types of package that the different systems create are quite different. “If you walked into any of the mills, you’d see a machine doing one thing, and a robot doing another thing, and the rolls going out the end, and it would look almost the same,” Merrill says. “The difference is that white paper, board, newsprint, and so on prioritize mechanical protection, but the cellulose fiber packages have both an environmental layer and a mechanical layer.”

As the cellulose is used for hygiene products and medical supplies, the environmental packaging requirements are stringent. The mechanical layer protects against physical impacts, while the environmental layer keeps the content pure and protects it from odor contamination, dirt, and bugs, for example.

Choosing suppliers on merit

International Paper begins projects like this by drawing up the specifications and then inviting vendors to bid for them. IP sends the specifications to a number of suppliers who have the capability and experience to provide complete systems. The vendors selected have either already proved that they are capable, or have presented strong evidence of this. This is a fairly select group of suppliers, as IP have stringent design requirements. “We’re willing to pay for all that, that’s

not a problem,” says Merrill, “but we have to have a supplier that’s willing to do it.”

These suppliers are invited to present their solutions. Following the presentation stage, IP whittles the group down to a shortlist of about three suppliers. The final choice is made based on the suitability of the solution and, of course, the price. Merrill is keen to point out that price is not the only consideration, though – the suitability of the solution is the most important factor. Of course, previous positive experience with a supplier plays a part in whether they are invited to present their solution, but contracts are awarded based on the merits of the solution in every instance.

Stan Merrill happily admits that International Paper is a demanding customer. “From IP’s perspective, the better that suppliers understand International Paper, the better it is for everybody,” he says. From start to finish, the process of implementing a packing system takes about two years, and it follows a very clear and detailed process.

An involved process

Fahllund explains how it works: “All IP investment projects follow the same model. It’s a meticulous process, with wallcharts and everything. The process can be a bit muddier with some customers, but everybody at IP knows how it goes and what comes next. There’s a checklist, with five main stages and maybe 50 items to check off at each stage.”

“There’s three steps until we reach the capital implementation stage,” says Merrill. “First is basic design and concept, then basic engineering and estimating, and then detailed engineering and estimating. The fourth step is the implementation stage, and the last step is a post-implementation

"As you evolve the process, you also increase your expectations."

evaluation." At the end of every step, there is a pause to confirm that everything is proceeding according to plan before the next step commences. It's a process that requires a great deal of cooperation between the supplier and IP.

The design and engineering phases normally take about six months and involve a number of very detailed meetings: kickoff meeting, general engineering review, mechanical design review, and electrical design review. "Then we'll have a full acceptance test at the factory," Merrill explains. "You put everything together, you hook it all up, and you actually run it."

Assuming everything has gone well to this point, the process proceeds to the construction phase, which involves yet more close collaboration: planning the installation and commissioning, analyzing potential problems, and in those projects where installation and commissioning will take place during the regular maintenance outage of the paper machine, what IP calls an "eye-popper": making sure that they are ready to go when the outage happens and that everything can be done in that relatively brief window of opportunity. In the old days, the installation and commissioning at site could take months, but now we are talking windows of weeks.

Having mill operations in diverse countries can create its own issues as well. There's obviously the language barrier, as working in countries outside the US means that, generally, there are three languages involved: English, the local language, and the lingua franca – "broken English" as Fahllund labels it. This obviously leads to potential for confusion. Even when things go perfectly smoothly, having multiple languages involved slows down the erection and start-up phases, as the local labor force generally doesn't speak English. Even when the local language is English, this doesn't mean communication will be flawless. Merrill describes a project in Australia where the slang that the local workers used was surprisingly difficult to understand.

Pesmel – a flexible partner

These projects and the systems involved have changed greatly in the past couple of decades. Where weekly maintenance shutdowns used to be the norm, now they happen once every three months. Safety has also been vastly improved, with light curtains and automatic shutdown systems to protect the workers. These developments have meant changes in the design process, too. Lessons are learned during every project as well, and new rules and standards are established. As a result, the requirements change for every project, which requires flexibility and a willingness to adapt from the supplier.

Merrill describes it as IP "evolving" their development with vendors. Pesmel's flexibility and cooperative attitude in this regard is one of the reasons why IP has selected Pesmel to supply so many systems. According to Kaj Fahllund, "At Pesmel, we

have a certain kind of experience and we have been doing these systems for decades. But it's not only the technology, it's also that we understand how they want to do these things."

International Paper is always keen to tell all their suppliers how they can improve, and Pesmel's willingness to learn and better themselves is a good fit for this. "As you evolve the process," says Merrill, "you also increase your expectations." Good previous performance becomes the baseline for the next project. Over a decade of working together, Pesmel and IP have both adapted. Says Merrill: "They learn from it. We learn from it. We put processes in place to check stuff. They put processes in place to check stuff."

Pesmel's solutions are often not the cheapest in price, but they have at various times been the best in terms of total cost of ownership and installation, technological solution, floor plan and construction costs, or timeline. Their modular, pre-built, "plug-and-play" systems simplify construction and start-up on site.

While the time zone differences and amount of travel involved have been minor issues, Merrill says that communication is good – there has been no language barrier, unlike with some other suppliers. Pesmel's understanding of International Paper's processes and the way they like to do things is important, and their willingness to cooperate, their flexibility, and their desire to evolve along with the systems have been major factors, too. It's the combination of all these things that has pleased IP on previous occasions, and it means that Pesmel continues to win their trust – and their contracts. •

In recent years, Pesmel has supplied or is currently supplying packing systems for six International Paper mills:

- Riegelwood, North Carolina, USA – softwood and fluff pulp – 2016 (2 lines)
- Prattville, Alabama, USA – kraft linerboard – 2016
- Kwidzyn, Poland – paper, paperboard, and newsprint – 2016 (2 lines)
- Mogi Guaçu, Brazil – pulp and uncoated paper – 2017 (2 lines)
- Três Lagoas, Brazil – uncoated paper – 2017
- Luiz Antônio, Brazil – pulp and uncoated paper – 2018 (3 lines)

Metsä Board's Husum mill demonstrates



Pespel's TransRoll automated storage systems have already proved their worth in cases where the height is no limit to accommodating a high-bay storage system. But as the recent reference at Metsä Board's Husum mill demonstrates, this system can also be applied in existing facilities – even ones with low roofs.

TransRoll concept's flexibility

Metsä Board is Europe's leading producer of premium paperboards, including folding boxboard, food service board and white kraftliner. Their products are used in the manufacture of consumer goods, retail-ready and food packaging. The company employs around 2,500 people and produces around 2 million tonnes of paperboard annually, with sales of EUR 1.7 billion. Metsä Board's Husum mill is an integrated board and pulp mill that produces 730,000 tonnes of bleached market pulp every year, as well as 400,000 tonnes of folding boxboard and 270,000 tonnes of kraftliner. The mill is located in the small village of Husum in eastern Sweden and is the main employer in the area, with 700 employees.

Reorganizing production at Husum

As part of Metsä Board's larger program to transform itself into a pure paperboard company, two paper machines at the Husum mill were shut down and replaced by a new state-of-the-art paperboard machine from Valmet in 2015–2016. One paper machine was converted to produce linerboard. After this, the mill has been producing 500,000 tonnes of paperboard a year on two production lines.

Along with this change, the existing fine paper sheet cutting operations also ceased, replaced by a new extrusion coating line. This change required intermediate roll storage (IRS) between the paperboard production lines and the extrusion coating line.

Extensive studies showed that the only practical area for this IRS was the old empty sheeting hall next to the new extruder line. The problem was the limited 6 m height of the ceiling this area, which would significantly limit storage volumes using the traditional method of stacking rolls on the floor. The available footprint was also too limited to allow the use of traditional clamp trucks or automatically guided vehicles (AGVs), because the access routes to allow these vehicles to clamp and lift large, seven-tonne paperboard rolls would take up almost half of the available footprint. Metsä Board's project team was in need of new ideas, so they contacted Pesmel.

Effective solution for limited space

Pesmel's proposed solution was based from the start on TransRoll, a concept that has been used successfully for a long time at converting plants for IRS needs. The standard TransRoll rack was scaled to fit the available height in this facility, which meant only two levels of TR channels for rolls with a maximum diameter of 1.8 meters. It also required asymmetric channel lengths (24 m and 17 m) with an aisle


between them for one stacker crane to make full use of the available footprint. In other words, the traditional stacks of rolls were changed for horizontal channels to fill the available shallow space optimally with rolls from wall to wall and floor to ceiling. The storage volume was double what could be achieved with an AGV solution. The handling and sorting capacity was met with intelligent WMS control (a PC-controlled warehouse management system linked to MIS to keep the IRS inventory).

In the final solution, this modified TransRoll concept was able to fit 4,500 tonnes of paperboard into a 3,180 m² space with a height of only 6 m and a handling capacity of 300 tonnes an hour. Fire safety was ensured with sprinkler pipes pulled in to the rack on each of the two levels.

Another remarkable benefit of this concept was that it simplified the layout by minimizing the need for conveyor equipment to move rolls between the production lines, the new extruder and the central wrapping station, as the stacker crane handle this. •



The stacker crane moves rolls to buffer storage between the paperboard lines and the PE coating station.



Reliability and adaptability the keys for Owens Corning

PHOTOS: PESMEL

One recent case for Pesmél was the delivery of a stretch film wrapping line to Owens Corning in the USA, the second big order from this firm.

Wim Weeres, technical director for non-wovens at Owens Corning, explained what it is about Pesmél that brought them back.

Owens Corning is a global corporation based in Ohio, USA, that develops, manufactures, and markets insulation, roofing, and fiberglass composites. Its roofing shingles and insulation products are a well-recognized brand. It also produces a wide range of glass fibers for composite materials. These are used in thousands of products, making them lighter, stronger, and more durable. They are utilized in a wide range of industries, from construction to transportation, and from energy production to consumer goods. Owens Corning employs

about 17,000 people in 33 countries, and it has been one of America's most successful firms for half a century.

Specialty composites in Apeldoorn

The first project was part of a production overhaul at the Owens Corning plant at Apeldoorn in the Netherlands. The plant produces a wide variety of specialty non-woven glass fiber composite products. Examples of these products include the faces for high-quality acoustic ceiling tiles, cushioned vinyl flooring, "lay flat, stay

flat" glass sandwich carpet tiles, circuit boards, glass-faced gypsum board, and even the blades for wind turbines.

Being a specialty plant means that it has frequent changes of production, where the plant shuts down production of one type of product, cleans everything up, and then starts up again making a different product. "I remember at one point we had 600 different products that the plant was shipping out for 200 customers over the entire world," explains Weeres, who has overseen both projects with Pesmél.

"The existing wrapping line was never completely satisfactory," Weeres tells

"Safety is something that cannot be debated."



A cooperative attitude and flexibility are as important as the systems themselves, says Wim Weeres from Owens Corning.

us, "and as part of a de-bottlenecking project, we redesigned the entire back end of the plant." One of the big drivers was safety; the packing area can involve large masses of material moving at quite high speeds, there is always the risk of an accident. Improving the capacity of the packing system was the other main goal. Specialty plants can be producing small rolls at quite high speed: more than 50 rolls an hour. This means almost one roll is entering the packing area every minute. Owens Corning opted for a single automated system that could cope with different types of packing and high speeds, as well as eliminating labelling errors.

Flexible attitude brings results

They had previously had problems with automated packing systems. Glass can be very fragile if it's not handled correctly, and earlier wrapping systems had exerted too much pressure, compressing the fibers and breaking them. Pesmel worked closely with Owens Corning to find the perfect solution. "They spent a whole lot of time with us to understand our needs and convert that to the equipment," explains Weeres. "Several times we needed to adjust the concept." Pesmel's flexibility and adaptability contributed greatly to the successful outcome, and the final system adds a foam layer and has technology designed so that the stretch wrapping doesn't apply too much pressure. The rolls are also lifted from the middle using poles, rather than clamped.

For their Apeldoorn project, Owens Corning spent a lot of time doing studies, talking with others in the

industry, and evaluating suppliers before finally settling on Pesmel. When the time came to build their new plant in Gastonia, North Carolina, however, their previous good experience of working with Pesmel and the flexibility and reliability that Pesmel had displayed in the previous project convinced them to go with Pesmel for the new mill right from the start. Their only real concerns were about whether a Finnish company could support a plant in the U.S., but Pesmel's proven ability to support plants in India, China, and elsewhere in the U.S. convinced them. During the execution of the project, Pesmel finalized their North American service organization, which finally allayed this concern.

Safety the #1 priority

Similarly to Apeldoorn, the Gastonia plant is a specialty plant producing non-woven composites. It serves the same market and customers, and it will partially replace the Apeldoorn plant as a supplier. "The market here in the U.S. is growing," explains Weeres. "The market in Europe is more mature, meaning they developed earlier. In the U.S., they're still converting non-glass-based applications to glass-based applications."

The concept for the wrapping system was also similar to that used in Apeldoorn. The biggest difference between the two plants is that the Apeldoorn plant uses parent reel cars to move parent reels between the buffer storage and winder, whereas the Gastonia plant uses cranes above the parent reel buffer storage system that Pesmel delivered. The number one design factor

was safety. "Safety is something that cannot be debated," says Weeres. "The Gastonia line makes rolls that have diameters of up to two meters and they can weigh two-and-a-half tonnes. If something goes wrong, you've got that coming towards you." The rolls are just too big and the lines too fast for manual packing. OC's own safety requirements are stricter than those in the US or EU, and Pesmel had to meet them, as well.

A trusted and flexible partner

Pesmel's cooperative attitude and flexibility is as important for Owens Corning as the systems themselves. Some suppliers have their own ways of doing things and do not want to change anything. Pesmel, on the other hand, are always happy to discuss OC's requirements. "They may question the need for something, but once they understand why, they make sure that their equipment fulfills all requirements," according to Weeres. "Some companies have become so slim, so lean, that they don't have the manpower anymore to do something special. But Pesmel re-evaluated, reprogrammed or redesigned basically every element. They have the manpower, the creativity and the flexibility to be able to do that."

Owens Corning is also happy that it can rely on Pesmel to keep their promises. Once something is agreed, it will be done as agreed.

Weeres was also "surprised by the communication skills of the Finns," as he puts it. Pesmel's willingness to listen and eagerness to communicate about issues exceeded his expectations – and broke the stereotype about Finns! •

The background of the entire page is a photograph of a large industrial facility, likely a pulp and paper mill. It features a complex network of green metal beams and structures, with a prominent yellow crane or lifting mechanism in the center. The perspective is looking down a long, narrow aisle within the facility.

After 10 years, TransRoll keeps on rolling...

In 2006, Pespel delivered a TransRoll storage system to a pulp and paper mill in Indonesia operated by Riau Andalan Pulp & Paper. After almost a decade in operation, the system is still running smoothly and reliably – and it should continue to do so for decades more. Of course, maintaining a complex system like TransRoll isn't the simplest operation, but Pespel are happy to cooperate with customers with long-term service to help them keep their rolls moving.



Mr. Wahyu Setiady,
finishing manager
of the Riau Andalan
Pulp & Paper mill

Riau Andalan Pulp & Paper (RAPP) is part of Indonesia's APRIL Group. RAPP operates mainly around the town of Pangkalan Kerinci on the island of Sumatra. The mill is one of the group's main subsidiaries, and APRIL also has a number of plantations that supply the raw materials for its operations. APRIL makes pulp and paper products that are used by millions of people every day in packaging for liquids, printing and writing paper, tissues, shopping bags, food packaging, magazines, and books.

The RAPP mill is among the five most efficient such mills in the world. It produces 2.8 million tonnes of bleached acacia kraft pulp and more than 1.1 million tonnes of paper every year, mainly copy and offset papers, digital printing grades sold in sheets, and customer rolls. Its customers include offset printing houses, book converters, governments, banks, and large retail chains. It sells its products in over 70 countries around the world, with the bulk of its operations taking place in Asia.

TransRoll at RAPP

The solution that Psmel created for RAPP is an automated, high-density, deep-lane intermediate storage system for paper rolls. It features a rack-supported storage facility and uses two automated stacker cranes with shuttle vehicles. At RAPP, TransRoll has two functions: it serves as intermediate storage for rolls that come from the paper machines and are destined for the converting plant, and it is also a warehouse for finished rolls that are sold directly to customers.

This order was the first agreement between APRIL Group and Psmel. APRIL carefully examined several possible solutions before making their choice. At the time, one of the major contributing factors in the decision was TransRoll's capacity and throughput. "Capacity was key. Nobody else could match the required in/out capacity," says Mr. Wahyu Setiady, finishing manager at RAPP. TransRoll has provided a number of other benefits at the mill: it saves space, it has reduced the manpower required, fewer forklifts are needed, and loading containers is now much faster. The RAPP mill has had no major problems with the system since it was installed nine years ago. In fact, the system has proved to be more reliable than a different system used in a nearby warehouse, and APRIL were so pleased with their TransRoll system that they ordered another, larger system for a mill in Guangzhou, China as well.

Long-term reliability through proper maintenance

Psmel has a lot of experience in this field, and it knows how to produce reliable systems. With proper care and maintenance, a TransRoll system will run for at least 15 years, and possibly well over 20, before any major upgrades are required. After such an upgrade, customers can expect it to continue running smoothly for a similar amount of time. Components in TransRoll systems from other suppliers are just as reliable – some TransRoll systems have cranes supplied over 25 years ago that are still running smoothly.

Keeping any system running smoothly requires maintenance, and any industrial expert will tell you that prevention is better than cure. Properly planning, scheduling and conducting an effective preventive maintenance program is important. Doing things properly keeps the amount of maintenance required to the minimum, and the old-school "run-to-failure" model of maintenance simply isn't an option for a system like TransRoll.

Keeping TransRoll rolling

Properly maintaining a TransRoll system requires special skills and good planning. Psmel have provided RAPP with good instructions and training in the steps that need to be taken, giving them the ability to handle everyday maintenance and preventive measures themselves. "It is special equipment that requires special training, so every visit is a training visit as well. It requires well-planned maintenance and a focus on minimizing dead stock," says Wahyu Setiady. The basic elements of the preventive maintenance program include making sure that all the bearings are properly greased, and that all the chains and rolling parts are properly lubricated.

Parts that are wearing out also need to be replaced. The wheels on the TransRoll cars are made of polyurethane. While this is a tough plastic, it does eventually wear out. The carbon parts of the current collectors, which convey the electric current from the rails to the cranes, also wear and need to be replaced. RAPP's own technicians take care of these actions themselves as part of the regular monthly maintenance program.

Psmel is always eager to provide good service to all its customers. Engineers from Psmel visit the RAPP mill at least once a year for more involved maintenance activities, such as making adjustments to the frequency converters and sensors, and checking the condition of electrical components. They also use specialized equipment to examine the condition of the fieldbuses every few years.

Looking further ahead in the life cycle

After nine years of operation, there is still no need to consider any major upgrades to the system. Eventually, this will need to happen – when, for example, the PLCs or frequency converters are no longer supported by the manufacturer. Even then, the team from Psmel try to adapt and reuse things like control software as much as possible, rather than rewriting it, to simplify the process.

The environment in Riau is quite humid and rainy, but this has not affected the reliability of their TransRoll solution. TransRoll systems are always built to be robust: Psmel's engineers always consider the operating environment – temperature (hot or cold), humidity, dust, etc. – and choose appropriate components and subsystems to make sure their TransRoll solutions keep on rolling.

It's not only the efficiency and capacity of TransRoll itself that keeps customers happy and coming back, it's also Psmel's exceptional customer service and proactive attitude to servicing and maintenance. •



We know the flow

SPAREPARTS
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SPARE PARTS



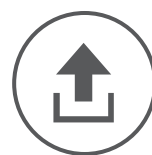
MAINTENANCE



HELPDESK



FLOWCARE 2.0



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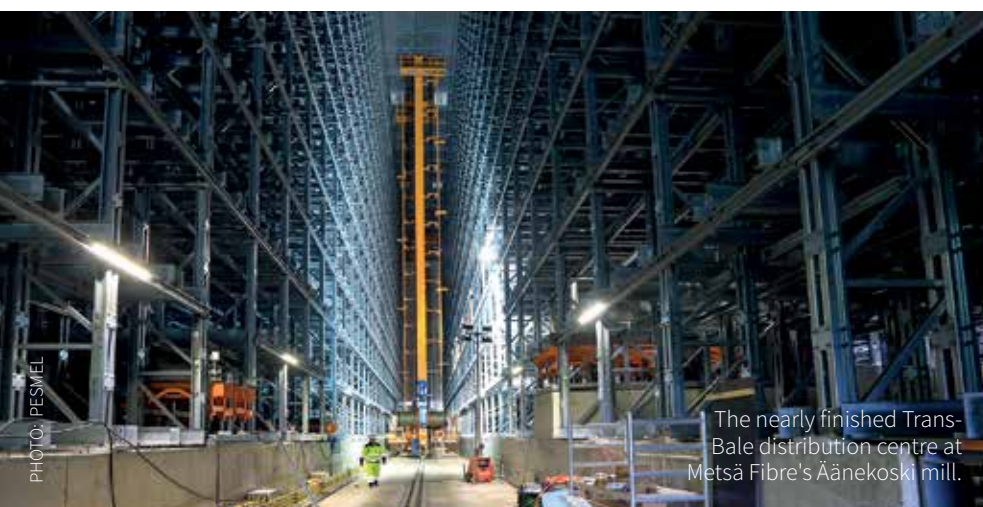
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Pioneering TransBale system approaching completion in Äänekoski

Metsä Group – a Finnish forest industry group – is currently building a next-generation bioproduct mill in Äänekoski in Central Finland. It selected Pesmel to supply a high-tech automated intermediate storage and distribution facility for the mill, which is now approaching completion.



The nearly finished TransBale distribution centre at Metsä Fibre's Äänekoski mill.

TRANSBALE AND ÄÄNEKOSKI IN NUMBERS

Bioproduct mill:

- €1.2 billion investment
- 1.3 million tonnes of pulp annually
- 40 hectare site
- Up to 2,500 workers on site at a time during construction

TransBale:

- Storage building 35 m high, 100 m long and 30 m wide
- 1,500 tonnes of steel for the structure and racks
- 7,000 m² of sandwich panels for the walls and 3,000 m² for the roof
- 2 trains per day, each with 22 cars
- 64 tonnes of pulp per car

Pesmel's involvement in the project showcases the company's latest technology: TransBale. The system is an evolution of the already successful TransRoll system for handling paper rolls, developing the technology to be suitable for storage and distribution of pulp bales.

The TransBale implementation in Äänekoski consists of a completely automated high-bay intermediate storage solution for bales of pulp, an automated distribution system to load the bales onto trains for export, and another system for loading trucks for delivery to the domestic market. These are combined with a computerized warehouse management system integrated with the local production management and SAP systems, as well as the conveyor system from Valmet and the overhead cranes from Konecranes. It will handle all the bales of pulp from both the new bioproduct mill and the existing pulp mill at the site.

The bales arrive consolidated into units on a conveyor from the production facility. Two stacker cranes pick them up and take

them to buffer storage in the high-bay rack system, where they usually stay for a few days. Using RFID tags on each bale unit allows maximum efficiency in storage, and the system can function with just one crane if the other is down for maintenance or repair. Typically, after a few days in storage, the stacker cranes return and take the units to the loading dock, where overhead cranes load them into trains or forklifts load trucks at the other side of the facility.

TransBale is a very robust solution – as it needs to be to cope with the harsh Finnish climate, where temperatures can range from 30 °C in summer to -30 °C or more in winter. The system in Äänekoski uses very high-quality components along with electrics and electronics that are as simple as possible, in order to promote reliability.

Implementation is complex but smooth

The construction of the bioproduct mill is a vast, complex undertaking, not least because the existing mill at the

site is continuing to operate throughout the process. At the peak of construction, there were as many as 2,500 people working at the site at one time, and coordinating all the work, material, communication between the various suppliers, and logistics is extremely demanding.

The construction process itself went fairly smoothly. Of course, in any project – never mind a project on this scale – things never go perfectly, but Metsä Group is a very professional organization that understands that reality never matches the plans perfectly. The keen attitude to cooperation and transparency that both Metsä and Pesmel exhibit meant that the minor issues were resolved, and lessons have been learned for the future, too.

The new mill will be connected to the TransBale system in June or July this year, the trains should start running in August, and the entire bioproduct mill was started according to schedule in August 2017. •

CAREFUL ROLL PACKING

The Kotkamills logo is printed on a roll of white paper. It features the word "KOTKAMILLS" in a bold, black, sans-serif font. Above the letter "i" in "MILLS", there is a small green graphic of a stylized leaf or sprout.

Pesmel is proud to be involved in the fully recyclable consumer board revolution taking place at Kotkamills. With new Finnish owners and visionary technology, Kotkamills turned to Pesmel for a packing solution that meets its needs.

When Kotkamills initiated major investments and adopted pioneering production technology under a new owner in 2015, it quickly discovered that it was going to need a new roll packing system. Pesmel was able to design a layout to fit the challenging facilities seamlessly, and construction soon began on the conveyor systems and packing line to serve both the new board machine as well as the existing laminating paper machine.

A revolutionary product range

Kotkamills is a paper and board mill with a long history. Originally a sawmill, it branched out into pulp and later to kraft paper production, always preferring local raw materials and looking at future trends to steer operations. The sawmill remains part of mill operations to this day, with sawdust used in the production of pulp for laminating papers, and chips used for consumer board products.

Kotkamills now operates one paper machine and one board machine in Kotka. PM1 produces Absorbex® base kraft paper for laminates, which can be further converted into Imprex® core stock and surface films. The other machine, BM2, is the pride of the mill: a modern board machine able to produce recyclable, repulpable and renewable folding boxboard and barrier board. The key to its extended recyclability is the dispersion technology, which replaces traditional plastic barriers to hold in liquids and fats.

The products from PM1 still constitute an important part of the mill's sales. BM2 is, however, expected to become the real flagship of the mill when its best features are put to good use in the production of plastic-free barrier board to meet the global need for sustainable and ecological packaging. The potential market for such products is huge. However, the machine also produces regular folding boxboard.

"Kotkamills is the first producer to adopt dispersion technology on this scale," says Timo Tallinen, Technical Director at Kotkamills. "We have already started selling the product.

Through close co-operation with our customers, we are able to even improve our products based on the results of customers' tests and audits."

Bigger rolls required new packing system

With the construction of BM2, the Kotkamills machine hall underwent drastic changes. PM1 continued running throughout the project, which imposed additional constraints on the work. With the new production technology emerged other new requirements: the existing packing solution was not able to handle the large rolls that would be produced.

Modifying the existing packing system proved to be an unsatisfactory solution, so Kotkamills began looking at an electro-mechanical system to replace the old hydraulic machinery with its constant risk of smudging the valuable rolls with oil. Kotkamills also wanted a fully automated packing system that would free personnel for other duties.

Pesmel's solution

The layout of the mill posed a challenge: the new board machine took up a major part of the space in the machine hall, making it necessary to move the packing system downstairs. Pesmel designed the conveyor system and the fully automatic roll packing system, OptiWrap Multi, to exactly fit the available space.

The mill conversion project was characterized above all by the great speed at which the changes took place. As PM1 continued to run, it was crucial that the existing packing system remained operational while the new one was being built. Pesmel was able to ensure that production outages were minimized, which was one of the reasons why it was chosen as the supplier.

"Pesmel was also able to design a relatively simple layout, which was very attractive to us," says Tallinen. "Their designers were able to ask good questions that helped us further develop the concept. The good start-up resources and continued support and cooperation after the start-up were also important for us."

The fully automated roll packing system usually only requires attention when wrapping materials need to be refilled. An operator monitors the system from the winder control room upstairs and only goes downstairs to the packing area when necessary. The operator also has time for other duties besides managing the packing operations.

Automation ensures hygienic food packaging

The packing method must always meet the particular requirements of the mill and its customers. For the food packaging grades that Kotkamills produces, good hygiene is essential. An automated handling and packing system ensures that rolls are processed without the operator's manual touch. Odor or bacteria must not be able to enter the rolls, which need to be in pristine condition when they arrive at the packing machine to receive their watertight and weatherproof kraft packing layer, ready for shipment to the customer.

In food packaging, customer audits are a normal part of the process. In addition to the actual production process of the board machine, auditors also inspect the packing system to ensure that the entire process meets the required standards.

The work continues

The extreme speed with which the project was implemented posed major challenges for the design of the conveyor and packing system. As every mill is different, the systems always need to be tailored specifically for each case. It usually takes years to optimize and complete the layout before implementation; in this case, the process was carried out within a few months.

Ongoing development of board production technologies also requires further work on the packing system to ensure optimal operations. The roll size from the new board machine has proven to be smaller than was anticipated, which means that instead of packing large rolls at a slightly slower speed, the system must manage smaller rolls at a faster speed.

Pesmel and Kotkamills will continue to work together in good co-operation to fine-tune the system when the product range of the mill changes. In the paper and board markets of a changing world, there is no such thing as a final production concept. •



The new packing line was fitted into challenging facilities.

BENEFITS OF MODERNIZATION

- Faster packing operations
- Less workforce required
- No hydraulics
- Automation helps ensure hygiene
- Capability to process a large range of roll sizes

Simulation helps ensure optimal operation

Pesmel has been using 3D modeling to demonstrate the functionality of its material flow systems for quite some time. Advanced simulation is now taking the process of designing complex systems to a new level.

Intelligent simulation brings the shared vision of Pesmel and the customer to life during the design process, allowing testing of complex systems and removal of possible bottlenecks before the construction phase even begins. This saves costs and speeds up the launch of full production operations.

An integral part of the design process

"Simulation should be introduced into the process as early as possible," says Pesmel's simulation specialist Eero Anttila. "It produces valuable information that can help to tweak the sales process and make sure that the customer only invests in a system that is truly optimal."

The simulation model uses actual data from the customer's existing or planned production system, including the dimensions of products and the storage facilities, as well as the speed, acceleration and capacity of transport devices. Interfaces with other systems complete the model, and repeated validation rounds ensure that the model represents a fully functional system.

Hard facts beat intuition

Test runs carried out with the completed model help to ensure that the planned system has adequate capacity and to find the best operating practices. Weeks or even months of operations can be simulated in mere minutes, broadening the perspective and

revealing bottlenecks that would otherwise only emerge over longer periods of time. The model can also be adjusted to test alternative solutions, and uncertainties can be introduced into the model to establish their impact.

"Simulation provides a realistic overview of the system," says Anttila. "It's very important for both the customer and the designers to be able to see the system in action." The detailed input parameters and the authentic rendition of the mill's actual processes, complete with correct timing, produce a level of accuracy that cannot be achieved with other design tools.

In addition to the intended operation of the system, unwanted scenarios can be also simulated. Experiments can, for example, include component failures. The impact of these failures can then be analyzed, and appropriate precautions taken.

Customer involvement for maximum benefit

The model is always built in close cooperation with the customer. Each simulation process begins with a specific issue, such as the need to know whether the capacity of the system is large enough, or if the planned layout works for the facility or process.

The customer provides information and understanding of the usage of the system, and the team decides on the appropriate level of detail for the model. It's vital for the customer to be actively involved throughout the process: to gain maximum benefit, the designers and the customer work together to find the right questions as well as the best ways to answer them. •



"Simulation provides a realistic overview of the system," says Eero Anttila from Pesmel.

Second generation of FlowCare getting ready for business

Pesmel is currently piloting the FlowCare 2.0 service package, which includes a range of new services giving customers easy access to spare parts, services, and documentation.

Instant access to up-to-date documentation anywhere, any time; a handy support ticket system that accelerates the service process; an online store that showcases the exact parts and services that you require; a virtualized twin of your Material Flow How system, allowing test runs of new features and troubleshooting before the problems even occur. These are the main building blocks of the new advanced FlowCare software package included for free in Pesmel deliveries.

The first version of FlowCare was a detailed data collection and remote supervision system designed to speed up maintenance, assist in preventing unplanned outages, and enhance the further improvement of the system. The data collection system can be implemented as an online service directly involving Pesmel, or as a local service with data only available to the customer. The updated version adds important new features that provide a major boost to Pesmel's ability to serve customers.

Putting the IoT to good use

New technological developments have opened up many possibilities for online services based on the Internet of Things. Pesmel's software development team has eagerly seized this opportunity.

"Many similar services have become part of consumers' everyday lives all around the world," says Marko Nousiainen, director of engineering and R&D at Pesmel. "We want to make these services available in the B2B world as well. We are continuously looking into new ways of working with our customers to ensure that the processes are smooth

and that the customers gain the maximum benefit from the services."

New additions to the service package

FlowCare 2.0 includes a set of new services designed to make life easy for customers. A customized online store for spare parts and services always includes exactly those products that the customer's systems might need. Later, the system will also offer proactive recommendations, helping customers keep track of their needs.

The online store is available through Pesmel's customer portal. Another customized service utilizing the same channel is the document library, a centralized storage location for all the documentation related to the customer's systems. The document library ensures that up-to-date documentation is available at all times, without the need for tedious rounds of updates to multiple copies on paper stored in different locations – but paper copies of documentation are, of course, also available when required.

Pesmel's support systems will also enter a new era with FlowCare 2.0. Existing support will be boosted by a service ticket system and enhanced 24/7 support. With an online data collection system in place, Pesmel's service specialists can access customer data directly and start solving problems immediately.

Enhanced commitment from Pesmel

FlowCare 2.0 is a symbol of Pesmel's continuous development efforts and its willingness to serve customers more



FlowCare 2.0

- Data collection
- Online store for spare parts and services
- Document library
- Support tickets
- 24/7 online support

effectively and to deepen the post-delivery relationship. The new software allows Pesmel to look after the delivered hardware better than ever, as well as adding a new area of maintenance services: software development and updates will be an important part of the overall service.

As an additional benefit, the service package gives Pesmel the opportunity to further develop its products based on combined data from customer systems and the online store. As a result, customers will benefit from the increased fault tolerance of new generations of Pesmel's systems. Advanced information systems drive value for everybody. •

Meet the



Kaj Fahllund

**Vice President,
Paper & Converting**

My job is to lead Pesmel's Paper business. My biggest challenge is to adjust and direct our resources towards real customer needs

that are within our reach. The most rewarding moments for me are when, after months of comparing processes, revising proposals, and countless meetings, the customer selects us to be their trusted project supplier.

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Marko Heikkinen

**General Manager
Service**

I've been at Pesmel for over a decade, and I lead the service department. The most rewarding part of my work is to have satisfied customers, and I enjoy meeting customers face to face and solving their problems. The atmosphere at Pesmel is good, and the work is challenging.

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Pekka Jormanainen

**Sales Manager,
Projects and Rebuilds**

I tend to work on paper roll handling and rebuild sales. The biggest challenge is usually to find cost-effective solutions that

meet customers' needs. The best part of working with customers is to collaborate with them to develop the solutions that they need. At Pesmel, I can work independently, but with support from my colleagues when I need it.

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Risto Lehtonen

**Sales Manager,
Paper and Converting**

I've been working on technical sales and CRM at Pesmel since 2013. The best part of my job is winning the customer's confidence, then working with them to develop a new logistics system. Working at Pesmel gives me the chance to work with great people on interesting projects.

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Jagannathan Rajagopalan

**Managing Director,
Pesmel South Asia and
Senior Consultant,
Pesmel North America**

I've been with Pesmel for 14 years promoting the business in India and the USA. It's a positive company with unique modern logistics expertise and a great culture of teamwork. It's really rewarding to see the end results of all our work, when a customer's finishing operations are completely automated, improving safety and quality, and enhancing productivity.

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Jani Matikainen

Product Group Manager

I work with automated storage systems, and I've been with Pesmel for ten years. My main duties are developing concepts, and providing support for sales and projects. Juggling many different tasks can sometimes be challenging, but it's very rewarding to collaborate with customers to develop the solution they need and then to see them satisfied.

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sales team

Ari Mäkinen

**Account Manager,
Service**

I work mainly in after-sales service for customers in the paper converting business area, and I've been with Pesmel for eight years. Tight schedules can sometimes be tricky, but I'm surrounded by helpful and cooperative teams, there is a lot of in-house expertise, and we have a great product portfolio.

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Niko Nyman

Product Engineer

I've been providing product support for sales, designing layouts in 2D and 3D, and managing our product portfolio for a couple of years. Other than having satisfied customers, the best part of interacting with customers is that you can see different cultures and production sites all over the world.

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Jouni Räisänen

Sales Manager

I've been working on interesting sales projects at Pesmel for nearly 15 years, helping customers find the best solutions for their warehousing challenges. The biggest challenge is usually to develop solutions that are cost competitive, and the most rewarding bit is working with customers as one team to find solutions.

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Eero Perälä

Product Engineer

My main duties are creating simulations and animations, and lately I have been designing automated warehouses. I work on complex and highly automated projects that are almost always unique, and in almost every project I learn something new. It's very rewarding when my simulation or animation is helpful in closing a deal.

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Veli-Matti Hirsimäki

Product Manager

I work with layout solutions as well as pricing and have been with Pesmel for almost 37 years. I enjoy the challenge of competing among the industry leaders and constantly trying to think a couple of steps ahead. Interacting with new people and company cultures make each day different. I consider getting repeat orders as my reward for serving our clients.

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Kari Terho

Product Manager

I support the sales team and manage kraft wrapping products. I've been with Pesmel for four years, and I'm surrounded here by innovative people. I find it very rewarding when we work together with a customer to find a solution to their needs that is competitive and reliable.

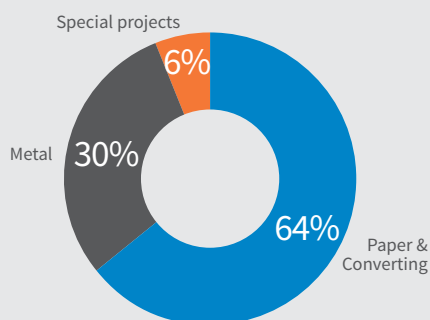
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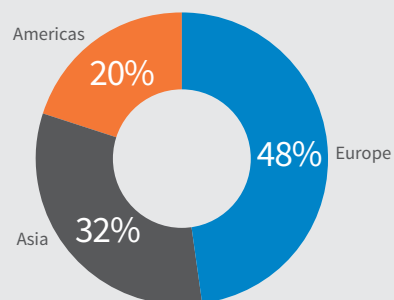
Pesmel is an international expert in material handling. The company's highly automated handling, packing and storage systems improve the mills' internal logistics as well as product quality. The company has two main customer groups, metal and paper industry.

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.

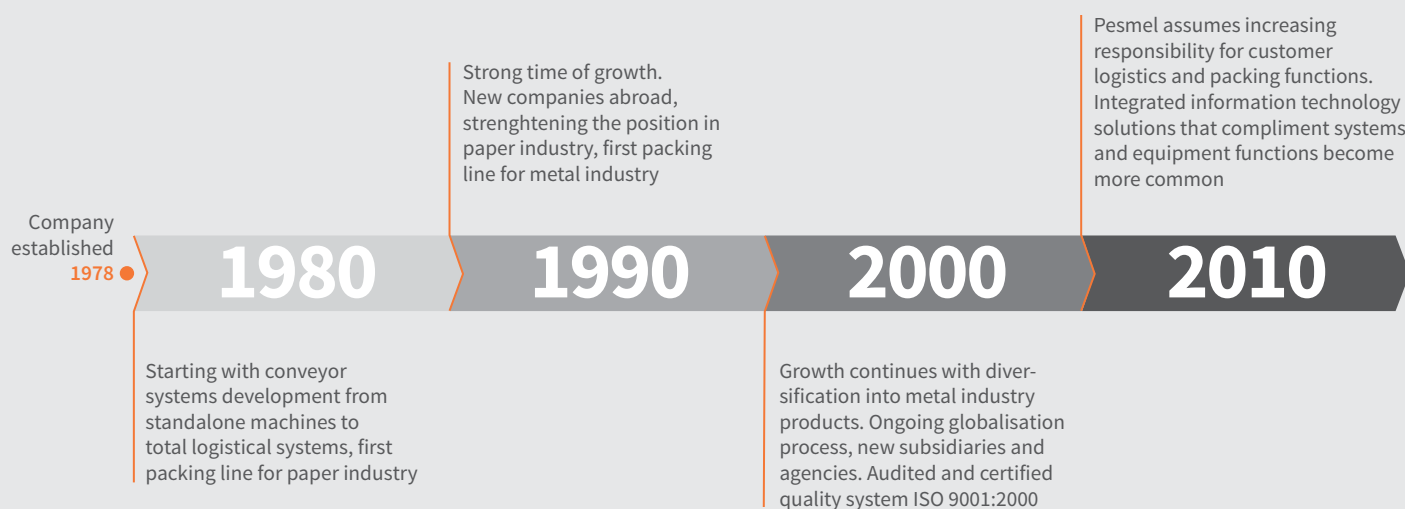
SALES BY BUSINESS AREAS 2016



REVENUE BY MARKET AREAS 2016



DECADES OF DEVELOPMENT



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