Forward

VALMET'S CUSTOMER MAGAZINE | 1/2014

The new Valmet is **ready to serve**

Valmet

Editorial

Dear Reader,

Welcome to the first issue of Valmet Corporation's new customer magazine – Forward!

For Valmet, 2013 was a historical, challenging year. Valmet's demerger from Metso Group was finalized at the end of December 2013, and trading in Valmet shares began on the Helsinki Stock Exchange on January 2, 2014.

As one indication of the strong, new, future-focused Valmet, you are holding a completely refreshed magazine. It will give you ideas and insights into how choosing the right technology and service solutions have helped our customers to improve their performance. We also take a closer look at our most recent innovations in the field of pulp, paper and energy technologies and services, and we discuss topical issues related to market dynamics.

The name Forward comes directly from Valmet's customer promise: we are committed to moving our customers' performance forward. Valmet's mission is to convert renewable resources into sustainable results. This mission and our promise are turned into action through our strong emphasis on customer service: our 11,000 professionals around the world work closely with our customers – every single day.

Valmet is ready to serve!

ANU SALONSAARI-POSTI
SENIOR VICE PRESIDENT
MARKETING AND COMMUNICATIONS

> We are committed to moving our customers' performance forward.

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A world-class specialty paper machine saw daylight at Sappi Alfeld after extensive rebuild.

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New biomass conversion technologies bring benefits in a world of reducing resources.

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Increased efficiency through maintenance

Profitability and production efficiency through good maintenance culture.

In brief

Sappi trusts Valmet's technology

Valmet will deliver a complete multi-fuel boiler to Sappi Ltd's Kirkniemi mill in Finland.The start-up of the plant is scheduled for mid 2015.

The new boiler can flexibly use solid fuels such as bark from the mill's debarking process, other wood-based fuels and coal. Together with the current biofuel boiler the mill can produce biomass-based energy up to 100%.

Valmet will further rebuild a paper machine at the Gratkorn mill of Sappi Austria Produktions in Austria. The large delivery will include the modernization of all the main sections of the paper machine and it targets to improve end product quality. The start-up will take place at the end of 2014.

Sappi also recently started up a project of converting its graphic paper machine PM 2 at Alfeld, Germany, into a specialty paper machine. Read more about this on page 6.

Suzano pulp mill starts up in Brazil

Suzano Papel e Celulose's new pulp mill, located in Imperatriz, Maranhão, Brazil was started up at the end of 2013. The greenfield mill is the first complete pulp mill supplied by Valmet in South America.

UN's Global Compact principles govern Valmet's operations

Valmet has been approved as a participant of the United Nations Global Compact (UNGC), which is the world's largest voluntary corporate responsibility initiative run by the United Nations. The UN Global Compact works toward the vision of a sustainable global economy which delivers lasting benefits to people, communities and markets.

THE GLOBAL COMPACT
WE SUPPORT

Commitment to this globally acknowledged initiative is regarded as very important at Valmet. We want our business operations to be based on fair play and respect to each others. This mindset should cover all the actions throughout the value chain – from sourcing to the use and recycling of our products.

Cheng Yang Paper Mill orders a containerboard line to Vietnam

Valmet will supply an OptiConcept M containerboard production line for Cheng Yang Paper Mill Co.,Ltd., a subsidiary of of Nine Dragons Paper (Holdings) Ltd. in Vietnam. The new production line will produce high-quality containerboard grades out of 100% recycled raw materials. The machine will start up in 2015.

"The line ordered by Cheng Yang Paper Mill will be Valmet's fifth OptiConcept M production line to be supplied to Asia. The advantage of the OptiConcept M technology is in its modular approach which enables short delivery times, quick start-up and low project costs. The OptiConcept M production line stands for economy of total investment," says Kari Räisänen, Sales Director of Valmet.

FORTUM, UPM AND VALMET DEVELOPING TECHNOLOGY FOR BIOMASS BASED FUELS

Fortum, UPM and Valmet have joined forces to develop a new, winning technology to produce advanced high value lignocellulosic fuels, such as transportation fuels or higher value bio liquids. The idea is to develop catalytic pyrolysis technology for upgrading bio-oil and commercialise the solution. The five-year project is called LignoCat (lignocellulosic fuels by catalytic pyrolysis).

Key pulp mill technology to OKI in Indonesia

OKI Pulp & Paper Mills has ordered key technology for their new pulp mill project in South Sumatra, Indonesia. Valmet supplies a part of pulp mill equipment and systems with a value of approximately EUR 340 million.

The new mill is expected to produce approximately 2 million ADT of pulp annually. The commercial production is expected to begin in 2016. Valmet's delivery includes two biomass gasifiers, two biomass boilers, an evaporation system, two lime kilns and two pulp dryers.

Large pulp dryer delivery to Klabin in Brazil

Valmet and Klabin S.A. have signed a letter of intent according to which Valmet will deliver two pulp drying lines to Klabin's new plant in Ortigueira in Paraná, Brazil. The start-up of the new plant is scheduled to be in the first half of 2016.

The pulp dryer investment is part of Klabin's Puma project, the largest investment in the company's history, which will double the company's production in three years. The annual production capacity of the new plant will be 1.5 million tonnes and consists of both softwood fluff pulp and eucalyptus hardwood market pulp.

Valmet's maintenance outsourcing services operating model aligned with EFNMS standards

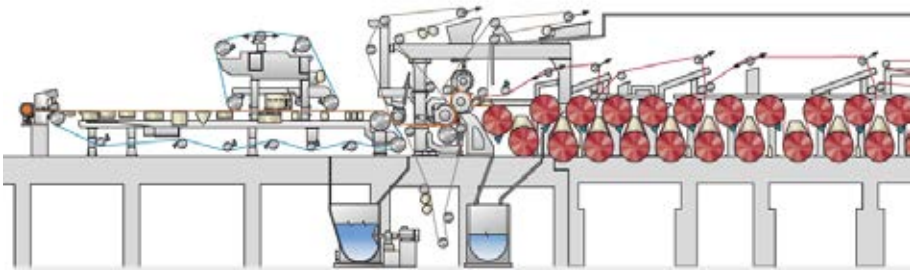
Valmet offers maintenance outsourcing services for the pulp, paper and energy industries. In its eight outsourcing services units, it employs about 800 maintenance professionals who maintain the production equipment of our customers.

To harmonize the ways to operate in the units and to create a vision for the units, Valmet has conceptualized an operating model for the maintenance services, described in the book called "Valmet Way to Operate in Maintenance" (WTO). It describes the main procedures in Valmet's maintenance concepts and provides frameworks for their implementation.

The central content of the operating model is aligned with the skill requirements set for European maintenance managers drawn by the European Federation of National Maintenance Societies (EFNMS) and the technical report CEN/TR 15628 drawn by European Committee for Standardization (CEN).

A "SPECIAL" STAR IS BORN

The Sappi Alfeld Mill near Hannover in Germany has been making paper since the 1700s. Over the last 80 years it has carved out something of a solid reputation in the field of bespoke, speciality papers, which has created a perfect platform for growth in the uncertain world of paper production. Sappi recently took on an ambitious project to convert its one remaining graphic paper machine at Alfeld - PM 2 - into what is probably the largest, most innovative, automated and versatile speciality paper machine on the planet, with a capacity of 135,000 tonnes/yr. Sappi chose Valmet as a partner to help it achieve its goal. **TEXT** Mark Rushton



Sappi is one of the world's largest producers of high quality, coated graphic papers, but unfortunately – and no matter how good those products are - the introduction of the iPad, the Samsung Galaxy, the Kindle, and a raft of other electronic media devices have put a large dent in graphic paper demand.

At this crucial crossroads, Sappi could easily have introduced the unimaginative management philosophy of cut, cut and cut some more. However in the case of Sappi Fine Paper Europe's Alfeld mill, a much bolder approach was taken; to significantly expand into the lucrative market for speciality papers.

"The existing PM 2 at Alfeld was losing us a lot of money", says Sappi Fine Paper Europe CEO, **Berry Wiersum**. "And a graphic paper machine sitting in the middle of four other paper machines which were more than paying their way in specialities made no sense at all."

"Our existing speciality papers' customers were telling us that they liked the idea of a "big" machine," continues Wiersum, "One that could cope with larger orders, and one that could ease the transition from using lots of plastic to using lots of paper instead – a growing trend in Europe."

> "PM 2 was going to become a star paper machine in the world of specialities.

Let Project Leopard commence!

The history of the idea for what was to become known at Sappi as Project Leopard started at the Alfeld mill itself. The name came from an action photo of a Leopard leaping from one rock to another on one of Sappi's customer calendars – a perfect illustration of the plan for PM 2.

One of those people instrumental in the idea of the transformation of PM 2 is director at the Alfeld mill, Dr. **Stephan Karrer.** "We had an unusual situation at Alfeld, four speciality machines that were doing really well in a growing market, and one graphic machine that was struggling in a declining market. The four speciality machines were running 24/7, 365 days a year, and the graphic paper machine was subject to commercial standstills due to lack of orders. We had to do something.

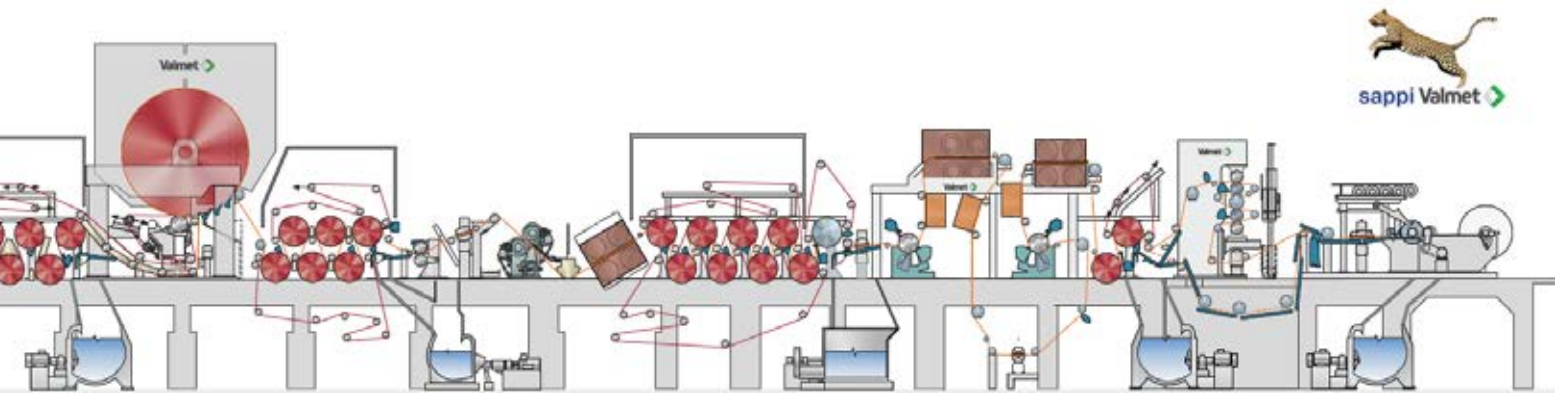
"We thought about having a minor rebuild, and tackling specialities that way around," continues Karrer, "But specialities is our business, and we were not convinced we could deliver the quality, particularly at the speed of PM 2, which is much faster than a "normal" speciality machine. Then we came up with the bold plan of going the whole way and doing a complete rebuild."

The concept for the new PM 2 was for a world-class, prototype speciality machine with a width of 5,150 mm that could handle intricate grades from a basis weight of 40-180 g/m^2 and run at a production speed of 1,200 m/min. This would mean that production would leap from the five or six tonnes per hour norm for a speciality machine to 20 tonnes per hour. The machine would also have to cope with numerous, complex grade changes.

It was a clear plan from the start that PM 2 was going to become a star paper machine in the world of specialities.

In May 2011, the Alfeld team including Karrer presented to Sappi's European management team in Brussels the ambitious plan to rebuild PM 2 into what he described as "something fantastic that will increase our specialities by 135,000 tonnes/yr".

Karrer describes the management team at the presentation as going completely silent after the ambitious plan for



PM 2 was put forward, which was then broken by CEO Wiersum, uttering "Wow!"

Another 14 months later, in July 2012, and after a lot of serious studies, discussions and site visits, Project Leopard commenced, and Valmet was appointed as the main supplier for the project.

Sappi Alfeld: a demanding customer

Valmet's scope of supply was a complex and all-encompassing one; the new PM 2 has a completely new headbox with dilution circulation, forming, press and dryer sections rebuilt. One of the essential ingredients in the rebuild is a brand new solid casting 6.4 m diameter Yankee cylinder with hood. The machine also has a completely new coating section with air dryers plus two ValCoat coating stations, a multinip calender rebuild with existing Nipco rolls, a reel rebuild and broke collection. The automation supplied also included a DNA quality control system and machine control PCS7.

Mauri Laurikainen, Valmet's senior paper technology manager for paper mills says of the PM 2 project: "From the beginning when the concept was first presented, it was clear this was going to be an unusual one – a totally online concept with finished products coming off the end of the machine. Added, interesting challenges are the wide basis weight range and the differing speciality grades, at the same time being produced on a wide machine at speed. The Yankee cylinder of course was an absolute must to obtain the base paper surface quality.

"We trialled many of the grades at our pilot plants in Finland making sure that the coatings and calendering demands would work across the grades needed," continues Laurikainen. "There is no doubt that the Sappi Alfeld mill was a demanding customer for this project, but they knew what they wanted and they always came at us with their ideas in a cooperative fashion."

↑ PROJECT LEOPARD
The machine was extensively rebuilt to cover a wide range of products.

A carnival atmosphere

Wim Devens, the company's manager of central technology and engineering was Project Leopard's leader from the

The new Opti range of products

Valmet has fused its paper and boardmaking offering to introduce the new Opti range of products. All Valmet coating stations are combined under one family name OptiCoat. Alfeld's two ValCoat blade coating stations represent the upgraded technology that is today called OptiCoat Jet. Read the article "Our customers are really happy with our products" at www.valmet.com/opticoatjet.

Sappi side, he says: "We went through the whole process with the main suppliers, and in the end it came out that Valmet had the experience and know-how in specialities, as well as the facilities for the casting of the Yankee cylinder. There was also a gut feeling among the team at Sappi that Valmet was the right choice of supplier."

With the order in place, it was then left to Devens and the project team, the mill team, and the suppliers - which was all overseen by a steering committee made up of the senior management of both Sappi and Valmet - to ensure the deadline for timing was met, as well as the guarantees of quality. But first, there was transportation of the massive Yankee cylinder to arrange.

The journey itself from Sweden to Germany by boat and barge was not so much of a problem, but the road trip from the river port to the mill was full of challenges, says Devens: "It took over 100 local authority approvals to allow the Yankee to pass through towns and villages and over bridges to the mill. Street lighting had to be dismantled, high voltage cables lifted and over 120 trees had to have branches sawn off – 10 trees had to come down completely.

When the Yankee finally arrived in Alfeld, it was to something of a carnival atmosphere as this was not only one of the most exciting projects the town of Alfeld had seen for some time, but it was also the biggest engineering project going on in the whole of Germany which was being hit by the economic turndown. Devens said, "When the Yankee arrived, it was as if the whole county had turned out to watch, people were out on the streets, and houses alongside the route were hosting barbecues and

parties. We had a small viewing area in the woodyard, and on the first weekend something like 1,500 visitors came to see the huge Yankee."

The race is on

On the 30th of August 2013 the 'old' PM 2 was shut down and the serious race to the finish began, there were only 39 days available for the installation of the Yankee and the rebuild.

Valmet gave the assurance that the project would take 39 days, and on October 12th 2013, exactly according to plan, there was stock on the wire. "We couldn't quite believe it," says Devens.

On the 17th October, and again absolutely according to plan, Alfeld produced the first two saleable jumbo reels. "It was part of the agreement with Valmet that we had to have two jumbo reels full of saleable paper to go out to our speciality customers," adds Devens.

On Forward's recent visit to Alfeld, more progress had been made and now PM 2 can produce all of the top quality grades required for its demanding, discerning customers to its own quality benchmark Q1. So what is next? Devens says: "Well, the work doesn't end for us until the end of July. We are now in the optimization stage, and we are ironing out the problems that go with that. This machine has quite a task ahead of it, we are expecting it to do all grades from 50 to 180 g/m^2 with calender, without calender, with coater, without coater, one side, two sides, all those different parameters, and all at high speed. It is a high expectation we have."

Devens concludes: "We are really happy all in all with how it has gone and we have had splendid support from Valmet whenever we have needed it during the installation and start-up phase."

"Biggest experience of my life"

Perhaps the most important person to finally ask about the success of the PM 2 project is mill director, Dr. Stephan Karrer who originally came up with the concept: "Apart from the birth of my two children, this project really has been the biggest experience of my life. The last few months we have been optimizing the start-up and have been tiring for everybody, but it makes me so proud that the whole PM 2 team are still so delighted to be working on what is going to be such a remarkable machine when it is fully up to speed." ■

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CHALLENGING BUT IN TIME
Wim Devens has great trust in Valmet's performance.

IN PLACE AND RUNNING
The impressive Yankee in operation.

EXPECTATIONS MET
Dr. Stefan Karrer has lived with the project all the way from the very beginning.

SHOWTIME
Customers and partners paid a visit to the mill during the inauguration on March 27, 2014.

Forward had the pleasure of interviewing Berry Wiersum, CEO, Sappi Fine Paper Europe.

TEXT Mark Rushton
PHOTO Courtesy of Sappi

Forward: **What are the challenges facing the graphic paper industry today?**
Berry Wiersum: I think it is pretty clear that the graphic paper sector does have its challenges. It is actually doing more or less what we predicted a while ago, with a 5 - 7% reduction annually depending on the grade. We think this decline will continue, not at the same speed, but will continue to happen until at some point the decline will bottom out. We in the graphic papers industry have to adjust our capacity as this occurs, which of course we have been doing.

As we have seen with the Alfeld PM 2 project, it seems there is light at the end of the tunnel for graphics producers by switching to packaging grades. Is there really the growth there in Europe for fiber-based packaging?
Packaging is offering up a lot of opportunities for the paper industry, it's not just demographics, we have the environmental reasons now. Customers and consumers are getting the fact that paper packaging is a better alternative to plastic and metal. And these opportunities are not just for Alfeld, they are for all producers involved in packaging. We see a growth of around 3-4% for fiber based packaging.

What we are noticing about the packaging area, is that it is a real

"Fiber-based packaging is a much better option."

rewarder of innovation, and that if you put a machine down like PM 2 at Alfeld, customers want to come along with you, they love new products. The profit margins are also a lot more attractive than in graphic papers as it is not a commodity area and it doesn't have the same over-capacity issues. Making specialities is rewarding in the sense you are no longer scratching a living as in graphic papers, in specialities we are actually making a decent living.

Sounds like everyone should be doing it, what are the pit falls and challenges?

Well, different recipes and the quality demands from the customers of course mean that you are entering a different ball game. All of these products have to be certified, and by that I mean that each one carries a certificate of quality, as well as a list of all the ingredients. We spend a lot of time and effort on certifications and a lot of effort trailing and proving to customers that the packaging we supply is going to perform the task they want it to.

Are the sustainability factors of fiber-based packaging making the role of selling paper packaging any easier?

The great news is that "yes", the message has actually finally got through, our customers and the consumer are getting the fact that paper packaging is a much better option, and the big brands love this as they have a story to tell. For instance with our product Algro Nature, they can recycle it if it has a dry product in it, or put it on the compost heap. The FMCG companies really like this idea as it makes them look like they are taking the whole sustainability idea very seriously.

And it is a great story to tell, particularly when you talk to customers about the whole sustainable chain, about how forests are being planted all over Europe, how pulp comes from controlled sources, how energy is renewable, or comes from waste and then how all the products that are made are then recyclable or compostable. And then even better when they realise it is a lighter weight and could even cost less than other less sustainable materials. Fiber-based packaging ticks so many boxes that it becomes a no-brainer in the end.

And for once, EU legislation is on the pulp and paper industry's side when it comes to sustainability of our products, which is going to open up even more doors of opportunity.

Any particular comments to make about the performance of PM 2 at Alfeld so far?

Well, it is certainly a big, complicated machine. Optimization is coming along, it always seems to take longer than we expected, but we have top quality products coming off it, which was the aim. We have also got to a point where it is quality that is consistent, and we can depend on it. Of course the real aim is to keep the costs down, the volume up so that we can streamline the production and have much less downtime when changing grades. We are working hard with the Alfeld team and Valmet on that now.

All in all we have been extremely happy with Valmet who have been a thoroughly competent lot, great team workers, and have provided a fantastic machine that started up on time and at the agreed price. ■

Sustainabili through pellet firing

All efforts to decrease the environmental load in power generation are needed to reach sustainability targets. Using wood pellets – carbon neutral, high-quality biofuel – offers a viable alternative in district heating. The new pellet-fired heating plant at Tampereen Energiantuotanto Oy in Tampere, Finland, sets a good example with Valmet's Bioheat RampUp solution and advanced automation technology. TEXT Marjaana Lehtinen

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Bioenergy is something in which Tampereen Energiantuotanto strongly believes and wants to promote in its operations. The company, a subsidiary of Tampereen Sähkölaitos (Tampere Power Utility), is responsible for the group's electricity and district heat production, maintenance and development. In late 2012, the company started up a new 33 MW pellet-fired heating plant that is used as a peak load and backup plant. The plant, located in the Sarankulma industrial area in Tampere, was supplied by Valmet and is the largest of its kind in Finland.

"We consider the pellet-fired plant a good addition to our long-term heating plant palette. Increasing the proportion of renewable energy sources is part of our strategy," says **Timo Heinonen,** Development Manager, Tampereen Energiantuotanto.

With the new plant, the company has been able to replace some of the capacity of the existing oil- and gas-fueled boiler plants and thus boost sustainability. Replacing the old boilers with a new modern pellet-fired boiler significantly reduces the company's CO_2 emissions resulting from the production of district heating.

"We wish to be at the forefront in sustainable energy generation in Finland. District heating has always been an efficient and environmentally friendly alternative, and it will remain so in the future as well," Heinonen emphasizes.

Technologies combined in a new way

Tampereen Energiantuotanto selected Valmet to supply the environmentally friendly pellet-fired heating plant. Valmet's Bioheat RampUp solution utilizes existing technologies to form a new combination of pulverized combustion technology and traditional water boiler technology.

> We wish to be at the forefront in sustainable energy generation in Finland.

THE LARGEST OF ITS KIND
The new 33 MW pellet-fired heating plant in Tampere has aroused much interest since it is the largest of its kind in Finland.

The technology used at the 33 MW plant is based on pellet fuel being pulverized in separate grinding mills and burned in a pulverized combustion boiler. The start-up and load control of the combustion process is extremely high, and the pulverized fuel allows for clean, energy-efficient and flexible heat generation.

The wood powder burner is a multi-fuel burner that can be fired with gas or oil in addition to wood powder, if necessary. It has also a light oil firing possibility with a 47 MW firing rate.

"This solution brings new opportunities to gear the structure of district heat production towards the goals of sustainable development. Pellets represent CO_2 neutral, renewable energy and thus do not harm the environment," comments **Teemu Koskela,** Sales Director, Bioheat business, Valmet. "Another major benefit is that pellets are cheaper to use than oil or gas, so they lower fuel costs."

Koskela emphasizes that using wood pellets as fuel presents an easy-to-use and reliable solution not only for peak load and backup plants but also for demanding process steam production in various industries. Valmet has already supplied pellet-fired plants, for example, to the food industry and large laundries.

All plants under one system

The Sarankulma pellet-fired plant is unmanned and equipped with a complete Metso DNA automation system, which is fully integrated into the Metso DNA system used at Tampereen Energiantuotanto's other production facilities. Having all plants under one automation system brings many benefits.

"The installed equipment base is smaller, and the automation environment is simpler. There are also fewer places

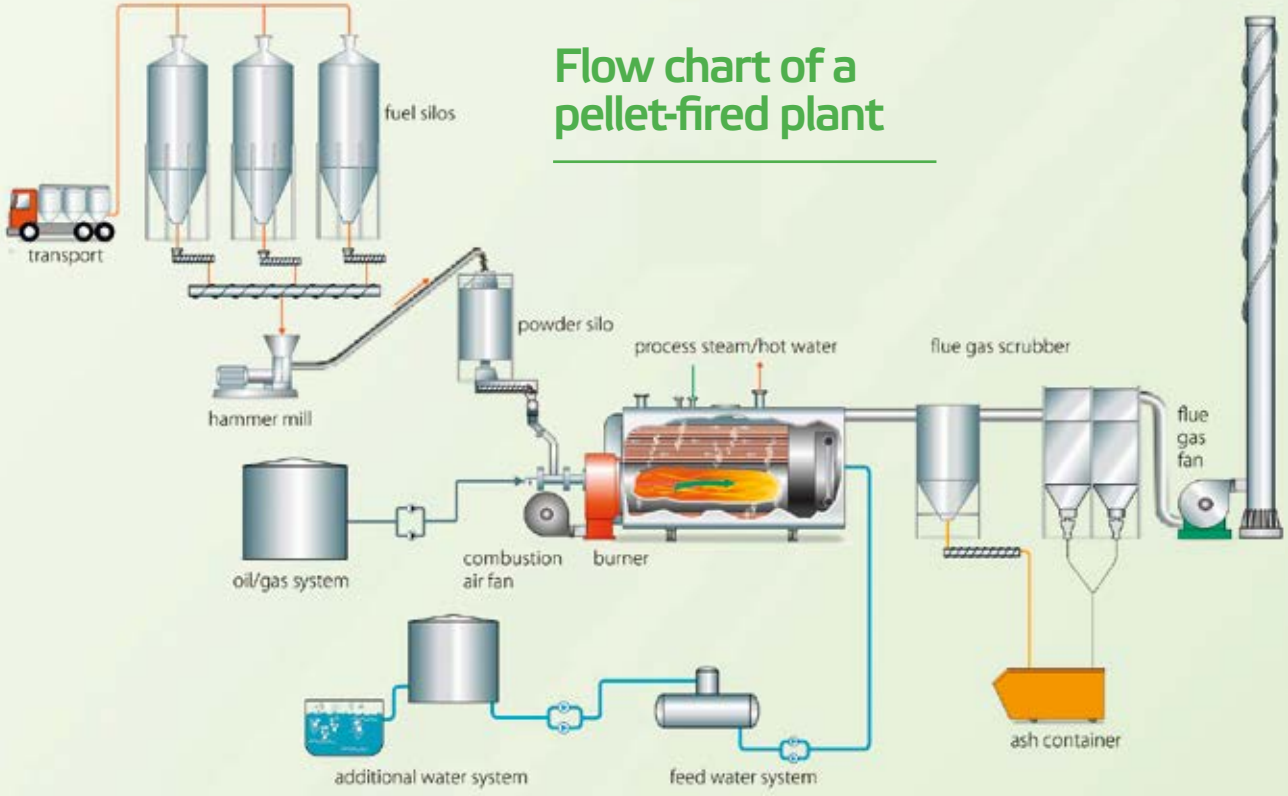
that can fail, adding to better availability and reliability," lists **Pentti Iso-Pietilä**, Production Service Manager at Tampereen Energiantuotanto. "Additionally, our operators' capabilities improve, system upkeep is easier and there is less system maintenance. And upkeep and maintenance costs are lower – or at least we hope this will be the case in the future."

"By using reliable automation technology, the operators are able to flexibly control the district heat production process and react to load variations," explains **Heikki Mylläri**, Sales Director, Automation, Metso.

With the history data that the system collects from the process, the users are able to follow how the process develops, learn from earlier situations and avoid the same problems in the future. Plant safety is ensured by a safety interlocking system.

"And as there are no barriers between the systems, changes only need to be made in one system," Mylläri continues. Other benefits include having the same spare parts and the possibility to expand the system, for example, by adding condition monitoring to the Sarankulma plant.

Flow chart of a pellet-fired plant



Pellet plant

How does pulverized combustion technology work?

1. The fuel, i.e. the pellets, is stored in silos with 2–5 day fuel buffers, depending on the situation.
2. The fuel is pulverized in a hammer mill after silo storage.
3. The pulverized fuel is led to a filter to remove excess air.
4. The fuel is then transferred to intermediate storage for a few hours before being fed to the burner.

Controlled locally or from kilometers away

The unmanned plant is controlled via a remote broadband connection from the company's main control room at the Lielahti power plant, about ten kilometers away. The same displays and functions are available also locally at the plant. Having the same user interface, data collection, reporting and engineering tools at both locations improves process operability, controllability and availability.

"We have minimal control room operator resources, so remote control is beneficial for us in this respect. It also makes it clear how to manage production entities," Iso-Pietilä points out. "And creating backup connections is simpler, since there is no linkage."

All set for the next heating season

Experience gained last winter with the pioneering pellet-fired plant in Tampere has been positive. Pulverized fuel has allowed clean, energy-efficient and flexible heat generation during start-ups and quick load changes during production.

The plant's control capability has fulfilled the requirement of the district heating network of Tampere, a city of circa 220,000 inhabitants. Plant efficiency and availability have been at a high level. Also, flue gas emissions requirements have been met; wood pellets are fired with low CO and NO_x emissions.

So, everything is all set for the next heating season. Just by pushing a button at the main control room kilometers away, the pellet-fired plant will go on stream when needed and provide heat for housing and other facilities in the southern parts of the city. ■

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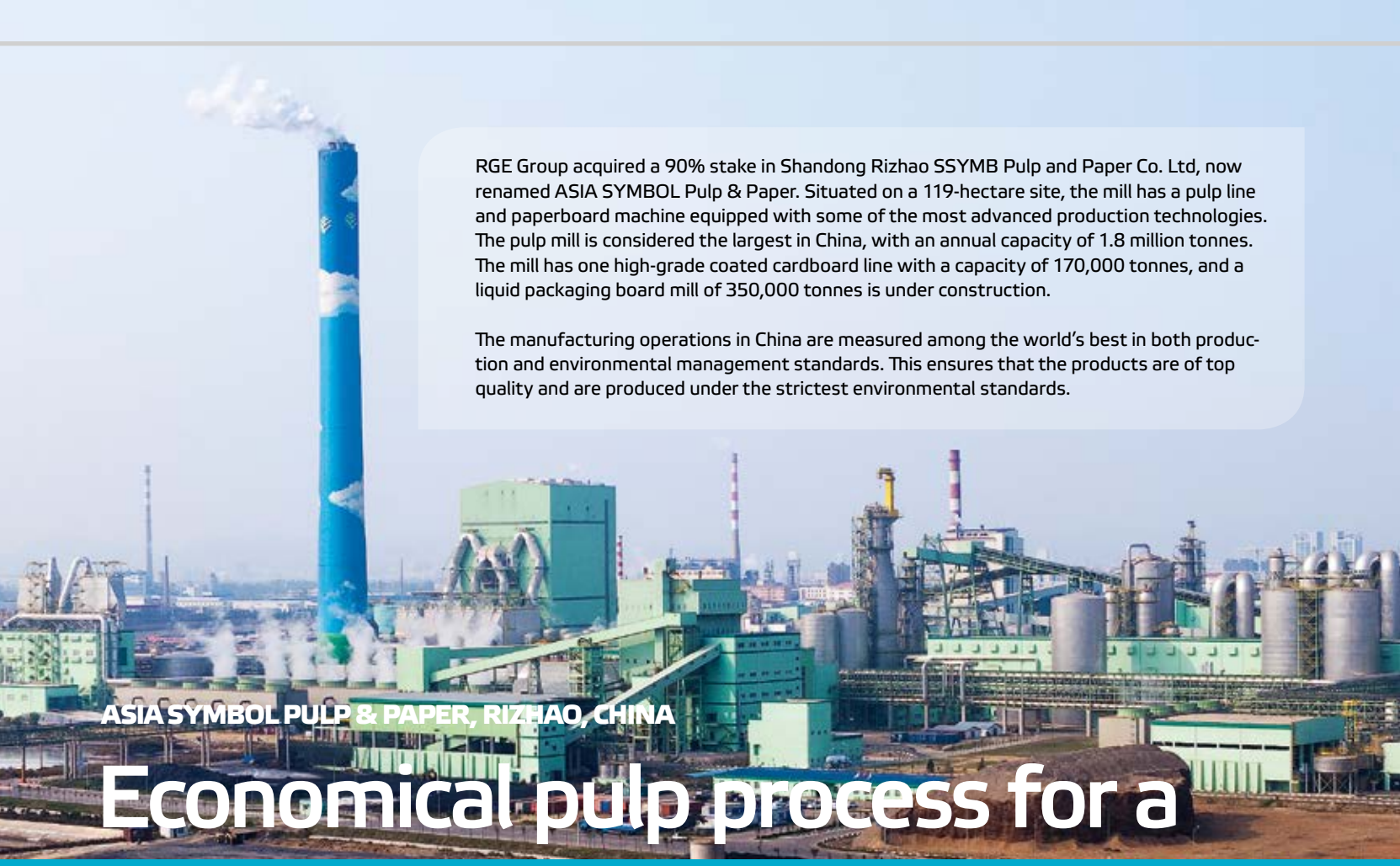
← REMOTE CONTROL
The Sarankulma plant is unmanned and controlled via a remote connection from Tampereen Energiatuotanto's main control room at the Lielahti power plant, about ten kilometers away.

↓ CLEAN TECH
Pellets represent CO_2 neutral, renewable energy and thus do not harm the environment.



RGE Group acquired a 90% stake in Shandong Rizhao SSYMB Pulp and Paper Co. Ltd, now renamed ASIA SYMBOL Pulp & Paper. Situated on a 119-hectare site, the mill has a pulp line and paperboard machine equipped with some of the most advanced production technologies. The pulp mill is considered the largest in China, with an annual capacity of 1.8 million tonnes. The mill has one high-grade coated cardboard line with a capacity of 170,000 tonnes, and a liquid packaging board mill of 350,000 tonnes is under construction.

The manufacturing operations in China are measured among the world's best in both production and environmental management standards. This ensures that the products are of top quality and are produced under the strictest environmental standards.

ASIA SYMBOL PULP & PAPER, RIZHAO, CHINA

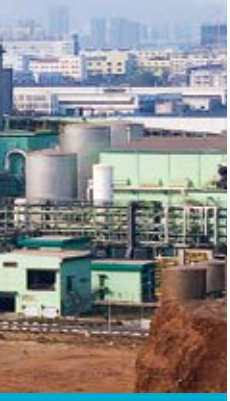
Economical pulp process for a healthier environment

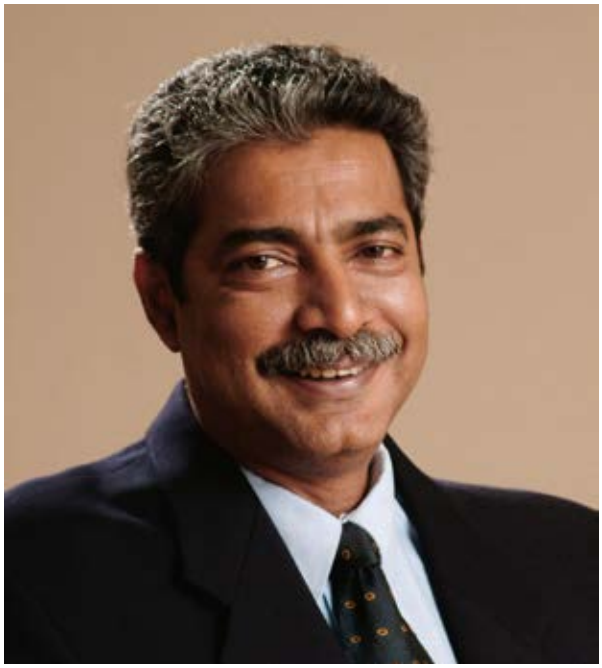
An impressive combination of very low ecological footprint, high capacity and top-quality production. These features go well with the environmental values that have been guiding ASIA SYMBOL Pulp & Paper's operations over the years.

TEXT Anne Riekkola and Andreas Liedberg

ASIA SYMBOL Pulp & Paper's newest pulping line in Rizhao, China, was supplied by Valmet and produced its first pulp sheet at the end of June 2010. This investment was the biggest foreign investment ever seen in Shandong province at the time. The sizeable investment gave everyone reason to anticipate something exceptional. Looking back, those expectations have been fulfilled.

The Rizhao mill, located next to a city of three million inhabitants, is designed for very low energy, water and chemical consumption. Compared to any other pulp mill built in recent times, it ranks at the very top in terms of environmental performance.





Mr. Devanesan: "The mill invested in the best available technologies to maximize the environmental performance. We feel that it is a benchmark in performance for the pulping industry."

A benchmark for the pulping industry

Mr. Devanesan of ASIA SYMBOL Pulp & Paper expresses pride in the performance of the Rizhao mill:

"Sustainability is a key criterion in realizing our company vision. Our key challenge as a company is how to use natural resources to generate enduring economic growth and long-term social benefits, while at the same time protecting sensitive environments. One way is to do what we have done, and invest in the best available technology for our production facilities."

Mr. Devanesan continues:

"What we did in Rizhao was to invest in the best technologies we could find to minimize the impact on the environment. This included, among many things, minimizing odors and solid waste. We feel that this mill is a benchmark in performance for the pulp industry."

Ambitious design for outstanding environmental values

Since the first stages of this investment, ASIA SYMBOL has planned ahead and allocated a sizeable budget to environmental protection. The Rizhao mill was designed to exceed the highest environmental standards. The work began with the best worldwide standards and ended up surpassing them.

Emissions from mill operations are lower than every aspect of the industrial standards that have been set in both Shandong province and across the whole of China. This is an achievement worth mentioning, since the environmental standards for new projects in China are very strict and put technologies to a serious test.

High capacity throughout the process

The fiber line and chemical recovery plants are well balanced and designed for the lowest possible consumption of water and energy – everything is done with the environment in mind.

All odorous gases are eliminated

Treatment of odorous gases is implemented in a way that is not found at any other pulp mill. Both strong and weak odorous gases are collected and incinerated, mainly in the recovery boiler. The big difference is that all weak odorous gases are incinerated along with the strong ones. This is possible thanks to back-up incineration locations that are hot and ready to receive and incinerate all odorous gases at all times, whenever necessary.

The plant aims for 100% odor-free operation. As a responsible company, ASIA SYMBOL continuously invests in this area in order to secure odor-free pulping in all situations, including start-ups and shutdowns as well as increases in capacity. ■

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Pulping line in Rizhao Valmet scope of supply:

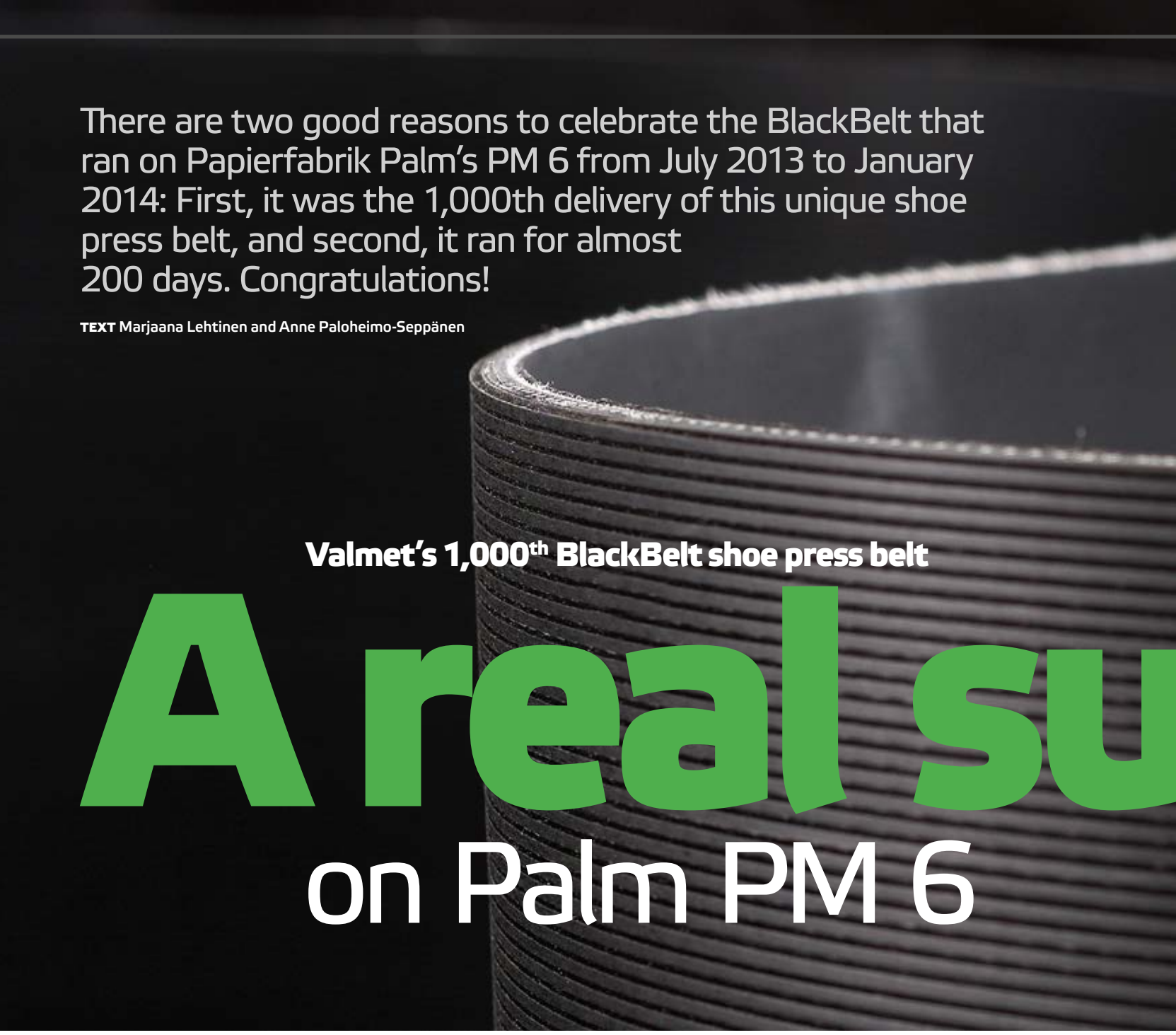
- All main processes for kraft pulp production and chemical recovery
- Supervision services for construction and start-up
- Training the mill staff

Some equipment data:

- Two evaporation lines with 1,000 t capacity each. Total capacity: 2,000 t of evaporated water an hour.
- Recovery boiler capacity of over 7,000 t DS (dry solids) of black liquor per day. The boiler has been operated at 7,550 t DS a day. This places it among the biggest in the world.
- The mill is supported by its own power plant, which meets the demands for water, steam, power and pressurized air.

There are two good reasons to celebrate the BlackBelt that ran on Papierfabrik Palm's PM 6 from July 2013 to January 2014: First, it was the 1,000th delivery of this unique shoe press belt, and second, it ran for almost 200 days. Congratulations!

TEXT Marjaana Lehtinen and Anne Paloheimo-Seppänen



Valmet's 1,000th BlackBelt shoe press belt

A real su

on Palm PM 6

"Absolutely, yes!" The answer given by **Jürgen Kosse**, Mill Manager, Papierfabrik Palm GmbH & Co. KG, in Wörth, Germany, to the question of whether BlackBelt achieved the targets it was set leaves no room for interpretation. "First, the product offers excellent performance. Its various properties contribute to a consistent, smooth run of the paper machine. Belt performance is absolutely constant from beginning to end, and the belt improves press performance."

In July 2013, the mill installed two BlackBelt shoe press belts on PM 6: one in

BlackBelt shoe press belt

- Made of high-performance elastomer material reinforced with dimensionally stable synthetic yarns.
- Available in several reinforcing structures and surface options to fulfill the demands of every shoe press.
- Wear-, chemical- and heat-resistant, ensuring long and trouble-free running.
- Excellent running results from many demanding shoe press belt positions.

ccess

the first press and another in the second press. The first was the 1,000th BlackBelt delivered by Valmet, and it ran from July 2013 to January 2014 – almost 200 days. The second belt ran from July 2013 to October 2013. "The paper machine's performance was very good, and we got a perfect dewatering profile before and after the nip. The dry content after the press increased, and the moisture profile after the press was excellent," Kosse says.

Kosse names BlackBelt's excellent material mix, long lifetime and good dewatering capability as the product highlights. "The dewatering process in the nip area looks perfect. The most important properties in a good shoe press belt are stiffness and hardness."

High belt performance needs teamwork

As a paper producer, Palm wants to utilize the latest technological innovations in order to give its customers excellent-quality products and reliable service. The principles for the cooperation and success of this independent family business are its openness and honesty. As a customer, the company sticks to the same principles with its own suppliers.

"We expect good communication with our clothing/shoe press belt supplier, steady advances in all products as

The 1000th BlackBelt on its way into the machine.

Mr Jürgen Kosse, Mill Manager at Palm Wörth.

well as research and development for the customer's benefit," Kosse states. The mill also appreciates cooperation in troubleshooting and finding successful solutions to all kinds of problems. Responding rapidly to emergency cases and taking care of the relationship are also highly prized.

"We think Valmet is a perfect partner in research and development. We have received complete support in every situation, and our wishes and requirements have been taken into account at all times. Our successful relationship is in line with our principle of working together."

According to Kosse, the relationship between machine crew and supplier is very important. "The parties have to share their experiences with the product. The machine crew has to tell the supplier how the product works in their daily process, and the supplier must provide development ideas and benchmark belt performance with other machines. Finding solutions takes teamwork."

> Belt performance is absolutely constant from beginning to end.

Clear plans to optimize the whole process

Since the PM 6 start-up, cooperation between Palm and Valmet has been close, and the mill is looking to the future with optimism. The mill manager continues: "We are going to optimize our process from the wet end to the winder and increase the output of PM 6." There are clear plans for the PM 6 press section and the shoe press position in 2014. They include using different felts, improving the work with the steambox, getting better profiles after the press for perfect paper quality and good performance, increasing the dry content after the press and improving the dewatering relation between the first and the second press.

While happy with the performance of the BlackBelt shoe press belt, Palm has high expectations for the future development of belts in general. "We expect a long running time. On the other side, we need consistent, smooth belt performance. We have to optimize the dewatering process in the nip, and maybe we will do some research into new materials," Kosse remarks. "Another point is energy consumption. If it is possible to increase the dry content after the press, steam consumption will drop. Working together with Valmet, we'll find solutions, and both sides will improve their engagement in the coming years." ■

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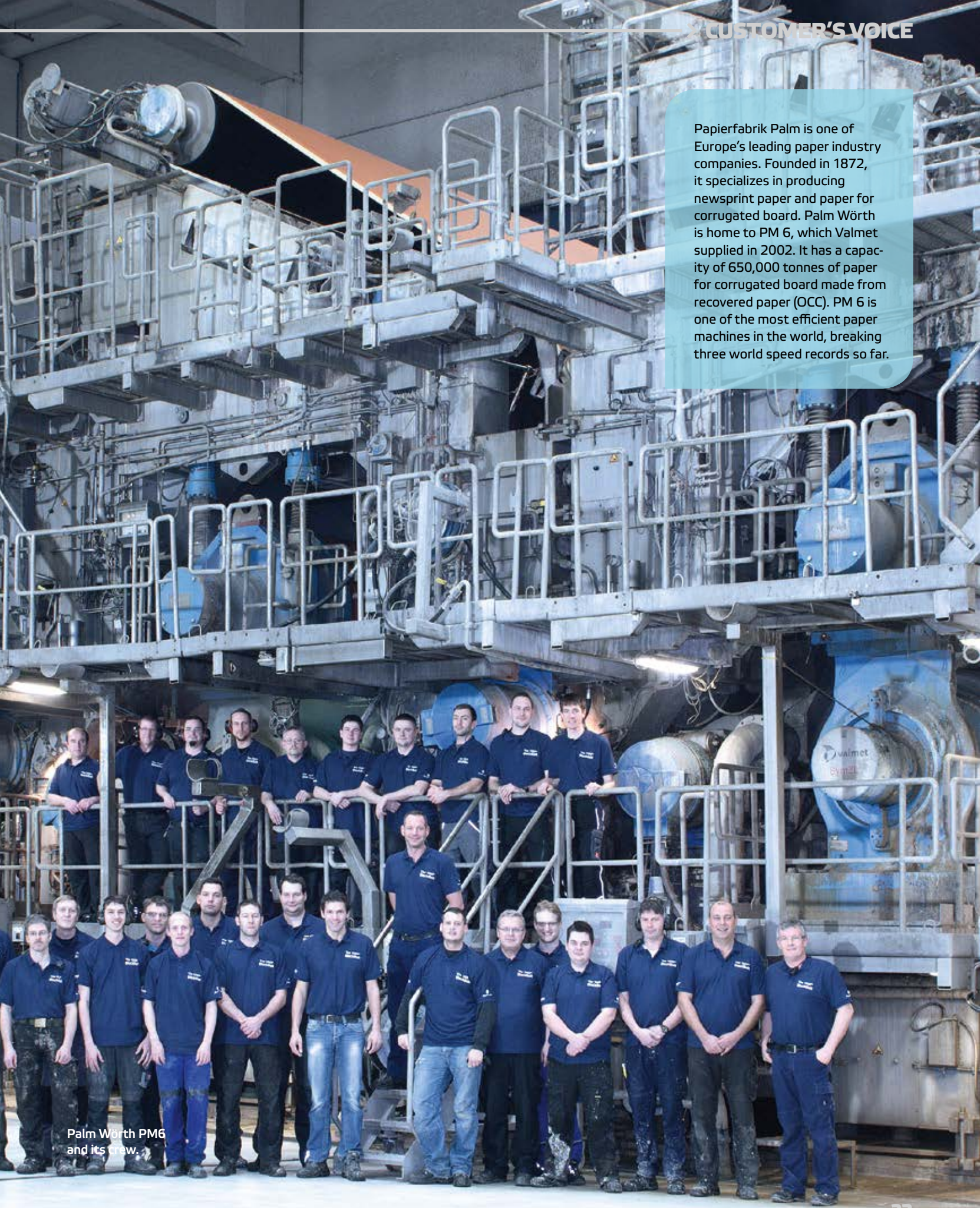
Papierfabrik Palm is one of Europe's leading paper industry companies. Founded in 1872, it specializes in producing newsprint paper and paper for corrugated board. Palm Wörth is home to PM 6, which Valmet supplied in 2002. It has a capacity of 650,000 tonnes of paper for corrugated board made from recovered paper (OCC). PM 6 is one of the most efficient paper machines in the world, breaking three world speed records so far.



Palm Wörth PM6 and its crew.

PERFECT COMBINATION at Greenpac Mill

High-quality, lightweight containerboard production line and mill maintenance agreement move the Greenpac Mill forward.

TEXT Eric Tetreault, Marika Mattila and Anne Paloheimo-Seppänen

On July 15, 2013, Cascades Inc. announced that Greenpac Mill LLC group had manufactured its first roll of lightweight linerboard at its new, ultra-modern containerboard mill. The Valmet-supplied PM 1 containerboard production line successfully came on stream at the company's new mill site in Niagara Falls, NY, in the United States.

Safe, efficient board making

Valmet delivered a complete linerboard line from headbox to roll handling, including air systems, machine pulpers, a broke collection system and a quality control system. Valmet is additionally assuming full responsibility for mill maintenance operations for the entire production facilities at Greenpac Mill. Valmet will also supply PM 1 with board machine clothing in a multi-year agreement.

"The board machine started on time and was producing good-quality product from day one. Valmet provided excellent support for commissioning and start-up to ensure a smooth transition to normal operations. I was very impressed with the overall simplicity and automation of the paper machine, which meant we reached safe, efficient production levels in a short time," says **Murray Hewitt**, General Manager of Greenpac Mill.

Multi-year mill maintenance agreement provided by Valmet

Before making the decision of outsourcing mill maintenance, Cascades personnel visited mills in Europe where similar agreements with Valmet have been running for several years. "We are pleased to collaborate with Valmet in creating a unique world-class operation at our Greenpac site. After visiting a similar world-class site in Europe we were convinced of the benefits, performance and customer satisfaction of Valmet maintenance operations", says **Marc-André Dépin**, President and Chief Executive

The Greenpac Mill containerboard line.

RECYCLED RAW MATERIAL
The Greenpac Mill's PM 1 produces lightweight containerboard out of recycled fiber.

MARC-ANDRÉ DÉPIN:
"After visiting similar sites in Europe, we became convinced of the benefits of Valmet maintenance operations."

Officer of Norampac. The outsourcing of maintenance is a first of its kind for Norampac and its partners in North America.

As mentioned above, Valmet is responsible for all maintenance operations at the Greenpac mill. The agreement includes also the establishment of Total Productive Maintenance (TPM) and condition-based maintenance procedures in SAP. The focus is on improving reliability and maximizing availability, as well as safety in every respect. This six-year agreement included also the recruitment of all maintenance personnel prior to the start-up.

Recycled high-quality lightweight linerboard production in central location

The 23,000 m^2 (250,000 sq ft) mill sits on 7.3 hectares (18 acres) of land adjacent to Norampac Industries in Niagara County, which provides a central location and ease of access to the markets in the Northeastern U.S. and Canada. It also has low-cost hydropower and access to quality workforce.

The production speed of the 9.05 m (356.3 in) wide board machine is 915 m/min (3,000 ft/min). The annual production capacity is approximately 486,000 tonnes of linerboard in a basis weight range of 97.6–170.9 g/m^2 (20–35 lb/ft^2), out of 100% recycled fiber. The state-of-the-art mill has generated 118 jobs in the region and is considered one of the most advanced in its category in North America.

Greenpac Mill was designed for optimal energy efficiency and has many automated operations. The water is treated and reused to reduce consumption as much as possible, and the water treatment system generates gases that are used to produce steam in the dryer section.

Latest board making technology

Thanks to the mill's numerous technological advances, the linerboard it manufactures has optimal strength but a lower basis weight, allowing the mill's customers to better respond to the growing demand for lightweight packaging. Furthermore, the linerboard manufactured by Greenpac Mill has superior smoothness, offering better printability qualities.

The new board machine comprises the latest board making technology from headbox to roll handling. One modern technology highlight is the OptiWin Drum two-drum winder. Read more about the winder on page 43.

Reaching another level in packaging

PM 1 produces high-quality lightweight linerboard from recycled fiber. This broadens the company's product range into a new area.

"The start-up of this new mill is a proud moment for Cascades. Its state-of-the-art technology will enable us to better meet the needs of our customers," says Marc-André Dépin.

According to **Alain Lemaire**, Executive Chairman of Cascades' board of directors, Greenpac is the most important investment in the company's history. "Thanks to the audacity and leadership of the Norampac team, we are realizing a major project that will take our company to another level in packaging," Lemaire summarizes. ■

ABOUT THE MILL

Greenpac Mill LLC is a Norampac affiliate. Created in 1997, Norampac is the largest containerboard producer in Canada and the sixth largest in North America, with over 4,200 employees. Norampac is a division of Cascades Canada ULC. Today, Norampac operates several containerboard and boxboard mills, corrugated product plants, folding carton plants and a graphics center in Canada and the United States.

Founded in 1964, Cascades produces, converts and markets packaging and tissue products that are composed mainly of recycled fibers. The company employs more than 12,000 people at over 100 units located in North America and Europe.

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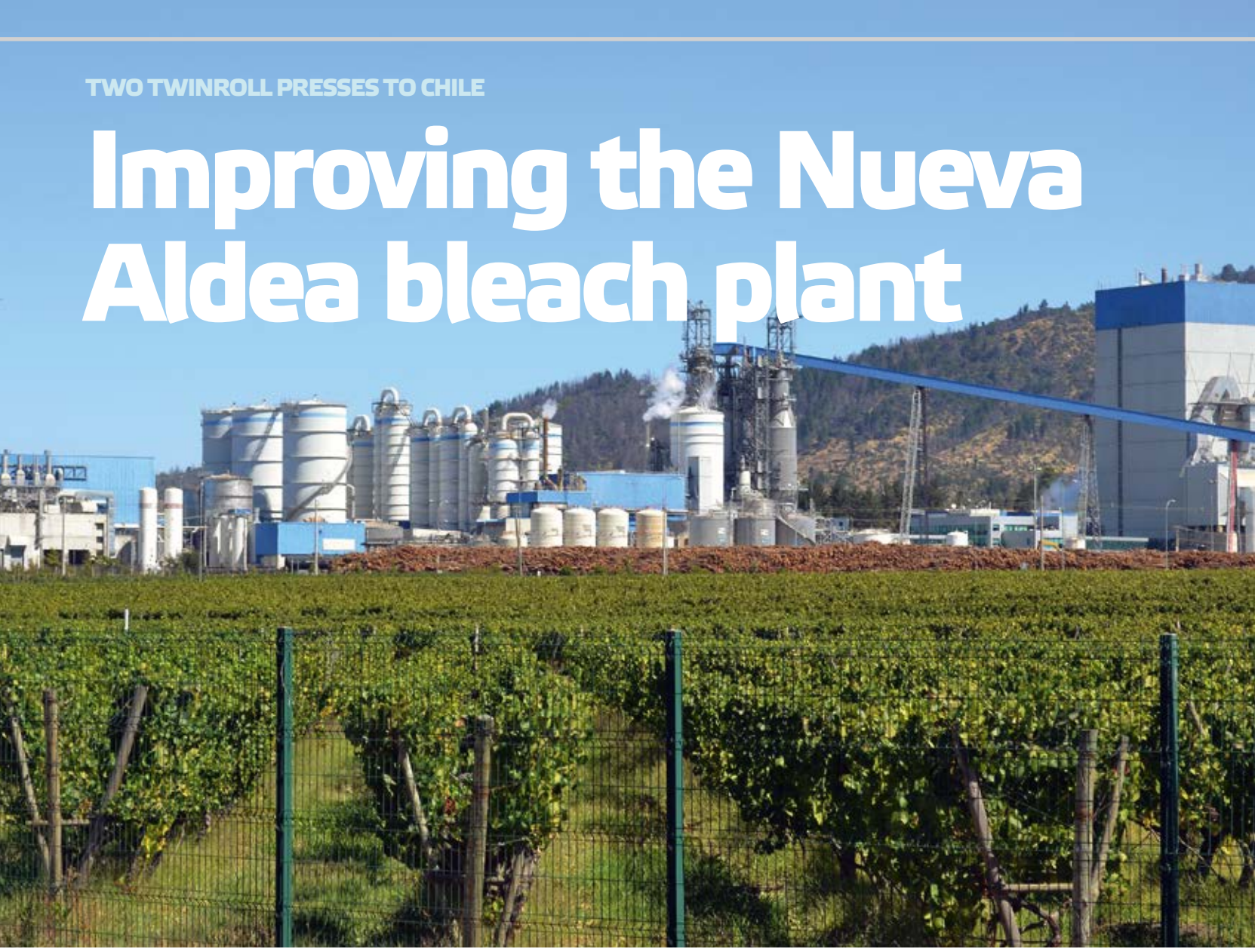
TWO TWINROLL PRESSES TO CHILE

Improving the Nueva Aldea bleach plant



The Itata Valley in Chile is home to both wine and pulp production. Dazzling vineyards surround Nueva Aldea – a modern pulp mill that has just been upgraded with an even more effective bleach plant.

TEXT Kristofer Sjöblom

Nueva Aldea is part of the Arauco Group and has two fiber lines for market pulp production. One fiber line uses eucalyptus and the other uses pine (Pinus radiata) to produce market pulp. The wash presses had been an Achilles' heel for the mill for some time. **Patricio Henríquez**, Director of Arauco's Engineering and Construction Division, says: "We had some issues with the existing presses. In particular, the availability was low and we had problems getting them to run properly."

A couple of years ago, Nueva Aldea turned to Valmet to replace the wash press placed before the bleach plant. The solution was a TwinRoll Evolution press. The positive experience from that press was decisive when the mill decided to replace two wash presses in the bleach plant. They turned to Valmet again, and **Gunnar Viklund**, Valmet's project manager, was assigned to lead the project. "We are confident in our ability to carry out these types of projects. The challenge was the unusually short delivery time. The presses needed to be installed within a window of ten days during which the mill was to shut down, so there were no safety margins," he says.

Location and function

The wash presses are TwinRoll presses, model TRPE-1540. They were delivered in July 2013 and the shut-down of the plant took place in October 2013. One press is placed between the first stages of the bleaching sequence,

between the D0 and EOP stages, while the other one is installed after the D1 stage. The presses are designed for a production of up to 1,580 tonnes per day and a pulp feed consistency of 7%. Patricio Henríquez sums up the advantages of the new presses: "The main advantages of the new equipment are the high availability, the high output consistency and the low consumption of chemicals."

Good partnership

The geographical distance between South America and the Nordic countries is considerable, and there are cultural differences to consider as well. But this has not impeded the cooperation between Arauco and Valmet in any way. This is not the first partnership between the two companies and neither is it the first time that Patricio Henríquez and Gunnar Viklund have collaborated on a project. Patricio Henríquez is positive about the outcome: "It has been very easy to work with everyone on the project team. We have been involved with Valmet on several projects and we appreciate that they usually accomplish what they promise. This is important to us and we feel comfortable working with Valmet."

> The main advantages are the high availability, the high output consistency and the low consumption of chemicals.

Strong technical performance

Valmet has extensive experience in developing and delivering wash presses. We have now reached the fifth generation, TwinRoll Evolution, that washes more effectively than its predecessors and have up to 30% higher capacity for any given roller size. The new TwinRoll generation can be fed with pulp consistencies of up to 9-10%.

Thanks to the TwinRoll presses it is possible to reduce the chemical usage of the bleach plants, which has considerable economic and environmental advantages. Money that was previously spent needlessly can now be invested more wisely, while at the same time making pulp mills more eco-friendly. Arauco's Patricio Henríquez says that this is a key issue for Nueva Aldea: "It is very important for us to reduce the consumption of chemicals, not only because of the environment but also for cost reasons."

A textbook example of a successful project

A few months have passed since the new presses were installed. Patricio Henríquez observes that the new equipment has lived up to expectations: "I have been in contact with the mill people and they are very comfortable with the new equipment. TwinRoll is a cost-effective solution and this project is a good example of how a project should be managed. The key to the success of the project was the excellent cooperation between the mill team, the Valmet team and the Arauco Engineering and Construction Division team. We greatly appreciate that Valmet delivered these presses in such a short time," he concludes. ■

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SATISFIED WITH THE PROJECT
Arauco's Patricio Henríquez is very pleased with the new equipment.

STRONG DEMAND
Since the launch in 2009, Valmet has sold 83 TwinRoll Evolution presses.

Health checks
carried out at ITC Bhadrachalam

ITC Limited has made a three-year service agreement with Valmet for a process audit and complete health check at their Bhadrachalam Unit in Andhra Pradesh, India.

With this agreement, Valmet will be responsible for enhancement of the performance and operational optimization of fiber lines 1 and 2, and the SuperBatch digesters, including wood handling. The scope includes providing expert services and a complete health check of the equipment.

ITC has three wood handling lines, SuperBatch cooking and two fiber lines with ZTrac bleaching sequence, which have been supplied by Valmet. Fiber line 1 (with a capacity of 340 TPD bleached pulp) was commissioned in 2002 and fiber line 2 (440 TPD bleached pulp) in May 2008.

The service agreements aim to optimize production costs and maintain production and quality through planned and executed servicing. The scope and content of the agreement is based on specific demands and requirements. This agreement also includes training and scheduled maintenance operations at the mill. As part of the agreement, Valmet has already executed the first round of expert services for a health check of the chippers, major fiber line equipment and a performance audit of Super-Batch digesters, supplied by Valmet.

"With Valmet's expert services throughout the long-term service agreement, we are able to ensure the availability of the plant by performing an equipment health check in a planned way and be able to plan and execute effective maintenance based on the information obtained. This helps ITC to reduce unplanned down time and enhance the availability of the plant," says **K D Sharma**, Deputy General Manager of the Pulp Mill and Soda Recovery Plant. ■

ITC Limited is one of India's foremost private sector companies with a market capitalization of US$ 35 billion and a turnover of US$ 7 billion. ITC has a diversified presence in fast moving consumer goods, hotels, paperboards and specialty papers, packaging, agri business and information technology.

K D Sharma has three decades of experience through working in different paper mills both in India and abroad. His contribution has been instrumental in improving the fiber lines' performance, which includes Ozone bleaching state-of-the-art technology. He has introduced a number of improvement initiatives to maintain the availability and performance of the fiber lines, and reduce production costs, by upgrading the plant capacity from 770 to 1,100 tonnes and adding other improvements each year. One such initiative is the automation service agreement with Metso, which helps in ensuring timely maintenance and plant availability with expert support services for the various sections of the fiber line.

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En route to a prosperous future

Xiamen, the beautiful city located on the southeast coast of China, provides excellent conditions for trade and industry as well as for tourism and recreation. The Xiamen municipality is actively promoting and stimulating the realization of viable industrial projects. This article is about one of these: Xiamen Sinyang Paper Co. Ltd. **TEXT AND PHOTOS** Ingemar Myrén

The project at Xiamen Sinyang Paper is being implemented in two phases; the first phase, which included a production unit of 60,000 tonnes of tissue per year, was completed in September 2012. When phase two is completed, no less than 470,000 tonnes of paper will be produced per year, consisting of

The OptiFlo II TIS multi-layer headbox and the Advantage ViscoNip press provide excellent sheet properties.

further expansion of tissue products but also a larger share of other paper products, such as fine paper.

"Our decision to enter into the tissue business is based on the Chinese tissue market's growth in the past 20 years and the potential for further growth in the coming years," says Chen Qi, Chairman of the Board of Xiamen Sinyang Paper Co. Ltd.

"Our finished products are appreciated by the consumers and our company is growing in a good direction."

Breaking into a market with established strong brands is a major task. A tissue maker capable of creating various 'sheet designs' on the base paper has valuable options to differentiate the finished product. A new product that wipes, feels or even looks different arouses curiosity among consumers more than a copy of a leading brand, even if it is slightly improved.

"Our Valmet machine provides excellent flexibility with the fiber mix in the sheet," says Lin Wen, Deputy Chief Engineer. "We can adjust the percentage mixture of soft wood / hard wood fibers from 20/80 to 40/60. This large operating window gives us the possibility to meet the sheet properties required by our own branded products as well as meeting the specifications from our export customers."

Sinyang's first tissue line is an Advantage DCT 200HS tissue machine with a width of 5.6 m and a capacity of 60,000 tonnes per year. The advanced Valmet technology has given superior 'sheet property influencing capacities'. The OptiFlo II TIS multi-layer headbox and the Advantage ViscoNip press provide excellent sheet properties: softness (bulk softness and hand feel), strength and bulk. The delivery also comprises an extensive automation package.

Gao Bo, General Manager, says: "In order to produce high-quality tissue products we have chosen Valmet's tissue-making equipment. We believe Valmet has the world's most advanced tissue machine technology and we are convinced we made the right decision. Our tissue product quality has been recognized by our peer tissue producers, which is inspiring us in our ongoing development. I would like to mention that Valmet's equipment, technology and onsite working teams have provided good support to the Sinyang project. Altogether, this has gradually increased our confidence for future growth."

Sinyang are doing well in reaching their goals. Gao Bo continues: "To position our products in the market, we have done the market strategy planning, sales promotion plan, building up the brands and considering the differentiation market analysis. Sinyang now has a sales team with over 200 salesmen with previous experience in the tissue business. In addition to our major brand, RINO, we have the supplementary brand, Enjoy. The two brands cover more than 40 items: toilet rolls, handkerchiefs, soft pack facial, paper box facial and others. We hope that in one year our product portfolio will include over 100 items, covering all market categories targeting medium to high-end customers as well as special needs consumers. We also have an R&D team and are prepared to move ahead.

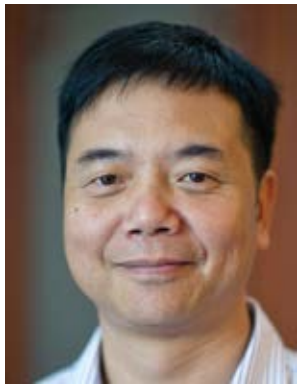
In the past, the tissue machine start-up curve was usually up for lengthy discussions since delays would impact upon the financial outcome of the project. Fulfilling the curve was not a pure technology-related performance. The machine crew learned the various speed-related settings and their interaction along with the process.

Today it is completely different. The trend has been

← ← Chen Qi, Chairman of the Board

← Gao Bo, General Manager

→ Lin Wen, Deputy Chief Engineer.



going towards Valmet supplying complete machinery packages, from stock preparation through to the reel. In the Sinyang case, a Metso automation package was included. The advanced process control, built on years of experience, has simply taken over. It accurately makes the speed-related settings and the learning is already delivered in the computer!

Steep start-up curves are common at Valmet today and Sinyang was no exception: "We started to run the machine at 1,080 m/min on 10 September 2012," says Lin Wen. "Four days later we reached 1,600 m/min. After only nine days the machine was running at the guaranteed production speed of 1,900 m/min. The start-up curve is excellent! I believe the success is due to our installation workers' good knowledge of the installation and that several of them had assembled Valmet machines before. Also, the machine operators had experience from other tissue mills and some were even familiar with Valmet equipment. Finally, and maybe most important, is the reliable

↑ **PACKING POWER**
The tissue products are being packed for delivery into stores.

← **HIGH CAPACITY**
Sinyang's first tissue production line is a Valmet Advantage DCT 200HS with a capacity of 60,000 tpy.

process design of the Advantage DCT tissue machine and the skill of Valmet's installation supervisors and start-up experts. Their abundant experience contributed to guaranteeing the quality of the installation and achieving the superb start-up curve.

Luo Yaolin, director of the papermaking workshop, shares the opinion that good training and good people are behind the excellent start-up of the machine: "We started training our staff six months prior to the start-up date and their skill has played a key role in the tissue machine's good start-up and stable running performance to date. Valmet has been very active in the training process, both regarding training materials and in giving lectures."

"Maintaining the specified sheet quality throughout the speed range is imperative and I am pleased to say that the very first jumbo roll produced was of good quality. Valmet has conducted and completed the performance tests. All the guaranteed figures have been fulfilled.

The perfectly shaped rolls demonstrate the good sheet profiles (BW and moisture) and the stable and smooth reeling operation in the Advantage SoftReel.

Valmet, previously known as Metso Paper, have reached a market position where everyone seems to know about them. Their personnel are very experienced and practical. The contacts and communications with them are good and smooth. We have built a trustful relationship, even personal friendship in some cases," concludes Lin Wen.

Differentiated and innovative consumer products can be expected from the developing and growing Xiamen Sinyang Co. Ltd., who also announces continuing growth in exports.

Gao Bo: "Currently, we are following a balanced and sustainable development path in production, product quality and sales. This will provide a good foundation for acquiring a future market share and for taking us into phase two of our project."

Chen Qi: "We, as well as other tissue manufacturers, predict that China's tissue market will have strong further growth. However, we will not only focus on the domestic market but also on increasing our global business. Currently, Sinyang is doing well in exports. Our global customers are in Europe, America, the Middle East, Australia and some Asian countries. Manufacturing in Xiamen is excellent from an export point of view."

Sinyang is en route to a prosperous future. ■

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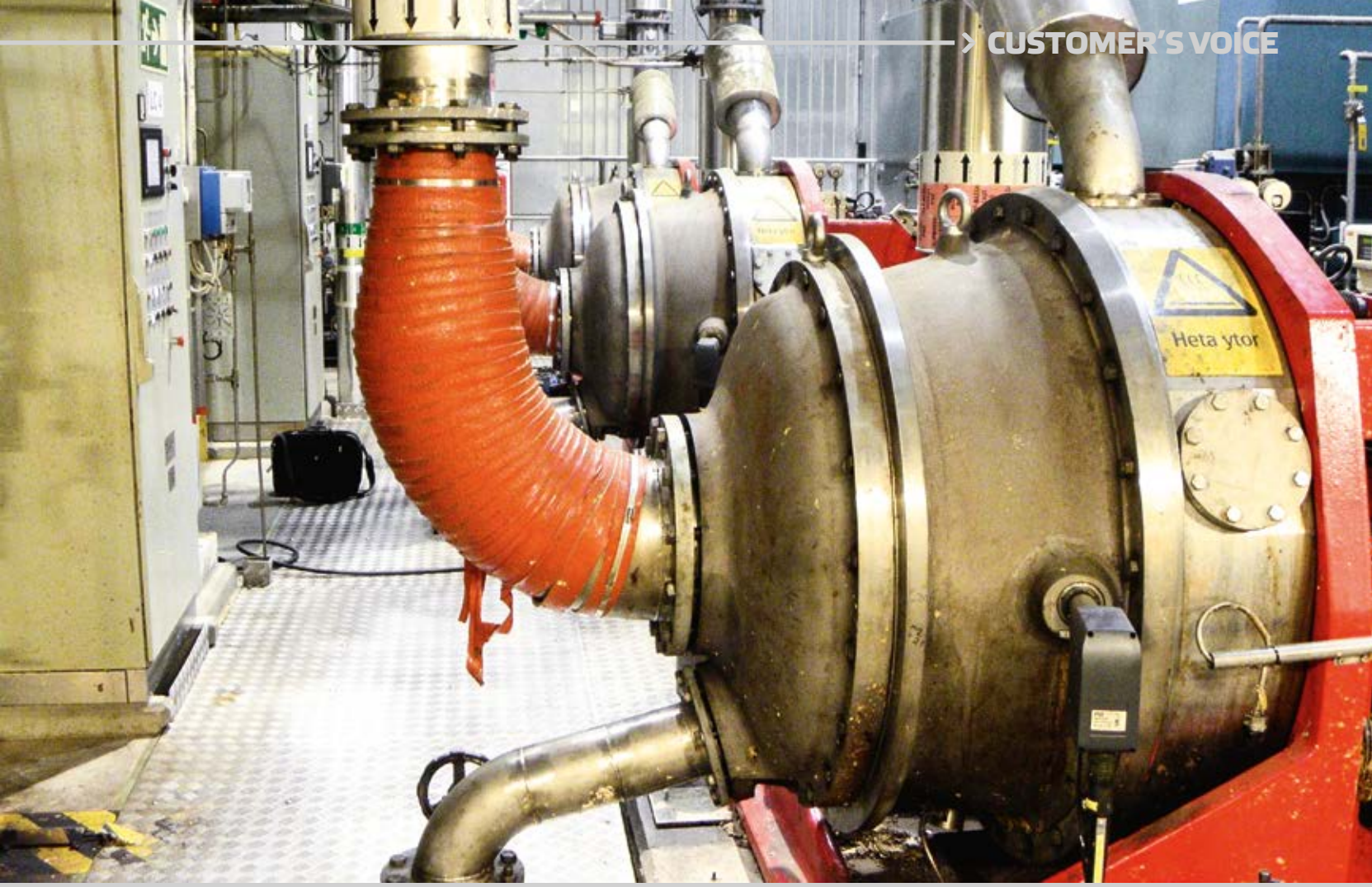
DOWNTOWN PRESENCE
The company has opened a beautiful showroom in downtown Xiamen where potential customers can view, feel and receive information about the various SinYang consumer products.



More than 4 GWh
in annual energy savings

When Stora Enso initiated a project in 2012 targeting a reduction in energy consumption in the TMP refining process, staff at the Hylte Mill called on Valmet for help. **TEXT** David Wold

Valmet's recommendation for the Hylte Mill energy savings project was the installation of an Adjustable Gap Sensor (AGS) on each of the three Valmet conical low consistency refiners of type Conflo CF82, installed after the mainline high consistency refiners in 2003. Valmet also recommended installing additional measurement points for their current Metso Pulp Analyzer (MAP) for better control of the pulp fiber length and shive content.

Hylte and Valmet agreed on a guaranteed energy saving of 15 kWh/admt (air dry tonnes) of produced pulp. While working in close collaboration with each other, they hit the bull's eye. For Hylte, this means a Return On Investment

> Our target was to gain maximum control of the refining process in order to minimize energy consumption without sacrificing pulp quality.

(ROI) of less than one year. What's more, the saving has been carried out without sacrificing TMP pulp quality. In fact, according to **Patrick Nordin**, superintendent, mechanical pulping, and **Stefan Snygg**, the project leader, the project has resulted in significantly greater pulp uniformity. Currently, Hylte and Valmet are working on even more ways to save more energy.

The task of the Conflo CF82 refiners is to further refine the TMP pulp to paper machine specifications. The installed AGS enables the refiners to run with an optimal constant disc gap via automatic recalibrations during production with a precision as exact as 0.25 hundredths of a millimeter.

Customer specifications

Patrick Nordin points out that the pulp mill's customers are the paper machines. In turn, the paper machines'

↑ PLEASED WITH THE RESULT
From left: Patrick Nordin, TMP Superintendent, Hylte Mill; Jonny Björklund, Valmet; and Stefan Snygg, Process Optimization Engineer, Hylte Mill.

The Stora Enso Hylte Mill in a nutshell

The Stora Enso Hylte Mill is a world-class producer of standard newsprint, ranging in basis weights from 40 to 52 g/m^2. The main market for Hylte's products is Europe. Other markets are located throughout the world.

The annual production of 490 tpy is carried out on two machines, PM 3 with a trim width of 840 cm and max. speed of 1,430 m/min, and PM 4 with a trim width of 840 cm and max. speed of 1,550 m/min. The raw materials are DIP and spruce for production of TMP.

The mill is located along the Nissan River in a heavily forested part of Småland, a province in the south of Sweden. The company's production facilities are centrally located in the town of Hyltebruk, which has around 4,000 inhabitants. The mill is the largest private employer in the community.

customers are printers. "Among the various variables defining quality, runnability is one of the most important, and runnability means avoiding web breaks on the paper machines and on printers' printing machines."

Stefan Snygg adds: "With this in mind, we studied the relationship between fiber length, shive content and tensile strength over time. Our target was to gain maximum control of the refining process in order to minimize energy consumption without sacrificing pulp quality."

"After installing an AGS on each of the three Conflo CF82 refiners and a MAP, our study enabled finding the secret of the most efficient way of determining the correct pulp length and shive content. With this information at hand, we could improve tensile strength to meet our customer's and their customers' specifications for quality."

The pulp fed into the low consistency refiners is at a consistency of between 4 and 4.5%. **Jonny Björklund**, the Valmet representative at the mill, is proud to say that the installation of the AGS at Hylte is the first on low consistency refiners, and that its success has led to additional sales at other mills.

Control of the process

The MAP measures fiber length and shive content. By ensuring an optimal disc gap, the AGS makes sure that the fiber length and shive content are as specified. Both Nordin and Snygg emphasize control over production and its consequences – uniform pulp quality and reduced energy consumption – as the most important results of the project.

They point out that, currently, the maximum shive content is 0.37% (Sommerville 0.15 mm) and not one iota more. The energy saving amounts to 15 kWh/admt of produced pulp. This was achieved by increasing the energy by 15 kWh/admt of produced pulp into the Conflo CF82 refiners and reducing the energy input in the mainline refiners by 30 kWh/admt of produced pulp, resulting in a net energy saving of 15 kWh/admt of produced pulp.

Efforts to reduce energy consumption are ongoing. The mill staff are still testing and learning. The latest move toward additional saving is implementation of the AGS in the mainline refiners and a newly designed segment pattern for the Conflo CF82 refiners.

When asked why they chose Valmet for this project, Patrick Nordin replies: "They are the only company we know of with this technology and, needless to say, we're very happy with the results it has made possible." He adds: "The disc gap can be calibrated without shutting down production. And it's as reliable as Valmet's collaboration in the project, meaning very reliable." ■

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INNOVATOR'S VOICE

Get inspired

lue from renewable raw materials

Resources are increasingly becoming a constraint in global development and welfare. Hence societies and industries are being driven to find more eco-efficient raw materials and sources of energy, as well as to make products and services in a more sustainable way.

TEXT Marita Niemelä

EXPANDING FUEL PORTFOLIO
To give energy producers more options for renewable energy, Valmet is continually developing its solutions towards more demanding biofuels.

Valmet is contributing to resolving the sustainability challenges by maximizing the value created from each processed tonne of biomass through improving the energy and raw materials efficiency of production lines. Thereby, Valmet is creating sustainable results and supporting customers in moving their performance forward. We are firmly committed to advancing our customers' success.

Valmet is building its future on sound foundations

Valmet's raw material focus is on non-food woody biomass, recycled paper, agricultural residues, purposely grown sustainable energy crops and combustible sorted waste.

> New biomass conversion technologies create opportunities for companies, especially in the pulp and paper, oil and gas, chemicals and materials, and power generation industries.

Hence Valmet's technologies are a perfect fit with the pulp, paper and energy industries, where Valmet already has an outstanding track record and large global installed base. The service and product offering cover the entire life cycle of the industrial processes, including new machine and plant installations, rebuilds and services. In addition, Valmet is pursuing growth by developing and commercializing new competitive technologies and services across various industry sectors for converting renewable resources into a spectrum of products. When developing new technologies, Valmet is reliant upon on its world-class expertise in the handling and processing of biomass on a commercial scale and providing customers with additional revenue streams from their existing processes.

Seizing the new opportunities

New biomass conversion technologies create opportunities for companies, especially in the pulp and paper, oil and gas, chemicals and materials, and power generation industries. It is estimated that by 2030 there will be several entirely new value chains. Increasing numbers of bio-based markets are expected to grow and pave the way towards new technologies, products and production systems. New kinds of eco-efficient gaseous, liquid and solid fuels, chemicals and materials will be developed. In this business it is very important to manage the entire life cycle of a product, from purchasing the raw material to end use and recycling.

As an example, companies in the forest industry sector are in an excellent position to gain significant benefits by implementing new biomass conversion technologies. Integrated production of solid and liquid biofuels in the pulp and woodworking industries is an important outcome. Biomaterials such as lignin-based carbon fibers and nano-cellulose fibers, composites and bioplastics also have great potential as bio-based materials will increasingly emerge in the markets.


Valmet

Maximizing the value of biomass across industry sectors

Valmet is already providing customers with technologies for intensifying the sustainable use of wood, agricultural materials, recyclable paper and various waste flows, and has a long track record and vast experience in converting biomass into renewable energy like heat, electricity and gas, and recyclable products like paper, pulp, board and tissue. Valmet is also supporting customers in recovering useful ingredients from secondary flows of their existing processes and converting them into valuable end products. Valmet's LignoBoost process, for example, separates and collects lignin from the pulping liquor. The world's first commercial installation of LignoBoost technology was supplied to Domtar in North America. Separation of a portion of the Plymouth North Carolina pulp mill's total lignin production has enabled an increase in pulp production capacity. It has also enabled the mill to create a new revenue stream from a product that was traditionally burned in a recovery boiler.

New solutions are also used to reach the targets of sustainable development. For instance, Lahti Energia's gasification power plant in Lahti, Finland, uses solid recycled fuel to efficiently generate electricity and district heat. Valmet supplied the main equipment for the plant, including a Metso mill-wide automation system. The environmental impact of the new plant has been positive. With a little over one year of operation, Lahti Energy has significantly reduced the need of coal. The CO_2 emissions under the EU emissions trading system (EU ETS) where reduced by 26% from 2011 to 2012 and the specific emission of CO_2 reduced by 32% compared to the figures of 2011.

Getting more out of processes

Because of rising energy prices, all industries are paying more and more attention to the energy consumption and operating costs of their production lines. New innovations are already making pulp and papermakers' production processes more efficient. For instance, a press to improve press dryness and save energy, as well as a new process for low consistency refining are already part of commercial practice. Pulp and paper companies can also improve their product quality and materials efficiency through light-weighting and by using new coating methods.

For the needs of power generation, the current infrastructure for generating power and heat is based on coal and heavy fuel oil. Valmet offers solutions for markets dominated by these traditional technologies. Valmet's

NEW REVENUE STREAMS
Valmet develops solutions for new revenue streams from renewable materials.

technologies can also make the existing power and heating plants more sustainable by using different kinds of biomass or sorted waste as a co-fuel. Hence Valmet is continuously expanding its fuel portfolio towards more demanding biofuels and developing new solutions for multi-fuel power production. As an example of bioenergy projects, the Nacogdoches generating facility in Sacul, Texas, was named the Project of the Year in the biomass category by Power Engineering magazine.

Customer value from close co-operation

Valmet is known among its customers as a reliable supplier of solutions and services – and the numbers prove it. Today, 40 percent of the world's paper is produced with Valmet's machines. Over the past ten years, Valmet has delivered more than 13GWth of boiler capacity that utilizes renewable fuels and reduces emissions associated with fossil-fuel-fired boilers. This carbon dioxide-neutral energy production has helped to avoid 40 million tonnes of greenhouse gas emissions annually, corresponding to emissions from over 24 million cars. The world's largest biomass boilers come from Valmet, Europe's leading provider of medium and small-scale power and heating plants using biomass and fuels derived from recycled waste. ■

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EXAMPLES OF RECENT PROJECTS MOVING CUSTOMERS' PERFORMANCE FORWARD

New revenue streams through lignin separation

Valmet's LignoBoost process separates and collects lignin from the pulping liquor. The world's first commercial installation of this technology was supplied to Domtar in Plymouth, North Carolina, USA, where it was started up in 2013. The second will be supplied to Stora Enso's Sunila mill near Kotka in the southeast of Finland; the start-up is scheduled for the first quarter of 2015. The separation of a portion of the mill's total lignin production allows an increase in pulp production capacity. It also provides the mill with a new and more profitable value stream from a product that was traditionally burned in a recovery boiler. Lignin can be utilized as renewable fuel instead of fossil fuels and as a starting material for new bio-based products.

New revenue streams through bio-oil production

Fortum's first industrial-scale bio-oil production plant was commissioned in Joensuu, eastern Finland, in November 2013. The plant, integrated with Fortum's Joensuu combined heat and power plant (CHP), is unique in the world. It will annually produce 50,000 tonnes of bio-oil from wood-based fuels, in addition to electricity and district heat. The produced bio-oil can be used to replace heavy fuel oil, for example, in power plants and this annual production corresponds to the heating needs of around 10,000 households. In the future, bio-oil could be further processed into transportation fuels and raw material for the chemicals industry.

Valmet supplied the plant to Joensuu as a turnkey delivery, including the foundations and buildings, feedstock reception and pre-treatment, pyrolysis system, bio-oil storage tanks and loading equipment, as well as a Metso DNA automation system and electrification. The delivery also included installation, testing and training.

New valuable products from biomass

Valmet will supply a prehydrolysis system to Bioprocess Pilot Facility BV's (BPF) bio pilot plant in Delft, The Netherlands. BPF's bio pilot plant is designed to handle different biomass raw materials and agricultural wastes like wheat straw and bagasse, and also wood. The key parts of the pilot plant are biomass feeding, hydrolysis reactors and equipment for the separation of liquid and residual solid biomass after hydrolysis.

Valmet's delivery consists of a prehydrolysis system on a pilot scale that is designed for a capacity of 40 kg of wheat straw (biomass) per hour. The start-up of the system is scheduled for August 2014. The prehydrolysis step prepares the biomass and renders the polysaccharides accessible, and is an important initial step in several biorefining processes.

Valmet has launched a new online service for spare and wear parts customers. **TEXT** Jukka Holopainen

All the spare parts, all the time

"Valmet's eServices is a new online channel that gathers Valmet's product data and parts services in a single interface. It is a web-based tool that both customers and Valmet customer service representatives use," explains **Michael D Nelson**, head of spare parts for Valmet in North America.

This new global solution allows customers to inquire about technical product data as well as lead times, prices and availability of products and items.

"Our customers can use eServices to easily find information about spare parts and consumables. Everything from product information to availability and pricing data is there, and customers can also ask our customer service personnel troubleshooting questions," Nelson summarizes.

More benefits for customers

But what benefits and business value will customers get from this new online service?

"Firstly, eServices is available around the clock. It provides a fast, secure way to contact Valmet spare part services and an always-on channel for technical and other documentation related to spare parts. For registered customers, eServices is also an easy way to find price and availability information for the parts they are interested in," emphasizes Nelson.

No registration is required to see general availability of products, search for common items or make inquiries. Customers can search based on the part ID number, its description or by the category.

"For customers looking for more specific information – e.g. inventory availability, lead time of products, pricing or searches based on customer's unique part numbering systems – we ask them to register with Valmet at the eServices website," says **Ismo Katila**, who has global responsibility for Valmet's spare parts services.

"The new online solution serves our entire installed technology base. The complete product range of the major brands, including Valmet, Metso, Sunds, Beloit and Kvaerner, are fully represented in the online service, as are dozens of smaller brands," Katila continues.

Additional service channel

The eServices channel also provides an easy, rapid way to contact Valmet's local spare parts specialists. All the major market areas have customer service supervisors dedicated to helping the online parts customers; customers from China, for example, will be served using their mother tongue.

Nelson emphasizes that the new online parts service does not take any existing service channels away from customers. Customers can still access the same customer service specialists as before and can request information from Valmet via the mill sales manager, by phone or email. eServices simply provides our customers with another online tool for spare parts information and the ability to contact us day or night, regardless of time and area. It can easily be used on smartphones and other mobile equipment."

Over 400,000 items online

The online parts service has been available to customers since the end of March. According to Katila, customers have already expressed their interest in online self-service channels.

"Many customers have mentioned that they would welcome new, easy solutions for finding the spare parts they need and checking their price and delivery times. Now, right from the start, we are giving our customers online access to more than 400,000 product items," Katila points out.

He promises that Valmet will be happy to listen to any and all feedback from customers regarding the new eServices solution.

"We will continue to develop the offering and the features of the online channel according to our customers' needs," Katila concludes.

Visit eServices at eservices.valmet.com ■

Michael D Nelson (left) and Ismo Katila.

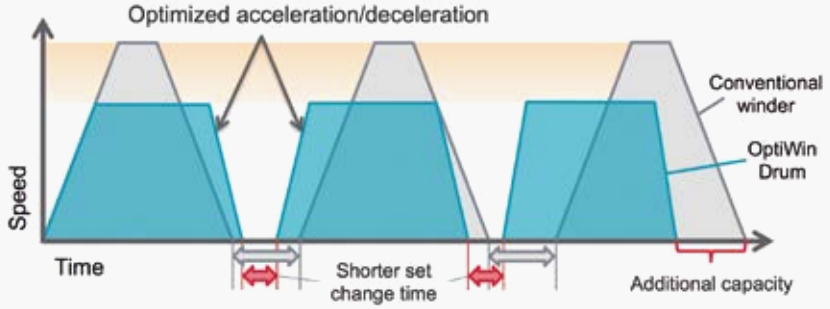
Reliable winding capacity at Greenpac Mill

The opening of the new lightweight linerboard plant at Greenpac Mill in Niagara Falls, NY, in the United States (featured in the article on page 24) is certainly newsworthy. For the new line, the mill chose an OptiWin Drum winder for its high capacity and reliability. This winder is perfect for showcasing all of Valmet's winder innovations. **TEXT** Pauliina Purola

High capacity without web breaks

The capacity of the Greenpac linerboard line is high, with a parent roll width of over 8 m and a designed production speed of more than 900 m/min. This sets high expectations for winder capacity as well. The minimized sequence time and speed kept in reserve are the keys to reliably reaching these capacity goals. Greenpac Mill needs just one OptiWin winder to reach its targets.

The winder capacity can be maximized under any circumstances when the acceleration and deceleration are controlled by Valmet drive controls. Over the last decade, the dynamics of the winder have been the main focus of research. With the results achieved, Valmet has taken a serious step towards increasing the designed speeds beyond 3,000 m/min. In this case too, drive controls enable more advanced control loops to control the tension levels under changing speeds. Valmet holds the winder speed world record of 3,201 m/min (10,502 ft/min). Yet in the case of liner winders, capacity is as essentially a matter of sequence times; very high capacity is reached even with lower operating speeds. This increases winder reliability, because high speeds are used only when needed.



With Valmet winders, you get higher capacity even with lower speeds - thanks to faster set change time and maximized acceleration / deceleration rate.

Designed with efficiency and safety in mind

By removing bottlenecks in a paper machine and increasing the capacity, other issues may emerge. Existing winders are often too inefficient for paper capacity –winder capacity becomes the bottleneck. In most cases, rebuilding the existing winder will not solve the capacity problem. With its compact size, high capacity, safety and fast installation time, OptiWin Drum is the perfect solution.

Old winders do not comply with the most recent safety standards and regulations. The safety of old equipment can be considerably improved by rebuilding, but achieving a safety level similar to a new winder will probably require a very costly investment. Safety may therefore become the decisive factor in choosing a completely new winder.

Safety is a built-in feature in OptiWin Drum winders. The first priority in a safe winder design is to eliminate all hazards. Remaining risks are prevented with mechanical guards and safety devices. Highly automated

The OptiWin Drum winder (formerly known as WinDrum Compact) at Greenpac Mill is designed and constructed according to ISO 13849-1. The Occupational Safety & Health Administration (OSHA) adopted the machine guarding-related part of this standard in 2012.

functions from parent roll handling to set change and roll tail gluing eliminate or minimize the need for operators to access areas within winder frames. Access is prevented unless the winder functions are in a safe state. This means that movements of e.g. rider rolls and core locks are prevented with safety latches. The essential functions needed for winder operation can still be operated with hold-to-run controls.

All the safety equipment is connected to a safety PLC controlling and monitoring operator access. Safety circuits related to operator safety are provided with parallel redundancy; they are doubled to guarantee safe operation in all situations.

All the latest safety functions are in use at Greenpac Mill. OptiWin winders are viewed as the safest winders on the market.

Always ahead

The OptiWin winder is renowned for its high capacity and good reliability. No wonder, since Valmet has been introducing new technology to winders regularly. A very recent improvement is the traversing tail gluing technology also in use in the Greenpac winder. It gives the best tail fastening and is the easiest gluing device on the market in terms of maintenance and operation. This device saves on running costs (labor and adhesive costs), and maintenance costs are also reduced over its entire lifetime. ■

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New OptiWin winder product family

Valmet's famous winders are now available under the renewed OptiWin winder family. Read more about OptiWin winders at **www.valmet.com/optiwin**

Compact and efficient dryer section geometry for single-fabric applications

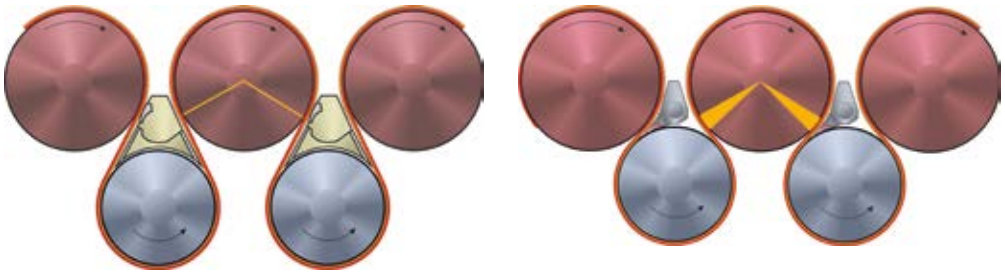
Valmet has developed a new, compact OptiRun Single dryer section geometry for single-fabric applications. This solution combines excellent runnability with low energy and maintenance costs.

TEXT Eero Eduardo Halmari

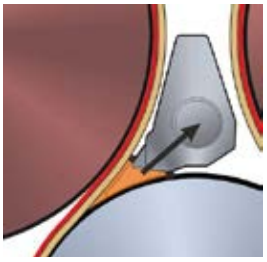
The new OptiRun Single with compact geometry is part of Valmet's OptiRun dryer section family. The idea behind this solution is to simplify the design by minimizing the gaps between dryer cylinders and rolls, and by reducing the number of blowers and air ducts, while still ensuring excellent runnability and fluent tail threading. Thanks to the compact design, the wrap angle of the web on the cylinder surface is increased, thus increasing the drying capacity. The minimized gaps contribute to less wear on the dryer fabrics and sealings because there is less unwanted fabric bending. The compact geometry provides very high vacuum (the underpressure on the pocket when the web is on up to -2 kPa compared with the conventional -0.3 kPa) on the whole pocket, including the closing nip of the bottom roll. The vacuum is created by suction only, compared with the suction and blowing technology used in conventional blow boxes. This contributes to lower energy consumption.

The compact OptiRun Single solution is best applicable to fine paper and liner and fluting board grades, and machine widths up to 8 meters. The speed range is 1,000 – 1,600 m/min. At lower machine speeds the bottom roll can be a UnoRoll without a vacuum blower. As the speed increases to more than 1,200 m/min, Edge VacRolls can be used to facilitate tail threading and web edge behavior. At speeds of more than 1,400 m/min, VacRolls can be used to ensure maximum runnability. The freely adjustable vacuum levels mean that it is easily operated and there are optimal vacuum levels in all conditions.

The compact OptiRun Single solution is suitable for both new machines and rebuild installations. Proven with two recent references, runnability and tail threading are excellent. When using open fabrics and/or UnoRolls, cleanliness is improved and the overall energy and maintenance costs are lower compared with conventional systems. With this new innovative dryer design, Valmet's OptiRun dryer section product portfolio is able to provide perfect solutions for all market needs. ■



INCREASED DRYER CAPACITY
A conventional dryer section (left) compared with the compact OptiRun Single (right), which has an increased wrap angle of the web on the cylinder surface, thus increasing drying capacity. The simplified design also means a reduced number of blowers and air ducts, and less wear on the dryer fabrics and sealings, contributing to lower energy and maintenance costs.



HIGH VACUUM
Underpressure in the opening nip is created by suction. The compact single-fabric geometry provides very high vacuum on the whole pocket, including the closing nip of the bottom roll.

Top References

Fujian Liansheng PM 6, China

Grade	Recycled fluting
Design speed	1,200 m/min
Trim width	7,250 mm
Basis weight range	60 – 100 gsm
Capacity	300,000 tpy
Start-up	2012

This new machine features OptiRun Single with compact geometry in the 7th dryer group.

Paper production line in Europe

Grade	Specialty paper
Design speed	1,500 m/min
Trim width	7,250 mm
Basis weight range	40 – 130 gsm
Capacity	230,000 tpy
Start-up	2013

This machine has been rebuilt with OptiRun Single with compact geometry in the 1st dryer group.

Before rebuild:		**After rebuild:**
Runnability problems	→	Excellent runnability
High draws limiting speed	→	Possibility to increase speed
Problems with tail threading	→	Fluent tail threading
Reduced efficiency	→	Improved efficiency
	→	Simple and easy blow box control

"The dryer section's runnability and tail threading have performed perfectly. In this section we almost never see any breaks or stuck doctors. We have even tested running without paper guiding blows, and still the web runs through smoothly. I think this geometry has quite unique advantages."

XUE RONG JUN, PROJECT MANAGER, FUJIAN LIANSHENG

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Valmet's OptiRun dryer section family – optimal drying solutions for all needs

The OptiRun dryer section family consists of four solutions that cover all geometric applications, providing optimal drying capacity and excellent runnability.

OptiRun Single:
- For single-fabric dryer sections
- Available in conventional as well as the newest compact geometry

OptiRun Double:
- For double-fabric dryer sections
- Available in conventional and compact geometry

OptiRun Triple
- For triple-tier dryer sections

OptiRun Hybrid
- For dryer sections with single-fabric and double-fabric dryer groups.

Each dryer section features UnoRolls, VacRolls and/or Edge VacRolls, depending on the machine speed and paper grade, in order to ensure smooth tail threading, runnability and energy efficiency.

Increased efficiency
through maintenance services

Improved Profitability

Paper & board prices in Europe (8/2013)

Grade	Price
WFC	EUR 672/t
Newsprint	EUR 466/t
Cartonboard (GD2)	EUR 717/t

Lost turnover in a 1-hour unplanned shutdown

Grade	Production	Cost / hour
WFC	350,000 t/y =	EUR 22,800
Newsprint	250,000 t/y =	EUR 12,000
Cartonboard (GD2)	200,000 t/y =	EUR 11,500

Turnover increment with 1.0% efficiency

Grade	Value / +1.0%
WFC	EUR 2,352,000
Newsprint	EUR 1,165,000
Cartonboard (GD2)	EUR 1,434,000

Faced with increasingly tough competition, papermakers are actively seeking maximum profitability and optimum production efficiency in their operations. One success factor is a reliable and effective predictive maintenance culture. TEXT Aapo Kuortti

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Whatever the maintenance need or strategy at a mill is, Valmet provides optimal maintenance solutions and services for it. Cooperation brings out and combines the best expertise of both parties.

With efficient maintenance solutions, a paper mill can reach its goals and deliver the value needed when facing challenges related to machine or operational performance. "It is about focusing on each mill's business goals. Together we can find solutions that are cost-effective, reduce downtime and improve runnability," says **Ari Saari**, Product Specialist at Valmet. "Our extensive benchmarking data and broad know-how and experience play a key role in improving the efficiency of machine lines."

Maintenance services help papermakers plan and optimize maintenance operations. These services include rolls and spare parts, automation and field services, studies, upgrades, process development cooperation, maintenance management and outsourcing support.

Service solutions for many needs

"As a maintenance partner, Valmet can act as an advisor in a support role or handle specific areas such as the maintenance of one machine section, like a winder," explains Saari. "Or, we can take charge of maintenance management and development, or be responsible for all maintenance." Professional resources and know-how are available to deliver a solution to meet the needs of the customer, from emergency repairs, OEM replacement parts or consumables all the way to a full-scope machine section performance boost.

"Unexpected breaks or failures in particular require prompt action as they are costly for a mill. With our wide range of solutions and proven expertise, problems can be solved with minimal downtime," Saari adds.

Tailor-made maintenance agreements

More efficient maintenance services are based on tailored maintenance agreements. Each agreement is designed to match the specific mill and its culture with the target of maximizing mill maintenance and production efficiency. Saari explains how the process typically gets started: "In these cases, Valmet operates as a doctor. Through careful studies we diagnose the main challenges and suggest a cure for the problems."

The studies can be divided into two levels: *machine condition* and *operational*. At the machine condition level, the measures include audits, troubleshooting and condition testing. Data from the studies gives direct answers to a particular mill's challenges. At a more operational level, typical procedures include audits, analyses and surveys. "Based on Valmet's large installed base and long experience, results can be benchmarked with similar machines and production lines around the globe. This gives clear guidelines on how to improve procedures," Saari points out.

Preventive maintenance and upkeeping programs increase reliability

The optimal solution for machine maintenance is to plan almost everything in advance. Proactive solutions that reduce unplanned shutdowns and breaks improve availability. Maintenance planning is most effective as part of a maintenance management program. Valmet has developed a preventive maintenance plan that can be incorporated into a mill's computerized mill maintenance system (CMMS). This preventive maintenance plan gives all the relevant information needed regarding the necessary maintenance elements, such as routed preventive maintenance plans, spare part information, drawings, bills of materials, documents and machine cards.

New upkeeping programs have been developed to control all operations on a production line or in a selected area of the machine line. They include tasks and observations ranging from normal preventive maintenance checks to process support and service packages. The main benefits of the upkeeping program typically come from the detailed instructions and training of maintenance and production personnel. "Who, what, when and how? The upkeeping program answers these questions in a very detailed way. This makes maintenance work clear and reliable, which then extends to the whole papermaking line," Saari explains.

Profitability through maintenance outsourcing

In maintenance cooperation, the most comprehensive service solution covers complete maintenance outsourcing at the mill site. It means that Valmet takes full responsibility for a pulp or paper mill's maintenance operations, including hiring the required maintenance personnel.

Maintenance outsourcing enables a mill to decrease the number of unplanned maintenance-related shutdowns and to lower maintenance costs compared with the industry average, resulting in significant savings. The annual value of reducing unplanned shutdowns by one per cent can amount to one million euros. "In addition, a mill has access to the machinery supplier's know-how and resources, and only one contact for all maintenance operations." ■


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Eco-cities go greener with their energy supply

TEXT Marjaana Lehtinen
ILLUSTRATION Shutterstock

According to the old saying, where there's a will there's a way. With the environmental legislation tightening, cities around the world have to meet the growing energy demand and cope with rising production costs.

With the latest power generation technology, it is possible to balance environmental compliance with economic performance. In many countries and cities, the current infrastructure to generate power and heat is based on coal and heavy fuel oil. However, their usage is becoming more challenging due to their effect on climate change. Another major challenge that cities face is the ever-increasing amount of waste and how to handle waste streams sustainably.

In finding the most efficient and sustainable solutions to these challenges, it is important that decision-makers, research institutes, universities and technology providers communicate and cooperate with each other, for example, through public-private partnerships. Encouraging new approaches are found in the Nordic countries where cities and local energy producers have successfully replaced fossil fuel energy flows with biomass and waste.

Waste is a valuable fuel

The view on waste is changing; what used to be a problem is now a valuable fuel. One tonne of combustible waste contains the energy equivalent of approximately 300 liters of crude oil. Air pollution and the issue of hazardous emissions connected to combustion have been basically eliminated by modern environmental technology.

One of the cities that has actively made its energy production more sustainable is Borås in Sweden. Years ago, it set itself a goal to become a city free from fossil fuels. The transition from using oil and gas in district heating has been made in steps. A major leap towards a fossil-free city was taken in 2005 with the commissioning of a new, world-class waste-to-energy plant that features two 20 MW_{th} Bubbling Fluidized Bed boilers. The plant's 200 GWh annual production of fossil-free energy has contributed to coming closer to the city's goal.

Increased efficiency and greater value from waste at all points of the waste stream

Well-planned waste management can benefit cities in many ways. Lahti, Finland is another city which has set high targets for sustainability and wants to be recognized as a truly green city. In April 2012, its energy company, Lahti Energy Ltd., started up the Kymijärvi II plant, which is the world's first gasification power plant running purely on sorted waste, in other words, solid recovered fuel (SRF). It produces 50 MW of electricity for the national grid and 90 MW of district heat for Lahti and its neighboring areas. According to the company's experience, gasification is the most energy-efficient way to utilize waste.

In Lahti, a new supply chain has been born around waste. Fuel payments have created a new market for fuel preparation, and the quality of SRF has improved. Tighter quality control benefits other SRF users as well, for example, material recycling of items such as metals. Fuel suppliers have been able to invest in new machinery, and operations have created approximately 100 new jobs in the supply chain.

The CO_2 emissions were cut by 30 % from 2011 to

2012, which is remarkable for a plant that has operated only since April 2011. The company's goal is to reduce CO_2 emissions to half from the 1990 level by 2025 and help City of Lahti to seek the role of the leading green city in Finland.

Biomass and waste are playing an increasing role in the future energy supply

All forms of renewable energy are needed to reduce greenhouse emissions and plan for greener future. In addition to waste, the local renewable fuels such as various biomasses are the most economically viable way – they generate both heat and electricity, are locally available and benefit the local economy.

With today's technology biomass can also replace coal in existing coal-fired plants. Such a plant was recently started up in Vaasa, Finland. Local energy company, Vaskiluodon Voima now operates the world's biggest biomass gasification plant. With the new 140 MW gasification plant, the company will be able to cut CO_2 emissions by around 230,000 tonnes per year, equivalent to the annual emissions of 70,000 cars.

Several conversion technologies to choose from

All of these three cases feature Valmet's technology. During the past ten years, the company has delivered more than 13 GW_{th} of boiler capacity that utilizes renewable fuels and reduces emissions associated with fossil-fuel-fired boilers.

"This CO_2 neutral energy production has helped to avoid 40 million tonnes of greenhouse gas emissions annually, corresponding to emissions from over 24 million cars," says **Jyrki Holmala**, President of Valmet's Pulp and Energy business line. "This is possible thanks to our fluidized bed boiler and gasification technology and their ability to convert various renewable raw materials, such as forest residuals, non-food agro fuels and waste, into energy."

The world's largest biomass boilers come from Valmet, but the company is also Europe's leading provider of medium- and small-scale power and heating plants using biomass and fuels derived from recycled waste.

Bio- and waste based fuel sources can be found in all corners of the world, and Valmet aims to create technology that can efficiently and sustainably utilize these local resources globally. To fully cover all possibilities, the company is constantly looking for ways to expand not only its technological base and geographical coverage but also to offer its comprehensive energy expertise for cities in their waste and energy challenges. ■

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Liner and fluting producers no longer need to make compromises between long felt lifetime and good dewatering. Valmet's new LineMaster press felt family for liner and FluteMaster family for fluting provide the optimal solution to achieve both. **TEXT** Marjaana Lehtinen

In the past few years, Valmet's fabric product development has strongly focused on meeting the requirements set by packaging papers for press felts. As packaging papers are mainly made from recycled fiber, cleanliness issues, plugging and short press felt lifetimes have presented major challenges for producers. Production and energy efficiency also need to be increasingly considered.

Liner and fluting machines have traditionally been run with press felts featuring an open structure. Today, as machine speeds increase, dewatering is carried out both in the nips and through Uhle boxes. The press felts need to be good at both.

"We have now developed press felt families that are specifically optimized for packaging papers: LineMaster and FluteMaster for liner and fluting production," says **Leena Silakoski**, Product Manager, Press Felts at Valmet. "They complement our existing press felt product range, especially for packaging paper machines in the medium speed range. They have, however, also been run on faster packaging paper machines and even on folding boxboard machines with good results."

Unique: high void volume adjustability

"A unique feature, and the greatest benefit from both of these new press felts, is the adjustability of void volume thanks to a laminated structure. There can be either two or three layers in the press felt," explains **Ari Tauschi**, Product Sales Manager, PMC at Valmet. "The same basic structure can be easily tailored to each customer's specific position."

At the beginning of the press section, where a larger void volume is needed for dewatering, a triple-layer structure presents an ideal solution. A double-layer structure, in turn, is suitable for later press positions where there is less water.

The new felts stay open even under high loads in a shoe press or a long-nip press.

LineMaster and FluteMaster press felts: Optimized dewatering with packaging papers

Long lifetime combined with good dewatering

Compromising between a long press fabric lifetime and good dewatering has been one of the challenges in making liner and fluting. Achieving a long lifetime has called for open felts and dewatering, mostly over the Uhle boxes. However, in many cases this is not the optimum way to produce paper with regard to dry content, machine runnability and energy consumption in particular. Each machine has its own dewatering strategy, which depends on its speed and construction.

"With the new LineMaster and FluteMaster felt designs, mills do not have to make compromises in felt dewatering at the expense of felt lifetime. Instead, they can optimize water removal by choosing nip dewatering, combined nip and Uhle box dewatering or Uhle box dewatering," Tauschi says. "Felt lifetime always depends on the mill's running strategy and preferences. For example, in China the typical lifetimes of LineMaster and FluteMaster press felts have ranged from four to eight weeks."

Another plus: energy savings

Yet another benefit presented by the new press felt designs involves savings and sustainability. As optimized dewatering in the press section reduces steam consumption in the dryer section, a mill saves energy.

"When nip dewatering increases, less Uhle box dewatering and less vacuum are needed. In the best case it may even be possible to close vacuum pumps that consume a lot of energy," comments Leena Silakoski. "With the new press felts it is possible to optimize the dewatering process on each machine."

Both LineMaster and FluteMaster press felts are manufactured in Valmet's production facilities in Tampere, Finland. ■

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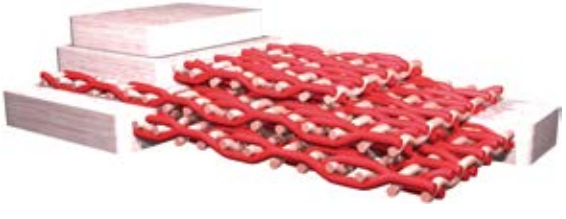
LineMaster

- Especially suitable for liner machines
- 1+1 or 1+1+1 laminated structure
- Monofilament MD yarns and twisted CMD yarns in the base fabric
- Increased nip dewatering
- Good batt fiber entanglement
- Adjusted water handling capacity
- Long lifetime

FluteMaster

- Especially suitable for fluting machines or positions where high Uhle box dewatering is needed
- 1+1 or 1+1+1 laminated structure
- Monofilament MD and CMD yarns in the base fabric
- High Uhle box dewatering
- Open structure, high void volume and good compaction resistance
- Good dewatering throughout the whole lifetime
- Long lifetime



EXPERT'S VOICE

Food for thought

OLLI REHN
The most cost-effective way to achieve our objectives was to have one leading EU-level 40% target for greenhouse gas reductions.

TEXT Vesa Puoskari PHOTOS Juha Roininen

Reviewing EU energy and climate goals

The European Commission has begun a debate concerning future EU climate, energy and industrial policy by presenting a proposal for the 2030 package together with the European Industrial Renaissance paper in January.

European Commission Vice-President **Olli Rehn**, responsible for economic and monetary affairs, says that the focus of the new energy and climate framework is on ensuring Europe transitions to a low-carbon economy according to the principles laid out in the EU's 2050 low-carbon roadmap. "The new proposal is based on thinking that having one primary, Europe-wide target of greenhouse gas reductions of 40% and a well-functioning emissions trading scheme is the most cost-effective way to achieve our ambitious objectives," says Rehn. Another important goal of the package is to increase the proportion of renewable energy sources to 27% of the EU's energy mix.

Rehn is confident that these goals can be reached without setting nationally binding targets for EU member states. For example, a recent study by the UK Department of Energy and Climate suggests that setting a single emissions reduction target of 40% would by itself account for 30% of necessary investments in renewable energy. "On top of that, member states are being asked to make voluntary commitments as part of their own energy and climate programs. If the markets and these voluntary actions are not enough to encourage sufficient investments in renewable energy, the Commission will introduce new legislative proposals to speed things along."

At the same time, the Commission intends to avoid carbon leakage and ensure Europe's competitiveness by offering free CO_2 allowances for heavy industry. "We don't want our policies to lead to closures in our energy-efficient industries – which would only mean exporting our emissions to other parts of the world where emissions from industrial production are higher than ours," Rehn adds.

Revising subsidies policy

The Commission is planning to adjust the EU's climate and energy policies based on the lessons learnt from the 2020 package. For example, it is revising its state aid guidelines on environmental and energy subsidies. According to Rehn, "The goal is to avoid over-subsidizing mechanisms that distort the energy market and lead to higher overall costs in reducing emissions and building new renewable capacity." Over-subsidized renewable energy production has combined with the economic downturn to cause a significant slump in ETS prices. "This has led to a contradictory situation where most market-based investments and power generation are focused on increasing the use of coal. This is the worst possible option for the climate," he adds.

Renewable energy, energy savings and energy-efficient technology will, however, remain the primary methods of achieving the EU's CO_2 emissions reduction targets. "In the future, different energy sources will have to compete with each other in more open markets. This should increase efficiency and productivity and reward the best and most cost-effective solutions. It will lead to more competitive green growth and economy," Rehn predicts.

> "The goal is to avoid over-subsidizing mechanisms, which are distorting the energy market and leading to higher overall cost in reducing the emissions.

Preparing for climate negotiations

The Commission proposal also began a discussion process for EU member states to agree on a common position for the forthcoming climate negotiations. The global agreement is scheduled to conclude in Paris in 2015.

Rehn estimates that situation has changed fundamentally in the negotiations. Carbon dioxide emissions in the U.S. are decreasing rapidly as its energy production shifts from coal to shale gas. China also needs to take action to resolve its serious air pollution problems. "My visit to Beijing gave me first-hand experience of how unbearable urban pollution can be. The smog covering the city made breathing difficult. Growing up in such a polluted environment does not bode well for the health of future generations. We owe it to our children to get it right," states Rehn. ■

MARCO MENSINK
The key element in the whole process is how to decarbonize the power sector without placing a further cost burden on the industry.

CEPI COMMENTS

Back on track

Deputy Director-General **Marco Mensink** from the Confederation of European Paper Industries (CEPI) is content that the focus is finally back on industry. The 2030 package includes several positive aspects for the forest industry: The Commission and the EU member states emphasize the general importance of the industry and recognize that European energy costs are uncompetitive. It also admits that using distorting subsidies to push biomass for producing renewable energy is a problem and needs to end.

"There is growing recognition that burning wood in coal plants at low efficiencies is not a solution for climate change. This new policy communication recognizes the idea that there should be a cascading use of biomass to increase its value first," Mensink says. However, the pressure remains on biomass markets, as some member states have long-term subsidy commitments. "Secondly, the focus is now going to shift from the use of subsidies to using the price of carbon as the main driver to meet the EU's new targets for CO2 emissions and renewable energy," he adds.

Another important element in the policy package is the Commission's proposal to keep the EU Emission Trading Scheme unchanged until 2020. The paper industry should remain on the carbon leakage list and receive free emissions trading allowances based on the current system. "These were important steps, as there was a lot of pressure to change the system before 2020," Mensink points out.

Decarbonizing the power sector

CEPI does, however, criticize the 2030 initiative for leaving the most fundamental question unanswered. "The key element in the whole process is how to decarbonize the power sector without placing a further cost burden on the industry or making the competitive situation worse," stresses Mensink.

Currently, the price of electricity in Europe is double that of the U.S. and natural gas is two to four times more expensive. "As long as member states translate climate policy into legislative targets, taxes, levies and costs while the rest of the world has no climate policy, there will be an impact on our competitiveness."

Need for investment

CEPI is also very concerned about the uncertainty that the ongoing debate on European industrial and climate policy measures is causing, and the effect this is having on investment. Mensink continues: "The industry is not going to close down tomorrow, but neither are we getting the investments we need for the future. We have all the resources and opportunities we need to stay in Europe if we keep on getting investments."

Funds are needed to stimulate innovation, in particular. With its 2050 roadmap and two team projects, CEPI has put a lot of effort into discovering new technologies that will cut costs and reduce emissions, save energy and create more value in pulp and papermaking. "If Europe really wants to reach its climate targets, it has to look at new ways of funding innovation. We believe that the EU's climate change goals cannot be achieved without new breakthrough technologies", Mensink emphasizes.

Around the world

Pellets replacing fossil coal in Texas

Zilkha Biomass Energy LLC of Texas, United States, and Valmet have signed a five-year collaboration agreement in the field of steam exploded black pellets.

Pulp baling targets met in Estonia

Estonian Cell of Estonia has boosted its baling capacity with a new slab press and partial baling line upgrade. The mill has reached all the targets of the project. Estonian Cell is the only mill in Europe sourcing products solely from aspen.

Bleach plant rebuild in Portugal

Caima Industria de Celulose in Portugal will rebuild its bleach plant. The renewed plant will start up at the beginning of 2015.

GoBiGas starts up the world's first gasification plant

The Valmet-supplied gasification plant at GoBiGas (Gothenburg Biomass Gasification Product) was inaugurated in March 2014 in Gothenburg, Sweden. The plant will use forest residues and wood pellets to produce gas to be used in the transport sector to replace fossil fuel. The plant is first of its kind in the world.

PulPaper 2014 gathers the industry people

Visit Valmet at the PulPaper 2014 exhibition and conference in Helsinki, Finland, on June 3-5, 2014. PulPaper will be the meeting point for the world's pulp and papermakers this year.

Valmet's tissue technology to Mexico

Absormex CMPC Tissue of Mexico is expanding its tissue production by buying a Valmet Advantage DCT200 tissue line. The new line will add 60,000 tonnes of high-quality toilet and tissue grades to the company's annual production.

Suzano pull mill inaugurated

Suzano inaugurated their new pulp mill in Imperatriz, Maranhão, Brazil, with the presence of President Dilma Rousseff. Valmet has supplied the complete process equipment for the mill.

What is happening in the global pulp, paper and energy industries? *Around the world* demonstrates some of the events and projects where Valmet has worked together with its customers to move their performance forward.

Wood chips reduce use of fossil fuel

Valmet will supply a wood-chip-fired heating plant to Tampereen Energiatuotanto in Finland. The new plant will reduce the need to use heavy-fuel-oil-fired heating plants in the district.

PeriVapor launched in China

Valmet's wood handling and chip washing products and Defibrator system were on display at WMF 2014 in Beijing in February. The event marked the launch of PeriVapor, Valmet's new mechanical steam separator on the Chinese market.

Wuhan Chenming starts up new tissue line

Advantage DCT200 tissue line was successfully taken into stream at Wuhan Chenming Hanyang Paper in Wuhan, China at the end of 2013. The line started up ten days before the estimated time and has been since producing high-quality tissue at high speed.

Valmet's Customer Days to be held in Berlin

Valmet's Customer Days will be arranged in Berlin, Germany, on October 22 - 24, 2014. The event will include presentations of the latest pulp, paper and energy technologies.

Prehydrolysis assists biorefining processes

Bioprocess Pilot Facility has ordered a Valmet prehydrolysis system for its bio pilot plant in Delft, the Netherlands. Prehydrolysis is an important step in the production of second-generation ethanol and several other biorefining processes.

First bio-oil plant commissioned

The first industrial-scale bio-oil production plant was commissioned in Joensuu, Finland in November, 2013. The plant will produce 50,000 tonnes of bio-oil per year from wood-based fuels. The bio-oil will replace fossil oil in production of heat and power.

Pulp mill relocated from Finland to India

Relocating an entire pulp mill from one corner of the world to another is a huge venture.This was accomplished by Ballarpur Industries of India by transferring the 40-year-old Kaskinen pulp mill from Finland to Ballarpur, India.

Mondi boilers upgraded for capacity and availability

Mondi Group will upgrade its recovery boiler in Dynäs, Sweden, and its power boiler in Stambolijski in Bulgaria. Both upgrades are targeting capacity and availability increase.

About Valmet

The new Valmet is committed to serving its customers

"To convert renewable resources into sustainable results" – this is the mission of the new Valmet, which has been operating since the beginning of this year. The company carries out its mission in cooperation with its customers in the pulp, paper and energy industries. Our customers refine renewable raw materials into recyclable products and renewable energy in their processes, utilizing Valmet technologies.

Valmet's President and CEO Pasi Laine, how has the new company's journey started?

"The first part of the year has gone very well. We had carefully prepared for the creation of the new company. We had prepared the company's name, brand image and organizational structure, in good time, so starting the operations was quite straightforward. As the market also seems to have picked up during the first part of the year, we can be satisfied with the beginning of the operations."

What does the future look like?

"Valmet is a strong company, and I firmly believe that it will be able to meet all future challenges. We are in first or second place in nearly all of our main areas of operation, and our service business with a turnover of one billion euros brings us stability. The growth in pulp, board, tissue and energy demand provides us with further growth possibilities.

In what way is Valmet different from Metso's Pulp, Paper and Power business, which it was before the turn of the year?

"The time within Metso was a good time, too. During that time, new businesses were acquired that have significantly extended our field of operations. However, as an independent company, we will now be able to react faster and develop our business according to our own needs. This has also brought with it new kinds of responsibilities: we no longer have a big brother to help us with our problems. We

Valmet Corporation is a leading global developer and supplier of services and technologies for the pulp, paper and energy industries. Our 11,000 professionals around the world work close to our customers and are committed to moving our customers' performance forward – every day.

have a new kind of freedom but also new responsibilities, both of which are positive factors in my opinion."

What kind of comments have you received from customers concerning the new company?

"Our customers have accepted the new company and the "new old" company name quickly and without hesitation. Many customers have expressed that they are happy about there being a dedicated company specifically for the clientele they represent, developing its operations precisely according to their needs. I am very happy about the way Valmet has been accepted."

Which issues will Valmet focus on in the future?

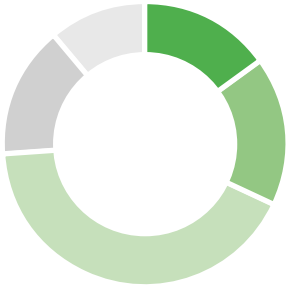
"Excellent customer skills are one of our key objectives. We also want to be a technology and innovation leader in the future and develop new solutions to ensure the success of our client industries. The development of our own processes, such as quality, safety and procurement, is important and also benefits our customers.
We have launched an initiative promoting a "winning team" spirit within the company, including positive energy, service orientation and commitment to our own and our customers' objectives. We want to become the global champion in serving our customers."

Valmet figures in 2013

Net sales by business line

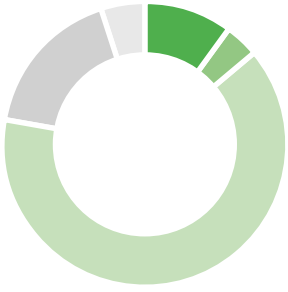
- Services 39%
- Pulp and Energy 35%
- Paper 26%

Net sales by area



- North America 15%
- South America 17%
- EMEA 42%
- China 15%
- Asia-Pacific 11%

Personnel by area



- North America 10%
- South America 4%
- EMEA 64%
- China 17%
- Asia-Pacific 5%

Forward

VALMET'S CUSTOMER MAGAZINE

FORWARD
Valmet's customer magazine

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Committed to moving our customers' performance forward – every day

Valmet Corporation is now an independent, listed company that was reborn through the demerger of the pulp, paper and power businesses from Metso Group in December 2013. We develop and supply competitive services and technologies for the pulp, paper and energy industries.

Valmet's services cover everything from maintenance outsourcing to mill and plant improvements and spare parts. Our strong technology offering includes entire pulp mills, tissue, board and paper production lines, as well as power plants for bio-energy production. Valmet and Metso will continue to work closely together to offer winning automation solutions.

Our 11,000 professionals around the world work close to our customers and are committed to moving our customers' performance forward – every day.

Discover more at
www.valmet.com

Valmet
FORWARD