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Forward

VALMET'S CUSTOMER MAGAZINE | 2/2020

Pratt Industries PM 17:

Expert training gets the whole team on board

Valmet

Editorial

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Learning for success

"The success of a pulp, paper, board, tissue or energy producer depends not only on the quality of the technology they use but also the level of competence of their employees. Their competence may, in fact, be the differentiating factor that helps companies to stand out in competition," says **Emmeli Olén**, Director of Valmet Learning Services.

Jay Hennessey, Education Manager at Pratt Industries, shares this view: he says that education and training of people are among the top success factors for a paper line start-up. The start-up of Pratt Industries' PM 17 described in this magazine is a great example of how comprehensive training can secure a huge investment like a new papermaking line.

But naturally, learning needs to expand to the entire lifecycle of the equipment, which for instance for papermaking lines is typically several decades. This is why training is an essential part of Valmet's long-term customer relationships and helps to ensure that our customers get the most out of their equipment, systems and processes. And the best results are achieved when the training is planned based on every customer's unique targets and needs.

But ensuring future success is also about securing knowledge transfer and the adaptation of new technologies. The decades-long knowledge of the industries we serve is a precious asset, while digitalization is changing how we work – at an ever-increasing speed.

In this Forward issue, you can read about some of our customers' training experiences, and how they are maintaining their personnel's skills and knowledge. And the Expert's voice article with Professor **Frederic Dalsace** from the International Management Institute (IMD) provides useful insights into what is required from today's leaders to deal with constant change. I wish you inspiring reading!

ANU SALONSAARI-POSTI
SENIOR VICE PRESIDENT
MARKETING AND COMMUNICATIONS

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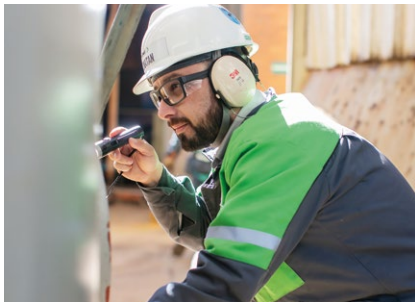

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In brief

Digital twins with 3D laser-scanning technology

The changing operational environment and aging machinery have increased the need for performance optimizing services, large renovation projects and machine rebuilds. If the original or updated drawings of the machines required for such projects are lacking, 3D laser-scanning technology can be used to record the existing equipment structure. The data is then transferred to a point cloud and converted to CAD-compatible data.

Valmet utilizes 3D laser-scanning technology in building digital twins, varying from single components to entire machines, production lines or even mills. The digital twin is often used for a relocation or a rebuild of a pulp or paper production line, but it can also be used for training purposes or the planning of shutdowns and maintenance work. Compared to traditional measuring methods, 3D laser-scanning technology is a time- and labor-saving data collection method. It also provides accurate data, reducing planning and design errors.

Remote pilot trials

Piloting is one of Valmet's core assets when developing solutions with customers. Our pilot facilities for board- and papermaking and finishing are equipped with online video monitoring systems, making trials available remotely as well – no matter where you are.

"Remote piloting is a great opportunity for our customers to effectively proceed with their investment projects during restricted travel conditions. Through a video connection, we can demonstrate the most essential pilot trial elements to our customers. Daily online meetings keep customers up-to-date about a trial's progress," says **Krista Nukarinen**, Paper Technology Manager, Valmet.

The services included in remote pilot trials are:

- Live monitoring of pilot trials remotely via an online video connection
- Pilot samples delivered to the customer after trials
- A comprehensive report of trial results delivered to the customer after trials

LNG terminal goes virtual

Valmet's Extended Reality (XR) is a multipurpose mixed reality platform, streamlining the design review, training, preplanning maintenance and remote collaboration processes at any liquefied natural gas (LNG) terminal. "As a tool, Extended Reality gives us great opportunities to visualize complex industrial environments," says **Dr. Mika Karaila**, Research Director, who leads the development of Extended Reality at Valmet.

Benefits originally used in gaming technology are now being utilized in Valmet's Extended Reality (XR) to bring different scenarios to life. You can see the operations of your LNG process in 3D, check equipment, review service plans, discuss issues with others and get real-time help from Avatars or through a connection to Valmet's Performance Center. For design engineers, a realistic site environment is essential when making exact measurements, and detecting possible collisions or other faults at an early stage of the project.

Breaking ground at LD Celulose's dissolving pulp mill

The ground breaking at LD Celulose's "Amadeus" dissolving pulp mill project took place in May 2020. Valmet and its partner Fortes celebrated the "first pile in the ground", which will be part of the foundation of the drying machine building.

The new 500,000 tonne/year dissolving pulp mill, which is planned to be completed in the first half of 2022, is located in the cities of Indianópolis and Araguari in Minas Gerais State, Brazil. When it is ready, LD Celulose S.A. will employ approximately 1,100 people to operate the industrial plant, and the plantations that will supply it.

Valmet's delivery for the project includes a fiber line, a pulp drying and baling line, an evaporation plant, a white liquor plant and a mill-wide automation system.

Palm Aalen PM5: the world's biggest containerboard machine

A handshake in 2018 between Palm and Valmet started a collaboration to realize a new high-performance containerboard machine, which is to be designed to produce light and high-quality recycled corrugated board and testliner grades. The construction of the machine started in June, 2019 in Aalen, Germany, and is aiming for a start-up in 2021.

The scenery at the 18.1-hectare building site is changing rapidly. When flying over the construction site in November 2019, the 27-meter-high, 50-tonne precast concrete columns for the new paper machine hall were being erected. In March 2020, the view was already quite different, with the paper machine hall visible (picture). Another highlight is the world's first new generation of Siemens gas turbines, with the highest efficiency and low CO_2 emissions, as well as the future possibility of using hydrogen as a fuel source. The electricity and steam generated by these turbines will be enough to fully supply the paper mill, with additional capacity equivalent to the supply for the entire city of Aalen.

Once completed, the 11,700-mm-wide (wire) board machine will have a design speed of 2,000 m/min, and an annual capacity of 750,000 tonnes.

In brief

The seventh tissue line for Hayat Kimya

Valmet will supply the seventh tissue line, including an extensive automation package, to Turkish tissue producer Hayat Kimya.

Hayat Kimya has followed their straight expansion plan by installing a new tissue machine every second year. Previously, Valmet has delivered six Valmet Advantage DCT 200TS tissue production lines to Hayat Kimya's mills in Turkey, Russia and Egypt. Valmet also conducted an extensive rebuild of the customer's TM1 machine in Turkey during 2015.

"When everybody knows each other, the technology and the process, it's easy to achieve great results together," says **Lütfi Aydın**, Director, Paper Group, Hayat Kimya.

The 300th Valmet Paper Lab order

Valmet will supply the 300th Valmet Paper Lab automated board and paper testing laboratory to Papierfabrik Palm. In total, Valmet will deliver three Valmet Paper Labs to the company's Descartes mill in France, and its Wörth and Aalen-Neukochen mills in Germany.

Valmet's Paper Lab delivers accurate and rapid measurement results that are used either as a quality stamp for the end product or for board machine operation optimization. With the widest selection of industry-standard tests on the market, reporting can detail more than 400 properties. With Valmet's Industrial Internet remote support, the automated laboratory's performance can be taken to an even higher level.

Read more: → **www.valmet.com/paperlab**

How can you get started with the Industrial Internet?

In the future, the Industrial Internet won't just change your production processes – it will also change how you think about your business and get value from it. The utilization of near real-time analytics and Artificial Intelligence (AI) will empower a shift toward autonomous mills or plants. The future autonomous mill will communicate its maintenance needs well in advance, and you will be able to concentrate on the most important aspect of your business – your customers.

But what is the Industrial Internet all about? What do you need to know about it? And how do you get started with it? Download Valmet's Industrial Internet guidebook, and discover why and how data can benefit your business!

→ **www.valmet.com/industrial-internet-guide**

Valmet's experts share their thoughts on topical issues

by **Petri Lakka**
Vice President, Services Development

The new normal – the opportunities of digitalization in industrial maintenance

It has been said that exceptional circumstances and crisis situations strengthen certain trends and weaken others. The COVID-19 pandemic means that now more than ever, digitalization is a trend that is here to stay in working life. An everyday example of this is the numerous virtual meetings. Digitalization, mobile applications and the Industrial Internet also impact industrial maintenance work. Let's look at an example.

A mechanical or process failure in the customer's production line appears. Thanks to the increasing number of smart sensors and the connectivity of industrial equipment and processes, maintenance experts can monitor and analyze real-time data remotely with the customer or a wider network of experts, and only then decide on the need to travel to the site. And even if it is decided to do so, the problem can be specified in more detail, and virtual reality (VR) applications can even help the maintenance expert study the situation in advance. With mobile tools, documents and reports can be made available to all parties in real time.

"Digitalization is a trend that is here to stay."

And the possibilities won't stop there: autonomous robotics such as drones are already being tested at industrial sites with challenging or limited access, for example. But digitalization is also affecting how training is offered. Virtual reality and simulator training offer the chance to increasingly operate in an environment that corresponds to the reality and works equally well, e.g., for the maintenance work supervisor, supplier and the production plant's maintenance personnel. They also enable creating an inspiring learning environment with varied exercises.

So - what all is made possible by this digitalization of maintenance? How about fast problem-solving, the networking of competences, enhancing cooperation between the parties involved in maintenance... and learning can also be fun!

The "new normal" is here to stay – I will now continue my day by taking a virtual coffee break with my colleagues!

Preliminary agreement for key technology and automation for the planned Kemi bioproduct

Valmet and Metsä Fibre, which is part of Metsä Group, have signed a preliminary agreement according to which Valmet will deliver key technology, covering all the main process islands and automation systems for Metsä Fibre's planned Kemi bioproduct mill in Finland. If it materializes, the new bioproduct mill will have an annual pulp production capacity of 1.5 million tonnes, and it will also produce various other bioproducts.

"We have set high environmental, material and energy efficiency targets for the Kemi bioproduct mill. Valmet has been able to offer us the technology to reach these targets. Our good and long cooperation with Valmet creates a good foundation for a successful execution of this mill project and for the high performance of the bioproduct mill throughout its whole lifecycle," says **Ismo Nousiainen**, CEO of Metsä Fibre.

8,000

people participate in Valmet's Learning Services courses each year.

CUSTOMER'S VOICE

Moving forward together

Pratt is America's fifth largest corrugated packaging company and the world's largest privately-owned 100 percent recycled paper and packaging company.

Expert training

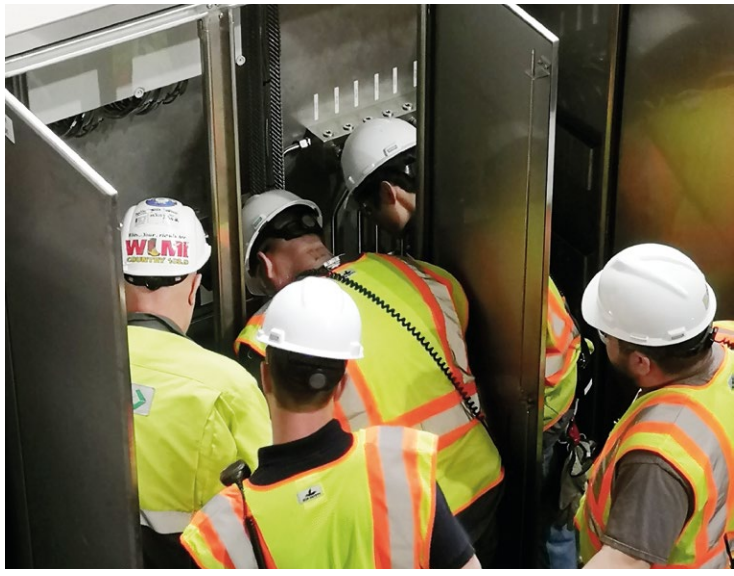
gets whole team on board

Pratt Industries started up their new PM 17 board machine in 2019 at Wapakoneta, Ohio. The start-up was a great success thanks to both extensive training and the unique opportunity to train their personnel on exactly the same type of OptiConcept M line at Pratt's PM 16 machine in Valparaiso, Indiana. **TEXT** Peter Cura

↑ Hands on papermaking: forming, pressing and drying.

↠ Pekka Raitala from Valmet (left) leading the hydraulics training.

→ Students on the machine studying the headbox with the help of the Valmet training manual.



Pratt is America's fifth largest corrugated packaging company and the world's largest privately-owned 100 percent recycled paper and packaging company, with more than 7,500 highly-skilled, green-collar employees dedicated to sustainable board making.

Prior to starting up Pratt Paper Ohio LLC, Wapakoneta Ohio, PM 17 in 2019, Pratt had already had good experience with Valmet Learning Services when they started up their OptiConcept M machine at their Valparaiso PM 16 mill in Indiana, in 2015. "The training and pre-training that Valmet offered allowed the Pratt team to get the machine up and going in short order. We were on the reel in just a day or two and have stayed on the reel essentially

"It was flawless. With the Wapakoneta PM 17 start-up, I'd say we had the best start-up ever."

ever since, apart from scheduled maintenance," says **Jay Hennessey,** Education Manager, Pratt Industries.

Preparing for success

Back in 2015, Hennessey was the General Manager of the Valparaiso mill and he worked as part of the team that started up PM 16. This experience gave him a superb foundation for preparing to start up the new OptiConcept M machine in Wapakoneta. "Our goal with PM 17 was to execute a safe, efficient start-up and quickly ramp up to 1,100 tpd of high quality liner and medium. We selected Valmet for the Valparaiso Mill, PM 16, in 2014 and we bought the same machine for PM 17. The two machines and two mills are identical in nearly all aspects. The advantages of having two identical mills within 200 miles of each other are huge."

A good start-up depends on good training

"The education and training of your people are one of the top five success factors that affect how well your mill will start up," says Hennessey. "A company spends hundreds of millions of dollars to build a mill, so the faster the mill can start up and begin operations the faster the company can begin reaping the rewards of their investment."

Hennessey designed the training program for PM 17 and the first 6 months involved intensive training. This meant that the recruits began the day with two hours in the classroom, followed by two to three hours hands-on in the mill, with time in the afternoon to decompress. The new recruits were allowed to work with the Valparaiso PM 16 machine almost immediately. Hennessey adds, "they got lucky. It's very rare to be hands-on with the exact paper machine that you'll be running during training. Normally you only get to be hands-on for a couple of weeks, with a machine that can be quite different. They really got used to the whole machine exactly as it was going to be run. And after finishing the training they assisted with the construction and start-up preparations for PM 17, too."

Making papermakers

The recruitment process was a bit different, too – most of the recruits had no prior papermaking experience. Pratt

Valmet's scope of delivery included a complete OptiConcept M board production line from headbox to winder with a wide scope of automation.

Jay Hennessey, Education Manager, Pratt Industries.

Together toward a common goal

"The customer had a very clear idea of what they wanted," says **Pekka Raitala**, Specialist, Customer Training at Valmet. "They explained their needs to us and we agreed that they made good sense. For example, they wanted several things to be combined in all-in-one packages, like the training and the manuals."

"Everything went really well and the training facilities were just perfect. They were in an adult training center just 15 miles from the mill," Raitala says. "We also combined some of the training for both maintenance staff, as well as the operators. Usually, we would only train the maintenance people about the hydraulics and automation. However, the customer wanted their operators to know everything about the machine, so they participated in the training too."

"I gave both hands-on and theoretical training while I was there," Raitala says. "Everyone was very motivated so it was a pleasure to train them. And I have to say it was a pleasure to work with Mr. Hennessey, too."

Industries hired local people from the North West Ohio region 12 months before the start-up and then began intensive training. "For our papermakers we recruit smart professionals with a blend of skills," Hennessey explains. "This type of recruitment has been in the Pratt business model in the US since 1994. For PM 17, I refined and defined the concept a bit. We recruit smart people – who are brand new to paper machines and paper making. We hire people who don't have preconceived ideas, who are hungry to learn and want to achieve things. The mix of backgrounds creates good discipline and a focus on getting things done. With an investment like this you have to succeed, and we give our new papermakers the opportunity to succeed, too. Valmet supported our plan and was integral in its success," he continues.

Valmet on-site training

While Hennessey organized the basic training, he turned to Valmet for the expert training. Valmet integrated on-site classroom training for the production line start-up and operation into the training at the end of the program. "We used Valmet's experts as the 'Cap Stone' of the Education Program and the Valmet Training Manuals were the basis of the Paper Machine and Winder Training Program. My program gave the students the basic knowledge they needed and the field work at PM 16 gave them critical hands-on experience. Valmet's experts reinforced the basics, connected the dots, and shared their years of experience with the class. And, obviously, getting both the training and the machine from the same supplier was a big plus," Hennessey says, "and the Valmet process control integrates completely into the machine."

"A lot of what paper makers learn is through stories and experience, so experience helps because you can pass it on," Hennessey adds. "For example, the most complicated part of the paper machine is probably the press section, so when you have someone with great experience in that area, it's invaluable. Everybody gets something from it, even me."

"For each part of the machine Valmet had an expert to provide training."

Tailor-made cooperation

"My role was to coordinate the training for PM 17, and I organized the schedule, planning and details with Pratt and the other parties," says **Tuuli Lu** (picture on the left), Designer, Customer Training at Valmet. "What made this case special is that Pratt's target was to give their personal as broad an understanding of board machines as possible."

"Usually, operator training is mostly related to running processes and operating procedures, but Pratt specifically asked for additional training for their operators. This combined training for the board machine and winder, as well as the hydraulics and automation," Lu says. "Hands-on training for the operators was integrated into the daily routine of Valmet's on-site personnel during the start-up phase. So their operators know pretty much everything about the new machine."

"We tailor-made the Valmet program together with the customer and I would say that the cooperation and communication with Pratt went really well and we succeeded in meeting their expectations," Lu concludes.

Expert Valmet trainers

Another significant aspect of Valmet's training was that the technical experts who helped to start-up the machine were the same people who gave the training. This included expert training specific to the different parts of the machine, such as the wet end, the hydraulics, pneumatics, automation and mechanical maintenance. "We worked closely together with Valmet, and the entire team was part of putting the education and machine together," adds Hennessey.

"During start-up, the Valmet start-up team was there, and they worked well with our production engineers. The start-up team also gave the training, so for example, the technical expert for the headbox provided the headbox training. For each part of the machine Valmet had an expert to provide training who was also there to assist with the start-up. It's really helpful for us as customers."

Useful documentation

Along with the customized training program, Hennessey also asked Valmet to provide the training manual for Wapakoneta PM 17 as a single document. "Valmet did this for us already for PM 16. By having a training manual with everything in one place, you're able to solve everything with that one document. And credit to Valmet for writing a manual that people actually use – the Valpo manual gets opened regularly," he says. "The Valmet machine seldom has problems but we still use the trouble shooting information to improve our knowledge and production. People can use it to dig into the details of how things work, so we know what we're changing. We know what hydraulic fluid goes where, what the pressure sensors are telling us. And if we ever do have to trouble shoot, 99 percent of the time the answer is in the manual."

The best start-up ever

After all the carefully planned recruitment and training, the results were excellent. PM 17 started up quickly and smoothly with no challenges or issues of any kind. As Hennessey says, "it was flawless. In 2015 we said that the Valparaiso PM 16 start-up was the best Pratt start-up ever. With the 2019 Wapakoneta PM 17 start-up, I'd say we had the best start-up ever."

Now that the PM 17 is up and running Hennessey still has plans for further training. "Absolutely. I'm hosting short intensive training for all the Pratt Mills now. We will also be engaging Valmet and their expert trainers for advanced and specialist education," he says.

"The Wapakoneta PM 17 Mill is running very well and we are all very proud of everyone who had a hand in the design, build, training, start-up, and operation of the mill," he concludes.

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First reel of paper at PM17.

Taking steps toward zero coal

To decrease their carbon footprint, many energy producers are going green with Valmet's sustainable biomass-fired plants. BS Energy in Germany and Ørsted in Denmark are already on their way to successfully phasing out coal.

TEXT Marjaana Lehtinen **PHOTOS** Ørsted, BS Energy

Climate change, carbon neutrality and low-emission energy production are at the top of every environmentally conscious energy producer's agenda. The key to this lies in phasing out coal as a fuel and replacing it with biofuels.

From coal to biomass

One of the companies taking steps toward zero coal with Valmet's technology is BS Energy in Braunschweig, Germany. It supplies energy to a city of approximately 250,000 inhabitants and owns the local distribution networks.

"We're aiming for a climate-friendly future, and will end heat and power generation from hard coal in 2022. At around 220 million euros, our energy generation conversion project represents the largest investment in our company's history. In future, we will generate environmentally friendly electricity and heat from a new biomass CHP plant in combi-

nation with a new gas turbine CHP plant and our existing Combined-Cycle-CHP plant. Our focus was and still is on security of supply, the economy and climate protection," says **Paul Anfang**, Deputy Chairman of the Board of BS Energy.

Valmet is to supply a Valmet CFB Boiler, including flue gas cleaning and auxiliary systems, for the new biomass CHP plant. "Valmet's offer convinced us: we will get a really efficient and flexible boiler that is also robust and easy to maintain. And we'll benefit from expertise from worldwide reference projects. Valmet is providing us with a very good technical and commercially attractive concept," Anfang remarks.

Low emissions and high thermal efficiency

In planning the investment, BS Energy considered grate technology and bubbling fluidized bed (BFB) technology for the plant, but eventually chose Valmet's circulating fluidized bed (CFB) technology.

Anfang continues: "Valmet's technology enables reliable operation with waste wood of categories from A I to A IV and other demanding biomass fuels. This project will meet future environmental requirements with low emissions and high thermal efficiency. By positioning the final superheating in the loop seal, the Valmet boiler allows high steam temperatures while achieving longer lifecycles for the other superheaters. This enables us to achieve higher electrical efficiency in the process and hence higher electricity production. Higher processing costs for the fuel can therefore also be compensated."

The modernization project is currently being undertaken in tandem with the ongoing operation at the existing power plant site. The biomass-fired CHP plant will produce approximately 20 megawatts of electricity and 60 megawatts of district heat. The boiler will run primarily on recycled wood.

Ørsted's Asnaes power plant in Kalundborg is one of Denmark's largest energy producers. The company's goal is to become coal-free by 2023.

"We will get a particularly efficient and flexible boiler that is also robust and easy to maintain."

Ørsted to go coal-free by 2023

Let's move a little to the north, to Denmark. A decade ago, Ørsted (formerly DONG, Danish Oil and Natural Gas) was one of the most fossil fuel-intensive energy companies in Europe. Today, it ranks as the most sustainable company in the world in the Corporate Knights 2020 Global 100 Most Sustainable Corporations Index.

Ørsted's Asnaes power plant in Kalundborg is one of Denmark's largest energy producers. By converting electricity and heat production from coal to sustainable biomass at the plant, Ørsted has taken an important step toward reducing its CO_2 emissions. The company's goal is to become coal-free by 2023.

Valmet BFB Boiler key to successful coal phase-out

The key role in this successful coal phase-out is played by a 140 MW_{fuel} biomass-fired Valmet BFB Boiler.

The new Asnaes 6 plant has a net electrical capacity of 25 MWe, a flexible process steam capacity of 66 MW and a district heating capacity of 65 MW, including 28 MW generated by a Valmet-supplied flue gas condensing plant. District heat and process steam production started in August 2019, followed by connection to the grid and the inception of green electricity production in November 2019.

The conversion from coal to wood chips at Asnaes has enabled the decommissioning of the site's remaining operable coal-fired units. It has been estimated that the conversion provides a CO_2 reduction corresponding to the annual emissions of approximately 400,000 cars.

↑ The conversion from coal to wood chips at Asnaes has enabled the decommissioning of the site's remaining operable coal-fired units.

The process is controlled by a Valmet DNA automation system that covers the entire plant, including information management and safety systems. Valmet also supplied flue gas treatment, consisting of a baghouse filter, combustion air humidification, flue gas condensing, condensate treatment and a stack, as well as the power plant buildings above ground, electrification and instrumentation.

"The project was carried out in good cooperation with the customer. Although the site layout and timetable were challenging, and the work took more than 500,000 hours to complete, there were no injuries at the site," observes **Valto Harju**, Project Manager, Valmet.

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Replicating SUCCESS

The proven success of the bleached chemi-thermo-mechanical pulp (BCTMP) production line of Guangxi Jingui Pulp & Paper Co., Ltd convinced APP to invest in another Valmet BCTMP line for their mill in Xiaogang, Ningbo.

TEXT Sara Li, Xin Mingqing

Located in Qinzhou City, Guangxi Province, China, Guangxi Jingui Pulp & Paper Co., Ltd.'s BCTMP line was started in mid-2013 to produce bleached chemi-thermo-mechanical pulp (BCTMP) from eucalyptus as a raw material for integrated cardboard production.

In the past few years of its operation, APP Jingui has constantly developed the production line's great potential and broken the production record, while creating a series of benchmarks for the sector.

A high-efficiency and low-consumption benchmark

Deputy Manager **Zhong Yichang** has been working at Jingui for more than twelve years. He knows every detail of this production line. "Its designed capacity is 750 BDMT/day, which was achieved only two months after its start-up," Mr. Zhong says in describing the new line's first success.

Mr. Zhong and the team have continually worked to develop the production line's huge potential, all the time setting new output targets. He says that the production capacity of this line can be adjusted quickly, flexibly and stably as required. "It's routinely overhauled once a month, with relatively low maintenance costs," says Mr. Zhong.

The team are most proud of the fact that the BCTMP production line has created a series of benchmarks for the sector. Currently, the energy consumption per tonne of pulp is nearly 20 percent lower than competitor production lines at the same site. The refiner segments' service life is double that of its competitors, and the consumption of chemicals has hit a global record low.

"Next, we hope that we can continue to break these

Qian Jianchun, Valmet Automation Area Sales Manager, South China, and Juuso Paloniemi, Valmet Automation VII Product Manager at mill site.

records and turn this production line into a worldwide benchmark for mechanical pulp production," adds Mr. Zhong.

Stable pulp quality

Mr. Zhong is also very proud of the Valmet BCTMP line's pulp quality performance. Stability is high and pulp quality, including fiber strength, bulk and shive content, easily meets the requirements for high-end white cardboard.

"We're among the best in the industry in terms of whiteness and freeness, and we also achieve a notably small fluctuation range and high stability." Mr. Zhong adds that their current quality rate achieves 99.5 percent and says, they are still working hard to improve quality and enhance stability. "As we all know, stable pulp quality positively affects the quality of paper products."

"The designed capacity of the BCTMP production line was achieved only two months after its start-up."

Right: Huang Junyan, General Manager of Guangxi Jingui Pulp & Paper Co., Ltd.; left: Zhong Yichang, Deputy Manager of Production Department of Guangxi Jingui.

Mill site of Guangxi Jingui Pulp & Paper Co., Ltd.

Wang Lexiang, CEO of APP (China) Paper Division, explains that their investment in chemi-ther-mo-mechanical pulp aims to enhance their paper product development, paper quality and product cost control.

Xin Mingqing, Valmet Product & Application Engineer.

Valmet high consistency refiner.

Valmet TwinRoll press.

Proven success leads to a second order

Recently, the ground-breaking ceremony for a new Valmet BCTMP production line took place in Xiaogang, Ningbo. The idea behind the investment was to replicate the success seen in the Valmet BCTMP line at Guanxi Jingui.

Wang Lexiang, CEO of APP (China) Paper Division, explains that APP (China) has gained a long-term foothold in the paper industry to improve quality of life with high-quality paper products. To meet consumers' various demands, they have invested heavily in the fields of household, cultural and industrial paper, and have continuously strengthened product research, development and upgrading.

When he explains why they chose Valmet's technology again, Mr. Wang says the first reason was that they were satisfied with the pulp quality and output of the Guangxi Jingui mill's bleached chemi-thermo-mechanical pulp production line. Second, this production line's energy consumption per tonne of pulp was nearly 20 percent lower than other brands' production lines, while the operation was quite stable, and the maintenance cost was relatively low.

HT-CTMP technology further improves quality and reduces consumption

"We've noticed that Valmet has been continuously investing in research and development that focuses on

> "The idea behind the second investment was to replicate the success."

From left to right: Li Chuanghua, Team Leader of Guangxi Jingui's BCTMP line; Chen Bo, Chief of Guangxi Jingui's Pulp Division; Yi Bo, Valmet Account Manager.

combining market trends and customer feedback. We all know that mechanical pulp production is a high-energy process, so what we most hope to achieve is the production of chemi-mechanical pulp with benchmark low-energy consumption and high quality," says Mr. Wang.

The new pulp production line at Ningbo Xiaogang uses Valmet's latest HT-CTMP technology. A characteristic of the new technology is that it softens the lignin in the wood chips through the simultaneous application of a high temperature and chemicals to achieve easier refining and a more developed fiber, thereby producing pulp with a high bulk and very low shive content – while achieving low energy consumption.

These advantages are exactly what Mr. Wang's team was looking for: "Thanks to this new technology, we can now further reduce the energy consumption per tonne of pulp while meeting raw material needs for the continuous development of high-end cardboard."

Toward win-win results

Mr. Wang summarizes the cooperation between the two sides and mentions further expectations: "We understand that Valmet adheres to technological innovation and always supports the progress of industrial equipment and process technology, especially in the research, development and application of biomass refining technology. This encourages low-carbon production and the industry's sustainable development." In this respect, Mr. Wang says the two enterprises share the same ideas and responsibilities. APP holds to an open win-win culture, and they hope that both sides will continue to innovate new cooperation models, uphold the concept of win-win cooperation, and promote common development. Mr. Wang promises they will join hands to drive the sustainable development of China's pulp and paper industry.

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With an electrical capacity of 250 MWe, the Veolia Karolin plant covers the heat demand of the city of Poznan and delivers power to the national grid.

Smart forecasting

to improve energy management

With short- and long-term planning capabilities, Veolia's Karolin CHP plant in Poznan, Poland, can create an optimal power and heat generation schedule through the plant, and optimize forward temperature. **TEXT** Lisa Kettman-Kervinen **PHOTOS** Veolia

In reviewing options for modernizing its district heating operations in Poland, Veolia Energia Polska chose Valmet's DNA Energy Management System for its Karolin CHP plant in Poznan. Negotiations began in 2015, and the project was successfully implemented in three phases over a two year time period. With short- and long-term planning capabilities, Veolia can now create an optimal power and heat generation schedule through the plant, and optimize forward temperature.

Veolia's initial goals

Veolia's target was to achieve an optimal power and heat generation schedule for the entire CHP plant up to three days ahead in one hour time resolution. They also sought better risk management and performance improvement capabilities to avoid the high cost of power balancing. Another goal was to optimize forward temperatures to generate additional income, because outdoor temperatures in the region can change suddenly, dramatically affecting the heating load.

Short- and long-term planning capabilities

Valmet's DNA Energy Management System is an Industrial Internet application using modern modular database software for CHP plants. The solution was delivered in cooperation with Industrial Internet ecosystem partner, Energy Opticon Ab. The system offers tools for production planning, load and price forecasting, energy production optimization and electricity trading. Control functions and plant data are combined with flexible inputs from external sources like the electricity market and weather services.

The energy management system also includes a load scheduling solution, which enables profitable production with low energy prices or allows an intraday, one-hour market timeframe to switch to a 15-minute imbalance settlement period in the electricity market.

"The solution includes modules for short-term forecasting, production planning and long-term investment

Heat generation schedule and forward temperature can now be optimized.

planning," says **Pawel Kalbarczyk**, Product Manager, Valmet. "We can check investment plans and make forecasts. If something changes, we can see the cost or income impact – one of our solution's advantages."

The customer's energy system was modeled by Valmet to estimate possible heat demands, waste-to-energy unit disturbance, and potential electricity market or reserve power market income streams. Power exchange price forecasts and the price on the balancing and reserve markets were also included in the scope. In addition, all data exchanges were automatized.

Project implementation in three phases

The project was delivered in three phases in 2016. Phase 1, including modules for demand forecasting and short-term scheduling (up to one week ahead), concluded in September 2017; Phase 2, including a module for long-term optimization, concluded in 2018.

"Phase 3 included a module for forward temperature optimization called the Smart Optima Heat Network. A feasibility study determined the system's financial impacts with the module and without it," Kalbarczyk says. "The forward temperature optimization has a huge potential to bring gains."

In Phase 3, tools for continuous district heating load forecasting between users and traders were also integrated with the system. This information ensures that as much electricity as possible is produced when the electricity price is attractive, and as little as possible when the price is below the variable cost.

Advanced modeling

Valmet's DNA Energy Management System includes comprehensive libraries of equipment models. The models allow Veolia to envision start-up, stop or load change costs, and more. Such realistic models are crucial for long-term optimization.

The solution also optimizes linear and non-linear objects, which are more complicated to model. It provides different fuel options for different boilers, and considers both the variable and environmental cost of the fuel.

Fuel savings and additional income

Although the solution has been fully operational for only a year, the results show that the decision to move forward with Valmet's DNA Energy Management System was worthwhile. Better system modeling and the optimal forward temperature feature have helped the Poznan plant achieve fuel savings, while electricity generation at peak prices has resulted in additional income.

"This project has been very successful. The software has met our requirements, and we have been pleased with the calculation results," says Michal Lesko, Digital Transformation Project Manager at Veolia.

"We look forward to a long relationship with Valmet, further developing the Energy Optima modules to bring new benefits to our company," says **Michal Lesko**, Digital Transformation Project Manager at Veolia. "This project has been very successful. The software has met our requirements, and we have been pleased with the calculation results. We've also appreciated our productive meetings, as well as Valmet's fast and accurate remote support."

"Energy markets are becoming increasingly complex due to the volatility of renewable energy production and new rules in the electricity balancing market. There's huge potential for similar companies to generate more income with smarter energy forecasting and production planning," concludes **Tiina Stenvik**, Director, Performance Solutions at Valmet.

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Valmet's DNA Energy Management System is an Industrial Internet application using modern modular database software for CHP plants. Control functions and plant data are combined with flexible inputs from external sources like the electricity market and weather services.

Dewatering optimized!

The Valmet Sludge Dewatering Optimizer (Valmet SDO) has helped Norske Skog to stabilize sludge dewatering process and improve fluidized bed boiler operation.

TEXT AND PHOTOS Nigel Farrand

Norske Skog in Bruck an der Mur, Austria makes high-quality lightweight coated and newsprint grades, with varying amounts of post-consumer waste pulp. Effluent treatment is an important contributor to the mill's sustainability. Water is generally used and recovered multiple times throughout the papermaking process, and dewatering for separate solids and other contaminants is a continuous development area.

To this end, the mill decided in 2016 to purchase a Valmet Sludge Dewatering Optimizer (Valmet SDO) solution to stabilize the process and improve boiler operation. Integrated with the existing Valmet DNA distributed control system, which was installed in 2007

to control effluent treatment, the software package was accompanied by a Valmet Total Solids Measurement (Valmet TS) microwave transmitter to measure the total solids amount for sludge dewatering.

Improved boiler operation

"Sludge comes mainly from the two deinking lines, in addition to effluent treatment and PM4 (LWC) rejects. It's relatively constant but sometimes changes according to recycled fiber quality and ash content," says **Martin Simmler**, Energy Manager in charge of utilities, including power plant and effluent treatment, for the mill. Sludge dewatering is achieved with two dewatering gravity tables feeding two screw presses, after which the 60 percent dry-content sludge is fed with wood bark into the mill's fluidized bed boiler to generate electricity and steam.

"Dewatering is one of the biggest consumers of additives in the mill, and we use alum and polymer to aid flocculation. The Valmet SDO control now stabilizes the dewatering conditions to meet the dry solids target with the optimum addition of additives. And with Valmet TS, we not only optimize dewatering, it helps us determine sludge solids for the boiler, which assists its operation. If we get this wrong, it can bring the entire mill to a standstill," says Simmler.

Continuous solids measurement

Before the Valmet TS was installed in the gravity table feed, the only indication of total solids was a laboratory test indicating the average over 24 hours from an automatic sampler, meaning that short-term variations went undetected. Valmet TS is a third-generation microwave solids transmitter, designed for use in the demanding pulp and paper mill environment. It uses patented microwave-based technology to measure total solids content, and is unaffected by flow rate or the color of the process stream.

"We already had good experience of a similar measurement – the Valmet Microwave Consistency Transmitter (Valmet MCA) – in the deink plant and started with a low-level loop control using the TS in 2016," says Simmler. "Previously, we only had a flow measurement and the 24-hour laboratory average. With continuous total solids measurement, the control results were good." Valmet SDO was started in the summer of 2017.

> "With Valmet TS, we not only optimize dewatering, it helps us determine sludge solids for the boiler."

Stable operation

"A single operator in the control room oversees the operation of the fluidized bed boiler, combined cycle plant and bark handling, as well as effluent treatment. Supervising sludge dewatering used to take a lot of operator time, especially during interruptions. Now, with Valmet SDO controlling dewatering, the operator's job is a little easier. We've achieved the stable operation we were looking for, and the process is better balanced, leading to more stable boiler operation," concludes Simmler.

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"A single operator in the control room oversees the operation of the fluidized bed boiler, combined cycle plant and bark handling, as well as effluent treatment," says Martin Simmler (right), Energy Manager, pictured with Otmar Mayerhofer, Assistant Energy & Environment.

Valmet TS is a third-generation microwave solids transmitter, designed for use in the demanding pulp and paper mill environment. It uses patented microwave-based technology to measure total solids content, and is unaffected by flow rate or the color of the process stream.

Three steps to records

Valmet's new innovative solutions have enabled Nordic Paper Bäckhammar go full speed ahead and reach pulp production levels over 800 admt/d (air dry metric ton per day) while also increasing availability, reducing emissions, and reducing maintenance costs.

TEXT David Elfman

2014
Valmet Chip Bin OB

- Production: 620 → 660 admt/d
- Kappa: 41 → 43
- Lower weak gas emissions
- Reduced wood consumption

2016
Valmet Flexible Screen

- Production: 660 → 700 admt/d
- Kappa: 43 → 48
- Increased yield

2017
Valmet Pump feed solution G3

- Production: 700 → 810 admt/d
- Reduced maintenance costs

"The upgrades have allowed us to increase production and reduce both wood losses and maintenance costs. After two years of operation, the wear and tear we have seen on, for example, the chip pump has been minimal," says Bengt-Erik Larsson, pulp mill technician at Nordic Paper Bäckhammar.

Nordic Paper's pulp mill at Bäckhammar's has a capacity of 230,000 tonnes of unbleached pulp a year.

It has been over five years since Nordic Paper Bäckhammar in Sweden, began its journey to increase the capacity of the cooking plant. The initial production target was 700 admt/d with a future target of 800 admt/d – a level that has now been surpassed.

Three upgrades were made to the cooking plant and Valmet was chosen as the exclusive supplier. In addition to having a very good customer relationship, one of the deciding factors was that Valmet had new products ready for the market for two of the upgrades which allowed Bäckhammar to be the first to install the new technology.

Optimized runnability and reduced emissions

In September 2014, the newly developed Valmet Chip Bin OB (OptiBin) was installed – a product designed to not only optimize runnability, but to also eliminate channeling in the bin which reduces the environmental impact from emissions. Installation was completed during the annual maintenance stop (7 days).

The operation of the new chip bin has been very successful: Chip pre-steaming has improved allowing the Kappa number to be increased, which has reduced wood consumption by almost 3% as a result of the higher yield. Additionally, the mill's emissions of weak gases have been reduced. The previous equipment accounted for about 50% of these emissions, but the Chip Bin OB has eliminated that portion entirely.

Production was increased from 620 to about 660 admt/d, but other limitations were discovered in the cooking plant. The chip feeding line had reached its maximum capacity, resulting in vibrations throughout the system. The continuous digester was also limited, and modifications were needed to further increase production.

Increased production and Kappa numbers

In 2016, Valmet was commissioned to continue the upgrade of the cooking plant with modifications to the digester. By lowering the digester extraction screens, the retention time in the cooking zone could be increased and allow additional production. Valmet Flexible Screens (OptiFlex) were installed during the annual maintenance stop and the results were outstanding – the production was increased from 660 to 700 admt/d while also increasing the Kappa number from 43 to 48. Bäckhammar now had a digester that could reach the new goals set for the cooking plant.

Removing limitations in chip feeding

With the digester no longer limiting production, a decision was made to address the limitations of the chip feeding line. Valmet presented the newly developed Valmet Pump Feed Solution G3, which converts the conventional chip feeding system into a new modern pump solution and eliminates the High-Pressure Feeder. Bäckhammar accepted, and became the world's first mill to upgrade a conventional feeding line to this system. The new solution has helped to eliminate vibrations in the feed system and is extremely quiet despite the large chip pump.

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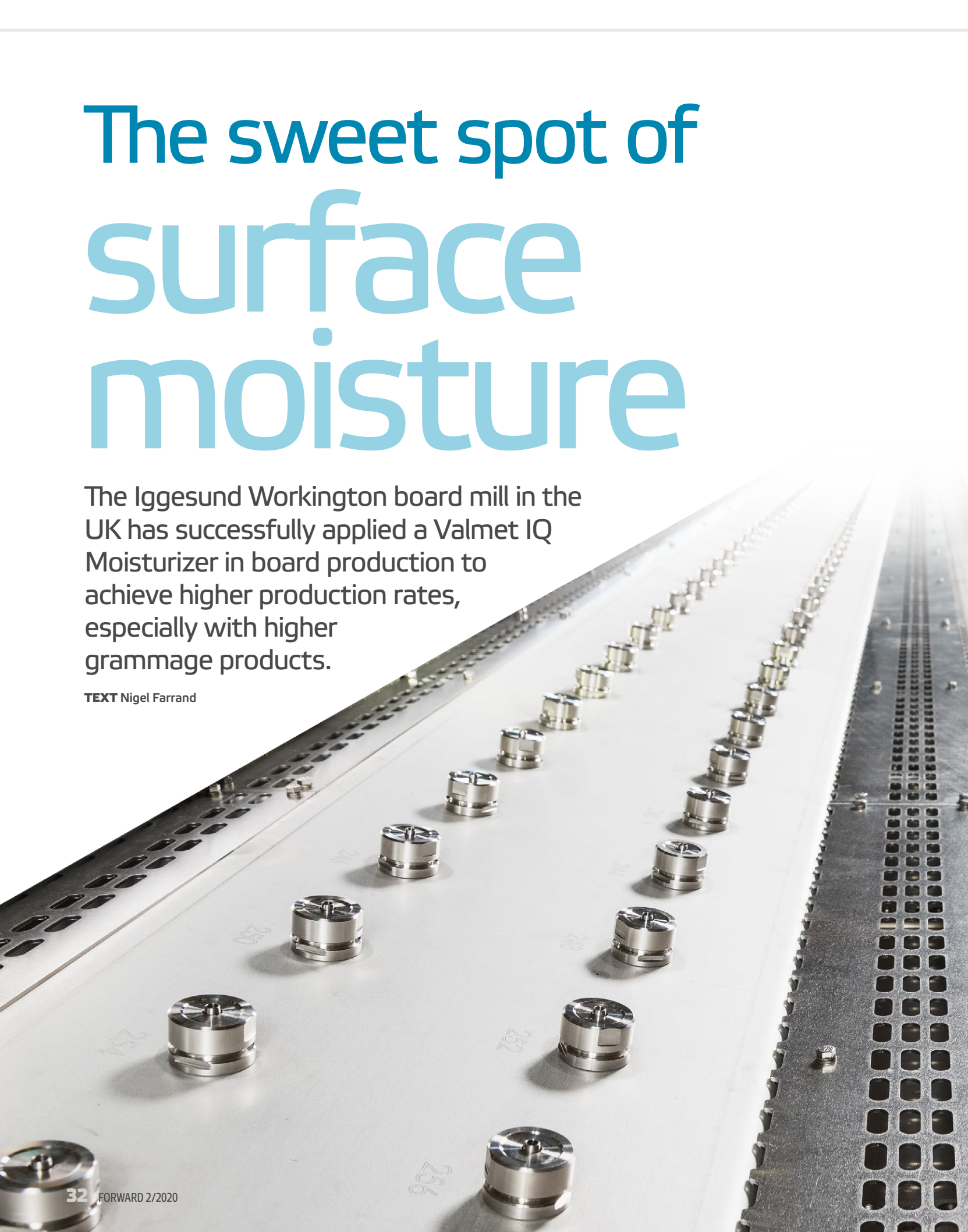
The sweet spot of surface moisture

The Iggesund Workington board mill in the UK has successfully applied a Valmet IQ Moisturizer in board production to achieve higher production rates, especially with higher grammage products.

TEXT Nigel Farrand



INCADA is the name of the folding box board produced at Workington. The board's five-layer construction with chemical pulp outer layers give INCADA its superior surface, printability and strength qualities. It is the preferred packaging material among companies who want to give their products good protection with low weight while getting the best possible print results on their packaging.

Achieving the required properties is ensured by a machine glazing (MG) cylinder located in the Workington board machine's drying section. This cylinder, commonly called an MG or Yankee cylinder, has a wide diameter of more than six meters, is steam heated and features a mirror-like polished steel surface. The paperboard web, containing about 40 percent moisture, adheres to this surface. The web dries when it comes into contact with the rotating cylinder and is released when the moisture content is insufficient to maintain adhesion. The sheet then leaves the cylinder, retaining the high level of smoothness imparted to it by the polished steel with no loss of thickness and its good stiffness properties maintained.

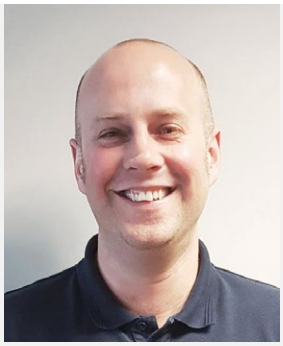
"We've been able to increase machine speed by several percent, especially with the heavier grades."

Right amount of surface moisture

Obtaining good adhesion to the MG cylinder and control of the release line where the sheet leaves the cylinder requires the right amount of surface moisture. The common control method for the surface moisture and release line is to adjust the pre-dryer steam pressure. Of course, this method not only affects surface moisture but the sheet's total moisture. As the drying process continues on smaller cylinders, too much web moisture after the

The IQ Moisturizer is the industry's most advanced moisturizing system, with applications in paper, board and converting production. IQ Moisturizer's two-stage spray head provides a highly atomized full cone spray pattern that is efficiently applied to the web.

↑ "We're more than satisfied – stiction has improved, and we've been able to increase machine speed by several percent, especially with the heavier grades, where drying after the MG was a problem," says Rolf Moring, Iggesund Workington's Development Engineer.



↑ "The equipment worked well from day one," says Mark Norman, Iggesund Project Engineer.

→ Iggesund Workington mill.

MG cylinder can limit machine speed, with post-drying a bottleneck to increased production.

"This was exactly our problem," explains **Rolf Moring**, Iggesund Workington's development engineer. "We were struggling with the limited drying after the MG cylinder but had more than enough capacity in the pre-drying. We saw an opportunity: If we increased only the surface moisture, we could improve stiction – the sticking of the web to the cylinder – which would give us the surface properties we required."

Valmet IQ Moisturizer

Recognizing that surface moisture, and not overall web moisture – at least to some extent – was the key to a good stiction and release line, Valmet recommended that the mill employ a Valmet IQ Moisturizer before the MG cylinder to impart the ideal surface moisture to the sheet. According to **Mark Norman**, Iggesund Project Engineer, "Valmet recommended a moisturizer for the pre-MG application. Although a moisturizer is not so common for this purpose, they believed in the solution and were proven correct."

The IQ Moisturizer is the industry's most advanced moisturizing system, with applications in paper, board and converting production. IQ Moisturizer's two-stage spray head provides a highly atomized full cone spray pattern that is efficiently applied to the web. The uniquely small droplet size allows its use in applications close to surface treatment processes like machine glazing. Prior to ordering, the mill conducted a test with a special one-meter trial unit from Valmet that showed that the system would meet expectations.

Increased production

The Valmet IQ Moisturizer now provides the potential to run heavy grammage products more quickly by fully utilizing pre-drying before the MG cylinder. The moisturizer sprays the sheet just before the MG cylinder to obtain the required sheet surface moisture to stick to the cylinder, without excessive total moisture. "We're more than satisfied – stiction has improved, and we've been able to increase machine speed by several percent, especially with the heavier grades, where drying after the MG had been a problem," says Moring.

Smooth installation and start-up

Installation was done in three steps, with the final beam installation and pipe work, which could not be done when the machine was running, undertaken during a 19-hour maintenance shutdown. "The Valmet team worked well during the installation and start-up phase, completing the work with no health and safety incidents and in line with the agreed schedule. One thing to note about the start-up and optimization is that no operational issues or disturbances caused any loss of production from the machine. The equipment worked well from day one," declares Norman.

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People make the success

A regular annual headbox service is the key to the old headbox's good condition at the Navigator Paper Figueira PM1 in Portugal, which was started up in 1991. A long and trusted maintenance relationship ensures that every detail is taken care of systematically. **TEXT AND PHOTOS** Heli Kankare

"Each year, Valmet analyzes the condition and maintenance need of the headbox, and the latest report shows that the nearly 30-year-old headbox is still in good condition and working very well," says **Helder Moreira**, PM1 Area Manager, Navigator Paper Figueira, S.A.

"Lots of improvement work has been done over the years, but this is still the original Valmet headbox. It's in good shape, even though it's at the end of its lifetime. Just recently, we were able to break the record for running

without breaks, achieving 171 hours. We've made very good fixes and some good innovations in the maintenance of the headbox to achieve this. We've kept it in good condition with regular maintenance. The equipment is so sensitive I think the service is best done by Valmet," he continues.

Quality is made by people

PM1 produces top quality Navigator brand paper, copy print, offset and reprint qualities with basis weights between 60 and 120 g/m^2. Keeping up the high quality of the end product is essential for the brand.

Mr. Moreira has a clear view of the reasons for the success: "It's achieved by people working on the PM1 on a daily basis, or when we need suppliers to help us. People make the success in every business and service. If you know what to do, if you have a good partnership, if you communicate freely, success will happen. We share the same target for the headbox condition, and we trust both Valmet's and Navigator's people."

Systematic planning for annual shutdown

Kimmo Juuti, Valmet's Global Product Manager for Headbox and Former services, has been a trusted contact

"Having people like Kimmo is amazing. It's such a reassurance to know that he knows what he's doing. I trust this gentleman 100 percent," says Mr. Moreira (left)) of the cooperation with Kimmo Juuti (right).

"Based on a report by Valmet, I know what to do in the next shutdown, and we start to prepare several months in advance."

and advisor for the PM1 headbox area for more than two decades.

"Each year, we go through all the details of the headbox services we need to cover in our annual shutdown with Kimmo. This is crucial for us, because everything starts with the headbox. When everything in the apron profile, new lip and control of the headbox's variables is in order, we're likely to have fewer problems, and the machine's performance improves. The hybrid former is quite sensitive machinery, and the paper's quality is extremely important to us. It's difficult these days to find the right people to do the right job with the equipment you want. Having people like Kimmo is amazing. It's such a reassurance to know that he knows what he's doing. I trust this gentleman 100 percent," says Mr. Moreira of the cooperation with Kimmo Juuti.

"Another important contributor from Valmet is Mill Sales Manager **Hugo Pinto**. He has been clarifying the scopes and commercial terms in order to agree on the way forward. We have a good relationship and with that it´s easy to find the best solutions to solve the problems that we face time-to-time," he continues.

Report is an important part of the maintenance planning

"Usually, Kimmo comes here to discuss what to do in the next shutdown. We don't have a maintenance agreement at the moment, but we know that headbox service work will be needed during each annual shutdown. Based on a report by Valmet, I know what to do in the next shutdown, and we start to prepare several months in advance," Mr. Moreira concludes..

"I know others that are as professional or even better than I am, but I know this headbox and its history. That's why I can assess what's needed in the approaching maintenance shutdowns," says Juuti.

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Customers' success drives motivation

Valmet's Global Product Manager for Headbox and Former services, Kimmo Juuti, became a Valmeteer about 25 years ago, doing headbox maintenance work. Today, he is responsible for the product category, including the training of Valmet's technical and sales organizations. "I still visit the mills often to keep up my understanding of our customers' needs. Every day brings a new challenge – it keeps me motivated," he says.

Juuti says trust is the most essential building block in good customer relations. "Trust is based on professionalism and personal relationships, and it can only be built over time. The best part of my work is when we're trusted with a customer's challenge and find a solution that helps them succeed."

Learning together

Valmet's Maintenance Schools and Roll Academies gather people from the pulp and paper industry to learn from Valmet and one another. They help secure the best possible knowledge and skills needed to maintain and operate the equipment throughout their life cycles.

TEXT Sari Lehtonen-Lammi

In North America, more than 4,000 industry experts have already shared this unique learning experience. Among them, Senior Reliability Engineer **Dan Griffith** and Senior Maintenance Planner **Rob Wilson** of Irving Pulp and Paper have joined Valmet's 3-day TwinRoll Press Maintenance School in Montreal. Irving Pulp & Paper produces softwood and hardwood grades of kraft pulp in Canada. The mill has a long and successful history with Valmet.

"We have an excellent working relationship with Valmet. We can depend on their technical guidance and maintenance recommendations. However, with an annual capacity of 335,000 tonnes and 25-year-old twin roll presses needed to run our 24/7 operation for the 18-month period, we wanted to challenge our knowledge and make sure we were maintaining our presses correctly," Griffith says. "The goal is to keep on top of our equipment's life cycle expectancy and maintenance possibilities."

From classroom to the shop floor

"Valmet Maintenance School provides specialized and in-depth training for the key fiberline products," says **Carlo Marrocco**, Director, Valmet Global Workshop Services. "The training program consists of various presentation materials focusing on the design and operation of the equipment, reviews of maintenance recommenda-

"Problem solving with industry peers made this training a unique learning experience."

Valmet Roll Academy contains both classroom presentations and hands-on training for Valmet suction rolls, for example.

tions and highlights of troubleshooting techniques and upgrade possibilities. In addition to classroom training, we provide a unique shop tour experience to explore Valmet's capabilities behind the curtains."

"This training exceeded all our expectations," Griffith enthuses. "All the presentations were very knowledgeable and educational. On top of this, a tour of the shop floor offered an all-encompassing view of the different roll constructions and enabled us to apply the theory into practice. It's simply, the best training ever."

A unique learning experience

The Maintenance School combines technology insights and teaming up with industry experts.

"Not only is it designed for one mill – many participants around the industry share the same passions, such as the 'less-cost-per-tonne magic' or the ambition for 18-month shutdown intervals. Each mill is also invited to bring their own questions to the table," Marrocco explains. "At the end of the course, the participants receive a certificate."

Both Griffith and Wilson also credit industry networking: "Problem solving with industry peers made this training a unique learning experience for us," they agree. Many people were directly involved in day-to-day maintenance with experience in various press sizes," Wilson points out.

"We learned from their questions and Valmet's answers, and gained many new tips for our preventive maintenance routines. Above all, we were convinced that our old presses were still maintainable," Griffith concludes.

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Valmet Roll Academies and Roll Maintenance Schools

Two- to three-day training for paper, board and tissue makers:

- Roll types
- Construction
- Maintenance
- Grinding and balancing
- Roll covers
- iRoll & Asset Manager

Countries: Germany, UK, North America, Thailand, Indonesia, India and New Zealand

Valmet Maintenance Schools

1.5-day training for the key fiber or paper line products:

- Refiner Maintenance School
- Chemical Pulping Maintenance School
- TwinRoll Press Maintenance School
- Chipper Maintenance School
- Paper Machine Maintenance School (5 days)

Countries: North America, South America and Scandinavia

Together for better performance at Valmet Roll Academy

Another long-term Valmet partner, ITC Bhadrachalam gathered participants from their three mills to take advantage of Valmet's Roll Academy. This first three-day journey into roll insights in India was designed and conducted by Valmet's global technology managers **Timo Karonen** and **Rob Stapels**, as well as **Ankit Arya**, Mill Sales Manager in Valmet India. "The mill was keen to upgrade its performance, and Valmet took the initiative to help," says Arya, the driving force behind this first Roll Academy in India.

ITC Bhadrachalam is the largest integrated pulping and paperboard manufacturer in India. "We have a three-decade partnership with Valmet, with dozens of machine replacements and some specialized maintenance audits. To keep pace with the growing market demands in India, we also need to enhance the knowledge and skills of our own maintenance managers," emphasizes **Makarand Barnanpurkar**, VP mill operations of ITC. "It's especially important for us to know how decisive the right roll materials are in decreasing downtime and increasing change intervals."

Valmet Maintenance Schools and Roll Academies are chargeable and include a course certificate.

Senior Reliability Engineer Dan Griffith and Senior Maintenance Planner Rob Wilson of Irving Pulp and Paper, Canada, joined Valmet's Maintenance School to ensure the maintainability of their 25-year-old TwinRoll presses. Starring here in front of their Valmet TRPW 1752.

Pulp for packaging grades – a growth area

E-commerce sets new records every year, and the long-term trend is clear. E-commerce, globalization, increasing living standards and environmental awareness are driving the growing need for paper-based packaging.

TEXT Kristofer Sjöblom **PHOTOS** Lars Berggren

Facts about global e-commerce

- In 2019, retail e-commerce sales amounted to EUR 3.3 trillion
- 19 percent estimated global growth rate in 2020
- Online shopping is one of the most popular online activities worldwide.

Source: Statista

Did you know?

Around **40%** of all board produced in the world is made by Valmet machinery. Our customers run world-class energy efficient production lines, exploiting the market's latest innovations for lightweight but strong containerboard making.

"Consumers and companies want to see new environmentally friendly and climate-smart alternatives to plastics," says Jan Laredius.

Online shopping is boosting the demand for packaging paper and paperboard. Sustainable packaging is becoming an increasingly important factor in e-commerce and other marketplaces, creating new opportunities for fiber-based, recyclable and biodegradable packaging materials. A bright future for liquid board is also predicted, as many companies want to replace plastics as packaging material for food products.

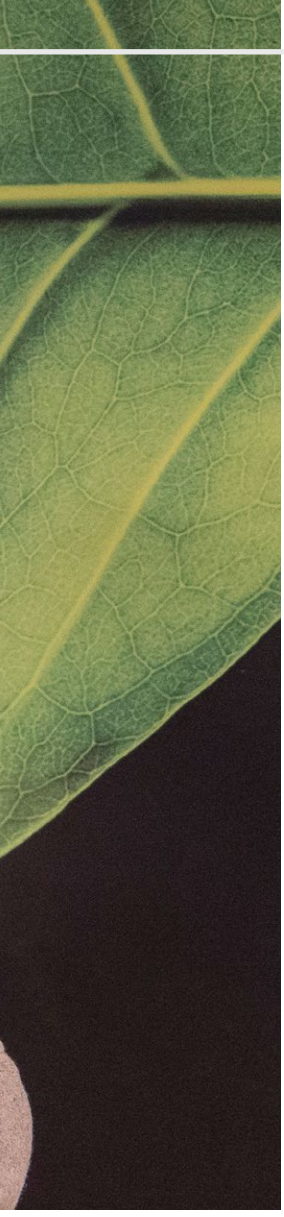
"Pulp for packaging grades is a future area, and we're really noticing this at Valmet, with many customers investing in kraftliner, fluting and liquid board production. We provide them with complete fiberlines and boardmaking lines, from wood raw material to finished paper and board. Our offering covers machinery, process technology, automation and services," explains **Jan Laredius**, one of the concept owners of the area of Pulp for packaging grades at Valmet.

"The decreasing demand for printing and writing paper means pulp and paper mills are seeing the potential to convert the fiberline to pulp for packaging paper and paperboard production. A large part of the growth for packaging will come from recycled fiber, but there's also a need for fresh virgin pulp to make higher qualities. Our goal is to transform existing fiberlines into first-class kraft pulping production with our know-how and machinery," Laredius says.

Higher kappa numbers for higher yield

The fiberline for kraftliner production has the same critical components (e.g. cooking and washing equipment), as that for kraft pulp intended for bleaching. The pulp is cooked to a higher kappa number for a higher yield and then refined to achieve complete fiber liberation and the desired pulp properties. When the kappa number increases above the defibration point – by decreasing the cooking time and chemical charges – mechanical defibration is required. The pulp is defibrated by refiners in the blow line or after the blow tank, followed by screening and washing.

"Valmet has a long and successful history in this field, dating back to the 1950s and 1960s. At the beginning of the 1970s, we were the first company to offer continuous cooking in combination with blow line refining," Laredius explains.



"Pulp for packaging grades is a future area, and we're really noticing this at Valmet, with many customers investing in kraftliner, fluting and liquid board production."

The importance of impregnation, cooking and washing

"Today, our Continuous Cooking G3 system is a cornerstone when we design new fiberlines," Laredius emphasizes.

"Impregnation is an important part of the cooking process, and it especially applies when pulp is produced for products such as linerboard, fluting, liquid board and sack paper. Owing to optimal impregnation means a higher pulp yield is obtained, and less energy is required in refining. There's no process that matches Valmet's ImpBin solution. The benefits are many, including more homogeneous cooking and delignification, which results in a narrower kappa number distribution and therefore the possibility to increase the kappa number. In turn, this means a higher yield. With ImpBin and Continuous Cooking G3, our customers achieve superior impregnation and cooking, which is of great importance for the end result," Laredius continues. For example, a longer average fiber length and stronger final paper and board are obtained.

"Another key to success is the washing efficiency of our TwinRoll wash presses. Because of the liquor displacement and high output consistency, the carry-over of dissolved substances from the pulp mill to the paper machine is minimized," Laredius says. "All the benefits are also demonstrated in our cooking references, which are the only new in the area during the past ten years."

The global containerboard market to grow

2.4%

annually between 2016 and 2030

Source: RISI

Asia-Pacific is the largest containerboard market representing

47%

of the total production.

Source: Afry

Refining and screening for every need

After impregnation and cooking, refining follows in one or several steps: blow line, hot stock, deshive and reject refining. The process design and selection of equipment are adapted for each customer to achieve the desired pulp quality. For example, low consistency refining in OptiFiner Conflo is applied for pulp for kraftliner and sack paper, for a medium to high kappa number.

"The acquisition of GL&V made us stronger in refining. All the refining techniques are now available on the market, and we can choose the one that's best for each application and customer. With the latest technology, we're continually developing the process to achieve even better performance and properties in the pulp, and reduce energy consumption.

"Screening plays a key role in achieving the high cleanliness of the end product. The fine screens have excellent efficiency and separation. They are also characterized by their high availability and runnability, with large operating windows. The design is optimized to prevent the screens from plugging," says Laredius.

Sustainability and environmental aspects are strong drivers

E-commerce, globalization and higher living standards mean that the demand for packaging paper is continuing to increase. Sustainability and the environment are also strong drivers, not least because consumers and companies want to see new environmentally friendly and climate-smart alternatives to plastics.

"There's a strong demand for fiber-based renewable materials to replace plastics, and the future looks very bright for products such as linerboard, fluting and liquid board. The upside is huge – for example, the food industry is looking for new ways to produce taste- and odor-neutral packaging with a minimal environmental footprint."

"Companies are very willing to invest in bio-based packaging, not least because consumers are increasingly expecting it. We're going to see many new packaging solutions in the future. The power of innovation is impressive, and it seems there are scarcely any limits to what we can achieve," Laredius concludes.

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"The new @Field application helps our planners to allocate the best available resources at all times, ensuring we offer excellent customer service – every time and everywhere," says Anders Öhrblad, Director, Field Services Growth, Valmet.

A digital leap in Field Services

The new mobile application @Field connects Valmet's more than 1,100 Field Services professionals. It unifies how we work and further improves the customer experience.

TEXT Marianne Valta
PHOTOS Elin Sundblad, Luciana Morassi, Ilmari Fabritius

Valmet is investing in its strategically important field services. Part of the investment is a new digital application called @Field, which will connect the company's Field Services professionals. Its global rollout will be completed during the summer of 2020.

"The new platform will unify and simplify the way we plan, dispatch and execute our field service operations globally. It will further improve Valmet's

↑ Operating on one platform supports a more uniform and similar customer experience, regardless of location.

↓ "The new platform will further improve our services by increasing workforce transparency and connecting our on-site field services professionals with Valmet Performance Centers through remote connections," says Anders Öhrblad.

capability to provide world-class services to our customers by increasing workforce transparency and remotely connecting our on-site field service professionals with Valmet Performance Centers. This will make delivering the desired services to customers' sites faster and more accurate. It will also allow us to better predict and advise on services, and develop shared maintenance and service roadmaps for our customers' equipment and processes," says **Anders Öhrblad**, Director, Field Services Growth, Valmet.

Uniform customer experience, regardless of location

Operating on one platform supports a more uniform and similar customer experience, regardless of location.

Guidelines, manuals and checklists are now integrated in the digital tool, making them easily available.

"The application helps our planners to allocate the best available resources at all times, ensuring we offer excellent customer service – every time and everywhere. The digital platform also allows us to align our health, safety and environmental principles and embed them in the service delivery in a logical and user-friendly way, contributing to the safety of our technicians, sub-contractors and

The platform allows excellent remote connectivity between service technicians and customers.

@Field makes things smoother for me and my customer

"I think the new digital tool has had many positive impacts on my work. I enjoy having all the material and work orders in one place. The integrated report functionality allows the customer to follow my work almost in real time: I can document my service execution and report it to the customer on site in the blink of an eye. I can also contribute to the customer's success by suggesting further maintenance or process development activities through @Field,"says **Jonatan Melo**, a Valmet Field Services professional in Brazil.

↑ "I can contribute to the customer's success by suggesting further maintenance or process development activities through @Field," says Jonatan Melo.

customers' workers," Öhrblad explains. The platform also allows excellent remote connectivity between service technicians and customers.

"We quite often see opportunities to offer remote support in customer contracts, even in Field Services. We launched @Field in the middle of the Covid-19 crisis and could immediately help our customers through remote support in global field service cases," Öhrblad continues.

At your service – stronger than before!

Valmet's Field Services workforce has grown organically by more than 11 percent during the last year, making it an organization of 1,100 technicians, planners, managers and back office personnel. Besides being a tool for workforce allocation, @Field enables unified and more efficient ways of working across a vast global organization, supporting improved customer satisfaction and the overall development of Valmet's performance as a company.

"Our goal is to become a frontrunner in field services, and I believe @Field will play a key role in achieving this. Our personnel are very dedicated to new ways of working, and I'm very excited to see the results of this digital leap we've taken," Öhrblad says.

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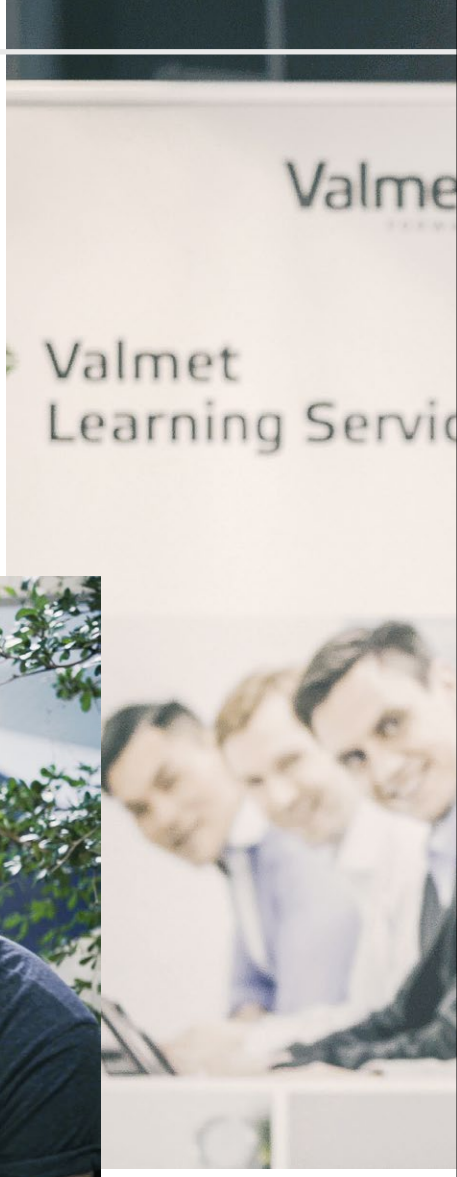
Training is an essential part of Valmet's long-term customer relationships and helps to ensure that customers get the most out of their equipment, systems and processes. Securing skilled workforce is also elementary for competitiveness. **TEXT** Sanna Haanpää-Liukko



Sharpening competitiveness by boosting competence

"The success of a pulp, paper, board, tissue or energy producer is not only dependent on the quality of the technology they use but also the level of competence of their employees. Their competence may, in fact, be the differentiating factor that helps companies to stand out in competition," says **Emmeli Olén**, Director, Valmet Learning Services.

Reliability and performance improvements, shorter start-up times, longer equipment lifetime as well as learning how to get the most out of new technology are some of the concrete benefits that customers can gain by training their personnel.

However, it is important to understand that it takes a certain kind of training to get these positive impacts. Training must be planned based on every customer's unique targets and needs – and built on a solid foundation of both learning expertise and deep substance knowledge.

"With our long and extensive experience with training and as a technology provider to all our customer

"By understanding the problems that our different customers face we can help them to bridge the identified competence gaps in order to enhance their performance and to secure their future success," says Emmeli Olén, Director, Valmet Learning Services.

segments, we understand the problems that our different customers face. We can help them to bridge the identified competence gaps in order to enhance their performance and to secure their future success."

Securing knowledge transfer and adaption of new technologies

There are at least two reasons why the need for competence development is increasing within traditional industry segments.

"First, there are a vast number of employees that will retire in the near future and they will take all their lifelong expertise with them – unless the transfer of knowledge to younger generations is secured. The second reason is the emergence of the new technologies, digitalization and the industrial internet that have strongly become part of virtually every industry in recent years. These are some of the areas where we can help our customers," says Olén.

At the same time, the competition for high-quality professionals is tightening also within traditional industry segments.

"Today, employees at all levels expect dynamic, self-directed, continuous learning opportunities from their employers. Offering these is one way to build employee engagement and an attractive employer image."

> "Competence may be the differentiating factor that helps companies to stand out in competition."

A unique offering for the entire range of solutions

Valmet Learning Services provide a unique combination of in-house learning competence and deep expertise covering the full range of our solutions throughout their lifecycles.

"Our pedagogical approach and capability to serve all our customer segments with relevant, high-quality

Lisa Månsson, Global Product Manager of Valmet Online Learning.

Listening to our customers to meet their expectations

Despite the high-quality content, a customer felt that its CFB boiler operators were not too keen about taking the e-learning courses provided by Valmet Learning Services. Based on customer feedback, **Lisa Månsson**, Global Product Manager of Valmet Online Learning and **Andreas Simbeck**, Manager Sales and Service in EMEA area, together with Valmet's subject matter and training experts started to think of a more inspiring and engaging training approach for operators.

The brainstorming resulted in a new, more interactive solution for CFB boiler consisting of three steps – Bronze, Silver and Gold – that progress from the basics to more advanced content about boiler operation and optimization.

"Interactivity, quizzes, videos, scenario trainings and to-the-point microlearning courses were added to the training to make the learning experience motivating and engaging, and at the advanced level there are individual assignments," Lisa Månsson explains.

Also, gamification features, such as competing with peers, digital badges and certifications for each passed training step, along with and visual progress tracking were included in the solution.

"This is a good example of how customer feedback helps us to develop our offering and meet the needs of our customers. Customers have been very interested in this new, engaging learning opportunity, and the learning results so far have been very promising."

content is really appreciated by our customers. Content is king, even when it comes to training," Olén points out.

Valmet offers both standard and customized courses that can be executed through a variety of ways and combinations, including online learning, cloud-based simulators and extended reality solutions as well as classroom-based, on-site or off-site courses – whatever serves the customer best.

"Our online courses covering pulp, paper, tissue and energy processes and equipment are available in Valmet Online Learning, which is a complete Learning Management System for the delivery, administration and reporting of e-learning courses."

Tailored training packages and open trainings for all customers

Customer-specific training packages are tailored both what comes to content and the form of courses.

"Our experience is that the best learning outcomes are achieved through a combination of standard and customized courses that are executed as classroom or other face-to-face training with a human-touch and supported strongly by our broad digital offering," Olén explains.

In addition to customized learning solutions, Valmet's Learning Centers are situated at Valmet locations around the world and offer regularly scheduled programs, including open courses and seminars in the topics most relevant to customers.

Maximizing the training value for customers

Valmet Learning Services has created a learning path concept that maximizes the training value for its customers. The concept consists of four steps:

Competence mapping to map the existing skills and knowledge and to identify competence gaps based on customer needs and targets.

Program design to design learning paths and courses to meet the customer's targets and to bridge individual competence gaps.

Training execution consisting of a set of standard and customized courses – on-site, off-site and online –to meet individual learning needs.

Assessment, evaluation and reporting where the learning is assessed, and the results are evaluated and reported.

> Read more www.valmet.com/about-us/learning-services/ or contact us at learning.services@valmet.com

Best piloting for paper finishing

Valmet's Paper Technology Center in Järvenpää, Finland, stands out with its unique paper finishing piloting services. To be even better and to correspond more accurately to the mill environment, the sizing section at the pilot facility has been updated with new spray beams and rolls.

TEXT AND PHOTOS Pauliina Purola

The sizer trials must be carefully planned and monitored.

A sizer with spray application has been in Valmet's piloting product portfolio for quite some time. In 2019, the whole sizing station was upgraded to meet the improved equipment design, but an even more important target was to be in a position to offer more efficient and accurate piloting services for surface sizing. "The rebuilding work for the pilot sizer went very well and as planned. The pilot sizer rebuild was relatively easy for Valmet because of our vast experience with rebuilds," says Superintendent **Esko Nupponen**.

Narrower beams – but like the real thing

The new spray sizing beams, rolls and hard roll covers for the hard nip sizer are the most significant upgrades. They correspond closely to the spray beams in a mill-scale sizer. "In a way, our previous spray beams were a result of continuous development. We started with one type of beam and added bits and pieces as the design evolved. This is quite a normal process in R&D. However, the end result did not look professional, even if this previous R&D version spray beam was working OK," says Superintendent **Mika Linjamäki**.

"With these new pilot beams, all the details and functions are exactly the same as with the mill-scale spray beams. The only major difference is the width of the machine. The pilot spray beam width is less than one meter, while the full-scale spray beam can be more than 10 meters wide. When the sizing process is well-tested at the pilot scale, the start-up curves with the new sizers at mill sites are very steep," Development Manager **Henri Vaittinen** describes the improvement.

Faster piloting services

Because the rebuild improves the efficiency of the pilot activities with reduced machine downtime, the sizing concept changes are shortened considerably. The structure of the pilot machine was designed for an easy beam exchange to test different sizing application methods

↑ Esko Nupponen and Henri Vaittinen are measuring web temperature during the sizer trials.

more quickly. For example, standard film sizer can be exchanged with a novel hard nip spray sizer in just one day. Previously, changing the film sizer took three days. Concept changes can now be made in a day, which improves the customer experience. "This is a real advantage when a customer wants to compare different surface sizing methods," adds Nupponen.

Preheating to imitate the paper mill environment

Experiments have shown that the sizing of hot web gives higher SCT and burst strength than the sizing of cold web. "Previously, there were cases where sizing pilot trials gave poorer strength improvements compared to the results from the mill. The sizing environment at the pilot didn't match the paper mill environment," Linjamäki describes the starting point.

Only one week after installing the web preheating system, the results were promising: "The laboratory test results correspond a lot better to the paper mill-scale environment when the web is preheated to similar temperatures to the web exiting the drying section. A 20-degree web behaves quite differently from a web of 60 or 80 degrees," Vaittinen says.

All the available sizing technologies can be tested in the most mill-like environment.

All the available surface sizing technologies

With the Valmet pilot sizer, all the available surface sizing technologies – film, spray and pond applications, with soft and hard rolls – can be tested in the most realistic and mill-like environment. These upgrades underline the fact that Valmet provides the world's most comprehensive piloting services for the entire board and paper making process – and has the best equipment to develop new technologies for the future. You're most welcome to come and test them for yourself!

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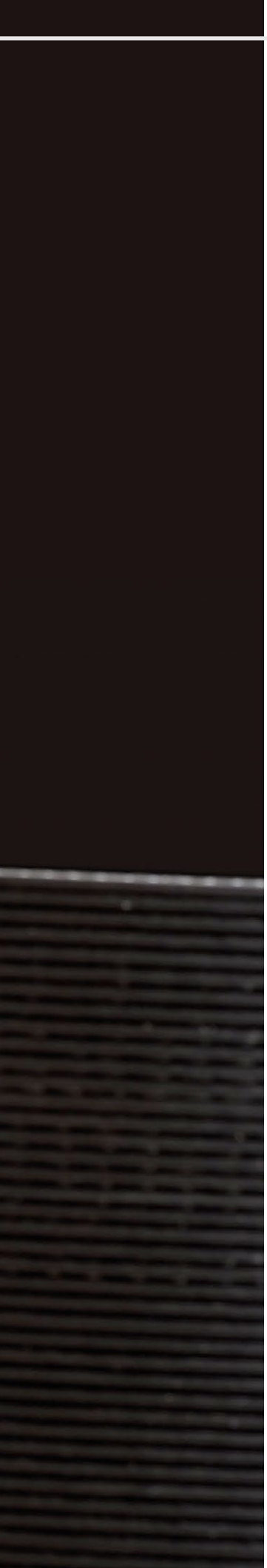
Valmet Black Belt R is especially designed for tissue machines.



All you need for tissue machine clothing

It's all moved rapidly since Valmet took the strategic decision to boost its tissue machine clothing development. The focus has been on the best possible raw materials, structure and runnability features of fabrics for tissue machines.

TEXT Marianne Valta

Valmet's paper machine clothing production has traditionally concentrated on the forming fabrics, press felts, shoe press belts and dryer fabrics used in paper and board machines. A few years ago, Valmet made the strategic decision to invest increasingly in the R&D and production of tissue machine clothing.

"Since the strategic decision, we've concentrated on fine-tuning our product portfolio and strengthening our brand in the tissue market. Today, we have a full and comprehensive selection of products for tissue machines

in all product categories – forming fabrics, press felts and shoe press belts," says **Juha Luhtalampi**, Global Product Manager, Tissue Machine Clothing.

Little things make the difference

The desired characteristics of tissue machine clothing differ little from those in paper and board machines – good runnability, water-removing properties and energy-saving potential being the most important.

"Our product offering has already covered tissue machine clothing for a while, but we've now had the opportunity to really seek out the best possible raw materials, structure and runnability features for our fabrics for tissue machines," Luhtalampi says.

"For example, we've launched a completely new shoe press belt, the Valmet Black Belt R, which is especially designed for the Valmet Advantage ViscoNip press. Its thin structure, durability and high-density grooves guarantee excellent performance at the highest tissue machine speeds and loads. It survives for a long time in harsh conditions and maintains a high level of water removal, offering very good drying energy savings potential," he continues.

Safety comes first

Valmet is the frontrunner in seam press felt development and has expanded its offering of seam press felts for tissue machines. It goes without saying that in addition to excellent performance, tissue machine clothing is developed with machine operators' safety in mind.

"We've enjoyed very close cooperation with several European tissue mills in developing our seam felt. We've achieved very good results, with a felt lifetime of up to 63 days. We've also seen a significant decrease of as much as 7 percent in drying energy consumption in one tissue machine with our seam felt. Above all, the seam felt ensures safe, fast and easy installation, meaning less downtime for the machine," Luhtalampi summarizes.

When you run at 2,000 m/min, you want clothing that fits.

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Valmet Black Belt set tissue belt running-time world record

Yunnan Yunjing Forestry & Pulp Co. Ltd., located in Yunnan province, China, started its tissue production in 2014 with a TM1 delivered by Valmet. Since the start-up, Yunnan Yunjing has relied on Valmet Black Belt shoe press belts. The cooperation has led to the continuous improvement of production efficiency and quality.

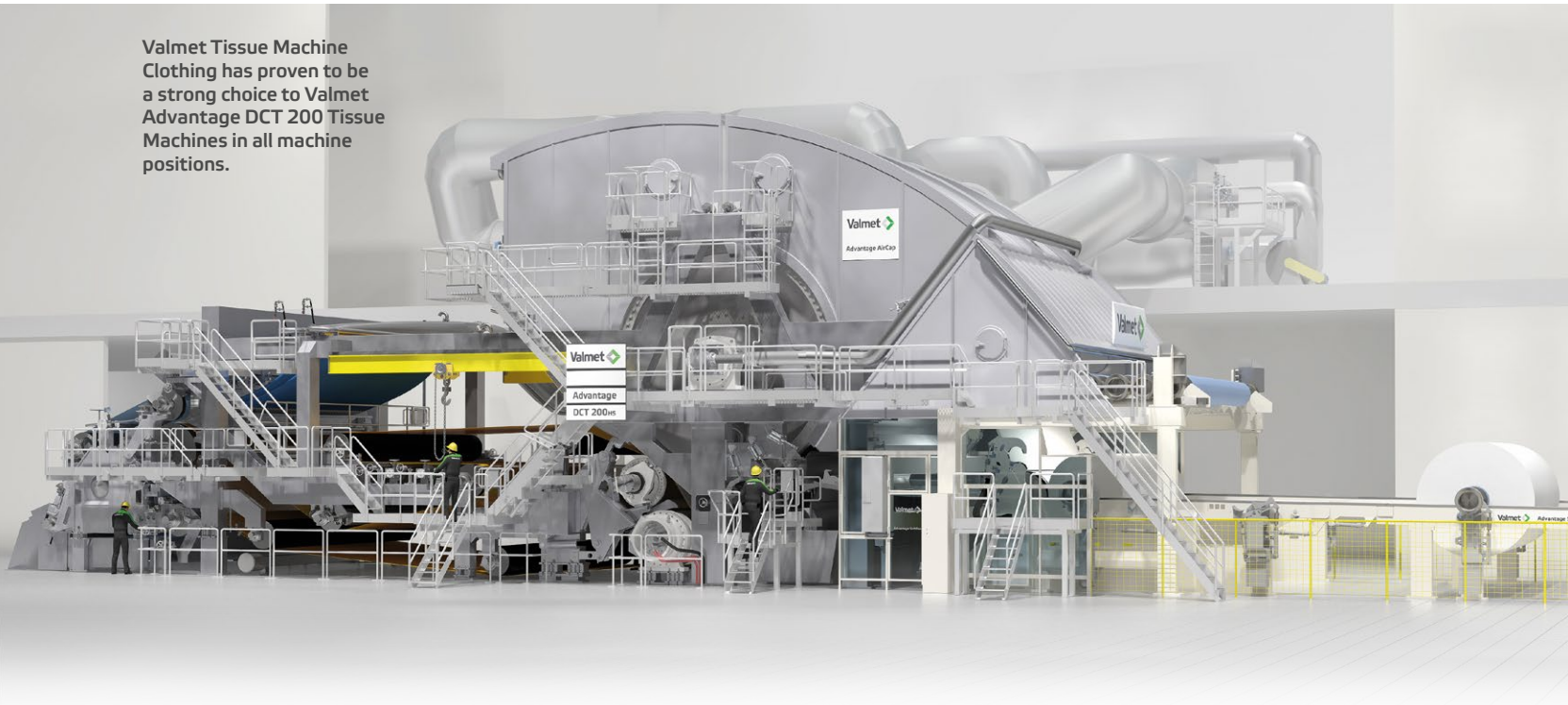
Mr. Rao Mingyou, Manager of the tissue machine mill, says: "We're really happy with Valmet's products and services. The Valmet Black Belt has shown especially good wear resistance, with the result that we achieved the world record tissue belt lifetime of 695 days with net running time of 665 days and approximately 500 000 000 nip cycles in 2018. And the belt has good dewatering efficiency, with 43 to 45 percent sheet dryness after the press, as well as stable quality."

CMPC Tissue – Softys Zarate TM4 relies on Valmet tissue machine clothing

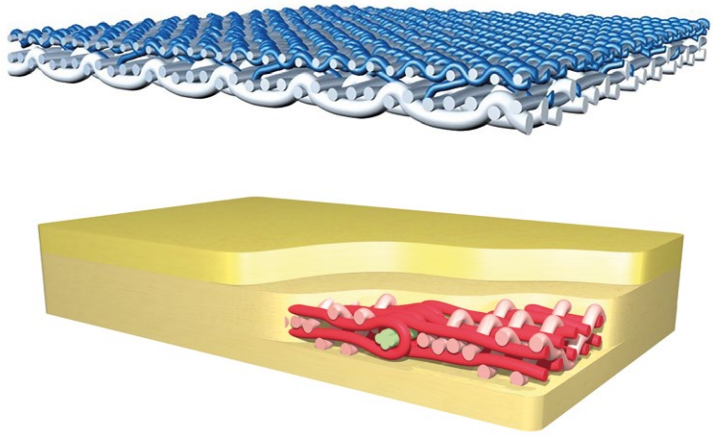
CMPC Tissue – Softys is one of Latin America's leading pulp and paper companies, running 30 tissue machines in seven countries with an annual production capacity of 980,000 tonnes of tissue products for the Latin American consumer and away-from-home markets. The latest addition to the CMPC Tissue – Softys fleet is the Advantage DCT200 tissue production line, which Valmet has delivered to the company's site in Zarate, Argentina.

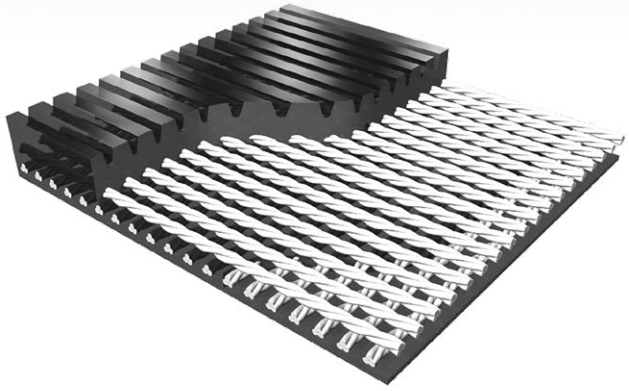
Valmet delivered all the tissue machine clothing for the start-up of the company's new TM4 in February 2020. The delivery included forming fabrics, press felts and belts for the Valmet Advantage ViscoNip press.

"Valmet's machine clothing performed well, meeting the requirements we'd set for the start-up of our new TM4. We were also satisfied with the cooperation with Valmet's staff, and the support we received from sales and technical groups at the site before and during the start-up. We're looking forward to continuing the collaboration, and we've therefore placed a repeat paper machine clothing order for all machine sections," says **Juan Caillabet**, Tissue Operations & Innovation Manager at CMPC Tissue – Softys.



Valmet Tissue Machine Clothing has proven to be a strong choice to Valmet Advantage DCT 200 Tissue Machines in all machine positions.





Valmet's full line of tissue machine clothing: Valmet Forming Fabric GM, seamed Valmet Press Felt SMO and Valmet Black Belt R.

Strength lies in versatile tissue expertise

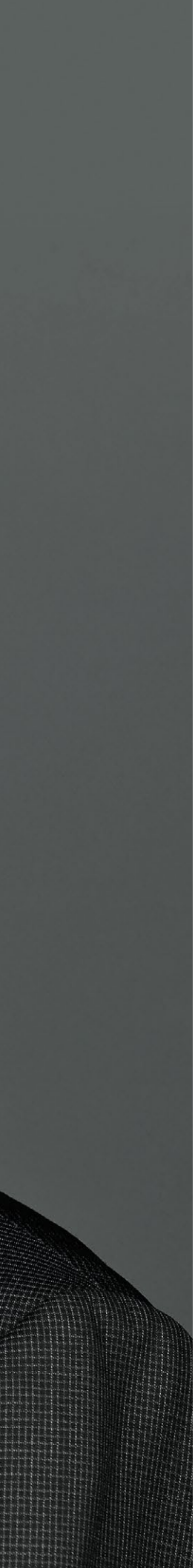
Juha Luhtalampi's experience in the tissue industry goes back to the 1990s, covering production, tissue machinery technology and tissue product development. As a Global Product Manager, he leads the Valmet crew in seeking a stronger position in the global tissue machine clothing market.

"Our strength definitely lies in our enduring in-depth expertise in paper machine clothing, as well as production and process technology, and tissue machine maintenance. Our comprehensive product and service portfolio can really make the difference," Luhtalampi says.

EXPERT'S VOICE

Food for thought

Frédéric Dalsace, Professor of Marketing and Strategy at IMD, Institute for Management Development in Lausanne, Switzerland.



Information age calls for empathic leaders

In the era of rapid digitalization and emerging new technologies, one may think that they would be at the center of learning efforts. But no. Focus should instead be put on the leaders' capacity for reflective leadership and on fostering empathy, humility and audacity.

TEXT Sanna Haanpää-Liukko

Life is more complicated today than, say, thirty years ago, when there were no laptops, no e-mails, nor mobile phones. Everything happened more slowly compared to today's fast pace at work and in our private lives.

Today, mobile communication devices, social media and 24/7 connectivity mean that work and nonwork roles are overlapping more and more, and almost everybody is working at home outside the office hours and during weekends.

"Sunday evening is the new Monday morning if you look at the flow of work-related e-mails. And a response is expected within hours, not days. It sometimes feels that companies are prioritizing 'busyness', not business. In my opinion, we should consider very carefully if this is what we want to have – this culture of boundarylessness – in our company or in our society. Does it really give us the best

results and brightest innovations at work or joyful non-work life?" says **Frédéric Dalsace**, Professor of Marketing and Strategy at IMD, Institute for Management Development in Lausanne, Switzerland.

But it is not only employees in white-collar roles whose work has changed radically. Digitalization and Industrial Internet, among other things, have changed the nature of the work done in blue-collar jobs. New technologies have made the work partly easier and safer and partly more demanding in terms of adopting new computer and mobile applications as well as information interpreting skills.

Pursuing reflective leadership

Technological development is so fast that it doesn't make sense to concentrate so much on learning specific solutions that may be old in only a couple of months; it is more important to support people in creating a mindset of continuous learning.

To succeed in this, leaders themselves should, firstly, adopt a mindset called reflective leadership and, secondly, foster empathy, humility, and audacity as fundamental aspects at work.

Reflective leadership is an approach where leaders constantly reflect on what they do and how they act in their leader roles, and evaluate their decisions, mistakes and successes in a constructive way. What did I do and what was the outcome of my action? What did I achieve today? What were the tools I used? What did I learn? How can I become better? Who could help me to develop? These are the kinds of questions reflective leaders ask themselves.

"Reflection supports leaders in developing, understanding, and adopting versatile leadership styles."

Reflection also supports leaders in developing, understanding, and adopting versatile leadership styles that are the best fit with different individuals and situations in order to make the biggest impact.

The three fundaments of leadership, customer centricity and innovation

Instead of skills in areas that are usually connected to management and leadership development, Dalsace highlights quite different things that are necessary for a leader to master.

"Empathy, humility and audacity form the true fundament of leadership, customer centricity and innovation," Dalsace explains.

Empathy, the ability to feel with others, is needed to create shared value – it is the number-one starting point for customer centricity and essential for fruitful interaction with colleagues, team members or suppliers. Humility helps people to be open to learning new things and adopting new ways of thinking, a personality element necessary in times of rapid change and need for innovation. And last, but not least, audacity helps people to dare to think big, to take risks and to try new things.

Managing the work–nonwork boundaries

A growing number of employees globally are feeling increased work–life stress and are in need of better ways to manage the boundaries between the work and nonwork parts of their lives. Why? In order to be effective, productive and innovative at work people should be able to focus on their work duties – and, on the other hand, contentment in one's private life requires that the focus can be directed to the things they find important in life. Both parts of life – work and nonwork – contribute to and impact each other.

"People have different personal strategies to cope with the work–nonwork balance. Some of us choose integration, others choose separation and some a combination of these two as their strategies. What you choose depends on the degree of control you have over your work, your situation in life and your personality," says Dalsace.

The integration approach means that a person shifts flexibly between work and nonwork roles; separation emphasizes the clear boundaries between work and nonwork. A combination of these two may occur when an individual adopts the integration approach during weekdays and separation during weekends.

It is a leader's responsibility to act as a role model and ensure that individuals in her/his team have an opportunity to reach a work–nonwork balance by using the strategy that suits them best.

"Open-minded support for these different strategies is an important way to help people to be at their best – both in their job roles and outside work."

"Reflective leadership is an approach where leaders constantly reflect on what they do and how they act in their leader roles, and evaluate their decisions, mistakes and successes in a constructive way," explains Frédéric Dalsace, Professor of Marketing and Strategy at IMD, Institute for Management Development.

"Empathy, humility and audacity form the true fundament of leadership, customer centricity and innovation."

Strong ethics supports decision-making in challenging situations

Dalsace points even out ethics as something that should be included in management and leadership studies.

"Ethics helps us to find and create meaning and purpose for companies and supports organizations to act in a way that is beneficial for the whole society."

Artificial intelligence (AI), machine learning and other modern technologies provide great opportunities to improve both businesses and people's lives. But the question is: how much decision-making power and in what contexts should we humans allow AI to have. Strong ethics and the readiness to ask eye-opening questions will help us to make conscious decisions in these kinds of questions.

"I sincerely hope that we could teach the future leaders to question where and in what way do we really want to use all these possibilities created by advanced technology," Dalsace concludes.

Around the world

A biomass-fired boiler plant for Tampereen Sähkölaitos

Valmet will deliver a biomass-fired boiler plant to Tampereen Sähkölaitos Oy's Naistenlahti power plant in Tampere, Finland, to replace the Naistenlahti 2 boiler.

New reeling and winding technology for Metsä Board

Valmet will supply new reel and winding technology and surrounding equipment for Metsä Board Kyro mill in Finland to modernize the KK 1 board machine.

Automation for a gas clean-up system for Viridor

Valmet will supply automation for a gas clean-up system at Viridor's Dunbar Landfill site in East Lothian, Scotland, UK. The first-of-its-kind system allows the successful capture of CO_2 and transforms landfill gas into transport fuels.

Automation for AustroCel's new bioethanol plant

Valmet will supply automation for AustroCel's bioethanol plant, currently under construction in Hallein, Austria.

Ash treatment system for L.D. Celulose

Valmet will supply an ash crystallizer plant to LD Celulose S.A. in Brazil. The ash crystallizer delivery is part of Lenzing's and Duratex's joint venture LD Celulose's project to build a new 500,000 tonne/year dissolving pulp mill in Minas Gerais State, Brazil.

A complete steam boiler plant for Norske Skog

Valmet will supply a complete steam boiler plant to Norske Skog's paper mill in Bruck an der Mur, Austria.

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 customers to move their performance forward.

A central control and data collection system for PVO-Vesivoima

Valmet will supply a central control and data collection system to operate PVO-Vesivoima's hydro power plants on the Iijoki, Kemijoki and Kokemäenjoki rivers in Finland.

Automation for greenfield waste-to-energy plant

Valmet has agreed with Hitachi Zosen Inova AG (HZI) to supply automation to a new waste-to-energy facility in Moscow, Russia.

Automation systems for Shandong Sun Paper Industry Joint Stock Co., Ltd.

Valmet will supply Valmet DNA automation systems to Shandong Sun Paper Industry Joint Stock Co., Ltd. (Sun Paper) in China for the company's PM 39 and PM 40 paper machines.

Mill-wide distributed control system for JK Paper Limited

Valmet will supply a complete mill-wide Valmet DNA Distributed Control System (DCS) to JK Paper Limited for their upcoming board project at Fort Songadh Mill, India.

Marine scrubber systems for Mitsubishi Shipbuilding Shimonoseki Shipyard

Valmet has signed a contract with Mitsubishi Shipbuilding Co., Ltd.'s Shimonoseki Shipyard in Japan to deliver hybrid scrubber systems, water treatment units and Valmet's marine automation system for two ferries.

A fine paper making line with an extensive scope and a recovery boiler for Sun Paper

Valmet will supply a fine paper making line with stock preparation, an extensive automation scope and a recovery boiler for Sun Paper in Beihai, China. Another stock preparation line for a different Sun Paper site will also be supplied.

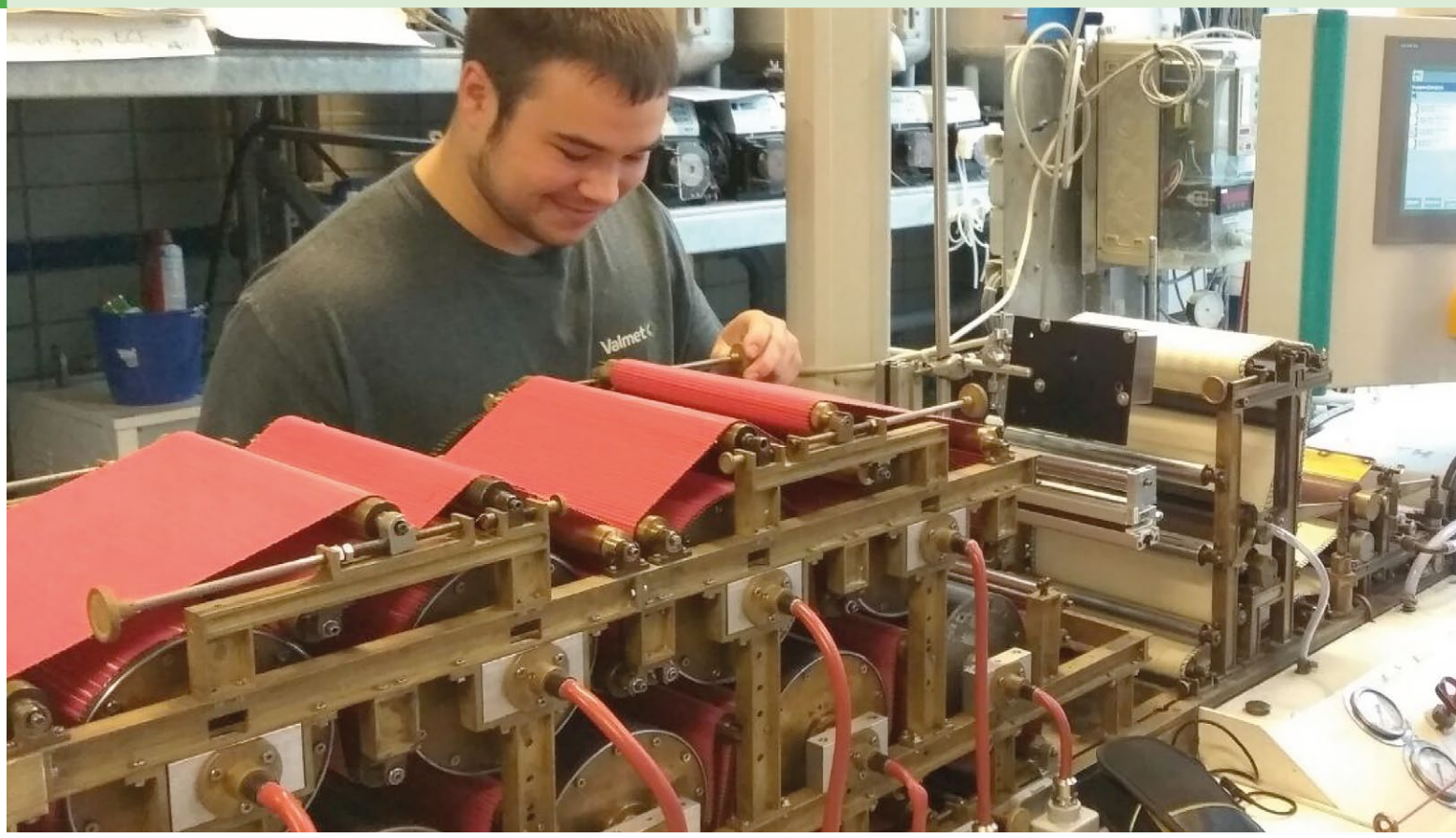
Conversion of a lignite-fired boiler plant to biomass combustion at Zespół Elektrowni Pątnów-Adamów-Konin SA

Valmet has received an order from Zespół Elektrowni Pątnów-Adamów-Konin SA (ZE PAK) to convert a lignite-fired boiler into a biomass-fired boiler at its power plant in Konin, Poland.

Cooking and fiberline for Sun Paper's Beihai mill

Valmet will supply cooking and fiberline to Guangxi Sun Paper Co., Ltd's new Beihai mill in China, which will have a capacity of 800,000 air dried tonnes per year of bleached hardwood kraft pulp.

About Valmet



A deep dive into papermaking

Jelle Schuivens has joined Valmet as an intern and trainee. At Valmet, he has been using every opportunity since his bachelor's degree to discover the different areas of paper production. We asked him about his experiences.

Jelle Schuivens chose to study paper technology at the Munich University of Applied Sciences, because he was fascinated by papermaking. To gain international experience in the paper industry and to work on his own at an early stage, he joined Valmet as an intern. Since then he has participated in a one-year work stay in the USA, spent two-years as a summer trainee in Finland and was a trainee in Italy and Belgium.

How did you come to study paper technology?

Instead of my matriculation exam, I completed my training as a paper technologist in Gernsbach, Germany. I went through every area of the paper mill, from raw material handling, stock preparation, paper and board machines to shipping. Then I decided to take a year off from school and go to work for Valmet in the preventive maintenance department of a paper mill in the USA. That awakened my appetite for more, and for further study.

Can you give an example of the tasks you were assigned?

One of my trainee experiences took place at a paper mill in Italy. The state-of-the-art machine there produces test liner for corrugated board. I was allowed to carry out tests on an interesting former and headbox

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combination. It was one of the first of its kind, consisting of a horizontal shoe and blade former, and a multi-layer headbox with Aqualayer technology. I started tests on the headbox – things like jet-wire ratio optimization and layer flow distribution – and documented them. I set the optimal dewatering parameters for the former. With the Aqualayer, I investigated further parameters that led to maximum strength properties.

How would you describe your role in the team?

For example, responsibility in production looked like this: I was given a plan/diagram (P&ID) with the request to flush the showers of the wire and press sections all by myself. I noticed again and again that trust was placed in me, and that my work made sense.

During that time, I worked several night shifts. I was often "Mister Valmet" – and got to answer questions when problems arose. This allowed me to go troubleshooting with the customer, and I learned a lot. I could determine with the customer which values needed to be changed on the machine to achieve the desired result. And when you solve the problem, it's a great feeling and incredibly exciting.

How did being a trainee at Valmet meet your expectations?

They were more than exceeded. I couldn't imagine getting so much responsibility. I learned a lot about commissioning and saw for the first time how paper gets onto the reel. I was given a lot of meaningful tasks that helped me improve my technical skills.

Can you imagine a future at Valmet?

Absolutely. My plan is to continue working in the commissioning team after my studies. At Valmet, I know I can develop myself further. For example, it is possible to start out as a process engineer, and if you do well, you can advance to a position with more responsibility for staff and big machinery.

Would you recommend Valmet to others?

I'm always recommending Valmet to others. It's exciting to have the opportunity to spend time abroad and work with other nationalities. Part of the time, I was the only German among Finns. I was often able to stand out with a different approach. That's certainly not always an easy undertaking as an outsider, but – with a little patience – it's no problem!

Forward

VALMET'S CUSTOMER MAGAZINE

FORWARD
Valmet's customer magazine

PUBLISHED BY
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ENGLISH LANGUAGE EDITOR
AAC Global

LAYOUT AND ART WORK
Neutron Design

PRINTING
Grano

Printed on MultiArk Silk 115/250 g/m²
Supplement printed on Lumiforte 115 g/m²

Printed on July 3, 2020

ADDRESSES
Valmet Corporation, customer data

ISSN
0356-2751 (Printed)
1458-8013 (Electronic version)

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